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Harvests and Uses of Wild Resources in 4 Interior Alaska Communities and 3 Arctic Alaska Communities, 2014

by

Caroline L. Brown

Nicole M. Braem

Marylynne L. Kostick

Alida Trainor

Lisa J. Slayton

David M. Runfola

Elizabeth H. Mikow

Hiroko Ikuta

Christopher R. McDevitt

Jeff Park

and

James J. Simon

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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	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

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Caroline L. Brown, Nicole M. Braem, Alida Trainor, Lisa J. Slayton, David M. Runfola,
Elizabeth H. Mikow, Hiroko Ikuta, Christopher R. McDevitt, Jeff Park, and James J. Simon
Alaska Department of Fish and Game Division of Subsistence, Fairbanks

and

Marylynne L. Kostick
Alaska Department of Fish and Game, Division of Subsistence, Anchorage

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

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Caroline L. Brown, Nicole M. Braem, Alida Trainor, Lisa J. Slayton, David M. Runfola,
Elizabeth H. Mikow, Hiroko Ikuta, Christopher R. McDevitt, Jeff Park, and James J. Simon
Alaska Department of Fish and Game Division of Subsistence
1300 College Road, Fairbanks, AK 99701-1551

and
Marylynne L. Kostick
Alaska Department of Fish and Game Division of Subsistence
333 Raspberry Road, Anchorage, AK 99518-1565

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ABSTRACT

This report summarizes the results of research conducted on the 2014 harvests and uses of wild food by 7 communities in Alaska's Interior and North Slope regions. Between December 2014 and April 2015, eligible households in Tanana, Rampart, Stevens Village, Healy and nearby census designated places, Utqiaġvik, Nuiqsut, and Anaktuvuk Pass answered questions about their harvest and use of fish, wildlife, and wild plants in 2014. Using a combination of ethnographic key respondent interviews and household surveys, researchers 1) estimated annual harvests and uses of wild fish, wildlife, and plant resources in a 12-month study period by residents of study communities; 2) mapped areas used for hunting, fishing, and gathering; 3) collected demographic and income information; 4) evaluated trends in wild resource harvests; and 5) documented traditional knowledge observations regarding wild resources.

This project was conducted cooperatively by Alaska Department of Fish and Game Division of Subsistence, City of Utqiaġvik, Native Village of Utqiaġvik, Native Village of Nuiqsut, Village of Anaktuvuk Pass, Native Village of Tanana, Rampart Traditional Council, and the Stevens Village IRA Council. It was funded through a reimbursable services agreement with State Pipeline Coordinator's Section (SPCS) and the Alaska LNG partners. The results of the project may be used as part of the National Environmental Policy Act review of the proposed Alaska Liquid Natural Gas Project (LNG) alternatives.

Total estimated harvests of wild foods for the seven study areas were 197,715 edible pounds (969 lb per capita) in Tanana, 14,754 edible pounds (378 lb per capita) at Rampart, 3,748 edible pounds (375 lb per capita) at Stevens Village, 51,996 edible pounds (52 lb per capita) at Healy,1,923,351 edible pounds (362 lb per capita) in Utqiaġvik, 371,992 edible pounds (896 lb per capita) in Nuiqsut, and 124,269 edible pounds (391 lb per capita) in Anaktuvuk Pass. Results indicate that high levels of subsistence harvest and use of wild foods remain a hallmark of Interior and Arctic communities despite very different subsistence bases. Total subsistence harvests appear to have declined for the study communities in Interior Alaska. In the 3 communities for which earlier comprehensive data exist, 2014 harvest levels were all 45% or less of mid-1980s levels. Harvest levels for the participating Arctic communities appear to have remained stable or increased.

Key words: subsistence hunting, subsistence fishing, Healy, Utqiaġvik, Nuiqsut, Anaktuvuk Pass, Tanana, Rampart, Stevens Village, Alaska LNG.

1. INTRODUCTION

Caroline L. Brown and Nicole M. Braem

This report summarizes the results of research conducted on the 2014 harvests and uses of wild food by 7 communities in Alaska's Interior and North Slope regions. This research took place in the second year of a 3-year study in 19 communities situated along the proposed Alaska Liquified Natural Gas Project (Alaska LNG) pipeline route from the northern coastal plain of Alaska through Interior Alaska to Southcentral Alaska's Kenai Peninsula.

The 2015 study communities are located within the boundaries of the North Slope, Fairbanks North Star, and Denali boroughs (Figure 1-1). Demographic characteristics and harvest levels vary among the study communities, as does the species composition of harvest. Population estimates for the study communities in 2014 ranged from 10 in Stevens Village to 5,314 in the North Slope regional center of Barrow (Table 1-1). Alaska Natives were the majority of residents in the smaller, off-road communities; in these communities, the Alaska Native population ranged from 84% to 100% (Table 1-2). Division of Subsistence estimates differed from those produced by Alaska Department of Labor; these differences can be explained by a number of factors including survey timing, definitions of residency, and sampling strategies. Two of the North Slope communities have regular access to a resource category—marine mammals—that is unavailable for harvest by residents of the other study communities.

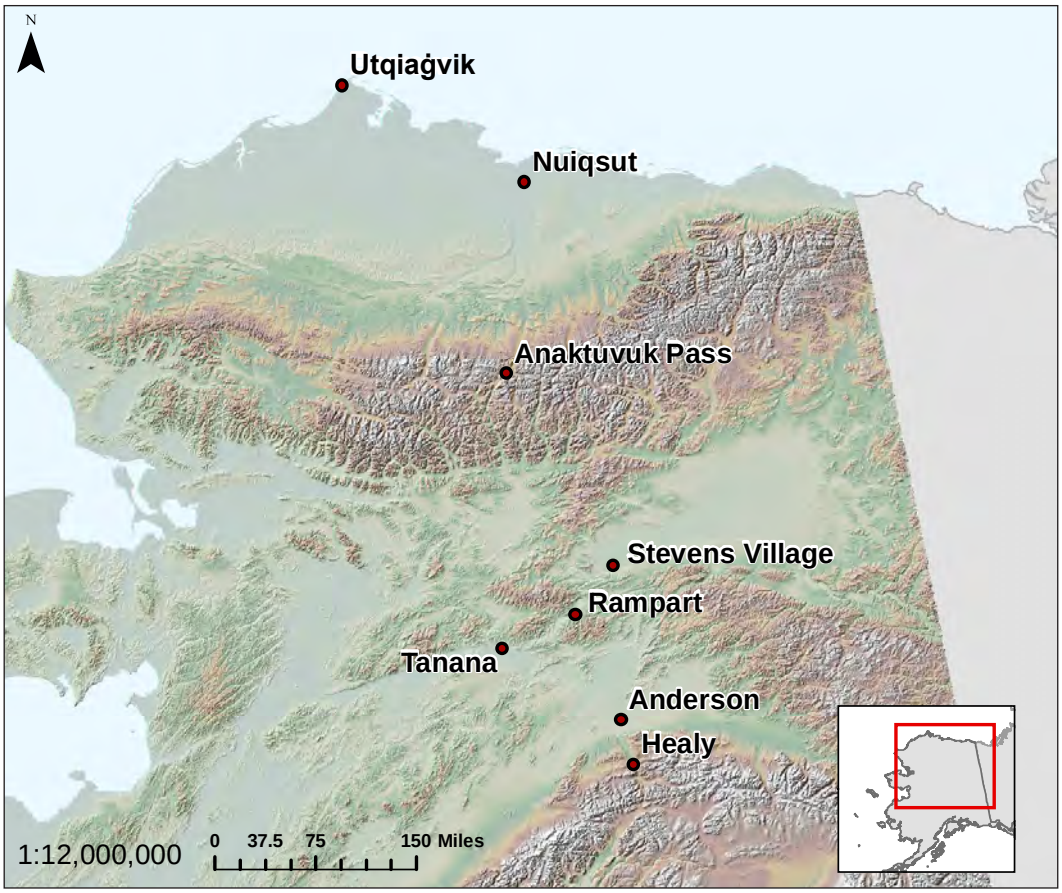

Figure 1-1.–Map of study communities, 2014.

Table 1-1.–Population estimates, study communities, 2010 and 2014.

	Interior				Arctic		
Year	Tanana	Rampart	Stevens Village	Healy	Utqiaġvik	Nuiqsut	Anaktuvuk Pass
2010 (U.S. Census)	246	24	78	1,021	4,212	402	324
2014 (This study)	204	39	10	1,006	5,315	415	318

Sources U.S. Census Bureau (2011) for 2010 estimate; ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate.

Project Background

This project was conducted cooperatively by Alaska Department of Fish and Game (ADF&G) Division of Subsistence, City of Barrow, Native Village of Nuiqsut, Village of Anaktuvuk Pass, Tanana Tribal Council, Rampart Traditional Council, and Stevens Village IRA Council. It was funded through a reimbursable services agreement with the State Pipeline Coordinator's Section (SPCS) and the Alaska LNG partners. The results of the project may be used as part of the National Environmental Policy Act review of the proposed Alaska LNG alternatives.

The Alaska LNG project, as proposed, includes a natural gas treatment plant at Point Thomson, an 800-mile pipeline, compressor stations along the route, and a liquefaction plant at Nikiski on Cook Inlet. Project partners anticipate that at least 5 offtake points will be built to help facilitate in-state gas delivery.[1]

The goal of this research was to document baseline information about the contemporary harvest and uses of fish, wildlife, and plant resources by communities situated near the proposed Alaska LNG pipeline route, as well as traditional knowledge about these resources. Systematic documentation of this information is needed to help address long-term data gaps in the proposed development area. In some study communities, little comprehensive subsistence research has been conducted that documents the full range of wild resource harvests and uses; in others, data were very old and in need of updating. Maps of subsistence harvest areas were also limited.

Between 2011 and 2012, the division conducted comprehensive baseline subsistence research in 12 communities located along the proposed corridor of a natural gas pipeline. These communities were located in an area that stretched from the northern coastal plain of Alaska, through the eastern Interior to Delta Junction, then along the Alaska Highway to the Canadian border (Holen et al. 2012). This research was part of the Alaska Pipeline Project (APP). Early in 2013, the division conducted similar research in the communities of Manley Hot Springs and Minto related to a proposed road to Tanana (Brown et al. 2014). Subsistence surveys were also conducted in 2013 in communities in the Susitna River Basin (Holen et al. 2014). As a result of this recent research, a number of communities along the LNG pipeline route did not require inclusion in this study.

Regional Background

Interior

The middle and upper Yukon River areas roughly include all the land and waters that drain into the Yukon River mainstem from the community of Holy Cross upriver to the community of Tanana and the area from Tanana to the community of Eagle at the border with Canada, respectively. The middle and upper Yukon areas surrounding the study communities are primarily encompassed by Alaska Department of Fish and Game (ADF&G) game management units (GMUs) 21E, 21D, 21B, 20F, and 25D. A variety of similar, but not always identical, political boundaries are also part of the middle and upper Yukon areas. These include service areas of Doyon, Limited (an Alaska Native corporation formed under the Alaska Native Claims Settlement Act [ANCSA]), Tanana Chiefs Conference (TCC; a nonprofit ANCSA corporation), the Council of Athabascan Tribal Governments (CATG; a tribal consortium of Yukon Flats communities); and the

1. Alaska LNG. 2016. "Access to gas: gas for Alaskans." Accessed March 9, 2016. http://ak-lng.com/project/gas-for-alaskans

Table 1-2.–Ethnic composition of households and population, study communities, 2014.

	Tanana	Rampart	Stevens Village	Healy	Utqiaġvik	Nuiqsut	Anaktuvuk Pass
Total population							
Households	91.0	13.0	4.0	366.0	1584.0	108.0	99.0
Population	204.1	39.0	10.0	1005.8	5314.7	415.2	317.5
Alaska Native							
Households	78.6	13.0	4.0	14.4	978.5	96.8	81.5
Percentage	86.4%	100.0%	100.0%	3.9%	61.8%	89.7%	82.4%
Population	180.6	39.0	10.0	25.9	3559.5	398.5	267.2
Percentage	88.5%	100.0%	100.0%	2.6%	67.0%	96.0%	84.1%

Source ADF&G Division of Subsistence household surveys, 2015.

communities served by the federal subsistence management program by the Western- and Eastern-Interior Regional Advisory Councils. The project area includes both state and federal waters used for subsistence fishing, including waters within or adjacent to the Yukon Flats and Nowitna national wildlife refuges. In Healy, the only Interior Alaska community included in this study not located on the Yukon River, fishers reported a pattern of traveling to the Copper or Kenai rivers to dipnet for sockeye and Chinook salmon under personal use regulations.

The middle Yukon River area was historically occupied by Athabascans representing different language groupings. It was occupied primarily by Deg Hit'an, Holikachuk, and Koyukon speaking people. Ancestors of these groups inhabited this area for at least a few thousand years (de Laguna 1936, 1947; Nelson 1978; Osgood 1940). The middle Yukon communities of Tanana and Rampart are culturally and linguistically distinct Koyukon Athabascan, while residents of Stevens Village occupy the boundary areas between Koyukon and Gwich'in Athabascan speaking peoples. Historically, 2 principal groups of people—the Nenana-Toklat and the Wood River bands of Athabascans—utilized the upper Nenana River basin and lowlands of the Tanana River valley between the Nenana and Wood rivers near the foothills of the Alaska Range where Healy is located (McKennan 1981; Shinkwin and Case 1984). However, by the 1940s most of the region's indigenous residents had settled primarily into the communities of Nenana and Minto (Shinkwin and Case 1984).

Historically, all of these were semi-nomadic groups that maintained larger winter villages consisting of several families and smaller seasonal camps usually occupied by only a few families. The joint forces of missionization and economic development, primarily fur trapping and mining, ultimately consolidated these settlements into more permanent communities in the early 1900s. Specific community histories can be found in each community's chapter.

These seasonal settlements were characterized by a long-established pattern of moving around the land in pursuit of wild resources that was still followed in 2014, though modified by the existence of permanent communities. Although some generalizations about the overall historical seasonal round of subsistence activities for the middle and upper Yukon areas can be made, specifics of the activities, species harvested, and movements from camp to camp varied significantly between groups within this large area. In general though, the seasonal round began in spring, before breakup, when families moved to spring camps to trap, fish for various nonsalmon species, and hunt migratory birds. Summers were devoted primarily to salmon fishing at fish camps, usually along the mainstem of the Yukon River where large quantities of salmon were caught and processed for consumption by both humans and dogs. Depending on the area of the Yukon River drainage and the run timing of salmon species, subsistence salmon fishing occurred from late May through early October. Fishing activities, based either from fish camps or from home communities, varied from community to community in terms of gear, targeted species, preferred sites, and fishing social structure. Extended family groups, typically representing several households, often undertook subsistence salmon fishing together. Households and related individuals typically cooperated to harvest, process, preserve, and

store salmon for subsistence uses. (For more detail on subsistence uses of Yukon River salmon, see ADF&G [1987]). In the fall, families traveled to fall camps (which were sometimes the same as their spring camps) from which they fished for nonsalmon species and hunted for ducks and geese. In winter, subsistence activities took the form of moose and caribou hunting, small game trapping, and fishing under the ice. Winter was also the time for mending subsistence equipment, visiting, and storytelling. These seasonal activities continued in 2014; although fishing was usually based out of the permanent communities, some summer fish camps were still in operation.

Arctic

Barrow, Nuiqsut, and Anaktuvuk Pass are located on Alaska's North Slope. The region lies entirely above the Arctic Circle. Its boundaries are, from west to east, Point Hope to the Canadian border; the Chukchi and Beaufort seas to the north; and the crests of the Brooks Range to the south. A significant portion of the area is flat coastal plain characterized by wet, treeless tundra; however, topography and vegetation gradually change in the southern foothills of the Brooks Range. Temperatures in the Arctic range from -58°F to 78°F (Braem et al. 2011). The sun sets at Barrow, the northernmost community in the United States, on November 18 and does not rise above the horizon again until January 24 (although there is usable twilight during that time). During the summer, the sun does not set between May 10 and August 2.[2]

The region holds, by Arctic Slope Regional Corporation (ASRC) estimates, 4 trillion tons of coal.[3] Additionally, the petroleum industry estimates that 7.7 billion barrels of oil lie within the Arctic coastal plain east of the National Petroleum Reserve Alaska (NPR-A), in an area that includes the Arctic National Wildlife Refuge (ANWR; Bird and Houseknecht 2001).[4] Within the NPR-A, the United States Geological (USGS) estimates there are 896 million barrels of oil and 53 trillion cubic feet of natural gas (Houseknecht et al. 2010). The USGS stated that the greatest potential for finding oil within the reserve is located in the northeast portion of the reserve.

The area's political boundary is the North Slope Borough (NSB), a home-rule borough formed in 1972 that encompasses nearly 95,000 square miles.[5] Eight predominately Iñupiaq communities are part of the NSB: Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Hope, Point Lay, and Wainwright. Industrial settlements associated with the oil industry are located at Prudhoe Bay and Umiat. The boundaries largely coincide with the service areas of the Arctic Slope Regional Corporation (ASRC; an ANCSA for profit regional corporation), the Iñupiat Community of the Arctic Slope (a regional tribal government), and the Arctic Slope Native Association (ASNA), a regional Alaska Native nonprofit corporation that provides health care and social services. Most of the region falls within the state GMU 26, however a small portion is included within GMUs 23 and 24. North Slope communities are represented in the federal subsistence management system by membership in the North Slope regional advisory council.

In 2014, more than one-half of the borough's 7,565 residents lived in the regional center, Barrow, and the rest lived in communities ranging in size from 190 to 654 inhabitants (ADLWD 2015).[6] In 2010, three-

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 June 2, 2016. http://commerce.state.alaska.us/dcra/DCRAExternal/community

3. Arctic Slope Regional Corporation (ASRC), Barrow. 2013. "Resource development." Accessed March 29, 2016. http://www.asrc.com/Lands/Pages/Coal.aspx

4. The value 7.7 billion is the mean value of estimates of technically recoverable oil.

5. North Slope Borough, Barrow. 2016. "Official website of the North Slope Borough." Accessed June 16, 2016. http://www.north-slope.org

6. In 2010, the U.S. Census began including the population living in group quarters at Prudhoe Bay as part of the population of the NSB. Workers living and working there maintained primary residences elsewhere in Alaska and outside the state. Thus, the 2014 estimated population of 2,174 in the Prudhoe CDP is excluded from the division's description of the NSB population. Additionally, the North Slope Borough produces its own census estimates which differ from the U.S. Census and Alaska DOL estimates. In 2010, the NSB estimated a total borough population of 7,998, and the U.S. Census estimated 7,256 (excluding the Prudhoe Bay CDP estimate of 2,174; Shepro et al. [*n.d.*]; U.S. Census Bureau n.d.).

quarters of borough residents were Iñupiat Eskimo, and an additional 1% comprised members of other Alaska Native groups and American Indians (Shepro et al. [*n.d.*]:5). The percentage of non-Native residents in Barrow in 2014 was 35%, a decrease from 40% in 2003 (Shepro et al. [*n.d.*]:35).

Funded by oil tax revenues, the borough provides a variety of services to Barrow and the surrounding communities such as water and sewer, fuel subsidies, landfills, laundromats, and trash pickup. Most goods coming into the region arrive either by barge, in ice-free months, or by jet. The Dalton Highway, located in the eastern portion of the borough, provides access to the Prudhoe Bay oil complex. Few sources of information describe living costs in the region relative to urban areas of Alaska. A 2009 study that sampled the regional hubs of Nome, Kotzebue, Barrow (and the small community of Teller) found that living costs across "Arctic" Alaska were approximately 148% higher than in Anchorage, Alaska's largest city (McDowell Group 2009). However, given its sample limitations, this report likely understates the expense of living in the smaller communities. North Slope residents benefit from borough fuel and electricity subsidies. In 2014, the price for residential heating oil (the primary heating source in most communities) ranged from $1.40–$2.50 per gallon in the smaller communities and electricity rates varied from $0.08 to $0.35 per kilowatt hour. Most homes in Barrow and Nuiqsut are heated by natural gas (WHPacific, Inc. 2015).

The official unemployment rate in the NSB is high: approximately 26.5%. However, a far higher percentage of adults (49.4%) are considered to be underemployed (Shepro et al. [*n.d.*]). More job opportunities exist in Barrow than elsewhere; unemployment rates are higher in the smaller communities. Borough residents, particularly those living smaller communities, remain heavily dependent on the subsistence harvests of fish and game and participate in a mixed wage–subsistence economy.

In the mid-19th century, 25 distinct Iñupiaq Eskimo societies with an estimated total population of 2,975 existed in Northwest Alaska (Burch Jr. 1980). On the North Slope, these included the Arctic coastal plain society, Barrow society, Colville River society, Northwest coast society, Point Hope society, and Utukok River society. The territory of the Barrow society (estimated population 600) ranged along the Arctic coast from Point Belcher to the vicinity of Christie Point and inland approximately 50 km. Numerous small settlements existed within each, typically inhabited by large, bilaterally extended families. Occasionally at very productive locations such as Point Hope and Barrow, larger settlements existed. Archaeological and ethnographic evidence points to the presence of an intercontinental trade network that preceded the presence of non-Natives in Alaska (Bockstoce 2009). Annual trade fairs across the north at Pastuliq, Port Clarence, Sisauliq (Sheshalik), Icy Cape, Nigliq[7] and Barter Island moved Alaskan furs to Chinese markets through Native traders at Bering Strait and Chukchi. A flow of manufactured goods and desired commodities spread across Alaska through the same trade fairs in return:

> The fur trade at Bering Strait was one aspect of the European expansion into the most remote regions of Asia and America. At times it involved the contest for dominion between Russia and Great Britain, but at its basis was always the search for profit—in whatever way it was defined by the participants. Far beyond the Europeans and Americans who sought to buy furs, ivory and whalebone for the markets in the south, members of fifty native nations provided these commodities to one another—and to foreigners—in return for goods that they required or desired. Manufactured goods, coastal products, inland products, tobacco, tea, alcohol and hundreds of others things changed hands many times in the immense region between the Kolyma River in the west and the Mackenzie River in the east. (Bockstoce 2009:xviii)

On the North Slope, the trade fair at Nigliq (on the Colville River delta) also drew participants from the McKenzie River delta area who brought with them European goods originating from Hudson Bay Company trading posts in Canada.

Pre-1900, most residents did not live in permanent settlements; rather, they moved seasonally to most efficiently take advantage of seasonally abundant marine mammals, fish, land mammals, and migratory birds. The historical subsistence patterns of North Slope Iñupiat societies fall into 2 broad categories: those

7. Alternately referred to in literature as Nirliq or Nigliq.

oriented on sea mammal hunting with a secondary focus on terrestrial animals, birds, and fish, and those whose primary subsistence focus was caribou, supplemented with a variety of other game, birds, and fish.

Members of the Arctic coastal plain society overwintered along the middle and lower Meade and Ikpikpuk rivers relying primarily on caribou, whitefish, and marine mammal foods saved from summer. Prior to breakup they moved to the mouth of the Colville River for the Nigliq trade fair. Afterwards, most of the population spread out along the Beaufort Coast to hunt seals and fish. In early fall they returned to the lower and middle Meade and Ikpikpuk rivers to hunt caribou and catch whitefishes. By freezeup, members of the Barrow society had returned to their winter settlements (Burch Jr. 1980:286). From there they harvested seals and occasionally caribou, and relied upon whales from spring and fall hunts. After the spring whaling season ended in June, most went east to the Nigliq fair, although some went on to trade at Barter Island (Burch Jr. 1980). They eventually traveled back to their own territory, hunting seals and fishing as they went. They hunted whales again in September and October.

Colville River people spent the winter at small settlements located at good fishing spots along the Colville River (Burch Jr. 1980). Caribou (and small game) hunting and fishing took place during the winter; people moved as necessary to find game. In the spring after breakup, they too traveled to the Nigliq fair. Afterwards, some groups hunted seals on the coast or fished in the Colville River delta. By fall, prior to freezeup, all had returned to upriver settlements to hunt caribou.

The impact of non-Natives was not significant until the middle of the 19th century, when the disappearance of Sir John Franklin's expedition drew search vessels to the area for more than a decade. The HMS *Plover* overwintered at Point Barrow for 2 seasons (1852–1854) in its search for Franklin. Rochfort Maguire, who served aboard the *Plover*, documented the seasonal activities, travels, and trade of the Iñupiat living at Nuvuk (Point Barrow). He described extensive travel for trade: as far as the mouth of the Colville for the Nigliq trade fair and to Barter Island further east (Bockstoce 1988).

The 5 Iñupiaq societies of the North Slope had ceased to exist by 1900 as a result of 2 processes, sometimes in combination.

> One was biological extinction and dispersion of societal memberships through a complex combination of imported disease, famine, and flight as refugees from one of these disasters...The second process was a gradual loss of self-sufficiency as representatives of Russia, and later the United States, took control of various aspects of Native life. (Burch Jr. 1980:282)

Afterwards, Burch notes, some traditional territories had been abandoned, others newly reoccupied, and survivors from specific societies were separated and intermingled with survivors from other ones.

The arrival of the commercial whaling fleet to Arctic waters set off a period of contact with devastating effects from approximately 1848 to 1910. Whalers and the traders who followed brought epidemics, large quantities of liquor for trade, and direct competition for the resources on which coastal Iñupiat depended, especially whales and, after whale populations had been depleted, walruses. The decline in these important marine subsistence resources coincided with a decline in caribou populations, on which inland Iñupiat relied (Burch Jr. 1975).[8] Iñupiaq societies, already stressed by diseases and the introduction of alcohol, found their primary subsistence resources in reduced numbers and experienced additional significant population declines due to famine.

Following the decline of commercial whaling, the establishment of reindeer herding stations and the growth of the fur trade brought additional change and economic opportunity to local Iñupiat. Larger, permanent settlements at Point Hope and Barrow with schools, clinics, stores, and wage work attracted residents of smaller communities. In contrast, trapping and reindeer herding required thinly dispersed populations over large areas (Hoffman et al. 1988). The introduction of fur trapping and expansion of reindeer herding also meant a loss of local control: they signaled the beginning of a period which would entail ever greater

8. Caribou populations plunged from an estimated 300,000 animals in Northwest Alaska to 10,000–15,000 (Burch Jr. 1975, 1998; Fall and Utermohle 1995).

influence by outsiders. Often decisions about herd policies and fur prices were made thousands of miles away, and local people were helpless to change them (Schneider et al. 1980; Simon 1998).

When the fur trade collapsed during the Great Depression in the 1930s, small, scattered settlements began to empty as their inhabitants moved into larger permanent settlements. Barrow grew in the following decades, bolstered by economic opportunity in the form of wage work at the Tigalook coal mine near Atqasuk, oil exploration, the construction of the Distant Early Warning sites, and an influx of people from smaller inland communities. Later, the terms of the Alaska Native Claims Settlement Act (ANCSA)—which included land, money, and the creation of Native corporations—provided the means by which the ASRC was able to aid in the resettlement of Atqasuk and Nuiqsut (Braund and Associates 1993).

Modern subsistence economies continued to thrive in these communities in 2014, based primarily on the harvest of marine mammals, fish, and caribou. Each community is unique in the degree to which it depends on a particular resource, although cautious generalizations can be made. Communities located on or near the coast tend to rely more heavily on marine resources than those located inland, for which terrestrial animals, especially caribou, make up a larger percentage of annual harvest. A variety of resources are available to subsistence hunters and fishers, including beluga and bowhead whales, walruses, several species of seals, salmon, whitefishes, burbot, Arctic grayling, Arctic char, Dolly Varden, moose, caribou, muskoxen, berries, edible greens, and a wide variety of migratory birds. Studies documenting customary and traditional uses of resources by North Slope residents have documented some of the highest pounds per capita harvest of subsistence foods in Alaska: in 1993, Nuiqsut residents harvested an estimated 742 edible pounds per person, 228 lb of which was caribou (Fall and Utermohle 1995).

Regulatory Context

Alaska is unique in the nation in having both state and federal laws that make customary and traditional subsistence uses 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, after a court decision striking down state regulations that imposed a rural residency requirement on subsistence users, the Alaska Legislature adopted a statute re-establishing a rural subsistence priority consistent with ANILCA's so that the state could continue to manage all subsistence uses on state and federal land. In 1989, the state statute re-establishing a rural subsistence priority was ruled unconstitutional in *McDowell v. State of Alaska*.[9] 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 affecting subsistence have been further refined by and in response to 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 adopted by the Federal Subsistence Board.

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 be confusing, even for agency personnel. State regulations generally apply on most lands, and exclusively on state and private lands, which include ANCSA corporation lands.[10] Federal subsistence regulations apply to federally-

9. McDowell v. State of Alaska. 785 P. 2d 1 (Alaska 1989).

10. 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.

qualified subsistence users[11] on federal public lands. State and federal seasons and bag limits are often identical, but in some cases they differ significantly. One example is on Alaska's North Slope, where state regulations allow hunters to take 5 caribou per day, but until July 2016 federal regulations allowed qualified subsistence users to take a 10 caribou per day. On most federal public lands, unless pre-empted by federal law, all Alaska residents may hunt and fish under state regulations and bag limits. In certain national parks and monuments, hunting and fishing may be restricted to certain federally-qualified subsistence users, for example resident zone community residents.

The Migratory Bird Treaty Act of 1918 prohibited 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. Subsistence migratory waterfowl hunting and egg harvesting are permitted by federal law during spring and summer, with defined seasons and bag limits (50 CFR 92). Federal law also permits a fall season for migratory waterfowl sport hunting with defined seasons and bag and possession limits (50 CFR 20.102).

Regulations pertaining to marine mammals will be discussed in the Arctic section, below.

Interior

The Interior Alaska study communities of Tanana, Rampart, and Stevens Village are heavily dependent on the boreal and riparian resources of moose and salmon. Although Healy's resource use patterns differ from the Yukon River communities, residents there also heavily depend on moose and salmon resources. This section reviews the regulatory context for these important Interior resources.

Recent sharp declines in Chinook salmon abundance have caused severe hardship for fishery-dependent communities in the Yukon fisheries management area. The Chinook salmon run initially failed in 2000 and has yet to fully rebound to pre-2000 numbers. In response, the State of Alaska Board of Fisheries designated Chinook salmon as a stock of yield concern in 2000 because it failed to produce expected returns. The federal government declared an economic disaster for Yukon River drainage communities as a result of the extremely low run of Chinook salmon during the 2009 fishing season. The department has not provided a commercial harvest opportunity on Chinook salmon in the Yukon River since 2008, and the subsistence fishery experienced restrictions in 2008–2009 and 2011–2015. In 2014 the region's salmon fishers experienced the lowest subsistence harvest on record.

As noted above, regulatory authority for Yukon River salmon management is shared by the Federal Subsistence Board (FSB) and the State of Alaska Board of Fisheries (BOF). On the Yukon River, ADF&G is responsible for implementing regulations in accordance with multiple species and tributary specific management plans (5 AAC 05.360, 5 AAC 05.362, 5 AAC 05.365, 5 AAC 05.367, 5 AAC 05.368, 5 AAC 05.369) and also has inseason discretionary management authority over salmon in Alaska navigable waters. However, Yukon River salmon fisheries are also managed in accordance with the Pacific Salmon Treaty: the Yukon River Panel, a board of appointed members from both Alaska and Canada, meets twice a year to negotiate annual aspects of the treaty, such as escapement goals and border passage goals, and to approve funding of scientific research addressing salmon biology and use patterns.

The highest priority in management of Yukon River salmon populations is biological sustainability of the resources based on principles of sustained yield. In the event that returning salmon numbers are not sufficient to meet established escapement goals that will allow for the maintenance of future generations of salmon populations, consumptive uses of salmon may be restricted. Under conditions that there is a harvestable surplus beyond these minimum escapement levels, consumptive uses of salmon are prioritized for different user groups.

11. Federal qualifications include being a rural Alaska resident domiciled in a community determined to have customary and traditional use of a fish stock or game population.

Subsistence harvest of Pacific salmon species in the Yukon River is allowed without a permit except for in a few locations, most of which are accessible by road (5 AAC 01.230). Fishing in the Yukon Area is allowed at any time with the exceptions of those times outlined in 5 AAC 01.210 and 5 AAC 05.360 and unless otherwise noted for conservation purposes. Alaska regulations allow a variety of gear types to be used in the Yukon River drainage for subsistence salmon fishing and include specifications regarding the use of gillnets and fish wheels (5 AAC 01.220). With few exceptions, there are no federal or state bag possession limits for subsistence salmon harvests in the Yukon River.[12]

By regulation, the subsistence salmon fishing season is open unless a subsistence fishing schedule closure is implemented. If closures to the fishery are necessary, they are implemented by emergency order prior to, during, and after commercial fishing periods, or closures to the fishery are implemented by emergency order for conservation purposes (see 5 AAC 01.260, and 5 AAC 07.365 for the Kuskokwim and 5 AAC 01.230(e)(5)–(7), 5 AAC 01.310, 5 AAC 05.360, 5 AAC 05.367, and 5 AAC 05.369 for the Yukon River). In the Yukon River, a subsistence fishing schedule with periodic fishing closures (openings between these closures were often referred to as "windows" or "openers") was implemented by the BOF in 2001 and remains in place. Fall et al. (2013) describe these windows by district.

During the most recent period of decline for Yukon River Chinook salmon, the BOF implemented additional regulatory changes for the Yukon River. In 2011, area managers implemented a 2010 Board of Fisheries' decision to reduce the maximum stretched-mesh net size to 7.5 inches. Prior to this, Yukon Area fishers widely used 8-inch to 8.5-inch mesh nets to target Chinook salmon. This change was considered a conservation tool that should allow more of the older and larger Chinook salmon, especially females, to escape to the spawning grounds. At their 2013 Arctic-Yukon-Kuskokwim (AYK) meeting, the BOF required first pulse protection, or the prohibition of fishing on the first Chinook salmon pulse entering the river, in order to account for the uncertainty in the preseason Chinook salmon run projection. This prohibition may be relaxed in districts 3–6 if run assessment information suggests sufficient abundance. During the 2013 meeting, the BOF also prohibited the sale of Chinook salmon incidentally caught during directed summer chum commercial openings when subsistence salmon fishing is restricted (5AAC 05.360(i)).

For those fishers in Healy who use the Copper River for fishing, the BOF has classified state fisheries in the Chitina Subdistrict as personal use (5 AAC 77.591), and the state fisheries in the Glennallen Subdistrict as subsistence (5 AAC 77.591, 5 AAC 01.647, and 5 AAC 24.360). Dip nets are the only allowable gear in the personal use fishery; dip nets or fish wheels may be used in the subsistence fishery. There are also federal subsistence fisheries in both the Chitina and Glenallen subdistricts, and rod and reel is allowed under federal regulations. Fishers utilizing either fishery are subject to harvest and gear limitations defined in the fishing permits.

Variable moose densities in different parts of Interior Alaska have led to very different hunt structures; this is discussed in more detail in the Regional Comparison and Conclusions chapter. State and federal open and closed seasons and bag and possession limits for black bears, brown bears, and caribou are relatively similar and nonrestrictive, but in the case of caribou, seasons are dependent on herd size and health (5 AAC 85; 50 CFR 100.26). Trapping of furbearers in the region is regulated under Alaska state statutes and regulations with designated seasons and no bag limits (5 AAC 84) as well as under federal subsistence regulations.

Arctic

Residents of Arctic Alaska remain substantially dependent upon wild resources obtained through subsistence hunting, fishing, and gathering. Each community has unique patterns of harvest and use based upon the resources available. Barrow and Nuiqsut are located on or near the coast and harvest various species of marine mammals, salmon and nonsalmon fishes, terrestrial mammals, marine invertebrates, birds, wild berries, and greens. Anaktuvuk Pass, located much further inland in the central Brooks Range, does not have access to marine mammals and is far more dependent on caribou and nonsalmon fishes.

12. Bag limits for salmon are set in regulation for subdistricts 6A and 6B (5 AAC 01.230(e)(4)) on the Tanana River. Also, 5 AAC 01.234 provides the opportunity for ADF&G to set bag limits during times of conservation for subsistence use of hook and line attached to a rod or pole through open water from the lower mouth of Paimiut Slough downriver to the coast.

In 2014, the relative abundance of species important to North Slope residents' subsistence was generally good. Few restrictions were in place with regard to harvest, with the exception of certain marine mammals and migratory birds. However, concerns over the future of various ice-dependent species of marine mammals were well-documented.

The harvest of marine mammals is regulated under the Marine Mammal Protection Act (MMPA); certain species are also listed under the Endangered Species Act (ESA). The MMPA granted "coastal Alaska Natives" an exemption from the law's prohibition of hunting marine mammals, allowing them to continue to hunt marine mammals for subsistence. The International Whaling Commission sets aboriginal subsistence whaling quotas for 4 countries, including the United States (International Whaling Commission 2012). Catch limits for U.S. subsistence whaling of bowhead and gray whales are set for 5-year periods. For 2013–2018, the commission has set a quota of 336 bowhead whales, with a limit of no more than 67 strikes per year (Alexander 2013). Bowhead whale harvests are restricted to allowable strikes and harvests set for 5-year periods by the IWC. In 2014, Barrow was allowed 25 whales total over the spring and fall seasons, and Nuiqsut was allowed 4.[13] Anaktuvuk Pass is not a bowhead whaling community. No harvest limits were in place for the various seal species, beluga whales, or walruses taken by coastal hunters.

Several marine mammal resources are listed as threatened under the ESA. The National Oceanic and Atmospheric Administration listed both ringed and bearded seals as threatened in December 2012 (Speegle 2012).[14] Polar bears were listed as threatened by the U.S. Fish and Wildlife Service in 2008.[15] In 2011, the U.S. Fish and Wildlife Service found that listing of Pacific walrus as endangered or threatened was warranted, but higher priority actions precluded listing at that time (U.S. Fish and Wildlife Service 2014).

Beginning in 2011, a workgroup of state and federal agencies, nongovernmental organizations, tribal representatives, specialists, and laboratories worked to determine the cause of an unexplained mortality event (UME) occurring in various seal species and walruses across the North Slope and Bering Strait regions. In 2014, because few new walrus cases were found, walruses were removed from the list of affected animals; the UME remained open for ringed, ribbon, bearded, and spotted seals. Several times in recent years, Pacific walruses have hauled out in groups of thousands on the Northwest Alaska coast in response to a lack of sea ice (Borenstein 2010; Joling 2011, 2013).

Polar bears in the U.S. are managed by the U.S. Fish and Wildlife Service, the Alaska Nanuuq Commission, and local communities. Russian and Alaska Native hunters both take polar bears from the Chukchi Sea population; a harvest limit of 58 bears per year has been set for that population.[16] Harvest of polar bears from the Southern Beaufort population, which are harvested by residents of Wainwright, Barrow, Kaktovik, and Nuiqsut, is governed by the Inuvialiut-Iñupiat Polar Bear Commission. The commission set an annual harvest quota of 70 bears: 35 each for the U.S. and Canada.

Caribou are the most commonly harvested large land mammal by communities on Alaska's North Slope by virtue of their abundance and availability. Four herds with overlapping ranges are present seasonally in the North Slope region: the Western Arctic herd (WAH), the Porcupine herd (PCH), the Central Arctic herd (CAH), and the Teshekpuk Lake herd (TLH). The range of the TLH lies mainly within the NPR-A, which is within the traditional hunting ranges of several North Slope Borough communities, in particular Atqasuk, Barrow, and Nuiqsut. All communities studied in this project harvest caribou from the WAH.

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13. North Slope Borough. 2016. "The AEWC." Accessed March 25, 2016.
http://www.north-slope.org/departments/wildlife-management/other-topics

14. Bearded seals were also listed in 2012, but in July 2014, the U.S. District Court ruled that they were improperly granted that status and directed the National Marine Fisheries service to correct deficiencies in its study of the Beringia population (Rosen 2014).

15. U.S. Fish and Wildlife Service, Marine Mammals Management, Alaska Region, n.d. "Endangered Species Act Listing." Accessed March 29, 2016. http://www.fws.gov/alaska/fisheries/mmm/polarbear/esa

16. North Slope Borough, Barrow. 2016. "Polar Bears." Accessed March 29, 2016.
http://www.north-slope.org/departments/wildlife-management/studies-and-research-projects/polar-bears

Both the WAH and TLH are in decline. The WAH, with an estimated 2013 population of 235,000 animals, is still the largest caribou herd in Alaska (ADF&G Division of Wildlife Conservation 2014a). At its peak in 2003, the herd numbered 490,000 caribou. It declined at a rate of 4–6% annually between that census and 2011, when the herd numbered 325,000. The July 2013 census of 235,000 animals was a decrease of about 27% since 2011. In 2016, ADF&G biologists believed the decline had since slowed due to a series of mild winters and other factors that likely benefited the herd.[17] The TCH population, estimated at 55,000 animals in 2011, had declined to 41,542 in 2015 (Parrett 2015). In 2014, under state regulations, Alaska residents could harvest 5 caribou per day with no annual limit. Under federal regulations, federally qualified hunters could take 10 caribou per day with no annual bag limit. Regulations passed in April 2016 reduced the daily bag limit to 5 caribou per day as of July 1, 2016.

Two controlled use areas (CUA) exist on the North Slope: Anaktuvuk Pass and Unit 26A. After a series of poor harvest years in the late 1980s, Anaktuvuk Pass residents expressed concern that migrating caribou were being deflected from established patterns by airplane traffic and hunting activity associated with guided and transported hunters north of the community. In 1990, the Alaska Board of Game (BOG) took no action on a proposal to create a CUA, citing insufficient information.[18] The BOG addressed the issue in 2005 by establishing the Anaktuvuk Pass CUA, which closed the entire Anaktuvuk Pass drainage to the use of aircraft for caribou hunting from August 15 through October 30.[19] This included the transportation of hunters, their gear, or parts of caribou, except between publically-owned airports. In 2007, Anaktuvuk Pass proposed changing the CUA boundaries to a 25-mile radius around the community (ADF&G 2007). The board passed an amended version of the proposal that set the CUA's current boundaries (ADF&G 2005, 2006).

The Unit 26A controlled use area closes the entire subunit to the use of aircraft for moose hunting from July 1 through September 14 and January 1 through March 31, except under terms of a drawing hunt in a limited area.

Nonsalmon species of fish, particularly whitefishes and Arctic grayling, play a larger role in subsistence diets in North Slope communities than salmon. Chum and pink salmon are the most abundant salmon species in the region. State management actions on subsistence fishing are minimal, with no closed seasons, bag limits, required licenses or permits, reporting requirements, harvest monitoring program, and few gear restrictions. 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 set forth in sport fishing regulations. Under federal regulations, the North Slope is located within Yukon-Northern Area. For all species, there are no closed seasons or bag limits; all residents of the Yukon-Northern Area, except for those in GMU 26B and the Yukon River drainage, are considered federally qualified. Rod and reel are considered subsistence gear.

Study Objectives

The project had the following objectives:

- Estimate annual harvests and uses of wild fish, game, and plant resources in a 12-month study period in 2014 by residents of the study communities
- Map areas used for hunting, fishing, and gathering during 12-month study period

17. Lincoln Parrett, North Slope Borough Division of Wildlife Conservation, personal communication, March 25, 2016.

18. Pedersen, S., T. Hepa, and M. Pederson. *Subsistence caribou hunting in Anaktuvuk Pass, Alaska: Summary of 1990–1994 community harvest information.* Alaska Department of Fish and Game Division of Subsistence, unpublished data, n.d. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK, 99701.

19. ADF&G Division of Subsistence. 2007. Proposal #55: Anaktuvuk Pass CUA. Powerpoint presentation to Board of Game at November 2007 meeting.

- Collect demographic information including community size and composition, ethnicity, birthplace, and length of residency in study community
- Document involvement in the cash economy, including jobs and other sources of cash income
- Evaluate trends in wild resource harvests
- Collect traditional knowledge observations regarding wild resources
- Conduct preliminary scoping of current issues related to hunting and fishing
- Administer health impact assessment questions

Research Methods

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*[20] and by the National Science Foundation, Office of Polar Programs in its *Principles for the Conduct of Research in the Arctic*[21], the *Ethical Principles for the Conduct of Research in the North* (Association of Canadian Universities for Northern Studies 2003), as well as the Alaska confidentiality statute (AS 16.05.815). These principles stress community approval of research designs, informed consent, anonymity or confidentiality of study participants, community review of draft study findings, and the provision of study findings to each study community upon completion of the research.

Project Planning

Projects of this geographic and informational scope require the coordination of multiple staff along with the community tribal and city councils and other key individuals on the community level. Table 1-3 lists all the project staff associated with the design, implementation, and finalization of the research, including, importantly, the local research assistants hired in each community to assist ADF&G staff with household identification and contact as well as to provide important insight into research methods and approaches.

Standard Divisional practice requires that staff obtain tribal or city council approval of research, when available, before working in any community. As a result, staff contacted each community in the fall or winter of 2014 to provide information about the research and answer any questions. Often, staff will travel to communities to provide this information directly unless requested to provide it via mail or email. Table 1-4 outlines these community approval meetings as well as the dates of the subsequent fieldwork, and finally the dates of community review meetings. After the data collection and analysis were complete, ADF&G staff presented preliminary survey findings and associated search area and harvest maps at a community review meeting in each community. These meetings allow community residents to review the data, ask questions about the analyses, and provide additional contextual information. After receipt of comments during the community meetings, report authors finalized individual chapters. ADF&G mailed a short (4-page) summary of the study findings to every household in the 7 study communities.

20. Alaska Federation of Natives. 2013. "Alaska Federation of Natives Guidelines for Research." Alaska Native Knowledge Network. Accessed February 25, 2014. http://www.ankn.uaf.edu/IKS/afnguide.html.

21. National Science Foundation Interagency Social Science Task Force. 2012. "Principles for the Conduct of Research in the Arctic." Accessed February 25, 2014. http://www.nsf.gov/od/opp/arctic/conduct.jsp.

Table 1-3.–Project staff.

Task	Name	Organization
Northern Regional Program Manager	James Simon	ADF&G Division of Subsistence
Principal Investigator	Nicole Braem	ADF&G Division of Subsistence
	Caroline Brown	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
Data Management Lead	Marylynne L. Kostick	ADF&G Division of Subsistence
Programmer	Marylynne L. Kostick	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
	Margaret Cunningham	ADF&G Division of Subsistence
	Nicholas Jackson	ADF&G Division of Subsistence
Data Cleaning/Validation	Margaret Cunningham	ADF&G Division of Subsistence
Data Analysis	Marylynne L. Kostick	ADF&G Division of Subsistence
Cartography	Terri Lemons	ADF&G Division of Subsistence
Editorial Review Lead	Rebecca Dunne	ADF&G Division of Subsistence
Production Lead	Rebecca Dunne	ADF&G Division of Subsistence
Field Research Staff	Andrew Brenner (Shageluk lead)	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
	Dan Gonzales	ADF&G Division of Subsistence
	Luke Henslee	ADF&G Division of Subsistence
	Glenn Helkenn	ADF&G Division of Subsistence
	Hiroko Ikuta (Barrow co-lead)	ADF&G Division of Subsistence
	Chris McDevitt	ADF&G Division of Subsistence
	Beth Mikow (Barrow co-lead)	ADF&G Division of Subsistence
	Odin Miller	ADF&G Division of Subsistence
	Loraine Naaktgeboren	ADF&G Division of Subsistence
	Jeff Park (Anaktuvuk Pass lead)	ADF&G Division of Subsistence
	David Runfola (Healy lead)	ADF&G Division of Subsistence
	Erin Shew	ADF&G Division of Subsistence
	Lisa Slayton (Rampart lead)	ADF&G Division of Subsistence
	Alida Trainor (Tanana lead)	ADF&G Division of Subsistence

-continued-

Table 1-3.–Page 2 of 2

Task	Name	Organization
Local Research Assistant	Elena Alexie	Anaktuvuk Pass
	Mandy Alexie	Anaktuvuk Pass
	Karlene Cleveland	Anaktuvuk Pass
	Oliane Kameroff	Anaktuvuk Pass
	Alexandra Myers	Anaktuvuk Pass
	Sharon Myers	Anaktuvuk Pass
	Darrell Nick	Anaktuvuk Pass
	Richard Nick	Utqiaġvik
	Stefen Wassillie	Utqiaġvik
	Grace Anaver	Utqiaġvik
	Vera Cleveland	Utqiaġvik
	Maggie Echuck	Utqiaġvik
	Marcella Jones	Utqiaġvik
	Taren Jones	Utqiaġvik
	Joseph Roberts	Healy
	Kris Sharp	Healy
	Crystal Akerelrea	Healy
	Jason Akerelrea	Healy
	June Kaganak	Healy
	Alice Kaganak	Healy
	Yvonne Kasayuli	Healy
	Tashina Long	Healy
	Roxy Oyagak	Nuiqsut
	Peter Kosbruk	Nuiqsut
	Edward Nukapigak	Nuiqsut
	Evelyn Ulak	Rampart
	Harold Arrow	Stevens Village
	Joseph Michael	Stevens Village
	Everett Semone	Tanana
	Carlotta Evan	Tanana
	April Morgan	Tanana
	Jeffery Pavila	Tanana
	Kathleen Simon	Tanana
	Grace White	Tanana

Source ADF&G Division of Subsistence, 2016.

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 individual community survey instruments between December 2015 and April 2016. 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[22]). Appendix A is an example of the survey instrument used in this project. Appendix D, Table D1-1 lists the common and scientific names of all resources included on the survey instrument.

22. ADF&G Community Subsistence Information System: http://www.adfg.alaska.gov/sb/CSIS/. Hereafter *ADF&G CSIS*.

Table 1-4.–Community meetings, study communities, 2014–2016.

Community	Community Approval meeting	Fieldwork
Tanana	November 2014 approved via email	March 1–8, 2015
Rampart	December 2014 approved via email	May 11–15, 2015
Stevens Village	February 5, 2015 approved via email	May 26–29, 2015
Healy	October 8, 2015 Denali Borough Assembly meeting November 4, 2015 Middle Nenana Advisory Committee meeting	December 4–12, 2015 June 15–16, 2016
Utqiaġvik	July 16, 2014 Alaska Eskimo Whaling Commission September 18, 2014 North Slope Borough October 14, 2014 Native Village of Barrow October 21, 2014 Alaska Eskimo Whaling Commission October 23, 2014 City of Barrow November 18, 2014 North Slope Borough via teleconference	January 7–21, 2015
Nuiqsut	December 18, 2014 and February 10, 2015	March 23–April 1, 2015
Anaktuvuk Pass	January 28, 2015	April 8–16, 2015

Source ADF&G Division of Subsistence, 2016.

Household Survey Implementation

Depending on the number of households in a community and the sample size, fieldwork is conducted by crews of ADF&G staff consisting of Subsistence Resource Specialists and Fish and Wildlife Technicians. Prior to implementing surveys, the crew lead, often with the help of the community tribal or city council, hires local research assistants to work with the ADF&G crew. The crew lead along with local research assistants and other tribal or municipal staff members review and finalize a household list that will serve as the basis for the sampling method. Once the sample is identified, surveys are usually conducted with household heads by teams of 2 individuals: 1 ADF&G staff member and 1 local research assistant. A brief description of the fieldwork in each community follows, highlighting some of the successes and challenges of this project in particular communities. Sample achievements and average survey lengths for each community can be found in tables 1-5 and 1-6.

Along the Yukon River, ADF&G staff worked in 3 communities: Tanana, Rampart, and Stevens Village. Fieldwork went smoothly in Tanana; the refusal rate was low. Researchers had the opportunity to travel upriver to an allotment to conduct an interview with a respondent who described seeing lights flashing into the cabin window from the Tanana-Tofty Road construction crew's equipment. In Rampart, surveys all went well except that most elders were out of town during the fieldwork, so staff returned at a later date to conduct ethnographic interviews. Fieldwork in Stevens Village was more challenging. Few residents were in the community, the result of outmigration over the past several years. The limited number of completed surveys created challenges in reporting harvest estimates for Stevens Village for confidentiality reasons that are described in more detail in the results section of that community chapter.

The fourth Interior community and the only one accessible year-round by road,[23] Healy, offered different challenges. Survey fieldwork was planned for the road-accessible areas of the Healy CDP only. No household lists, physical addresses, or names of residents were available from any municipal or state agency source. Staff identified all potential dwellings in the CDP from satellite imagery obtained through Google Earth.[24] Each potential dwelling was identified with a random map identification number that oriented it to a unique street address or plat number on a map. Map and household identification numbers were entered into an MS

23. A 30-mile road connects the community of Rampart to the Elliot Highway north of Fairbanks, but is accessible mainly during the winter months by snowmachine. Experienced travelers may use 4-wheelers in the summer (Wiehl and Rampart Tribal Council 2014).

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

Table 1-5.–Sample achievement, study communities, 2014.

	Community						
Sample information	Tanana	Rampart	Stevens Village	Healy	Utqiaġvik	Nuiqsut	Anaktuvuk Pass
Number of dwelling units	103	13	8	551	833	108	85
Survey goal	93	13	7	126	300	100	85
Households surveyed	66	7	4	127	259	58	53
Households failed to be contacted	18	5	1	163	209	24	18
Households declined to be surveyed	7	1	1	68	212	26	23
Households moved or occupied by nonresident	10	0	1	19	22	0	5
Total households attempted to be surveyed	91	13	6	358	680	108	94
Refusal rate	9.6%	12.5%	20.0%	34.9%	45.0%	31.0%	30.3%
Final estimate of permanent households	91	13	4	366	1,584	108	99
Percentage of total households interviewed	72.5%	53.8%	100.0%	34.7%	16.4%	53.7%	53.5%
Survey weighting factor	1.38	1.86	1.00	2.88	6.12	1.86	1.87
Sampled population	148	21	10	349	869	223	170
Estimated population	204.1	39.0	10.0	1,005.8	5,314.7	415.2	317.5

Source ADF&G Division of Subsistence household surveys, 2015.

Access database program for future recall and tracking during survey fieldwork. Two ADF&G staff members spent one day in the CDP driving to as many addresses as possible to remove nonresident dwellings from the complete household list. Dwellings were disposed as vacant only if it could be reasonably determined that a household did not or could not reside in the dwelling based upon evidence of human activity and condition of structure.

This study also included 3 Arctic communities: Barrow, Nuiqsut, and Anaktuvuk Pass. Because of its size, working in Barrow also presented logistical challenges. With the exception of the community co-leads, Beth Mikow and Hiroko Ikuta, who were in Barrow for the entire fieldwork period of 3.5 weeks, survey staff worked in shifts of approximately 2.5 weeks each. Fieldwork coincided with the North Slope Borough's census project. In order to minimize confusion and respondent fatigue, the 2 groups divided the areas (census blocks) in which they would survey. Division of Subsistence received 54% of occupied units from which to draw a random sample. Refusal rates were high (approximately 45%); the survey crew completed 259 surveys, resulting in a 16% sample of Barrow households. Working in Nuiqsut posed different challenges; Nuiqsut residents experience heavy research pressure because of the community's proximity to oil and gas development. As a result, there was a relatively high refusal rate, likely due to survey fatigue, which may have been exacerbated by the fact that ADF&G does not compensate households with monetary payments for answering harvest survey questions (only for participating in ethnographic interviews). Fieldwork in Anaktuvuk Pass required ADF&G staff to work independently because of a lack of local research assistants. Local research assistants greatly improve the quality of the research by helping to identify households, explain the survey in locally-relevant terms, and provide important context for survey answers. Although staff members were able to conduct 5 ethnographic interviews, there was a 19% refusal rate for the surveys.

Mapping Locations of Subsistence Hunting, Fishing, and Gathering Activities

During household interviews, the researchers asked respondents to indicate the locations of their fishing, hunting, and gathering activities during the study year. In addition, interviewers asked the respondents to mark on the maps the sites of each harvest, the species harvested, the amounts harvested, and the months of harvest. ADF&G staff established a standard mapping method. Points were used to mark harvest locations, and polygons (circled areas) were used to indicate harvest effort areas, such as areas searched while hunting moose. Some lines were also drawn in order to depict when the harvesting activity did not occur at a specific point; for example, lines were used to depict traplines or courses taken while driftnetting for fish.

Harvest locations and fishing, hunting, and gathering areas were documented using an application designed on the ArcGIS Runtime SDK for iOS platform, a mapping data collection application for iPad. The point, polygon, or line was drawn on a U.S. Geological Survey topographic relief map downloaded on the iPad. The iPad allowed the user to zoom in and out to the appropriate scale and to document harvesting activities

Table 1-6.–Survey length, study communities, 2014.

	Interview length (in minutes)		
Community	Average	Minimum	Maximum
Tanana	52	13	168
Rampart	42	30	60
Stevens Village	53	30	70
Healy	36	7	88
Utqiaġvik	30	3	210
Nuiqsut	48	10	139
Anaktuvuk Pass	32	9	99

Source ADF&G Division of Subsistence household surveys, 2015.

wherever they occurred in the state of Alaska. Once a feature was accepted, an attribute box was filled out by the researcher that noted the species harvested, amount, method of access to the resource, and month(s) of harvest. The data were uploaded via Wi-Fi to a server. Once data collection was complete the data were downloaded into an ArcGIS file geodatabase. The application was developed by HDR, Inc., an environmental research firm located in Anchorage. In some communities, paper maps were also available to be used as a reference for respondents as well as by an LRA when an ADF&G researcher was not available for the interview. These maps were 11x17 inches at a scale of 1:250,000 and 1:500:000 and only documented the area within the survey area. Very few paper maps were used and research staff digitized markings on paper maps using the iPad application.

Once a survey was complete researchers reviewed map data by matching it to the survey form to ensure all map data had been documented. This was completed in the field before the surveys were submitted to the community's lead researcher. Once the data had been uploaded, researchers also verified that the household data were logged into the server.

Key Respondent Interviews

While researchers were in the study communities they consulted with tribal governments, community councils, and LRAs to identify key respondents to interview. The purpose of the key respondent interviews was to provide additional context for the quantitative data and also to provide information for the community background section at the beginning of each chapter, the seasonal round sections, harvest-over-time analysis, and the local comments and concerns section at the end of each chapter. The number of key respondent interviews varied among communities. Key respondent interviews were semi-structured and directed by a key respondent interview protocol designed by ADF&G researchers Hiroko Ikuta, Nicole Braem, and Elizabeth Mikow (see Appendix B). Interviews were digitally recorded, when allowed, and fully transcribed. ADF&G staff took notes during interviews to provide additional context for this report. Key respondents were informed that, to maintain anonymity, their names would not be included in this report.

Data Analysis and Review

Survey Data Entry and Analysis

All data were coded by ADF&G field staff 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 intranet 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.

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[25]). Prior to the application of conversion factors, PI Braem undertook a review of conversion factors used in previous studies for species of nonsalmon fish and marine mammals. As a result, factors differ in some cases from those used in prior Division of Subsistence, contractor, and North Slope Borough Division of Wildlife harvest survey projects. A detailed explanation of this review is presented in Appendix E.

ADF&G staff also used SPSS for analyzing the survey information. Analyses 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

$$H_i = \overline{h}_i S_i \tag{1}$$

$$\overline{h}_i = \frac{h_i}{n_i} \tag{2}$$

where:

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

$\overline{h}_i$ = the mean harvest of returned surveys,

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 SE 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 value of the constant is derived from student's *t* distribution, and varies

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

slightly depending upon the size of the community. Though there are numerous ways to express the formula below, it contains the components of a SD, V, and SE:

$$C.L.\%(\pm) = \frac{t_{(\alpha/2)} \times \frac{s}{\sqrt{n}} \times \sqrt{\frac{N-n}{N-1}}}{\overline{h}} \tag{3}$$

where:

s = sample standard deviation,

n = sample size,

$\overline{h}$ = mean harvest of returned surveys,

N = population size, and

$t_{\alpha/2}$ = student's t statistic for alpha level ($\alpha = 0.95$) 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 survey will be added to the Division of Subsistence Community Subsistence Information System (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 6 months during the 2014 study year. 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. In Barrow and Healy, household lists were built from maps as described in the Household Survey Implementation section.

There may be several reasons for the differences among the population estimates for each community generated from the division's surveys and other demographic data developed by the 2010 federal census (U.S. Census Bureau 2011), the U.S. Census Bureau's American Community Survey (U.S. Census Bureau n.d.), and the Alaska Department of Labor and Workforce Development (ADLWD n.d.). Sampling of households, depending on when surveys are conducted or eligibility criteria for inclusion in the survey, may explain differences in the population estimates.

Map Data Entry and Analysis

As discussed above, maps were generated based on data collected using an iPad or on 11x17-inch paper maps. All data were entered on the iPad, whether in the field during interviews or by ADF&G research staff while coding survey data. Map features were matched to the survey form to ensure that all harvest data were recorded accurately.

Once all data were entered, an ArcGIS file geodatabase was downloaded by ADF&G researchers from the server and maps showing harvest locations for each species created in ArcGIS 10.2 using a standard template for reports. Maps show harvest locations for fish species, harvest areas for plants, berries, and birds, and hunting areas for land and marine mammals. To ensure confidentiality, harvest locations for large land mammals were not produced for the report. Maps were reviewed at a community review meeting to ensure accuracy as well identify any data the community would like to keep confidential.

Food Security Analysis

A food security section of the survey used a standard national questionnaire to assess whether or not the household had enough food to eat, whether from subsistence sources or from market sources. The protocol used in this survey was a modified version of the 12-month food security scale questionnaire developed by the U.S. Department of Agriculture (USDA). This 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 here.

The Division of Subsistence standard food security protocol includes 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. As in Brazil (Pérez-Escamilla et al. 2004), the USDA term "balanced meals" was difficult to interpret for indigenous Alaska populations, and was replaced with the term "healthy meals" to reflect unique dietary and cultural circumstances in rural Alaska. In 2015, Division of Subsistence added filter questions to reduce the number of questions asked to food secure households. Households filtered as food secure were not asked about increasingly severe instances of food insecurity.

Final Report Organization

This report summarizes the results of systematic household surveys and mapping interviews conducted by staff from ADF&G as well as LRAs, and the report also summarizes resident feedback provided at community review meetings. The findings are organized by study community. Each chapter includes tables and figures that report findings on demographic characteristics, employment characteristics, individual participation in harvesting and processing of wild resources, and characteristics of resource harvests and uses—including the sharing of wild foods, food security, and harvest and use trends over time. The final chapter of the report provides a short, general overview of the harvests and uses of wild resources in the study communities.

With regard to the 2014 harvest and use data in each chapter, the content is consistent in each chapter because the data are based on the survey instrument. However, there are differences among the chapters in terms of documenting historical trends because each community has a different history of subsistence harvesting practices, and not all communities have had past comprehensive harvest surveys upon which to base comparisons.

2. TANANA

Alida Trainor

In March 2015, 6 researchers surveyed 66 of 91 eligible Tanana households (73%; Table 1-3). Expanding for 25 unsurveyed households, Tanana's estimated total harvest of wild foods between January and December 2014 was 197,715 edible pounds (Table 2-1). The average harvest per household was 2,172 lb; the average harvest per capita was 969 lb (tables 2-1 and 2-2).

This chapter summarizes findings from household surveys, including demographic characteristics, responses to harvest assessment questions, harvest estimates, reported employment and income, and responses to food security questions. Harvest numbers are expanded estimates. Results from this survey are available online in the ADF&G Community Subsistence Information System (CSIS).[1]

In addition to the comprehensive survey, 9 interviews were conducted with 11 individuals, including 4 elders and 2 married couples. Ten of the individuals were still actively engaged in hunting, fishing, gathering or preparing subsistence foods. All had spent the majority of their lives in Tanana with some travel away from the community at various times in their lives. By providing a better understanding of the seasonal round, local history, and subsistence activities in the area, the ethnographic interviews contextualize the quantitative harvest and use data collected in the surveys.

Community Background

The community of Tanana is located on the north bank of the Yukon River near the confluence of the Yukon and Tanana rivers, 130 miles northwest of Fairbanks. The community was first incorporated in 1961, and later, after years of growth, was incorporated as a first-class city in order to assume control of its school system.[2] Tanana has a continental climate characterized by extremely cold winters (minimum -43˚ F) and warm summers (maximum 87˚ F).[3] Precipitation averaged 13.2 inches in 2013–2014. The Yukon River in this area is ice-free from mid-May through mid-October.

Tanana is characterized by boreal forest vegetation. Subsistence patterns are shaped by this boreal forest environment and its natural seasonal cycles (Betts 1997). Tanana residents have access to 3 salmon species: Chinook, coho, and chum salmon (which run both in the summer and the fall). Nonsalmon fish species in the area include Arctic grayling, Dolly Varden, various whitefish species, sheefish, burbot, northern pike, and longnose sucker. Porcupine, beaver, marten, lynx, snowshoe hare, and muskrat are some of the small land mammals available to residents. Large land mammals include moose, black and brown bears, and caribou. Migratory waterfowl such as geese, ducks, and cranes are available during both spring and fall migrations. Nonmigratory birds such as grouses and ptarmigans are often harvested year-round. Vegetation in the form of edible greens, berries, mushrooms, and wood is abundant.

The community of Tanana has a long prehistory and history of use by Alaska Natives and Euroamericans as a trading and supply center (Orth 1971rep.:947). Consequently, the community of Tanana and its immediate vicinity has been known by many names throughout the years. Prior to the first Euromerican contact in 1863, the area near modern day Tanana was a well-known traditional meeting and trading locality between Koyukon Athbabascans and other groups. The area was called Nucha'la'woy'ya, which means "where the 2 rivers meet" (L'Ecuyer 1997). Or as Betts (1997:56) describes it, "Tanana grew from the centralization of several settlements in the area, both Alaska Native villages as well as trading post populations and

1. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." https://www.adfg.alaska.gov/sb/CSIS. Hereafter *ADF&G CSIS.*

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 February 16, 2016. http://commerce.state.alaska.us/dcra/DCRAExternal/community Hereafter *ADCCED n.d.*

3. ADCCED n.d. Climate data are for the period July 2013–July 2014.

Table 2-1.–Resource harvest and use characteristics, Tanana, 2014.

Characteristic	
Mean number of resources used per household	**11.3**
Minimum	1
Maximum	40
95% confidence limit (±)	9.8%
Median	9.0
Mean number of resources attempted to harvest per household	**8.0**
Minimum	0
Maximum	33
95% confidence limit (±)	12.6%
Median	5.5
Mean number of resources harvested per household	**6.9**
Minimum	0
Maximum	33
95% confidence limit (±)	13.5%
Median	5.0
Mean number of resources received per household	**5.6**
Minimum	0
Maximum	25
95% confidence limit (±)	11.8%
Median	4.0
Mean number of resources given away per household	**4.2**
Minimum	0
Maximum	24
95% confidence limit (±)	15.8%
Median	3.0
Household harvest (pounds)	
Minimum	0
Maximum	33,878
Mean	2,172.7
Median	116.5
Total harvest weight (pounds)	197,714.5
Community per capita harvest (pounds)	968.9
Percentage using any resource	100%
Percentage attempting to harvest any resource	91%
Percentage harvesting any resource	86%
Percentage receiving any resource	98%
Percentage giving away any resource	82%
Number of households in sample	66
Number of resources asked about and identified voluntarily by respondents	136

Source ADF&G Division of Subsistence household surveys, 2015.

Table 2-2.–Comparison of selected findings, Tanana, 2014.

Category	Community Tanana
Demography	
Population	204.1
Percentage of population that is Alaska Native	88.5%
Percentage of household heads born in Alaska	83.2%
Average length of residency of household heads (years)	35.5
Cash economy	
Average number of months employed	6.6
Percentage of employed adults working year-round	46.3%
Percentage of income from sources other than employment	19.0%
Average household income[a]	$45,140
Per capita income[a]	$20,130
Resource harvest and use	
Per capita harvest (pounds usable weight)	968.9
Average household harvest (pounds usable weight)	2,172.7
Number of resources used by 50% or more households	3.0
Average number of resources used per household	11.3
Average number of resources attempted to be harvested per household	8.0
Average number of resources harvested per household	6.9
Average number of resources received per household	5.6
Average number of resources given away per household	4.2
Percentage of total harvest taken by top ranked 25% of households	94.4%
Percentage of households that harvested 70% of harvest	6.1%
Per capita harvest by lowest ranked 50% of households (pounds usable weight)	6.3
Percentage of total harvest taken by lowest ranked 50% of harvesting households	0.7%
Average number of resources used by lowest ranked 50% of households	7.2
Average number of resources used by top ranked 25% of households	20.1

Source ADF&G Division of Subsistence household surveys, 2015.
a. Includes income from sources other than employment.

government stations." The peninsula at the junction of the Tanana and Yukon rivers was initially known as Noochuloghoyet. The name Noochuloghoyet was used over the years to describe several locations of trading posts within a 20-mile stretch of the Yukon River near modern day Tanana. (Turck and Turck 1992). The first historical notation of the area came in 1886 when Captain C.W. Raymond of the United States Engineers included it on a map as Fort Adams, which was a trading installation located approximately 11 miles downriver of the present community, near the mouth of the Tozitna River (Orth 1971rep.:947). This American trading post was short-lived, soon replaced by an Alaska Commercial Company trading post. The well-known trader Arthur Harper opened the trading post and called it Nuklukyet (also known as Harpers Station; Orth 1971rep.:947). Soon after, in 1891, St. James Episcopal Mission was established east of the present-day community. This mission provided the first known school and hospital in the area. In 1897, the Northern Commercial Company established a trading post, called Tanana Station, approximately 1 mile downriver of the mission. The first post office for the area was established here the next year and called the Tanana Post Office. By this time, a trading post of the North American Trading and Transportation Company called "Weare" was established approximately one-half mile downstream of what was then being referred to as Tanana Station or Tanana (Orth 1971rep.:947).

In 1899, the U.S. Army established Fort Gibbon at Tanana. The staff at Fort Gibbon was tasked with overseeing the shipping and trading of fur-trading and gold-prospecting supplies and with keeping civil order during the early days of the various gold rushes. In addition, the staff was tasked with supporting a

telegraph line to connect Fairbanks with Valdez, which was being constructed by the Washington–Alaska Military Cable and Telegraph System (L'Ecuyer 1997; Simon et al. 2001). The fort was closed by the U.S. Army in 1923 (Orth 1971rep.:947). During World War II, a U.S. air base was established in the area to support the lend-lease aircraft program as a refueling stop between the U.S. and Russia.[4] Later, during the cold war, the Bear Creek Long-Range Radar Station was built near Tanana (Simon et al. 2001).

As the population of non-Native settlers grew, Athabascans from the Tanana River valley became increasingly concerned that their land and way of life were being infringed upon. In 1915, leaders from Tanana and 5 other communities gathered in Fairbanks to meet with federal Judge Wickersham and outline their concerns, including efforts to protect a Nenana cemetery from being destroyed by construction of the Alaska Railroad.[5] During this meeting the leaders asked to be informed of any government action that would affect their tribes, and they dismissed the idea of establishing reservations. They also wanted unrestricted access to their hunting and fishing grounds, medical assistance, and education. This meeting ultimately led to the establishment of the Tanana Chiefs Conference in 1962, a nonprofit tribal consortium with which the community of Tanana is still affiliated (Simon et al. 2001).

The St. James hospital, the administration of which was transferred from the Episcopal Mission to Bureau of Indian Affairs administration during the 1920s and to U.S. Public Health Service in the 1950s, closed in 1982. This caused a significant drop in the population, because the hospital was a major employer for the area (L'Ecuyer 1997). Today, the hospital facilities are used as a smaller health clinic, nurse's quarters, a children's day care center, and the Tribal office.[6]

Contemporary Tanana provides its residents with most major conveniences. Tanana Power provides electricity, water is from community wells, and the sewage system is septic tanks or municipal water treatment. There is a laundromat, stores, several private businesses, and visitor facilities in the community. Communications include telephones, radio, mail plane, and television. Freight arrives via barge on the Yukon River and by cargo plane. Tanana hosts the Yukon River Championship Sled Dog Race in early April, a Nuchalawoya festival each June, and boat races over Labor Day weekend each year (Valencia et al. 2005). The community was not on the road system during the study year, but a road connecting Tanana with the Elliott Highway by way of the Tofty Road was under construction.

Seasonal Round

The harvest of wild food varies in response to a variety of factors, including fluctuations in animal populations, employment opportunities, changes in local climate, and changes in hunting and fishing regulations. In Tanana, declines in Chinook salmon abundance have affected harvest patterns and reduced the number of families who participate in the salmon fishery. Unseasonably warmer weather, reduced snowfall, and deteriorating river-ice conditions during winter months have changed the hunting and trapping patterns of Tanana residents. Despite these changes, however, subsistence harvest activities in Tanana continue to occur in a seasonal round. Figure 2-1 shows the search and harvest areas used by Tanana residents in 2014. This section discusses the contemporary harvest patterns throughout the year. Historical harvest information can be found in a later section. One ethnographic respondent described his subsistence activities in terms of seasonal preparedness:

> The life we live is all geared around the next season. Like, it's in the winter right now, and I'm already getting ready for geese-hunting. So I'm looking 2 months down the road and—to live like this you have to have a lot of proper planning and preparation. If the geese are 2 weeks early, you're already ready to go—there's no—you know, every

4. Lundberg, M. 2016. "Explore North: The History of Tanana, Alaska." Accessed February 17, 2016. http://explorenorth.com/alaska/history/tanana-history.html

5. Alaska Historical Society. 2015. "The 1915 Tanana Chiefs Meeting." Accessed May 4, 2016. http://alaskahistoricalsociety.org/the-1915-tanana-chiefs-meeting/

6. Lundberg, M. 2016. "Explore North: The History of Tanana, Alaska." Accessed February 17, 2016. http://explorenorth.com/alaska/history/tanana-history.html

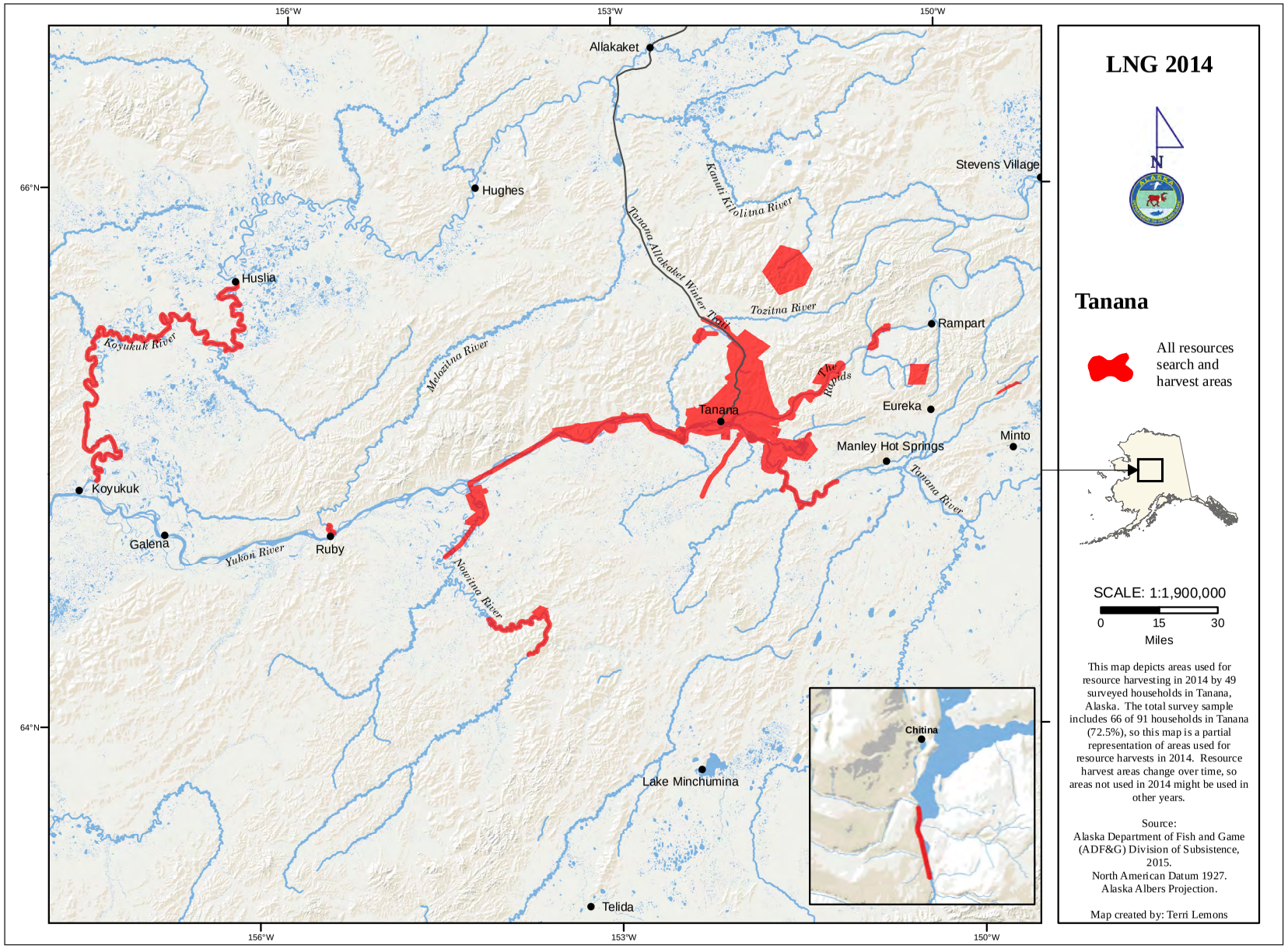

Figure 2-1.–All resources search and harvest areas, Tanana, 2014.

> season is prepping up. I'll start prepping for geese season right now, and then, soon as I'm done hunting geese I'll start prepping for the logging part—you know the firewood, and after that I'll get into, like—you know, if they let us fish for kings maybe I'll do that. But I know I will be prepping my whitefish nets…And then you prep in for your fall-time fishing, which is the big one. (TAL030620151)

For many in Tanana, springtime starts the seasonal round anew. In April, when the days begin to grow longer, residents await the arrival of ducks and geese. Migratory birds, including Canada geese, white-fronted geese, mallards, and black scoters are used and harvested by many residents. Men and boys primarily hunt the birds, while women pluck and prepare the fowl. A respondent described bird hunting as a rite of passage:

> I started, probably when I was 10 or 11 years old, trying to call [in birds]. I was banished from the main hunting group until I actually could call. We want [boys] to learn how to call, but they're gonna have to do it on their own, you know? We don't want them to piggyback or have to carry them. (TAL030620151)

Spring is also a time to travel to nearby lakes in search of muskrats. An elderly respondent recalls that:

> In the spring, [we would] go between Rampart and Stevens Village, and there are lakes there, and just going out and just hunting, you there are spring 'rats. And we would get 'rats and I 'member we would get muskrats…we had to stretch them and skin them, and we'd dry and put away the carcasses, you know, and that was what we were eating [in the springtime]. (TAL030720152)

In the past, summer in Tanana was filled with fishing for Chinook salmon, known locally as king salmon. Many families would travel up the Yukon River to a narrow canyon known as the Rapids. Fish camps and fish wheels dotted the shoreline. Today, regulatory restrictions have greatly reduced the fishing opportunities for Chinook salmon, and very few people travel to their family fish camps. Fall chum salmon, known locally as silvers, migrate past Tanana in the late summer and are harvested for subsistence. A limited fall chum salmon commercial fishery provides a few fishermen with an economic opportunity for a few days in the summer. Further discussion on this fishery is provided below. Those in Tanana who have dog teams catch summer and fall chum salmon and dry them as a winter dog food supply. Unlike Chinook salmon, very few restrictions exist for summer chum salmon. However, due to the proximity of Tanana to spawning grounds up the Tanana River, the fish are not ideal for human consumption. Many people still look forward to berry picking. Blueberries, cranberries, and wild raspberries are frequently picked during the summer months.

In fall time, families turn their focus to moose hunting. Moose, a large land mammal and traditional resource of the Koyukon Athabascans, provide a significant source of red meat. Hunters work together to gather supplies and search for moose. The harvest is usually divided and shared widely though out the community.

As fall comes to a close, residents prepare for winter. Trappers in Tanana ready their trap lines by setting new snares, breaking trail, and making sure all their equipment is working well. Some trappers use snowmachines to check their lines, while others continue to prefer dog teams for winter travel. Marten, wolves, wolverines, and foxes are a few of the furbearing animals targeted in the Tanana area. Some furbearers are also important food sources. Snowshoe hares, for example, are eaten by residents, and their fur is also used by local sewers or sent away for sale.

Population Estimates and Demographic Information

One hundred and forty-eight residents lived in the 66 surveyed households in Tanana in 2014 (Table 1-3). Expanding for the unsurveyed households, the estimated population of 204 included 108 males (53%) and 97 females (47%); 181 were Alaska Native (89%; Figure 2-2; tables D2-1 and D2-2).

Household sizes ranged from 1 to 6 occupants with an average of 2 residents per household (Table 2-3). During the survey period, the median age was 48, the oldest resident was 93, and the youngest was less than 1 year old. The average length of residency was 28 years. Fifty-three percent of household heads reported Tanana as their birthplace (Table 2-4). Fifteen percent of household heads were born outside of Alaska in

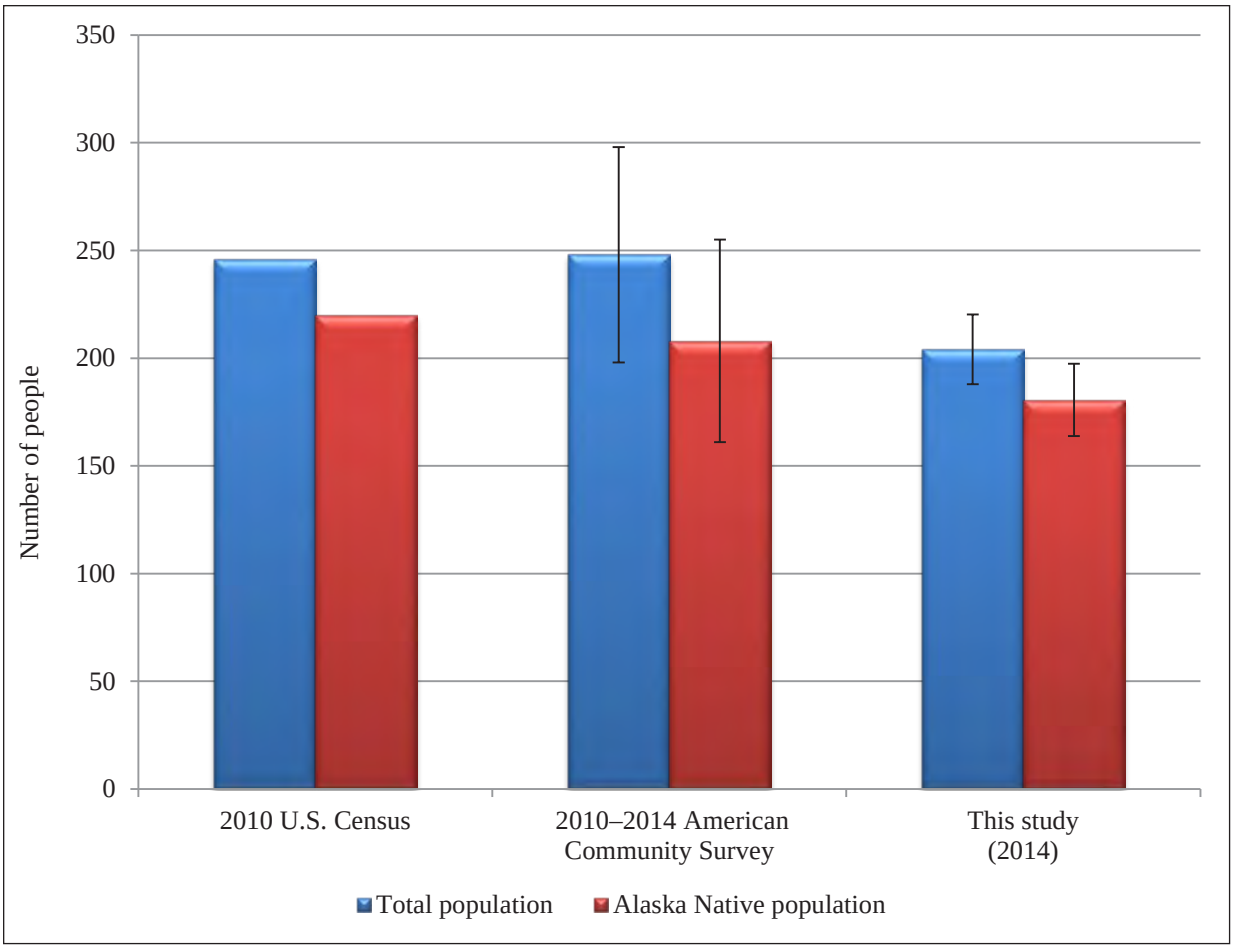

Figure 2-2.–Population estimates, Tanana, 2010 and 2014.

other states. Small percentages (less than 4%) of the remaining household heads were born in communities across Alaska. Many upper and middle Yukon River communities were listed, including Beaver, Fort Yukon, Rampart, and Ruby. Similar to household heads, most of the population was born in Tanana (53%); 10% was born in other U.S. states, and most of the rest were born in Interior Alaska (Table D2-3).

Figure 2-3 shows historical population estimates between 1929 and 2014. The figure compares this study's population estimate with the estimates from the U.S. Census Bureau and the Alaska Department of Labor. With the exception of decennial U.S. census years, the Alaska Department of Labor estimates population annually. In 2010, the U.S. Census Bureau counted 246 residents in Tanana. In 2013, the Alaska Department of Labor estimated a population of 238. This study's estimate of 204 shows the continuation of a gradual decline in the local population since the early 1980s, when the population peaked at 444 in 1984.

Figure 2-4 is a population profile depicting the number of males and females in age groups from 0 to 94. Out of the 204 residents in Tanana, about 25% (47 individuals) were younger than 20 with relatively equal sex distribution in each cohort between 0 and 19 (Table D2-2). Forty-one percent of residents were between the ages of 40 and 64, showing a large middle-aged population.

Table 2-3.–Sample and demographic characteristics, Tanana, 2014.

Characteristics	Community Tanana
Sampled households	66
Eligible households	91
Percentage sampled	72.5%
Sampled population	148
Estimated community population	204.1
Household size	
Mean	2.2
Minimum	1.0
Maximum	6.0
Age	
Mean	38.9
Minimum[a]	0
Maximum	93
Median	48
Length of residency	
Total population	
Mean	27.6
Minimum	0
Maximum	80
Heads of household	
Mean	35.5
Minimum	0
Maximum	80
Alaska Native	
Estimated households[b]	
Number	78.6
Percentage	86.4%
Estimated population	
Number	180.6
Percentage	88.5%

Source ADF&G Division of Subsistence household surveys, 2015.
a. A minimum age of 0 (zero) is used for infants who are less than 1 year of age.
b. The estimated number of households in which at least 1 head of household is Alaska Native.

Table 2-4.–Birthplaces of household heads, Tanana, 2014.

Birthplace	Percentage
Alatna	1.0%
Beaver	2.1%
Fairbanks	1.0%
Fort Yukon	1.0%
Galena	2.1%
Huslia	3.1%
Kaltag	1.0%
Kokrines	1.0%
Kotzebue	2.1%
Nome	2.1%
Nulato	4.2%
Rampart	2.1%
Ruby	3.1%
Shageluk	1.0%
Stony River	1.0%
Tanana	53.1%
Missing	1.0%
Other Alaska	1.0%
Other U.S.	14.6%
Other country	2.1%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

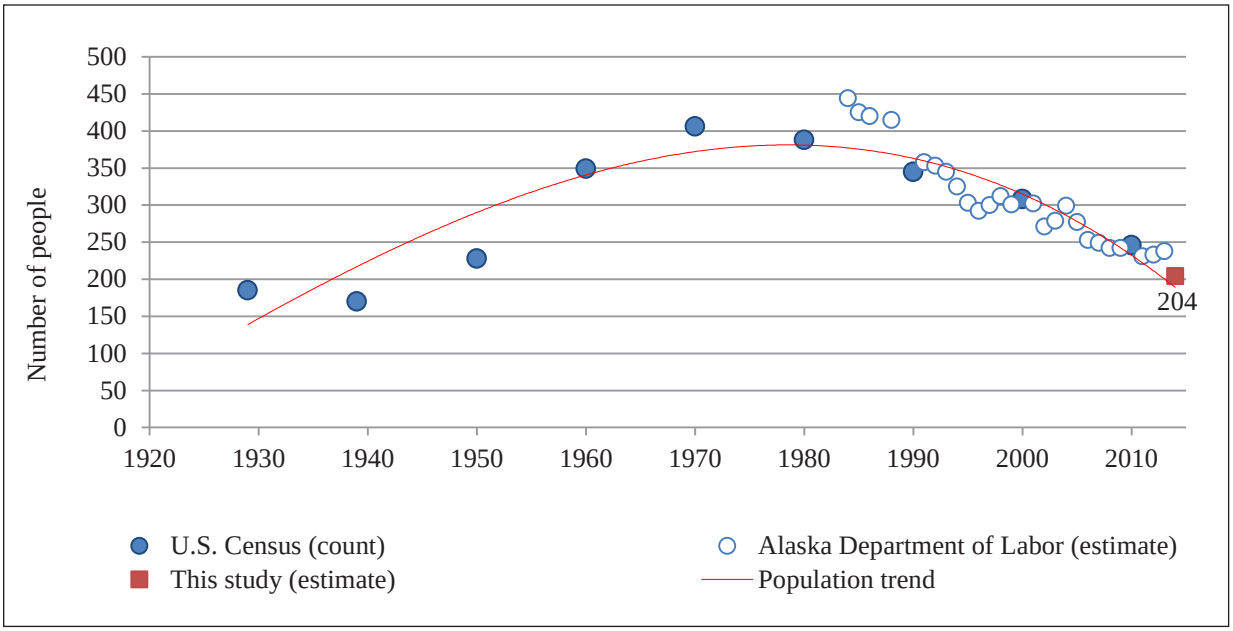

Figure 2-3.–Historical population estimates, Tanana, 1930–2014.

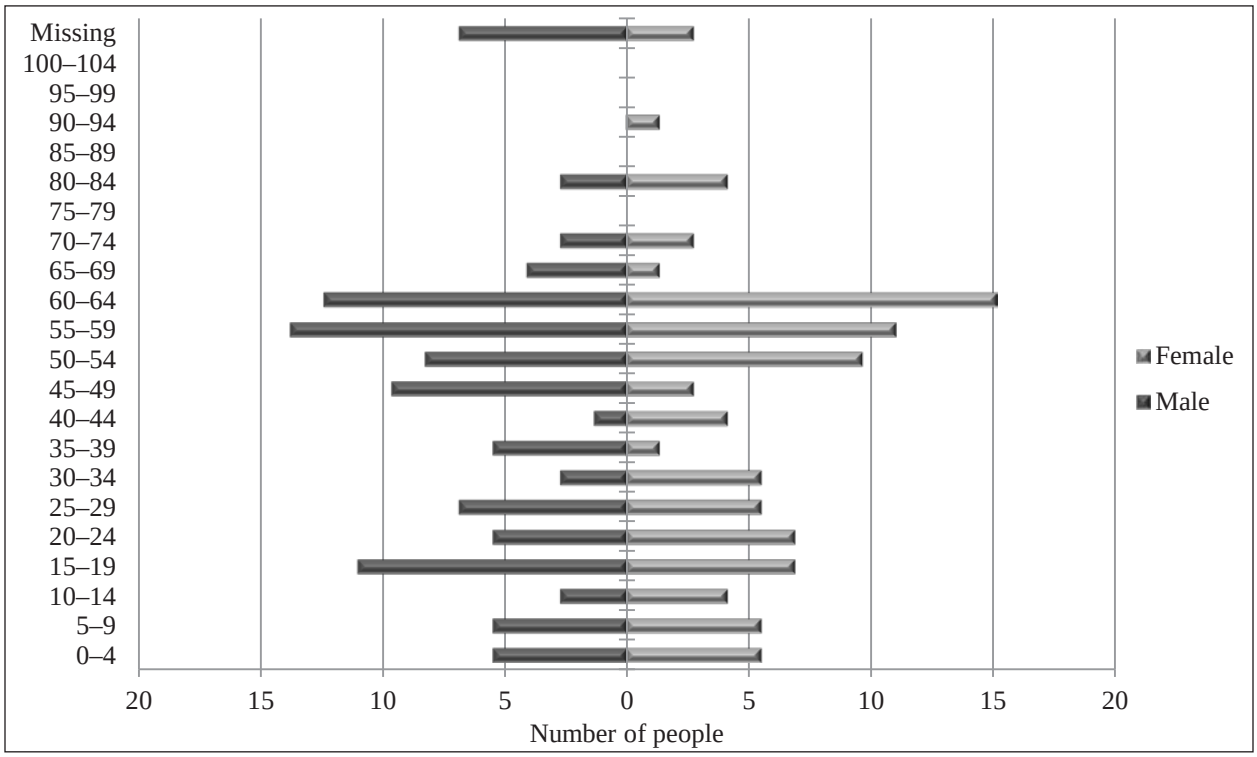

Figure 2-4.–Population profile, Tanana, 2014.

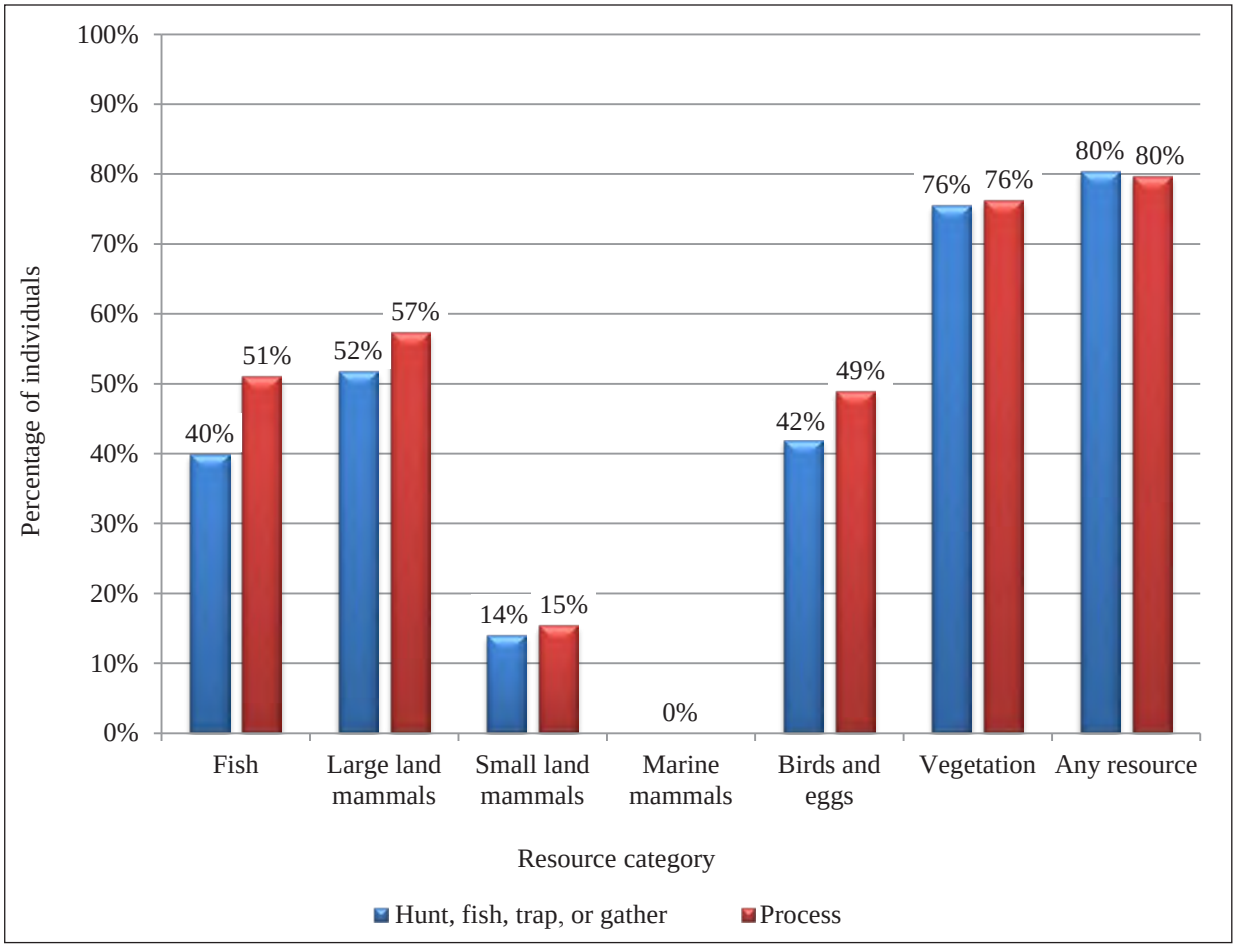

Figure 2-5.–Individual participation in subsistence harvesting and processing activities, Tanana, 2014.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Table D2-4, found in Appendix D of this report, and Figure 2-5 show the expanded levels of individual participation in the harvest and processing of wild resources by all Tanana residents in 2014. Overall, 80% of people attempted to harvest resources, and 80% of the population helped process the harvest. In all resource categories, a higher percentage of people processed wild food than participated in the harvest of those foods. This demonstrates that although not everyone is able to harvest, a shared effort is needed to effectively process and store wild foods. More than one-half of households reported participation in the processing of large land mammals (57%) and fish (51%), 2 resource categories upon which residents of Tanana rely heavily, but only 52% and 40% of households reported harvesting species in these categories.

Harvest and Use of Wild Resources at the Household Level

Figure 2-6 shows by resource category the percentages of Tanana households that used wild resources, attempted to harvest, and harvested wild foods. Most households used wild foods from a variety of resource categories. Tanana households reported the greatest use levels of the large land mammals and salmon resource categories (86% and 85% respectively). Sixty-eight percent of households used nonsalmon fish species, the third most utilized resource category. Birds and eggs followed, with 64% of households reporting use. Although the use of resources in these categories is high, the percentages of households attempting harvest and actually harvesting are much lower. The widest gulf between these 2 metrics was

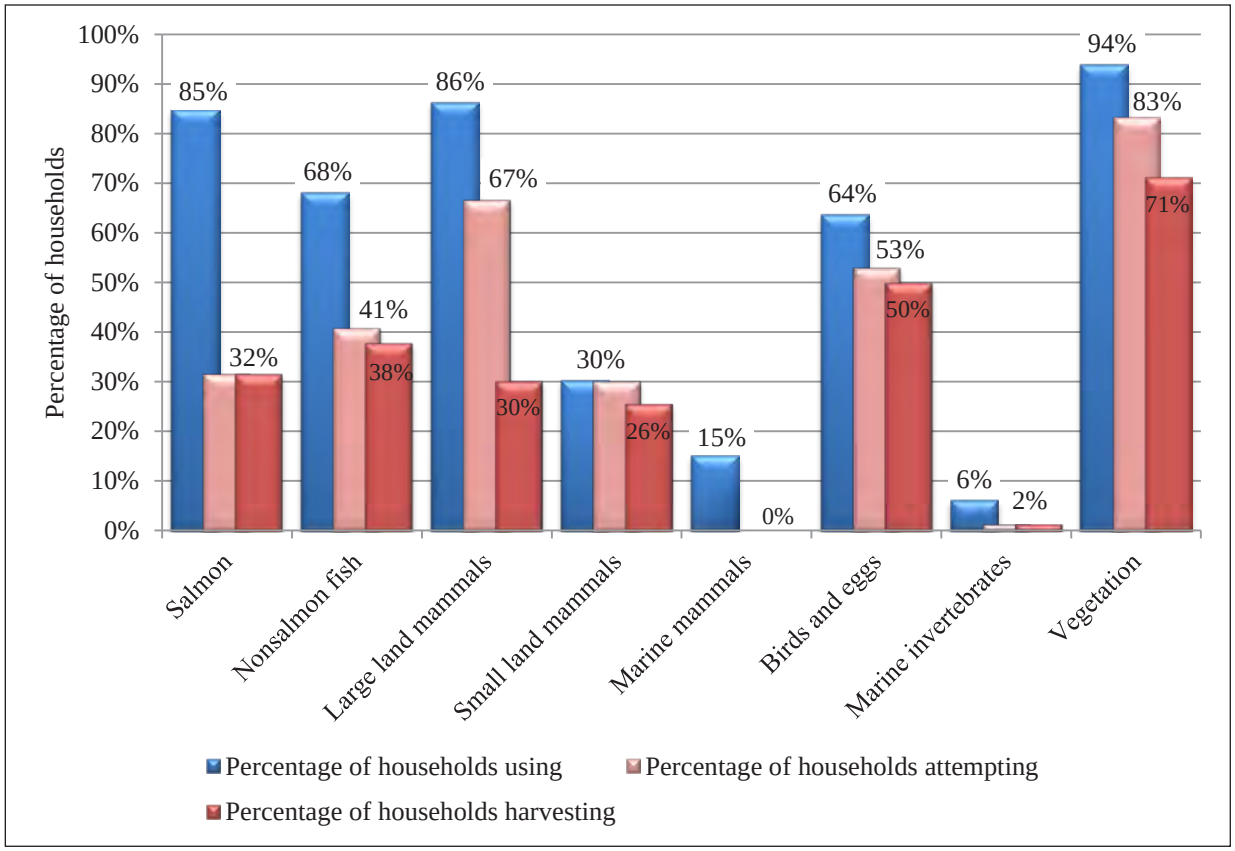

Figure 2-6.–Percentage of households using, attempting to harvest, or harvesting wild resources, by category, Tanana, 2014.

reported with salmon: although 85% of households used salmon, only 32% of households harvested them. Fishing for salmon takes gear, time, and money for boat fuel—resources not available to all residents. The same percentage of households that reported attempting to harvest salmon also reported harvest (32%). This suggests that catching salmon is dependent on whether a household has the means to fish. Unlike the salmon category, residents reported a lower success rate in harvesting large land mammals. Sixty-seven percent of households attempted to harvest large land mammals in 2014, but only 30% reported harvest. Hunting a moose or another large land mammal does not guarantee success, but those who are successful may distribute the moose to those who did not harvest one by sharing, bartering, and trading. A further discussion on the connection between sharing and high rates of use is discussed in the large land mammals section below.

Table 2-1 summarizes resource harvest and use characteristics for Tanana in 2014 at the household level. The average harvest was 2,172 lb edible weight per household. During the study year, community households harvested an average of 7 kinds of resources and used an average of 11 kinds of resources. The maximum number of resources used by any household was 40. In addition, households gave away an average of 4 kinds of resources. Overall, as many as 136 resources were available for households to harvest in the study area; this included species that survey respondents identified but were not asked about in the survey instrument.

Harvest Quantities and Composition

Table 2-5 reports estimated wild resource harvests and uses by Tanana residents in 2014 and is organized first by general category and then by species. All edible resources are reported in pounds edible weight (see Appendix C for conversion factors). 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 a household, and resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Purchased foods are not included, but resources such as firewood are included because they are an important part of the subsistence way of life. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

Tanana residents harvested 197,715 edible pounds of wild foods for an estimated harvest of 969 lb per capita (Table 2-5). Although Tanana residents do eat fall chum salmon, a considerable portion of the harvest is fed to dogs[7] (78% of all fall chum harvest; 62% of the total resource harvest). Although the prevalence and significance of dog teams in Tanana is discussed in a later section, it is worth noting here that if the fish caught and fed to dogs were removed from the estimate, the total community harvest estimate would be 75,252 lb, decreasing the per capita harvest estimate to 367 lb.

Figure 2-7 shows the composition of Tanana's harvest by resource category. Salmon made up 71% of the total harvest, and nonsalmon fish and large land mammals followed with 17% and 10%, respectively. Salmon contributed 141,140 lb to the community total (692 lb per capita), significantly more than any other resource category (Table 2-5). Residents harvested a total of 34,312 lb of nonsalmon species, accounting for 169 lb per capita. Together, fish species made up 88% of the subsistence harvest (175,452 lb or 860 lb per capita; Table 2-5 and Figure 2-7). The other resource categories made less significant contributions to the community's harvest. Large land mammals contributed 19,121 lb of the total harvest, accounting for 94 lb per capita (Table 2-5). The remaining categories of small land mammals, birds and eggs, marine invertebrates, and vegetation each made up 1% or less of the community's harvest (Figure 2-7).

Table 2-6 lists the top ranked resources used by households and Figure 2-8 shows the species with the highest per capita harvests during the 2014 study year. Although fish species made up the bulk of the harvest, they were not used by the largest percentage of households. Moose, a large land mammal, was used by 86% of households, more than any other resource (Table 2-6). Blueberries, part of the vegetation category that only made up 1% of the community's harvest, was used by 76% of households (Table 2-6; Figure 2-8). Fall chum salmon and Chinook salmon followed; 44% of households reported using each of type of salmon (Table 2-6). Spruce grouse, used by 33% of households, was the only bird in the top 10 used resources. In terms of per capita harvest, fall chum salmon made up more than one-half of the community's harvest (53%, or 511 lb per capita; Table 2-5; Figure 2-8). The next highest harvested resource was summer chum salmon with only 11% of the harvest (112 lb per capita). Moose added 88 edible pounds to the total per capita harvest and accounted for 9% of the total community harvest. The remaining top species harvested were small amounts of salmon and nonsalmon fishes.

If the fish caught and fed to dogs were removed from the total community harvest, the composition of harvest would change little. The top 10 species with the highest per capita harvest would be ranked in the following order: fall chum salmon (30% of per capita harvests), moose (24%), summer chum salmon (19%), coho salmon (12%), sheefish (4%), humpback whitefish (1%), broad whitefish (1%), and other resources that made up less than 1% of the per capita harvest including Chinook salmon, black bear, and blueberries. In this scenario, moose becomes a more prominent component of the harvest. The contribution of fall chum salmon is reduced, but fall chum harvests still constitute a significant portion of the total harvest. The contribution of nonsalmon fish species remains relatively unchanged. This demonstrates that fall chum salmon is a keystone resource for both dogs and humans; the harvest of fish for dogs does not exist independently from the harvest and use of other resources. Removing the fish fed to dogs from the

7. Under subsistence statute 16.05.940 (33) transportation, including dog teams, is a valid subsistence use. There are limitations on the use of Chinook salmon for dog food; however, other salmon and nonsalmon species can be fed to dogs.

Table 2-5.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Tanana, 2014.

	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
All resources	**100.0**	**90.9**	**86.4**	**98.5**	**81.8**	**197,714.5**	**2,172.7**	**968.9**	**197,714.5**	**lb**	**2,172.7**	**37.4**
Salmon	**84.8**	**31.8**	**31.8**	**68.2**	**43.9**	**141,140.2**	**1,551.0**	**691.7**	**141,140.2**	**lb**	**1,551.0**	**40.6**
Summer chum salmon	30.3	22.7	22.7	12.1	10.6	22,805.4	250.6	111.8	4,532.1	ind	49.8	64.7
Fall chum salmon	43.9	22.7	22.7	30.3	25.8	104,276.9	1,145.9	511.0	20,722.8	ind	227.7	40.9
Coho salmon	42.4	18.2	18.2	27.3	13.6	12,341.5	135.6	60.5	2,388.1	ind	26.2	64.8
Chinook salmon	43.9	10.6	10.6	31.8	12.1	1,197.2	13.2	5.9	137.9	ind	1.5	55.7
Pink salmon	3.0	1.5	1.5	1.5	0.0	355.3	3.9	1.7	137.9	ind	1.5	104.7
Sockeye salmon	6.1	1.5	1.5	4.5	1.5	150.1	1.6	0.7	37.2	ind	0.4	104.7
Unknown salmon	4.5	1.5	1.5	3.0	1.5	13.8	0.2	0.1	2.7	ind	0.0	104.7
Nonsalmon fish	**68.2**	**40.9**	**37.9**	**48.5**	**27.3**	**34,311.8**	**377.1**	**168.1**	**34,311.8**	**lb**	**377.1**	**54.2**
Pacific herring	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe	4.5	0.0	0.0	4.5	1.5	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe/unspecified	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring spawn on kelp	1.5	0.0	0.0	1.5	1.5	0.0	0.0	0.0	0.0	gal	0.0	0.0
Eulachon (hooligan, candlefish)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific (gray) cod	1.5	1.5	1.5	0.0	0.0	0.7	0.0	0.0	1.4	ind	0.0	104.7
Pacific tomcod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Starry flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Lingcod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pacific halibut	15.2	1.5	1.5	13.6	3.0	68.9	0.8	0.3	68.9	lb	0.8	104.7
Unknown rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0
Burbot	21.2	18.2	16.7	4.5	9.1	261.4	2.9	1.3	108.9	ind	1.2	43.3
Dolly Varden	1.5	1.5	1.5	0.0	0.0	6.2	0.1	0.0	6.9	ind	0.1	104.7
Arctic grayling	9.1	12.1	7.6	1.5	1.5	63.3	0.7	0.3	70.3	ind	0.8	53.0
Northern pike	21.2	21.2	19.7	1.5	4.5	1,007.6	11.1	4.9	719.7	ind	7.9	54.6
Sheefish	42.4	31.8	30.3	19.7	18.2	9,463.9	104.0	46.4	1,577.3	ind	17.3	53.7

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Table 2-5.–Page 2 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Nonsalmon fish, continued												
Longnose sucker	7.6	7.6	7.6	0.0	0.0	223.4	2.5	1.1	111.7	ind	1.2	49.8
Rainbow trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Broad whitefish	21.2	13.6	13.6	9.1	10.6	3,870.8	42.5	19.0	2,764.8	ind	30.4	52.1
Bering cisco	1.5	1.5	1.5	0.0	0.0	386.1	4.2	1.9	551.5	ind	6.1	104.7
Least cisco	10.6	7.6	7.6	4.5	3.0	1,985.5	21.8	9.7	1,985.5	ind	21.8	54.5
Unknown cisco	1.5	1.5	1.5	0.0	0.0	209.8	2.3	1.0	193.0	ind	2.1	104.7
Humpback whitefish	37.9	18.2	18.2	22.7	10.6	7,611.1	83.6	37.3	2,537.0	ind	27.9	48.1
Round whitefish	12.1	7.6	6.1	7.6	1.5	278.5	3.1	1.4	557.0	ind	6.1	81.5
Unknown whitefishes	10.6	4.5	4.5	6.1	4.5	8,874.7	97.5	43.5	3,739.3	ind	41.1	96.7
Large land mammals	**86.4**	**66.7**	**30.3**	**71.2**	**51.5**	**19,121.0**	**210.1**	**93.7**	**19,121.0**	**lb**	**210.1**	**30.2**
Black bear	15.2	13.6	6.1	10.6	10.6	689.4	7.6	3.4	6.9	ind	0.1	54.3
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Caribou	9.1	4.5	4.5	4.5	7.6	562.5	6.2	2.8	4.1	ind	0.0	59.5
Sitka black-tailed deer	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mountain goat	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Moose	86.4	63.6	27.3	71.2	50.0	17,869.1	196.4	87.6	33.1	ind	0.4	30.2
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Small land mammals	**30.3**	**30.3**	**25.8**	**10.6**	**10.6**	**295.8**	**3.3**	**1.4**	**295.8**	**lb**	**3.3**	**48.4**
Beaver	15.2	10.6	7.6	9.1	6.1	227.5	2.5	1.1	41.4	ind	0.5	51.8
Coyote	1.5	1.5	1.5	0.0	1.5	0.0	0.0	0.0	1.4	ind	0.0	104.7
Red fox–cross phase	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	1.4	ind	0.0	104.7
Red fox–red phase	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	1.4	ind	0.0	104.7
Snowshoe hare	12.1	12.1	10.6	3.0	1.5	38.6	0.4	0.2	41.4	ind	0.5	80.1
River (land) otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Lynx	4.5	4.5	4.5	0.0	1.5	5.5	0.1	0.0	6.9	ind	0.1	104.7
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marten	13.6	15.2	13.6	0.0	4.5	0.0	0.0	0.0	164.1	ind	1.8	67.6
Mink	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	1.4	ind	0.0	104.7
Muskrat	4.5	6.1	4.5	0.0	0.0	10.3	0.1	0.1	19.3	ind	0.2	104.7
Porcupine	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 2-5.–Page 3 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Small land mammals, continued												
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red (tree) squirrel	4.6	4.6	4.5	0.0	0.0	13.8	0.2	0.1	71.7	ind	0.8	104.7
Weasel	3.0	4.5	3.0	0.0	3.0	0.0	0.0	0.0	9.7	ind	0.1	74.2
Gray wolf	4.5	3.0	3.0	1.5	1.5	0.0	0.0	0.0	5.5	ind	0.1	73.4
Wolverine	3.0	3.0	3.0	0.0	1.5	0.0	0.0	0.0	6.9	ind	0.1	74.9
Marine mammals	**15.2**	**0.0**	**0.0**	**15.2**	**4.5**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Bearded seal	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ringed seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spotted seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown seals	12.1	0.0	0.0	12.1	3.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Walrus	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Beluga whale	4.5	0.0	0.0	4.5	1.5	0.0	0.0	0.0	0.0	ind	0.0	0.0
Bowhead whale	9.1	0.0	0.0	9.1	1.5	0.0	0.0	0.0	0.0	ind	0.0	0.0
Birds and eggs	**63.6**	**53.0**	**50.0**	**30.3**	**22.7**	**1,546.1**	**17.0**	**7.6**	**1,546.1**	**lb**	**17.0**	**33.1**
Canvasback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spectacled eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Goldeneye	4.5	4.5	4.5	0.0	1.5	44.6	0.5	0.2	29.0	ind	0.3	70.0
Mallard	18.2	13.6	12.1	9.1	6.1	365.7	4.0	1.8	187.5	ind	2.1	64.0
Northern pintail	6.1	6.1	6.1	1.5	3.0	57.9	0.6	0.3	38.6	ind	0.4	77.0
Black scoter	12.1	7.6	7.6	9.1	4.5	86.9	1.0	0.4	96.5	ind	1.1	75.9
Northern shoveler	1.5	1.5	1.5	0.0	0.0	1.5	0.0	0.0	1.4	ind	0.0	104.7
Green-winged teal	6.1	4.5	4.5	1.5	1.5	10.0	0.1	0.0	19.3	ind	0.2	77.9
Unknown ducks	7.6	1.5	0.0	6.1	1.5	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Cackling goose	9.1	6.1	3.0	6.1	3.0	13.2	0.1	0.1	11.0	ind	0.1	75.8
Canada goose	1.5	3.0	1.5	0.0	1.5	41.4	0.5	0.2	34.5	ind	0.4	104.7
Unknown Canada/ cackling goose	19.7	16.7	13.6	10.6	6.1	99.3	1.1	0.5	82.7	ind	0.9	44.7
Snow goose	1.5	1.5	1.5	0.0	1.5	16.5	0.2	0.1	4.1	ind	0.0	104.7
White-fronted goose	21.2	16.7	12.1	7.6	4.5	292.3	3.2	1.4	68.9	ind	0.8	43.2
Unknown geese	1.5	1.5	0.0	1.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 2-5.–Page 4 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Tundra (whistling) swan	1.5	1.5	1.5	0.0	1.5	15.5	0.2	0.1	1.4	ind	0.0	104.7
Sandhill crane	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spruce grouse	33.3	31.8	30.3	10.6	15.2	199.8	2.2	1.0	285.4	ind	3.1	24.4
Sharp-tailed grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ruffed grouse	6.1	6.1	6.1	0.0	3.0	105.2	1.2	0.5	150.3	ind	1.7	96.1
Unknown grouses	10.6	9.1	9.1	4.5	4.5	48.0	0.5	0.2	68.6	ind	0.8	54.4
Willow ptarmigan	1.5	1.5	1.5	0.0	0.0	5.8	0.1	0.0	8.3	ind	0.1	104.7
Unknown ptarmigans	10.6	7.6	7.6	6.1	6.1	132.2	1.5	0.6	188.9	ind	2.1	77.7
Snowy owl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown duck eggs	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown goose eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown swan eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown crane eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown small shorebird eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown gull eggs	4.5	3.0	3.0	1.5	1.5	10.3	0.1	0.1	34.5	ind	0.4	100.5
Unknown loon eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0
Marine invertebrates	**6.1**	**1.5**	**1.5**	**4.5**	**0.0**	**2.1**	**0.0**	**0.0**	**2.1**	**gal**	**0.0**	**104.7**
Butter clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Freshwater clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Razor clams	3.0	1.5	1.5	1.5	0.0	2.1	0.0	0.0	0.7	gal	0.0	104.7
Unknown clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dungeness crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
King crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tanner crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Shrimp	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0

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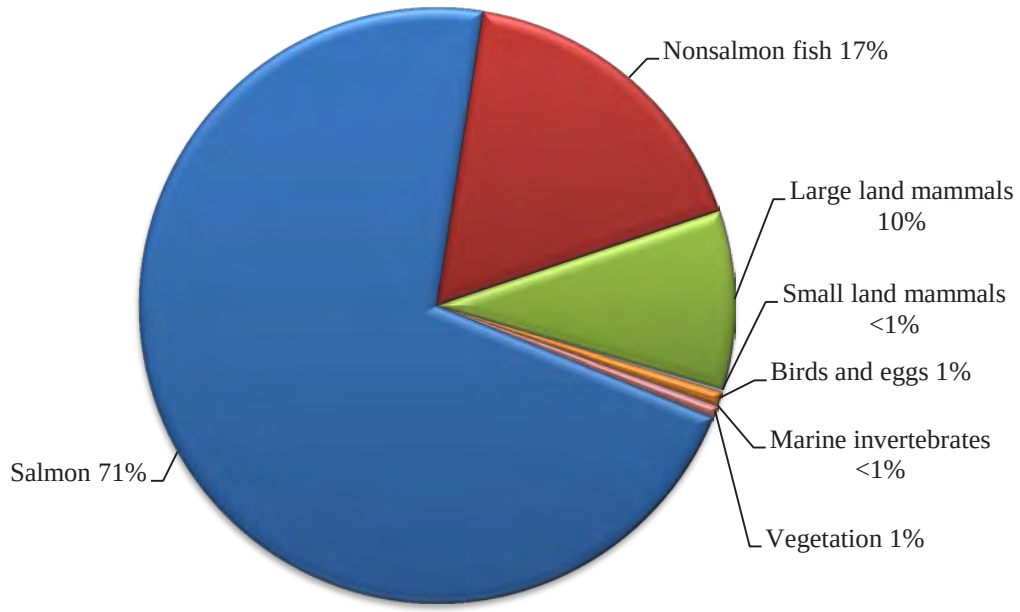
Table 2-5.–Page 5 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Vegetation	**93.9**	**83.3**	**71.2**	**65.2**	**50.0**	**1,297.6**	**14.3**	**6.4**	**1,297.6**	**gal**	**14.3**	**15.1**
Blueberry	75.8	63.6	59.1	30.3	34.8	668.9	7.4	3.3	167.2	gal	1.8	17.3
Lowbush cranberry	25.8	25.8	22.7	6.1	12.1	140.6	1.5	0.7	35.2	gal	0.4	28.9
Highbush cranberry	25.8	25.8	22.7	7.6	13.6	161.0	1.8	0.8	40.3	gal	0.4	34.9
Crowberry	1.5	3.0	0.0	1.5	1.5	0.0	0.0	0.0	0.0	gal	0.0	0.0
Cloudberry	7.6	4.5	3.0	4.5	3.0	2.1	0.0	0.0	0.5	gal	0.0	77.5
Raspberry	28.8	24.2	24.2	6.1	7.6	74.5	0.8	0.4	18.6	gal	0.2	34.1
Strawberry	1.5	1.5	1.5	0.0	0.0	2.8	0.0	0.0	0.7	gal	0.0	104.7
Other wild berry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Wild rhubarb	10.6	12.1	10.6	1.5	6.1	209.6	2.3	1.0	52.4	gal	0.6	46.3
Fiddlehead ferns	1.5	1.5	1.5	0.0	1.5	1.4	0.0	0.0	1.4	gal	0.0	104.7
Hudson's Bay (Labrador) tea	16.7	12.1	12.1	4.5	4.5	11.7	0.1	0.1	11.7	gal	0.1	43.9
Willow leaves	3.0	0.0	0.0	3.0	1.5	0.0	0.0	0.0	0.0	gal	0.0	0.0
Wild rose hips	1.5	1.5	1.5	0.0	0.0	1.4	0.0	0.0	0.3	gal	0.0	104.7
Other wild greens	4.5	3.0	3.0	0.0	0.0	2.8	0.0	0.0	2.8	gal	0.0	73.4
Unknown mushrooms	4.5	4.5	4.5	0.0	0.0	5.9	0.1	0.0	5.9	gal	0.1	77.7
Fireweed	1.5	1.5	1.5	0.0	0.0	1.4	0.0	0.0	1.4	gal	0.0	104.7
Plantain	1.5	1.5	1.5	1.5	1.5	1.4	0.0	0.0	1.4	gal	0.0	104.7
Stinkweed	6.1	4.5	4.5	1.5	3.0	5.5	0.1	0.0	5.5	gal	0.1	58.2
Punk	1.5	1.5	1.5	0.0	1.5	0.0	0.0	0.0	27.6	gal	0.3	104.7
Chaga	1.5	3.0	1.5	1.5	1.5	5.5	0.1	0.0	5.5	gal	0.1	104.7
Unknown fungi	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Wild chives	1.5	1.5	1.5	0.0	1.5	1.4	0.0	0.0	1.4	lb	0.0	0.0
Wood	89.4	63.6	63.6	45.5	24.2	0.0	0.0	0.0	0.0	lb	0.0	0.0
Bark	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0
Spruce	3.0	1.5	1.5	1.5	1.5	0.0	0.0	0.0	0.0	lb	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2015.

Note Resources where the percentage using is greater than the combined received and harvest indicate use from resources obtained during a previous year.

Note For small land mammals, species that are not typically eaten show a nonzero harvest amount with a zero harvest weight. Harvest weight is not calculated for species harvested but not eaten.



Note Categories having 0 lb of usable weight are not included.

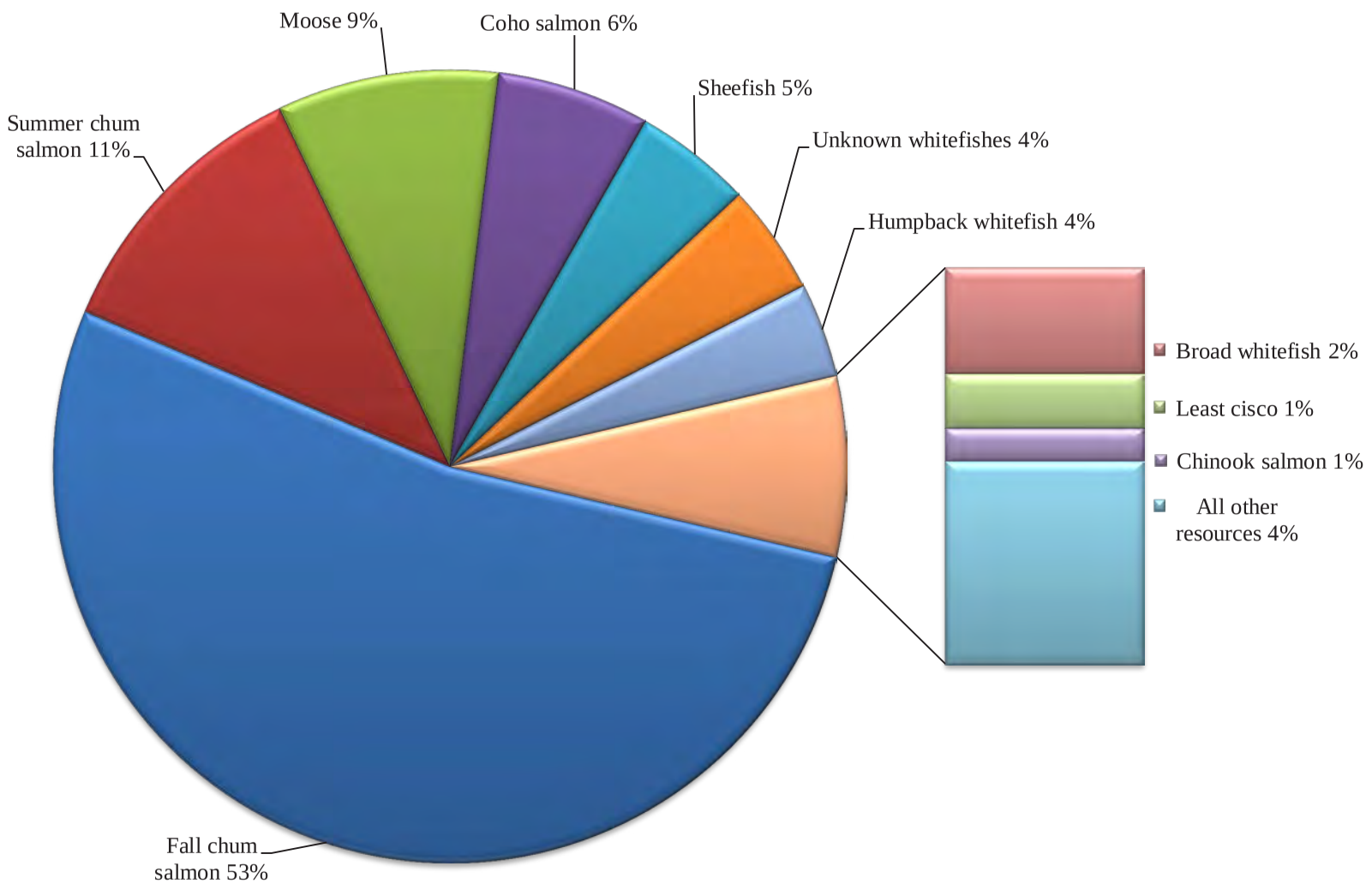
Figure 2-7.–Composition of harvest by resource category, by weight in usable pounds, Tanana, 2014.

Table 2-6.–Resources most commonly used by households, Tanana, 2014.

Rank[a]	Resource	Percentage of households using
1.	Moose	86.4%
2.	Blueberry	75.8%
3.	Fall chum salmon	43.9%
3.	Chinook salmon	43.9%
5.	Coho salmon	42.4%
5.	Sheefish	42.4%
7.	Humpback whitefish	37.9%
8.	Spruce grouse	33.3%
9.	Summer chum salmon	30.3%
10.	Raspberry	28.8%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Resources used by the same percentage of households share the lowest rank value instead of having sequential rank values.



Note The "all other resources" category represents all species that contributed less than 1% to the total harvest.

Figure 2-8.–Top resources harvested by weight in usable pounds per capita, Tanana, 2014.

community harvest should only be considered a hypothetical scenario for certain data applications, and not an alternative finding regarding total subsistence harvests in the community. For example, data on human consumption of subsistence resources may be needed for developing health advisories in cases of potential contamination of fish and wildlife. In such cases, it is appropriate to use harvest estimates with harvests specifically for dogs removed as an indirect measure of human consumption rates (Wolfe and Utermohle 2000:22). But as stated earlier, keeping dog teams and feeding fish to dogs are both legitimate subsistence practices. In Tanana, they are fundamental features of the subsistence seasonal round and a defining characteristic of the community.

Salmon

Despite years of fishing restrictions and declining abundance of Chinook salmon, salmon as a resource category made up 71% of Tanana's total harvest (Figure 2-7). Approximately 141,140 lb of salmon were harvested (27,959 fish and 692 lb per capita; Table 2-5). The same percentage of households that attempted to harvest salmon did harvest (32%), suggesting that anyone who tried to go fishing was successful. Sixty-eight percent of households reported receiving salmon from others, and 44% reported that they gave some salmon away. Of the 4 types of salmon available near Tanana, fall chum salmon constituted the majority of the harvest. Tanana fishers harvested 104,277 lb (or 20,723 fish) of fall chum salmon in 2014 (511 lb per capita), which accounted for 74% of the total salmon harvest and 53% of the community's total wild resource harvest (Table 2-5; Figure 2-9). Twenty-three percent of Tanana households caught the fall chum salmon used by the community. Even though fall chum salmon made up more than one-half of the community's harvest, their use was not as prevalent. Only 44% of households used fall chum salmon. The reliance on fall chum salmon as a source for dog food could partly explain this difference. Without the harvest of salmon for dogs, the per capita harvest of fall chum salmon drops to 110 lb (Table 2-7).

During the 10 ethnographic interviews, all 11 ethnographic respondents discussed the consumption, dependence on, and the harvest and processing techniques of salmon. Additionally, they often made comparisons between the heavily-harvested fall chum salmon and the historically-significant Chinook salmon. Respondents expressed differences over which type of salmon was the preferred eating fish in Tanana. One respondent noted a preference for fall chum over Chinook salmon because, "kings are so rich, but chum we could eat every day. We eat 2 or 3 times a day, they are just that good" (TAL030720154), while another stated that even though fall chum salmon are more abundant they "just aren't the same, the taste is

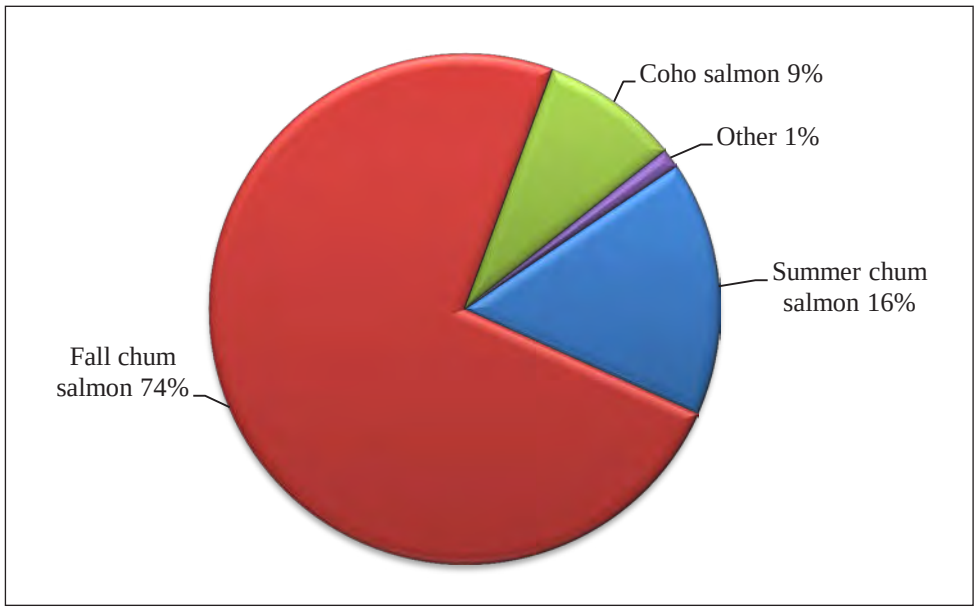


Figure 2-9.–Composition of salmon harvest by weight in usable pounds, Tanana, 2014.

Table 2-7.–Estimated per capita harvests of salmon and nonsalmon fish with and without fish used for dog food, Tanana, 2014.

	Per capita (lb)	
Resource	With fish for dogs	Without fish for dogs
Salmon	**691.7**	**230.1**
Summer chum salmon	111.8	72.1
Fall chum salmon	511.0	110.2
Coho salmon	60.5	43.1
Chinook salmon	5.9	3.5
Pink salmon	1.7	0.4
Sockeye salmon	0.7	0.7
Unknown salmon	0.1	0.1
Nonsalmon fish	**168.1**	**29.6**
Pacific herring	0.0	0.0
Pacific herring roe	0.0	0.0
Pacific herring roe/unspecified	0.0	0.0
Pacific herring spawn on kelp	0.0	0.0
Eulachon (hooligan, candlefish)	0.0	0.0
Unknown smelt	0.0	0.0
Pacific (gray) cod	0.0	0.0
Pacific tomcod	0.0	0.0
Starry flounder	0.0	0.0
Lingcod	0.0	0.0
Pacific halibut	0.3	0.3
Unknown rockfish	0.0	0.0
Alaska blackfish	0.0	0.0
Burbot	1.3	1.1
Dolly Varden	0.0	0.0
Arctic grayling	0.3	0.2
Northern pike	4.9	0.7
Sheefish	46.4	14.6
Arctic grayling	1.1	0.0
Northern pike	0.0	0.0
Sheefish	0.0	0.0
Longnose sucker	19.0	4.4
Rainbow trout	1.9	0.0
Unknown trout	9.7	1.4
Broad whitefish	1.0	0.0
Bering cisco	37.3	4.8
Least cisco	1.4	0.5
Unknown cisco	43.5	1.5

Source ADF&G Division of Subsistence household surveys, 2015.

Plate 2-1.–Tanana fishermen have shifted their fishing effort from Chinook salmon to fall chum salmon as their primary eating fish. This smokehouse was once filled with only Chinook salmon; now only fall chum salmon hang to dry.

different than the king salmon. I'm really picky. I can't, I don't like it. I don't like to eat it. I'd rather have king salmon!" (TAL030620155).

In recent years, conservation measures have reduced or, in some years, eliminated the harvest opportunities for Chinook salmon. Consequently, those who once fished primarily for Chinook salmon have shifted their harvest effort to the more abundant salmon species or are spending more time harvesting other wild foods. One ethnographic respondent characterized this shift by stating, "the fall chum, that's where we're really pushing hard, the demand now far outweighs the supply" (TAL030620151). Another respondent also emphasized the move away from Chinook, "the other species we are hitting hard now is probably, well, fall chum, because that's what we're making into strips and jarred fish you know, because we don't have the king [salmon]" (TAL030420158; Plate 2-1).

Although personal preferences vary, Tanana residents do not believe that fall chum salmon are an equal replacement for Chinook salmon. With fewer Chinook salmon, Tanana residents are learning to shift fishing effort and processing techniques to accommodate the differences in the fall chum salmon fishery. Several respondents described how fall chum salmon require more processing effort than Chinook salmon because they do not freeze as well. In the past, one respondent would vacuum seal 10 to 15 Chinook salmon for consumption throughout the winter, but in 2014, the respondent was unable to catch any Chinook salmon due to regulatory restrictions:

> So my dad and I tried to put away a couple really good fall chums, but you have to peel [the skin off], he said. Because the skin he believes makes them go bad quicker. But even after that, it's just, for me, I cooked some up as best I could. I tried to spice it up, season it up, and it was just gross. It was gross. You know, the fat in the king salmon keeps it better longer. I mean, you could go a whole year with it being in the freezer, and the king salmon would still be good. I think that chum kept for 2 or 3 months, but that's it. (TAL030620155)

Table 2-8.–Estimated harvests of fish for consumption by dogs, Tanana, 2014.

Resource	Amount	Pounds
Salmon		
Summer chum salmon	1,610.0 ind	8,101.5 lb
Fall chum salmon	16,254.9 ind	81,794.5 lb
Coho salmon	686.0 ind	3,545.2 lb
Pink salmon	103.4 ind	266.5 lb
Nonsalmon fish		
Burbot	15.4 ind	37.0 lb
Arctic grayling	13.8 ind	12.4 lb
Northern pike	621.8 ind	870.6 lb
Sheefish	1,082.2 ind	6,493.2 lb
Longnose sucker	111.7 ind	223.4 lb
Broad whitefish	2,116.4 ind	2,963.0 lb
Bering cisco	541.9 ind	379.3 lb
Least cisco	1,702.8 ind	1,702.8 lb
Unknown cisco	193.0 ind	209.8 lb
Humpback whitefish	2,217.6 ind	6,652.8 lb
Round whitefish	344.7 ind	172.3 lb
Unknown whitefishes	3,612.4 ind	8,573.6 lb
Total	**31,228.0 ind**	**121,998.0 lb**

Source ADF&G Division of Subsistence household surveys, 2015.

According to respondents, scraping the skin off the fall chum salmon is a new process that can successfully preserve the fish for longer periods of time. However, if fishermen are unable to catch high-quality fall chum salmon (usually found in the first portion of the run), they may be left with fish that spoil quickly regardless of processing techniques.

Another respondent made a similar observation while attempting to put away fall chum salmon as a replacement for Chinook salmon. In the past, the respondent would cut Chinook salmon, smoke them for a few days wrap them in plastic wrap, and vacuum seal them; but after realizing that fall chum salmon will "go rancid in the freezer" with this method, he began scraping the skin off the chum salmon before cutting them (TAL030520159).

More survey participants reported fishing for summer and fall chum salmon (both 23%) than any other type of salmon (Table 2-5). Summer chum salmon accounted for 16% of the total salmon harvest (22,805 lb, 112 lb per capita) and 12% of the total community harvest (Table 2-5; Figure 2-9). Summer chum salmon typically migrate up the Yukon River and spawn in the Tanana River. Because Tanana is close to the mouth of the Tanana River, the quality of the fish is poor in comparison to other types of salmon that continue up the Yukon River to their spawning grounds. As a result, few people in Tanana eat the summer chum salmon caught in the area. Approximately 36% of the summer chum salmon caught by Tanana residents was fed to dogs (8,102 lb; Table 2-8).

Table 2-8 shows the estimated salmon harvest for feeding dogs. An estimated total of 93,708 lb of salmon was fed to dogs in Tanana in 2014, roughly 66% of the total salmon harvest. Fall chum salmon made up the vast majority of the salmon fed to dogs (87%); summer chum and coho salmon contributed to lesser extents (9% and 4% respectively; Plate 2-2) One musher quantified the amount of salmon he feeds to his dog team: He usually feeds "roughly 15 [fall chum salmon]" to his dog team each day throughout the winter. Sheefish and other whitefish species are used along with dry dog food to sustain the dog team throughout the winter (TAL030620155).

Dog mushing in Tanana has a long history, and most ethnographic respondents recalled having a dog team at some point in their lives. The connection between fishing and dog mushing is also significant. According

Plate 2-2.–Mushers in Tanana rely heavily on fall chum salmon to feed their dog teams. To preserve the fish as dog food for the winter, fishermen split the salmon and hang them on poles to dry.

to respondents, because the cost of keeping a dog team in rural Alaska is so high, feeding fish to dogs is necessary. As a result, dog mushers are often high-harvesting fishermen. One respondent believes that the decline of dog teams in Tanana has had an effect on the generational transmission of knowledge regarding fishing. There are fewer mushers and fewer people fishing (TAL030620151).

Other respondents were worried that if the summer or fall chum salmon runs crash, keeping dog teams will no longer be an option. One respondent noted that "if the chum run stays steady, then I think we'll be okay" (TAL030620155). Without chum salmon, however, feeding and keeping dog teams would become difficult for some Tanana residents.

Chinook salmon was once a heavily-fished resource but it has not been harvested in quantity for many years because of subsistence restrictions put in place to make border passage goals as laid out in the Yukon River Agreement of the Pacific Salmon Treaty. Less than 1% (1,197 lb) of the salmon harvest came from Chinook salmon in 2014 (Table 2-5). Although far more fall chum salmon were harvested than Chinook salmon, the percentage of households using the 2 resources was the same (44%). The rate of sharing of fall chum and Chinook salmon was nearly the same as well (30% and 32%, respectively). This demonstrates that sharing a resource is not dependent on the availability of that resource. Instead, other factors, including cultural and historical significance and personal preference, may motivate residents to widely share Chinook salmon despite limited availability and harvest.

Shifting fishing effort from Chinook salmon onto other species has changed the seasonal activities of Tanana residents. For example, one respondent noted that, "if they had offered a king salmon season I'd probably be up in my camp, farther out of town but that's changed since the king salmon became less" (TAL030620151; Plate 2-3). Spending time at fish camps away from town was once ubiquitous among residents in the Tanana area. However, conservation measures including gear restrictions, reduced fishing periods, and full closures during the summer season have made the tradition of fishing from camps nearly obsolete. The same respondent believed that, because of the diminishing Chinook salmon fishery, the decline in fish camps in the Rapids area near Rampart has been dramatic:

Plate 2-3.–Tanana residents have a history of fishing in a canyon-like area known locally as the Rapids. The deep, swift water of this relatively narrow stretch of the Yukon River is ideal for fish wheels, a preferred gear type for fishermen on this portion of the Yukon River. In this photo, the river is cast in shadow from the steep walls of the hillside.

> It's changed. A whole lot. A generation of people who are without now. The biggest change I've seen was, if I go to Rampart [a neighboring Yukon River community] there is only one [fish] camp. Where as a kid there might have been 30 or 40 camps between here and Rampart. Those are all gone. (TAL030620151; Plate 2-4)

In the past, Chinook salmon were commonly jarred, smoked using cottonwood or driftwood from the river, made into strips, and stored for year-round consumption. Tanana residents also widely distributed the salmon they caught and processed through sharing, customary trade, and barter both within Tanana and with other communities (TAL030820157; TAL030720154; TAL030720152; Moncrieff 2007).

Figure 2-10 and Table D2-5 show the gear types used for each type of salmon. In Tanana, fish wheels are the primary gear used to harvest salmon, and in 2014, residents used fish wheels to harvest 87% of all salmon (plates 2-5 and 2-6; Table D2-5). For those fishermen who travel to the Rapids to fish, ideal conditions for fish wheels exist. A single river channel runs through a relatively narrow canyon almost "like a funnel point for fish" (TAL030720154). The current is swift and the river is deep, allowing fish wheels to turn quickly and take advantage of the numerous fish that must swim past the rotating baskets. One ethnographic respondent described the differences in using a fish wheel for chum salmon as opposed to Chinook salmon.

> You could put a wheel anywhere and catch chums. Kings are a little bit more selective. And big wheels will always catch more king. You want a small wheel for chum because you're closer to the bank and want big, deep wheels for catching kings because they're down [deep]. (TAL030520159)

Tanana residents also caught 3,256 salmon (16,560 lb) using set gillnets, roughly 12% of the total salmon harvest. Tanana fishermen who participated in the limited fall chum salmon commercial fishery removed

Plate 2-4.–Years of fishing restrictions have discouraged many Tanana families from returning to their traditional fishing camps on the Yukon River at the Rapids. All fish camps have cutting tables like this one for processing salmon. Knives, rubber gloves, brushes to scrub the cutting table, buckets, and hoses are all common and necessary items for efficiently putting salmon away.

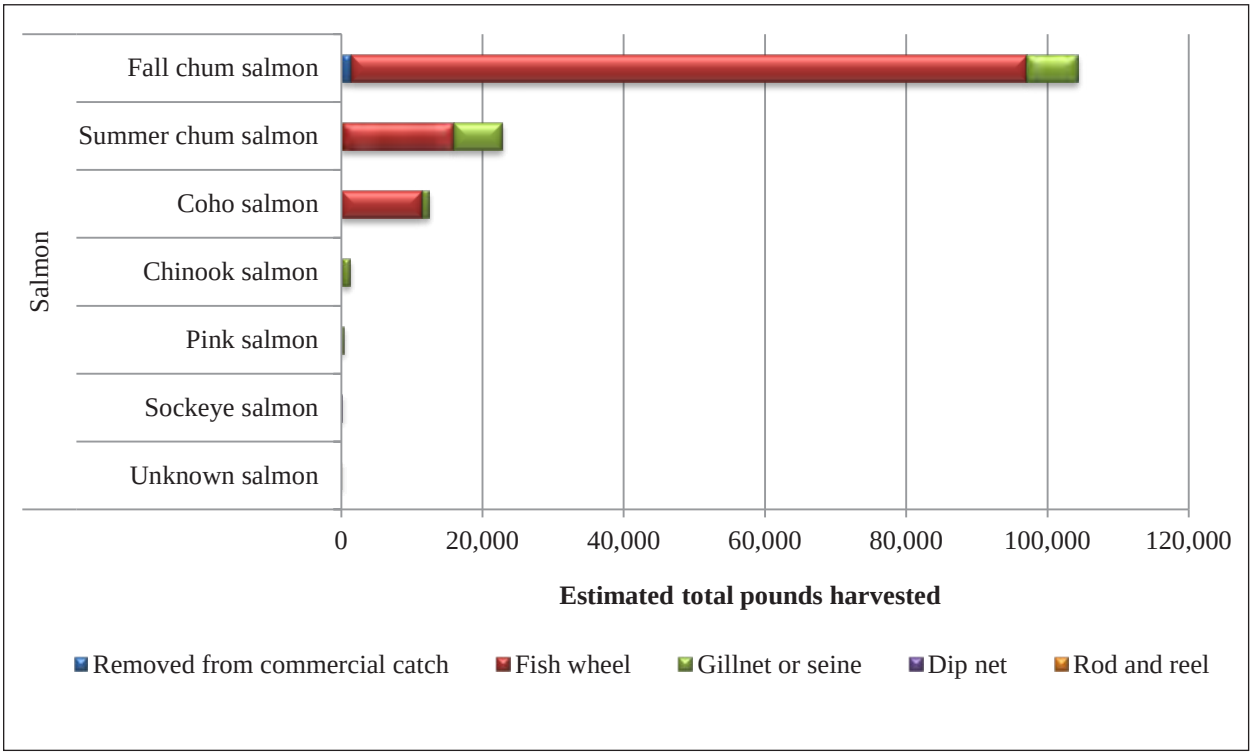


Figure 2-10.–Salmon harvests by gear type, Tanana, 2014.

Plate 2-5.–A fish wheel owned by a Tanana resident slowly spins on the Yukon River near town during the fall chum salmon fishing season.

276 fish for their own use (1,388 lb). Only 35 lb of salmon were harvested by rod and reel. An estimated 21 lb of summer chum salmon were harvested by rod and reel; the rest were reported as unknown salmon.

Figure 2-11 shows the salmon fishing locations of Tanana residents in 2014. Individual points, shown on the map as brown dots, can indicate setnet, dip net or fish wheel sites. Most are located within 4 miles from the community either up- or downstream. Others are much farther away. A cluster of locations were identified upstream from Tanana on the Yukon River in the canyon known as the Rapids. Although the map does not differentiate between setnet and fish wheel sites, ethnographic respondents described the historical and contemporary use of fish wheels in the Rapids area:

> The fish wheels up at the Rapids, the fish wheels, the fish wheels were amazing and when they're going, that's full-swing fishing, and you drive through there in a boat, it's just amazing. Lots of fish wheels, lots of action. People are busy and you can see the fish and the fish wheels when you drive by and smell the smoke and people are happy and waving and smiling. It used to be fun. (TAL030720154)

As noted above, the Rapids area has been a traditional fishing area for generations, but recent declines in Chinook salmon and the resulting fishing restrictions have reduced the number of people who travel to and camp there.

A long brown line appears at the center of the map along the Yukon River. In other communities, driftnets are represented by lines. However, Tanana residents do not use driftnets. Instead, this line likely indicates that a respondent used a variety of fishing locations throughout the season along the line drawn.

Although the majority of salmon fishing occurred along the Yukon River, a single location on the Tanana River was also identified. Additionally, some salmon, likely the sockeye salmon reported on the household

Plate 2-6.–Fall chum salmon sliding down the shoot of a fish wheel in the Rapids. Fish gather in a box attached to the wheel, where fishermen are able to collect them for processing.

surveys, were caught along the Copper River in Southcentral Alaska.

The importance of salmon to Tanana residents is evident not only in the 2014 significant harvest of fall and summer chum salmon but in the sometimes emotional ethnographic testimony describing the shared sense of loss surrounding the decline in Chinook salmon. One elder commented, "I wish I would have known today, you know, what the salmon thing was going to be because I didn't appreciate [Chinook salmon] enough. I had no idea that we wouldn't have [Chinook] salmon, not, not, not a clue" (TAL030720152).

Nonsalmon Fish

Nonsalmon fish contributed less than salmon in terms of estimated edible weight (34,312 lb versus 141,140 lb, respectively), but still accounted for a notable portion of Tanana's total harvest (17%; Table 2-5; Figure 2-7). Per capita, Tanana residents harvested 168 lb of nonsalmon fish (Table 2-5). A majority of households (68%) used nonsalmon fish in 2014, and 38% reported harvest. Nearly one-half of Tanana households received nonsalmon fish from others (49%). Figure 2-12 shows the composition of nonsalmon harvest by weight. Whitefishes accounted for 65% of the nonsalmon harvest.[8] Humpback whitefish, one of the largest types of whitefish, accounted for 22% of the known nonsalmon harvest. One ethnographic respondent remembers eating "raw whitefish, frozen whitefish" as a child (030620155). Thirty percent of households harvested 9,464 lb of sheefish and 42% of households used them (46 lb per capita; Table 2-5). Sheefish accounted for 28% of the nonsalmon fish harvest (Figure 2-12). Ethnographic respondents noted that sheefish are the favored fish for "Indian ice cream" (030720154).To make the dessert, sheefish are deboned and boiled, and small pieces of the fish are then "flaked" until they are a "fluffy" consistency. Crisco, berries, and a little sugar are added before serving (030820157). Tanana fishers also harvested 8,875 lb of unspecified whitefishes (44 lb per capita) as well as other nonsalmon fish species including northern pike (5 lb per capita), burbot (1 lb per capita), and longnose sucker (1 lb per capita; Table 2-5).

Figure 2-13 shows weights of nonsalmon fish harvested by gear type. Like salmon, the majority of nonsalmon fish caught by Tanana residents were harvested in a fish wheel. Approximately 25,640 lb of nonsalmon fish were caught in fish wheels, accounting for 75% of the nonsalmon harvest by weight (Table D2-6), including the majority of the whitefishes. Fish wheels, operated in the summer and fall months, caught all types of nonsalmon fish except Dolly Varden, Pacific cod, and Pacific halibut, the latter 2 of which are not locally available. Gillnets caught the majority of northern pike (83%) and Bering cisco (63%). Gillnets caught lesser amounts of sheefish and other whitefish species. Small amounts of sheefish and northern pike were also caught using a rod and reel (894 lb and 126 lb respectively). One ethnographic respondent explained the necessity of using a rod and reel to catch sheefish:

8. Sheefish (inconnu) is the largest member of the whitefish subfamily, but local residents do not consider it a whitefish. If sheefish are included in the subtotal, whitefishes would account for 93% of the nonsalmon harvest.

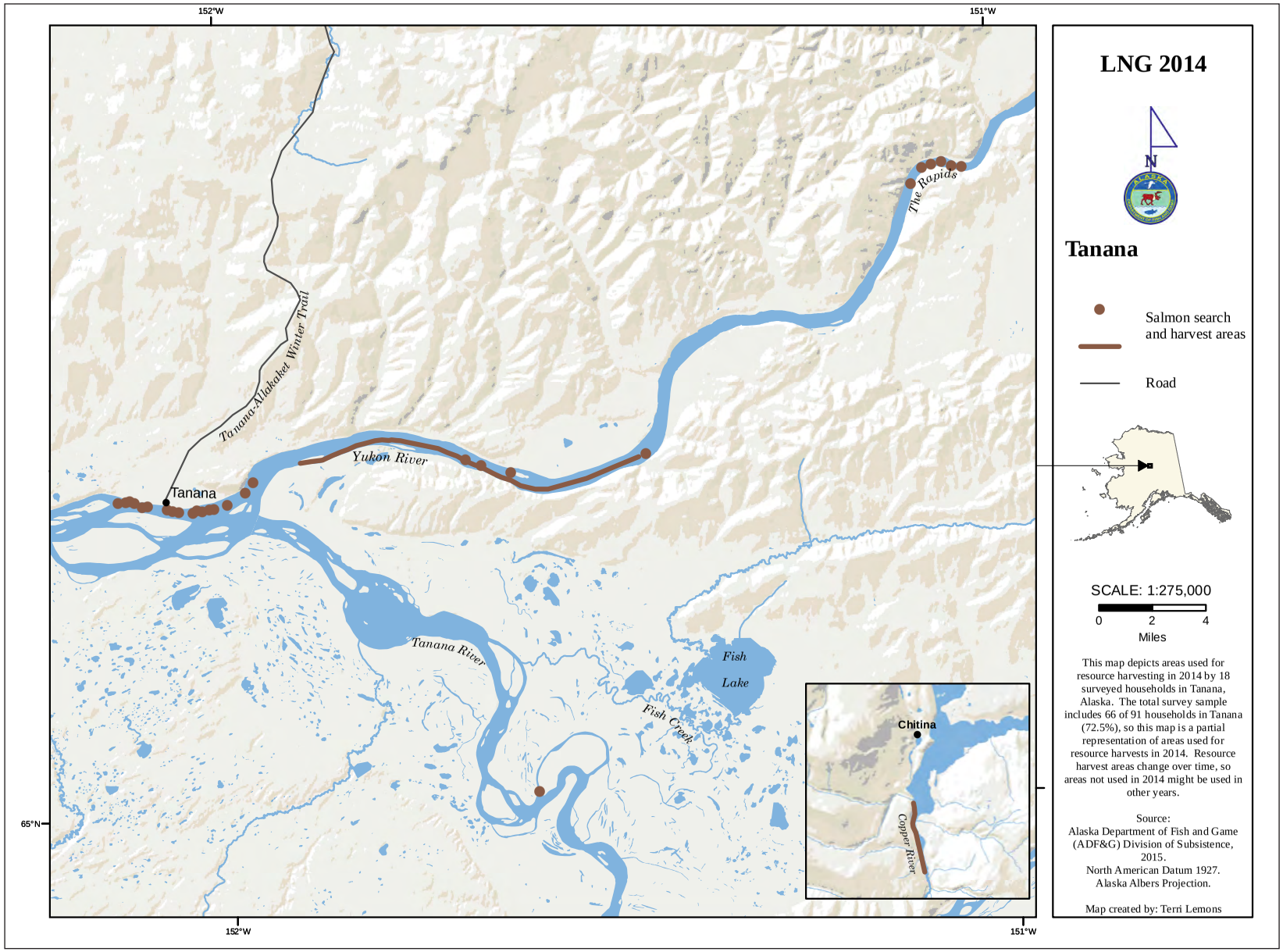


Figure 2-11.–Salmon fising areas, Tanana, 2014.

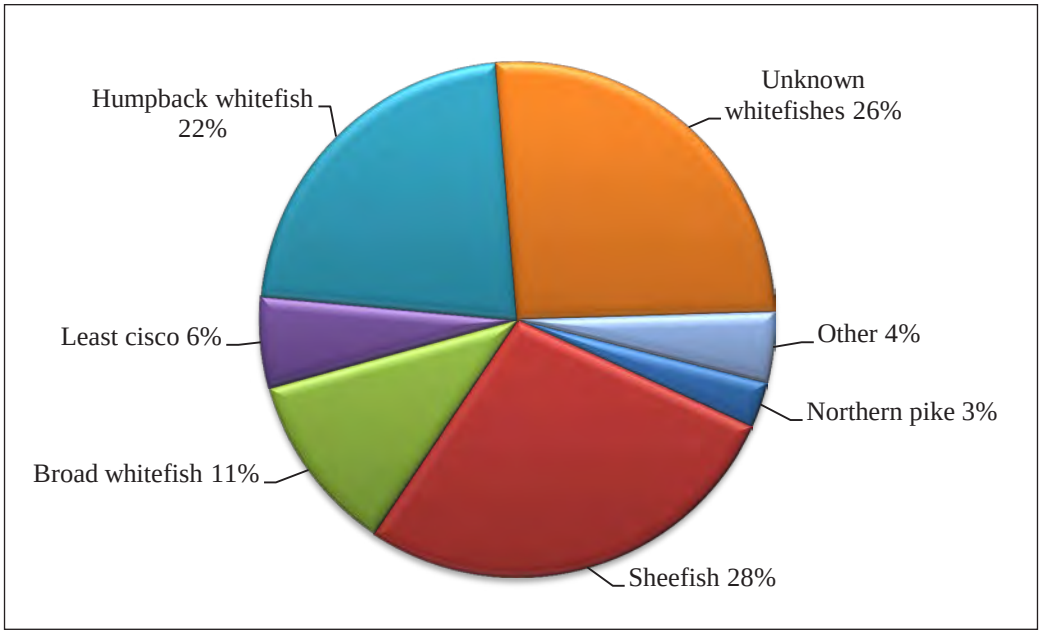


Figure 2-12.–Composition of nonsalmon fish harvest by weight in usable pounds, Tanana, 2014.

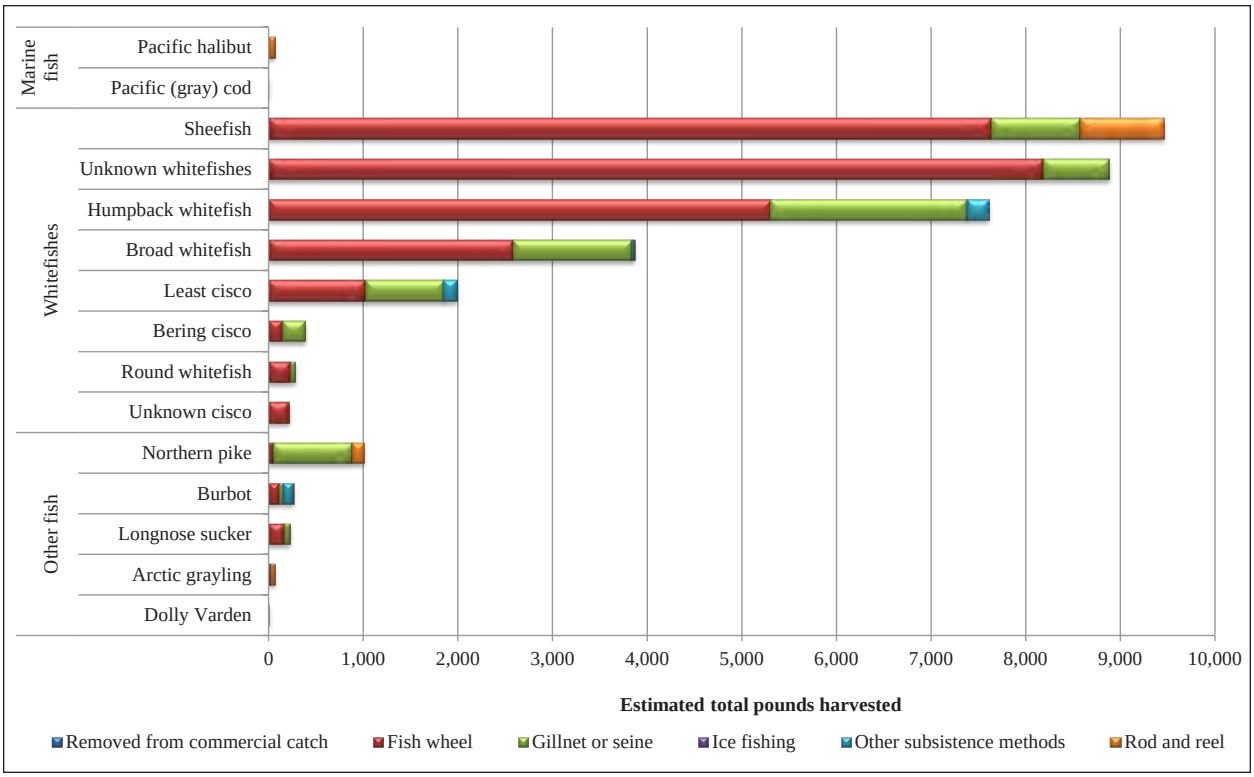


Figure 2-13.–Nonsalmon fish harvests by gear type, Tanana, 2014.

> …casting rod and reel, you have to use those for sheefish there [and] you got to have a dip net because they're big, you know? Some of them are almost as big as salmon. Huge ones, you got to have dip net or you can't get them after they get close to the boat. Now those, they uh, sheefish is kind of like more of a predator to me, the way I see them. (TAL030720156)

Another described changing gear types in order to shift some harvest effort away from salmon and onto northern pike:

> Instead of going for king salmon, I'll grab all my rods and reels and I'll go pike fishing. And that'll change the whole geographic area. I mean, I won't go up the Yukon [River] anymore, I'll just go over to where I know, to catch all the pike [with a rod and reel]. And that's just sometimes to supplement my dogs [food]. (TAL030620151)

Ethnographic respondents described the occasional use of dip nets:

> We use handmade dip nets. They are all wood. They're light. There's about four or five places you can actually just go and dipnet. It's gotta be a certain time, and if you miss it you're going to get nothing. So you gotta keep trying, keep trying. There's been nights where I've caught over 500 whitefish, lush [burbot], and pike [in a dip net]…dipnetting is tough, it's usually about a 3- or 4-man operation. Or we spell each other. You know, you get 10 minutes of dipping, you get tired of it, hand it over to the next guy, you know, and then that just goes all night. (TAL030620151)

In addition to dipnetting for whitefishes, an elder respondent remembers fishing for burbot with a dip net in the mouth of sloughs and creeks near Tanana. Burbot have "big heads" and slender bodies, allowing them to "wiggle out of [a] setnet pretty easy," making dip nets or other gear more suitable than gillnets (TAL030720156).

Although most of the nonsalmon fish harvested by Tanana residents occurred in summer fish wheels, some ethnographic respondents described setting gillnets under the ice in the winter to target whitefishes. However, in recent years the Yukon River has been freezing up "really rough, and you need smooth ice" to set a net properly (TAL030520159).

Table 2-8 shows the estimated nonsalmon harvest for feeding dogs. Tanana residents fed 28,290 lb of nonsalmon species to dogs in 2014 (82% of the total nonsalmon harvest). Unknown whitefish species accounted for the most fish (8,574 lb); however, respondents specified that an additional 6,653 lb of humpback whitefish were fed to dogs. Similarly, 6,493 lb of sheefish were used for dog food. Respondents identified 10 nonsalmon species as dog food in 2014. Table 2-7 shows the estimated per capita harvest of nonsalmon fish if the harvest of nonsalmon fish for dogs is removed. In this scenario residents harvested 30 lb of nonsalmon fish specifically for human use.

Harvesting fish for dogs does not always occur by the dog owners. One ethnographic respondent who owns a large dog team explained:

> People will be fishing for pike and they'll go catch 20. You know they'll take 1 or 2 of the best and then they'll come up to my dog pot and they'll just drop it off. People are really good about not wasting food. Like they might not eat it but they feel guilty about throwing it away so they'll come up and give it to me…or they won't even tell me, they'll just come by and just drop food off at my dog pot. (TAL030620151)

Figure 2-14 shows the fishing and harvest locations of nonsalmon fish. Similar to salmon, many of the fishing sites identified were located very near to the community on the mainstem of the Yukon River. A handful of fishing locations were identified in the Rapids area. As discussed above, salmon gear, particularly fish wheels, will also catch nonsalmon fish indiscriminately. As a result, it is not uncommon for salmon and nonsalmon fishing locations to overlap. Unlike salmon, however, a small cluster of sites appear at the confluence of the Tanana and Yukon rivers. Only a single location off the mainstem of either the Yukon or Tanana rivers was identified. A small lake near the Yukon River was used to harvest nonsalmon species.

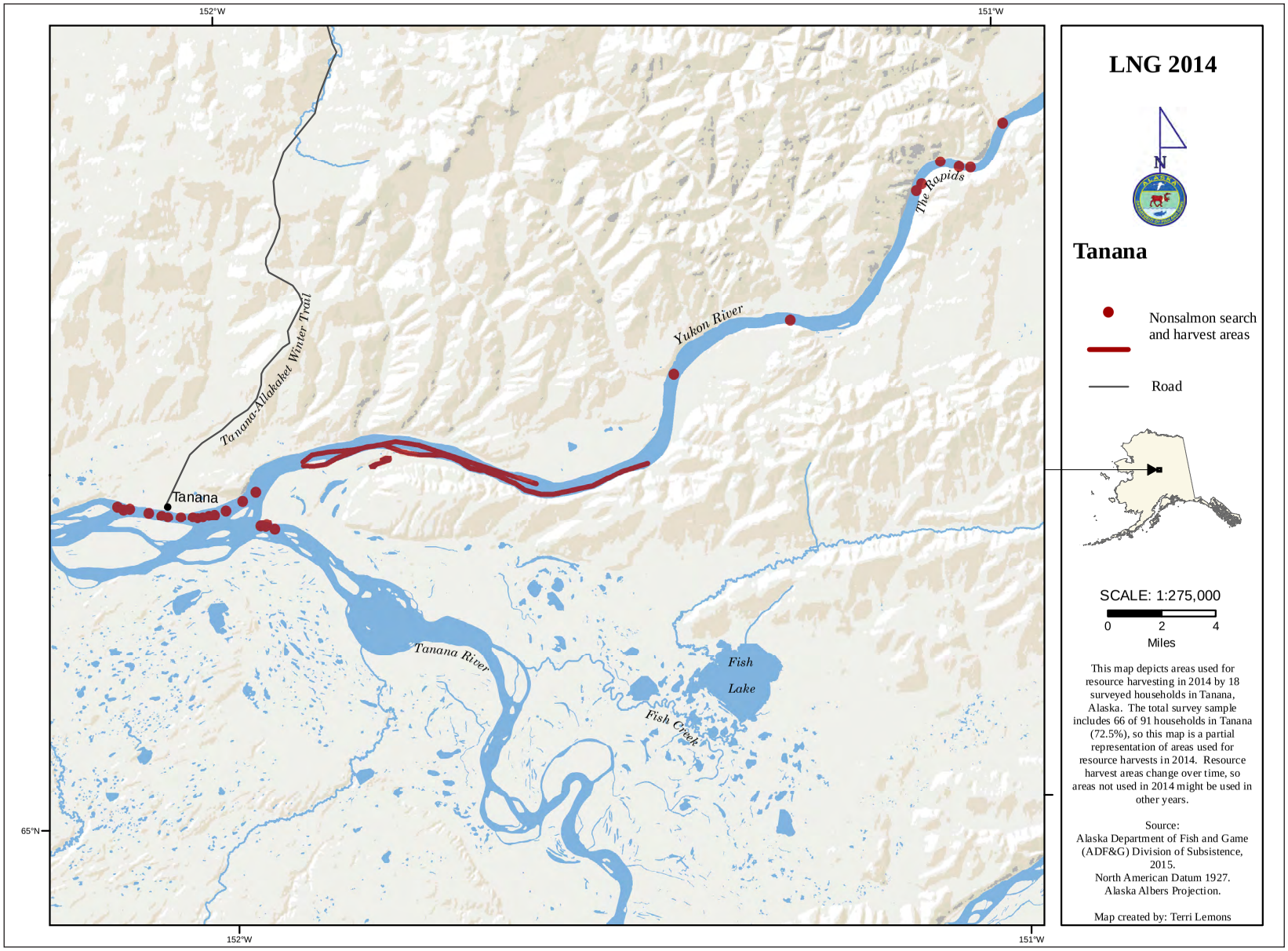


Figure 2-14.–Nonsalmon fishing areas, Tanana, 2014.

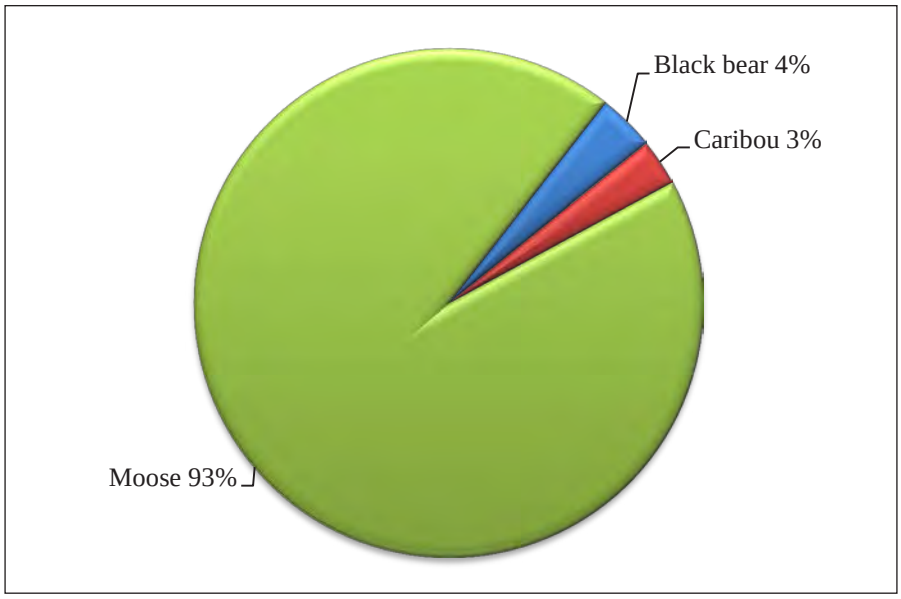


Figure 2-15.–Composition of large land mammal harvest by weight in usable pounds, Tanana, 2014.

Large Land Mammals

Land mammals contributed substantially to the diets of Tanana residents. Overall, 86% of Tanana households reported use of large land mammals, and 30% reported harvest (Table 2-5). Moose, the only large land mammal included in the top 10 resources harvested per capita (by edible weight), constituted 93% of the total large land mammal harvest (88 lb per capita; Table 2-5; figures 2-8 and 2-15). Tanana residents used moose in a variety of ways. In addition to describing the preparation of the hind quarters and ribs, many ethnographic respondents described the preparation of moose organs. The kidneys, heart, and fat are often eaten immediately after the animal is killed, "I don't think anybody puts that stuff away…You just eat a lot of that stuff fresh. Fry it right up" (TAL030820158). Another respondent favors stuffing moose heart with a "bunch of apples and spices and stuff, and we roasted that over the fire and that was probably the best thing ever" (TAL030820153). Several respondents described the process of eating moose head.

> We used just about every bit of [the moose], except the bones. But you know, the moose head, there's a lot of tasty food on there if you grew up with it, you know. It's kind of hard, but you cook it a long time and it softens up, and today we got those pressure cookers. We use them. Takes about 20 minutes to get it soft. (TAL030720156)

Another agreed, "You take all the meat off the [skull] 'cause that's the fattiest, that's what we call moose head soup, because that's where the richest, the fattiest meat comes from. And if you cut a piece of meat off the head and you fry it over a stick, you can tell why it's so good, it's just really fatty!" (TAL030820153). Moose nose, tongue, and bone marrow are also considered delicacies and were favored by respondents. An elder respondent remembered the satisfaction at hunting camp after successfully hunting a moose, "there was nothing better than throwing one of them [leg bones] on the fire and letting the marrow cook and then cracking it open with an axe and a little salt and we were in hog heaven" (TAL030520159).

Finally, an elder respondent noted that moose hides can be smoked and turned into clothing or dried and twisted into babiche, which can be braided into snowshoe webbing (TAL030720152).

Nearly three-quarters (71%) of households reported receiving moose from others, and one-half reported sharing some of their moose with others (Table 2-5). Respondents explained the way they decide with whom to share. One stated, "I usually hunt for my mom, my auntie, and my grandma, so it's whoever needs the moose of them first, whoever's freezer is empty." After he has provided for the single women in the family, he will hunt for and share with others. "You just want to help out when you can. Around here,

Table 2-9.–Estimated large land mammal harvests by month and sex, Tanana, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All large land mammals	**1.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**8.3**	**4.1**	**29.0**	**0.0**	**0.0**	**1.4**	**0.0**	**44.1**
Black bear	0.0	0.0	0.0	0.0	0.0	0.0	5.5	1.4	0.0	0.0	0.0	0.0	0.0	**6.9**
Black bear, male	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	**1.4**
Black bear, female	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	**1.4**
Black bear, unknown	0.0	0.0	0.0	0.0	0.0	0.0	2.8	1.4	0.0	0.0	0.0	0.0	0.0	**4.1**
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Brown bear, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	1.4	0.0	0.0	0.0	0.0	**4.1**
Caribou, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	1.4	0.0	0.0	0.0	0.0	**4.1**
Caribou, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Sitka black-tailed deer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Sitka black-tailed deer, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Mountain goat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Mountain goat, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Moose	1.4	0.0	0.0	0.0	0.0	0.0	2.8	0.0	27.6	0.0	0.0	1.4	0.0	**33.1**
Moose, bull	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	26.2	0.0	0.0	1.4	0.0	**30.3**
Moose, cow	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.4**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	**1.4**
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep, unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2015.

that's what it's all about" (TAL030820153). Another respondent agreed, "I try to reciprocate to the people that have helped me out in the past if they don't have [a moose]. So it's never the same, but family first and then others" (TAL030520159). Sharing wild foods is an important practice not only because it ensures the wellbeing of others, but also because "if you give and you share, then you're more likely to have luck yourself again" (TAL030720154).

Expanding for unsurveyed households, Tanana residents harvested 33 moose in 2014, 83% of which were caught in September (Table 2-9). The necessity of moose hunting, particularly in fall, creates an added strain for the residents of Tanana who maintain dog teams. September moose hunting often overlaps with the processing of fall chum salmon for dog food. Respondents described the relationship between fall time fishing and moose hunting.

> All the silver salmon fishermen are dog mushers. They're all the same people pretty much…Dog mushers probably have the hardest time getting moose. There's a time conflict. Like if I'm fishing and I'm actively fishing, so my smokehouse is actively going, I can only go so far from my fish wheel and my camp. I'm limited to a very small geographical area. (TAL030620151)

The respondent continued:

> Moose hunting falls right in when we're starting to split our fish. Like, we're pretty much done with all our eating fish. Our magic day is usually around the 7th or 10th of September when we're stopping the human consumption fish. It's because of temperatures we can't recover from, the varying fall temperatures. So we're standing there cutting, cutting, cutting, and if we get done early then we have maybe an hour or 2 to hunt that night, but that makes it tough, though. It makes it hard to stand there cutting fish and watching all your peers going out hunting and it makes it even harder watching them come back with boatloads of meat. (TAL030620151)

Some respondents observed that the timing of the moose rut, the mating season, is occurring later in the season and is forcing hunters to adjust the timing of their hunting activities (TAL030620151). Three moose were harvested in the winter months of December and January, likely taken as traditional "potlatch moose"

or during the winter bull moose hunt that occurs December 1–15 in GMU 20F, which encompasses Tanana (Table 2-9). Three bull moose were harvested in July. Only 1 cow was harvested in 2014, in the month of January.

Successful hunters often do not hunt alone. Respondents shared their knowledge and experience hunting in groups. A young hunter explained, "moose are really big animals, so you definitely need to be hunting with—I don't ever go by myself, you have to have a couple young buddies with you" (TAL030820153).

Figure 2-16 shows the search and harvest areas for large land mammals in 2014. Moose search areas, shown in green hash marks, cover a wide range of topographic areas including lowlands, marshes, and hilly terrain. The Yukon, Tanana, and Nowitna rivers were all identified as moose search areas. Additionally, hunters used an area along the Koyukuk River, extending nearly from the confluence with the Yukon River all the way to the community of Huslia and demonstrating the great distance Tanana residents travel for the large land mammal. A small area around the Yukon River community of Ruby was also identified.

Overland areas were also identified. Fish Lake and the surrounding area, located south of the Yukon River and east of the Tanana River was used by Tanana residents. An ethnographic respondent commented that hunting near Fish Lake is preferable because of the ideal moose habitat that exists there.

> [It is] just a huge lake with meadows and lakes all around. You know, we sit there, we call, we rake, [and] we walk to lakes…we do that all the way up the lake until we eventually run into one. Or we call them in, or we call and then we come back and they are standing right there. (TAL030820153)

A large polygon extending north of Tanana, over the Tanana-Allakaket Winter Trail and into the mountains was used by residents in 2014. With few waterways in this area, travel to this area was not done by boat and could likely represent the areas used during winter moose hunts. Travel during winter hunts often occurs by dog team or even snowmachine.

This broad hunt area provides Tanana hunters access to locally recognized, geographically specific moose characteristics. One respondent described the differences between the moose caught in the forest near Tanana and those caught in the mountains.

> I go after what's called a timber moose. These are deep forest moose. Around here you get some that'll swim north, get up in the mountains and eat up there [and] spread their rack out, whereas the ones down here, in the deep forest that are eating in the lakes and heavy spruce, their [racks] are curled in…The ones that went up to the mountains will flatten out but the timber moose are way healthier. Their bodies are bigger, the mass is bigger, the fat content is better, the food quality is way better. So I never, I don't harvest on the north side of the Yukon [River]. (TAL030620151)

Understanding the differences between moose is an important skill for a hunter. A respondent advised to "go for the good animals. You know, go for the really good ones. Try for the best quality, 'cause that's the only one you're gonna get, the only one they're gonna allow you to get" (TAL030620151).

In addition to moose, survey respondents reported using and harvesting black bear. In 2014, 15% of Tanana residents used black bear and 6% harvested them (Table 2-5). In total, 7 black bears were taken, accounting for 689 lb (3 lb per capita; Table 2-5; Figure 2-15). According to respondents, Koyukon Athabascan women of child-bearing age traditionally do not eat bears because it could adversely affect their reproductive health. Female respondents explained that although such strict cultural beliefs are waning, they continue to avoid handling or eating bears simply because they did not grow up doing it (TAL030820157; TAL030420158; TAL030620155). Black bears are typically hunted in the late summer, fall, or early winter, once they have put on their winter fat. In 2014, black bears were harvested in July and August. One respondent used to harvest several bears each year and described the process of hunting them in the early winter months. If harvested too early, the bear's fat is hard, but after several months of hibernation, the fat becomes "porous:" similar to the consistency of a pork rind (TAL030520159). During this time of year, when the fat is softer, the meat tastes sweeter than at other times of the year. In order to hunt hibernating bears, hunters must

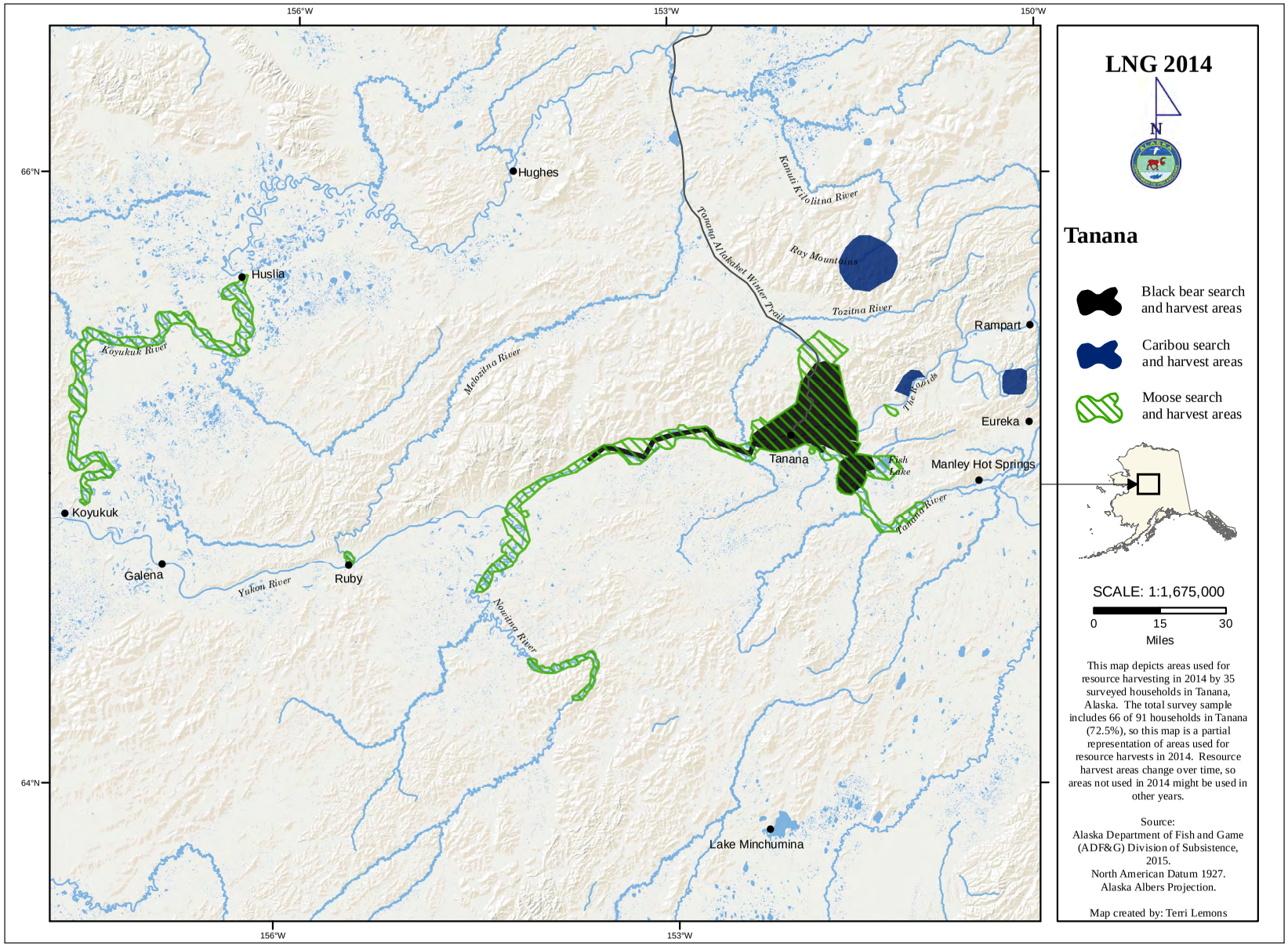


Figure 2-16.–Large land mammal hunting areas, Tanana, 2014.

carefully observe the ground in order to find a den. Typically, a dense layer of hoar frost up to 100 feet in diameter covers the entrance to the den. Hunters build a small fire at the entrance in the hopes of waking up the sleeping bear. They will either wait for the "drowsy" bear to come out, or: "you send the smallest guy in with a gun and he will shoot him in the hole" and drag it out by hand (TAL030520159).

In 2014, Tanana residents hunted black bears along the Yukon River downstream of the community. Searching for the large animal also occurred over land, primarily north of town. Additionally, hunters used a portion of the Tanana River near the confluence of the Yukon River. Figure 2-16 shows a round polygon that extends from the edge of Fish Lake across the Tanana River to a lake-dense area. Much of the black bear search area overlapped the moose search areas described above.

Caribou, a land mammal once used more extensively, was only used by 9% of households in 2014 (Table 2-5). An elder respondent noted that her parents would regularly hike up the Ray Mountains and "hunt caribou all the time. There was always herds of caribou and they used to come back with caribou meat all the time" (TAL030820157). However, the respondent believes the migration patterns changed after the Trans-Alaska Pipeline was built. Caribou are no longer common in the Tanana area. For those that do search for caribou, hunting occurs in the fall and winter. In 2014, the 4 caribou harvested were taken in the fall months of August and September (Table 2-9). One respondent described the difference between fall and winter hunting:

> In the fall time you're hiking on foot with a backpack, you know, and just a tarp, a sleeping bag to sleep in. In the wintertime you're usually on snowmachine with a sled, with all of your equipment in the sled and it's a lot more laid back and easy, but it's still just as hard because you're dealing with the weather. (TAL030820153)

Five percent of households attempted and succeeded in harvesting caribou (Table 2-5). Approximately 3 lb of caribou per capita (538 lb total) were harvested. Caribou accounted for 3% of the large land mammal harvest (Figure 2-15).

Figure 2-16 shows the caribou search areas, depicted in blue, in 3 areas to the northeast and east of Tanana. The largest search area was located north of the Tozitna River and east of the Tanana-Allakaket Winter Trail. Respondents also identified a smaller search area on the north bank of the Yukon River in the hills above the Rapids. An ethnographic respondent remembers hunting for caribou in this area as a child:

> You'd start by hiking the hill up to where the caribou were at with, you know, some adults, and they'd have guns, and you weren't really too sure what was going on, you just were hiking for fun, and you know, we would run into a few caribou and they would shoot 'em just like that, and we'd butcher them up, and pack it up, and we'd hike it down the hill. We'd all have a little chunk of meat on our back, and there would be like 10 of us little kids and 3 adults and they would just load us up with meat. I was probably like, I think 10 or something when we did that. (TAL030820153)

No other large land mammal harvest was reported, but 2% of households reported receiving deer and mountain goat, neither of which are available locally (Table 2-5).

Small Land Mammals/Furbearers

Thirty percent of households in Tanana used small land mammals (Table 2-5). Twenty-six percent of households were successful in harvesting small land mammals. Eleven percent of households received at least 1 small land mammal from another household. Table 2-5 assigns a zero value to species that were harvested but are not typically eaten. Red fox, marten, mink, weasel, gray wolf, and wolverine are a few furbearers that are typically used only for their fur.

Unlike other subsistence activities, trapping has a cash-earning element that can affect the level of participation. The declining market and prices for fur no longer incentivize the activity like they did in the past. One ethnographic respondent remembers a time when the furbearer market was stronger than it is today. Fur buyers would come through the community once or twice during the winter. "Like in April,

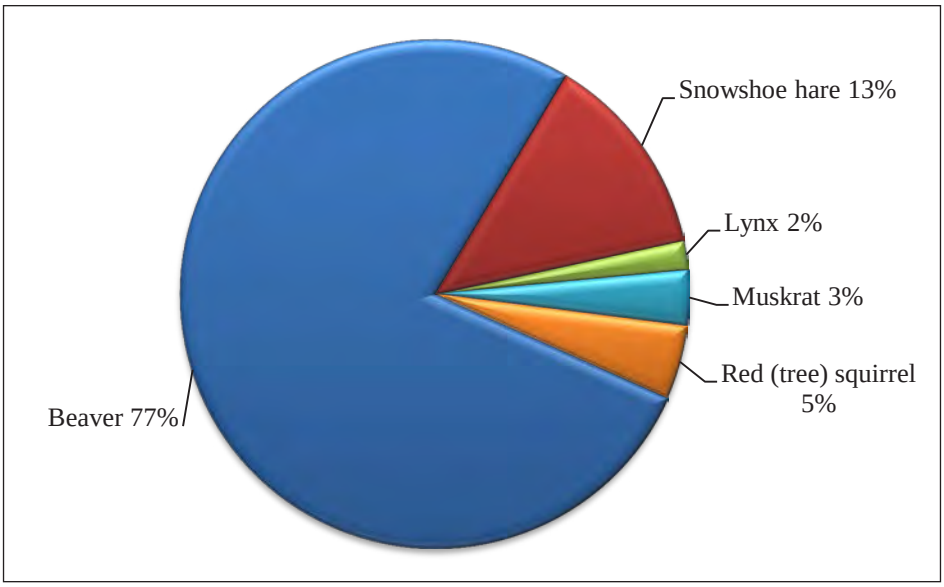


Figure 2-17.–Composition of small land mammal harvest by weight in usable pounds, Tanana, 2014.

around the first part of April, they used to come through by chartered flights or something. As soon [as they did], we would go to the village and have dog races and a little celebration" (TAL030720156). In addition, local stores in some neighboring Yukon River communities doubled as fur buyers throughout the winter, providing trappers with multiple opportunities to sell their catch. One ethnographic respondent explained why trapping in Tanana has declined.

> There is way less trappers. I think the cash-based economy has changed the whole thing and the fact that there's no money in trapping anymore. You know, you can't—and then you can't deal with these banks and loans, and they all have their barriers and markers so, a lot of people can't afford to go trapping. Say if they need a new [snow] machine, and it costs $10,000. You can't even barely break even trapping, so it makes it a lot harder. Uh, the most successful trappers that I know are the ones that work and do trapping part-time, so. That's what I noticed. (TAL030620151)

Beaver, an animal commonly trapped and eaten by residents, contributed 228 edible pounds to the community harvest (1 lb per capita), and made up the bulk of the small land mammal harvest by weight. Figure 2-17 shows the composition of the edible harvest. Of the 50 small land mammals harvested and used for food, 77% were beaver. Eight percent of households harvested beaver, and 15% used the animal (Table 2-5). Beaver meat and fur are both used by residents in Tanana. Figure 2-18 shows the number of furbearing animals harvested in 2014 that were eaten by Tanana residents. Twenty-six of the 41 beavers harvested were eaten. The remaining beavers were used only for their fur. An ethnographic respondent recalls how his late grandmother would cook the beaver tail for him while he stretched the skin. They also used the leftover meat as a source of food for dogs (TAL030620155). Beavers were harvested in the fall, winter, and spring months (Table 2-10). Ethnographic respondents described trapping beaver in the winter. In order to successfully catch the edible furbearer, trappers must first locate dams that are usually built along small tributaries or in lakes. The trapper cuts holes into the ice near the dam and drops a snare into the water. Fresh-cut birch or willow branches are submerged as bait (TAL030620155). Trappers are careful not to over-harvest beaver, however. One ethnographic respondent explained:

> When we're harvesting beavers we're taking the males so we're not wiping out the future generations. These are the ones that are either kicked out, beat up or whatever. You know, they're moving, they're looking to make new [dams] and those are the ones we try to get. (TAL030620151)

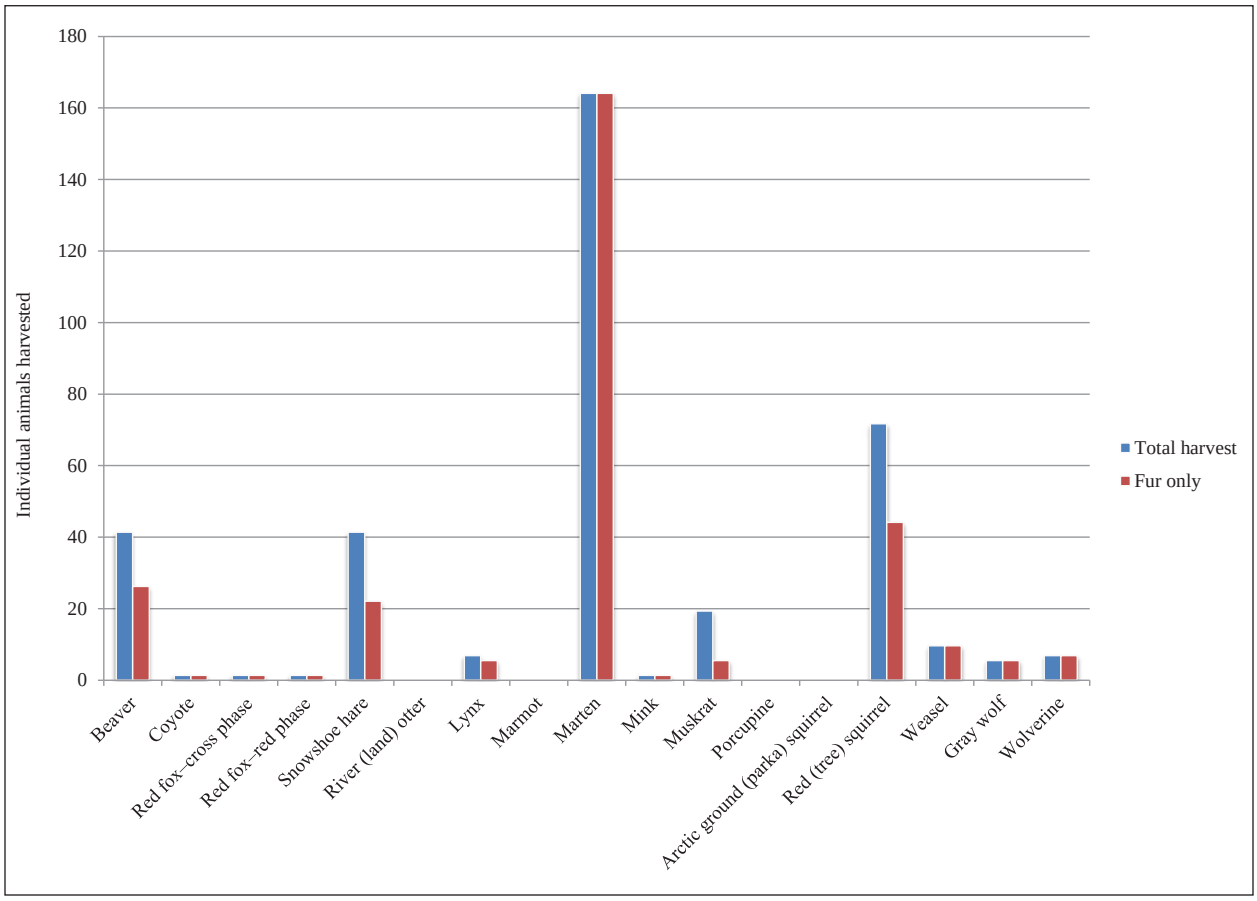


Figure 2-18.–Estimated small land mammal harvests for fur or food, Tanana, 2014.

Table 2-10.–Estimated small land mammal/furbearer harvests by month, Tanana, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All small land mammals	**44.1**	**44.1**	**33.1**	**17.9**	**5.5**	**0.0**	**5.5**	**0.0**	**1.4**	**15.2**	**51.0**	**46.9**	**107.5**	**372.3**
Beaver	0.0	4.1	6.9	4.1	5.5	0.0	0.0	0.0	1.4	0.0	2.8	0.0	16.5	**41.4**
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	**1.4**
Red fox–cross phase	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.4**
Red fox–red phase	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.4**
Snowshoe hare	4.1	4.1	2.8	0.0	0.0	0.0	1.4	0.0	0.0	15.2	8.3	5.5	0.0	**41.4**
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	**0.0**
Lynx	2.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	0.0	**6.9**
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	**0.0**
Marten	24.8	26.2	20.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.2	37.2	17.9	**164.1**
Mink	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.4**
Muskrat	0.0	0.0	0.0	13.8	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	4.1	**19.3**
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	**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	**0.0**
Red (tree) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	68.9	**71.7**
Weasel	4.1	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	0.0	**9.7**
Gray wolf	1.4	2.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**5.5**
Wolverine	5.5	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**6.9**

Source ADF&G Division of Subsistence household surveys, 2015.

Snowshoe hare, a species also used for food and fur, was harvested by 11% of households and used by 12% (Table 2-5). Tanana residents took 41 individual snowshoe hares in 2014. Snowshoe hares made up 13% of the small land mammal harvest by edible weight (Figure 2-17). Slightly more than one-half (53%) of the snowshoe hares caught in 2014 were used only for their fur (Figure 2-18).

Tanana residents harvested 164 martens (Table 2-5). Fifteen percent of households attempted to trap marten, and 14% were successful. Five percent of households gave some marten away to others but no survey participants reported receiving them. One respondent who regularly traps marten prefers using fish scraps as bait in a marten trap over expensive, store-bought lures. Experimenting with scents and visual distractions often leads to successful harvest. For example, the respondent says that hanging bones above a trap can draw the animal's attention to the area, while dragging fermented fish along the trap line can lure marten to each trap (TAL030520159).

Muskrat, an animal once abundant in the Tanana area, is no longer common. In 2014, 19 muskrats were harvested by only 5% of households (Table 2-5). Several respondents identified the 1970s as a time when local muskrat populations began to decline. Consequently, younger respondents did not remember trapping them. However, one elderly respondent recalled how to trap muskrat. In the spring time, shortly after the river ice begins to thaw and break up, muskrat begin coming out of their dens to feed during the daytime. After a trap was set near their feeding mound in a lake, "we hunted them with canoes. We paddle in different lakes, pack our canoes to different lakes and sloughs and stuff. It was a lot of work, but it was fun, so I enjoyed it" (TAL030720156). Although abundance is still dramatically lower than what residents remember prior to the 1970s, respondents observed that some muskrats are returning to nearby lakes and are hopeful that the population is rebounding (TAL030720156; TAL030820157; TAL030620155).

Three percent of households attempted to trap wolverine (Table 2-5). Together, they successfully caught 7 wolverines.

Figure 2-19 shows the search and harvest areas for small land mammals in 2014. Several lines are visible on the map. These lines likely indicate trap lines used by residents. Unlike other resources, trappers are able to set and tend traps along an unchanging route over the course of a season, or for some, many seasons. Although some trappers felt comfortable identifying their specific trap lines on the maps, others chose to record their trapping activity in a broader way by indicating larger, less specific polygons. This could explain why several large polygons appear on this map. Extensive trapping occurred north of Tanana, following the Tanana-Allakaket Winter Trail and extending beyond the Tozitna River. A smaller line and a single dot near the Tozitna River were identified on the opposite side of Ptarmigan Creek as the Winter Trail. Another trap line, extending southwest from the Tanana River, is roughly 20 miles long and crosses numerous lakes. Mapping participants included the Yukon River upstream to the Rapids in the search and harvest area for small land mammals. Beavers were possibly taken from dens in this area.

Marine Mammals

Tanana residents did not harvest marine mammals in 2014, which would require considerable travel and expense. Fifteen percent of households did, however, use a variety of marine mammals including walrus (3%), beluga whale (5%), and bowhead whale (9%; Table 2-5). Twelve percent of households reported receiving seal oil from others. Because not all households were surveyed, there is a chance that someone in Tanana traveled to another, distant community in Alaska to hunt marine mammals. More likely though, Tanana residents participated in an intricate trade network and received small portions of marine mammal harvest from friends or relatives in coastal communities.

Birds and Eggs

In 2014, Tanana residents used at least 15 different types of birds and 2 kinds of bird eggs (Table 2-5). Eight pounds of birds were harvested per capita (1,546 lb total). One-half of households in Tanana harvested birds. Thirty percent of households reported receiving birds from others, and 23% reported they gave some

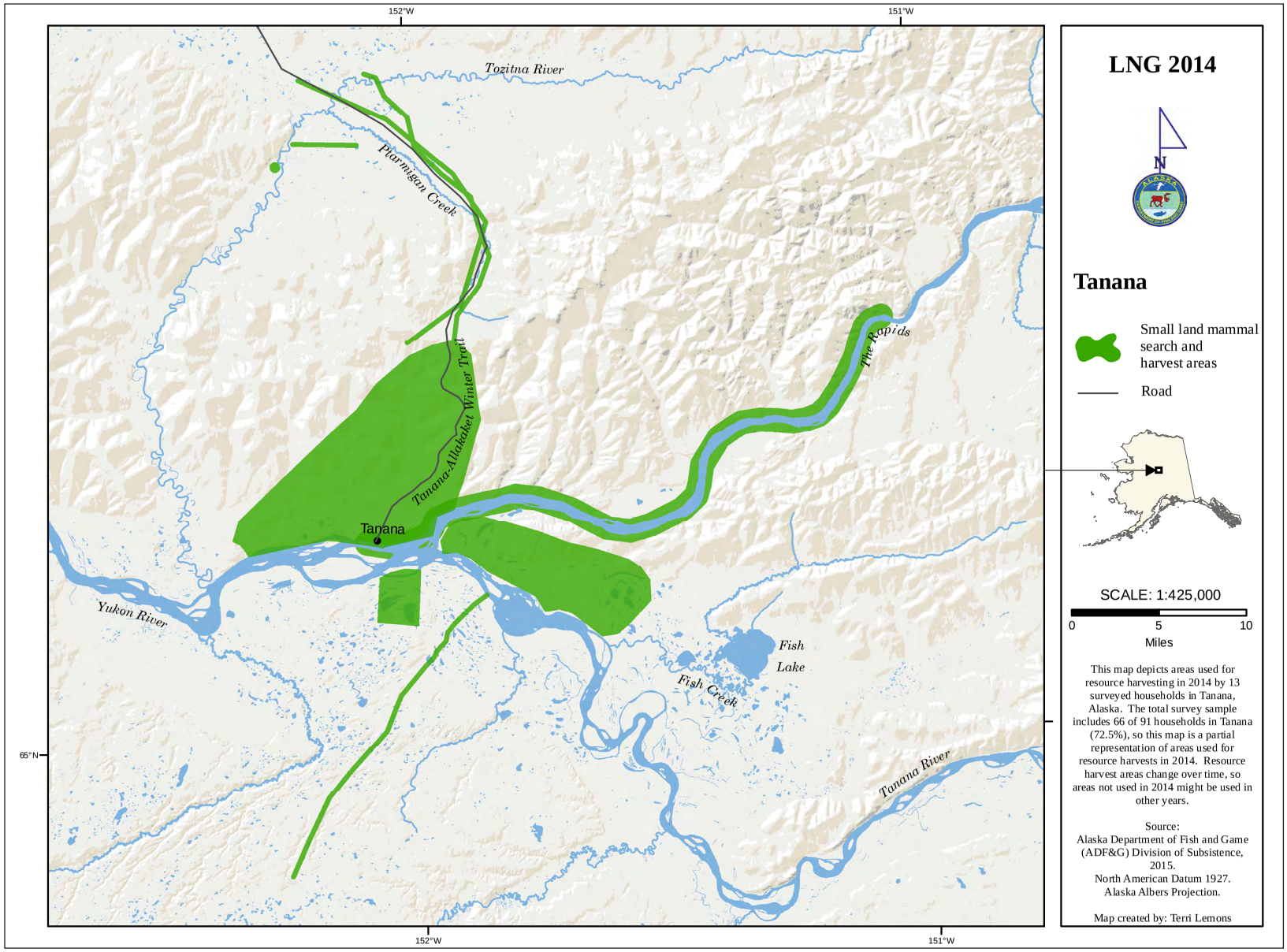
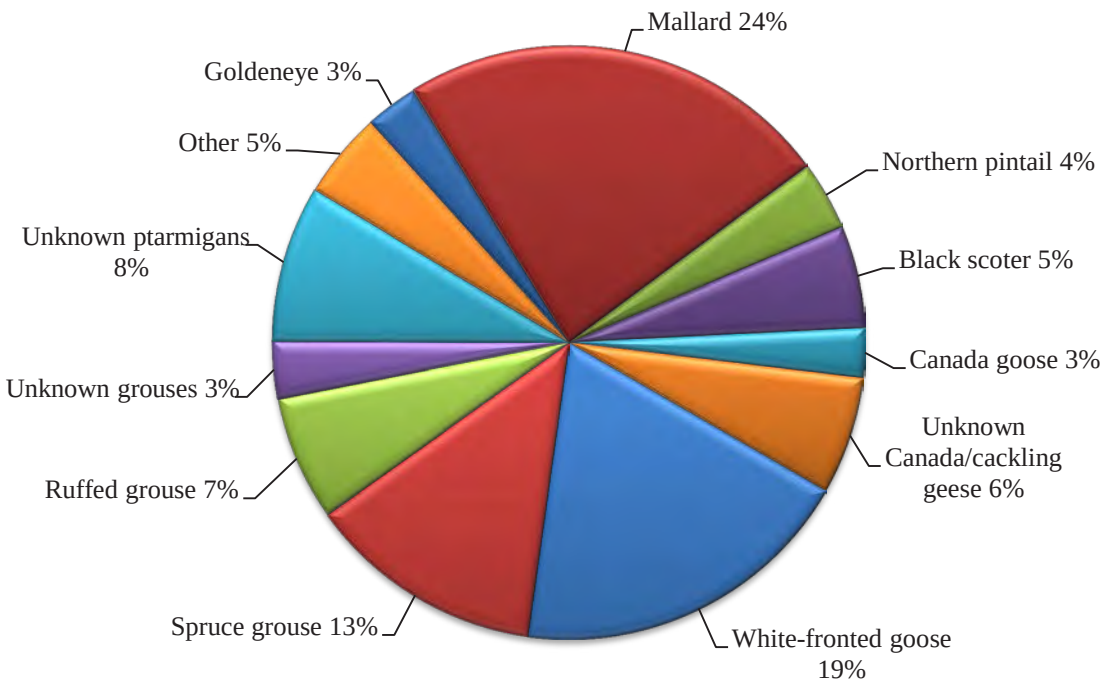


Figure 2-19.–Small land mammal hunting areas, Tanana, 2014.



Note The other category includes species providing less than 1.5% each to the per capita harvest.

Figure 2-20.–Composition of bird and bird egg harvest by weight in usable pounds, Tanana, 2014.

of their birds away. Figure 2-20 shows the composition of bird and egg harvest. Residents harvested a variety of migratory ducks and geese as well as nonmigratory birds such as grouses and ptarmigans.

For those who choose to go bird hunting in the spring, a variety of migratory species are available. Mallards contributed 366 lb to the community's harvest and made up 24% of the bird harvest, more than any other species (Table 2-5; Figure 2-20). Eighteen percent of households used mallards, but only 12% harvested them. White-fronted geese were popular among Tanana residents. They composed 19% (292 lb total, 1 lb per capita) of the bird harvest and were used by 21% of households. One ethnographic respondent explained why white-fronted geese are a personal favorite. Some white-fronted geese have farther to travel than others. They spend more time in the Tanana area resting, feeding and waiting for warmer weather before moving on, and, consequently, "are so much fatter" than other birds that don't go as far (TAL030620151). Spruce grouse and ptarmigans were also favored by residents. Spruce grouse accounted for 13% of the bird harvest (200 lb, 1 lb per capita) and was used by 33% of households (Table 2-5; Figure 2-20). A total of 285 spruce grouse were harvested in 2014, more than any other bird species (Table 2-5). More households shared spruce grouse than any other species (15%). Tanana residents harvested 197 ptarmigans for a total of 138 edible pounds. Ptarmigans composed 9% of the bird harvest (Figure 2-20).

Of the birds harvested in 2014, 44% were caught in the spring (Table 2-11). With the exception of 17 mallards that were reportedly caught in summer or fall months, and 7 black scoters caught in the fall, all migratory birds were harvested in the spring. The remaining birds, including ptarmigan and grouse species, were caught in the summer, winter, or fall. Ethnographic respondents described the dangers of bird hunting in the spring. Traveling by snowmachine on the Yukon River allows Tanana residents to access bird flyways, and in the past doing so was common. Recently however, the ice conditions on the Yukon River have become more dangerous, requiring more preparation prior to a hunt. One respondent described how preparation for spring bird hunting starts months in advance:

> To get ready for birds right now, first thing I'll do is find my route. Find the safest route to where I'm gonna go. Then I'll get all my shells in place and all my decoys. Everything I'm gonna need to hunt has to be in place, which might mean like dragging a canoe out,

Table 2-11.–Estimated bird harvests by season, Tanana, 2014.

	Estimated harvest by season					
Resource	Spring	Summer	Fall	Winter	Season unknown	**Total**
All birds	**563.9**	**24.8**	**513.9**	**173.7**	**0.0**	**1,276.4**
Canvasback	0.0	0.0	0.0	0.0	0.0	**0.0**
Spectacled eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Goldeneye	29.0	0.0	0.0	0.0	0.0	**29.0**
Mallard	171.0	2.8	13.8	0.0	0.0	**187.5**
Northern pintail	38.6	0.0	0.0	0.0	0.0	**38.6**
Black scoter	89.6	0.0	6.9	0.0	0.0	**96.5**
Northern shoveler	1.4	0.0	0.0	0.0	0.0	**1.4**
Green-winged teal	19.3	0.0	0.0	0.0	0.0	**19.3**
Unknown ducks	0.0	0.0	0.0	0.0	0.0	**0.0**
Brant	0.0	0.0	0.0	0.0	0.0	**0.0**
Cackling goose	11.0	0.0	0.0	0.0	0.0	**11.0**
Canada goose	34.5	0.0	0.0	0.0	0.0	**34.5**
Unknown Canada/cackling goose	82.7	0.0	0.0	0.0	0.0	**82.7**
Snow goose	4.1	0.0	0.0	0.0	0.0	**4.1**
White-fronted goose	68.9	0.0	0.0	0.0	0.0	**68.9**
Unknown geese	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	1.4	0.0	0.0	0.0	0.0	**1.4**
Sandhill crane	0.0	0.0	0.0	0.0	0.0	**0.0**
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Spruce grouse	12.4	11.0	234.4	27.6	0.0	**285.4**
Sharp-tailed grouse	0.0	0.0	0.0	0.0	0.0	**0.0**
Ruffed grouse	0.0	0.0	81.3	68.9	0.0	**150.3**
Unknown grouses	0.0	1.4	67.2	0.0	0.0	**68.6**
Willow ptarmigan	0.0	0.0	0.0	8.3	0.0	**8.3**
Unknown ptarmigans	0.0	9.7	110.3	68.9	0.0	**188.9**
Snowy owl	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2015.

> putting it in place and having it ready. You know, like a safety net if I can't make it home I know this canoe is here…A lot of it too is going in and talking with the people that are out there saying, "okay, this place is dangerous, there are open holes." What kind of ice conditions? What kind of snow conditions? It all starts in the fall actually, before I even go geese hunting, in the fall time before the ice comes, I go check every channel across here so I know exactly where the deep water is, where you can actually die, where you are safe, you know? (TAL030620151)

Very few residents reported gathering eggs, but 5% of households did use unknown gull eggs (Table 2-5). Two percent of households collected 35 individual gull eggs. Two percent of households used and received unknown duck eggs from others. Two respondents described searching for gull eggs on nearby sandbars. To locate gull eggs in the Tanana area, the respondents travel by boat looking for groups of gulls on sand bars or river islands. When "you pull up your boat [the birds] kind of leave their nest and they fly, circle above the sand or island kind of high and start squawking at you and get a little irritated with you. So we'd jump out of the boat and quickly run, run, run all over the sand bar filling our pockets with eggs" (TAL030720154).

Figure 2-21 shows the search and harvest areas of birds and eggs. Duck and goose search areas occurred primarily around Tanana to the north of town. A long, narrow polygon downstream of Tanana on the Yukon

River likely indicates boat travel along the sloughs in that area. A smaller polygon at the bottom left of the figure appears near the Nowitna River suggesting either extensive land travel or access to the river from another community.

Grouse and ptarmigan, represented in yellow, only appear in 2 small specks along the Tanana River.

Bird egg search areas, shown in red hash marks, occurred upstream from Tanana along the Yukon River into the Rapids area. Search areas were also documented along a smaller portion of the Tanana River and covered the lake-dense surroundings of Fish Lake. Some residents searched for bird eggs closer to the community following the Tanana-Allakaket Winter Trail.

Marine Invertebrates

Marine invertebrates, not locally available in Interior Alaska, were sparsely used by Tanana residents. Two percent of households attempted to harvest razor clams, and 3% of households reported using them, suggesting that the small harvest from outside the community was shared within it (Table 2-5). Additionally, 3% of households reported receiving shrimp from others.

Vegetation

Lastly, the survey asked about the vegetation harvested or used by respondents. The category of vegetation included berries, plants, and wood. Figure 2-22 shows the composition of vegetation harvest in Tanana by edible weight. Berries made up 81% of the vegetation harvest. One woman described berry picking in Tanana:

> Picking berries was something that was a community thing, and we'd go out with a bunch of women. Growing up, being a child, you know, we'd just go and pick berries and fill up the buckets and then as we got older, we would just go out on our own. (TAL030420158)

The same respondent characterized berry picking as an important activity that taught a variety of values to young children. "We weren't afraid of being in the woods…the elders or our parents would always have something funny to say, like, 'if you run into a bear, show part of your body and that way they'll know that you're just a child and they won't bother you'" (TAL030420158). In this way the children were taught to feel comfortable in the woods and not to fear the animals around them. Households primarily used blueberries, raspberries, and cranberries (76%, 29%, and 26%, respectively; Table 2-5). The 59% of households that picked blueberries in 2014 gathered a total of 669 lb (3 lb per capita), or 167 gallons. Raspberries were picked by fewer households (24%) and contributed 75 lb, or 19 gallons, to the total community harvest. Both lowbush and highbush cranberries were picked by 23% of households and used by 26%. Combined, a total of 302 lb, or 76 gallons, were gathered.

Plants and greens made up 19% of the vegetation harvest in 2014 (Figure 2-22). Stinkweed, harvested by 5% of households and used by 6%, is a medicinal plant. Ethnographic respondents remember using a variety of medicinal plants throughout their lifetime. For example, one respondent recalled how her mother would send her out to collect spruce sap:

> You know that sap that comes out of the tree? That sticky stuff. I remember going out at various times and you would cut, like make a small mark on the tree and then you would go back and with a spoon you would fill up a little jar with it because you would use it to put on cuts so that you won't have infections and it would heal. (TAL030420158)

Another respondent recalls the healing properties of willows, "I remember getting bee stings and [my grandmother] just grabbing willows, you know, and chewing the leaves and slapping them on there" (TAL030720154). Some respondents harvest wild potatoes in the fall when the root is thick and sturdy. Others search for wild rhubarb (TAL030420158). One respondent who has connections to western Alaska is experimenting with wild greens found around Tanana that resemble beach greens on the Seward Peninsula. For example, gathering fresh willow leaves and packing them in seal oil is an effective way to incorporate

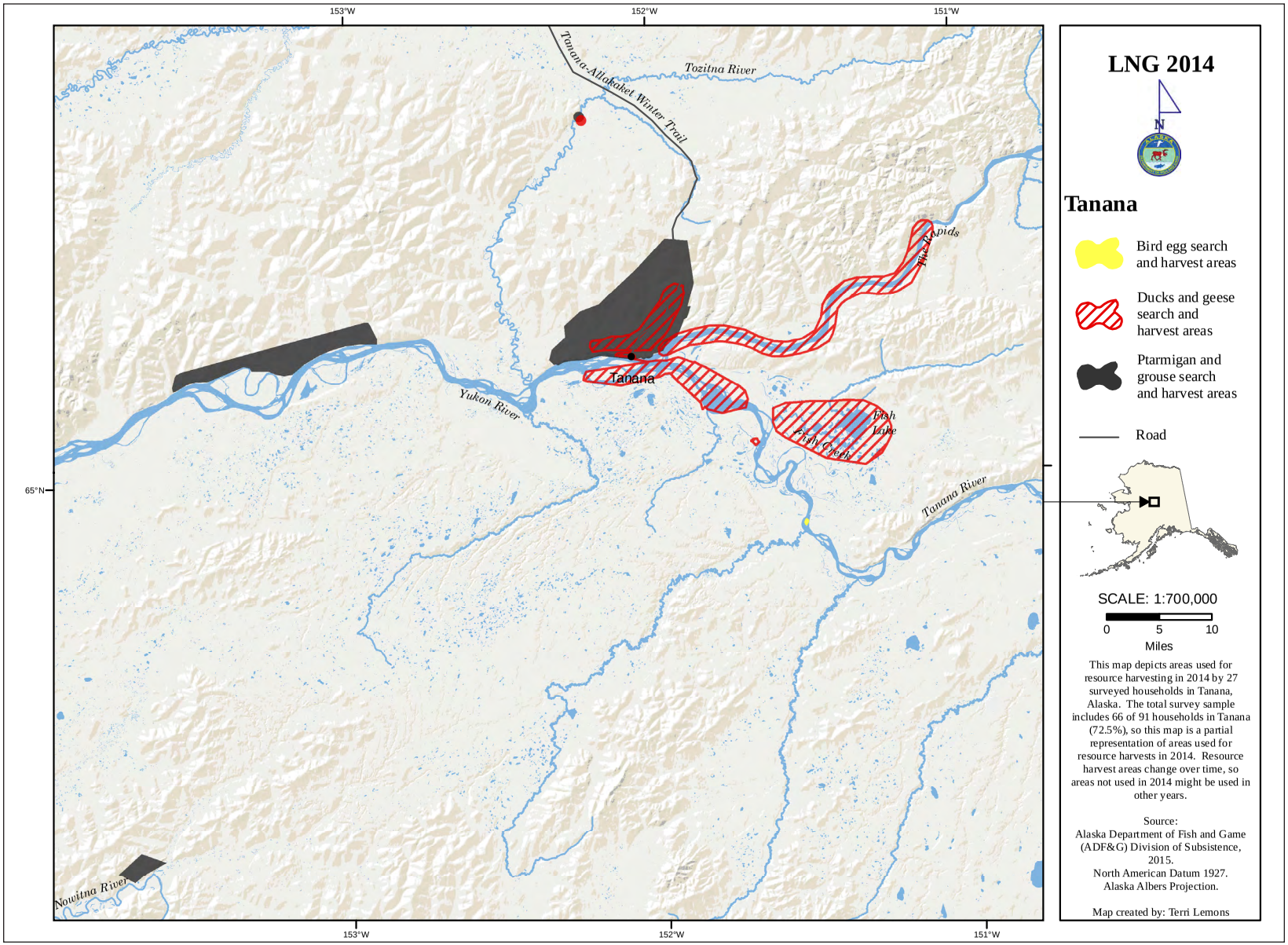


Figure 2-21.–Bird hunging and bird egg gathering areas, Tanana, 2014.

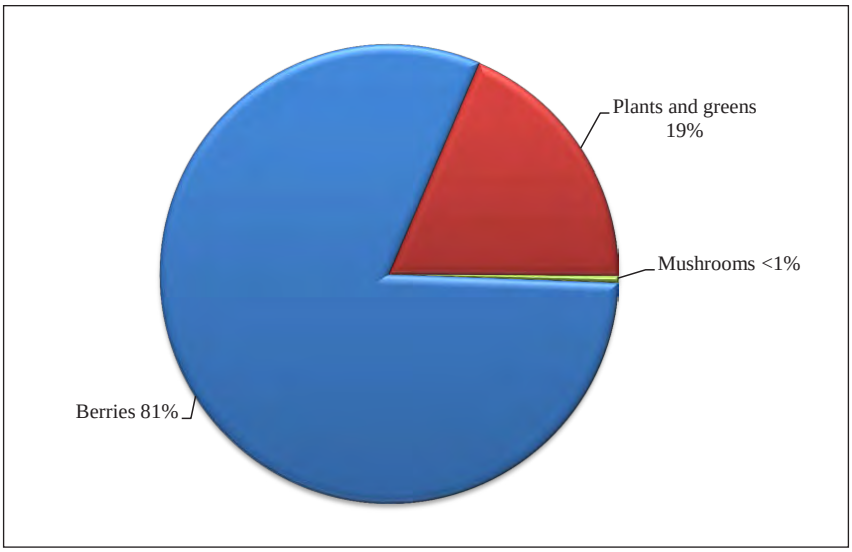


Figure 2-22.–Composition of vegetation harvest by weight in usable pounds, by type of vegetation, Tanana, 2014.

traditions from 2 distinct regions with which the respondent identifies (TAL030420158). Three percent of households attempted to harvest chaga, a fungus that grows on birch and aspen trees, is crushed into powder and used as a tea (Table 2-5). In 2014, only 2% of households successfully harvested and used the fungus.

Wood is not an edible resource, but it is used heavily by Tanana residents for home heating. Eighty-nine percent of households used firewood, and 64% gathered it. Nearly one-half of all households received wood from others (45%). Table 2-12 shows the percentage of home heat that comes from firewood. Thirty-five percent of residents reported that 100% of their home heat comes from burning wood. In the spring, residents gather driftwood from the river. Using boats and rope, residents are able to gather considerable amounts of wood for a community heat source and for rebuilding subsistence gear including fish wheels and fish racks. One respondent explains how driftwood is a unique resource because it serves several purposes:

> Firewood holds its value pretty much year round. I go out and get as much as I can and this is driftwood. So it's a different kind of season—it's not a food season but it's like a cash season…[You can] get all your fish wheel logs, you can get all your fish rack poles. Everything you need, you're gonna get out of that drift and there could be money too, there's a lot of money involved. (TAL030620151)

Table 2-12.–Use of firewood for home heating, Tanana, 2014.

Percentage of home heating from wood	Tanana households	
	Number	Percentage
0%	11	16.7
1–25%	3.0	4.5
26–50%	6.0	9.1
51–75%	9.0	13.6
76–99%	14.0	21.2
100%	23.0	34.8

Source ADF&G Division of Subsistence household surveys, 2015.

In Tanana, the laundromat, the city offices, and the school are heated by wood biomass boilers; local residents are encouraged to gather wood and sell it to the city. Wood is also gathered, cut, and sold to other residents in town for winter heating needs.

Figure 2-23 shows the search and harvest areas for berries and greens. Although much of the area used by Tanana residents in 2014 was located in the immediate vicinity of the community, residents also harvested plants at much greater distances. Fish Lake and the surrounding lakes and sloughs were identified as a location to harvest a variety of berries (TAL030420154). The lake- and slough-dense area stretching from the confluence of the Tanana River towards Fish Lake was also used. Smaller search areas were identified on the Yukon River downstream from Tanana and upriver in the Rapids area and even closer to

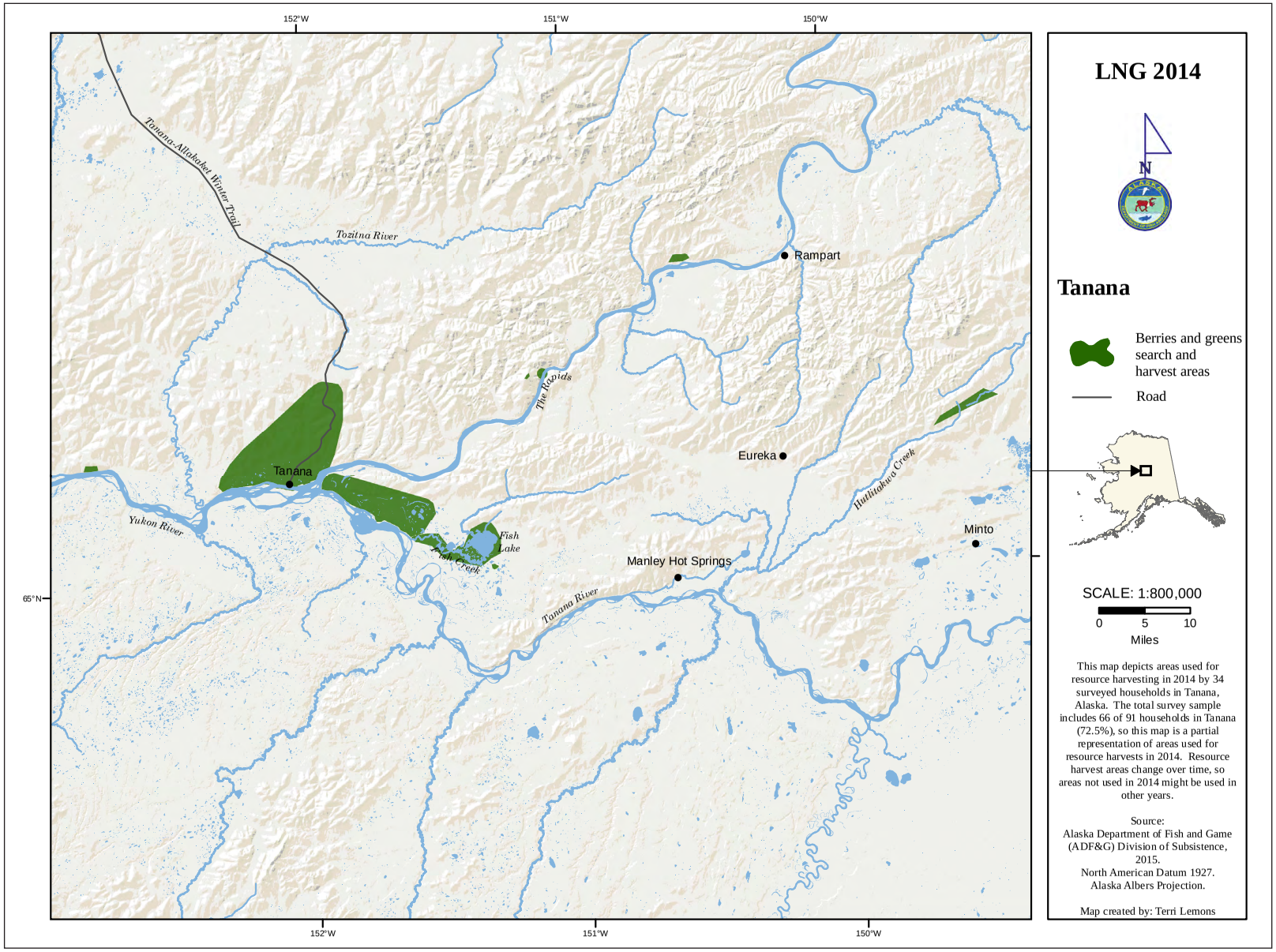


Figure 2-23.–Berries and greens gathering areas, Tanana, 2014.

Rampart. On the right hand side of the map, a rectangular polygon at the headwaters of Hutlitakwa Creek was reported by a respondent as a use area in 2014.

Production and Distribution of Wild Resources

Household Specialization in Resource Harvesting

Previous studies (Magdanz et al. 2009; 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.

In the 2014 study year in Tanana, about 69% of the harvests of wild resources as estimated in pounds usable weight were harvested by 6% of the community's households (Figure 2-24). This ratio is more dramatic than Wolfe's typical 30-70 split. Further analysis of the study findings, beyond the scope of this report, might identify characteristics of the highly productive households in Tanana and the other study communities.

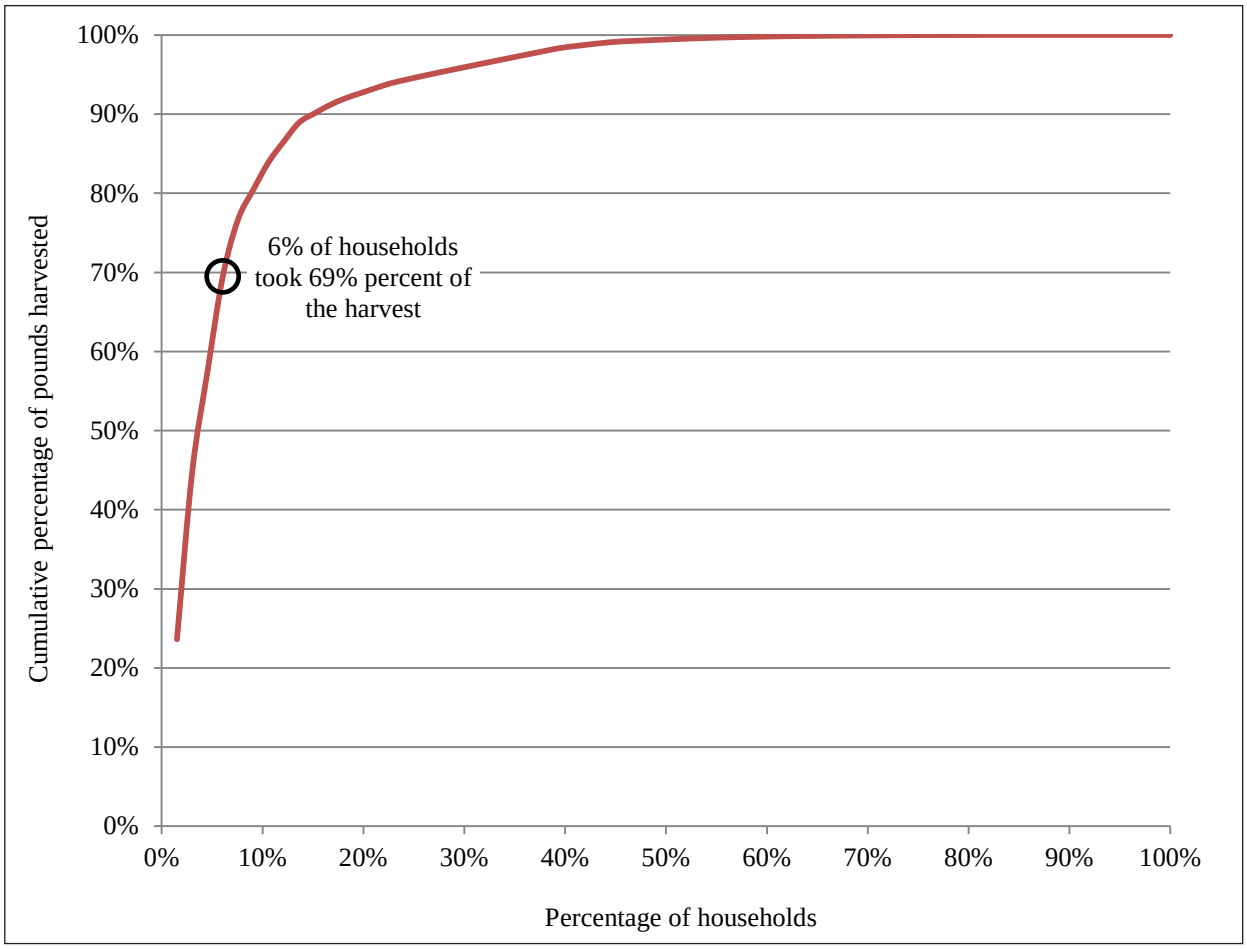


Figure 2-24.–Household specialization, Tanana, 2014.

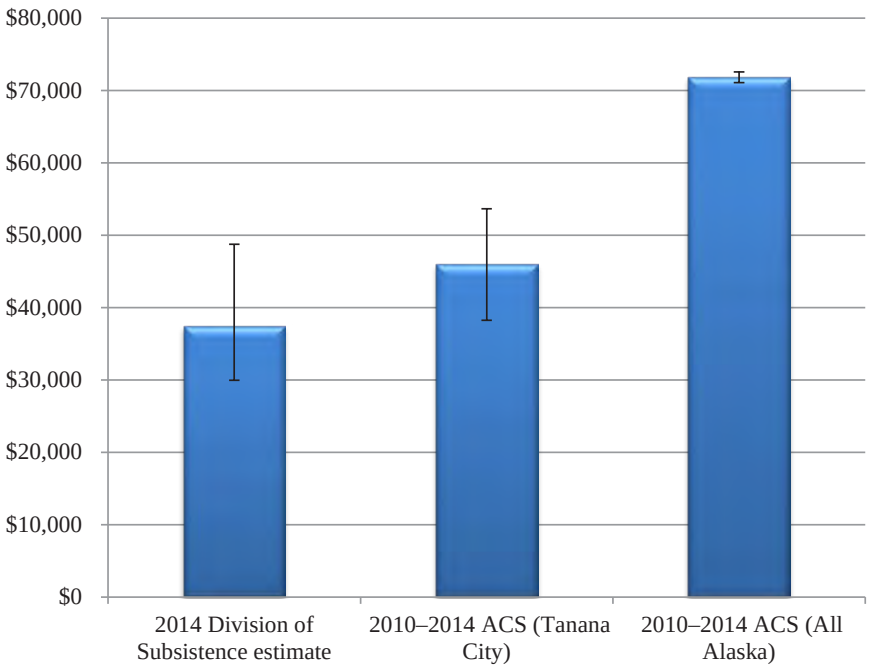
Table 2-13.–Estimated earned and other income, Tanana, 2014.

Income source	Number of employed adults	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government, including tribal	79.2	57.9	$1,808,171	$1,208,745 – $2,618,624	$19,870	44.0%
Services	43.5	36.2	$663,735	$354,142 – $1,184,111	$7,294	16.2%
Transportation,	9.3	8.7	$462,392	$67,024 – $1,324,165	$5,081	11.3%
Federal government	14.0	13.0	$333,334	$125,945 – $638,525	$3,663	8.1%
State government	1.6	1.4	$17,168	$11,785 – $46,455	$189	0.4%
Agriculture, forestry, and fishing	6.2	5.8	$17,168	$2,185 – $55,066	$189	0.4%
Mining	1.6	1.4	$13,734	$12,026 – $28,964	$151	0.3%
Retail trade	7.8	4.3	$9,342	$8,707 – $0	$103	0.2%
Construction	1.6	1.4	$2,884	$2,531 – $6,008	$32	0.1%
Earned income subtotal	**127.3**	**82.5**	**$3,327,929**	**$2,442,363 – $4,442,390**	**$36,571**	**81.0%**
Other income						
Alaska Permanent Fund dividend		81.3	$324,426	$267,883 – $387,048	$3,565	7.9%
Pension / retirement		22.1	$120,016	$58,563 – $199,207	$1,319	2.9%
Native corporation dividend		11.0	$76,983	$14,444 – $191,948	$846	1.9%
Disability		74.5	$68,751	$54,258 – $85,708	$756	1.7%
Unemployment		5.5	$54,600	$558 – $158,836	$600	1.3%
Food stamps		12.4	$47,707	$8,753 – $117,813	$524	1.2%
Heating assistance		13.8	$42,134	$11,816 – $82,391	$463	1.0%
Foster care		22.1	$15,964	$6,656 – $28,438	$175	0.4%
Adult public assistance (OAA, APD)		1.4	$12,409	$0 – $24,818	$136	0.3%
Meeting honoraria		1.4	$11,995	$0 – $23,991	$132	0.3%
Child support		4.1	$3,585	$0 – $8,548	$39	0.1%
Other		1.4	$191	$0 – $767	$2	0.0%
TANF (Temporary Assistance for Needy Families)		1.4	$191	$0 – $869	$2	0.0%
Supplemental Security Income		0.0	$0	$0 – $0	$0	0.0%
Longevity bonus		0.0	$0	$0 – $0	$0	0.0%
Workers' compensation / insurance		0.0	$0	$0 – $0	$0	0.0%
Veterans assistance		0.0	$0	$0 – $0	$0	0.0%
CITGO fuel voucher		0.0	$0	$0 – $0	$0	0.0%
Other income subtotal		**22.1**	**$778,953**	**$58,563 – $199,207**	**$8,560**	**19.0%**
Community income total			**$4,106,881**	**$3,193,617 – $5,193,993**	**$45,131**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.

Income and Cash Employment

Survey respondents were asked about both earned income (jobs held and wages earned by all household members 16 and older) and unearned income (Alaska Permanent Fund dividend, Social Security, public assistance, etc.). In 2014, Tanana households earned or received an estimated $4,106,881, with an average household income of $45,131. Of the total community income, $3,327,929 (81%) was from wage employment, and $778,953 (19%) was from other sources (Table 2-13). Figure 2-25 and Appendix Table D2-7 compare the estimated median income from this study with American Community Survey (ACS) estimates of median income in Tanana and in all of Alaska between 2009 and 2013. The 2014 median income estimate is comparable to the ACS calculation but substantially lower than the median income of all of Alaska. Figure 2-26 shows the top income sources for residents of Tanana. Local government including tribal government provided $1,808,171, or 44% of the community total, more than any other source (Table 2-13 and Figure 2-26). Fifty percent of jobs held by employed adults were in the local government sector (Table 2-14). Services including health care, social services, and education followed, with $663,735, or



Note For 2014, Division of Subsistence estimate does not include categories of income excluded by the 2010–2014 ACS median estimate, including food stamps, housing assistance, and one-time payments.

Figure 2-25.–Comparison of median income estimates, Tanana, 2014.

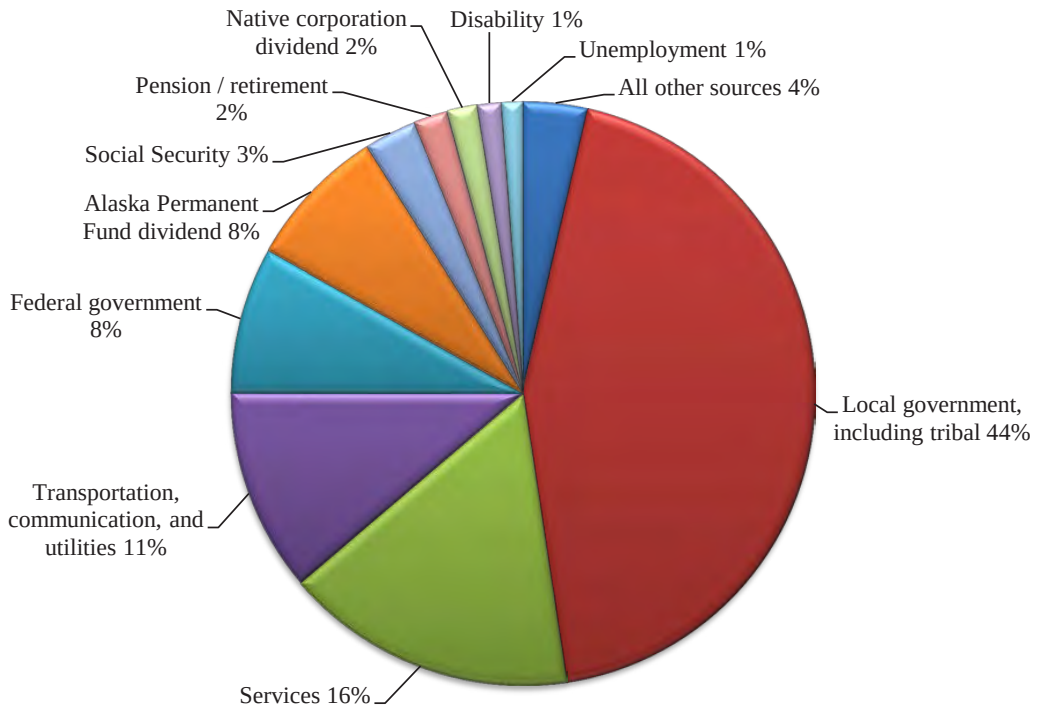


Figure 2-26.–Top income sources, Tanana, 2014.

Table 2-14.–Employment by industry, Tanana, 2014.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**176.9**	**82.5**	**127.3**	**100.0%**
Federal government	**8.8%**	**15.8%**	**11.0%**	**10.0%**
Teachers, librarians, and counselors	0.9%	1.8%	1.2%	1.2%
Technologists and technicians, except health	4.4%	8.8%	6.1%	7.4%
Administrative support occupations, including clerical	0.9%	1.8%	1.2%	1.1%
Service occupations	2.6%	5.3%	3.7%	0.3%
State government	**0.9%**	**1.8%**	**1.2%**	**0.5%**
Handlers, equipment cleaners, helpers, and laborers	0.9%	1.8%	1.2%	0.5%
Local government, including tribal	**50.0%**	**70.2%**	**62.2%**	**54.3%**
Executive, administrative, and managerial	4.4%	8.8%	6.1%	8.0%
Social scientists, social workers, religious workers, and lawyers	0.9%	1.8%	1.2%	0.1%
Teachers, librarians, and counselors	4.4%	7.0%	6.1%	7.9%
Registered nurses, pharmacists, dietitians, therapists, and physicians assistants	0.9%	1.8%	1.2%	1.4%
Health technologists and technicians	0.9%	1.8%	1.2%	0.6%
Administrative support occupations, including clerical	9.6%	19.3%	13.4%	14.6%
Service occupations	4.4%	7.0%	4.9%	5.4%
Mechanics and repairers	0.9%	1.8%	1.2%	1.4%
Construction and extractive occupations	6.1%	8.8%	7.3%	6.8%
Transportation and material moving occupations	5.3%	8.8%	6.1%	3.6%
Handlers, equipment cleaners, helpers, and laborers	12.3%	22.8%	17.1%	4.4%
Agriculture, forestry, and fishing	**4.4%**	**7.0%**	**4.9%**	**0.5%**
Agricultural, forestry, and fishing occupations	4.4%	7.0%	4.9%	0.5%
Mining	**0.9%**	**1.8%**	**1.2%**	**0.4%**
Precision production occupations	0.9%	1.8%	1.2%	0.4%
Construction	**0.9%**	**1.8%**	**1.2%**	**0.1%**
Construction and extractive occupations	0.9%	1.8%	1.2%	0.1%
Transportation, communication, and utilities	**5.3%**	**10.5%**	**7.3%**	**13.9%**
Executive, administrative, and managerial	1.8%	3.5%	2.4%	6.2%
Precision production occupations	0.9%	1.8%	1.2%	3.3%
Transportation and material moving occupations	2.6%	5.3%	3.7%	4.4%
Retail trade	**4.4%**	**5.3%**	**6.1%**	**0.3%**
Executive, administrative, and managerial	1.8%	1.8%	2.4%	0.2%
Marketing and sales occupations	1.8%	3.5%	2.4%	0.0%
Handlers, equipment cleaners, helpers, and laborers	0.9%	1.8%	1.2%	0.1%
Services	**24.6%**	**43.9%**	**34.1%**	**19.9%**
Executive, administrative, and managerial	2.6%	5.3%	3.7%	7.3%
Writers, artists, entertainers, and athletes	3.5%	7.0%	4.9%	2.8%
Health technologists and technicians	0.9%	1.8%	1.2%	1.4%
Technologists and technicians, except health	1.8%	3.5%	2.4%	0.4%
Administrative support occupations, including clerical	2.6%	5.3%	3.7%	1.3%
Service occupations	9.6%	19.3%	13.4%	3.6%
Mechanics and repairers	0.9%	1.8%	1.2%	0.0%
Handlers, equipment cleaners, helpers, and laborers	0.9%	1.8%	1.2%	1.7%
Occupation not indicated	1.8%	3.5%	2.4%	1.4%

Source ADF&G Division of Subsistence household surveys, 2015.

16% of the total community income (Table 2-13; Figure 2-26). Twenty-five percent of the jobs held by employed adults were service positions (Table 2-14). An estimated 127 of 165 adults (77%) held at least 1 job in 2014 (Table 2-15). Of the jobs reported by Tanana residents, 61% were full time, 20% were part time (fewer than 35 hours per week), and 15% were on-call positions, in which individuals worked when needed (Table 2-16). On average, employed adults worked 37 weeks out of the year, and 46% of employed adults worked year round (Table 2-15). At least 1 employed adult lived in 91% of households. On average, 2 employed adults lived in these households. Employed adults often reported having more than 1 job; the number of jobs ranged from 1 to 4 positions.

The Alaska Permanent Fund, the largest contributor of money in the "other income" category, paid an average dividend of $3,565 to households in Tanana (a total of $324,426; Table 2-13). This is roughly 8% of Tanana's total income and 42% of Tanana's income from other sources. Pensions and retirement was the next highest contributor to other income, adding $120,016 to the community total income. The remaining sources of other income included Native corporation dividends, disability benefits, unemployment benefits, food stamps, and a variety of other small contributors.

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). 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).

Core questions and responses from Tanana residents are summarized in Figure 2-27. Eight of the 10 statements listed in the figure are used to calculate a household's food security category. Twelve percent of households worried that they would not have enough food. Twenty-seven percent of households reported that once their food, either store-bought or subsistence, ran out, they were unable to get more. Eight percent of households reported that at least 1 adult in the household ate less than they felt they should because they could not get the foods they needed. Other responses associated with low food security included household members who were hungry but did not eat (6%), household members who lost weight because they did not have enough food (9%), and those who did not eat for a whole day (6%).

Food security results for surveys for Tanana, the state of Alaska, and the United States are summarized in Figure 2-28. Eighty-six percent of Tanana households experienced high and marginal food security in 2014, the same percentage as households across the United States and only slightly fewer than those across Alaska (88%). Fewer Tanana households fell into the low food security category than other Alaskan households or those in the rest of the country (6%, 8%, and 9%, respectively). However, 8% of households were considered to have very low food security, twice as many as other households across the state.

Figure 2-29 portrays the mean number of food insecure conditions per household by food security category by month. As discussed previously, subsistence harvests occur year round based on the seasonal availability of wild resources. The availability of wild resources fluctuates throughout the year and may affect the month to month food security of households participating in subsistence activities. Households with high

Table 2-15.–Employment characteristics, Tanana, 2014.

Characteristic	Community Tanana
All adults	
Number	165
Mean weeks employed	28.5
Employed adults	
Number	127.3
Percentage	77.1%
Jobs	
Number	176.9
Mean	1.4
Minimum	1
Maximum	3
Months employed	
Mean	8.5
Minimum	1
Maximum	12
Percentage employed year-round	46.3%
Mean weeks employed	36.9
Households	
Number	91
Employed	
Number	82.5
Percentage	90.6%
Jobs per employed household	
Mean	2.1
Minimum	1
Maximum	4
Employed adults	
Mean	
Employed households	1.5
Total households	1.4
Minimum	1
Maximum	3
Mean person-weeks of employment	51.7

Source ADF&G Division of Subsistence household surveys, 2015.

Table 2-16.–Reported job schedules, Tanana, 2014.

	Jobs		Employed persons		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full time	107.1	60.5%	91.6	72.0%	68.0	82.5%
Part time	35.7	20.2%	31.0	24.4%	26.0	31.6%
Shift	6.2	3.5%	6.2	4.9%	5.8	7.0%
On call (occasional)	26.4	14.9%	23.3	18.3%	20.3	24.6%
Schedule not reported	1.6	0.9%	1.6	1.2%	1.4	1.8%

Source ADF&G Division of Subsistence household surveys, 2015.

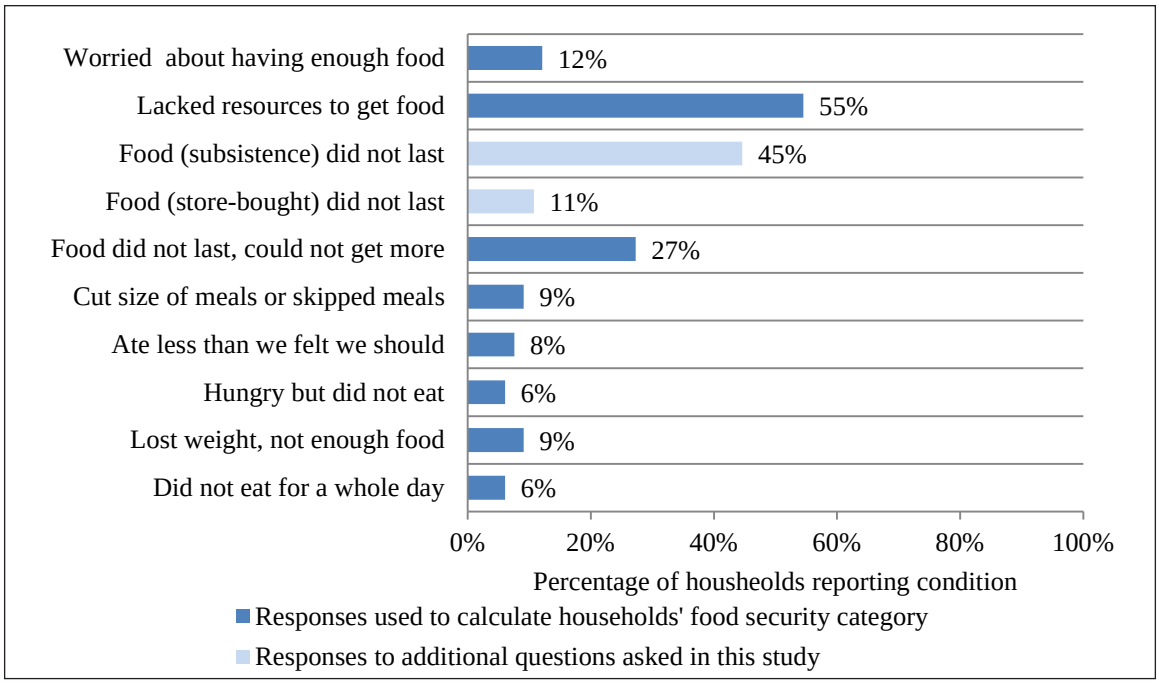


Figure 2-27.–Responses to questions about food insecure conditions, Tanana, 2014.

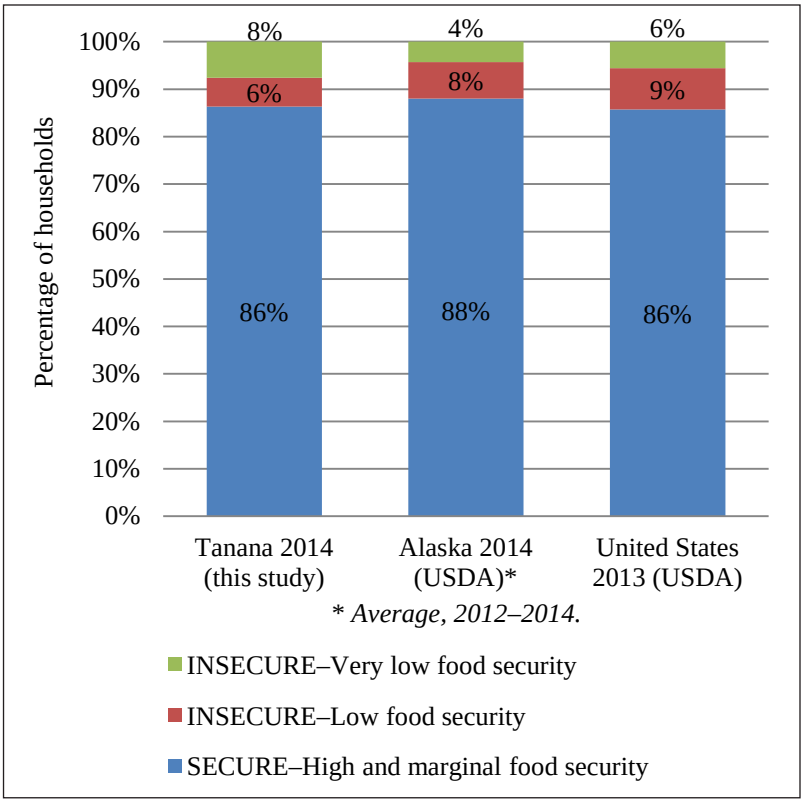


Figure 2-28.–Comparisons of food security categories, Tanana, 2014.

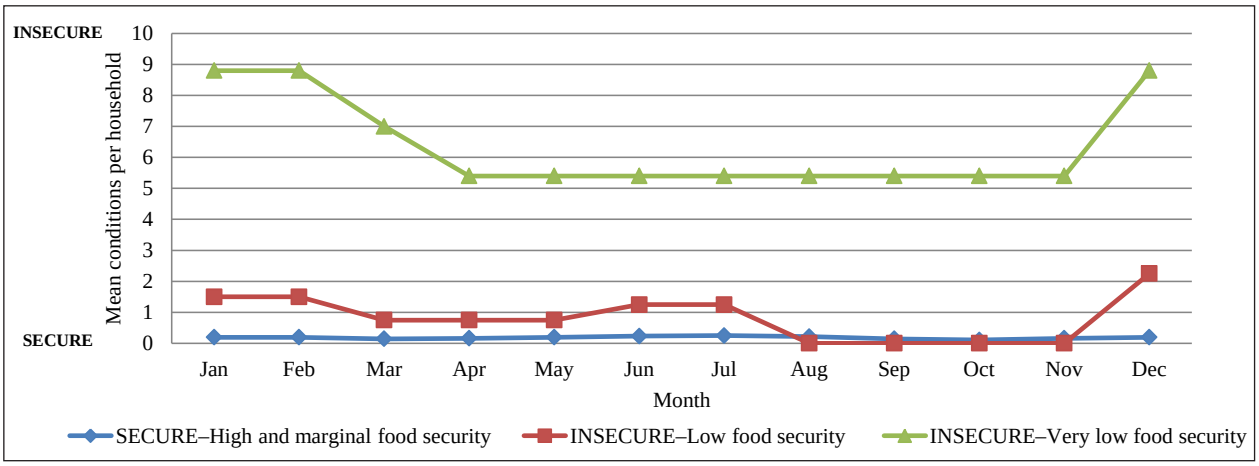


Figure 2-29.–Mean number of food insecure conditions by month and by household security category, Tanana, 2014.

and marginal food security (shown in blue) did not experience fluctuations throughout the year and reported less than 1 food insecure condition in any given month. Households with very low food security (shown in green) experienced the greatest fluctuation throughout the year, ranging from an average of 9 food insecure conditions in winter months to approximately 5 insecure conditions throughout the spring, summer, and fall. The seasonal availability of subsistence foods, including spring bird hunting, summer salmon fishing, and fall moose hunting may explain why households with very low food security experienced a reduction in the number of insecure conditions in warmer months. Low food secure households (shown in red) show a similar rise in food insecure conditions in the winter months of January, February, and December to households with very low food security. Although the months of fluctuations are similar, there is a wide difference between the numbers of food insecure conditions reported by these 2 groups of households. In December, the month with the highest number of food insecure conditions for both groups, households with low food security reported between 2 and 3 insecure conditions, while households with very low food security reported nearly 9 true conditions. A possible explanation for this pattern is that seasonal factors such as the limited availability of wild resources, the reduction in seasonal jobs such as firefighting or construction, and the increased need for costly heating fuel have a greater impact on households with very low food security than on those in more secure households.

Figure 2-30 shows the months in which households reported their food did not last. More households reported running out of subsistence foods (shown in red) in each month of the year than store bought foods. The highest percentage of households ran out of subsistence foods in the winter months of January,

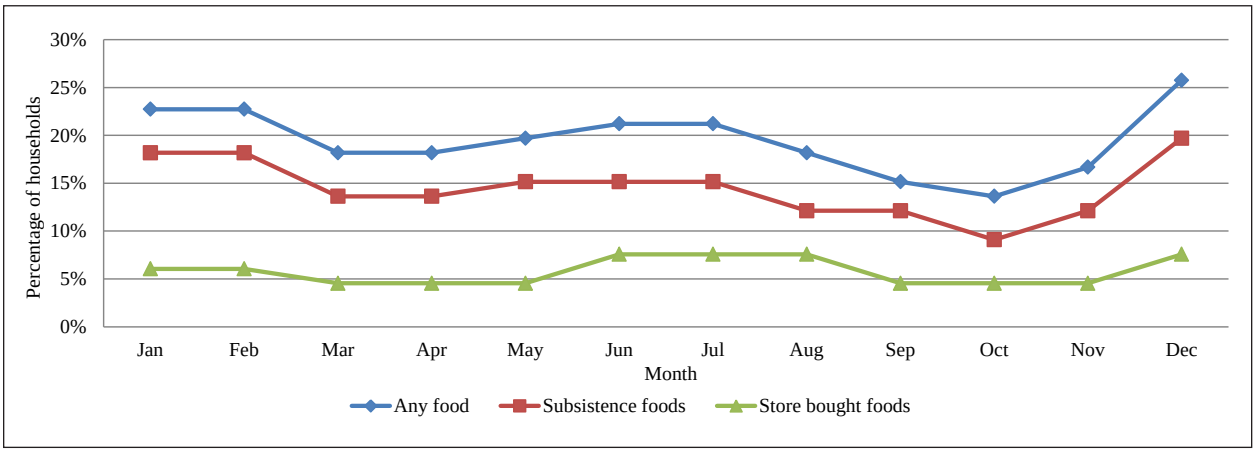


Figure 2-30.–Comparison of months when food did not last, Tanana, 2014.

Table 2-17.–Household descriptions of food eaten in the last 12 months, Tanana, 2014.

Statement	Percentage of affirmative responses
Had enough of the kinds of food desired	30.3%
Had enough food, but not the desired kind	56.1%
Somestimes, or often, did not have enough food	9.1%
Missing/No response	3.0%

Source ADF&G Division of Subsistence household surveys, 2015.

February, and December, the same months that had the highest rates of food insecurity. Households ran out of store-bought foods most often in the summer months of June, July, and August.

Of the households that participated in the food security section of the survey, 56% reported that they had enough food but not the kinds of foods they wanted to eat, while only 30% reported they did have enough of the kinds of foods they wanted to eat (Table 2-17).

Comparing Harvests and Uses in 2014 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 2 ways: whether they got more, less, or about the same amount of 8 resource categories in 2014 as in the past 5 years, and whether they got "enough" of each of the 8 resource categories. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different subsistence resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 2-18 and figures 2-31 and 2-32 provide a broad overview of households' assessments of their harvests in 2014. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions.

Figure 2-31 reports the percentages of households that reported whether they got enough of each resource category. About one-half (48%) of households reported that they did not get enough wild resources in 2014, while 47% reported that they did get enough. More than one-half (59%) of responding households used less wild foods in 2014 than in recent years (Table 2-18; Figure 2-32). Only 5% used more and 36% reported using the same amount. Very few households reported using more of a resource (less than 10% in any category).

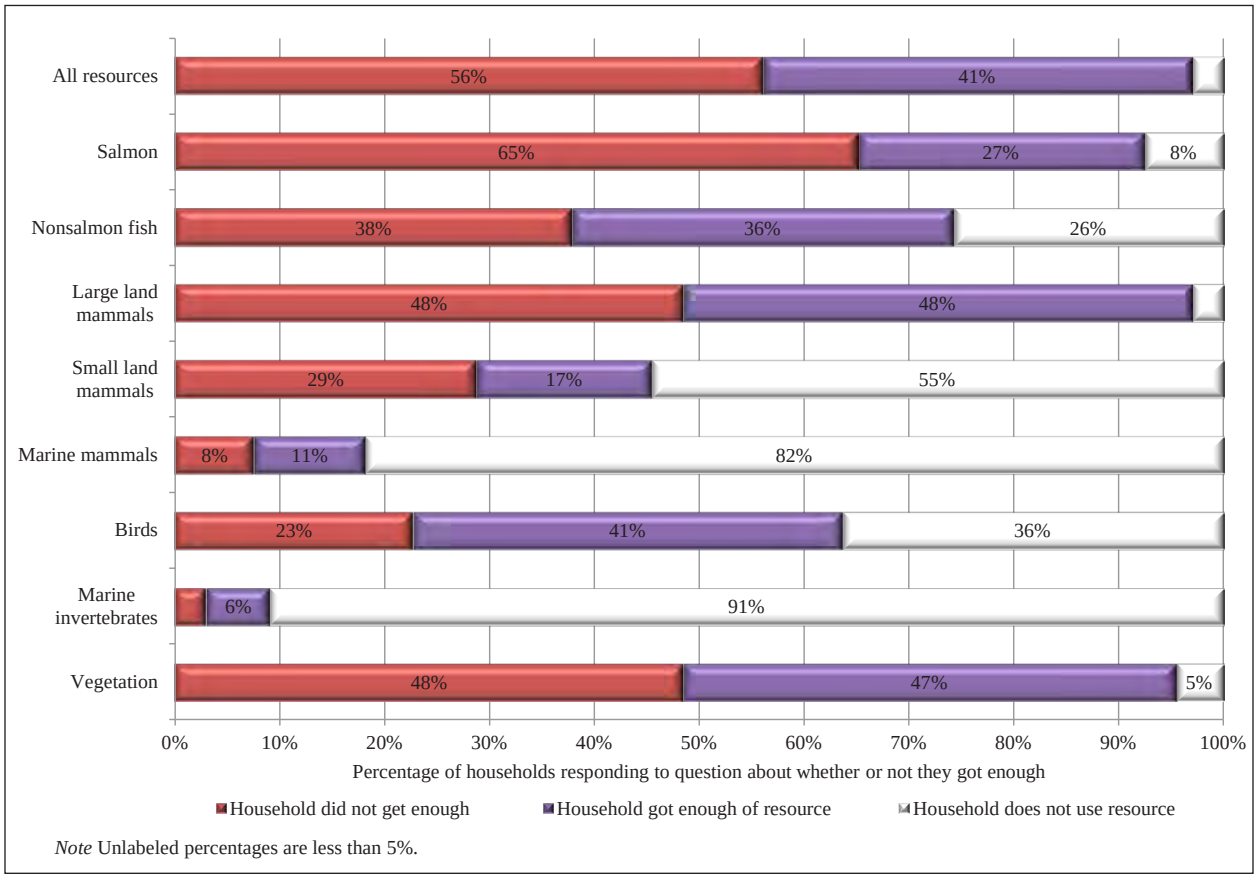
Sixty-five percent of households reported they did not get enough salmon, a primary resource (Figure 2-31). Figure 2-32 shows that 73% of households reported they used less salmon in 2014 than in recent years, 14% explaining that they used the same amount of salmon in 2014 as in previous years, and 6% said they used more. When asked why they used less, 57% of respondents reported that they did so due to fishing regulations (Table 2-19). Other stated reasons for using less salmon included reduced availability of salmon (30%) and a lack of equipment necessary to go fishing (11%). For those households that used more salmon in the study year, 2 households credited an increase in fishing effort for their increased use (Table 2-20). When asked to evaluate the impact of not getting enough salmon, 2% described it as not noticeable, 35% described the impact as minor, 35% explained that not getting enough salmon had a major effect on their household, and 28% stated that the impact was severe (Table 2-21). Sixty-one percent of responding households reported needing more Chinook salmon (Table 2-22).

Table 2-18.–Changes in household uses of resources compared to recent years, Tanana, 2014.

Resource category	Sampled households	Valid responses[a]	Households reporting use: Total households		Less		Same		More		Households not using	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	66	64	64	100.0%	38	59.4%	23	35.9%	3	4.7%	0	0.0%
Salmon	66	66	61	92.4%	48	72.7%	9	13.6%	4	6.1%	5	7.6%
Nonsalmon fish	66	64	48	75.0%	30	46.9%	17	26.6%	1	1.6%	16	25.0%
Large land mammals	66	64	62	96.9%	34	53.1%	22	34.4%	6	9.4%	2	3.1%
Small land mammals	66	64	30	46.9%	23	35.9%	6	9.4%	1	1.6%	34	53.1%
Marine mammals	66	66	11	16.7%	3	4.5%	8	12.1%	0	0.0%	55	83.3%
Birds	66	61	41	67.2%	22	36.1%	15	24.6%	4	6.6%	20	32.8%
Marine invertebrates	66	66	6	9.1%	2	3.0%	2	3.0%	2	3.0%	60	90.9%
Vegetation	66	65	62	95.4%	30	46.2%	26	40.0%	6	9.2%	3	4.6%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response.



Note Unlabeled percentages are less than 5%.

Figure 2-31.–Percentage of households reporting whether they got enough resources, Tanana, 2014.

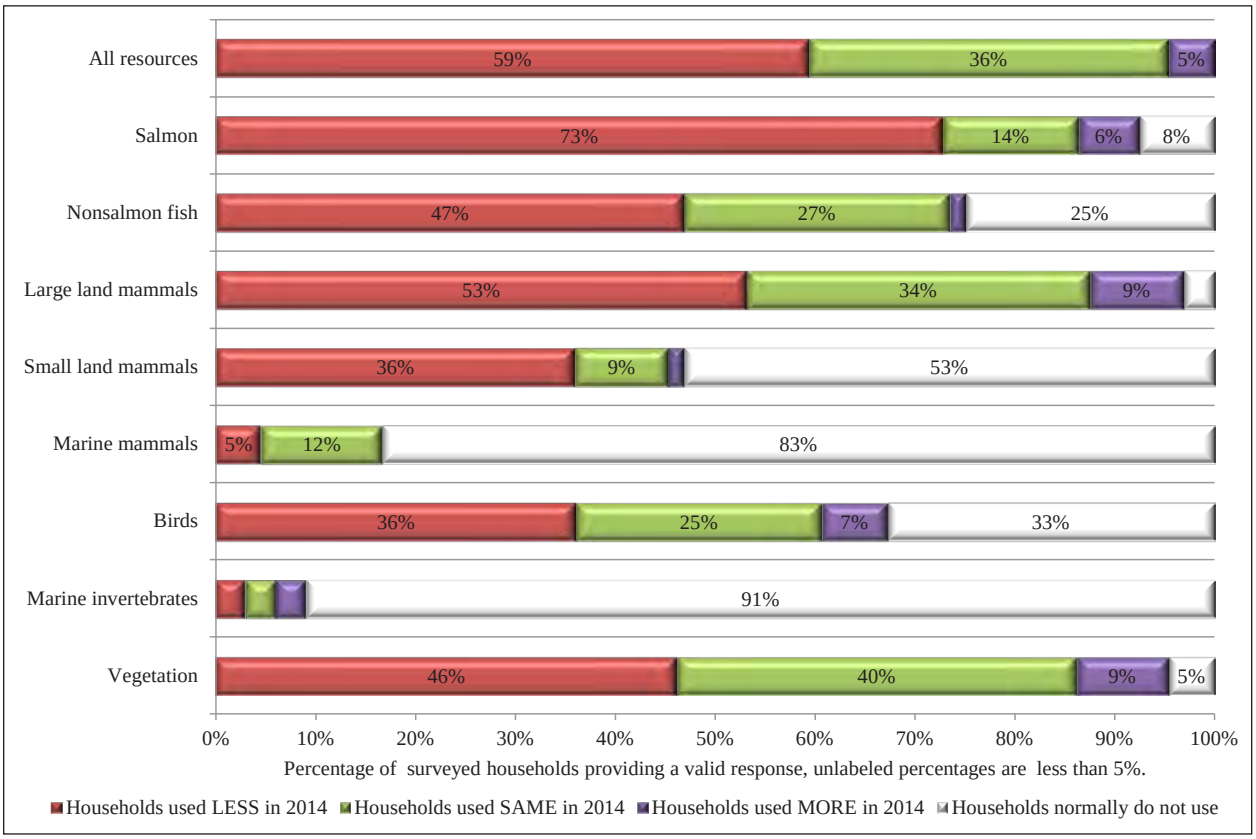


Figure 2-32.–Changes in household uses of resources compared to recent years, Tanana, 2014.

Large land mammals, used by 86% of households, also had a high percentage of households that reported they did not get enough (48%; Table 2-5; Figure 2-31). More than one-half (53%) of responding households reported they used less large land mammals in 2014 than in recent years (Table 2-18; Figure 2-32). Forty-nine percent of households reported they needed more moose, a commonly used large land mammal (Table 2-22). Similarly, vegetation—a resource category with a high rate of use (94% of households)—had decreased use and reported shortages in 2014 (Table 2-5). Forty-six percent of reporting households used less wild plants in 2014 than in recent years, and 48% reported they did not get enough vegetation in 2014 (Table 2-18; figures 2-31 and 2-32). Salmon, large land mammals, and vegetation were the 3 categories Tanana households used most in 2014 (Table 2-5). The reported shortages and reduced use is consistent with the food security data, discussed above, suggesting that households in Tanana could be experiencing difficulty getting the subsistence foods they need.

However, some Tanana households did get enough wild foods. Forty-eight percent of responding households got enough large land mammals, the same percentage as those that did not get enough (Figure 2-31). Forty-seven percent of responding households got enough vegetation, and 36% of responding households got enough nonsalmon fish.

Harvest Data

This section discusses the results of the 2014 study in comparison to previously collected data. Historical quantitative information on subsistence harvests in Tanana is limited. The Division of Subsistence administered a comprehensive study in Tanana for study year 1987 (Case and Halpin 1990) in order to quantify the use and harvest levels of wild resources in the area. The Division of Subsistence conducted large mammal harvest surveys in Tanana for study years 1996 through 2000 to quantify the harvest and use of moose, caribou, and bears (Andersen et al. 1998, 2000, 2001, 2004). Brown, Walker, and Vanek (2004) summarized the harvest and use of large mammals in several communities along the middle Yukon and

Table 2-19.–Reasons for less household uses of resources compared to recent years, Tanana, 2014.

Resource category	Valid responses[a]	Households reporting reasons for less use	Family/ personal		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful		Weather/ environment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	64	38	5	13.2%	13	34%	1	2.6%	4	11%	4	11%	6	16%	1	2.6%	3	7.9%
Salmon	66	47	1	2.1%	14	30%	0	0.0%	5	11%	4	9%	4	9%	2	4.3%	2	4.3%
Nonsalmon fish	64	29	2	6.9%	6	21%	1	3.4%	3	10%	5	17%	5	17%	2	6.9%	2	6.9%
Large land mammals	64	34	5	14.7%	6	18%	0	0.0%	2	6%	3	9%	2	6%	15	44.1%	0	0.0%
Small land mammals	64	23	3	13.0%	2	9%	1	4.3%	4	17%	2	9%	6	26%	3	13.0%	3	13.0%
Marine mammals	66	3	0	0.0%	1	33%	0	0.0%	0	0%	2	67%	1	33%	0	0.0%	0	0.0%
Birds	61	22	2	9.1%	5	23%	0	0.0%	3	14%	1	5%	6	27%	2	9.1%	6	27.3%
Marine invertebrates	66	2	0	0.0%	1	50%	0	0.0%	0	0%	2	100%	0	0%	0	0.0%	0	0.0%
Vegetation	65	30	4	13.3%	12	40%	1	3.3%	3	10%	0	0%	6	20%	0	0.0%	7	23.3%

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Table 2-19.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Other reasons		Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Equipment/ fuel expense		Used other resources	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	64	38	3	8%	4	10.5%	12	31.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	66	47	3	6%	3	6.4%	27	57.4%	0	0.0%	1	2.1%	3	6.4%	0	0.0%	0	0.0%
Nonsalmon fish	64	29	1	3%	2	6.9%	6	20.7%	0	0.0%	1	3.4%	2	6.9%	1	3.4%	0	0.0%
Large land mammals	64	34	1	3%	3	8.8%	1	2.9%	2	5.9%	3	8.8%	0	0.0%	1	2.9%	0	0.0%
Small land mammals	64	23	1	4%	4	17.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	66	3	1	33%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	61	22	0	0%	2	9.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	66	2	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	65	30	0	0%	3	10.0%	0	0.0%	0	0.0%	1	3.3%	2	6.7%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never using the resource.

Table 2-20.–Reasons for more household uses of resources compared to recent years, Tanana, 2014.

Resource category	Valid responses[a]	Households reporting reasons for more use	Increased availability		Used other resources		Favorable weather		Received more		Needed more		Increased effort		Had more help	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	64	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	1	50.0%	1	50.0%
Salmon	66	4	0	0.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%	2	50.0%	1	25.0%
Nonsalmon fish	64	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	64	6	0	0.0%	0	0.0%	1	16.7%	0	0.0%	1	16.7%	0	0.0%	0	0.0%
Small land mammals	64	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	66	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	61	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	75.0%
Marine invertebrates	66	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	1	50.0%
Vegetation	65	5	0	0.0%	3	60.0%	0	0.0%	1	20.0%	0	0.0%	1	20.0%	1	20.0%

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Table 2-20.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for more use	Other		Regulations		Traveled farther		More success		Needed less		Store-bought expense		Got/ fixed equipment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	64	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Salmon	66	4	1	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	25.0%
Nonsalmon fish	64	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	64	6	0	0.0%	1	16.7%	0	0.0%	0	0.0%	2	33.3%	0	0.0%	0	0.0%
Small land mammals	64	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	66	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	61	4	0	0.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	66	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	65	5	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, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never use.

Table 2-21.–Reported impact to households reporting that they did not get enough of a type of resource, Tanana, 2014.

		Households not getting enough _____ .				Impact to those not getting enough _____ .									
	Sample	Valid responses[a]		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
All resources	66	64	97.0%	37	57.8%	1	2.7%	0	0.0%	9	24.3%	18	48.6%	9	24.3%
Salmon	66	61	92.4%	43	70.5%	0	0.0%	1	2.3%	15	34.9%	15	34.9%	12	27.9%
Nonsalmon fish	66	49	74.2%	25	51.0%	0	0.0%	3	12.0%	11	44.0%	9	36.0%	2	8.0%
Large land mammals	66	64	97.0%	32	50.0%	2	6.3%	0	0.0%	11	34.4%	11	34.4%	8	25.0%
Small land mammals	66	30	45.5%	19	63.3%	0	0.0%	3	15.8%	9	47.4%	4	21.1%	3	15.8%
Marine mammals	66	12	18.2%	5	41.7%	0	0.0%	1	20.0%	3	60.0%	0	0.0%	1	20.0%
Birds	66	42	63.6%	15	35.7%	0	0.0%	1	6.7%	9	60.0%	1	6.7%	4	26.7%
Marine invertebrates	66	6	9.1%	2	33.3%	0	0.0%	1	50.0%	0	0.0%	0	0.0%	1	50.0%
Vegetation	66	63	95.5%	32	50.8%	3	9.4%	2	6.3%	9	28.1%	12	37.5%	6	18.8%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Includes households failing to respond to the question and those households that never used the resource.

Table 2-22.–Resources of which households reported needing more, Tanana, 2014.

Resource	Households needing	Percentage of households
All resources	3	4.5%
Fish	12	18.2%
Salmon	8	12.1%
Chum salmon	3	4.5%
Fall chum salmon	4	6.1%
Coho salmon	10	15.2%
Chinook salmon	40	60.6%
Nonsalmon fish	1	1.5%
Pacific halibut	3	4.5%
Arctic grayling	3	4.5%
Northern pike	1	1.5%
Sheefish	3	4.5%
Trout	1	1.5%
Whitefishes	6	9.1%
Broad whitefish	1	1.5%
Humpback whitefish	3	4.5%
Round whitefish	1	1.5%
Land mammals	1	1.5%
Large land mammals	2	3.0%
Black bear	1	1.5%
Caribou	3	4.5%
Moose	32	48.5%
Small land mammals	2	3.0%
Beaver	9	13.6%
Snowshoe hare	2	3.0%
Lynx	1	1.5%
Marten	8	12.1%
Porcupine	2	3.0%
Gray wolf	1	1.5%
Wolverine	1	1.5%
Marine mammals	2	3.0%
Seal	1	1.5%
Unknown seal oil	2	3.0%
Bowhead whale	3	4.5%
Birds and eggs	2	3.0%
Ducks	5	7.6%
Mallard	1	1.5%
Geese	10	15.2%
Grouse	3	4.5%
Spruce grouse	1	1.5%
Ruffed grouse	1	1.5%
Ptarmigan	3	4.5%
Marine invertebrates	1	1.5%
King crab	1	1.5%
Berries	15	22.7%
Blueberry	20	30.3%
Lowbush cranberry	12	18.2%
Highbush cranberry	2	3.0%
Cloudberry	2	3.0%
Raspberry	6	9.1%
Salmonberry	1	1.5%
Wild rhubarb	1	1.5%
Wood	2	3.0%
Unknown	8	12.1%

Source ADF&G Division of Subsistence household surveys, 2015.

Koyukuk rivers, including Tanana for the 2002–2003 study year. Additionally, in 2008 Wolfe and Scott (2010) conducted a quantitative study on the use and harvest of salmon and nonsalmon species in Tanana and 4 other Yukon River communities. Although Wolfe and Scott (2010) focuses primarily on changes and variability within the Yukon River salmon fishery, the report also describes use and harvest data for other wild resources, including land mammals, marine mammals, birds, and vegetation.[9] Finally, the ADF&G Division of Commercial Fisheries has collected comparable subsistence salmon harvest data through a postseason survey in Tanana since 1988.

These previous studies differ in methodology, data collection timing, and the length of the study period. Additionally, fluctuations in animal populations and social factors can contribute to reported changes in the harvests and uses of wild resources. Overall however, comparisons of the existing data show that the harvests and uses of wild resources, particularly salmon, by residents of Tanana have dropped substantially in the last 3 decades.

Case and Halpin's (1990) *Contemporary Wild Resource Use Patterns in Tanana, Alaska, 1987* contains thorough documentation of the subsistence profile of Tanana similar to that found in this report. The 1988 study estimated a considerably greater total community harvest of wild foods than either Wolfe and Scott (2010) or this study. During the 1987 study year, Tanana households harvested an estimated 745,940 edible pounds with a per capita harvest of 2,157 lb. In 2014, Tanana residents harvested a total of 197,715 lb (969 lb per capita; Table 2-5), more than a 50% decline since 1988. Figure 2-33 shows the total per capita harvests estimated by the 2 Division of Subsistence studies. Table 2-23 compares the per capita harvests in each resource category documented in the 1987 and 2014 Subsistence Division comprehensive reports, and Figure 2-34 visually represents those comparisons.

Salmon

Seen in blue, the 1987 per capita harvest of 1,600 edible pounds of salmon is more than double the 2014 per capita harvest of 692 edible pounds (Table 2-23; Figure 2-34). Despite huge declines in the actual amount of salmon being harvested by Tanana residents, the proportion of the total community harvest coming from salmon is consistent between the 2 study years. In 1987, salmon made up 74% of the total harvest (553,266 of 745,940 lb; Table 2-24). In 2014, salmon accounted for 71% of the total harvest (141,140 of 197,715 lb). In the 26 years between the 2 studies, many factors have affected change in Tanana residents' salmon harvests. A commercial fishery for chum salmon roe no longer exists; the number of dogs in Tanana has declined, resulting in fewer fish needed for dog food; and the implementation of conservation measures, especially during the summer season, has reduced fishing opportunity for residents. Additionally, the move away from summer fishing at camps has dramatically altered the way Tanana residents catch their salmon. The fact that the proportion of salmon has changed little despite the significant changes to the fishery over time could be explained by a substantial decline in the harvest of other resource categories including nonsalmon fish, land mammals, and birds and eggs, all of which have per capita harvests in 2014 that are about one-half of what they were in 1988. While declines in harvest have occurred in all of the leading resource categories, salmon remains the largest contributor to per capita harvest.

Figure 2-35 shows the harvest of each salmon species between 1990 and 2013. Data for this figure were gathered by the ADF&G Division of Commercial Fisheries during their annual postseason salmon surveys. Each fall, the Division of Commercial Fisheries asks a stratified sample of households to estimate their salmon harvests from the previous summer. The 2014 estimates, represented by an orange diamond on the figure, come from the results of this Division of Subsistence study. The methodological differences between the 2 surveys are important to consider when comparing the study year to prior years.

9. Results from Wolfe and Scott (2010) are not included in the tables and figures in this section because of methodological differences and because the intent of the research was to characterize the Yukon River salmon fishery in 5 communities, not to equally document harvest and use patterns of all subsistence resources. Additionally, salmon fed to dogs were removed from Tanana's estimated community harvest. This makes comparisons between total harvest and the harvest of salmon difficult between Wolfe and Scott (2010) and other sources, including this report. When appropriate, results from Wolfe and Scott (2010) are described in text.

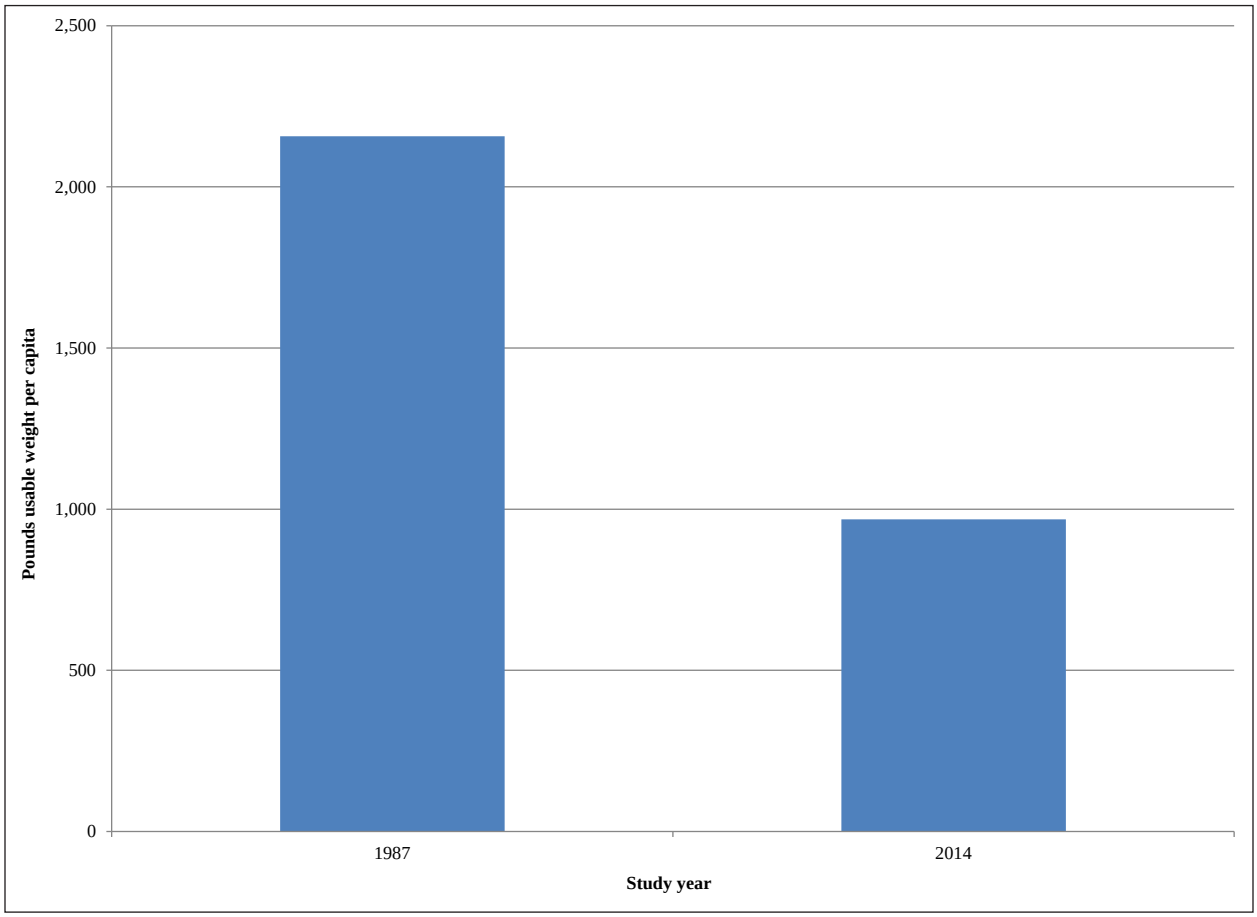


Figure 2-33.–Comparison of estimated per capita harvests, Tanana, 1987 and 2014.

Table 2-23.–Comparison of per capita harvests by category in usable pounds,Tanana, 1987 and 2014.

Resource category	1987	2014
Salmon	1600.0	691.7
Nonsalmon fish	358.4	168.1
Land mammals	179.2	95.0
Marine mammals	0.0	0.0
Birds and eggs	16.5	7.6
Marine invertebrates	0.0	0.0
Vegetation	3.2	6.4
All resources	**2157.2**	**968.8**

Sources Community Subsistence Information System (CSIS) for 1987 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data.

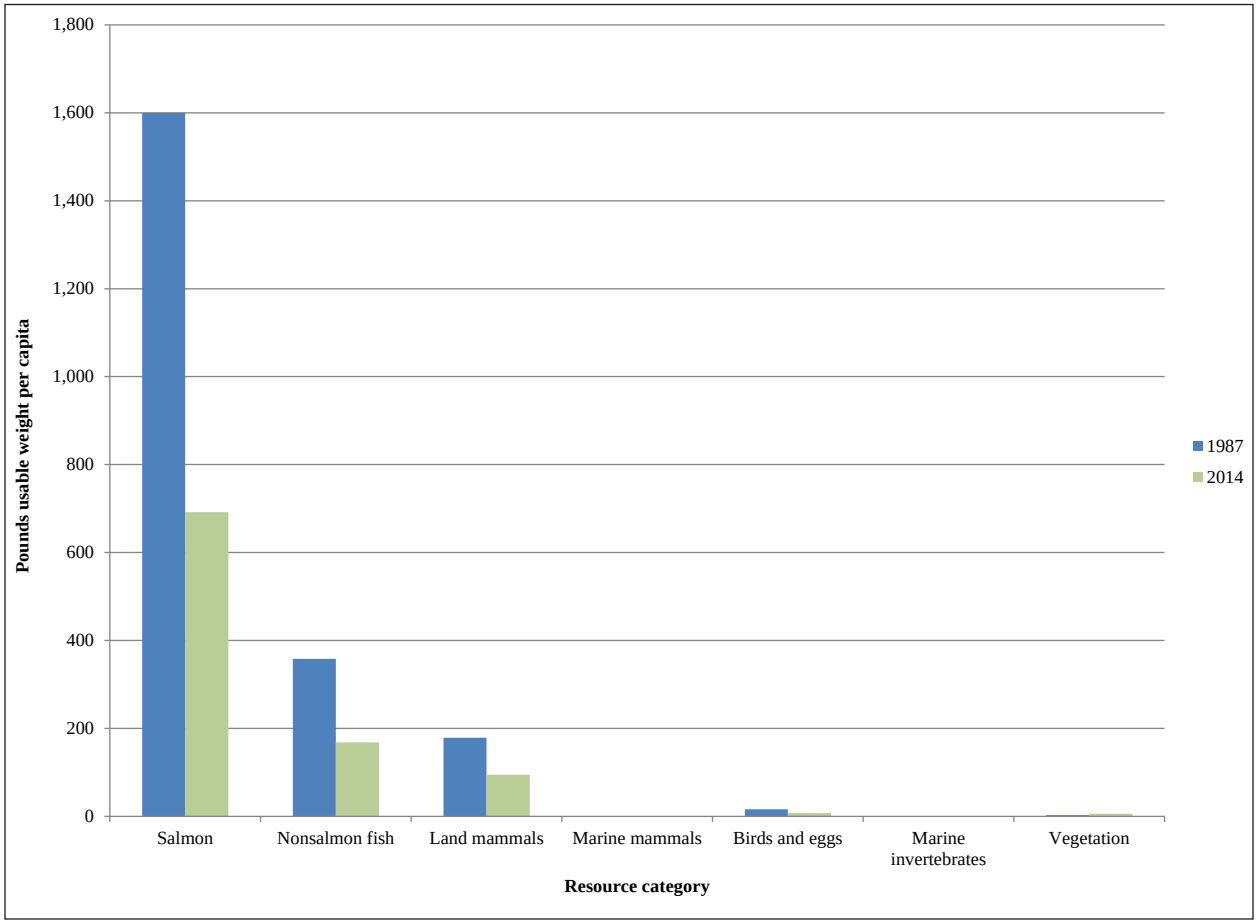


Figure 2-34.–Comparison of per capita harvests by category, Tanana, 1987 and 2014.

Table 2-24.–Comparison of harvest compositions by category, by weight in usable pounds, Tanana, 1987 and 2014.

Resource category	1987	2014
Salmon	74.2%	71.4%
Nonsalmon fish	16.6%	17.4%
Land mammals	8.3%	9.8%
Marine mammals	0.0%	0.0%
Birds and eggs	0.8%	0.8%
Marine invertebrates	0.0%	0.0%
Vegetation	0.1%	0.7%

Sources Community Subsistence Information System (CSIS) for 1987 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data.

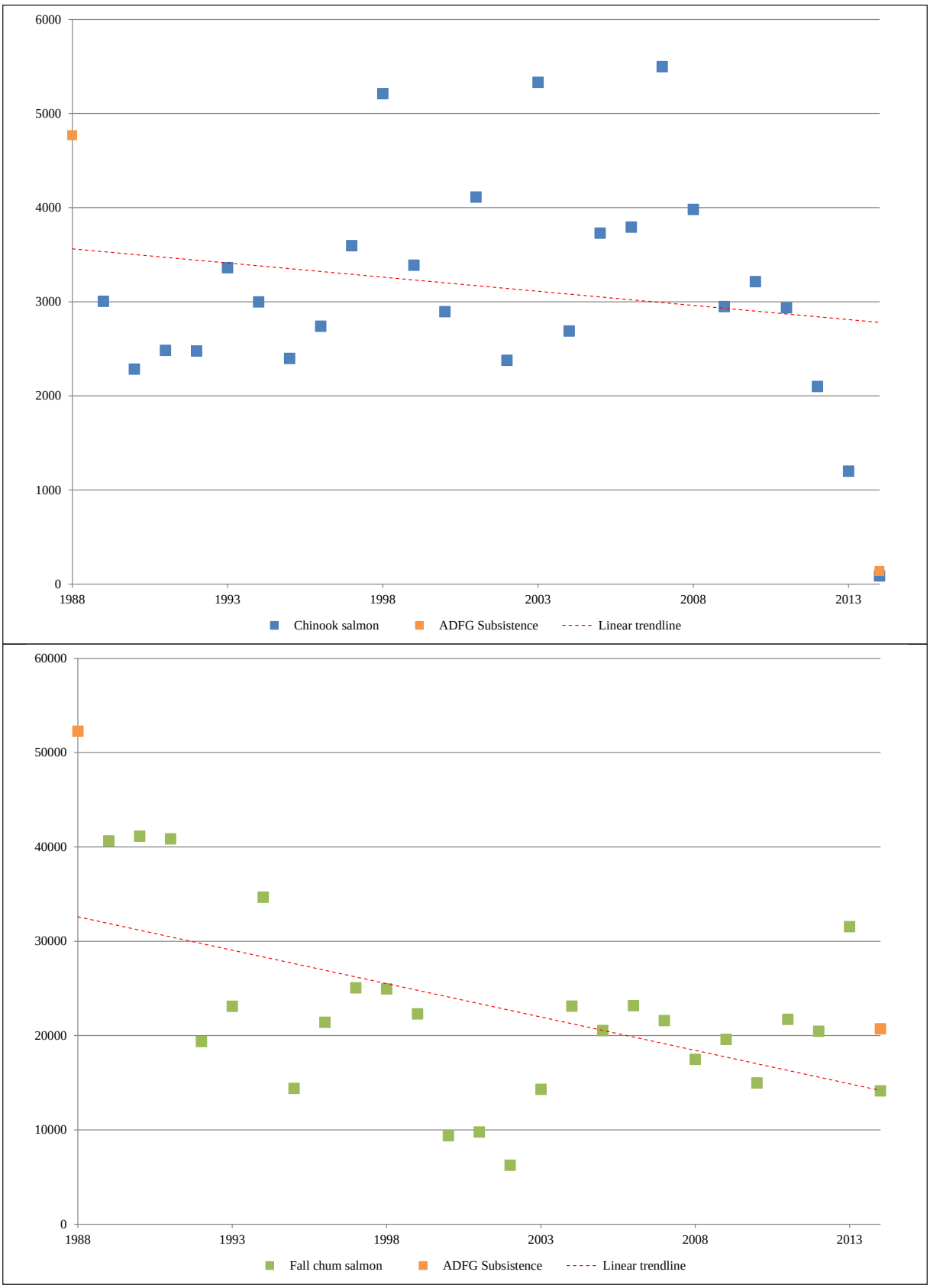
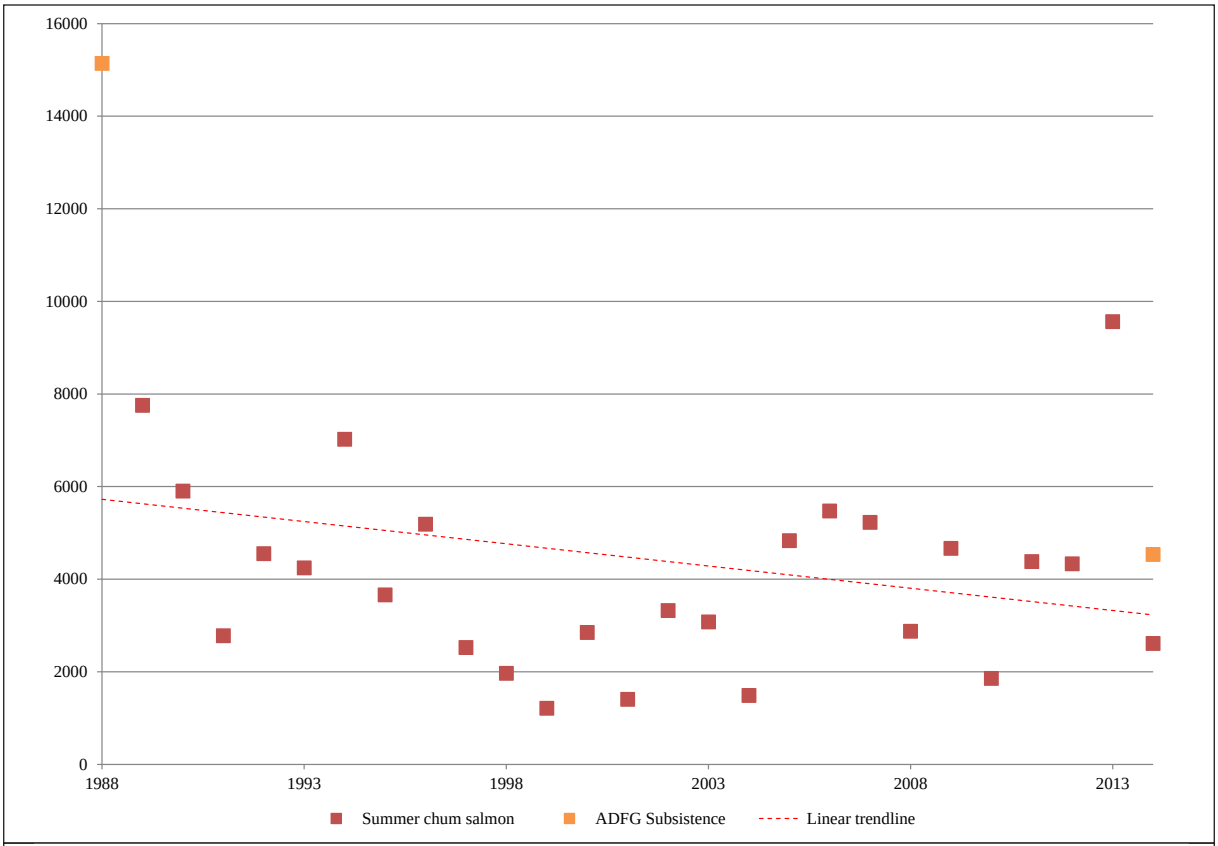


Figure 2-35.–Estimated numbers of Chinook, fall chum, summer chum, and coho salmon harvested, Tanana, 1988–2014 (continued on following page).



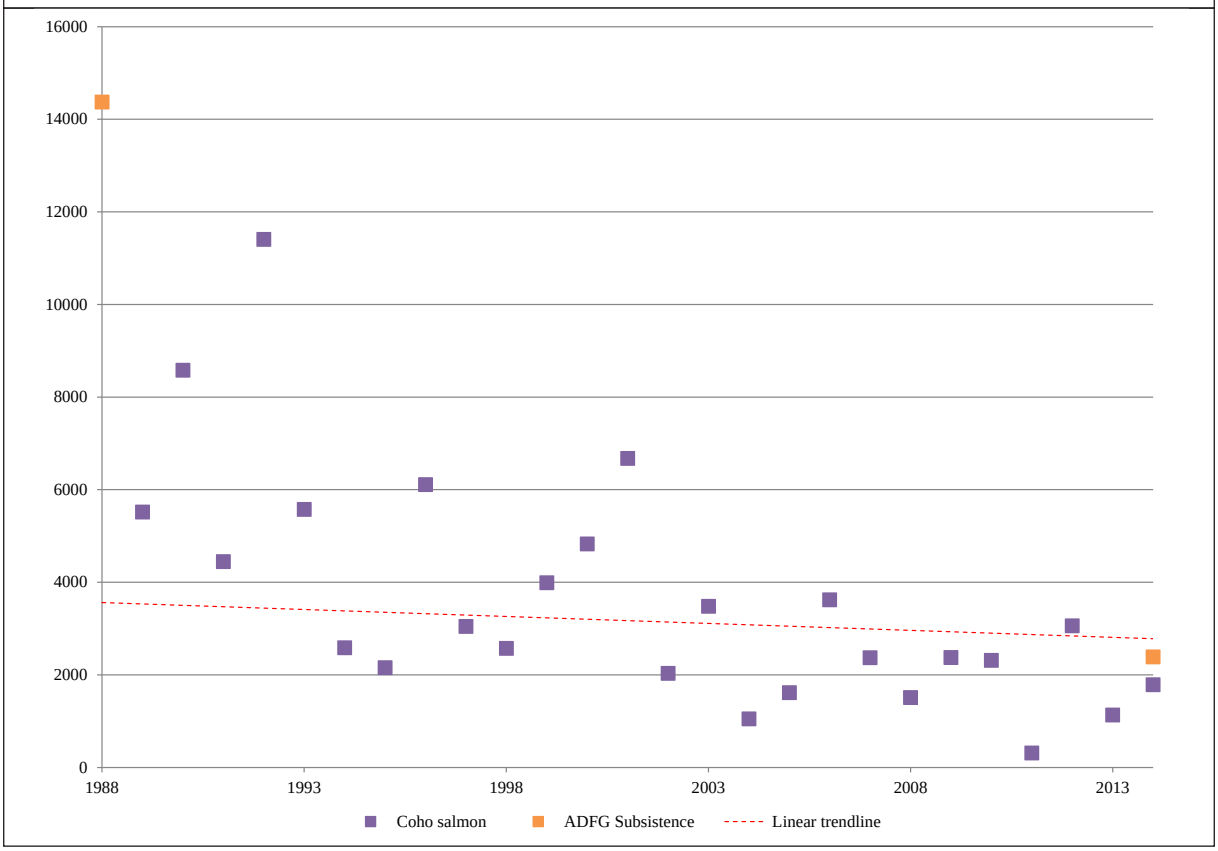


Figure 2-35.–Continued.

In 2007, Chinook salmon harvests by Tanana residents were higher than any other year between 1990 and 2014 (Figure 2-35). In total the Division of Commercial Fisheries estimated that 5,498 Chinook were harvested that year. In 2009, the Yukon River Chinook salmon fishery was declared a disaster by the U.S. Department of Commerce (U.S. Department of Commerce 2010). In the following years, Yukon River fishermen experienced more severe summer season fishing restrictions than they ever had before. Since then, harvests have steadily declined. In 2014, continued pulse closures protected Chinook salmon in all fishing districts, and fishermen had limited opportunity to catch or keep Chinook salmon.

Likely as a result of increased fishing restrictions and decreased resource availability, Tanana residents are no longer harvesting Chinook salmon to the same degree that they once did. In the 1990s and 2000s, Chinook harvests averaged more than 3,000 fish each year, but since 2010, harvest has rapidly been reduced. Harvest declined from 3,215 fish in 2010 to 138 in 2014, the lowest harvest in the last 22 years. Fishermen no longer have the opportunity to fish for Chinook at the same time or with the same gear that they once did. Discussed above, ethnographic respondents made it clear that their preference for Chinook salmon as an "eating fish" has not changed. If allowed to fish for Chinook salmon, residents would attempt to harvest.

Unlike Chinook salmon harvests that have plummeted in recent years, the harvests of other types of salmon have not rapidly declined. Instead, the harvests of summer chum, fall chum, and coho salmon have experienced gradual decline since peak harvests in the 1990s. The 2014 harvests of those types of salmon are consistent with the most recent 5-year averages.

Between 2009 and 2013, Tanana residents harvested an average of 4,960 summer chum salmon per year. The 2014 estimated harvest of 4,532 summer chum salmon diverges little from the 5-year harvest average and suggests that the harvest of summer chum has not been impacted by the changes in the Chinook salmon fishery in recent years. The harvest of summer chum salmon has fluctuated greatly since 1990, with harvests ranging from 1,214 fish (1999) to 9,565 fish (2013). Although very little ethnographic information exists to contextualize these harvests, harvest surveys do document that a measurable amount is fed to dogs. In 1987, Case and Halpin (1990:65) noted that 82% of the summer chum salmon was fed to local dogs. The 2014 data estimates that the percentage of summer chum salmon fed to dogs was much lower (36%; tables 2-5 and 2-8). The quality of summer chum salmon caught near Tanana is considered poor because of their close proximity to spawning grounds on the Tanana River. During a community review of this data, residents emphatically stated that summer chum salmon is not consumed by residents and is less frequently fed to dogs than fall chum salmon because of the poor quality. However, not all of the summer chum salmon harvest was attributed to dog food. Residents consumed approximately 72 lb per capita of summer chum salmon in 2014 (Table 2-7).

In their ethnographic testimony, fishermen described shifting their efforts away from Chinook salmon and onto other species in an effort to meet their needs. Fall chum salmon make up the bulk of the salmon fed to dogs, but are also considered the next best type of salmon for human consumption. Discussed above, respondents described how fall chum salmon are less fatty, poorer quality, and often smaller than Chinook salmon. Despite being plentiful, not all residents feel that fall chum salmon are an equal replacement for Chinook salmon. In 2014, when Chinook salmon harvests were the lowest on record, fall chum salmon harvests did not increase. Over time however, the change in salmon harvest composition is more clear. In 1987, fall chum salmon made up 60% of the salmon harvest, while Chinook salmon made up 6%. In 2014, the proportion of fall chum salmon rose to 74%, while the Chinook salmon harvest dropped to only 1% of the total salmon harvest. Although the move towards fall chum salmon and away from Chinook salmon may not be reflected in a higher fall chum salmon harvest, ethnographic respondents felt that the move away from Chinook salmon has an impact on many aspects of their lives.

With the exception of summer chum salmon, discussed above, the use of fish for dogs in 1987 is similar to that in this study. Case and Halpin (1990:128) estimated that Tanana residents fed 64% of all salmon harvested to dogs. In 2014, Tanana residents fed roughly 66% of their salmon to dogs (93,708 lb of 141,140 lb total; tables 2-5 and 2-8). In both study years, the majority of fall chum salmon harvested by Tanana residents was fed to dogs (79% in 1987 and 78% in 2014). The continued use of fish for dogs is notable, not only because it constitutes a considerable portion of the total salmon harvest, but also because it has

remained consistent when the harvest of all wild foods has dropped dramatically since Case and Halpin documented the harvest and use of wild foods by Tanana residents.

Despite considerable changes to the salmon fishery since 1987, salmon remain significant to the people of Tanana. Overall subsistence harvests are lower, but the ethnographic and harvest information documented in this study confirm the continuation of a cultural practice.

Nonsalmon Fish

In addition to the comprehensive subsistence data collected in Case and Halpin (1990), the Division of Subsistence collected traditional ecological knowledge as well as harvest and use data of nonsalmon fish in 5 middle Yukon River communities, including Tanana (Brown et al. 2010). Nonsalmon data from these studies are compared with 2014 results in this section. Figure 2-34 shows a drop in per capita harvests from 358 lb of nonsalmon fish per capita in 1987 to 168 lb per capita in 2014. In 1987, the majority of households fished for nonsalmon species (71%). In 2014, only 41% of households participated in the nonsalmon fishery (Table 2-5). Fewer households also reported using nonsalmon species, decreasing from 76% in 1987 to 68% in 2014.

Although a general decrease in the use and harvest of nonsalmon fish has occurred since 1987, Tanana residents may be responding to changes in the Yukon River salmon fishery by shifting fishing effort to nonsalmon fish. Case and Halpin (1990:66) report that in 1987 as many households attempted to harvest nonsalmon fish species as attempted to harvest salmon species (71%). In 2006 only 18% of households participated in the nonsalmon fishery, the lowest percentage of the 3 studies (Brown et al. 2010:31). In 2014, more households (41%) attempted to harvest nonsalmon fish than those that attempted to harvest salmon (32%; Table 2-5). The percentage of households that fish in Tanana has decreased since 1987; however, more households fishing for nonsalmon species than salmon species may indicate that fishing households are taking advantage of more abundant and less regulated fishing options.

Popular nonsalmon fish species in 2014 are consistent with those most used and harvested in prior study years. Whitefish, sheefish, and burbot were widely used and shared by Tanana households. Residents continue to fish for nonsalmon species throughout the year. Some species, like Dolly Varden and northern pike, are often caught incidentally when targeting salmon or whitefish, respectively.

Large Land Mammals

Case and Halpin (1990) collected data on large land mammals for study year 1987. Additionally, in 1997 the ADF&G Division of Subsistence conducted a pilot project to test the feasibility of collecting big game harvest data in 5 communities on the Yukon and Koyukuk rivers by employing local research assistants. Although data are available for the 1996 study year, no report was published. As a result of the pilot project, Andersen et al. (1998, 2000, 2001) gathered big game harvest data from 1997 to 2000 and expanded the number of study communities from 5 to 10. Brown et al. (2004) continued the big game survey work in the same study communities, resulting in harvest and use data for moose, caribou, black bear, and brown bear by Tanana residents in 4 study years. Tanana was included in every year except the 2001–2002 study year. Harvest data from Case and Halpin, Andersen, Brown and this study are presented in Table 2-26. Harvest data collected by Wolfe and Scott (2010) is described in text.

Moose is a key resource for most Interior Alaska communities. Existing data show that this is also true for Tanana residents between 1987 and 2014. Case and Halpin (1990:75) estimated that all households used moose. Hunter success rates were quite high: 68% of households attempted harvest and more than one-half of those successfully harvested them (35%). Success rates declined by 2014: 64% of households attempted to harvest moose, but only 27% were successful (Table 2-5). Low moose density could explain why residents continue to experience low success (Case and Halpin 1990:75). The ethnographic documentation of the hunting, processing, and preservation of moose described in Case and Halpin (1990) is consistent with the descriptions given for this report. According to key respondents, the techniques for harvesting and using moose have not changed in the last 26 years. Hunters continue to search for moose in groups made up of close friends or family members. A harvested moose is often divided between members of the hunting

Table 2-25.–Comparison of per capita caribou and moose harvests by number of animals, Tanana, 1987, 1996–1999, 2002, and 2014.

Resource category	1987	1996	1997	1998	1999	2002	2014
Caribou	11.5	1.4	0.0	0.0	6.5	2.2	2.6
Moose	115.8	62.0	77.1	110.5	77.6	123.4	87.6

Sources Community Subsistence Information System (CSIS) for 1987,1996–1999, and 2002 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data.

party and then shared widely throughout the community. The meat, head, organs, and even the marrow from the bones are consumed by residents in Tanana. After 1987, residents continued to report high levels of use (>89% of households); success rates, however, remained low, ranging from 32% of households successfully harvesting moose in 1999–2000 to 53% in 2008 (Andersen et al. 1998, 2000, 2001; Wolfe and Scott 2010). In 2014, the estimated use remained high (86% of households), while success rates remained low (27%; Table 2-5). Per capita, Tanana residents harvested the most moose in 2002 (123 lb per capita; Table 2-26).

The harvest and use of caribou varied between 1987 and 2014 more than for any other large land mammal. In 1987, when more households reported using and harvesting caribou (30% and 12% respectively)[10] than in any other study year, Case and Halpin (1990) described caribou as an important resource that had been harvested in the Tanana area for generations (Case and Halpin 1990:82). The availability of caribou depends on the season and the year. Case and Halpin (1990:83) reported that the proximity of caribou herds to Tanana had changed considerably since the 1930s. In 1987, residents reported that a resident herd of caribou, known locally as the Ray Mountain Herd, wintered in the higher elevations and migrated towards the Rapids in the summer and fall. In this study, ethnographic respondents recalled a history of occasional caribou harvest, but noted that caribou are much less common now than they were in the past (TAL030820157). Despite reports of decreased abundance, respondents who hunted caribou continued to travel to the Ray Mountains in the winter to search for them (TAL030820153). In 1998–1999, a year when caribou was used by 24% of households, the second highest on record, no households reported actually harvesting the resource (Andersen et al. 2000). This indicates that the community likely received meat from friends or family outside of the community and that it is shared widely within Tanana. Of the large land mammals utilized by Tanana residents, caribou is the only migratory species, making harvest and use dependent on local availability.

Case and Halpin (1990) also described the use of black bear by Tanana residents. The meat of the bear was eaten, but the fat was occasionally rendered and used for cooking. Bear grease was also used to waterproof items made from leather (Case and Halpin 1990:88). Ethnographic testimony collected during the 2014 study year did not capture the same variety of uses as those described in 1987. Instead, respondents explained that black bears were only occasionally eaten, but are fed to dogs if their quality is poor or garbage is found inside their stomachs (TAL030520159). Black bear is the only large land mammal that experienced a steady increase in use and harvest since 1997. In the 1997–1998 study year, Andersen (1998) reported that 9% of households used black bear with only 2% of households harvesting it. In 2002–2003, the percentage of households using black bear had doubled (18%), and the percentage harvesting them had risen to 9% (Andersen et al. 2004). In 2014, the use and harvest amounts dropped slightly to 15% and 6% respectively, but continued a slow trend of increased use and harvest (Table 2-5).

With the exception of the 2% of households reporting use and harvest of brown bears in the 1998–1999 study year, brown bears were not part of Tanana residents' subsistence profile (Andersen et al. 2000).

Small Land Mammals

In 2014, 30% of Tanana households participated in the hunting and trapping of small land mammals (Table 2-5). Compared to the 1987 Division of Subsistence study, little change has occurred (27% of households trapped in 1987; Case and Halpin 1990:91). Although a similar portion of residents trapped, the volume of harvest has decreased. Marten, a furbearer that was once a source of income for trappers, was no longer a

10. ADF&G CSIS.

heavily harvested resource. In 1987, 1,175 martens were harvested. In 2014, that number dropped to 164 martens (Table 2-5). Tanana trappers harvest less of other furbearers as well. In 1987, Tanana trappers harvested 379 beavers, while in 2014, only 41 beavers were harvested (Table 2-5; Case and Halpin 1990). Ethnographic respondents did not discuss the drop in trapping activity over the last 26 years, though some respondents who were active trappers in 2014 commented that it is more difficult to sell furs without a local buyer. In the past, a fur buyer from the downstream community of Ruby would travel to Tanana during spring carnivals and purchase furs from local trappers (TAL030720156). Now, trappers must send their furs away to be sealed and sold.

Birds and Eggs

Migratory species, including a variety of ducks and geese, were used by residents in both study years. In 1987, more than twice as many ducks and geese were harvested in the spring than in the fall. Case and Halpin (1990:103) report that fall bird hunting was less preferable because residents were busy salmon fishing and preparing for moose hunting in September. In 2014, nearly all migratory birds were harvested in the spring (96%). A preference for spring hunting was not captured in ethnographic data, but one respondent noted that spring bird hunting is becoming more dangerous because river ice is not as thick as it used to be in spring months (TAL030620151).

Although Tanana residents also used nonmigratory birds, such as ptarmigans and grouses, in both study years, comparing their harvest and use levels is more challenging. In their report, Case and Halpin (1990) included nonmigratory birds in the small game resource category and factored into the use and harvest estimates of that resource category rather than the birds and eggs category, as is done here. As a result, comparing individual species can more accurately describe the changes in participation that have occurred between 1987 and 2014. In 1987, for example, more households (77%) reported attempting to harvest grouse than any other resource (Case and Halpin 1990:39). In 2014, that level had dropped to 32%, though grouses were still among the most sought-after species (behind only moose and sheefish; Table 2-5).

Vegetation

Vegetation contributed very little to the total community harvest or the per capita harvests as measured in usable pounds in either the 1987 or 2014 study year (3 lb and 6 lb per capita, respectively); however, plants and berries were used by more than one-half of all households in 1987 (54%) and nearly all households in 2014 (94%; Table 2-5; Case and Halpin 1990). Both study years were considered to be poor blueberry years, but the popular berry was commonly shared between households. Fifteen percent of households received blueberries in 1987, while 30% received them in 2014. In addition to describing berry picking with relatives, ethnographic respondents in 2014 noted use of medicinal plants. In 1987, ethnographic respondents reported a practice of gathering bark from live trees to weave birch bark baskets (Case and Halpin 1990:108). This practice was not mentioned in 2014, though that does not necessarily mean that it no longer occurs. Respondents in both comprehensive studies described gathering driftwood from the river, often logs, for heating their homes or building fish wheels.

All Resources

Changes in the use and harvest of wild resources in Tanana are evident when comparing the 1987 and 2014 comprehensive subsistence reports but methodological differences between this study and Case and Halpin (1990), including the prior use of a stratified sample as opposed to a census sample could intensify and explain the wide spread between Tanana's harvest levels in each study years. In general however, the overall use and harvest of wild resources have declined. Ethnographic explanations for shifts in use and harvest patterns collected in this study vary. Climactic changes, noted in the discussion on migratory bird hunting, responses to changes in species abundance, and fishing restrictions have likely shifted fishing effort from favored salmon species to other salmon and nonsalmon species. Additionally, changes in personal preference have likely impacted the changes seen between the 2 study years. More frequent subsistence studies in Tanana could provide clearer insight into the explanations for change in the use and harvest of wild resources.

Current and Historical Harvest Areas

In an ADF&G report, Case and Halpin (1990) documented Tanana people's historical harvest areas for 5 resource categories and made individual maps for 2 species. Respondents in the study were asked to map their fish and wildlife search and harvest areas for the 1987 study year. Thirty household respondents participated in the mapping interview. Each mapping respondent depicted their use areas for 2 time periods: a 20-year time period (1968–1988) and a shorter, 5-year period (1983–1988). Mapping both recent and historical harvest areas ensured a more comprehensive depiction of the geographic areas used by Tanana residents. The resulting maps are aggregations of the 2 time sets and so do not differentiate between the short-term or long-term harvest areas. Comparing these data to the current study, it becomes clear that the areas reported for each resource category in this study—salmon, nonsalmon fish, moose, bears and small land mammals, caribou, birds, and vegetation—have either decreased or remained the same since Case and Halpin's study. This section will compare the available mapped harvest areas by resource categories.

Figure 2-36 shows the salmon fishing areas between 1968 and 1988. In 1988, Tanana residents identified salmon fishing areas along the Yukon River extending from a fish camp located upstream from Rampart to a camp slightly upstream from Ninemile Point. Some fishing locations were identified along the Tanana River as well, extending from the confluence with the Yukon River to roughly 5 miles upstream from the Cosna River. The extent of the salmon harvest area shown in the earlier study is greater than that found in this report (Figure 2-11). The salmon fishing map published in Case and Halpin (1990) shows a considerable number of fishing locations downstream from Tanana on the Yukon River that do not appear on the salmon map from 2014. The number of fishing locations on the Tanana River is also greater. Although there remains a small cluster of harvest locations in the area known as the Rapids on the 2014 map, survey participants did not identify using much of the Yukon River between the Rapids and the community of Tanana in 2014. In 1988, Tanana residents identified the majority of their fishing locations along the Yukon River between Tanana and the Rapids, as evidenced by the number of fish camps, represented by dark triangles. The apparent reduction of use areas between the late 1960s and today is consistent with the ethnographic testimony collected in this study that states that, for a variety of reasons, residents are no longer traveling to historical family fish camps like they once did.

Similar to their salmon fishing patterns, Tanana residents identified fewer nonsalmon fishing locations in 2014 than they did in 1988. Figure 2-37 shows the historical map from Case and Halpin (1990), and Figure 2-14 shows the nonsalmon fishing map published in this report. Nonsalmon fishing extended further downstream on the Yukon River historically than it did in 2014. Additionally, nonsalmon fishing was identified off the mainstem Yukon River on the Tozitna, Nowitna, and Tanana rivers in 1988. In 2014, the nonsalmon fishing locations were very similar to the salmon fishing locations and did not venture off the Yukon River. In 1987 the fishing areas for salmon and nonsalmon species were also alike. However, residents did report traveling to the Nowitna River to catch nonsalmon species.

Similar to other resources, the search and harvest areas for moose have changed since 1987. Figure 2-38 shows historical hunting areas between 1968 and 1988. Figure 2-16 of this report shows the search areas for large land mammals in 2014. In the earlier study, Tanana residents hunted for moose along the Yukon River between Ruby and Rampart and along the Nowitna, Tanana, and Tozitna rivers and their tributaries. Although Tanana residents continue to hunt in some of the same areas they did in 1987, the scope of use areas has diminished. In 2014, residents reported traveling downstream to Ruby and hunting on the Koyukuk River. Tanana residents continued to use the Nowitna River to search for moose, but they did not travel as far up the Tozitna River in 2014 as they did historically. Although residents reported hunting near Ruby, the Ruby-Poorman Road was not identified as a search area in 2014.

Figure 2-39 documents the historical black and brown bear hunting areas. In 2014, respondents did not hunt brown bear so were only asked to map the locations they used when hunting for black bear. The historical search areas for black bear are extensive. Residents traveled to the headwaters of the Nowitna River to search for the large animal. They also traveled along the Tanana River to Manley Hot Springs and between Ruby and Rampart on the Yukon River. In 2014, the search area for black bear was much more limited

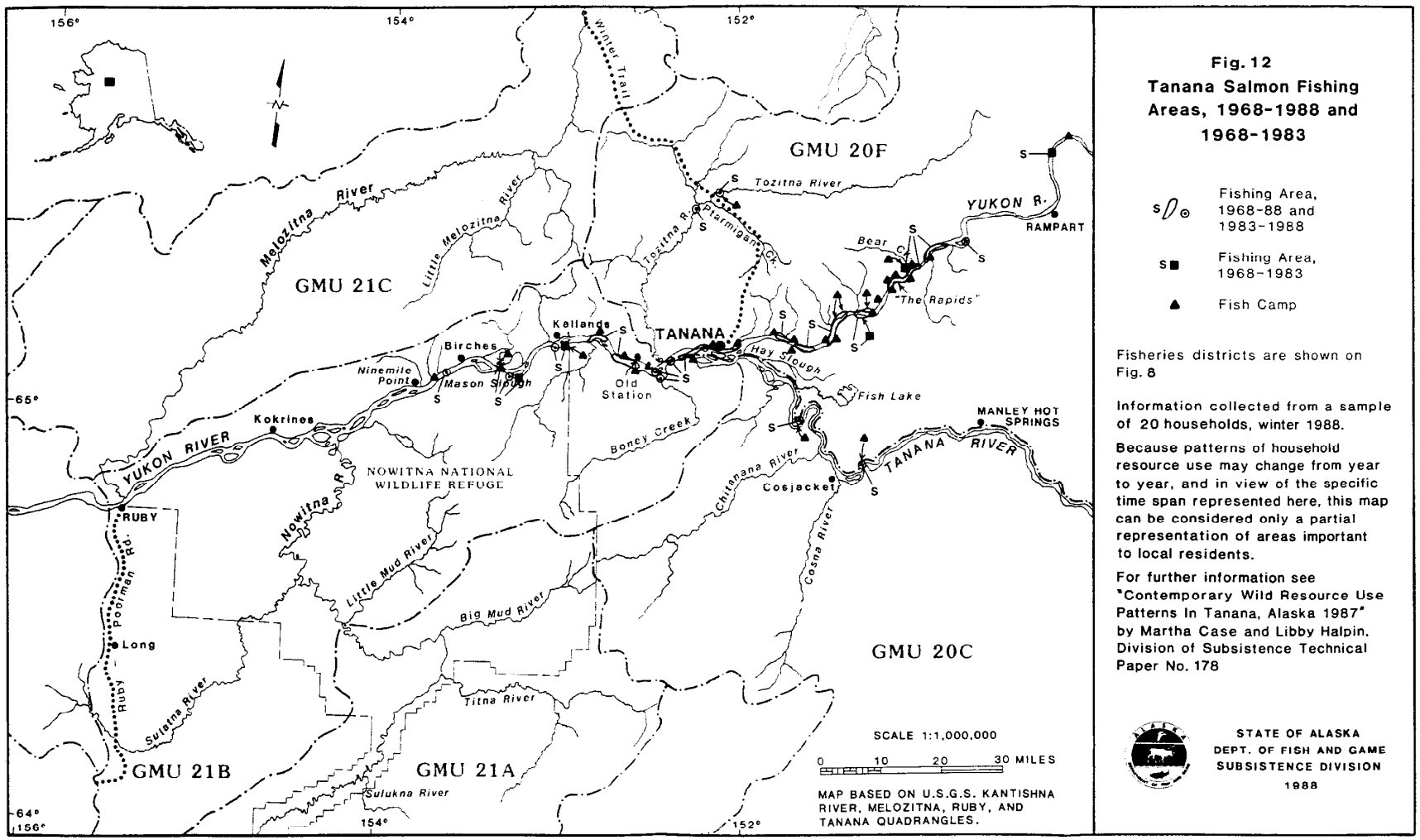


Figure 2-36.–Tanana salmon fishing areas, 1968–1988 and 1968–1983 (Case and Halpin 1990).

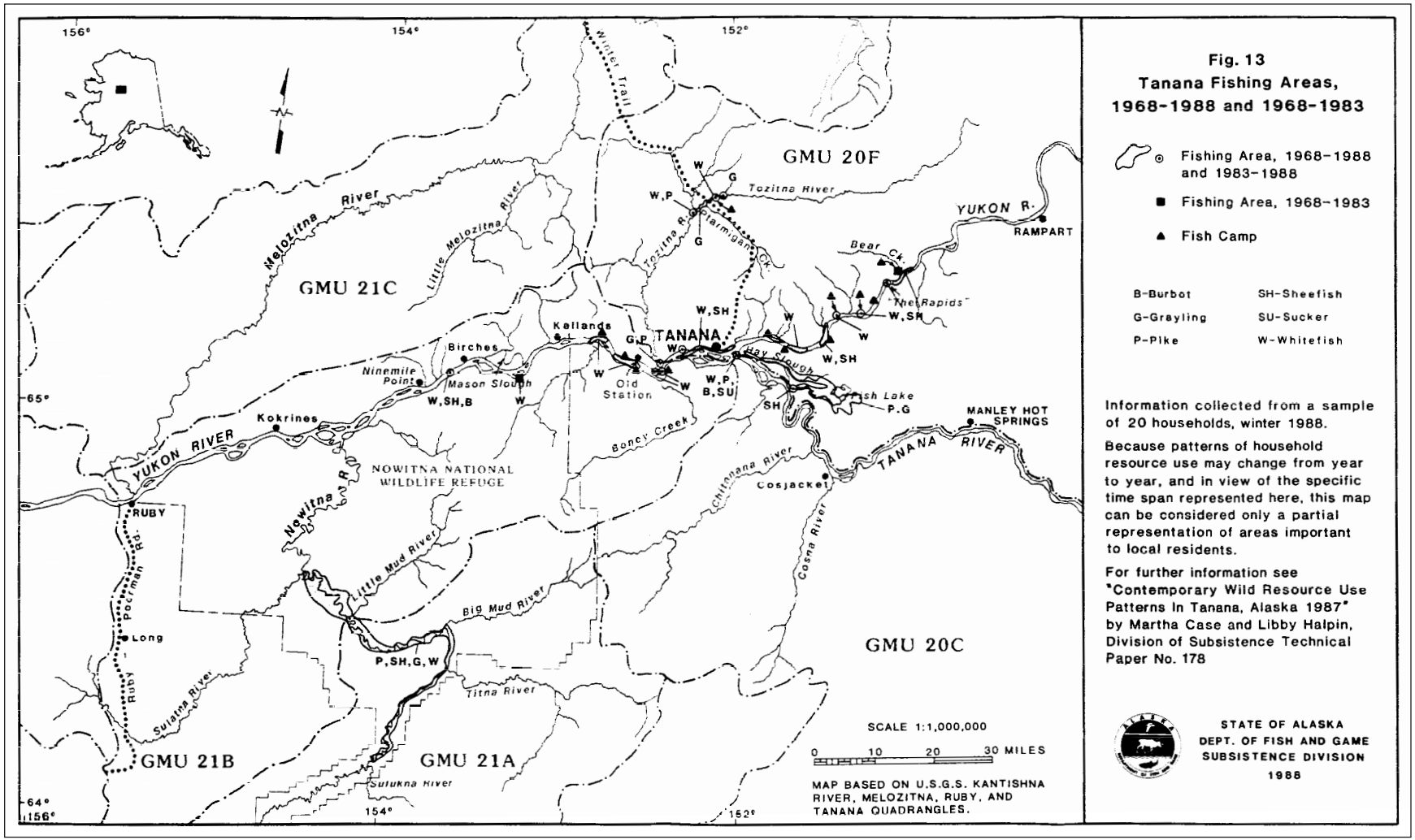


Figure 2-37.–Tanana nonsalmon fishing areas, 1968–1988 and 1968–1983 (Case and Halpin 1990).

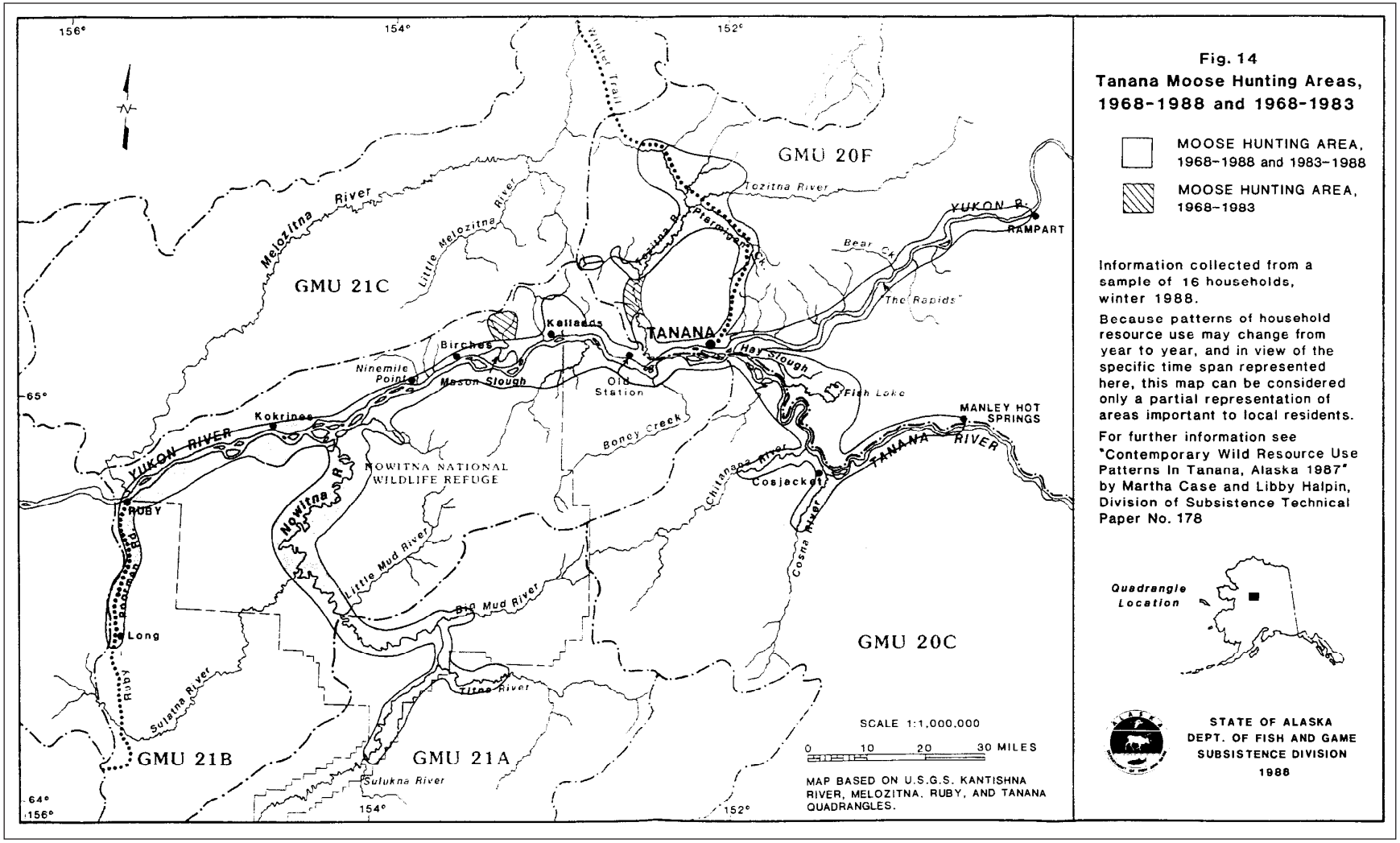


Figure 2-38.–Tanana moose hunting areas, 1968–1988 and 1968–1983 (Case and Halpin 1990).

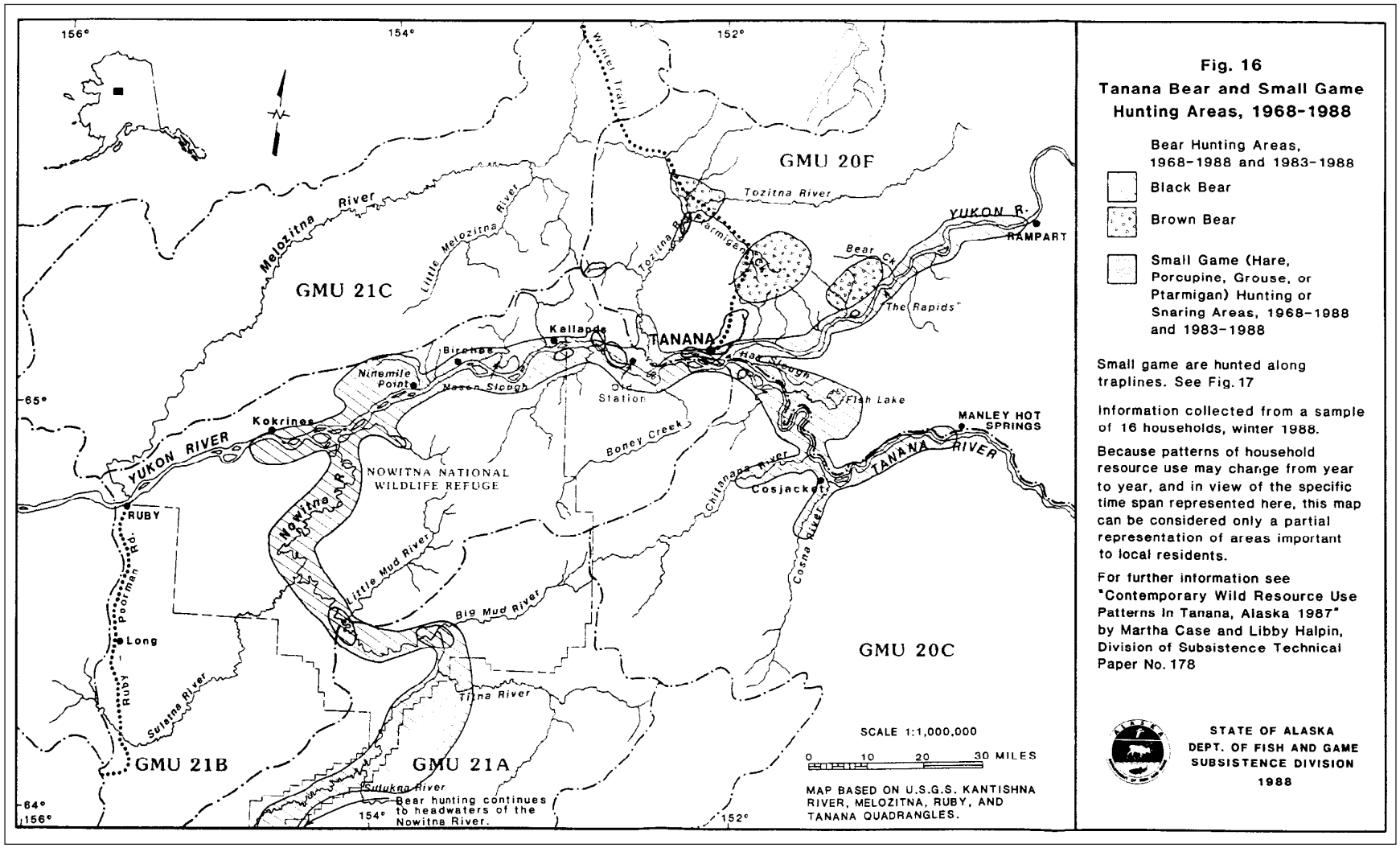


Figure 2-39.–Tanana bear and small game hunting areas, 1968–1988 and 1968–1983 (Case and Halpin 1990).

(Figure 2-16). Residents concentrated their black bear hunting efforts around the community with some travel downstream on the Yukon River and near Fish Lake on the Tanana River.

Case and Halpin (1990) provides a map depicting the area Tanana residents used to search for small game, including snowshoe hare, porcupine, grouses, and ptarmigans (Figure 2-39), and a map showing the areas used to trap furbearing animals (Figure 2-40). In 2014, a single map was produced to include the areas Tanana residents used to hunt and trap small land mammals including both animals that typically are eaten and those that are not (Figure 2-19). Respondents identified a trap line extending into the Nowitna National Wildlife Refuge and several north of the community that followed the Tanana-Allakaket Winter Trail to the Tozitna River. Compared to the historical maps, the survey and ethnographic respondents in the 2014 study did not use nearly as much land to hunt small land mammals as they once did. The earlier maps show the use of a variety of tributaries including the Titna, Big Mud, Melozitna, Chitanana rivers to name a few. Many more trap lines were identified in the 1987 study than in this one. Fish Lake was identified as a trapping area in the 1960s, 1970s, and 1980s but, despite ethnographic information describing the significance of the area, was not used for the harvest of small land mammals in 2014.

Historically, Tanana residents traveled up the Yukon River to the confluence of the Tanana, and up the Tanana to the Cosna River to hunt for migratory birds (Figure 2-41). They traveled down the Yukon River to the Nowitna River and up the Nowitna River to the Sulukna River. Case and Halpin (1990) also identifies other small harvest areas near the Rapids and along the Tozitna River. In 2014, survey respondents identified a search area on the opposite side of the Yukon River slightly downstream from the mouth of the Nowitna River and an area surrounding the community and extending northward (Figure 2-21). The Tanana and Nowitna rivers were not used in 2014.

Case and Halpin (1990) differentiated between gathering firewood and gathering edible vegetation (plants and berries). Figure 2-42 shows the historical harvest areas for these 2 resource categories, and Figure 2-23 shows the use areas for vegetation, not including firewood, in 2014. In the 1968–1988 time period, Tanana residents mostly gathered berries and plants close to town, including a large area surrounding Fish Lake. Smaller areas located on Nowitna River tributaries and along the Yukon River up to the Rapids were also used to harvest plants and berries. In 2014 the harvest locations remained relatively unchanged. Residents gathered vegetation close to town and along the Tanana River up to Fish Creek and surrounding Fish Lake.

Local Comments and Concerns

Following is a summary of local observations of wild resource populations and trends that were recorded during surveys and ethnographic interviews. Some households did not offer any additional information during the surveys, so not all households are represented in the summary. Tanana residents expressed concern that the Tanana-Tofty Road, currently under construction, will increase the number of nonlocal hunters in the area, increasing competition for limited resources and leading to possible habitat degradation (TAL030820157). Respondents described the potential impact to the land, water, and animals from air boats and all-terrain vehicles and the sound disturbance to wildlife from these types of transportation. Respondents believed that Fish Lake, not far from the new road on the opposite side of the Yukon River from Tanana, is in particular danger of overuse and degradation. An ethnographic respondent described the significance of Fish Lake to her family:

> It was a major place to migrate to in the spring time and fall time. You know, our ancestors would migrate from fishing grounds to hunting grounds to wherever else. I imagine they were going there before it was ever recorded…my husband and I hunt there annually. We love to go there. It's just a pretty awesome place to be, out on the water. There's many avenues to take, different places you can go, and there's lots of animals like birds, moose, beaver. We've even speared fish there. It's just a pristine, you know, ground for the animals. I think people know that, and it's kind of hard to keep it protected because it's so big. (TAL030620155)

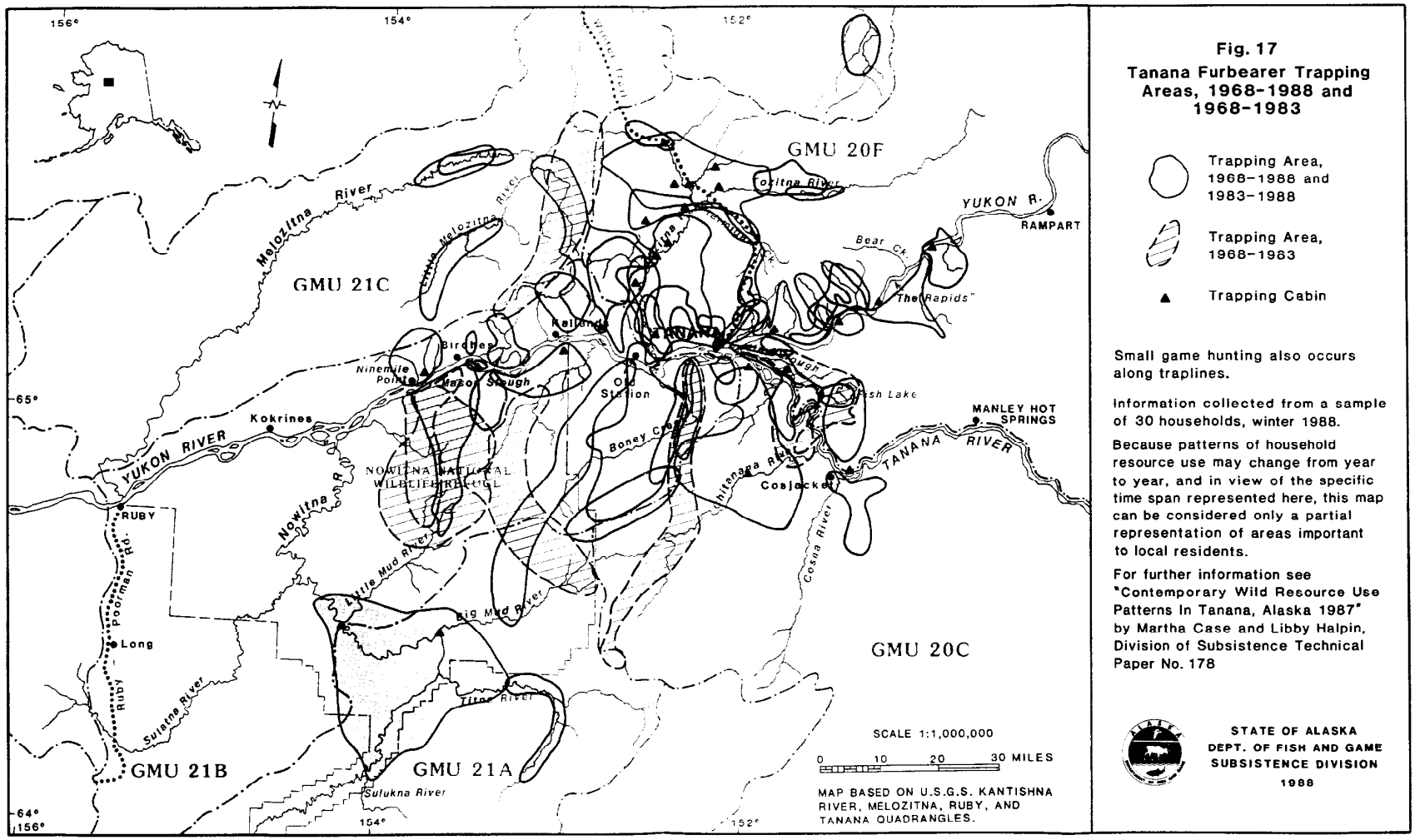


Figure 2-40.–Tanana furbearer trapping areas, 1968–1988 and 1968–1983 (Case and Halpin 1990).

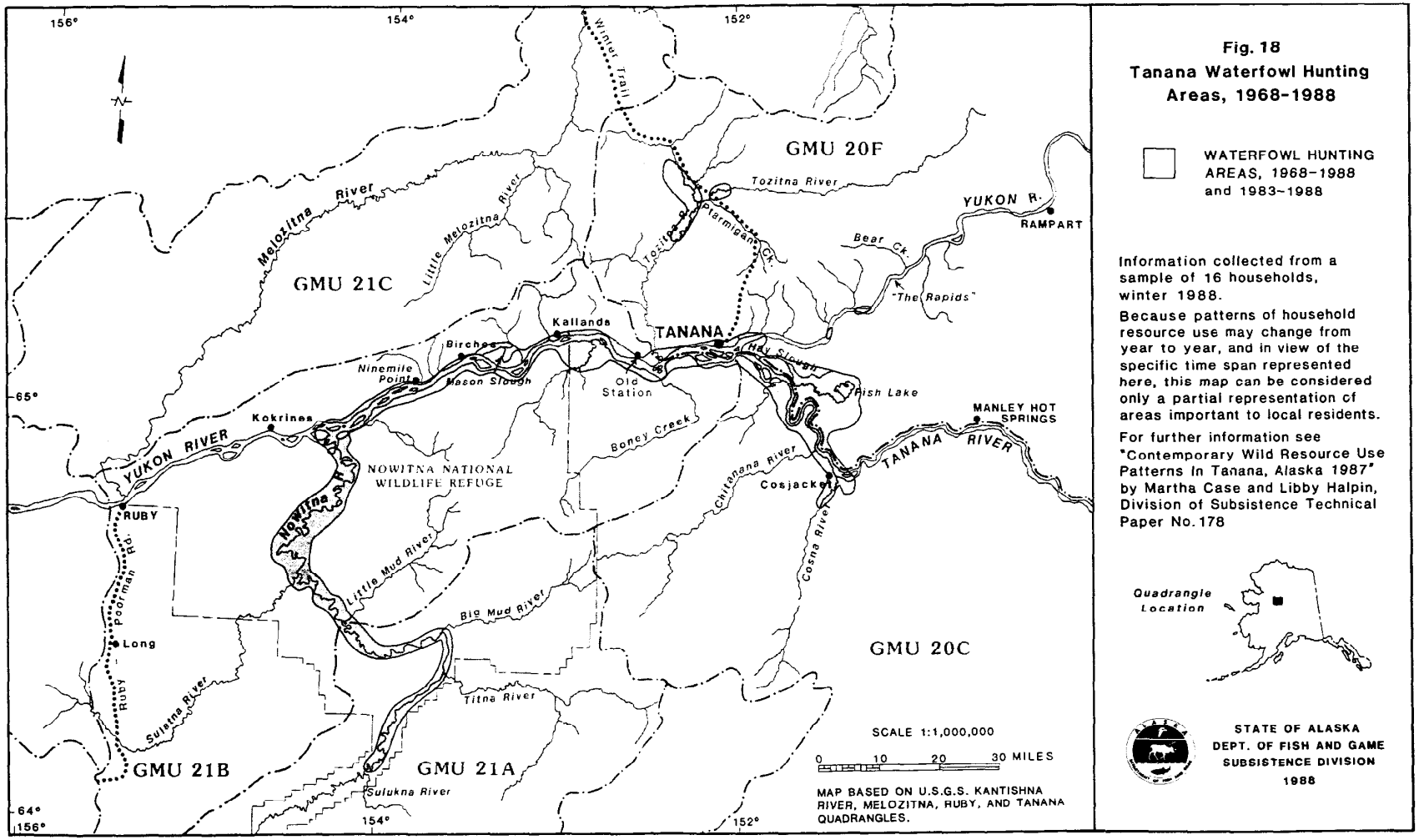


Figure 2-41.–Tanana waterfowl hunting areas, 1968–1988 and 1968–1983 (Case and Halpin 1990).

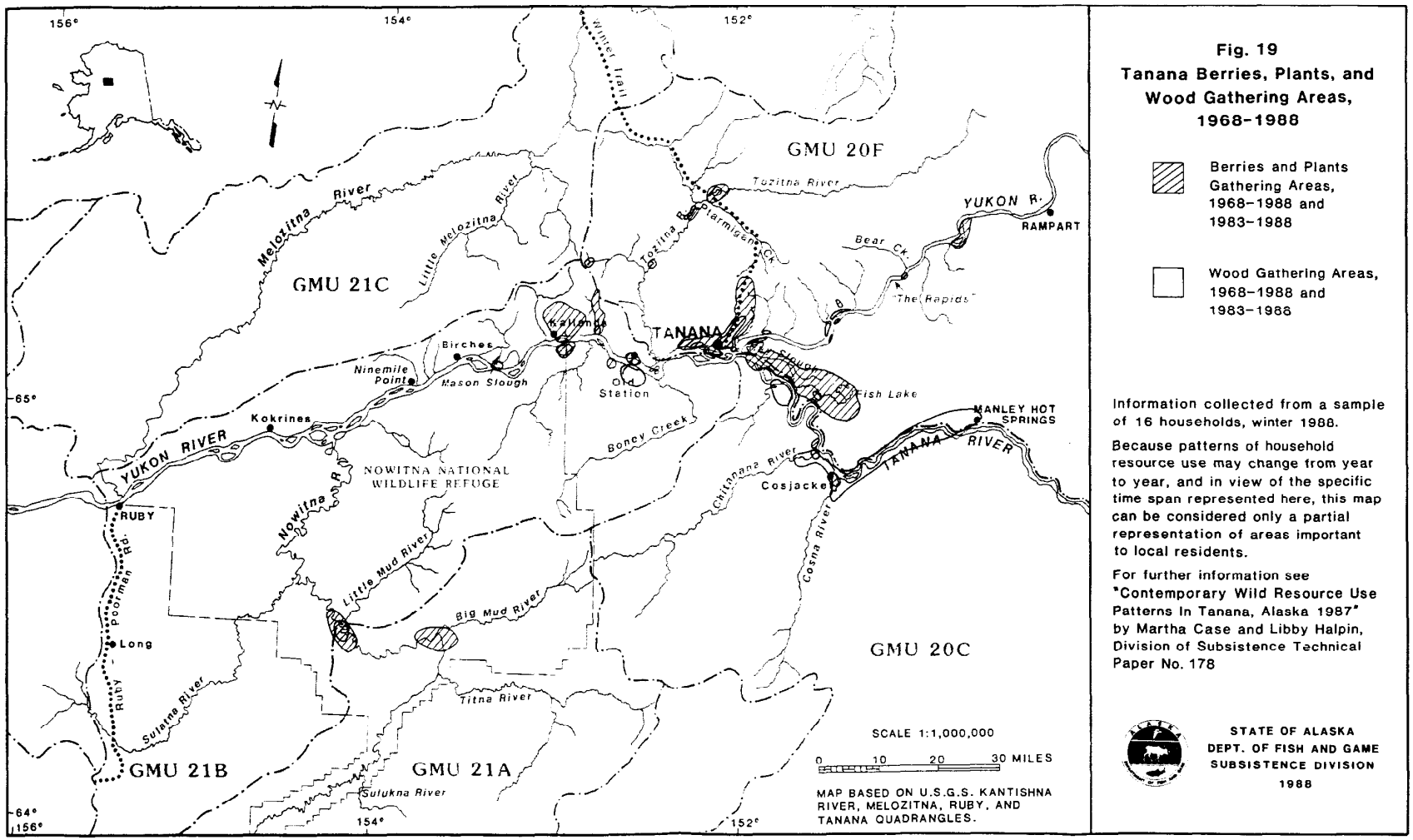


Figure 2-42.–Tanana berries, plants, and wood gathering areas, 1968–1988 and 1968–1983 (Case and Halpin 1990).

Other respondents talked at great length about their concern for the Chinook salmon fishery in both cultural and environmental terms. For example, one respondent expressed frustration when considering possible management exceptions that would give some fishermen a limited opportunity to harvest Chinook salmon in times of conservation:

> Why allow everyone along the river to catch a few kings when there are so few kings? I understand, because I know. I mean, it would be beautiful to be able to catch those kings and have all our family there. My mom, my sisters, all my nieces and nephews. Have our camp full again and like all the camps around us going and everybody is busy, everybody doing the same thing like we did for years. (TAL0304201510)

The significance of the Rapids to the people of Tanana cannot be overstated. All the ethnographic respondents interviewed for this study spent time at fish camps in the Rapids area before declining run sizes and more conservative management measures made it more difficult to catch Chinook salmon and less feasible to stay at camp for extended periods of time. All recalled fond memories of the Rapids and expressed sadness that without Chinook salmon fishing, life at fish camps is no longer a reality for the youth of Tanana. Several elder respondents characterized the Rapids as a place utilized by Koyukon Athabascans from time immemorial. Fishing closer to town or removing salmon fishing from the local subsistence seasonal round is impacting the mental, physical, and spiritual health of Tanana respondents (TAL030420158; TAL0304201510; TAL030720154).

Acknowledgements

The author would like to express gradtitude to all the residents of Tanana for their interest and participation in the 2014 comprehensive study. During fieldwork in March 2015, Tanana residents were generous with their time and hospitable to Division of Subsistence researchers who spent a week in the community, often sharing food and inviting researchers to their homes to learn about medicinal plants or skin sewing. Special thanks go to the Tanana elders who contributed their time and wisdom through participation as key respondents. Their knowledge of Tanana, the history of the Koyukon people, and the customary and traditional uses of fish and wildlife adds invaluable context for this report. Additionally, the Nucha'la'woy'ya Tribal Council was critically important to the feasability and completion of this study. Finally, this research would not have been possible without the help of local research assistants who scheduled and administered surveys and shared their knowledge of the community with Division of Subsistence research staff.

3. RAMPART

Lisa J. Slayton

In April 2015, a Division of Subsistence researcher surveyed 7 of 13 eligible households in Rampart (54%; Table 1-5). Expanding for 6 unsurveyed households, Rampart's estimated total harvest of wild foods between January and December 2014 was 14,754 edible pounds (Table 3-1). The average harvest per household was 1,135 lb; the average harvest per capita was 378 lb (Tables 3-1 and 3-2).

This chapter summarizes findings from household surveys including demographic characteristics, responses to harvest assessment questions, harvest estimates, reported employment and income, and responses to food security questions. Harvest numbers are expanded estimates. Results from this survey are available online in the ADF&G Community Subsistence Information System (CSIS).[1]

In addition to the comprehensive survey, 2 interviews were conducted with 3 individuals, 1 female and 2 males. All were active hunters and fishers between the ages of 20 and 45. By providing a better understanding of the seasonal round, local history, and subsistence activities in the area, the ethnographic interviews contextualize the quantitative harvest and use data collected in the surveys.

Community Background

The predominantly Alaska Native community of Rampart is located on the south bank of the Yukon River, approximately 75 miles upstream from its junction with the Tanana River, and approximately 100 miles northwest of the city of Fairbanks. Rampart is situated in an area of low mountains varying in height from 3,000 to 5,000 feet. Upriver from the community lie the broad lowlands known as the Yukon Flats (Darbyshire and Associates 1990). The village corporation for Rampart is Baan O Yeel Kon Corporation. The regional corporation is Doyon, Limited (Plate 3-1).

Like other communities in rural Alaska, weather is a factor that is always considered by Rampart residents when planning subsistence activities. Between November and March, daily minimum temperatures are usually below 0˚F. Prolonged periods of -50˚ to -60˚F are common. Average summer temperatures typically range between 65˚ and 80˚F with a maximum summer temperature of 97˚F in recorded history. Total annual precipitation typically averages approximately 6.5 inches of rainfall and approximately 43 inches of snowfall. The Yukon River at Rampart is usually ice-free from May to September (Wiehl and Rampart Tribal Council 2014).

Vegetation in the Rampart area varies according to soil types. Aspen, paper birch, and white spruce are found where the sediments are covered by a windblown layer of silty loam and the permafrost tables are deeper than 2 feet below the surface. Mosses, black spruce, dwarf birch, sedge tussocks, and lichens are found in shallow sloughs and old stream channels in poorly-drained soil where the permafrost tables are within approximately 2 feet of the surface (Darbyshire and Associates 1990).

Residents of Rampart have access to a variety of subsistence resources. The primary large land mammals available are moose, caribou, and black and brown bears. Small land mammals include hares (locally known as "rabbits"), muskrat, beaver, porcupine, lynx, gray wolf, coyote, weasel, wolverine, marten, fox, mink, and the occasional river otter. Several species of migratory waterfowl are harvested as they migrate in the spring and fall. Salmon types include Chinook ("king"), summer chum ("dog"), fall chum ("silver"), and coho salmon. Several species of nonsalmon fish are present in the Yukon River, local creeks and streams, and upland lakes. These include northern pike, Arctic grayling, sheefish, whitefishes, burbot, Dolly Varden, and longnose sucker. Vegetation resources include various types of berries such as blueberries and cranberries, wild rhubarb, and Labrador tea, among other wild plants and greens. Wood for heating, construction, and smoking fires is abundant as both standing timber and driftwood (Betts 1997).

1. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." https://www.adfg.alaska.gov/sb/CSIS. Hereafter *ADF&G CSIS*.

Table 3-1.–Resource harvest and use characteristics, Rampart, 2014.

Characteristic	
Mean number of resources used per household	**10.9**
Minimum	4
Maximum	22
95% confidence limit (±)	39.0%
Median	9.0
Mean number of resources attempted to harvest per household	**8.1**
Minimum	0
Maximum	20
95% confidence limit (±)	56.2%
Median	7.0
Mean number of resources harvested per household	**7.9**
Minimum	0
Maximum	19
95% confidence limit (±)	55.1%
Median	7.0
Mean number of resources received per household	**8.4**
Minimum	2
Maximum	16
95% confidence limit (±)	38.5%
Median	7.0
Mean number of resources given away per household	**6.0**
Minimum	0
Maximum	17
95% confidence limit (±)	62.8%
Median	5.0
Household harvest (pounds)	
Minimum	0
Maximum	3,414
Mean	1,134.9
Median	1,087.4
Total harvest weight (pounds)	14,754.0
Community per capita harvest (pounds)	378.3
Percentage using any resource	100%
Percentage attempting to harvest any resource	86%
Percentage harvesting any resource	86%
Percentage receiving any resource	100%
Percentage giving away any resource	86%
Number of households in sample	7
Number of resources asked about and identified voluntarily by respondents	116

Source ADF&G Division of Subsistence household surveys, 2015.

Table 3-2.–Comparison of selected findings, Rampart, 2014.

Category	Community Rampart
Demography	
Population	39.0
Percentage of population that is Alaska Native	100.0%
Percentage of household heads born in Alaska	100.0%
Average length of residency of household heads (years)	21.1
Cash economy	
Average number of months employed	1.4
Percentage of employed adults working year-round[a]	0.0%
Percentage of income from sources other than employment[a]	0.0%
Average household income[a]	$0
Per capita income[a]	$0
Resource harvest and use	
Per capita harvest (pounds usable weight)	378.3
Average household harvest (pounds usable weight)	1,134.9
Number of resources used by 50% or more households	7.0
Average number of resources used per household	10.9
Average number of resources attempted to be harvested per household	8.1
Average number of resources harvested per household	7.9
Average number of resources received per household	8.4
Average number of resources given away per household	6.0
Percentage of total harvest taken by top ranked 25% of households	43.0%
Percentage of households that harvested 70% of harvest	28.6%
Per capita harvest by lowest ranked 50% of households (pounds usable weight)	76.8
Percentage of total harvest taken by lowest ranked 50% of harvesting households	20.3%
Average number of resources used by lowest ranked 50% of households	6.0
Average number of resources used by top ranked 25% of households	14.0

Source ADF&G Division of Subsistence household surveys, 2015.
a. Data omitted under conditions of minimal sample size.

Plate 3-1.–View of Rampart from the river.

Plate 3-2.–Minook Creek.

Koyukon Athabascans lived in the Rampart area prior to the coming of Euroamericans (de Laguna 1947:28; McFayden Clark 1981:582; Van Stone and Goddard 1981:562). The Koyukon people followed an annual round dictated by the seasonal movement and availability of various subsistence resources. Small Athabascan settlements at the time of Euroamerican contact were located on Hess Creek, Squaw Creek, Minook Creek, and Julia Creek (Andrews 1977:419).[2] According to the 2014 Rampart Community Plan (Wiehl and Rampart Tribal Council 2014), the first Alaska Native settlement in the area was located directly across the Yukon River from Rampart at the mouth of Squaw Creek.

Modern-day Rampart, initially named Minook City, and then Rampart City (L'Ecuyer 1997), began as a small river supply point supporting prospectors after the discovery of gold on nearby creeks (Plate 3-2). In 1893 or 1894, John Minook, an Alaskan of mixed Russian and Athabascan heritage, first discovered gold on Little Minook Creek. During the fall of 1894, several long-time Euroamerican prospectors moved into the area after hearing of Minook's discovery. In April of 1896, the Rampart mining district was established. As more prospectors moved into the area, the land was cleared by these newcomers, and several businesses and residences were constructed. In June of 1897, townsite plats were drawn up, and the settlement was renamed Rampart (L'Ecuyer 1997:5–6, 31). According to the 2014 Rampart Community Plan (Wiehl and Rampart Tribal Council 2014), the name Rampart was derived from the range of low mountains through which the Yukon River flows and forms the "ramparts" (canyon walls and rapids) of the upper Yukon River west of the community.

During September of 1897, Captain Patrick Ray of the U.S. Army reported that Rampart had a population of 350 and that the community consisted of 70 tents, 1 store, and 10 huts (L'Ecuyer 1997:13). As prospectors discovered more gold on additional creeks (all within approximately 30 miles of Rampart) and staked their claims, the population of Rampart soared. During this "boom" time, Rampart had a local newspaper (*Rampart Whirlpool*), a fire department, a library, saloons, hotels, theaters, and various businesses and stores. Alaska Natives lived at the edge of town in a small settlement at the mouth of Minook Creek during this time. According to Betts (1997:20), "In the memory of one elder resident, Natives were not allowed to live in town in the early days…" The locations of early Alaska Native settlements such as Minook and Hess creeks continue to be used today as family fishing and hunting camps (Betts 1997:21). A post office was established in Rampart in July of 1898 (Couch 1957).

In addition to John Minook, at least 2 other notable historical figures were associated with Rampart during the boom period: novelist Rex Beach and infamous Western lawman Wyatt Earp. While on their way to the Dawson goldfields, Wyatt Earp and his wife Josephine stopped in Rampart during the winter of 1898–1899. They rented a log cabin from Beach, who was prospecting and writing in Rampart at that time (L'Ecuyer 1997:21). Earp opened and ran his own gambling establishment in Rampart during that winter. Beach is said to have modeled his character Ben Stark after Wyatt Earp in his novel *The Barrier,* and the mining camp of the novel was mostly modeled after Rampart (Wiehl and Rampart Tribal Council 2014) (L'Ecuyer 1997:31). According to L'Ecuyer (1997:31), "*The Barrier* fittingly summed up life in a mining camp on the Yukon River in Interior Alaska as the nineteenth century drew to a close."

2. Dixon, Mim. 1980. *History—Rampart, Alaska.* In Shareholders Notebook, Baan O Yeel Kon, Incorporated, Fairbanks, AK.

By 1901, many changes had come to Rampart. In 1900, the community experienced a major smallpox epidemic that took the lives of many of the Alaska Natives living in the area. In addition, due to new gold strikes in Nome and elsewhere, miners and their families began to migrate out of Rampart (L'Ecuyer 1997:44). In 1900, the University of Alaska established an agricultural experiment station across the river from Rampart to cross-breed legumes and grains, and to test grow vegetables, strawberries, flowers, and field crops (Wiehl and Rampart Tribal Council 2014). Also during this period, the United States government installed telegraph wires across Alaska, connecting Rampart to the line in 1901. On March 4 of 1901, Judge James Wickersham held the first court session in Rampart (Wickersham 1938). Wickersham (1938:70) reported that, "The Court was held in a vacant log house fronting the [Yukon] river—made arrangements to rent another cabin on a back street for use as a jail" (Plate 3-3).

The mid-1900s saw changes that for the most part increased the size of the community. Although the agricultural station closed in 1925, an airstrip was constructed by the Alaska Road Commission in 1939, a salmon cannery was established in the 1940s, and a sawmill and logging operation was built in the 1950s (Wiehl and Rampart Tribal Council 2014). Residents continued to work in nearby gold mines and to subsistence hunt and fish throughout these years.

During the second half of the 20th century, Rampart experienced a great deal of change in how subsistence activities were conducted. In the 1960s, snowmachines began to replace dog teams as the major form of travel in winter. As a consequence, the large amounts of fish needed for dog food were replaced by a need for cash to purchase gasoline for the snowmachines, boats, and eventually all-terrain vehicles (ATVs). The use of fish wheels, which were able to capture large amounts of fish mostly used for dog food, diminished. The 1970s

Plate 3-3.–Rampart courthouse in 2014.

and 1980s brought major changes in the form of 2 new federal laws, the well-documented Alaska Native Claims Settlement Act (ANCSA) and the Alaska National Interest Lands Conservation Act (ANILCA). The 1990s saw a decline in population, the closing of the school, and a decline in the cohesiveness in the community. According to respondents, many residents left the community in winter for cash employment and schooling for their children, returning only in summer to fish.

In 2014, the community was showing signs of revitalization. A strong commitment by the Rampart Tribal Council and community residents to reopen the school and bring families back to live year-round in Rampart was becoming a reality. The mission statement of the 2014 Rampart Community Plan says, "Our mission is to revive the community of Rampart and improve the quality of life for the residents through economic development and the preservation of our culture, heritage, and abundant natural resources" (Wiehl and Rampart Tribal Council 2014).

According to the 2014 Rampart Community Plan, Rampart currently has a laundromat with showers, a post office, a Tribal office, a clinic (although no full-time health aide), bulk fuel storage for the community generator and residents' home heating needs, a landfill, and a state-owned airstrip. The community hall suffered a fire in 2014 and is currently in need of replacement. A bright spot for Rampart was the reopening of the school for the 2015 school year. Several grants have recently been written for housing needs, street improvements, and preplacement of power poles. Currently, there is no store in Rampart. Residents must travel to Fairbanks to shop for building materials, store foods, household and personal needs, and most subsistence gear such as parts for boats, snowmachines, or ATVs; ammunition; nets; and camping gear.

Table 3-2 shows the 2014 selected findings of this report for Rampart. The 2014 per capita harvest for Rampart was 378 usable pounds, with households using an average of 11 different types of resources. The average number of resources harvested per household was 8, the average number of resources received was 8, and the average number of resources given to others was 6. This 2014 study provides a one-year snapshot of Rampart residents' subsistence activities and use patterns. However, annual variation does occur, and these data reflect current trends such as a low human population, severe restrictions on summer salmon fishing, and depressed economic conditions. All are variables subject to change.

Seasonal Round

Rampart residents harvest wild foods throughout the year following the natural seasonal patterns of locally-available fauna and flora. Most search and harvest is conducted during day trips from Rampart. Many residents also maintain traditional fish camps along the Yukon River and spend a week or longer at the camps during the summer fishing season. Some of the camps are also used as bases for hunting trips.

Figure 3-1 depicts the areas that Rampart residents used for subsistence fishing, hunting, trapping, and gathering in 2014. Although respondents documented using this area during this particular study year, Rampart residents have used a much greater area at various times throughout the years. They consider their traditional subsistence lands to be much larger than the lands documented for 2014.

While Division of Subsistence researchers were in Rampart in May 2015, breakup occurred. The Yukon River began to flow once again as massive chunks of ice crashed and crunched past the community. The sights and sounds of this annual occurrence brought a distinct atmosphere of excitement and expectation to the community. Spring had arrived in its usual dramatic fashion (Plate 3-4). One survey respondent stated that when all the ice passed he would be putting his boat in the river to set whitefish nets and to hunt for waterfowl as they begin to arrive on their annual spring migration. He noted that he might also set a whitefish net from shore when the river cleared of ice and driftwood. While the ice was still moving, however, he planned to use ropes and grappling hooks to gather driftwood and logs as they passed with the floating ice.

At the beginning of summer, in a typical year, residents fish for the first run of salmon (Chinook salmon). However, fishing restrictions forced them to focus solely on harvesting whitefish during the Chinook salmon run during the study year. After the Chinook salmon pass, coho and then fall chum salmon (known as silvers) mark the beginning of fall. The "new normal" for Rampart's overall salmon harvest (due to

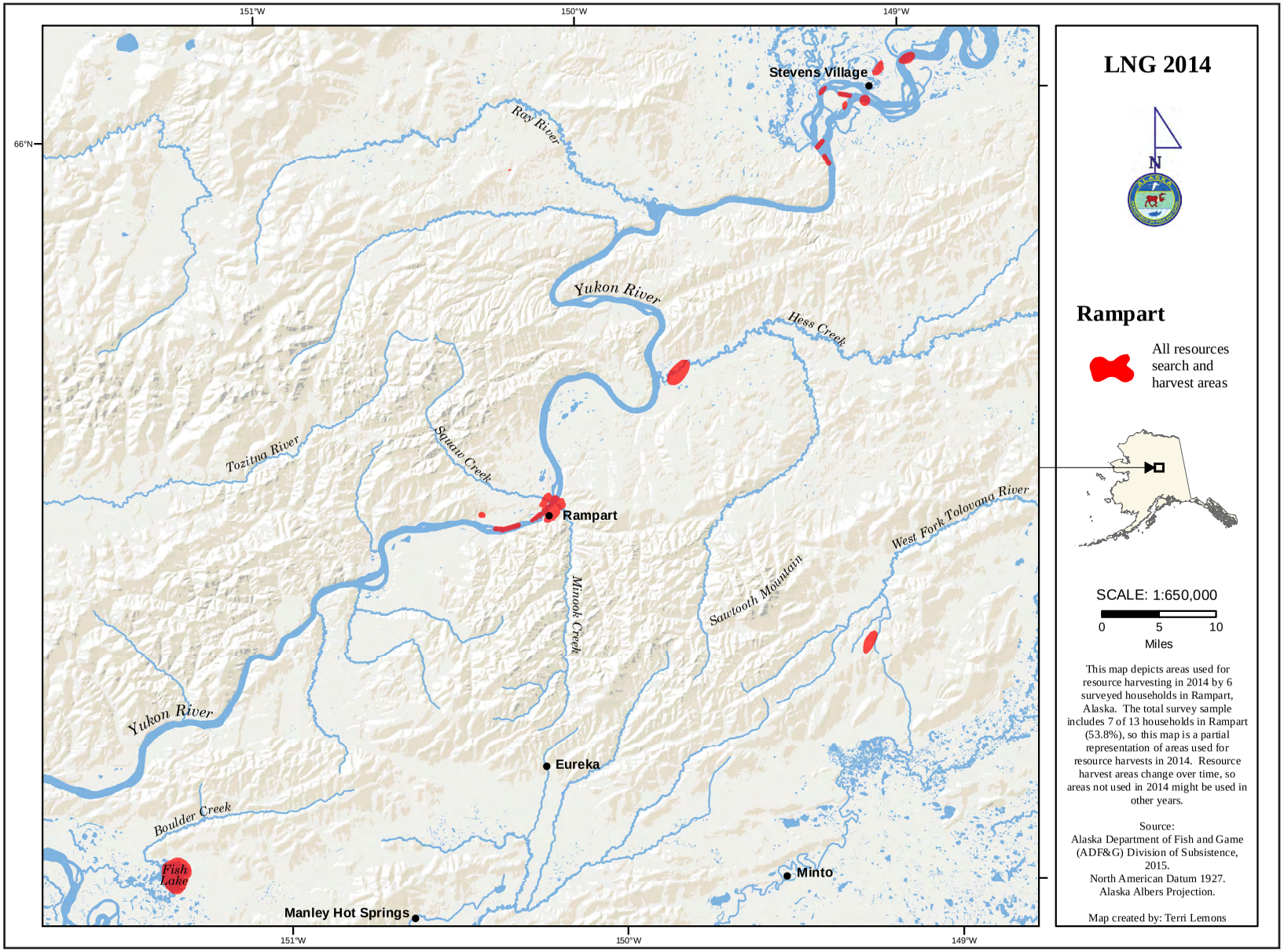


Figure 3-1.–All resources search and harvest areas, Rampart, 2014.

current restrictions) begins at this time (August, September, and early October). One interview respondent explained, "The silvers, we'll clean up on that, you know. Try to get as many as we could. But, like the last couple of years, that's the only kind—that's the only fish we'd fish for, it's the silvers, you know" (051420151). Other households in Rampart harvested fall chum salmon in addition to coho salmon in 2014.

Berry picking occurs in August and September and often coincides with small mammal hunting and trapping and moose hunting. Berry picking is a family affair in which both the young and the elderly participate. During the winter, residents participate in small mammal trapping, fishing (jigging) through the ice for Arctic grayling and other nonsalmon fish species, and opportunistic harvests of ptarmigans and spruce grouse. Winter is a time for visiting family and friends, repairing subsistence gear, and doing craftwork such as sewing and beading, as all await the sound of the first booming and cracking of river ice and the sight of spring waterfowl bobbing on open stretches of water. These are the sights and sounds of spring, yet another chance for renewal of ancient traditions in a modern world for the residents of Rampart.

Population Estimates and Demographic Information

Expanding for unsurveyed households, Rampart's estimated population for 2014 was 39 (Table D3-1, Figure 3-2). Based on self-reporting, all of the households that were present and participated in the survey were Alaska Native (Table 3-3). Household size ranged from 2 to 6 people with an average of 3 people per household. The average age was 27 years, and the oldest person was in their early 60s. There were residents older than this living in the community at the time of the researchers' visit; however, they were out of town when the survey was conducted. Only 7 of 13 households were surveyed (Table 1-5). Figure 3-3 and Table D3-2 show that there were more females than males in the population of Rampart in 2014. However, this imbalance was age dependent—there were more females in the older (age 40+) and younger (age 0 to 19) components of the population; and there were more males in the 20–24 age group than females. An increase in school-aged children in 2014 was a direct result of the community's effort to encourage families to move back to Rampart as year-round residents in order to reopen the school. The school had closed in 1999 due to

Plate 3-4.–Yukon River breakup at Rampart.

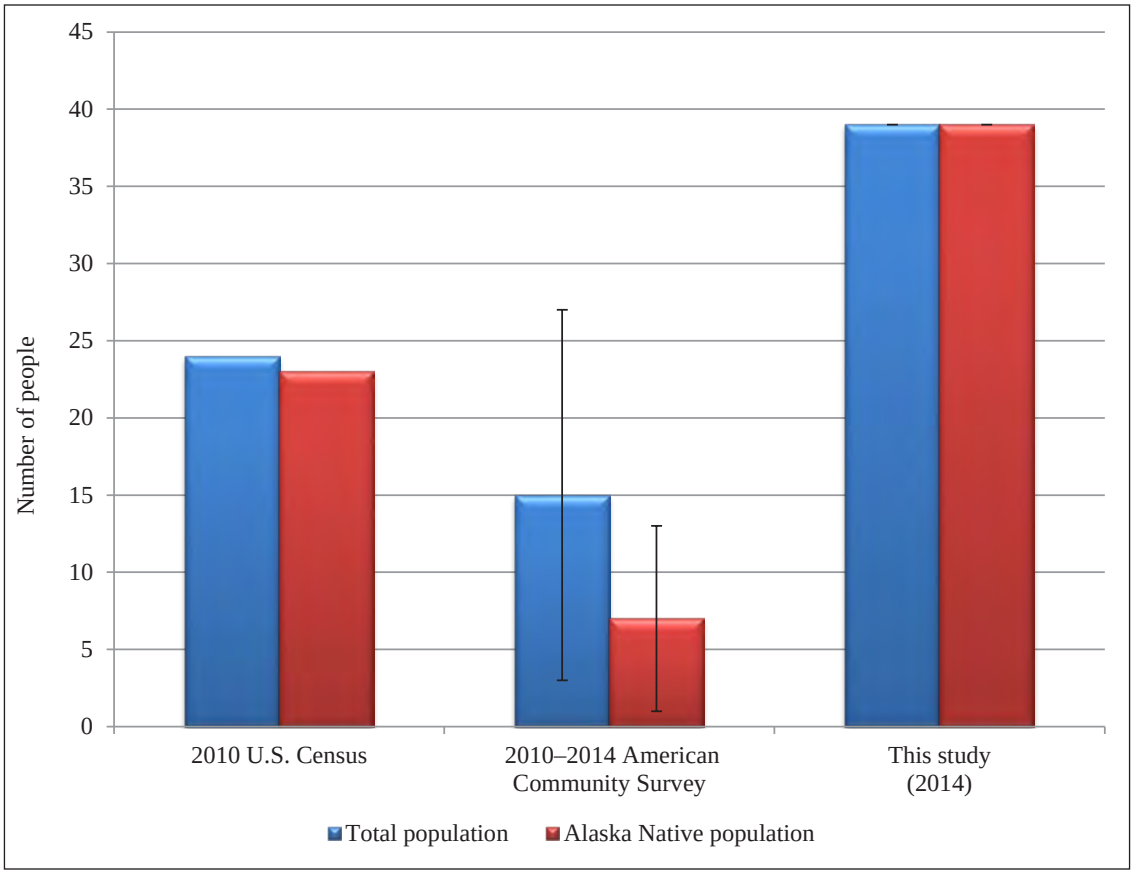


Figure 3-2.–Population estimates, Rampart, 2010 and 2014.

the lack of students. First Chief Floyd Green was instrumental in the school's reopening for the 2015–2016 school year.

Survey respondents who were heads of households were asked to identify their birthplaces (defined as where their parents were living when the respondent was born). Over one-half (55%) reported that their birthplace was Rampart (Table 3-4). Eighteen percent reported that their birthplace was Fort Yukon. Eagle, Tanana, and Tatitlek were reported as the birthplaces of the remainder of the heads of households (9% each). No places outside of Alaska were cited. Table D3-3 shows the birth places of the general population. One-third (33%) were born in Rampart. Nineteen percent were born in Fort Yukon, 14% in Tanana, 10% in Stevens Village, 5% in Arctic Village, and 5% in Eagle. All of these are rural communities in Interior Alaska. Other places of birth were Anchorage, Fairbanks, and Tatitlek (5% each). The 2014 population data suggest that Rampart residents have close family ties to Fort Yukon and other nearby Interior villages.

The population of Rampart has declined greatly since the early days of the community's establishment as a supply point for prospectors and miners on Minook and Little Minook creeks. Initially, when gold was discovered on several additional creeks in the area, the settlement became flooded with prospectors, business owners, and families. During this "boom" period in the late 1890s, the population at one point was estimated to be as high as 10,000 people, and Rampart was listed as the second largest city in Alaska (Wiehl and Rampart Tribal Council 2014). However, when the gold output of the Rampart-area creeks diminished and new gold strikes in the Dawson area were made, the community lost most of its citizens. Throughout the early 1900s, the population continued to decline, and by 1917 most homes and businesses were abandoned. In 1917, there were only 60 people living in Rampart: 30 Alaska Natives and 30 non-Natives. In 1930, the population was 103, but by 1970 the population had declined to 36 (Figure 3-4). There was a gradual increase during the 1980s and early 1990s; however, during the mid-1990s, year-round occupation by families began

Table 3-3.–Sample and demographic characteristics, Rampart, 2014.

Characteristics	Community Rampart
Sampled households	7
Eligible households	13
Percentage sampled	53.8%
Sampled population	21
Estimated community population	39.0
Household size	
Mean	3.0
Minimum	2.0
Maximum	6.0
Age	
Mean	27.4
Minimum[a]	2
Maximum	62
Median	24
Length of residency	
Total population	
Mean	13.4
Minimum	1
Maximum	62
Heads of household	
Mean	21.1
Minimum	1
Maximum	62
Alaska Native	
Estimated households[b]	
Number	13.0
Percentage	100.0%
Estimated population	
Number	39.0
Percentage	100.0%

Source ADF&G Division of Subsistence household surveys, 2015.
a. A minimum age of 0 (zero) is used for infants who are less than 1 year of age.
b. The estimated number of households in which at least 1 head of household is Alaska Native.

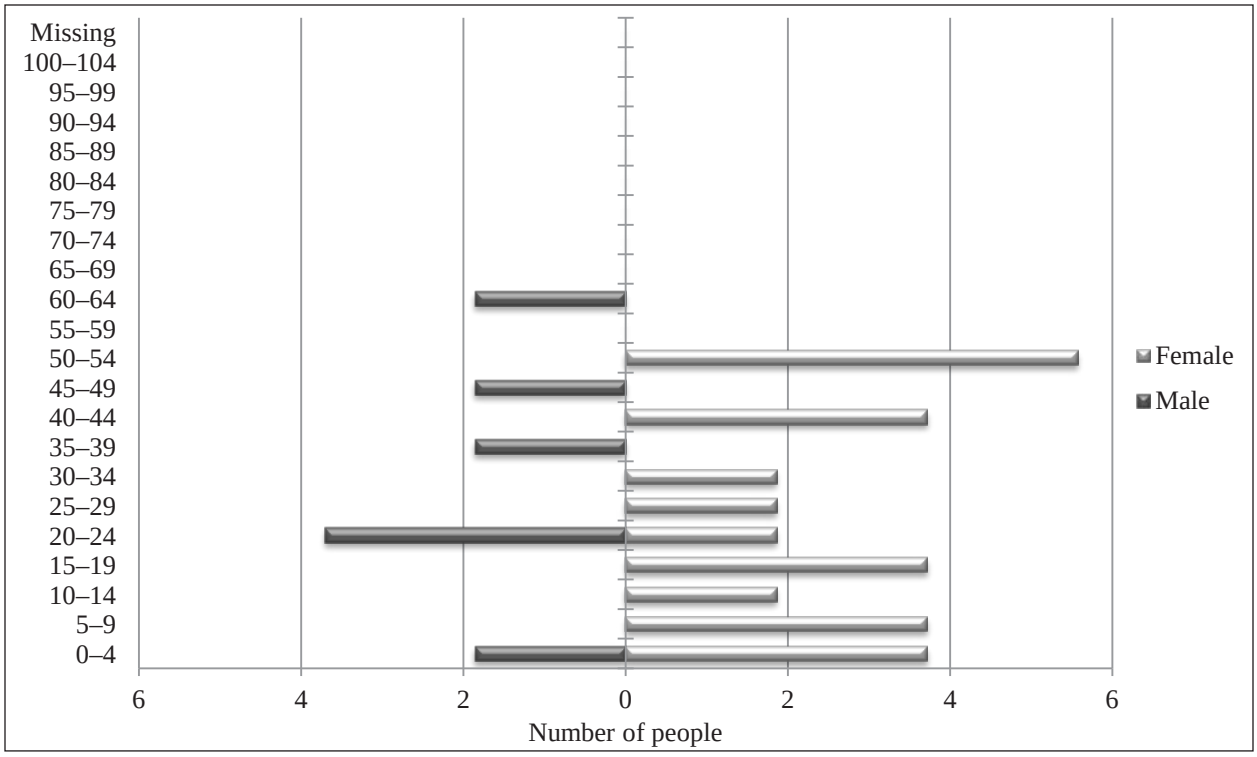


Figure 3-3.–Population profile, Rampart, 2014.

Table 3-4.–Birthplaces of household heads, Rampart, 2014.

Birthplace	Percentage
Eagle	9.1%
Fort Yukon	18.2%
Rampart	54.5%
Tanana	9.1%
Tatitlek	9.1%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

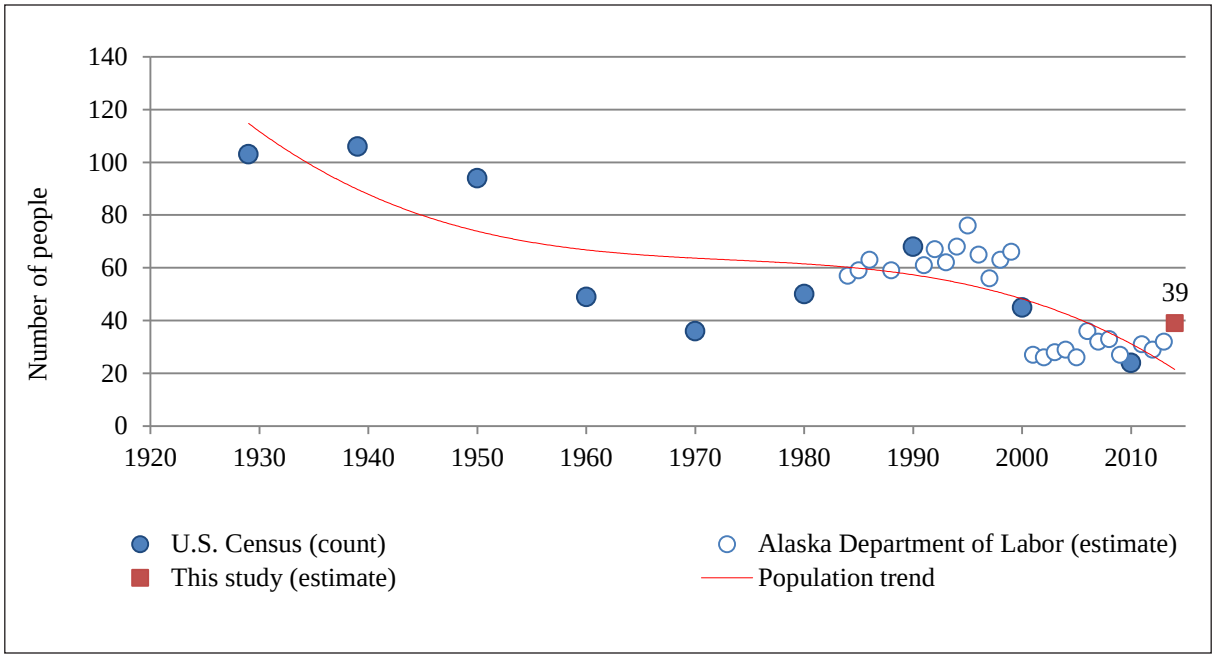


Figure 3-4.–Historical population estimates, Rampart, 1930–2014.

to decline again as families left to find jobs in Fairbanks and elsewhere. When the school closed in 1999, there was a steep drop in the overall population.

The 2010 United States Census recorded a population of 24 for Rampart (Figure 3-4). This study estimated a year-round population of 39 for 2014. The population increases for a time each summer when families and individuals return to their fishing camps in or near Rampart. They stay for various lengths of time to fish or participate in other subsistence activities.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Appendix Table D3-4 and Figure 3-5 report the expanded levels of individual participation in the harvest and processing of wild resources by all Rampart residents in 2014. Overall, 95% of people attempted to harvest resources, and 91% participated in processing wild foods. Because Rampart's population is so small, most residents take part in both the attempted harvest of subsistence resources and the processing of these resources. In 2014, the percentage of people processing fish (81%), large land mammals (67%), and vegetation (86%) was slightly greater than the percentage of people who participated in fishing or hunting for these resources. On the contrary, more people participated in hunting or trapping small land mammals (57%) and hunting for birds and eggs (62%) than in processing these resources.

Harvest and Use of Wild Resources at the Household Level

Figure 3-6 shows by resource category the percentages of households that used wild resources, attempted to harvest and harvested wild foods, and shared wild foods. Most households used wild foods from multiple resource categories. Along with vegetation, salmon and nonsalmon fish were the most used resource categories (by 100% of households each). Large land mammals was the next most used category by households (86%), followed by the categories of small land mammals, marine mammals, and birds and eggs (all at 57%). No Rampart households used or attempted harvest of marine invertebrates in 2014.

Of those households that attempted harvest of the various wild foods categories, most were successful. Of the 71% of households that attempted to harvest salmon, all 71% were successful. The same was true of

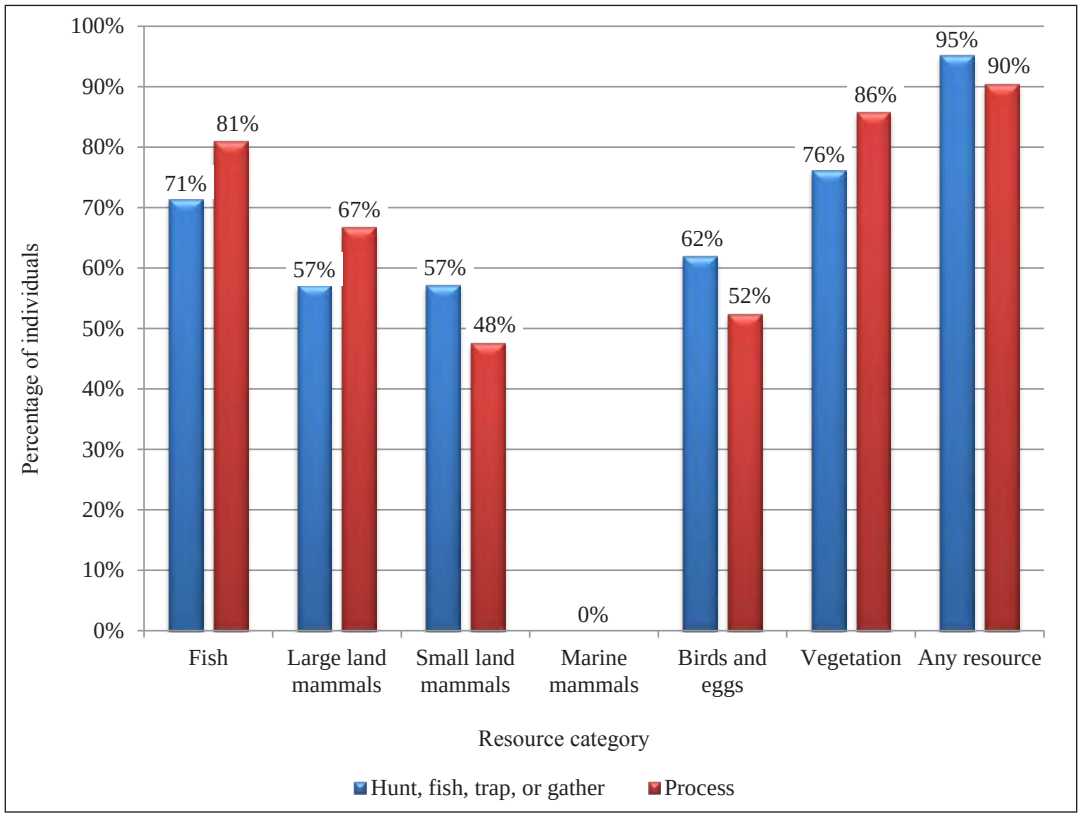


Figure 3-5.–Individual participation in subsistence harvesting and processing activities, Rampart, 2014.

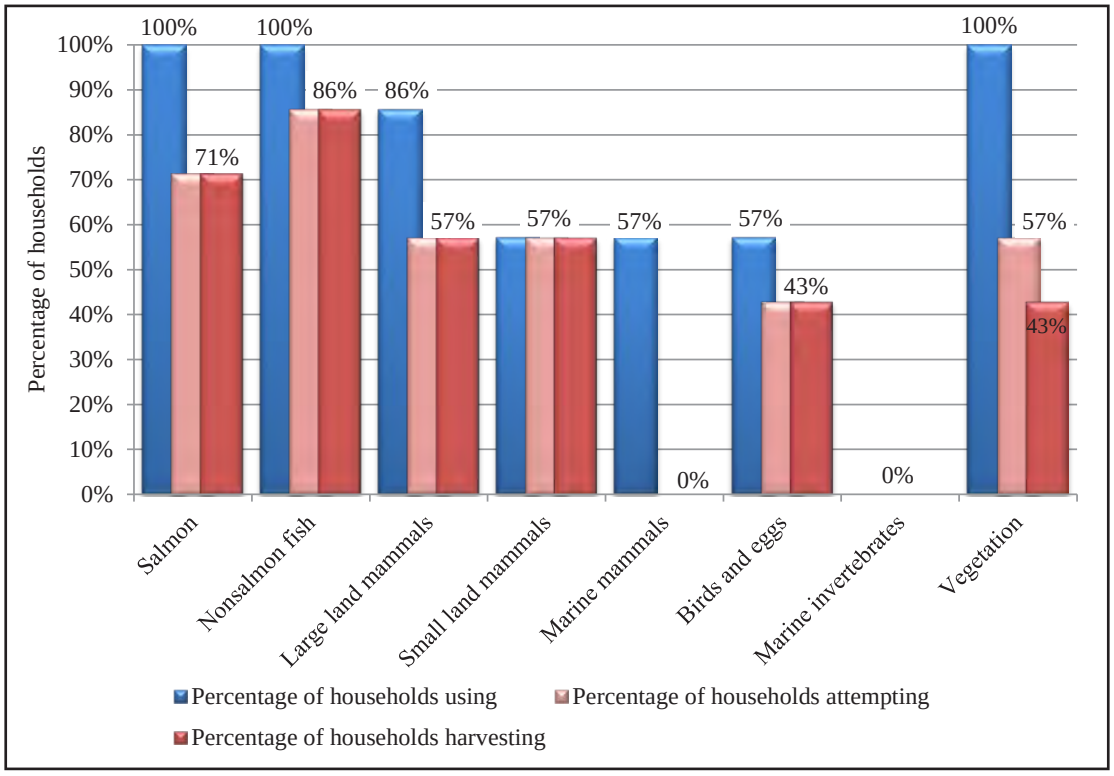


Figure 3-6.–Percentage of households using, attempting to harvest, or harvesting wild resources, by category, Rampart, 2014.

the nonsalmon fish category (86% attempted, 86% harvested), large land mammals (57% attempted, 57% harvested), small land mammals (57% attempted, 57% harvested), and birds and eggs (43% attempted, 43% harvested). Although marine mammals were used by 57% of Rampart households, there was no reported attempt at harvest or harvest of this resource category. All marine mammals or marine mammal products, such as seal oil, were received from outside of the community. The vegetation category showed a slight difference between those that attempted harvest (57%) and those who actually harvested (43%). According to residents, 2012 was not a particularly good year for berries.

Table 3-1 summarizes resource harvest and use characteristics for Rampart in 2014 at the household level. The average harvest was 1,135 lb edible weight per household and 378 lb per capita. During the study year, community households harvested an average of 8 kinds of resources and used an average of 11 kinds of resources. The maximum number of resources used by any household was 22. In addition, households gave away an average of 6 kinds of resources. Overall, as many as 116 resources were available for households to harvest in the study area; this included resources that survey respondents identified but were not asked about in the survey instrument.

Harvest Quantities and Composition

Table 3-5 reports estimated wild resource harvests and uses by Rampart residents in 2014 and is organized first by general category and then by species. All edible resources are reported in pounds edible weight (see Appendix C for conversion factors). 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 a household, and resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Purchased foods are not included, but resources such as firewood are included because they are an important part of the subsistence way of life. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

Rampart residents harvested 14,754 edible pounds of wild foods, or an estimated 378 lb per capita, in 2014 (Table 3-5). Figure 3-7 shows the composition of that harvest by weight for Rampart by resource category. Salmon made up 61% (8,992 lb) of the total harvest, and large land mammals accounted for 27% (4,011 lb; Table 3-5 and Figure 3-7). These categories were followed by nonsalmon fish (8%; 1,221 lb), birds and eggs (3%; 336 lb), and small land mammals (1%; 169 lb). Vegetation made up less than 1% (26 lb). Per capita, salmon contributed 231 lb, while nonsalmon fish species contributed 31 lb. Large land mammals contributed 103 lb per capita, and small land mammals contributed 4 lb. Birds and eggs contributed 9 lb per capita, and vegetation contributed less than 1 lb per capita.

Table 3-6 shows the top 10 individual resources used by Rampart households in 2014, and Figure 3-8 shows the species with the highest per capita harvests for the study year. Used by 100% of households, coho salmon was the resource used by the most households (Table 3-6). Moose was the next most used resource by households (86%), followed by burbot (71%). Fall chum salmon, unknown seal, and Canada or cackling geese were all used by 57% of households. These were followed by broad whitefish, humpback whitefish, unknown whale, white-fronted goose, spruce grouse, and blueberries, all of which were used by 43% of households.

Fall chum salmon was the most harvested single resource and made up 32% (120 lb per capita) of Rampart's per capita harvest, followed by coho salmon (29%; 111 lb per capita) and moose (27%; 103 lb per capita; Table 3-5 and Figure 3-8). These 3 species accounted for 88% of the total per capita harvest. Nonsalmon fish species contributed the next highest harvests (8% total). Humpback whitefish made up 3% (13 lb per capita), followed by burbot at 2% (6 lb per capita). Broad whitefish (5 lb per capita), sheefish (4 lb per capita), and Arctic grayling (3 lb per capita) all contributed 1% each. Beaver and white-fronted goose also accounted for 1% each.

Table 3-5.–Estimated harvests and uses of fish, widlife, and vegetation resources, Rampart, 2014.

	Percentage of households					Harvest weight (lb)			Harvest amount			
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	95% confidence limit (±) harvest
All resources	**100.0**	**85.7**	**85.7**	**100.0**	**85.7**	**14,754.0**	**1,134.9**	**378.3**	**14,754.0**	**lb**	**1,134.9**	**65.3**
Salmon	**100.0**	**71.4**	**71.4**	**100.0**	**57.1**	**8,991.5**	**691.7**	**230.6**	**8,991.5**	**lb**	**691.7**	**78.6**
Summer chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Fall chum salmon	57.1	57.1	57.1	28.6	28.6	4,672.6	359.4	119.8	928.6	ind	71.4	94.5
Coho salmon	100.0	71.4	71.4	100.0	57.1	4,319.0	332.2	110.7	835.7	ind	64.3	67.4
Chinook salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sockeye salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Nonsalmon fish	**100.0**	**85.7**	**85.7**	**71.4**	**57.1**	**1,220.5**	**93.9**	**31.3**	**1,220.5**	**lb**	**93.9**	**80.5**
Pacific herring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Eulachon (hooligan, candlefish)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific (gray) cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pacific tomcod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Starry flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Lingcod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pacific halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0
Unknown rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0
Burbot	71.4	71.4	71.4	42.9	28.6	236.2	18.2	6.1	98.4	ind	7.6	119.9
Dolly Varden	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic grayling	28.6	28.6	28.6	28.6	28.6	117.0	9.0	3.0	130.0	ind	10.0	140.5
Northern pike	14.3	14.3	14.3	0.0	0.0	13.0	1.0	0.3	9.3	ind	0.7	166.2
Sheefish	28.6	28.6	28.6	0.0	0.0	144.9	11.1	3.7	24.1	ind	1.9	127.2
Longnose sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Rainbow trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 3-5.–Page 2 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Nonsalmon fish, continued												
Broad whitefish	42.9	28.6	28.6	28.6	14.3	208.0	16.0	5.3	148.6	ind	11.4	124.7
Least cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Humpback whitefish	42.9	42.9	42.9	14.3	28.6	501.4	38.6	12.9	167.1	ind	12.9	108.2
Round whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown whitefishes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Large land mammals	**85.7**	**57.1**	**57.1**	**85.7**	**57.1**	**4,011.4**	**308.6**	**102.9**	**4,011.4**	**lb**	**308.6**	**58.8**
Black bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Caribou	14.3	0.0	0.0	14.3	14.3	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sitka black-tailed deer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mountain goat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Moose	85.7	57.1	57.1	85.7	42.9	4,011.4	308.6	102.9	7.4	ind	0.6	58.8
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Small land mammals	**57.1**	**57.1**	**57.1**	**28.6**	**42.9**	**169.0**	**13.0**	**4.3**	**169.0**	**lb**	**13.0**	**104.4**
Beaver	28.6	28.6	28.6	0.0	14.3	139.3	10.7	3.6	9.3	ind	0.7	131.6
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red fox–cross phase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red fox–red phase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Snowshoe hare	28.6	28.6	28.6	28.6	28.6	29.7	2.3	0.8	14.9	ind	1.1	124.7
River (land) otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Lynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marten	14.3	14.3	14.3	0.0	14.3	0.0	0.0	0.0	5.6	ind	0.4	166.2
Mink	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	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	ind	0.0	0.0
Red (tree) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Weasel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gray wolf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Wolverine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 3-5.–Page 3 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Marine mammals	**57.1**	**0.0**	**0.0**	**57.1**	**14.3**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Ringed seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spotted seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown seals	57.1	0.0	0.0	57.1	14.3	0.0	0.0	0.0	0.0	ind	0.0	0.0
Whale	42.9	0.0	0.0	42.9	14.3	0.0	0.0	0.0	0.0	ind	0.0	0.0
Birds and eggs	**57.1**	**42.9**	**42.9**	**57.1**	**42.9**	**335.5**	**25.8**	**8.6**	**335.5**	**lb**	**25.8**	**79.6**
Canvasback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spectacled eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Goldeneye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	28.6	28.6	28.6	28.6	28.6	29.0	2.2	0.7	14.9	ind	1.1	111.9
Northern pintail	14.3	14.3	14.3	14.3	14.3	8.4	0.6	0.2	5.6	ind	0.4	166.2
Black scoter	28.6	28.6	28.6	28.6	28.6	41.8	3.2	1.1	46.4	ind	3.6	110.3
Green-winged teal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown ducks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Canada/cackling goose	57.1	42.9	42.9	57.1	42.9	46.8	3.6	1.2	39.0	ind	3.0	89.7
Canada goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Snow goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
White-fronted goose	42.9	42.9	42.9	42.9	42.9	173.2	13.3	4.4	40.9	ind	3.1	82.8
Unknown geese	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tundra (whistling) swan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sandhill crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spruce grouse	42.9	28.6	28.6	28.6	14.3	36.4	2.8	0.9	52.0	ind	4.0	120.3
Sharp-tailed grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ruffed grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown grouses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown ptarmigans	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 3-5.–Page 4 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Snowy owl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown duck eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown goose eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown swan eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown crane eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown small shorebird eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown gull eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown loon eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown murre eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown tern eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine invertebrates	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Butter clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Freshwater clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Razor clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Dungeness crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
King crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tanner crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Vegetation	**100.0**	**57.1**	**42.9**	**85.7**	**57.1**	**26.0**	**2.0**	**0.7**	**26.0**	**lb**	**2.0**	**101.0**
Blueberry	42.9	28.6	28.6	42.9	28.6	18.6	1.4	0.5	4.6	gal	0.4	131.6
Lowbush cranberry	28.6	14.3	0.0	28.6	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Highbush cranberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Crowberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Cloudberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Raspberry	14.3	14.3	14.3	0.0	0.0	3.7	0.3	0.1	0.9	gal	0.1	166.2

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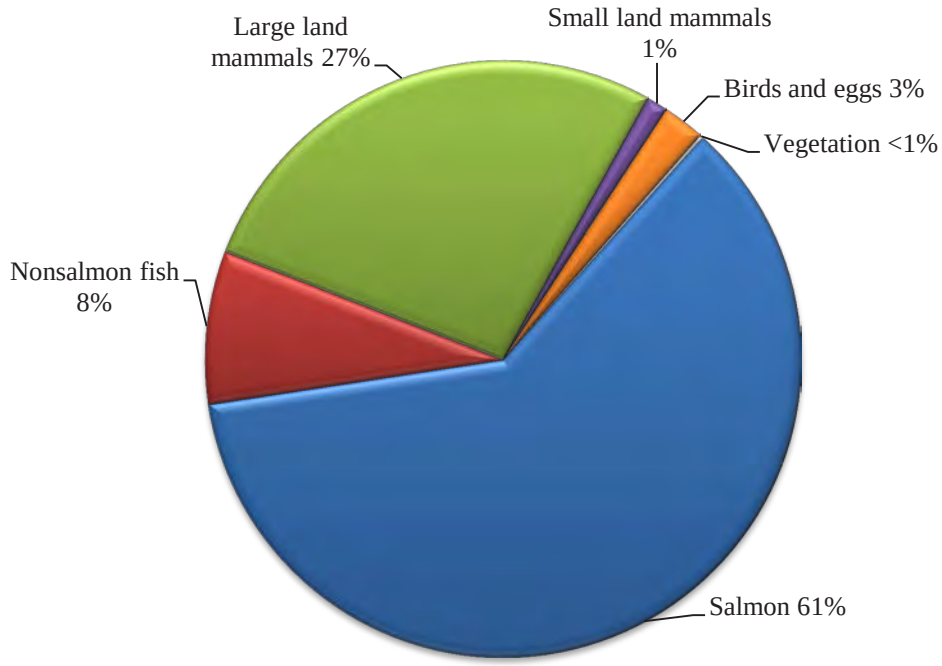
Table 3-5.–Page 5 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Vegetation, continued												
Other wild berry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Wild rhubarb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Fiddlehead ferns	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Hudson's Bay (Labrador) tea	14.3	14.3	14.3	14.3	14.3	1.9	0.1	0.0	1.9	gal	0.1	166.2
Willow leaves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other wild greens	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown mushrooms	14.3	14.3	14.3	14.3	14.3	1.9	0.1	0.0	1.9	gal	0.1	166.2
Fireweed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Wood	100.0	57.1	57.1	71.4	42.9	0.0	0.0	0.0	0.0		0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2015.

Note Resources where the percentage using is greater than the combined received and harvest indicate use from resources obtained during a previous year.

Note For small land mammals, species that are not typically eaten show a nonzero harvest amount with a zero harvest weight. Harvest weight is not calculated for species harvested but not eaten.



Note Categories having 0 lb of usable weight are not included.

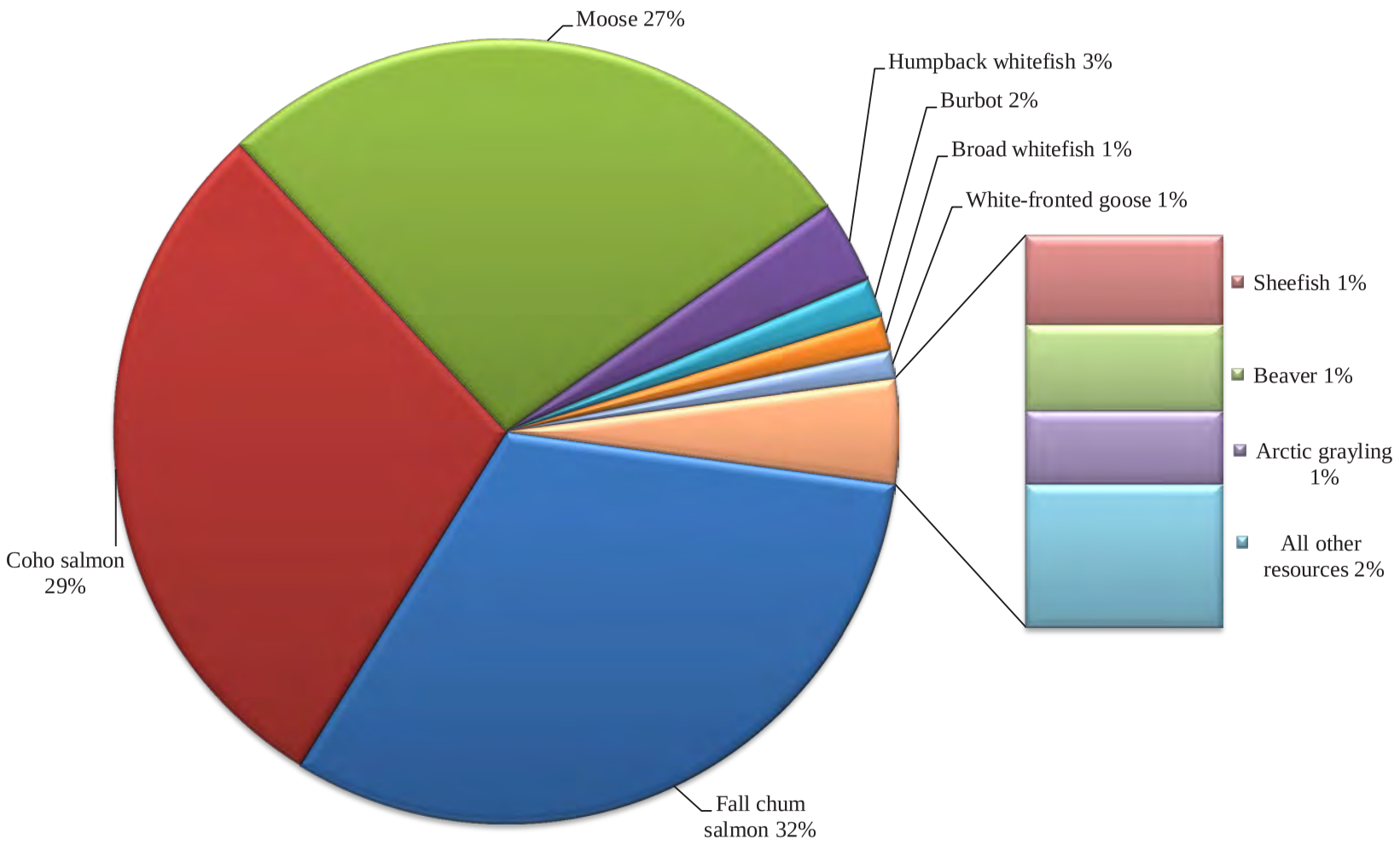
Figure 3-7.–Composition of harvest by resource category, by weight in usable pounds, Rampart, 2014.

Table 3-6.–Resources most commonly used by households, Rampart, 2014.

Rank[a]	Resource	Percentage of households using
1.	Coho salmon	100.0%
2.	Moose	85.7%
3.	Burbot	71.4%
4.	Fall chum salmon	57.1%
4.	Unknown seals	57.1%
4.	Canada/cackling goose	57.1%
7.	Broad whitefish	42.9%
7.	Humpback whitefish	42.9%
7.	Whale	42.9%
7.	White-fronted goose	42.9%
7.	Spruce grouse	42.9%
7.	Blueberry	42.9%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Resources used by the same percentage of households share the lowest rank value instead of having sequential rank values.



Note The "all other resources" category represents all species that contributed less than 1% to the total harvest.

Figure 3-8.–Top resource harvests by by weight in usable pounds per capita, Rampart, 2014.

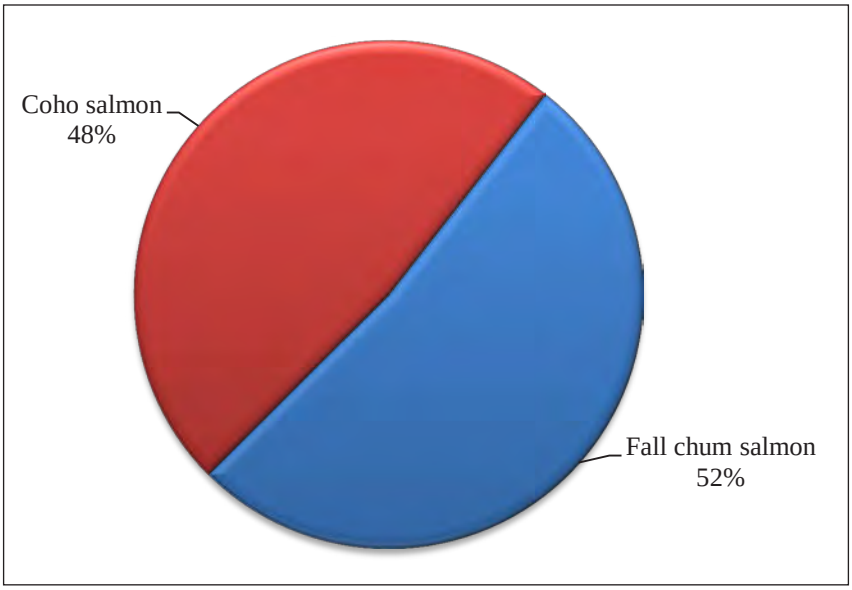


Figure 3-9.–Composition of salmon harvest by weight in usable pounds, Rampart, 2014.

Salmon

Rampart households reported harvesting only 2 types of salmon in 2014: fall chum and coho salmon. Fall chum salmon made up 52% of the total salmon harvest, and coho salmon made up 48%. (Figure 3-9). Of those who attempted to harvest either type of salmon, all were successful (Table 3-5). For fall chum salmon, 57% of households attempted harvest, and all were successful. Seventy-one percent of households attempted to harvest coho salmon, and all were successful. Fall chum salmon contributed 4,673 lb (71 fish per household) and coho salmon contributed 4,319 lb (64 fish per household) to the community's harvest. Coho salmon was used by 100% of households, but only 57% used fall chum salmon. Coho salmon was given away by 57% of households and received by 100%.

Salmon season begins with a run of Chinook (king) salmon in late June which continues through July. In mid-August, the fall run of chum salmon begins. These chum salmon run through September and into October until the Yukon River freezes. Coho salmon appear in late September and, like the fall chum salmon, continue running until the river freezes.

Although several households expressed that they would have liked to have fished for Chinook salmon, conservative management to protect Chinook salmon precluded subsistence fishing opportunities for Chinook salmon during the study year. The 2014 season for Chinook salmon on the Yukon River was not open at any time in the Rampart area. When asked how this closure affected people, 1 interview respondent stated, "It really affects them because you don't get your, your winter supply. Cause a lot of families live off of it" (051320152). This respondent felt that commercial bycatch in the ocean and at the mouth of the Yukon River in addition to drift gillnetting from the mouth of the river to the community of Galena were the main causes of the decline of Chinook salmon in the Rampart area. Residents fished for whitefishes in place of Chinook salmon during 2014.

Most residents expressed satisfaction with the levels of fall chum and coho salmon runs during the study year. However, respondents explained that the amount of rainfall during the summer of 2014 made it very difficult to process their salmon by drying, half drying, or smoking them. Instead, residents were forced to freeze them whole. A major aspect of processing salmon (or any fish) is cutting it correctly. Demonstrating the importance of teaching the next generation to prepare fish correctly, one respondent explained that both girls and boys were taught to cut and process fish at an early age, "We were just small. We used to go in the boat and help set the nets, check nets, pull the nets, cut the fish" (051320153).

Some households used salmon and whitefish eggs in 2014. One interview respondent said, "People like to fry, like, fish eggs, make caviar, make canned eggs. Or some people like to boil the, the king eggs, too [when available]" (051320152).

In 2014, 1,764 salmon (8,992 lb) were taken using fish wheels and gillnets (Table D3-5). No salmon were removed from commercial harvests for home use, even though there was 1 household with a commercial permit. Figure 3-10 is a visual representation of the number of salmon harvested by gear type. For both types of salmon, gillnets were the most commonly used gear type. Fishers harvested 761 fall chum salmon (3,832 lb) with gillnets. For coho salmon, Rampart residents harvested 706 fish (3,647 lb). Fish wheels (2 working wheels in 2014) were used by Rampart residents to harvest 167 fall chum salmon (841 lb) and 130 coho salmon (672 lb). No salmon were harvested with rod and reel gear.

Table 3-7 shows the estimated salmon harvest for feeding dogs. Although Rampart had a strong tradition of using dog teams for travel, subsistence activities, and racing, there were no dog teams present in the community in 2014. Only pet dogs were present during the study year. Fall chum salmon (467 lb) was the only fish used for dog food during 2014.

Figure 3-11 depicts the search and harvest areas for salmon by Rampart households in 2014. All search and harvest areas for salmon species during the study year occurred in 2 major areas on the Yukon River. The majority of search and harvest occurred within less than 10 miles of the community, stretching from the mouth of Squaw Creek less than 1 mile upriver of Rampart, then passing directly in front of the community and extending approximately 5 miles downriver of Rampart. The other search and harvest location was on the Yukon River approximately 1 mile south of the mouth of Little Dall River near Stevens Village.

Nonsalmon Fish

In pounds of edible weight, humpback whitefish was the top contributor to the nonsalmon fish category in 2014 (41%), followed by burbot (19%) and broad whitefish (17%; Figure 3-12). Sheefish provided 12% of the nonsalmon fish harvest, and Arctic grayling made up 10%. Northern pike contributed a small amount to the harvest (1%). Rampart households harvested total of 1,221 lb (31 lb per capita) of these 6 species in 2014 (Table 3-5). Of these fish, burbot was the most used (by 71% of households) and harvested (71%). All Rampart households that attempted harvest of these 6 nonsalmon species were successful. Only 2 species, northern pike and sheefish, were not shared.

In 2014, Rampart households harvested a total of 1,221 lb of nonsalmon fish using various gear types (Table D3-6). Figure 3-13 is a visual representation of the estimated pounds of nonsalmon fish harvested by gear type. Whitefish species were the only nonsalmon fish harvested by fish wheels. This is likely because there is a fall migration of whitefishes along with fall chum salmon, and they both are caught by fish wheels at the same time. Rampart residents harvested 223 broad and humpback whitefish (490 lb) using fish wheels (Table D3-6). One interview respondent compared using fish wheels to using setnets:

> It's easy with the wheel I mean, versus nets. But then you gotta, you know, a tree [drift wood] comes along and hits your wheel or rips it off, you know. Then you gotta rebuild it again. Put it back on uprights, so…And it's, it could go both ways far as fishing with nets, 'cause, you know, if there's lots of high water and there's lots of drift [drift wood] then you gotta deal with the drift of your net, and same with the fish wheel. If there's lots of drift then you gotta deal with logs getting hung up in your fish wheel, and I mean, it's the way you wanna look at it. You wanna deal with the fish wheel that's always in the water, or you wanna deal with the fish net that you take out and put in to, for twelve hours, until you catch as many fish as you need, and pull it out or whatever. It's just the way you want to fish. Kinda, you know, the way you look at it. (051420151)

One survey respondent noted that only 2 families in the community had used fish wheels as part of their fishing gear during the study year. Whitefishes and sheefish were also harvested by gillnets (98 fish, 317 lb), and humpback whitefish, specifically, were harvested by other methods such as spearing (9 fish, 28 lb). Many families put a whitefish net in the river as soon as the ice goes out in the spring. One survey respondent

Figure 3-10.–Salmon harvests by gear type, Rampart, 2014.

Table 3-7.–Estimated harvests of fish for consumption by dogs, Rampart, 2014.

Resource	Amount	Pounds
Salmon		
Fall chum salmon	92.9 ind	467.3 lb
Total	**92.9 ind**	**467.3 lb**

Source ADF&G Division of Subsistence household surveys, 2015.

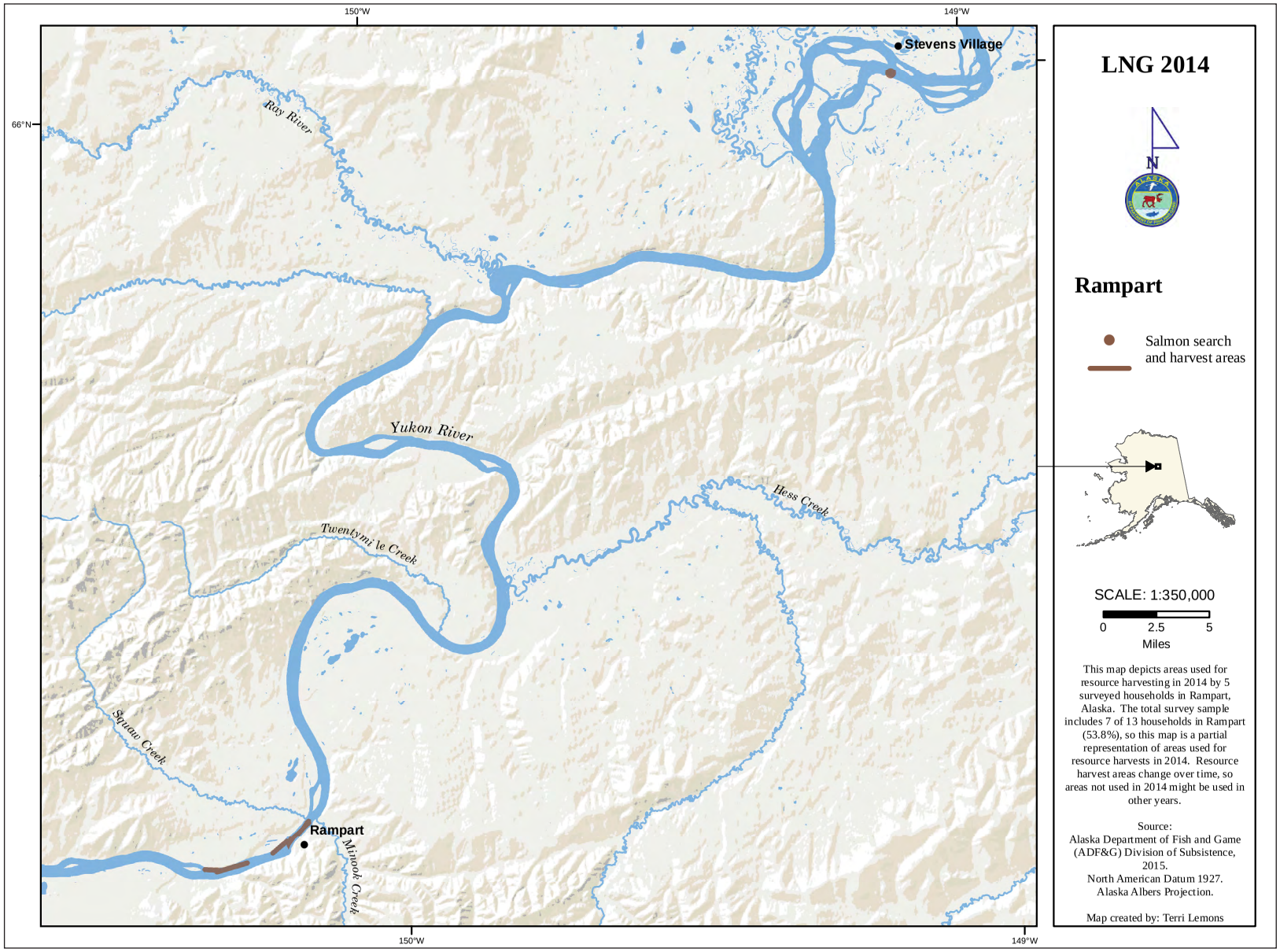


Figure 3-11.–Salmon fishing areas, Rampart, 2014.

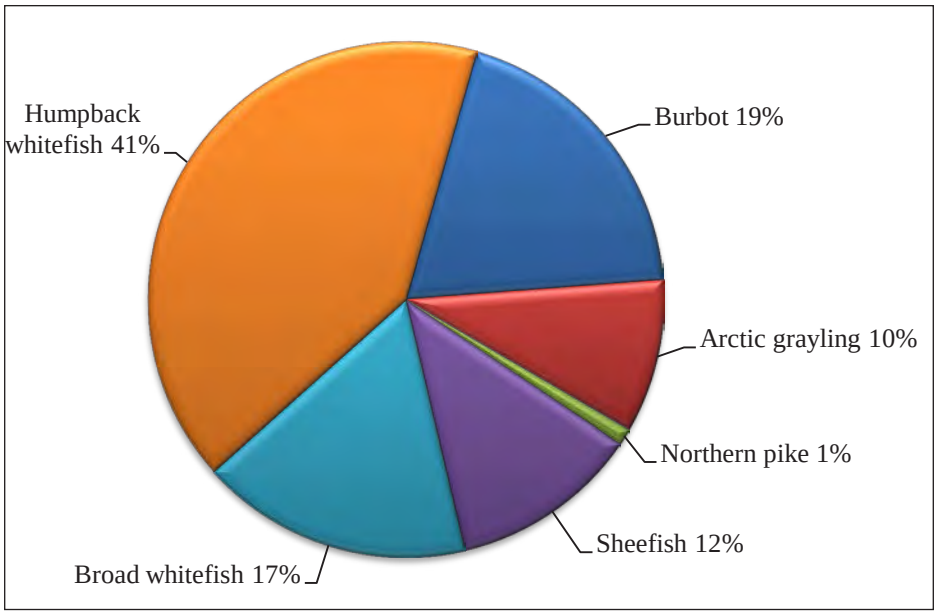


Figure 3-12.–Composition of nonsalmon fish harvest by weight in usable pounds, Rampart, 2014.

stated that his first fishing experience was learning how to check whitefish nets with his mother. When the river is still frozen, residents cut holes in the ice and use jigging gear for nonsalmon fish species. Rampart residents also harvested broad whitefish (6 fish, 8 lb) and humpback whitefish (4 fish, 11 pounds) using rod and reel gear. Fishers sometimes use burbot sets in winter. One interview respondent said, "[We] usually do the lush [burbot] sets, you know, in the middle of winter, fall time after the river freezes you could catch burbot, or we call 'em lush" (051420151). Some households reported that they primarily used spears to harvest burbot (84 fish, 201 lb) in the fall before freeze-up. Spear fishing for burbot is listed under "other method" on Table D3-6. An interview respondent described how he harvests burbot with a spear, "I've got a barb and I just go spearfishing. Yeah, like a little pitch fork, yeah. I'll stand down here in the river [Yukon River] in nighttime when it's dark with a headlamp [and hip boots] and rustle 'em right in" (051420151). Burbot was also harvested using rod and reel gear (15 fish, 36 lb). The only nonsalmon fish species harvested by ice fishing (jigging) during the study year was Arctic grayling. Respondents harvested an estimated 56 (50 lb) Arctic grayling using this method and gear type. They also caught Arctic grayling using rod and reel gear (19 fish, 17 lb). Rod and reel was the only gear type used to harvest northern pike (9 fish, 13 lb).

There was no use of nonsalmon fish species for dog food in 2016 (Table 3-7). However, 1 interview respondent described using some of his whitefish harvest as bait for marten trapping.

> You know, like in the fall time, when…rivers are really cold, before it starts freezing, I'll take my whitefish net again and go set it for a couple of days, across the river, you know, and I'll use—what I use for marten bait is whitefish. So I'll use a crib, I'll get 10–15 whitefish, and I'll just build a little crib from logs or whatever and put them there, and cover 'em with a tarp, and put a piece of tin on it. And that will turn that whitefish into my bait. It'll get stinky, and when it freezes, I'll take it out, and chop it up, and put it in a jar, you know, something I can travel in my backpack and use for marten bait. (051420151)

Figure 3-14 depicts the search and harvest areas for nonsalmon fish by Rampart households in 2014. The majority of nonsalmon fish were harvested in the Yukon River along a 2 to 3 mile length stretching both downriver and upriver from the community. Other areas included 3 distinct locations in the Yukon River near the community of Stevens Village.

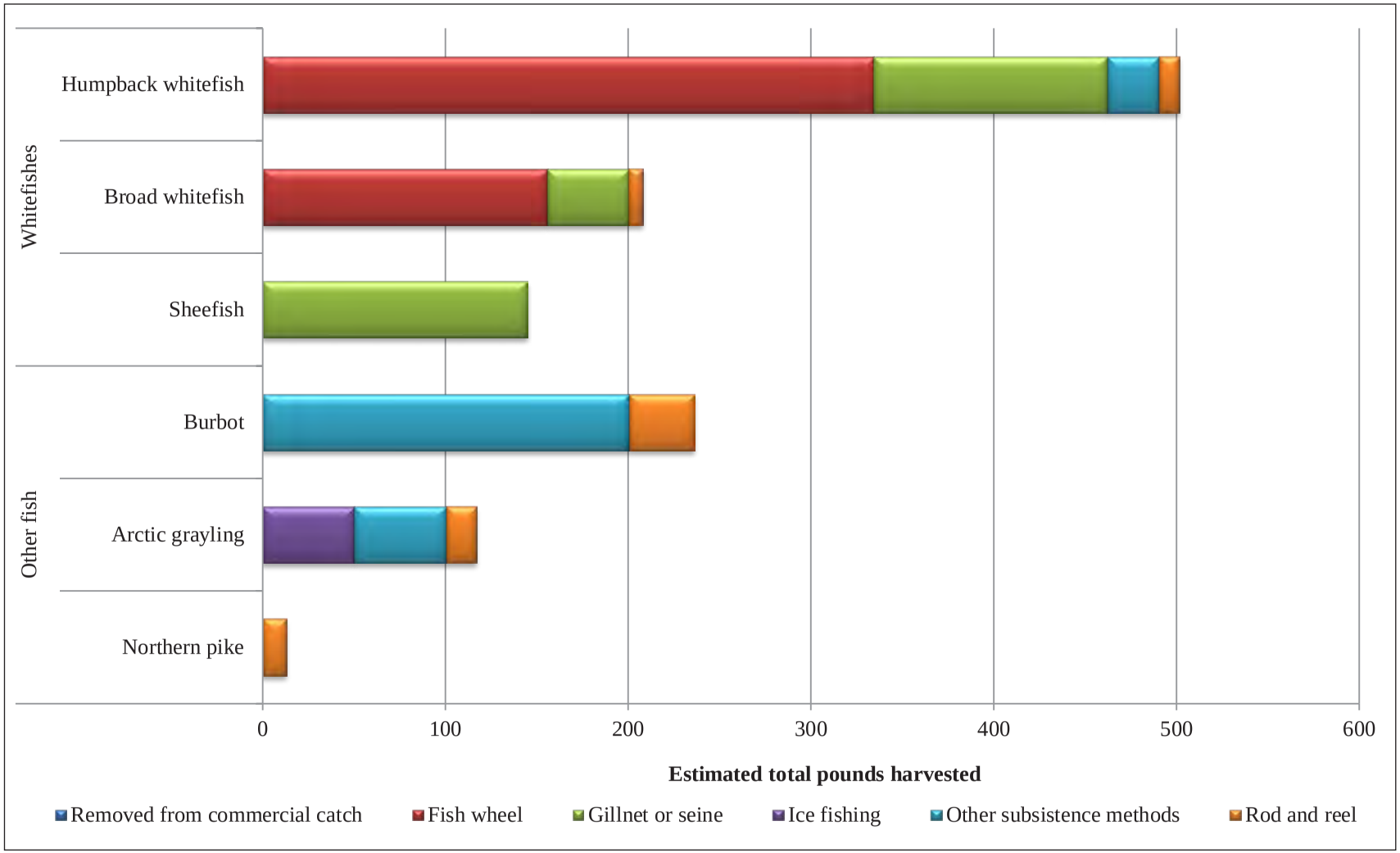


Figure 3-13.–Nonsalmon fish harvests by gear type, Rampart, 2014.

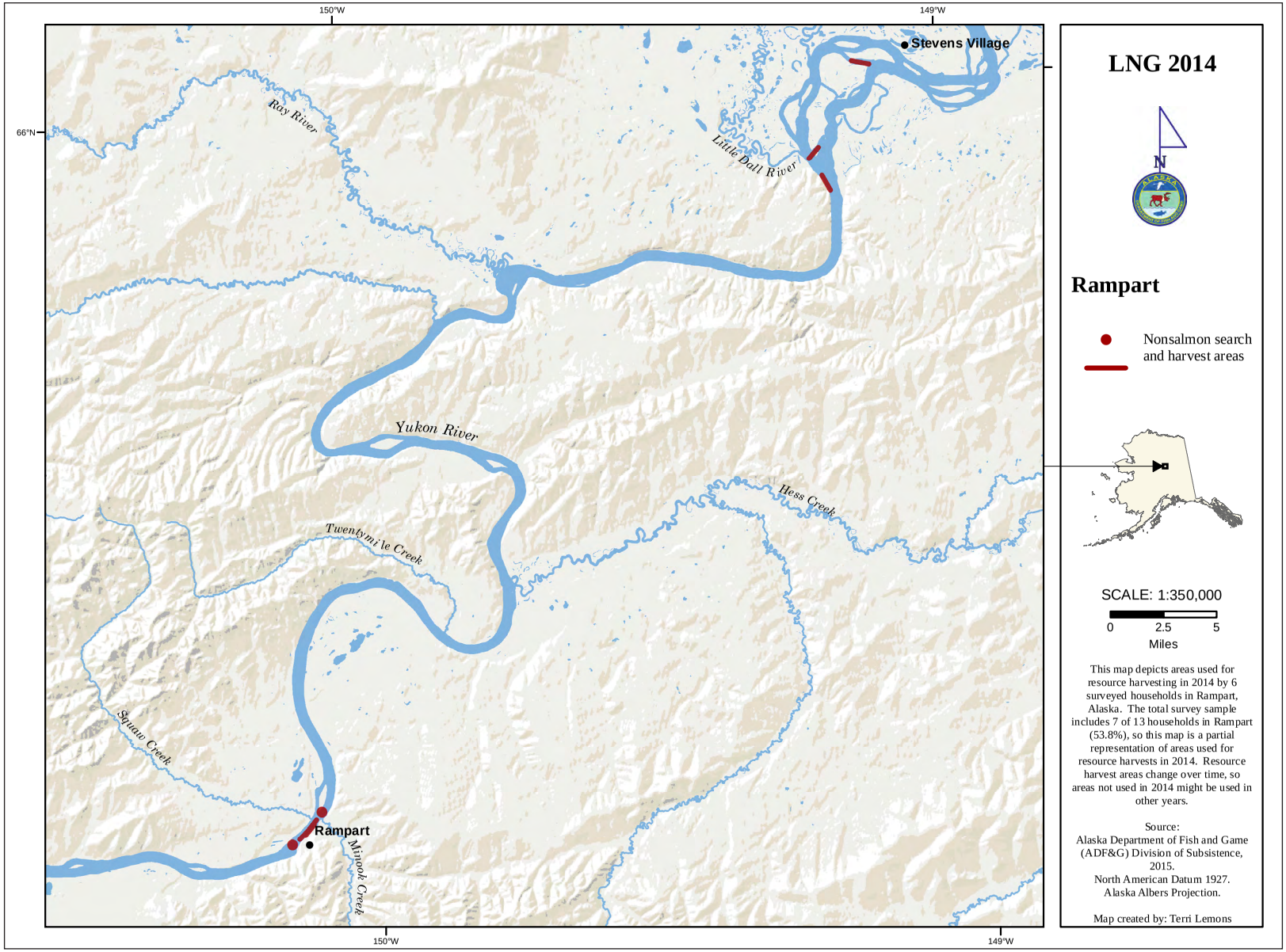


Figure 3-14.–Nonsalmon fishing areas, Rampart, 2014.

Large Land Mammals

The only large land mammal harvested by Rampart residents in 2014 was moose, which was used by 86% of households and harvested by 57% (Table 3-5). Moose contributed 4,011 lb (103 lb per capita) to Rampart. All moose were harvested in the fall months of September and November (Table 3-8). In addition to being an essential, favored wild food, moose meat is also a traditional and important contribution to potlatch ceremonies (Betts 1997:40). One survey respondent confirmed that moose head soup was a favored traditional dish, and that moose nose is considered a delicacy by residents of all ages. Moose hides, while no longer used to make blankets or large clothing items, are still used to make mitts, slippers, and backing for beadwork and other crafts. Hides are sent to commercial processors now, rather than hand processed within the community as in the past.

One interview respondent described how his family participates in moose hunting.

> Well, me personally, I'll go out with my buddies a couple of days here and there, whatever, but most time I'll bring my family up. My wife and my 4 daughters, and go with my nephews and stuff like that. We will go out for a week. (051420151)

He went on to say that he began taking out his oldest daughter out when she was 1 year old, "Now, she is my gunner. I got all daughters so, they need to know what I know…I have 4 daughters: a 20 year-old, 16, 12, and 8…[the 8 year old] is a berry picker." He then explained how he views the cultural and spiritual aspects of hunting moose,

> I want to teach the younger kids around town and stuff, you know, how to take care of the moose, fall-time, you know. I don't consider luck when I go out hunting, it's—to me the way I think about hunting when I get a moose is, I wasn't lucky enough to get a moose, it was that moose offered itself to me—to me. You know, pretty much, because that moose gave itself up for my benefit. So, therefore I got to respect every piece of the moose… what I do is I'll take the moose head and point the head towards where I'm from, you know. If I'm upriver and, the head has to face south to my town, so that moose can look and see where it's going to—so what it's benefiting, you know, it's benefiting my town, the people here. And, that's just the way I think about hunting and trapping…you gotta respect the animals that, you know, those animals offer themselves for my benefit, you know. (051420151)

Table 3-8.–Estimated large land mammal harvests by month and sex, Rampart, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All large land mammals	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**5.6**	**0.0**	**1.9**	**0.0**	**0.0**	**7.4**
Black bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Black bear, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Brown bear, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Sitka black-tailed deer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Sitka black-tailed deer, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Mountain goat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Mountain goat, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Moose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	1.9	0.0	0.0	**7.4**
Moose, bull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	**5.6**
Moose, cow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	**1.9**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep, unknown sex	0.0	0.0	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, 2015.

Figure 3-15 depicts the search and harvest areas for moose by Rampart households in 2014. Although residents are always watching for moose as they travel along the Yukon River by boat, they did not report harvesting along the shores of the river in 2014 except near the community of Stevens Village. Instead, they searched for and harvested moose in 4 distinct areas. The area closest to Rampart was a location approximately 5 miles downriver of the community, on the north side of the Yukon River. This relatively flat area with many ponds is dominated by willow, spruce, and alder. Another area close to Rampart was near the mouth of Hess Creek, located upriver and northeast of Rampart. Hunters accessed this tributary of the Yukon River by boat. The Hess Creek area has a history of moose hunting activity by Rampart residents, as evidenced by mapping data recorded in a 1997 report (Betts 1997). A third area was located on a wooded tributary of the West Fork of the Tolovana River, southeast of the community. The area farthest from Rampart was a location along the Yukon River near the community of Stevens Village approximately 46 miles upriver from and to the northeast of Rampart.

Small Land Mammals/Furbearers

In pounds of edible weight, beaver was the top contributor (82%) to the small land mammals category in 2014, followed by snowshoe hare (18%; Figure 3-16). Beaver added 139 lb (4 lb per capita) to the total amount of wild foods for Rampart in 2014; 29% of households reported harvesting and using beaver (Table 3-5). Beaver was harvested both for food and fur (Figure 3-17). Snowshoe hare added 30 lb (1 lb per capita) and was also used and harvested by 29% of Rampart's households. Beavers were harvested in the spring months of March and April, and snowshoe hares were harvested in January and October (Table 3-9). Six martens were harvested for their fur, but were not eaten (Table 3-5). Martens were harvested in December when their fur was at its prime (Table 3-9). One interview respondent described trapping martens for their fur:

> First I just trap for marten, you know, like in the fall time…I just catch marten, 'cause for my kids; hats and stuff like that …yeah, just for the fur. Fur clothing, mostly, I mean I don't, I rarely sell my marten. I just use it for, just like hats, mitts, and, you know, stuff like that. (051420151)

When asked who did fur sewing in Rampart he said, "Every woman in town," and he went on to say that the men also knew how to sew fur. "When the school was open, they had sewing night once a week and then, we had to go, growing up. So, I know to do beading, I know how to sew fur and stuff like that too" (051420151). This respondent also stated that trapping is no longer done as much as it was in the past, even within his lifetime.

> Used to trap with my cousin. We had, you know, a good 20 miles of trap line, but anymore, I mean…in high school that's how we made our money. Trapping, you know…but we used to, that's all we did in high school. That's how we made money in winter is just trapping. (051420151)

He attributed a downturn in trapping to falling fur prices and the increasing price of gas for his snowmachine.

Figure 3-18 depicts the search and harvest areas for small land mammals in 2014. Three major areas were used for the search and harvest of small land mammals in 2014. The immediate area in and around the community was utilized to a great extent. According to respondents, small land mammals were both actively searched for and also opportunistically harvested in this location. Respondents also extensively used the area around the mouth of Squaw Creek directly across the Yukon River from the community. The farthest area from the community was northeast of Rampart in the wetlands just north of Stevens Village.

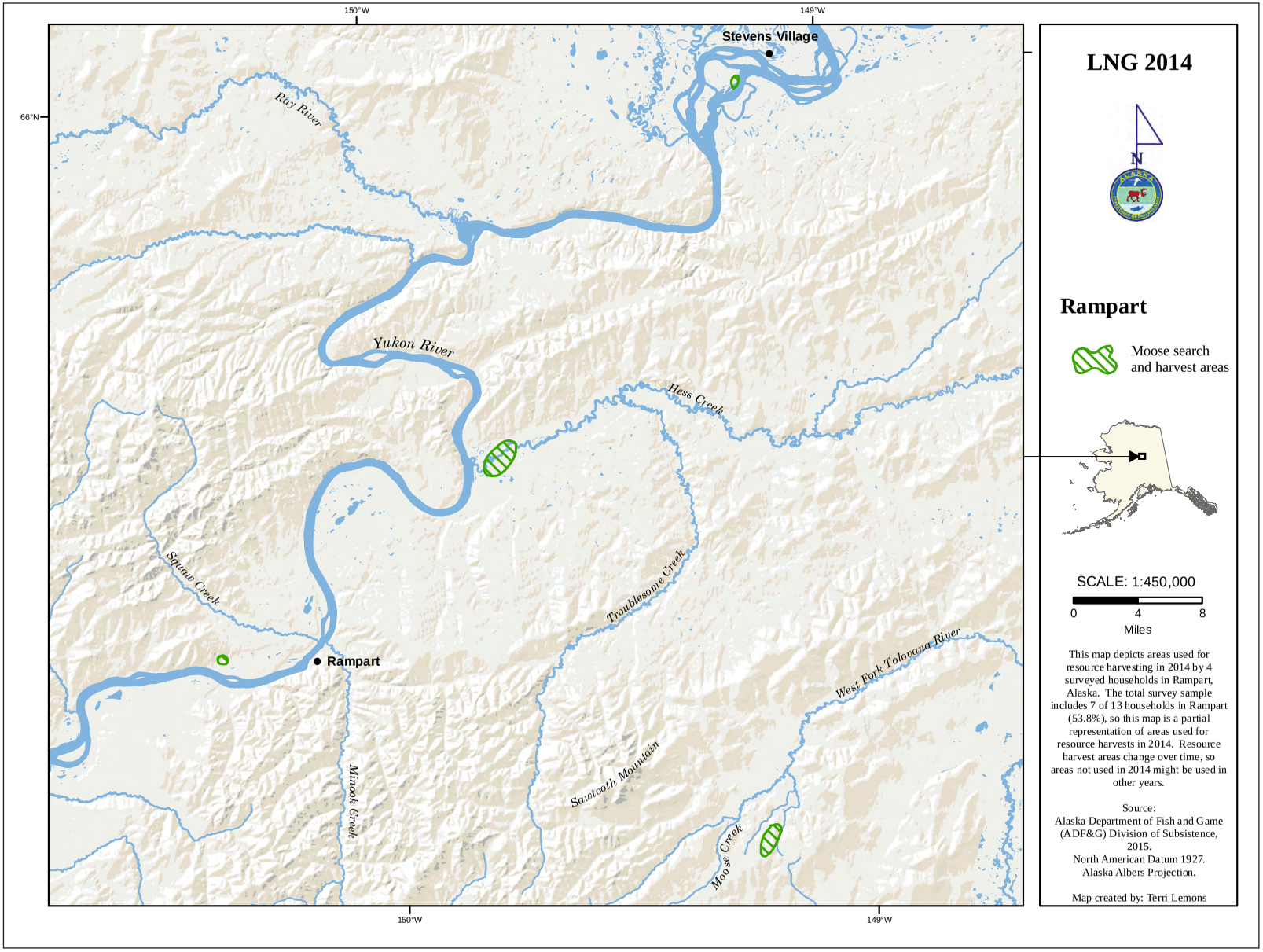


Figure 3-15.–Large land mammal hunting areas, Rampart, 2014.

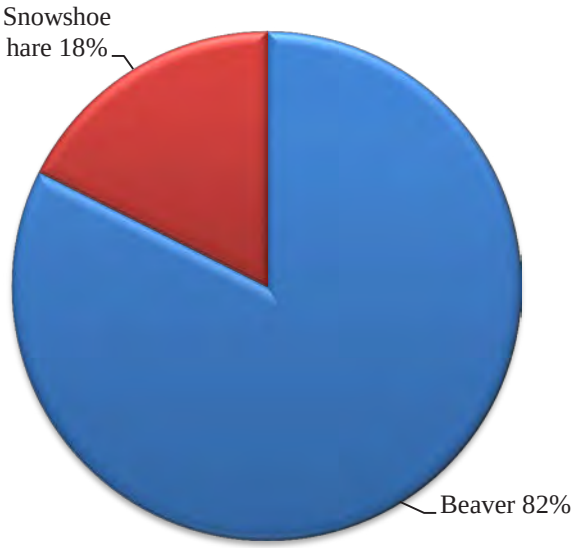


Figure 3-16.–Composition of small land mammal harvest by weight in usable pounds, Rampart, 2014.

Table 3-9.–Estiamted small land mammal/furbearer harvests by month, Rampart, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All small land mammals	**11.1**	**0.0**	**1.9**	**7.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**3.7**	**0.0**	**5.6**	**0.0**	**29.7**
Beaver	0.0	0.0	1.9	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**9.3**
Coyote	0.0	0.0	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–cross phase	0.0	0.0	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–red phase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Snowshoe hare	11.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	**14.9**
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	**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	**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	**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	5.6	0.0	**5.6**
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	**0.0**
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	**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	**0.0**
Red (tree) 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	**0.0**
Weasel	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**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	**0.0**

Source ADF&G Division of Subsistence household surveys, 2015.

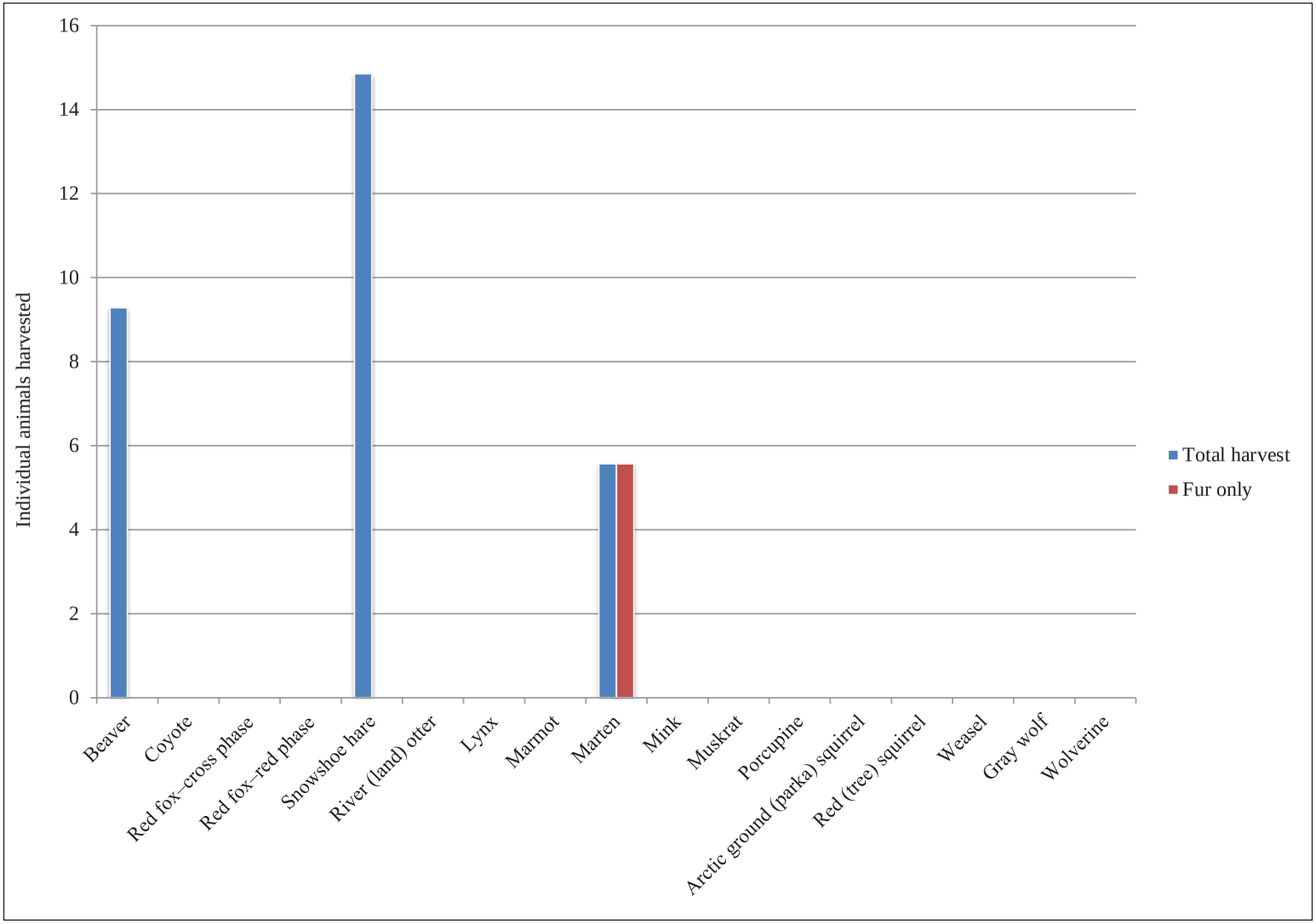


Figure 3-17.–Estimated small land mammal harvests for fur or food, Rampart, 2014.

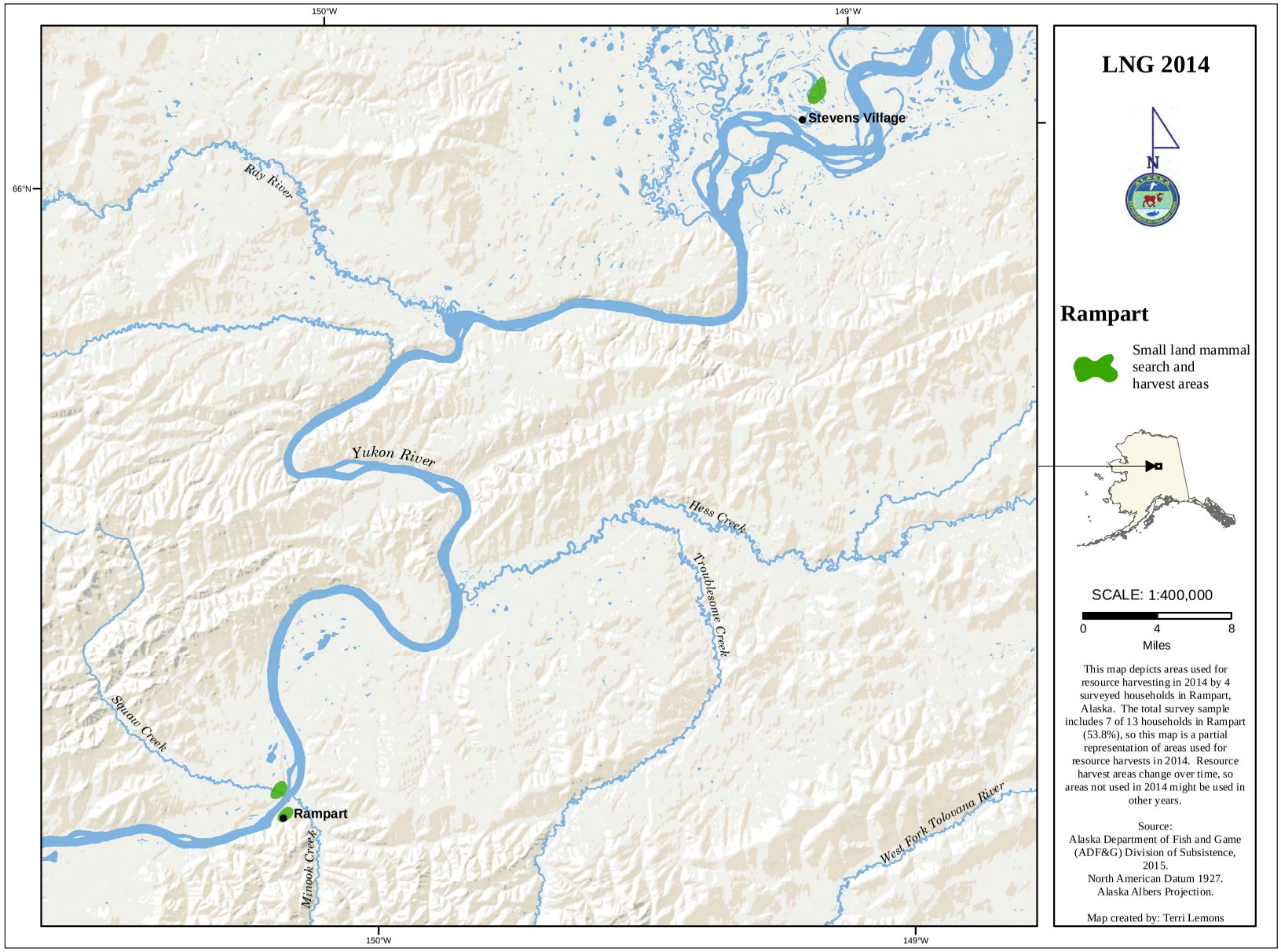


Figure 3-18.–Small land mammal hunting areas, Rampart, 2014.

Marine Mammals

Rampart residents did not hunt or harvest marine mammals in 2014. Rampart is an inland community situated along the Yukon River. Its distance from coastal areas and subsequent expense involved in traveling to coastal areas precluded any marine mammal hunting trips in 2014. However, whale (*muktuk*), seal meat, and seal oil were received from coastal areas. Fifty-seven percent of households received and used marine mammals or marine mammal products in 2014 (Table 3-5).

Birds and Eggs

In pounds edible weight, white-fronted geese contributed the most (52%) to the birds and eggs category for Rampart in 2014. These were followed by Canada or cackling geese (14%), black scoters (12%), spruce grouse (11%), mallards (9%), and northern pintails (2%; Figure 3-19). Although white-fronted geese contributed the most edible weight, Canada geese were the most used (57%) and received (57%; Table 3-5). White-fronted geese contributed 173 lb (4 lb per capita), and Canada geese contributed 47 lb (1 lb per capita) to the harvest. All bird species except spruce grouse were harvested during the spring migration (Table 3-10). Spruce grouse, available year-round, were harvested in winter and fall. No bird eggs were reported harvested or received by any household in 2014 (Table 3-5).

According to respondents, geese and black scoters (locally known as black ducks) are the first birds to arrive at the beginning of spring migration. Spring waterfowl brings a welcome fresh addition to the diets of residents after a long winter of eating stored wild foods and store-bought fare. One interview respondent explained how his family waits for prime specimens, rather than harvesting the first birds that appear.

> Yes, black ducks, uh, we usually will wait for the later ones, you know these first ones that come through they're kinda an early bunch, but we wait for the second ones that come through because they're a lot bigger and, you know, they are bigger ducks. (051420151)

He went on to describe how he processes his waterfowl harvest:

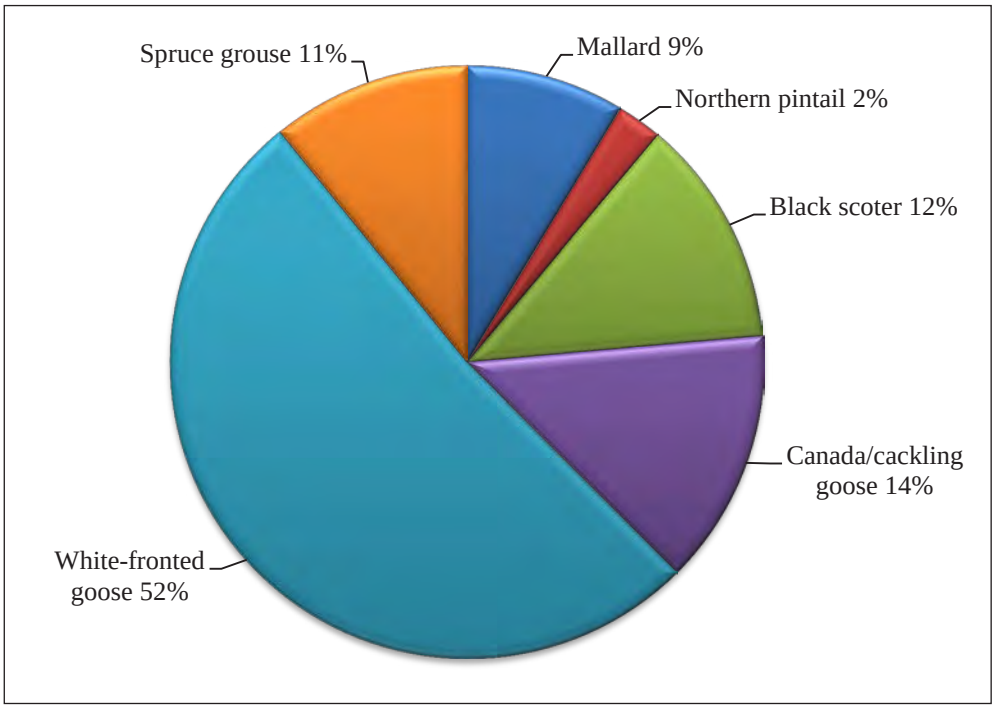


Figure 3-19.–Composition of bird harvest by weight in usable pounds, Rampart, 2014.

Table 3-10.–Estimated bird harvests by season, Rampart, 2014.

	Estimated harvest by season					
Resource	Spring	Summer	Fall	Winter	Season unknown	**Total**
All birds	**146.7**	**0.0**	**14.9**	**37.1**	**0.0**	**198.7**
Canvasback	0.0	0.0	0.0	0.0	0.0	**0.0**
Spectacled eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Goldeneye	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	14.9	0.0	0.0	0.0	0.0	**14.9**
Northern pintail	5.6	0.0	0.0	0.0	0.0	**5.6**
Black scoter	46.4	0.0	0.0	0.0	0.0	**46.4**
Green-winged teal	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown ducks	0.0	0.0	0.0	0.0	0.0	**0.0**
Brant	0.0	0.0	0.0	0.0	0.0	**0.0**
Canada/cackling goose	39.0	0.0	0.0	0.0	0.0	**39.0**
Canada goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Snow goose	0.0	0.0	0.0	0.0	0.0	**0.0**
White-fronted goose	40.9	0.0	0.0	0.0	0.0	**40.9**
Unknown geese	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	0.0	0.0	0.0	0.0	0.0	**0.0**
Sandhill crane	0.0	0.0	0.0	0.0	0.0	**0.0**
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Spruce grouse	0.0	0.0	14.9	37.1	0.0	**52.0**
Sharp-tailed grouse	0.0	0.0	0.0	0.0	0.0	**0.0**
Ruffed grouse	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown grouses	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown ptarmigans	0.0	0.0	0.0	0.0	0.0	**0.0**
Snowy owl	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2015.

> The way I do it, as far as I get waterfowl…I was raised up to bring 'em home ready to put in the pot to cook it. I mean, the way my dad raised me up is you clean the birds up, you pluck 'em. I don't let my wife or my mother or anybody pluck my ducks or anything like that. I mean, I shot 'em, I clean 'em up, I bring 'em to them [wife or mother]. They cook 'em for me. (051420151)

According to respondents, duck soup and smoked goose are traditional and favored dishes.

Figure 3-20 depicts areas used for the search and harvest for birds in 2014. Rampart residents hunted birds in 4 general locations during the study year. The area closest to the community was in and around the community itself, particularly the mouth of Minook Creek where it empties into the Yukon River near Rampart's airstrip. The flight path of the spring migration of waterfowl passes along the Yukon River directly in front of the community, and black scoters and Canada geese often land on the river itself around various sandbars (Betts 1997). Spruce grouse were exclusively harvested around and within the community itself. Another major location for waterfowl hunting was Fish Lake, a large lake located in a wetland area southwest of Rampart, close to the community of Manley Hot Springs. Two additional areas for waterfowl hunting were located on the Yukon River near the community of Stevens Village, several miles upriver from Rampart.

Marine Invertebrates

Rampart residents neither harvested nor used marine invertebrates in 2014 (Table 3-5).

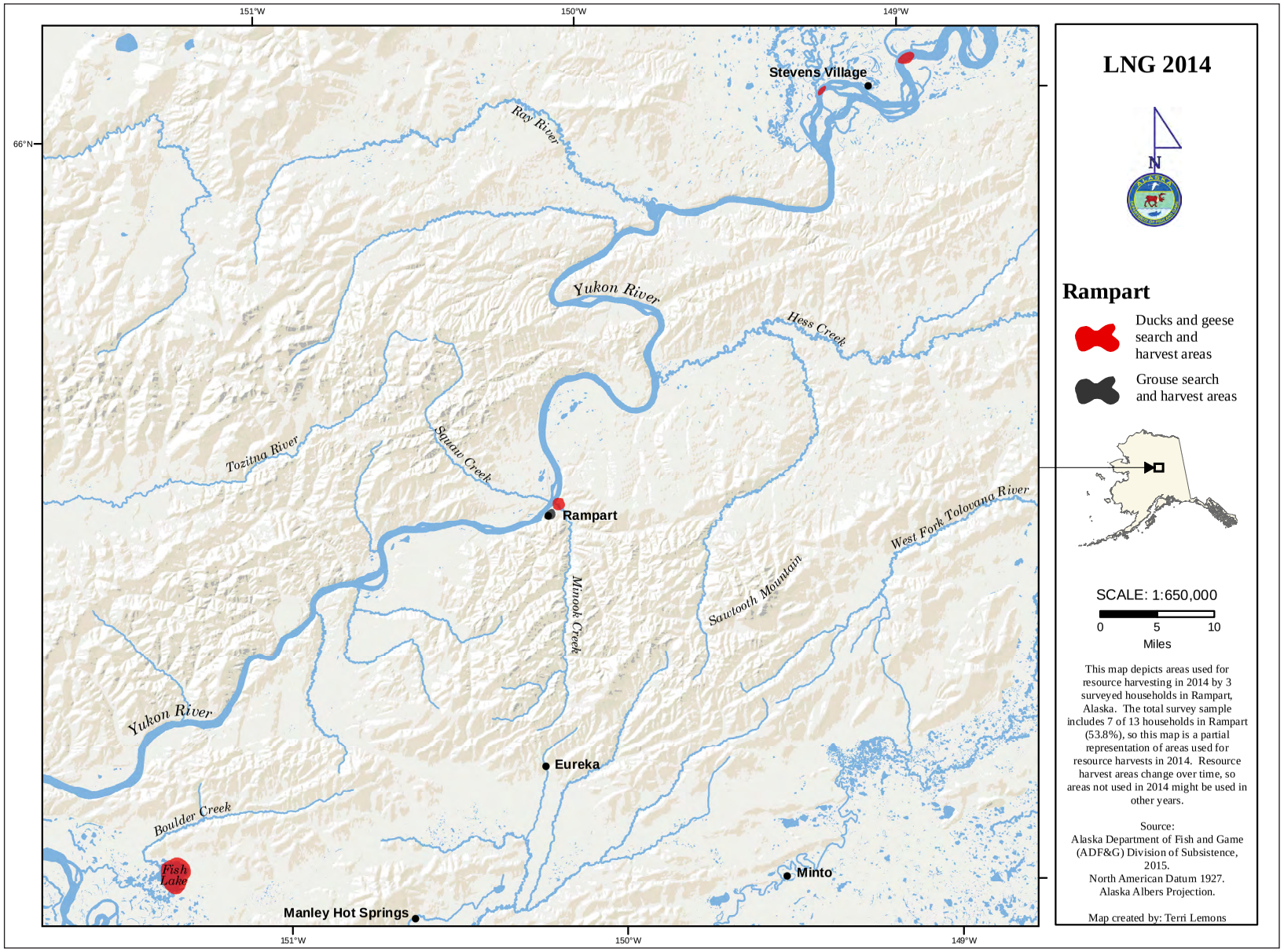


Figure 3-20.–Bird hunting areas, Rampart, 2014.

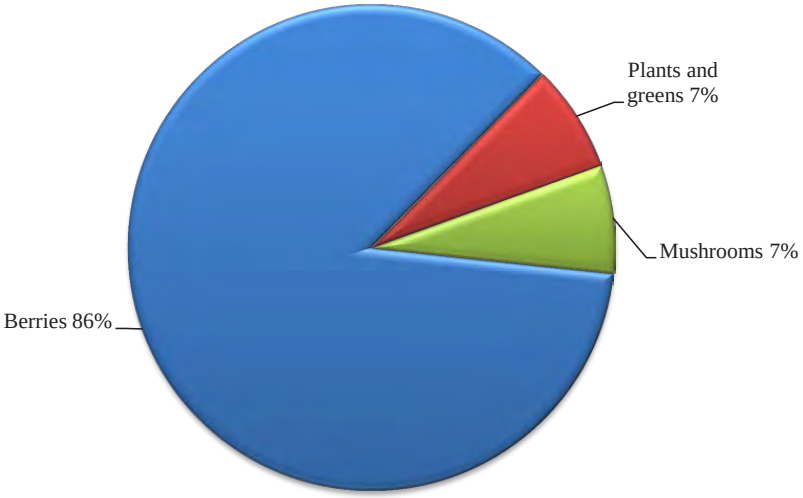


Figure 3-21.–Composition of vegetation harvest by weight in usable pounds, by type of vegetation, Rampart, 2014.

Vegetation

Berries contributed the majority of edible weight to the vegetation category for Rampart households in 2014 (86%). Plants and greens and mushrooms each constituted 7% of the vegetation harvest (Figure 3-21). Blueberries were the most used (43%) and the most received (43%) type of berry. They contributed 19 lb (0.5 lb per capita) to Rampart's total harvest. Other berries used and harvested included lowbush cranberries and raspberries (Table 3-5). As stated earlier, 2014 was not a good berry year. One interview respondent stated, "Blueberries, raspberries are pretty sparse. Salmonberries [cloudberries], you could find little patches every once in a while" (051320153). Several respondents reported that vegetation such as feral strawberries and onions was still growing in small amounts at the site of the old agricultural station across the Yukon River from Rampart (Wiehl and Rampart Tribal Council 2014). However, there was no report of any harvest or use of these feral plants in 2014. Some respondents stated that a growing familiarity with the different types of edible mushrooms available in their area (and how to identify those species that were safe to eat) was gradually leading to an increase in mushroom harvest and use in recent years.

Figure 3-22 depicts the search and harvest of vegetation by Rampart residents in 2014. Households did not travel far for their vegetation needs during the study year. All search and harvest occurred in and within approximately 1 mile of the community. The longest distance occurred from the center of the community to Minook Creek near Rampart's airstrip. Because this entire area is within walking distance of the community, residents gathered berries and other vegetation with little cash expense. Although respondents only reported gathering vegetation in the area around the community in 2014, one interview respondent stated that berry picking often occurred in conjunction with other subsistence activities in other locations.

> [We] camp out for a week…[wife and kids] they'll gather berries and stuff like that when we're, you know, when we're not hunting [moose]. You know, [moose will] travel around, they'll eat stuff in evening time and the morning. So, during the day, when it's hot, we'll pick cranberries, blueberries, whatever, you know, stuff like that. Put that away. So, and sometimes we hunt again [for moose] at night. (051420151)

Most respondents reported that plants other than berries were not gathered as much now as in the past. Some residents still gathered Labrador tea and wild rhubarb, but not to a great extent. Most residents had gardens, and they considered produce from those gardens as subsistence foods along with the wild foods they harvested. Some respondents felt that climate change was responsible for the decline in vegetation resources, particularly berries.

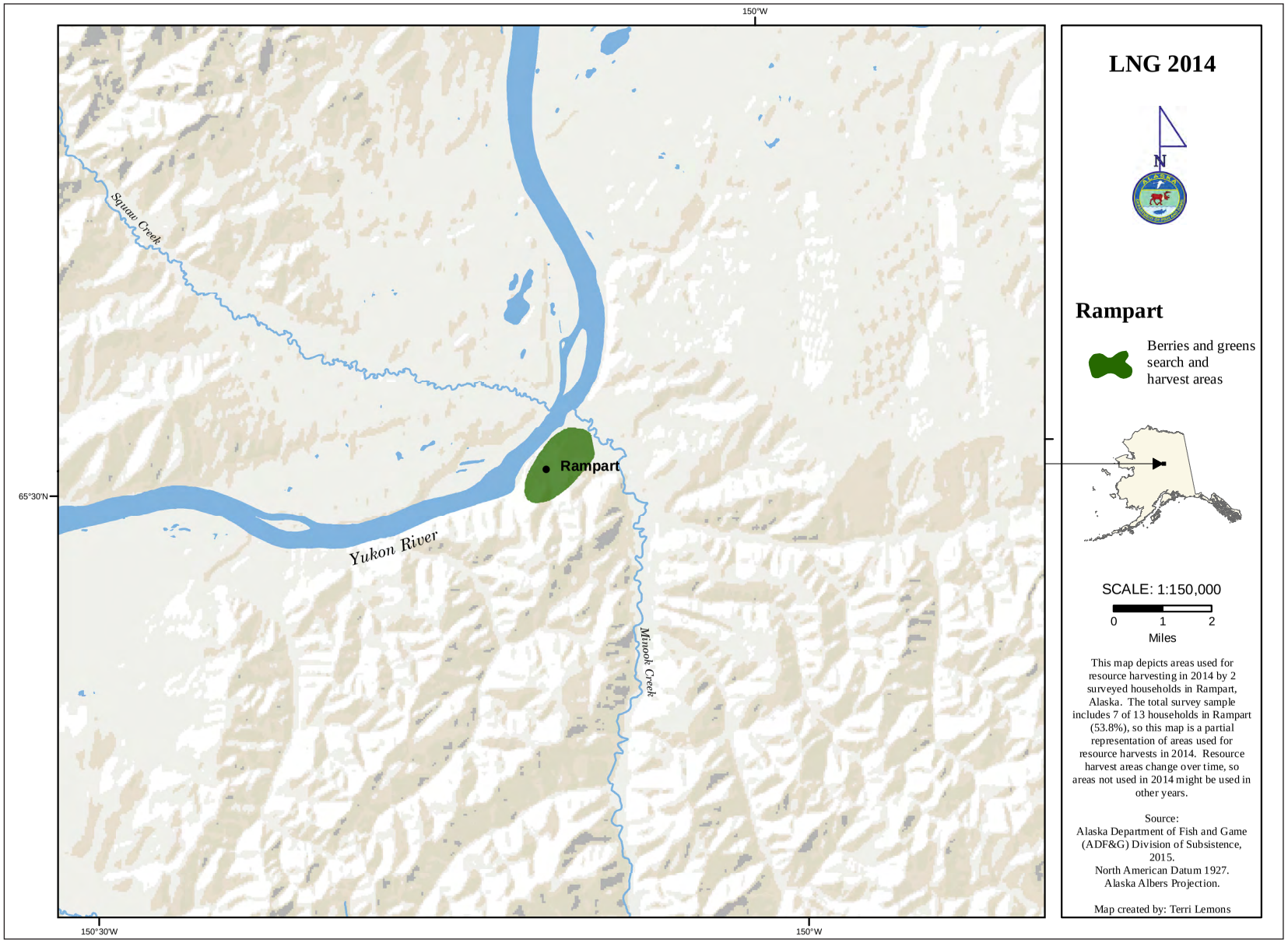


Figure 3-22.–Berries and greens gathering areas, Rampart, 2014.

Table 3-11.–Use of firewood for home heating, Rampart, 2014.

Percentage of home heating from wood	Rampart households	
	Number	Percentage
0%	1	14.3
1–25%	1	14.3
26–50%	0	0.0
51–75%	2	28.6
76–99%	3	42.9
100%	0	0.0

Source ADF&G Division of Subsistence household surveys, 2015.

Although wood is not eaten, it is a wild resource used for many purposes including firewood for smoking fish and heating homes. Table 3-11 shows the percentage of Rampart residents' home heating needs that are met with the use of firewood.

Production and Distribution of Wild Resources

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.

In the 2014 study year in Rampart, about 62% of the harvest of wild resources as estimated in pounds usable weight was harvested by 29% of the community's households (Figure 3-23). Further analysis of the study findings, beyond the scope of this report, might identify characteristics of the highly productive households in Rampart and the other study communities.

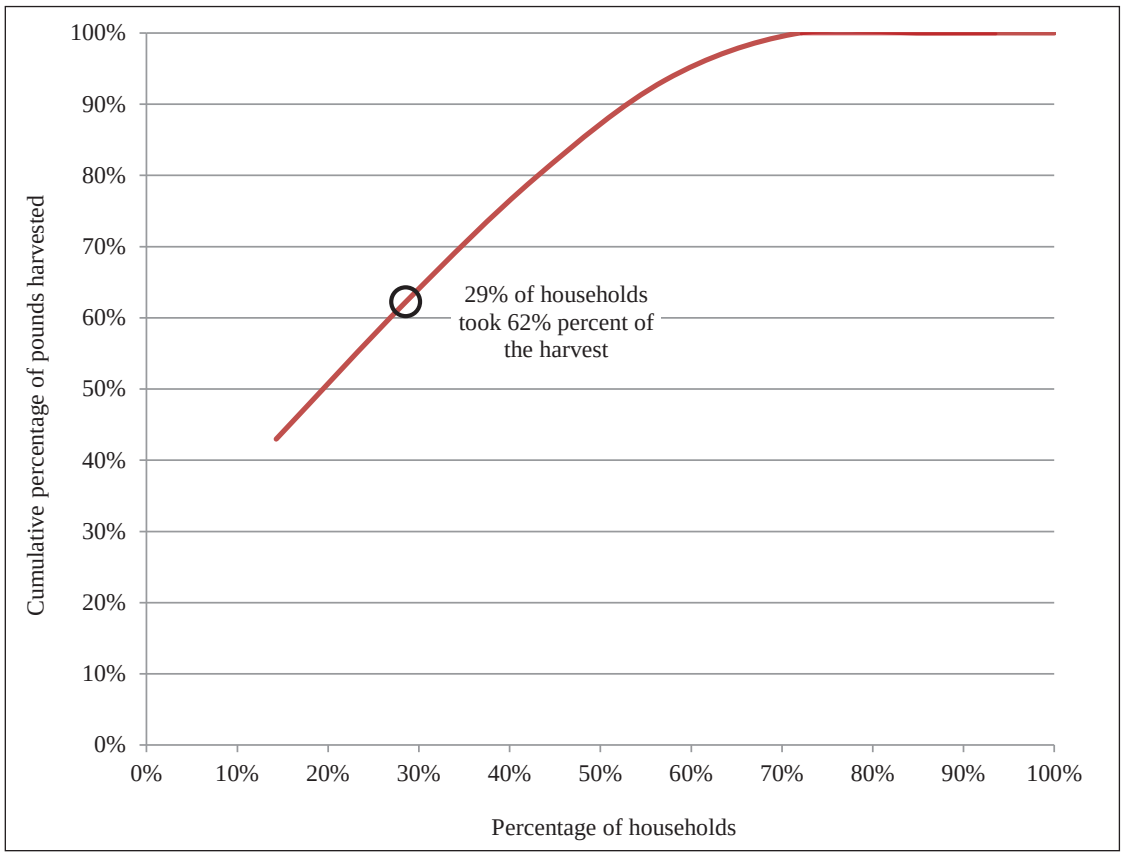


Figure 3-23.–Household specialization, Rampart, 2014.

Income and Cash Employment

Survey respondents were asked about both earned income (jobs held and wages earned by all household members aged 16 years and older) and unearned income from sources such as the Alaska Permanent Fund dividend, Social Security, and public assistance. Although there were 10 employed adults in the community in 2014, not all households with employed adults felt comfortable providing their incomes. Therefore, Figure 3-24, a visual depiction of the top sources of income for the community, does not include earned income. Of unearned income, the Alaska Permanent Fund dividend (87%) was the top income source for Rampart in 2014. Rampart's total community income (excluding wages earned) for 2014 was $80,041 (Table 3-12). The Alaska Permanent Fund contributed $69,977 to the community, followed by Native corporation dividends ($6,435). The American Community Survey (ACS) estimated that the median income for Rampart was $45,000 for the period 2010–2014, and the median income for all of Alaska was $70,760.[3] Although wages were not disclosed, households reported that of the 10 community members who were employed, all were employed by local and tribal governments (Table 3-13). Fifty percent of these specified that they worked in transportation and material moving occupations. All of these jobs were full time positions (Table 3-14). In 2014, 35% of Rampart adults were employed (Table 3-15). The mean number of weeks worked by employed adults was 17. For all adults in the community, the mean number of weeks employed was 6. On the household level, there was a mean of 0.8 jobs per household.

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). 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

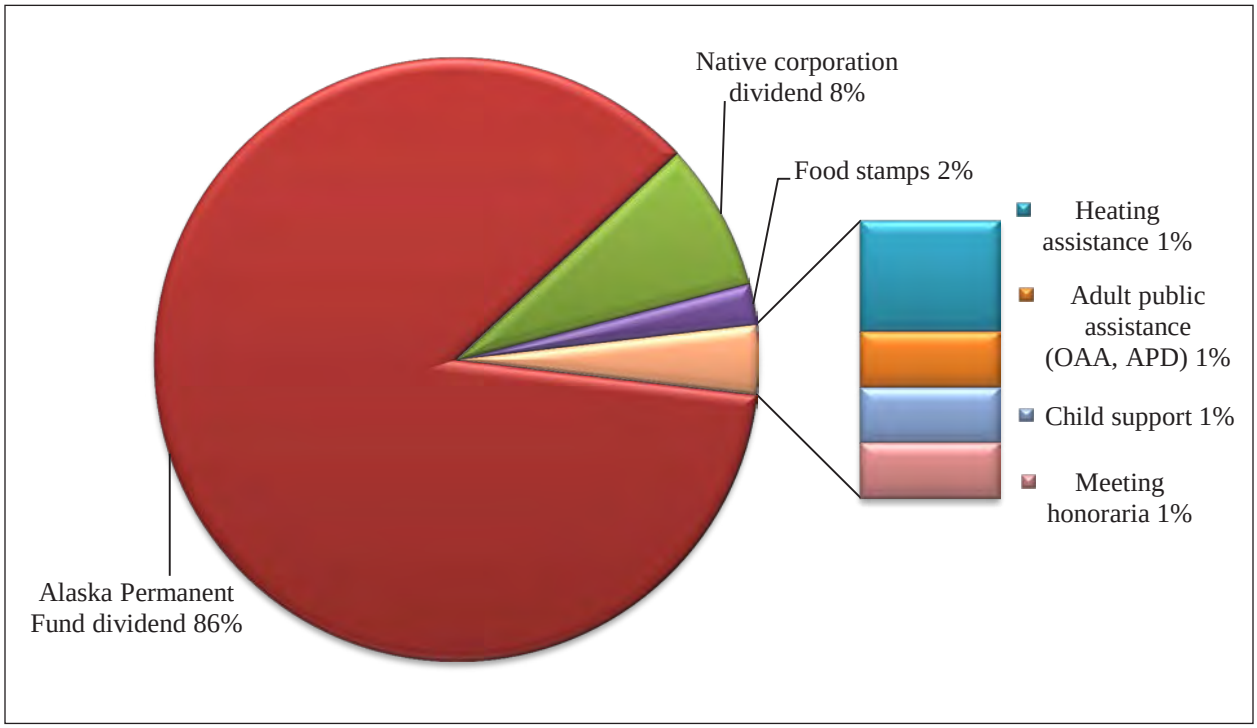


Figure 3-24.–Top income sources, excluding earned income, Rampart, 2014.

3. U.S. Census Bureau, Washington, D.C., n.d. "American FactFinder: Rampart CDP, Alaska." Accessed November 9, 2016. http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

Table 3-12.–Estimated income, excluding earned income, Rampart, 2014.

Income source	Number of employed adults	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government, including tribal	9.8	13.0	$0	$0 – $0	$0	0.0%
Earned income subtotal	**9.8**	**13.0**	**$0**	**$0 – $0**	**$0**	**0.0%**
Other income						
Alaska Permanent Fund dividend		13.0	$69,977	$52,483 – $97,968	$5,383	87.4%
Native corporation dividend		13.0	$6,435	$3,358 – $6,435	$495	8.0%
Food stamps		5.6	$1,787	$507 $3,333	$137	2.2%
Heating assistance		3.7	$1,192	$0 $2,495	$92	1.5%
Adult public assistance (OAA,		1.9	$596	$0 $2,015	$46	0.7%
Child support		1.9	$27	$0 $752	$2	0.0%
Meeting honoraria		1.9	$27	$0 $752	$2	0.0%
TANF (Temporary Assistance for Needy Families)		0.0	$0	$0 – $0	$0	0.0%
Supplemental Security Income		0.0	$0	$0 – $0	$0	0.0%
Longevity bonus		0.0	$0	$0 – $0	$0	0.0%
Pension / retirement		0.0	$0	$0 – $0	$0	0.0%
Social Security		0.0	$0	$0 – $0	$0	0.0%
Workers' compensation / insurance		0.0	$0	$0 – $0	$0	0.0%
Unemployment		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%
Other		0.0	$0	$0 – $0	$0	0.0%
Foster care		0.0	$0	$0 – $0	$0	0.0%
CITGO fuel voucher		0.0	$0	$0 – $0	$0	0.0%
Other income subtotal		**13.0**	**$80,041**	**$60,737 – $109,312**	**$6,157**	**100.0%**
Community income total			**$80,041**	**$60,737 – $109,312**	**$6,157**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.

Table 3-13.–Employment by industry, Rampart, 2014.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**9.8**	**13.0**	**9.8**	**0.0%**
Local government, including tribal	**100.0%**	**100.0%**	**100.0%**	**0.0%**
Transportation and material moving occupations	50.0%	50.0%	50.0%	0.0%
Occupation not indicated	50.0%	50.0%	50.0%	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.
Note Wage earnings are not included to preserve confidentiality.

Table 3-14.–Reported job schedules, Rampart, 2014.

	Jobs		Employed persons		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full time	9.8	100.0%	9.8	100.0%	13.0	100.0%

Source ADF&G Division of Subsistence household surveys, 2015.

Table 3-15.–Employment characteristics, Rampart, 2014.

	Community
Characteristic	Rampart
All adults	
Number	28
Mean weeks employed	6.1
Employed adults	
Number	9.8
Percentage	35%
Jobs	
Number	9.8
Mean	1
Minimum	1
Maximum	1
Months employed	
Mean	4
Minimum	4
Maximum	4
Percentage employed year-round	0%
Mean weeks employed	17.3
Households	
Number	13
Employed	
Number	13
Percentage	100%
Jobs per employed household	
Mean	0.8
Minimum	1
Maximum	1
Employed adults	
Mean	
Employed households	0.8
Total households	0.8
Minimum	1
Maximum	1
Mean person-weeks of employment	13

Source ADF&G Division of Subsistence household surveys, 2015.

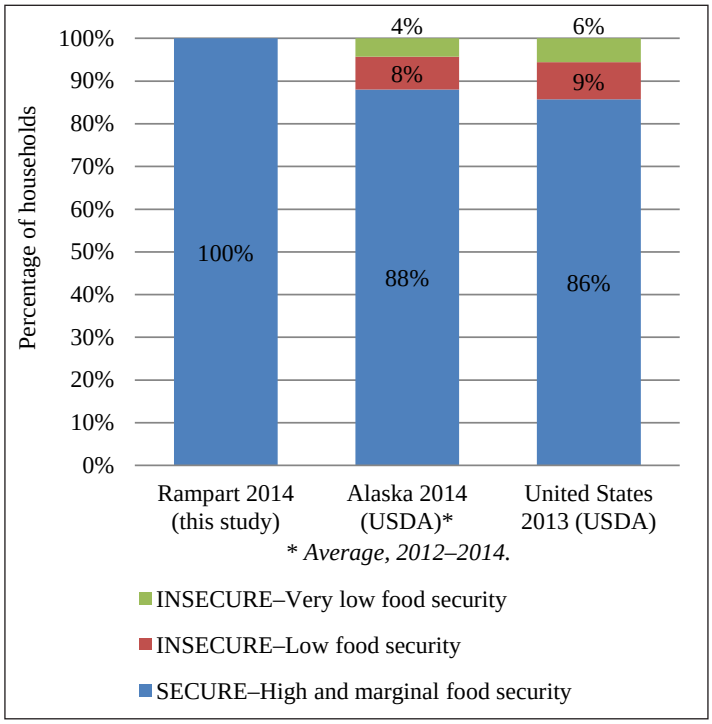


Figure 3-25.–Comparison of food security categories, Rampart, 2014.

Table 3-16.–Household descriptions of food eaten in the last 12 months, Rampart, 2014.

Statement	Percentage of affirmative responses
Had enough of the kinds of food desired	28.6%
Had enough food, but not the desired kind	71.4%
Somestimes, or often, did not have enough food	0.0%
Missing/No response	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.

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. Because of the limited number of surveys conducted, the entirety of Rampart's food security data will not be published due to respondent confidentiality issues. However, the overall assessment for Rampart was that the community was food secure (100%) as compared with Alaska and the United States in general (Figure 3-25). Seventy-one percent of households had enough food, but not the desired kind (wild foods), and 29% had enough of the kinds of food they desired (Table 3-16).

Comparing Harvests and Uses in 2014 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 2 ways: whether they got more, less, or about the same amount of 8 resource categories in 2014 as in the past 5 years, and whether they got "enough" of each of the 8 resource categories. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different subsistence resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 3-17, Figure 3-26, and Figure 3-27 provide a broad overview of households' assessments of their harvests in 2014. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category chose not to answer questions.

Figure 3-26 shows the percentages of households that used less wild foods in 2014 than in recent years, percentages of households that used more, and percentages of those that used about the same amount. For all resource categories combined, 71% of Rampart households said that they used less in 2014, and 29% said that they used about the same amount as in recent years; no households reported using more. Of the individual resource categories, 71% of responding households noted that they used less salmon in 2014 as they did in previous years, likely due to restriction on subsistence Chinook salmon fishing; 29% reported that they used about the same amount. No household reported using more salmon (Table 3-18; Figure 3-26). Seventy-one percent of respondents reported that that they did not get enough salmon (Figure 3-27).

Table 3-17.–Changes in household uses of resources of resources compared to recent years, Rampart, 2014.

			Households reporting use								Households not using	
			Total households		Less		Same		More			
Resource category	Sampled households	Valid responses[a]	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	7	7	7	100.0%	5	71.4%	2	28.6%	0	0.0%	0	0.0%
Salmon	7	7	7	100.0%	5	71.4%	2	28.6%	0	0.0%	0	0.0%
Nonsalmon fish	7	4	4	100.0%	0	0.0%	3	75.0%	1	25.0%	0	0.0%
Large land mammals	7	7	7	100.0%	1	14.3%	6	85.7%	0	0.0%	0	0.0%
Small land mammals	7	7	7	100.0%	3	42.9%	3	42.9%	1	14.3%	0	0.0%
Marine mammals	7	7	4	57.1%	0	0.0%	4	57.1%	0	0.0%	3	42.9%
Birds	7	6	4	66.7%	0	0.0%	4	66.7%	0	0.0%	2	33.3%
Marine invertebrates	7	6	1	16.7%	1	16.7%	0	0.0%	0	0.0%	5	83.3%
Vegetation	7	5	5	100.0%	4	80.0%	1	20.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response.

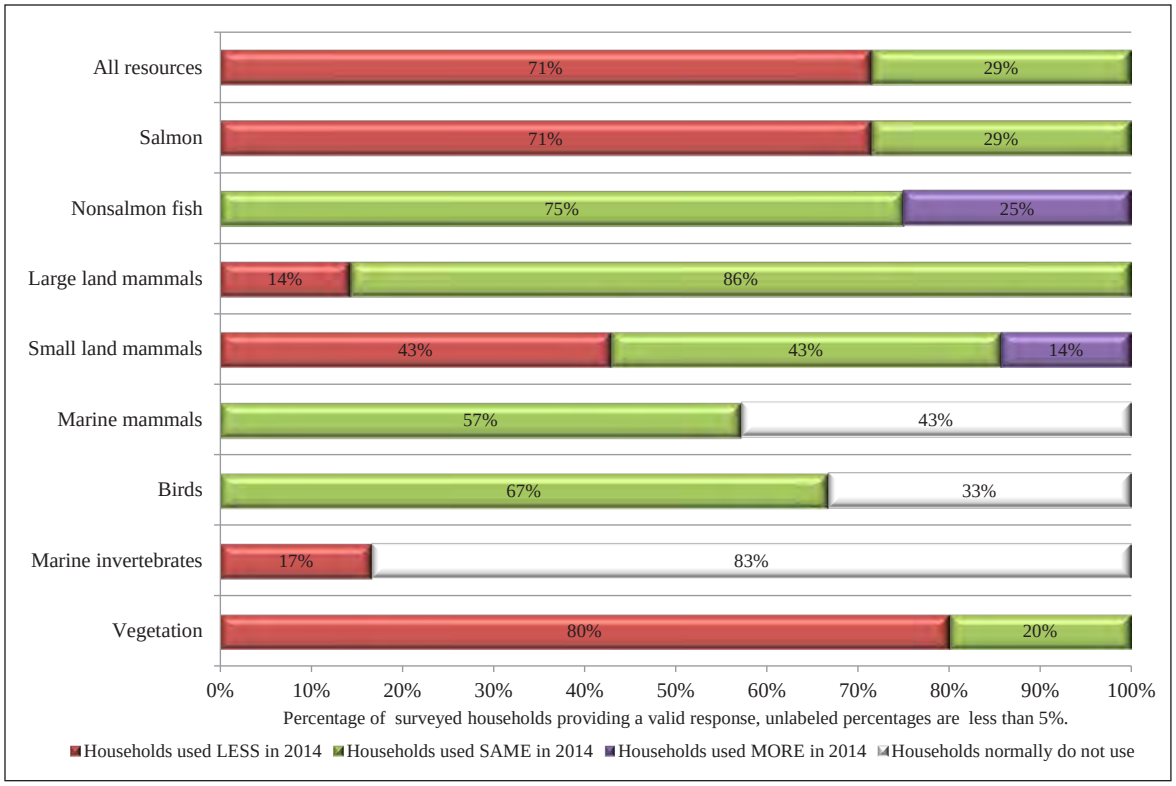


Figure 3-26.–Changes in household uses of resources compared to recent years, Rampart, 2014.

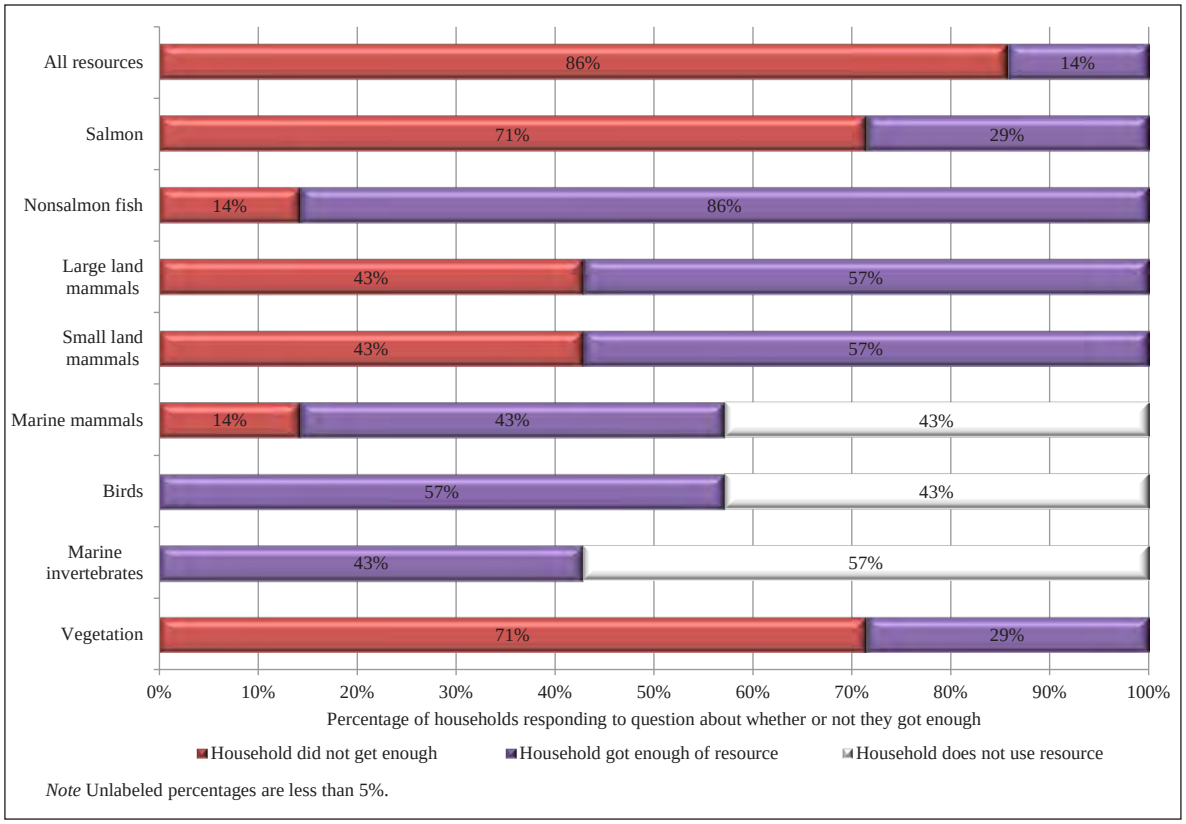


Figure 3-27.–Percentage of households reporting whether they got enough resources, Rampart, 2014.

Twenty percent of respondents stated that there was less sharing in 2014 (Table 3-19). Eighty-six percent of households said that they needed more Chinook salmon in particular (Table 3-20). When asked to evaluate the impact of not getting enough salmon, 80% described it as major and 20% described the impact as severe (Table 3-21). Patterns were different for the use of nonsalmon fish species, which were not as affected by fishing restrictions. Three-quarters (75%) of households used about the same amount of nonsalmon fish species, and 25% reported more use in 2014 (Figure 3-26). One household stated that they had more help fishing for nonsalmon fish, which accounted for their increased use (Table 3-18). Eighty-six percent of households said that they got enough nonsalmon fish in 2014 (Figure 3-27); 14% of households said that they would like to have had more burbot (Table 3-20).

In the land mammal category, 86% of households reported using the same amount of large land mammals in 2014; only 14% reported using less (Figure 3-26). Fifty-seven percent said that they got enough large land mammals, while 43% said they did not (Figure 3-27). Households reported needing more moose (29% of households) and caribou (14%; Table 3-20). Forty-three percent of households reported using less small land mammals in 2014 (Figure 3-26). This was also the percentage of households reporting that they used about the same amount as in recent years. Fourteen percent said that they used more small land mammals. One household received more help in 2014, which accounted for the increased use of small land mammals (Table 3-18). Fifty-seven percent said that they got enough small land mammals, and 43% said they did not get enough (Figure 3-27) and that they needed more beaver, specifically (Table 3-20).

For the birds and vegetation categories the majority of households in Rampart reported stable use of birds; 67% of households said that they used the same amount of birds in 2014, and 57% said that they got enough of this resource category (figures 3-26 and 3-27). The year 2014 was described by many respondents as being a bad berry year. This is reflected by the large amount of households that said they used less vegetation (80%) and households that said they did not get enough vegetation (71%). Only 20% said they used about the same amount of vegetation as in the recent past, and only 29% said that they got enough. Households said that they needed more berries, specifically blueberries (reported by 57%), raspberries (43%), and lowbush cranberries (14%; Table 3-20). The impact of not getting enough vegetation was reported as minor for 40% of households and major for 40% (Table 3-19).

Harvest Data

Changes in the harvest of resources by Rampart residents can be discerned through comparisons with findings from other study years. This study is the first ADF&G comprehensive subsistence study conducted in Rampart. Rampart was included in a subsistence harvest and use patterns study along with 4 other Interior Alaska communities in 1997 produced by Northern Land Use Research, Inc. (Betts 1997). This publication has served as background material for the current study. Betts (1997:34) reports that in 1995 an estimated 1,235 Chinook, 1,104 summer chum (most likely these were misidentified early fall chum salmon, because summer chum salmon runs do not extend as far as Rampart), 2,803 fall chum, and 0 coho salmon were harvested. In 2014, Rampart households harvested 0 Chinook (due to restrictions), 0 summer chum, 930 fall chum, and 836 coho salmon. The increase in the harvest of coho salmon in 2014 is a direct result of restrictions on Chinook salmon harvesting. Betts (1997) did not report a per capita salmon harvest specifically for Rampart for 1995. However, Betts (1997:26) did state that Rampart's overall per capita harvest of salmon was expected to be close to that of Stevens Village per capita for 1995, which was 921 lb. Rampart's overall per capita harvest of salmon for 2014 was 231 lb.

Figure 3-28 shows the harvest of each salmon species between 1989 and 2013. Data for this figure were gathered by the ADF&G Division of Commercial Fisheries during annual post-season salmon surveys. The results of this Division of Subsistence study are represented by an orange square. The most desired species of salmon has historically been Chinook salmon. A series of mesh-size regulations and fishing closures in recent years due to a decline of this resource, however, has forced Rampart residents to shift their harvest to other salmon species. The trendline for Chinook salmon shows a dramatic decline over the years; 2014 was the lowest harvest between the years 1989 to 2014. Although the trendline for fall chum salmon is less dramatic, it too shows a decline in harvests since 1989. However, harvests between 1994 and 2014 show

Table 3-18.–Reasons for more household uses of resources compared to recent years, Rampart, 2014.

Resource category	Valid responses[a]	Households reporting reasons for more use	Increased availability		Used other resources		Favorable weather		Received more		Needed more		Increased effort		Had more help	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	7	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	7	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	4	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Large land mammals	7	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	7	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Marine mammals	7	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	6	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	6	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	5	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

-continued-

Table 3-18.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for more use	Other		Regulations		Traveled farther		More success		Needed less		Store-bought expense		Got/ fixed equipment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	7	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	7	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	4	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	7	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	7	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	7	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	6	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	6	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	5	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, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never use.

Table 3-19.–Reasons for less household uses of resources compared to recent years, Rampart, 2014.

Resource category	Valid responses[a]	Households reporting reasons for less use	Family/ personal		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful		Weather/ environment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	7	5	1	20.0%	1	20%	0	0.0%	1	20%	0	0%	0	0%	0	0.0%	0	0.0%
Salmon	7	5	0	0.0%	0	0%	0	0.0%	0	0%	1	20%	0	0%	0	0.0%	0	0.0%
Nonsalmon fish	4	0	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Large land mammals	7	1	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	1	100%	0	0.0%	0	0.0%
Small land mammals	7	3	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	3	100%	0	0.0%	0	0.0%
Marine mammals	7	0	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Birds	6	0	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Marine invertebrates	6	0	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Vegetation	5	4	0	0.0%	2	50%	0	0.0%	0	0%	0	0%	2	50%	0	0.0%	0	0.0%

-continued-

Table 3-19.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Other reasons		Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Equipment/ fuel expense		Used other resources	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	7	5	0	0%	0	0.0%	2	40.0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%	0	0.0%
Salmon	7	5	0	0%	0	0.0%	4	80.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	4	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	7	1	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	7	3	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	7	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	6	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 invertebrates	6	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	5	4	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, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never using the resource.

Table 3-20.–Resources of which households reported needing more, Rampart, 2014.

Resource	Households needing	Percentage of households
Chinook salmon	6	85.7%
Burbot	1	14.3%
Caribou	1	14.3%
Moose	2	28.6%
Beaver	3	42.9%
Unknown seal oil	1	14.3%
Whale	1	14.3%
Berries	1	14.3%
Blueberry	4	57.1%
Lowbush cranberry	1	14.3%
Raspberry	3	42.9%

Source ADF&G Division of Subsistence household surveys, 2015.

Table 3-21.–Reported impact to households reporting that they did not get enough of a type of resource, Rampart, 2014.

		Households not getting enough _____ .				Impact to those not getting enough _____ .									
	Sample	Valid responses[a]		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
All resources	7	7	100.0%	6	85.7%	0	0.0%	0	0.0%	1	16.7%	4	66.7%	1	16.7%
Salmon	7	7	100.0%	5	71.4%	0	0.0%	0	0.0%	0	0.0%	4	80.0%	1	20.0%
Nonsalmon fish	7	7	100.0%	1	14.3%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	7	7	100.0%	3	42.9%	0	0.0%	1	33.3%	2	66.7%	0	0.0%	0	0.0%
Small land mammals	7	7	100.0%	3	42.9%	0	0.0%	0	0.0%	2	66.7%	1	33.3%	0	0.0%
Marine mammals	7	4	57.1%	1	25.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Birds	7	4	57.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	7	3	42.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	7	7	100.0%	5	71.4%	0	0.0%	1	20.0%	2	40.0%	2	40.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Includes households failing to respond to the question and those households that never used the resource.

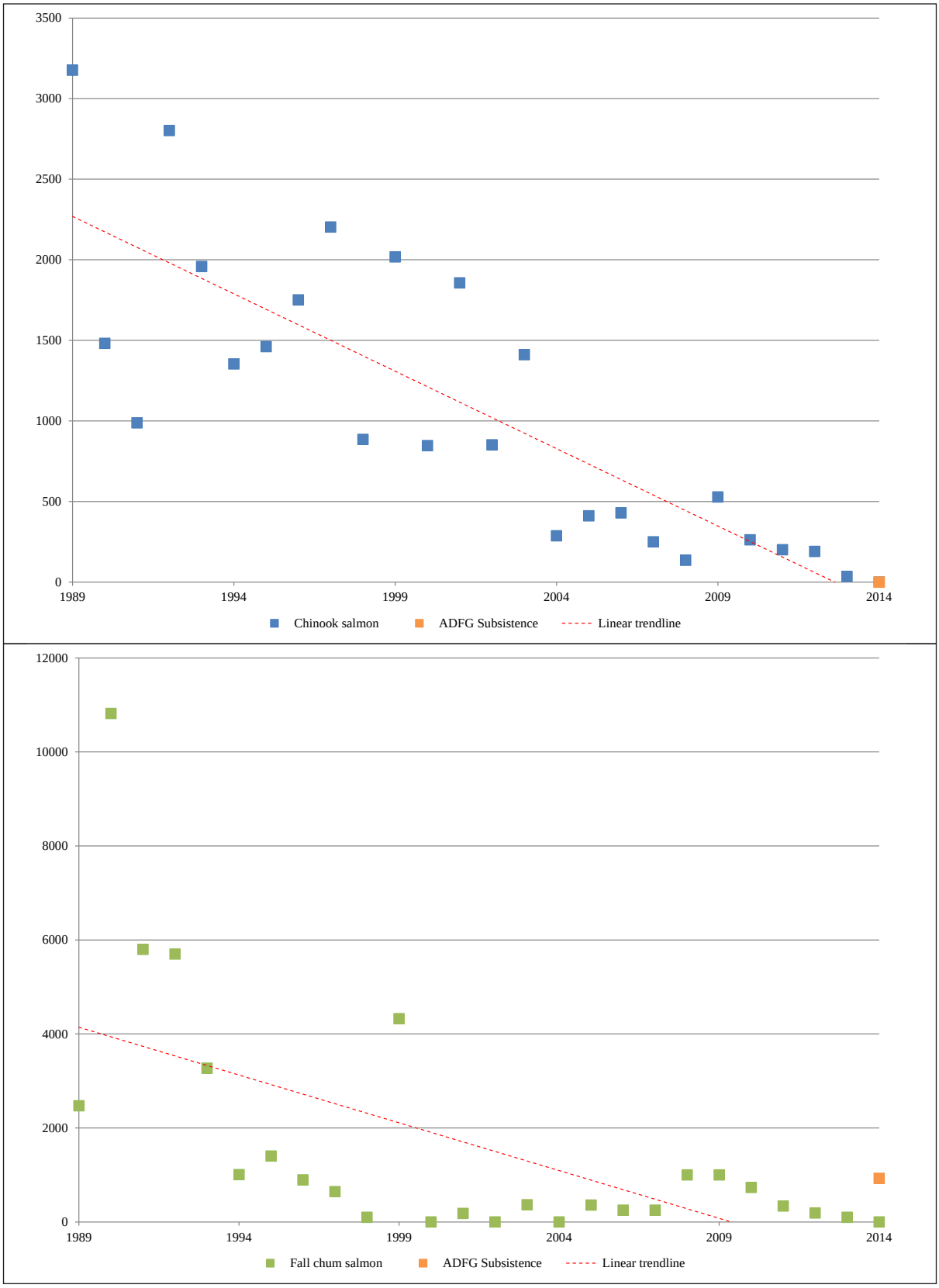


Figure 3-28.–Estimated numbers of Chinook, fall chum, summer chum, and coho salmon harvested, Rampart, 1988–2014 (continued on following page).

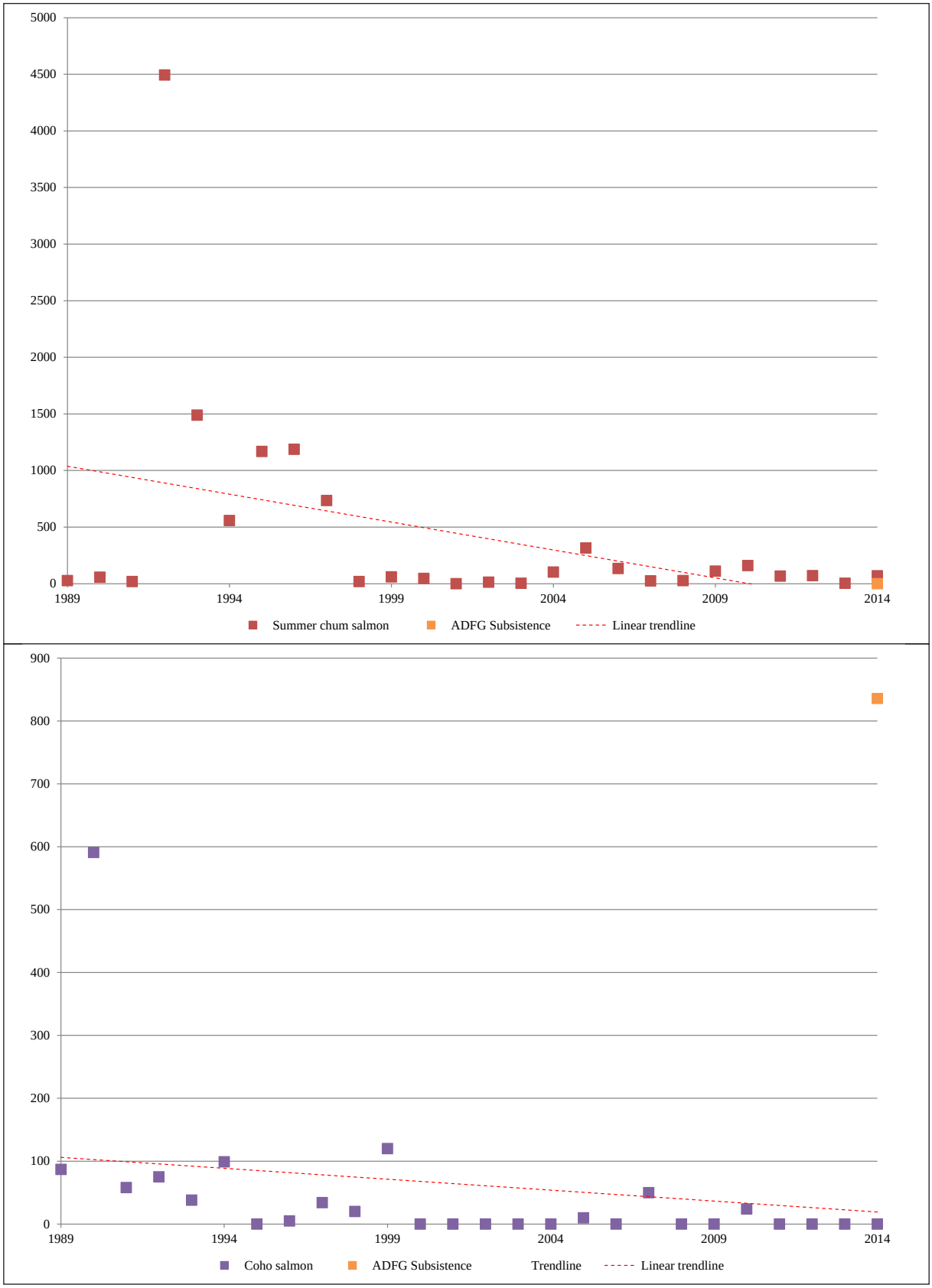


Figure 3-28.–Continued.

a more consistent pattern of harvest with only minor fluctuations. The trendlines for summer chum and coho salmon show similar negligible harvests between the years 2000 and 2014. Few summer chum salmon migrate as far as Rampart on the Yukon River, so recent harvests are generally low. Residents have started to harvest more coho salmon to replace Chinook salmon; the 2014 harvest measured by this study shows a marked increase in coho salmon harvest compared to historical harvests. The highest harvest years for all 4 salmon species occurred between 1989 and 1994.

Current and Historical Harvest Areas

According to Betts (1997), as the influx of prospectors and miners increased and displaced Alaska Natives living in the Rampart area at the turn of the 20th century, restrictions were placed on where the original residents could search for and harvest their wild foods. One elder resident remembered that, "…miners attempted to prohibit families from using traditional hunting areas around new mines in the Minook Creek drainage" (Betts 1997:20). These land use restrictions disrupted subsistence patterns and activities for years to come.

Betts (1997) provides historical harvest maps for Rampart for the years 1975 to 1995. Figure 3-29 depicts the historical harvest areas used for salmon and nonsalmon fish. Both Betts (1997) and this study documented Rampart residents' use of the Yukon River for the harvest of salmon and nonsalmon fish species (figures 3-11, 3-14 and 3-29). However, the stretch of river used was much longer according to the Betts (1997) historic map. In addition, historical locations for the harvest areas for nonsalmon species included Minook Creek, Hess Creek, and Twentymile Creek. Figure 3-30 depicts the historical harvest areas for moose. With the exception of Hess Creek, the harvest areas for moose are dramatically different from contemporary areas, and much more extensive (figures 3-15 and 3-30). Areas such as Minook Creek, Troublesome Creek, and the overland between the 2 creeks used from 1975 to 1995 were not used in 2014. In 2014, an area near the community of Stevens Village and a drainage of the West Fork of the Tolovana River were used for the search and harvest of moose. This was not the case in 1995, according to Betts (1997). Figures 3-31 and 3-32 depict the historical harvest areas for small mammal harvest. The majority of small mammal hunting and trapping occurred within 25 miles of Rampart and was concentrated on Minook Creek, Troublesome Creek, the Eureka area, and the Squaw Creek area. Some hunting also occurred on Hess Creek and the Ray River. In 2014, the search and harvest area was much more constricted (Figure 3-18). Although the Squaw Creek area and the area immediately around the community were still used, nearby Minook Creek and Troublesome Creek were not. One area that did not appear on the historical map for small land mammal search and harvest was an area near Stevens Village that was utilized in 2014.

A striking difference in search and harvest locations between the Betts (1997) historic maps and the land use areas recorded in this study is the 2014 use of locations near Stevens Village for several subsistence resources. Strong family connections and friendships between Rampart and Stevens Village may be one factor accounting for this change. The recent depopulation of Stevens Village may also be influencing the changing subsistence areas.

Local Comments and Concerns

Following is a summary of local observations of wild resource populations and trends that were recorded during the surveys and interviews. Some households did not offer any additional information during the surveys, so not all households are represented in the summary.

The major concern for the majority of respondents was salmon fishing regulations. The closure of Chinook salmon fishing in recent years and again in 2014 negatively impacted nearly every family in Rampart to some degree. Chinook salmon contains the most oil of any of the salmon species harvested by Rampart residents. The degree of oil content not only affects taste, but, according to local respondents, fish oil is a natural dietary supplement essential to sustain optimal health. As one interview respondent very succinctly said, "We need our fishing back" (051320152).

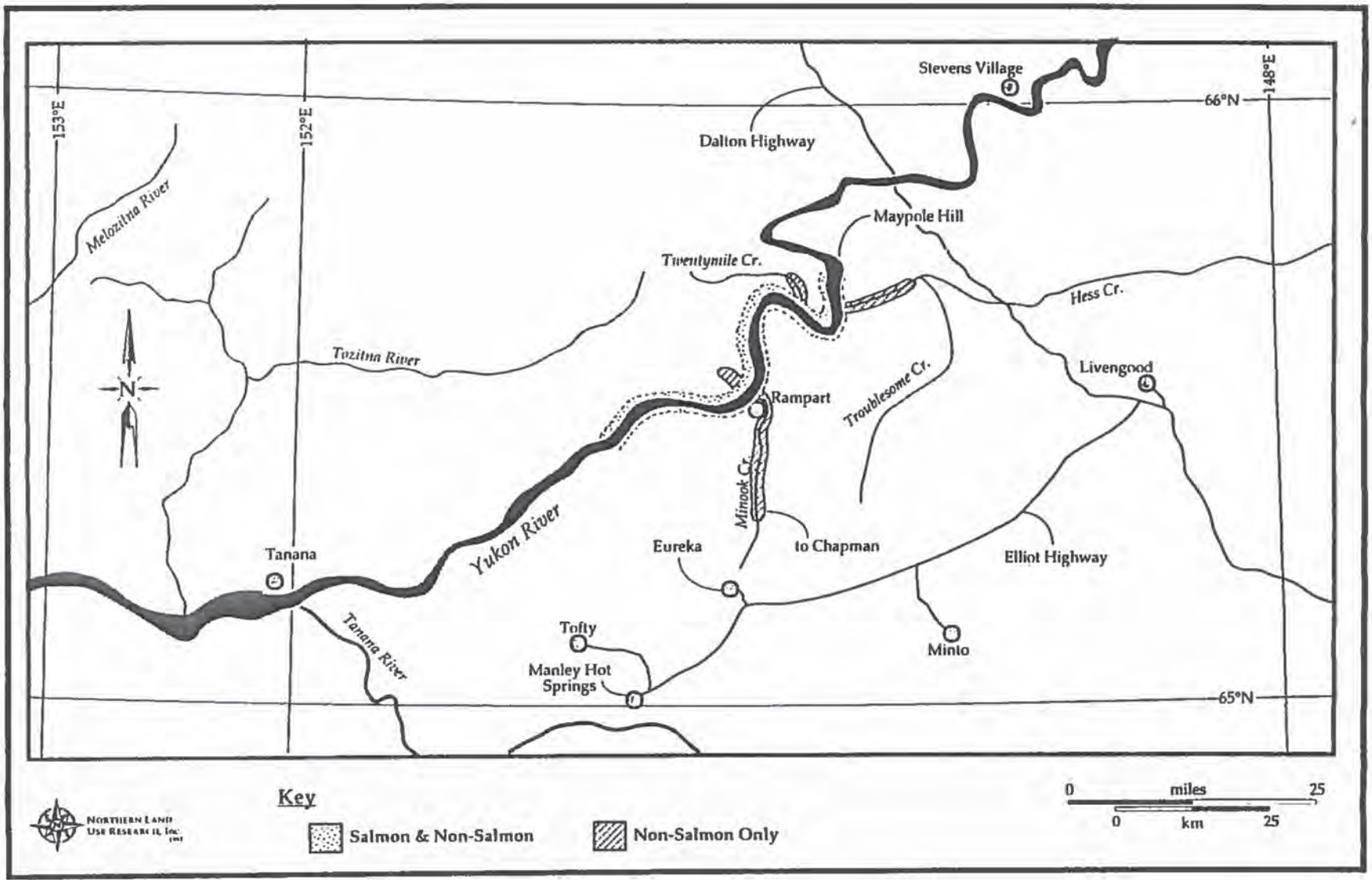


Figure 3-29.–Rampart salmon and nonsalmon fish harvest areas, 1975–1995 (Betts 1997:37).

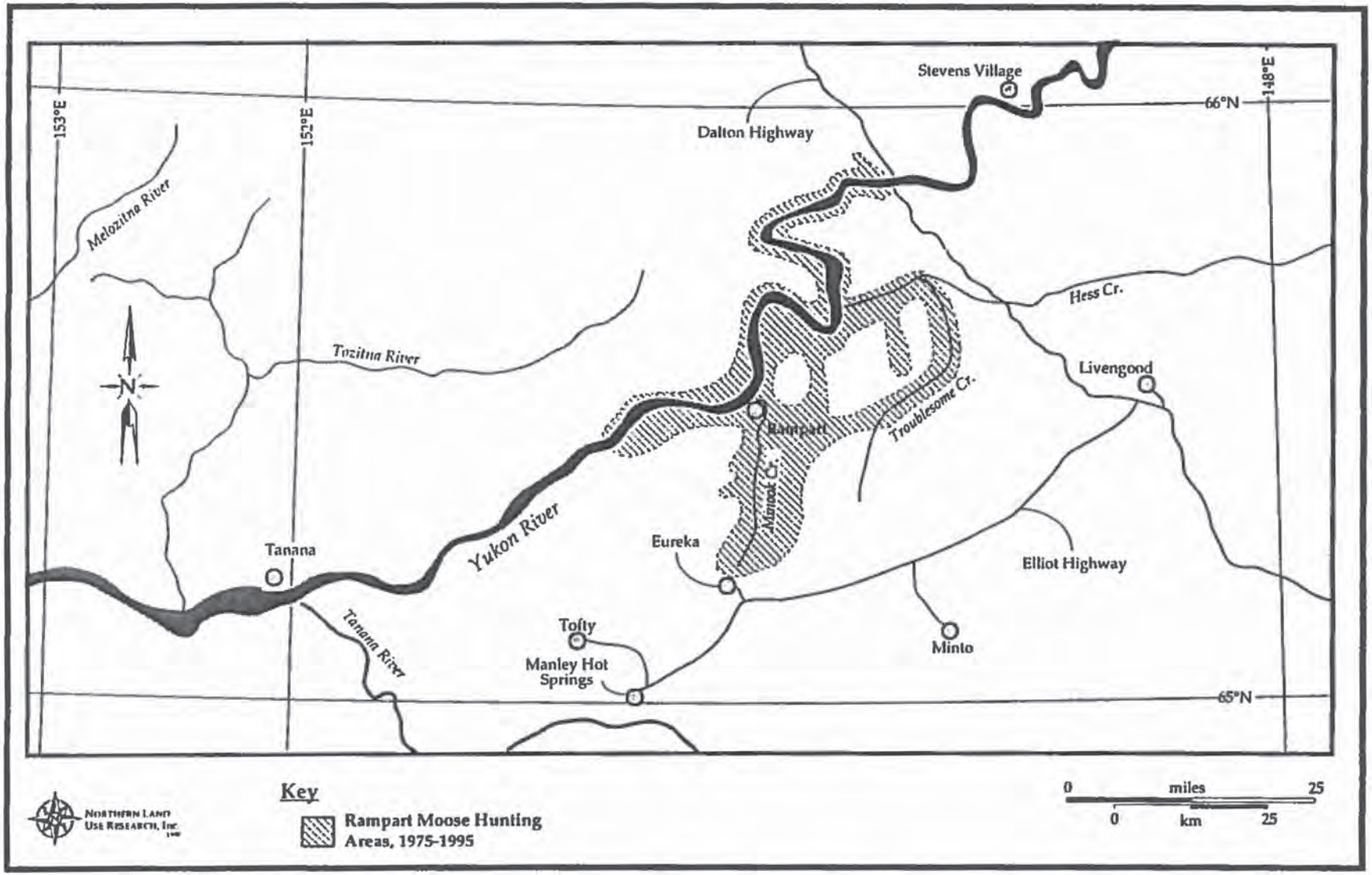


Figure 3-30.–Rampart moose harvest areas, 1975–1995 (Betts 1997:41).

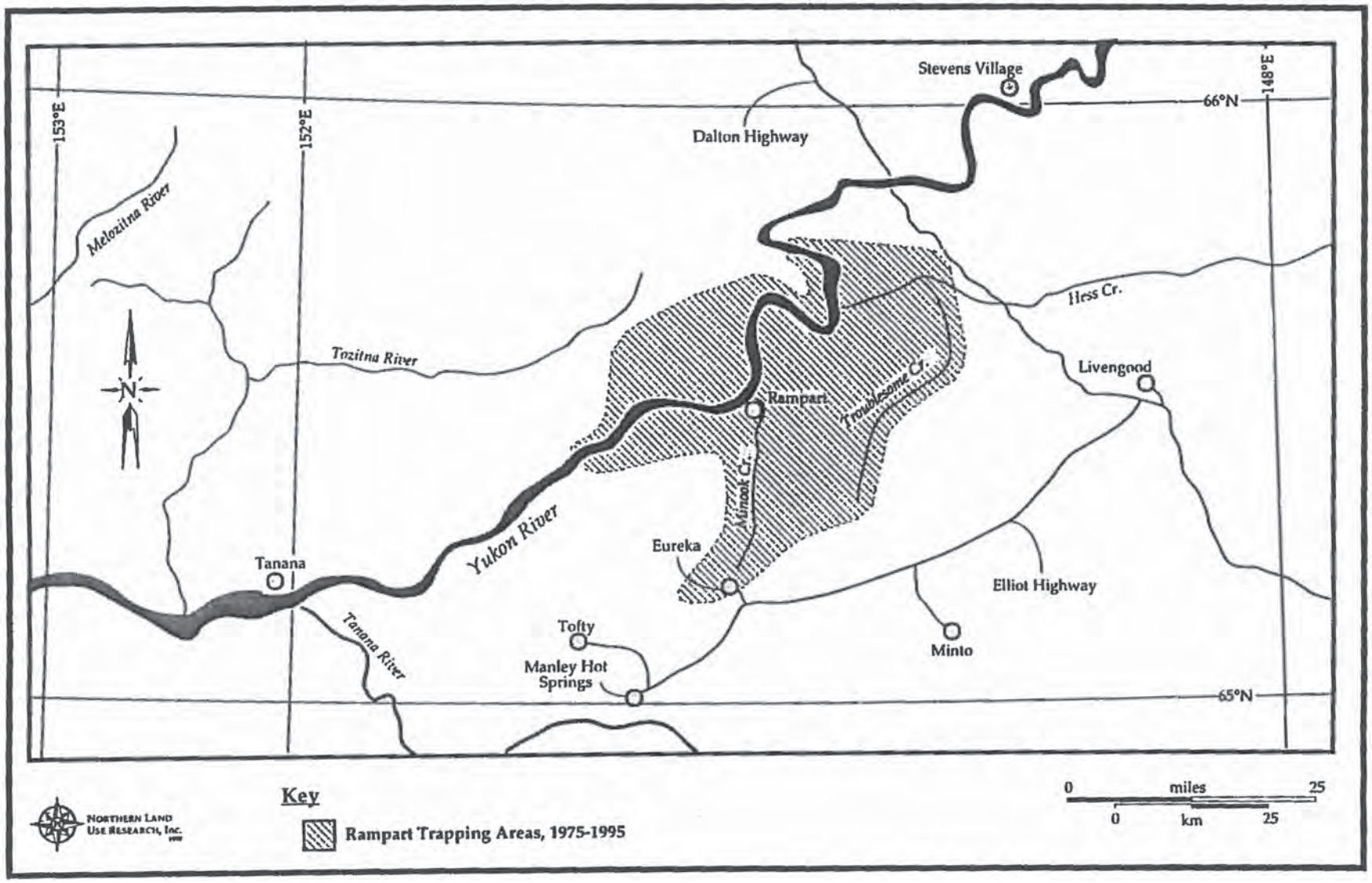


Figure 3-31.–Rampart trapping areas, 1975–1995 (Betts 1997:47).

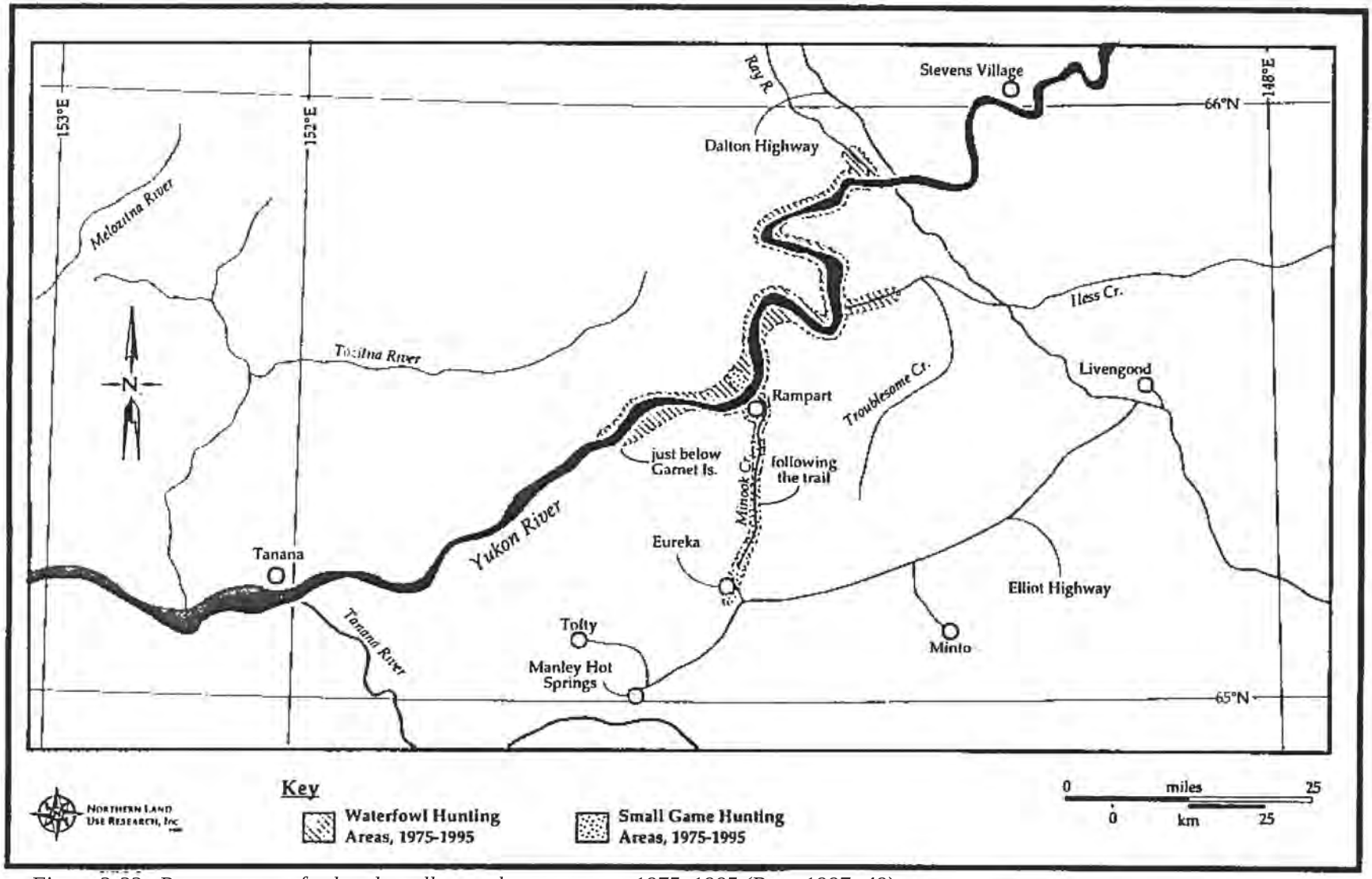


Figure 3-32.–Rampart waterfowl and small game harvest areas, 1975–1995 (Betts 1997: 49).

Another concern of many respondents is the increase of nonlocal sport fishers and hunters encroaching on tribal lands and interfering with the subsistence activities of Rampart residents. Nonlocal fishers and hunters access the area via boats on the Yukon River in summer from the Yukon River Bridge on the Dalton Highway, and via snowmachine along the old mining trail from the bridge in Eureka off the Elliott Highway in winter.

Many respondents commented that they would like to see their community increase in population by creating more employment opportunities within the community, reopening the school (which occurred in the fall of 2015 after this research was complete), completing the road between Eureka and Rampart (currently a winter snowmachine trail), and providing more housing. One interview respondent commented, "I'd love everybody to move back home…hopefully we can create enough jobs around here for people to come back and work here and live 24/7 like me. That's just what I want" (051420151). When another interview respondent was asked how he would like to see Rampart in the next 20 years, he replied, "The population back to what it was when I was a kid, the school reopened, our store reopened, and completing the road [Elliott Highway to Rampart]" (051320152). When asked where he saw himself in the next 20 years he said, "Pretty much the same, reviving the community."

Acknowledgements

The author would like to thank all Rampart respondents for their time, comments, corrections, and gracious welcome. The cooperation and involvement of Tribal Council members was greatly appreciated. Floyd Green, the young and strongly committed First Chief, was an inspiration both to the community and to this author. His determination to revitalize the community by helping to get the school reopened and new housing established was wonderful to witness. Maryann Wiehl along with the Rampart Tribal Council prepared the 2014 Rampart Community Plan, which was very helpful in writing this chapter. All residents that the author met were interested in restoring their community to a thriving area to which former residents would want to return and raise their families (Plate 3-5).

Figure 3-33.–Rampart in winter.

4. STEVENS VILLAGE

Lisa J. Slayton

In April 2015, 2 researchers surveyed 4 of 4 eligible households (100%) in Stevens Village (Table 1-5). Stevens Village's estimated total harvest of wild foods between January and December 2014 was 3,748 edible pounds (Table 4-1). The average harvest per household was 937 lb; the average harvest per capita was 375 lb.

This chapter summarizes findings from household surveys, including demographic characteristics, responses to harvest assessment questions, reported harvests, and responses to food security questions. Results from this survey are available online in the ADF&G Community Subsistence Information System (CSIS).[1] No ethnographic interviews were conducted during data collection.

Despite achieving a 100% sample, the small population creates concerns for confidentiality in this chapter. As a result, no mapped data are available for Stevens Village. For similar reasons, income data have been removed and results from food security questions are limited.

Community Background

The predominantly Koyukon Athabascan community of Stevens Village is located on the north bank of the Yukon River, approximately 17 miles upriver of the Dalton Highway (known locally as the "Haul Road") Yukon River bridge crossing, and 90 air miles northwest of Fairbanks (Plate 4-1). The nearest communities to Stevens Village are Beaver, approximately 90 miles upriver, and Rampart, approximately 48 miles downriver. Fairbanks serves as the hub community for Stevens Village. Stevens Village is situated at the western end of the Yukon Flats near where the Yukon River flows from the Flats into the Rampart Canyon (Stevens Village Council 1991). The original settlement was called Dinyea (or Dinyeet), meaning "mouth of the canyon." Dinyea was founded by 3 Athabascan brothers from the Koyukon area: Gochonayeeya, Old Jacob, and Old Steven. In 1898, the U.S. Coast and Geodetic Survey recorded the village of Shamansville near the present-day community (Orth 1971rep.:918). In 1902, the settlement was renamed for Old Steven after this brother was elected chief.[2] The settlement was also called Shamans or Shaman Village (Stevens Village Council 1991).

The Stevens Village people are called Dinyeet Hot' Anna, which means "Canyon People" (Stevens Village Council 1991). Their traditional lands are mostly located in the Yukon Flats, one of the prime migratory waterfowl wetland habitats in North America. The community is also situated within the Yukon Flats National Wildlife Refuge.

Contact with Euroamericans came late to many Alaska Native groups in Interior Alaska (Sumida 1988). By 1905, a trading post was established at a settlement called King's Slough, near the present day community (Orth 1971rep.:523; Sumida 1988). The first school opened in 1907, and a post office opened in 1936.[3] The first scheduled air service began in 1939. Also in 1939, a tribal government was formed under the Indian Reorganization Act, and the Stevens Village Council requested reservation status. The Department of the Interior failed to act upon this request (Stevens Village Council 1991).

Two important time periods for the community occurred in the 1950s and 1960s. In the early 1950s, Stevens Village musher Horace "Holy" Smoke made the community famous by winning the North American Dog Mushing Championship and setting records for 3 consecutive years: 1951, 1952, and 1953 (Couch 1957).

1. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." https://www.adfg.alaska.gov/sb/CSIS. Hereafter *ADF&G CSIS*.

2. Tanana Chiefs Conference, Fairbanks. "Stevens Village." Accessed March 4, 2016. https://www.tananachiefs.org/about/communities/ Hereafter *TCC 2016*.

3. TCC 2016.

Table 4-1.–Resource harvest and use characteristics, Stevens Village, 2014.

Characteristic	
Mean number of resources used per household	**9.3**
Minimum	1
Maximum	15
95% confidence limit (±)	0.0%
Median	10.5
Mean number of resources attempted to harvest per household	**8.3**
Minimum	0
Maximum	15
95% confidence limit (±)	0.0%
Median	9.0
Mean number of resources harvested per household	**7.3**
Minimum	0
Maximum	14
95% confidence limit (±)	0.0%
Median	7.5
Mean number of resources received per household	**1.8**
Minimum	1
Maximum	4
95% confidence limit (±)	0.0%
Median	1.0
Mean number of resources given away per household	**2.8**
Minimum	0
Maximum	6
95% confidence limit (±)	0.0%
Median	2.5
Household harvest (pounds)	
Minimum	0
Maximum	3,075
Mean	937.1
Median	336.9
Total harvest weight (pounds)	3,748.2
Community per capita harvest (pounds)	374.8
Percentage using any resource	100%
Percentage attempting to harvest any resource	75%
Percentage harvesting any resource	75%
Percentage receiving any resource	100%
Percentage giving away any resource	50%
Number of households in sample	4
Number of resources asked about and identified voluntarily by respondents	117

Source ADF&G Division of Subsistence household surveys, 2015.

Plate 4-1.–Stevens Village.

In the early 1960s, the community and surrounding area was threatened by the proposed Rampart Dam project. The dam was to be built on the Yukon River in the Rampart Canyon. Stevens Village submitted a protest to the Bureau of Land Management claiming at least 1,648 square miles of land for subsistence hunting, fishing, trapping, and wood cutting. The protest was successful. Had the project moved forward, approximately 10,600 square miles of prime migratory waterfowl and moose habitat would have been inundated with water (U.S. Department of the Interior 1965:3).

Current access to Stevens Village is primarily by water and air. There are approximately 3 miles of gravel roads within the community and a network of winter trails throughout the region. Most supplies reach Stevens Village via cargo planes that utilize the community runway, or by boats and barges via the Yukon River. The Yukon River usually freezes up at the end of October. The annual break-up of the river ice usually occurs in mid-May (Matthew et al. 1999).

The daily minimum temperatures from November to March in Stevens Village are typically below 0˚F.[4] Extended periods of extreme winter temperatures of -50˚F to -60˚F are typical. Temperatures in the summer months usually range from 65˚F to 72˚F. The total annual participation typically averages around 7 inches. Snowfall averages around 43 inches per year.

Currently the only services and facilities in Stevens Village are a safe water facility with showers and laundry, a bulk fuel storage tank, an electrical generator plant, and a council office building. There are no stores in Stevens Village, and the school is no longer open. The post office is only open part time.

Table 4-2 shows selected findings from this report for Stevens Village in 2014. This report shows findings for 1 year only, and should be viewed within the context of a low human population, severe salmon fishing restrictions, and depressed economic conditions. All are variables subject to change.

4. TCC 2016.

Table 4-2.–Comparison of selected findings, Stevens Village, 2014.

Category	Community Stevens Village
Demography	
Population	10.0
Percentage of population that is Alaska Native	100.0%
Percentage of household heads born in Alaska	100.0%
Average length of residency of household heads (years)	25.3
Cash economy	
Average number of months employed	6.3
Percentage of employed adults working year-round	60.0%
Percentage of income from sources other than employment	37.3%
Average household income[a]	-
Per capita income[a]	-
Resource harvest and use	
Per capita harvest (pounds usable weight)	374.8
Average household harvest (pounds usable weight)	937.1
Number of resources used by 50% or more households	5.0
Average number of resources used per household	9.3
Average number of resources attempted to be harvested per household	8.3
Average number of resources harvested per household	7.3
Average number of resources received per household	1.8
Average number of resources given away per household	2.8
Percentage of total harvest taken by top ranked 25% of households	82.0%
Percentage of households that harvested 70% of harvest	25.0%
Per capita harvest by lowest ranked 50% of households (pounds usable weight)	67.4
Percentage of total harvest taken by lowest ranked 50% of harvesting households	18.0%
Average number of resources used by lowest ranked 50% of households	7.3
Average number of resources used by top ranked 25% of households	15.0

Source ADF&G Division of Subsistence household surveys, 2015.
a. Data omitted under conditions of minimal sample size.

Seasonal Round

The harvesting of subsistence foods in Stevens Village follows a pattern repeated year after year according to the seasons. In the spring, with increasing daylight and warmer temperatures, subsistence activities increase. Spring is the time to hunt migratory waterfowl as they return to the area, and to put out setnets for whitefish and other nonsalmon fish species before the arrival of salmon in June. Summer usually is an intense period of salmon fishing. Chinook salmon arrive in June, followed by fall chum and coho salmon in August and September. Residents pick berries from the end of June until around the end of September, and they keep gardens throughout the summer. In the fall, waterfowl migrate through the area once again and are hunted by residents. Fall chum and coho salmon continue to be available into the first part of October. The fall months are also taken up with fishing for nonsalmon fish such as burbot, Arctic grayling, whitefishes, and sheefish, and for wood gathering. Fall and winter have typically been the time for moose hunting, small land mammal trapping and hunting, and continued wood cutting. According to Sumida (1988), a number of factors influence the seasonal round including environmental conditions, regulations (particularly concerning Chinook salmon), availability of resources, and food preferences.

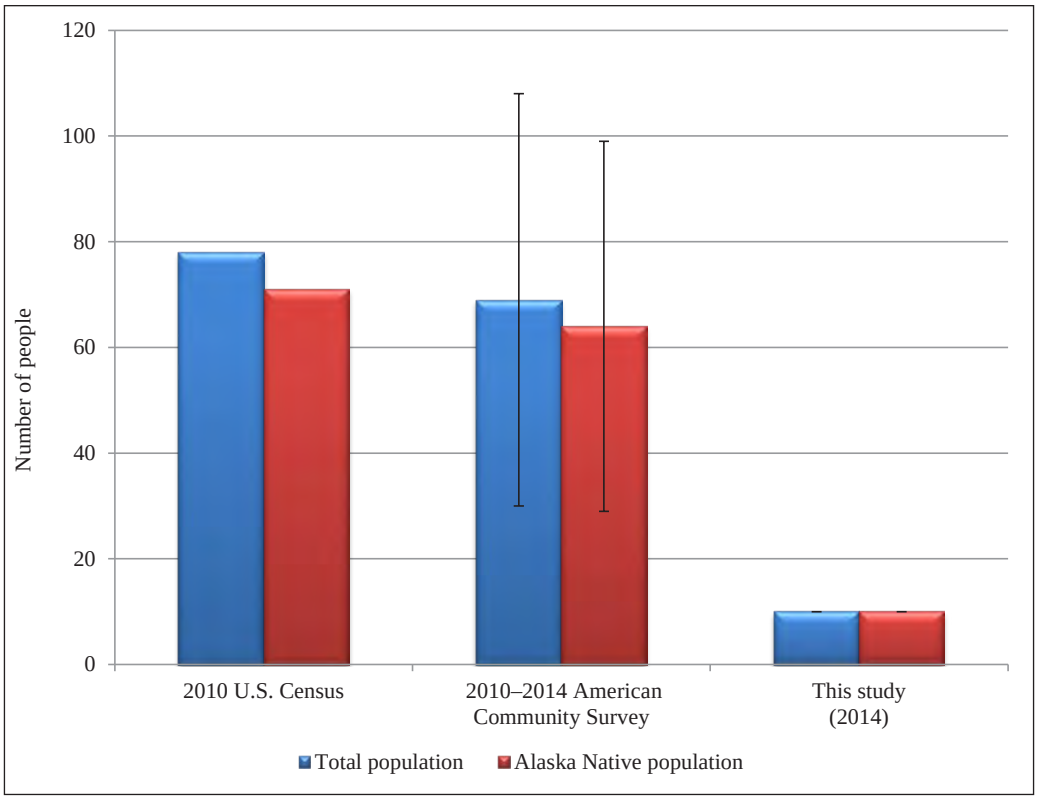


Figure 4-1.–Population estimates, Stevens Village, 2010 and 2014.

Population Estimates and Demographic Information

The population of Stevens Village for 2014 was 10 (Figure 4-1, Table D4-1). Based on self-reporting, 100% were Alaska Native. Only 4 households were available for surveys, and all 4 (100%) agreed to take the survey (Table 1-5). Household size ranged from 1 to 5 people, with an average of 2.5 people per household (Table 4-3). The average age of residents was 27 years, and the oldest person recorded was 79 years. Figure 4-2 and Table D4-2 show that Stevens Village comprised 5 males and 5 females in 2014. Those in their 30s or younger were predominant.

Survey respondents who were heads of households were asked to identify their birthplaces (defined as where their parents were living when the respondent was born). Over one-half (57%) reported that their birthplace was Stevens Village (Table 4-4). Others reported birthplaces in the Interior communities of Fairbanks, Arctic Village, and Tanana. No places outside of Alaska were cited. Table D4-3 shows the birthplaces of the general population. One-half (50%) of residents were born in Stevens Village. Ten percent (for each community) were born in Fairbanks, Arctic Village, and Tanana.

Records indicate that Stevens Village has never held more than 120 year-round residents. The first official population figures for Stevens Village were reported in the 1910 United States Census. According to the census, there were 100 residents living in the community at that time (Sumida 1988). The population has fluctuated through the years in response to various factors such as employment opportunities, school attendance, availability of services, and more recently, village safety issues.

The 2010 United States Census recorded a population of 78 for Stevens Village, and the 5-year American Community Survey estimated 66. In 2014 the Alaska Department of Labor estimated the population to be 46 (ADLWD).[5] Data from this 2014 study show that the overall year-round population of Stevens Village continues to be in decline (Figure 4-3).

5. Alaska Department of Labor and Workforce Development (ADLWD), Research and Analysis Section, Juneau, n.d. "Population Estimates." October 24, 2016. http://live.laborstats.alaska.gov/pop/

Table 4-3.–Sample and demographic characteristics, Stevens Village, 2014.

Characteristics	Community Stevens Village
Sampled households	4
Eligible households	4
Percentage sampled	100.0%
Sampled population	10
Estimated community population	10.0
Household size	
Mean	2.5
Minimum	1.0
Maximum	5.0
Age	
Mean	36.2
Minimum[a]	15
Maximum	79
Median	27.0
Length of residency	
Total population	
Mean	19.2
Minimum	3
Maximum	53
Heads of household	
Mean	25.3
Minimum	3
Maximum	53
Alaska Native	
Estimated households[b]	
Number	4.0
Percentage	100.0%
Estimated population	
Number	10.0
Percentage	100.0%

Source ADF&G Division of Subsistence household surveys, 2015.

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

b. The estimated number of households in which at least 1 head of household is Alaska Native.

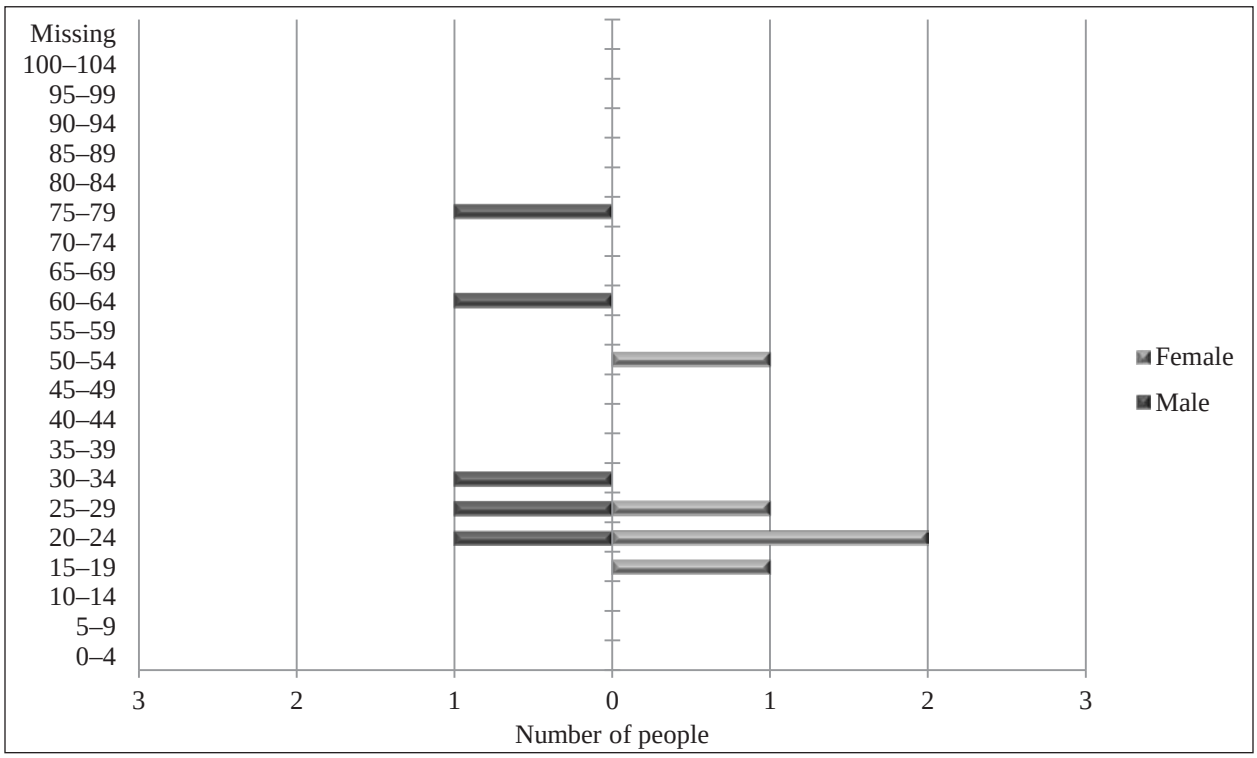


Figure 4-2.–Population profile, Stevens Village, 2014.

Table 4-4.–Birthplaces of household heads, Stevens Village, 2014.

Birthplace	Percentage
Arctic Village	14.3%
Fairbanks	14.3%
Stevens Village	57.1%
Tanana	14.3%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

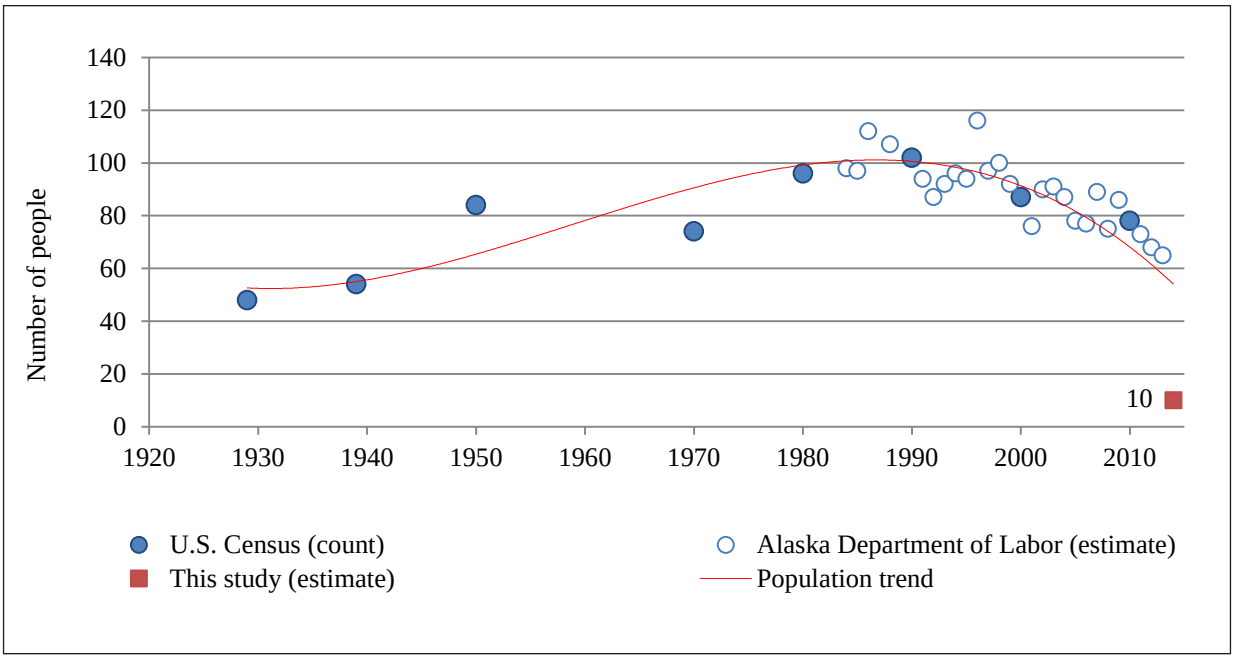


Figure 4-3.–Historical population estimates, Stevens Village, 1930–2014.

The population increases slightly for a time each summer when some families and individuals return to their fishing camps in or near the community. They stay for various lengths of time to fish or participate in other subsistence activities. According to some residents, fewer families have been returning during the summer in recent years.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Figure 4-4 and Table D4-4 report levels of individual participation in the harvest and processing of wild resources by all Stevens Village residents in 2014. Overall, 50% of people attempted to harvest resources, and 50% participated in processing wild foods. Because the population of Stevens Village is so small, most residents take part in both the attempted harvest of subsistence resources and the processing of these resources. In 2014, the percentages of people attempting to harvest fish and those processing fish were the same (57%). This was also the case with small land mammals (43%) and with vegetation (57%). The percentage who attempted harvest of large land mammals was 43%. There was no reported harvest of large land mammals and no reported processing of large land mammals in 2014. Birds and eggs were harvested by 43% and processed by 71%.

Harvest and Use of Wild Resources at the Household Level

Figure 4-5 shows by resource category the percentages of households that used, attempted to harvest, harvested, and shared wild resources. Fifty percent of Stevens Village respondents attempted to harvest, harvested, and used both salmon and nonsalmon fish. Although 75% of households reported attempting to harvest large land mammals, none was successful. However, 75% said that they used large land mammals. These respondents received large land mammals from friends or family living in other communities. Small land mammals were used by 75% of respondents, with 50% reporting they attempted harvest, and 50% harvesting. Fifty percent of respondents used marine mammals (seal oil) that they acquired from others living in coastal areas. There was no attempt to harvest, or harvest of marine mammals in 2014. Seventy-five percent of respondents reported attempting to harvest, harvesting, and using birds and eggs. Likewise,

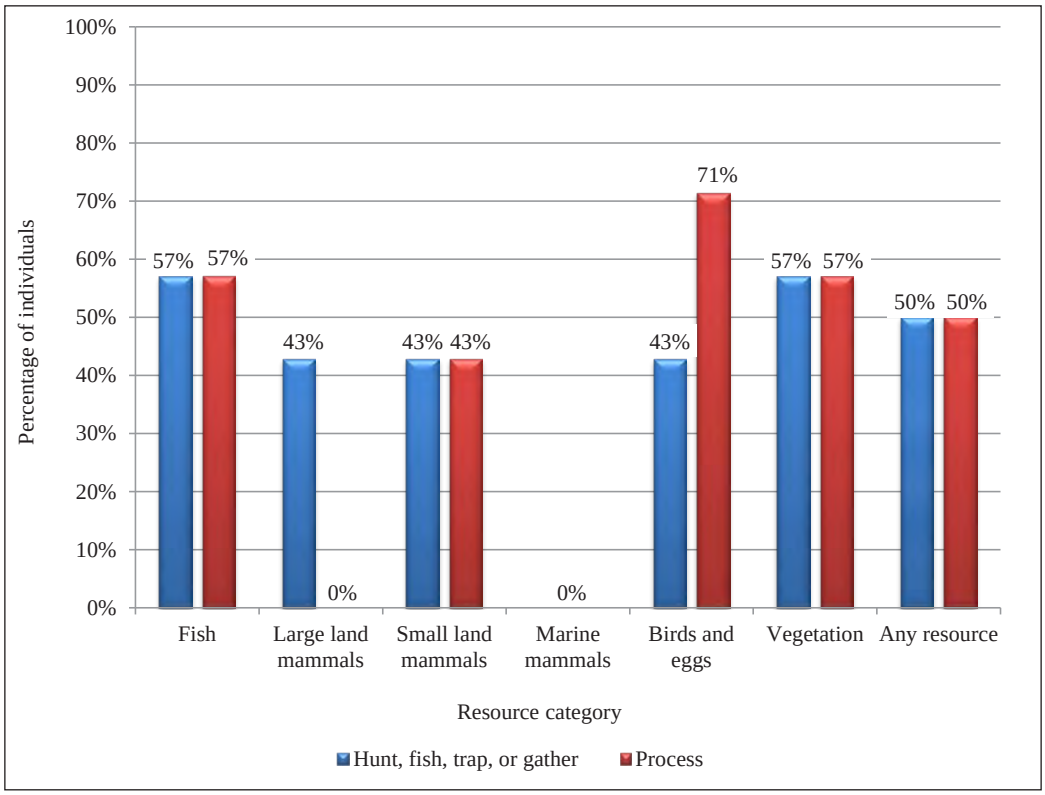


Figure 4-4.–Individual participation in subsistence harvesting and processing activities, Stevens Village, 2014.

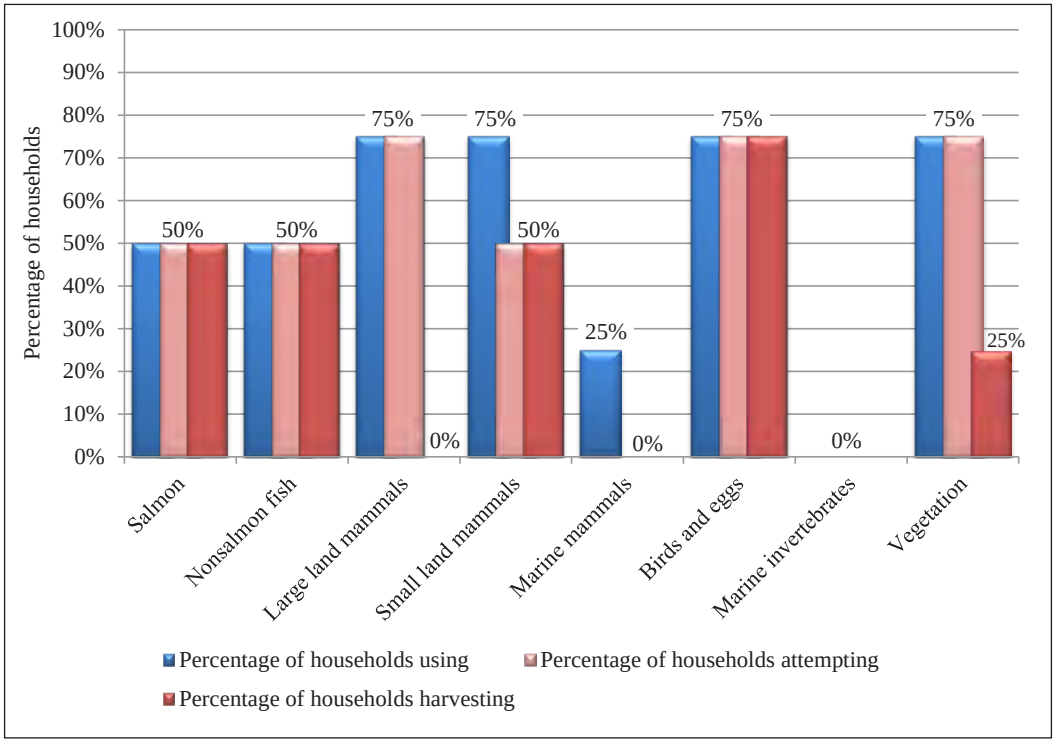


Figure 4-5.–Percentage of households using, attempting to harvest, or harvesting wild resources, by category, Stevens Village, 2014.

75% said that they attempted to harvest, and used vegetation. However, only 25% said that they successfully harvested vegetation.

Table 4-1 summarizes resource harvest and use characteristics for Stevens Village in 2014 at the household level. The average harvest was 937 lb edible weight per household and 375 lb per capita. During the study year, community households used an average of 9 different kinds of wild resources. The average number of resources that households attempted to harvest was 8, and the average number harvested was 7. In addition, households gave away an average of 3 kinds of resources and received an average of 2 different types of wild resources. Overall, as many as 117 resources were available for households to harvest in the study area; this included resources that survey respondents identified but were not asked about in the survey instrument.

Harvest Quantities and Composition

Table 4-5 reports wild resource harvests and uses by Stevens Village residents in 2014 and is organized first by general category and then by species. Because researchers surveyed all households in the community, the numbers in this report did not need to be expanded. All edible resources are reported in pounds edible weight (see Appendix C for conversion factors). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources that were harvested, given away, acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Purchased foods are not included, but resources such as firewood are included because they are an important part of the subsistence way of life. Differences between harvest and use percentages reflect the exchange of food among households, which results in a wider distribution of wild foods throughout the community.

Stevens Village residents harvested a total of 3,748 edible pounds of wild foods, or 375 lb per capita, in 2014 (Table 4-5). Figure 4-6 shows the composition of the harvest by resource category. Salmon made up 82% (3,073 lb) of the total harvest, and nonsalmon fish made up 12% (460 lb; Table 4-5; Figure 4-6). Small land mammals accounted for 4% (133 lb) of the total harvest by edible weight. The categories of birds and eggs and vegetation made up 1% each (45 lb and 38 respectively) of the total community harvest for 2014. There was no reported harvest of large land mammals, marine mammals, or marine invertebrates by Stevens Village residents in 2014.

Table 4-6 lists the top ranked individual resources used by Stevens Village households in 2014. Although not harvested, moose was received and used by 75% of households. The following species were also used by 75% of households: muskrat, black scoter, and cackling goose. The remaining top 10 resources used—fall chum salmon, northern pike, sheefish, humpback whitefish, beaver, and blueberries—were each used by 50% of households.

Figure 4-7 shows the species with the highest per capita harvests in pounds usable weight during the 2014 study year. Fall chum salmon made up 79% of the total harvest (297 lb per capita; Table 4-5; Figure 4-7). Humpback whitefish was 8% (31 lb per capita). Sheefish and Chinook salmon each contributed 3% (13 lb and 10 lb per capita, respectively), and beaver made up 2% (8 lb per capita). Muskrat (4 lb per capita), cackling goose, snowshoe hare, and blueberry each accounted for 1% of the harvest. Northern pike accounted for less than 1% (2 lb per capita).

Salmon

Stevens Village households reported harvesting only 2 types of salmon in 2014: fall chum salmon and Chinook salmon. Fall chum salmon made up 97% of the total salmon harvest (Figure 4-8). All households who attempted to harvest either type of salmon were successful (Table 4-5).

A total of 602 salmon (3,073 lb) were harvested using fish wheels and gillnet gear (Table D4-5). No salmon were removed from commercial harvests for home use or harvested with rod and reel. Figure 4-9 is a visual representation of the number of salmon harvested by gear type. Households used fish wheels to harvest 500

Table 4-5.–Reported harvests and uses of fish, wildlife, and vegetation resources, Stevens Village, 2014.

	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
All resources	**100.0**	**75.0**	**75.0**	**100.0**	**50.0**	**3,748.2**	**937.1**	**374.8**	**3,748.2**	**lb**	**937.1**	**0.0**
Salmon	**50.0**	**50.0**	**50.0**	**0.0**	**25.0**	**3,073.1**	**768.3**	**307.3**	**3,073.1**	**lb**	**768.3**	**0.0**
Summer chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Fall chum salmon	50.0	50.0	50.0	0.0	25.0	2,968.9	742.2	296.9	590.0	ind	147.5	0.0
Coho salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Chinook salmon	25.0	25.0	25.0	0.0	0.0	104.2	26.0	10.4	12.0	ind	3.0	0.0
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sockeye salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Nonsalmon fish	**50.0**	**50.0**	**50.0**	**0.0**	**50.0**	**459.6**	**114.9**	**46.0**	**459.6**	**lb**	**114.9**	**0.0**
Pacific herring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Eulachon (hooligan, candlefish)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific (gray) cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pacific tomcod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Starry flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Lingcod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pacific halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0
Rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dolly Varden	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pike	50.0	50.0	50.0	0.0	0.0	19.6	4.9	2.0	14.0	ind	3.5	0.0
Sheefish	50.0	50.0	50.0	0.0	50.0	132.0	33.0	13.2	22.0	ind	5.5	0.0
Longnose sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Rainbow trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 4-5.–Page 2 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Nonsalmon fish, continued												
Broad whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Least cisco	25.0	25.0	25.0	0.0	25.0	2.0	0.5	0.2	2.0	ind	0.5	0.0
Humpback whitefish	50.0	50.0	50.0	0.0	25.0	306.0	76.5	30.6	102.0	ind	25.5	0.0
Round whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown whitefishes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Large land mammals	**75.0**	**75.0**	**0.0**	**75.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Black bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Caribou	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sitka black-tailed deer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mountain goat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Moose	75.0	75.0	0.0	75.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Small land mammals	**75.0**	**50.0**	**50.0**	**25.0**	**50.0**	**132.5**	**33.1**	**13.3**	**132.5**	**lb**	**33.1**	**0.0**
Beaver	50.0	50.0	50.0	0.0	50.0	75.0	18.8	7.5	5.0	ind	1.3	0.0
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red fox–cross phase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red fox–red phase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Snowshoe hare	25.0	25.0	25.0	0.0	25.0	20.0	5.0	2.0	10.0	ind	2.5	0.0
River (land) otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Lynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marten	25.0	25.0	25.0	0.0	0.0	0.0	0.0	0.0	12.0	ind	3.0	0.0
Mink	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Muskrat	75.0	50.0	50.0	25.0	25.0	37.5	9.4	3.8	50.0	ind	12.5	0.0
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	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	ind	0.0	0.0
Red (tree) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Weasel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 4-5.–Page 3 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Small land mammals, continued												
Gray wolf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Wolverine	25.0	25.0	25.0	0.0	0.0	0.0	0.0	0.0	1.0	ind	0.3	0.0
Marine mammals	**25.0**	**0.0**	**0.0**	**25.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Ringed seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spotted seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown seal	25.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Birds and eggs	**75.0**	**75.0**	**75.0**	**25.0**	**25.0**	**45.1**	**11.3**	**4.5**	**45.1**	**lb**	**11.3**	**0.0**
Canvasback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spectacled eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Goldeneye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	25.0	25.0	25.0	0.0	0.0	2.0	0.5	0.2	1.0	ind	0.3	0.0
Northern pintail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Black scoter	75.0	50.0	50.0	25.0	25.0	18.0	4.5	1.8	20.0	ind	5.0	0.0
Green-winged teal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown ducks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Cackling goose	75.0	75.0	75.0	0.0	25.0	21.6	5.4	2.2	18.0	ind	4.5	0.0
Canada goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown Canada/cackling goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Snow goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
White-fronted goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown geese	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tundra (whistling) swan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sandhill crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spruce grouse	25.0	25.0	25.0	0.0	0.0	3.5	0.9	0.4	5.0	ind	1.3	0.0

-continued-

Table 4-5.–Page 4 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Sharp-tailed grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ruffed grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown grouses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown ptarmigans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Snowy owl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown duck eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown goose eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown swan eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown crane eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown small shorebird eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown gull eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown loon eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown murre eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown tern eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine invertebrates	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Butter clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Freshwater clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Razor clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Dungeness crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown king crabs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown Tanner crabs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Vegetation	**75.0**	**75.0**	**25.0**	**25.0**	**0.0**	**38.0**	**9.5**	**3.8**	**38.0**	**lb**	**9.5**	**0.0**
Blueberry	50.0	25.0	25.0	25.0	0.0	20.0	5.0	2.0	5.0	gal	1.3	0.0
Lowbush cranberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Highbush cranberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Crowberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0

-continued-

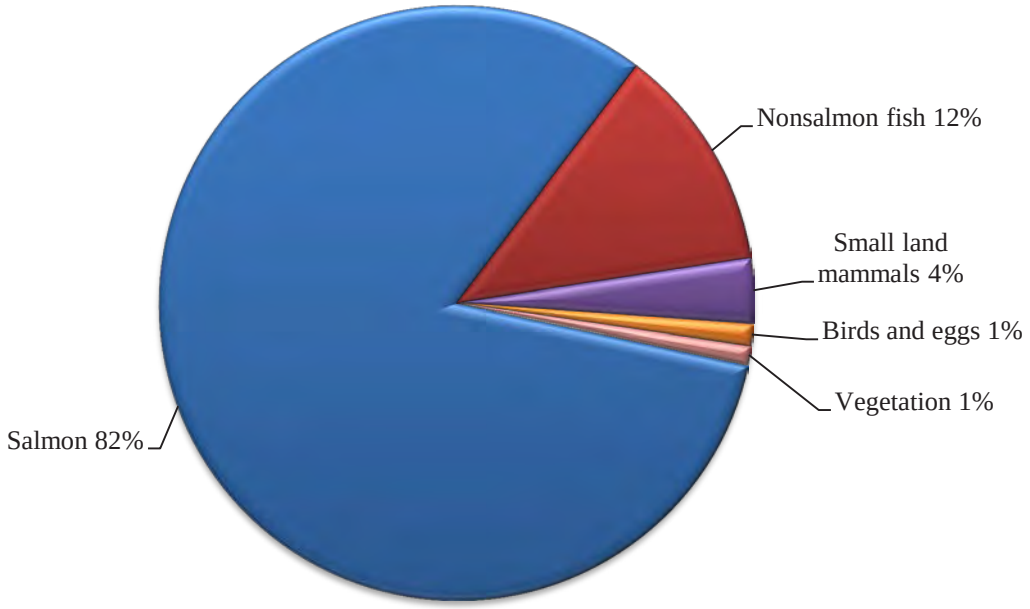
Table 4-5.–Page 5 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Vegetation, continued												
Cloudberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Raspberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other wild berry	25.0	25.0	25.0	0.0	0.0	8.0	2.0	0.8	2.0	gal	0.5	0.0
Wild rhubarb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Fiddlehead ferns	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Hudson's Bay (Labrador) tea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Willow leaves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other wild greens	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown mushrooms	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Fireweed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Chaga	25.0	25.0	25.0	0.0	0.0	10.0	2.5	1.0	10.0	gal	2.5	0.0
Wood	75.0	75.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2015.

Note Resources where the percentage using is greater than the combined received and harvest indicate use from resources obtained during a previous year.

Note For small land mammals, species that are not typically eaten show a nonzero harvest amount with a zero harvest weight. Harvest weight is not calculated for species harvested but not eaten.



Note Categories having 0 lb of usable weight are not included.

Figure 4-6.–Compostion of harvest by resource category, by weight in usable pounds, Stevens Village, 2014.

Table 4-6.–Resources most commonly used by households, Stevens Village, 2014.

Rank[a]	Resource	Percentage of households using
1.	Moose	75.0%
1.	Muskrat	75.0%
1.	Black scoter	75.0%
1.	Cackling goose	75.0%
5.	Fall chum salmon	50.0%
5.	Northern pike	50.0%
5.	Sheefish	50.0%
5.	Humpback whitefish	50.0%
5.	Beaver	50.0%
5.	Blueberry	50.0%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Resources used by the same percentage of households share the lowest rank value instead of having sequential rank values.

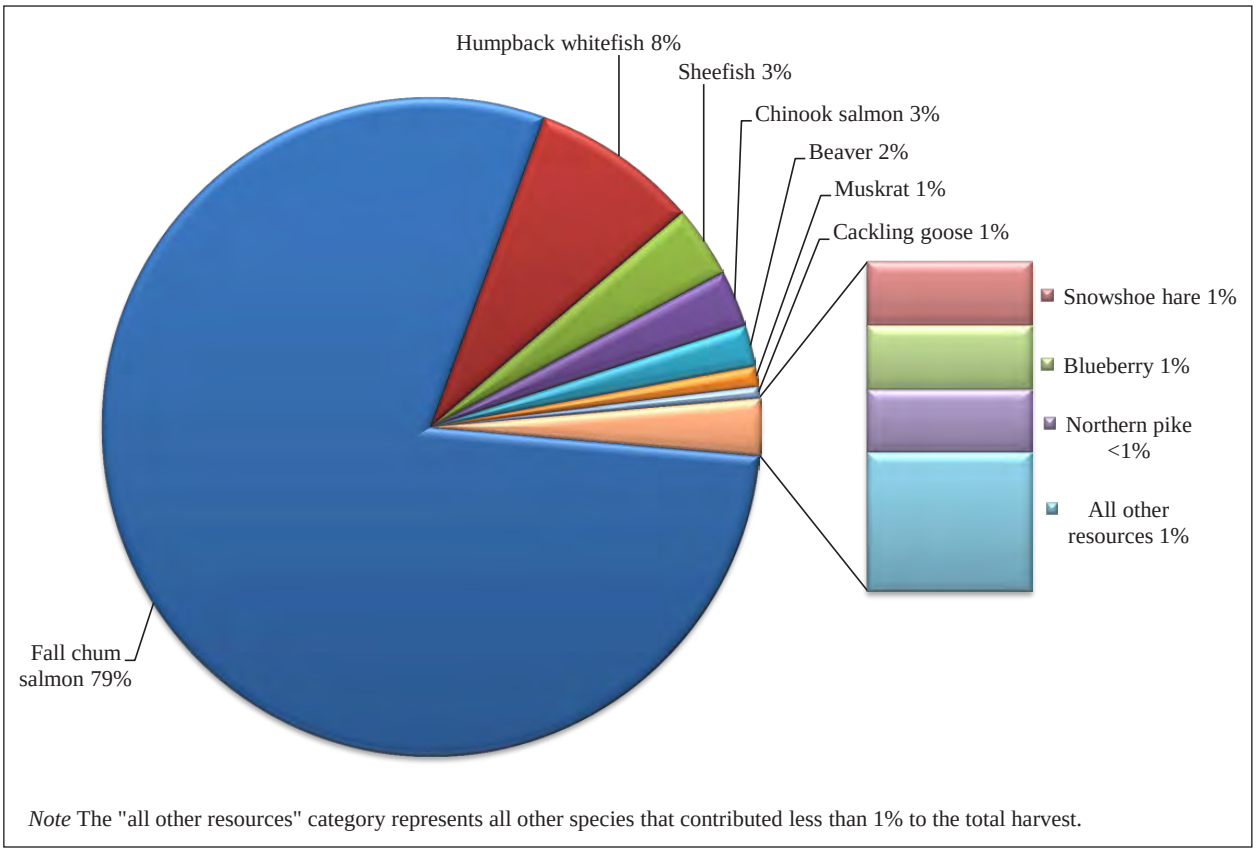


Figure 4-7.–Top resource harvests by weight in usable pounds per capita, Stevens Village, 2014.

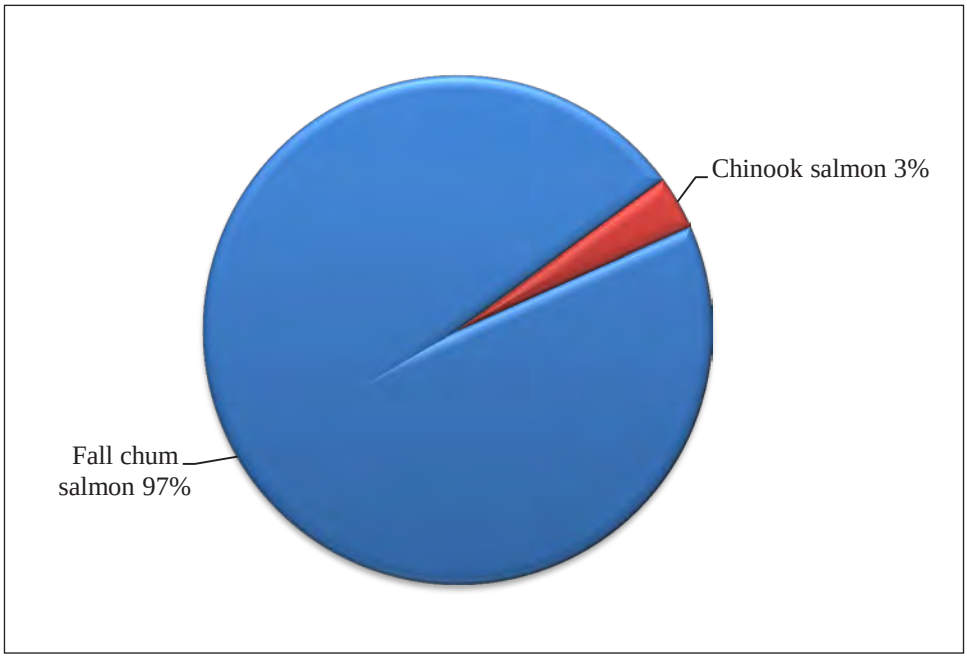


Figure 4-8.–Composition of salmon harvest by weight in usable pounds, Stevens Village, 2014.

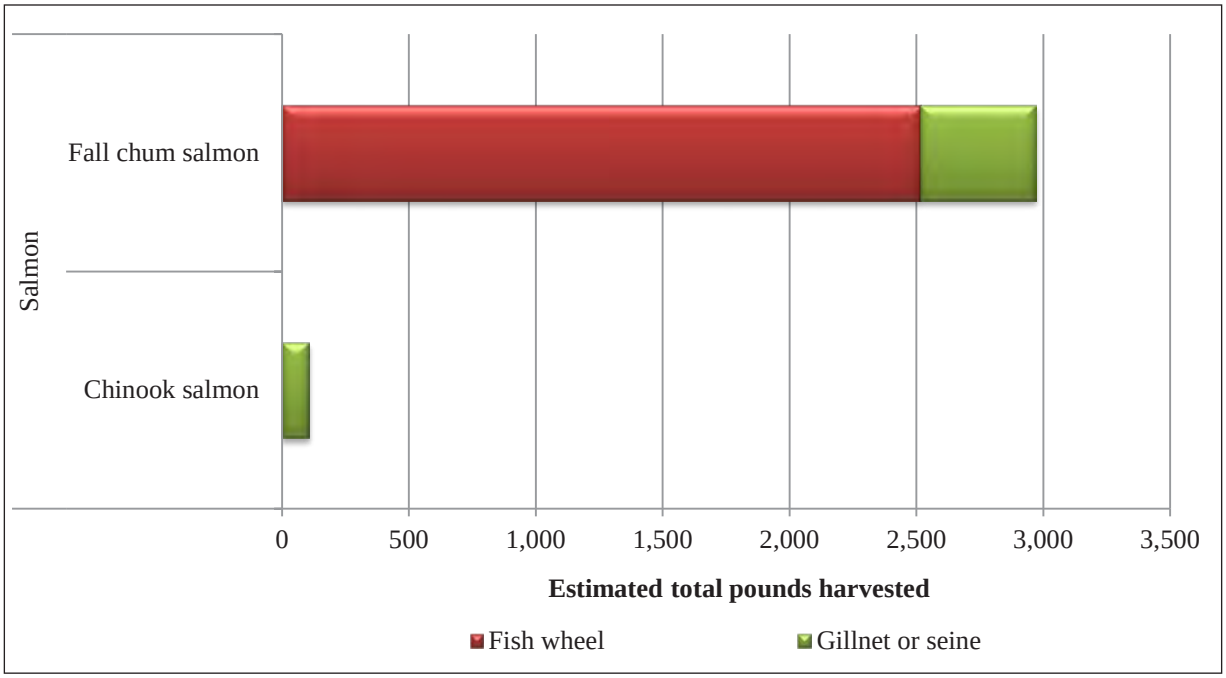


Figure 4-9.–Salmon harvests by gear type, Stevens Village, 2014.

(2,516 lb) fall chum salmon and gillnets to harvest 90 (453 lb) fall chum salmon (Figure 4-9; Table D4-5). Twelve (104 lb) Chinook salmon were harvested using gillnets. No other fishing gear was specified.

Table 4-7 shows the salmon harvest for feeding dogs. Stevens Village households fed 352 (1,771 lb) fall chum salmon to their pet dogs in 2014. Although dog teams were used extensively in the past, as recently as the 1980s, there were no dog teams in the community in 2014.

Table 4-7.–Reported harvests of fish for consumption by dogs, Stevens Village, 2014.

Resource	Amount	Pounds
Salmon		
Fall chum salmon	352.0 ind	1,771.3 lb
Total	**352.0 ind**	**1,771.3 lb**

Source ADF&G Division of Subsistence household surveys, 2015.

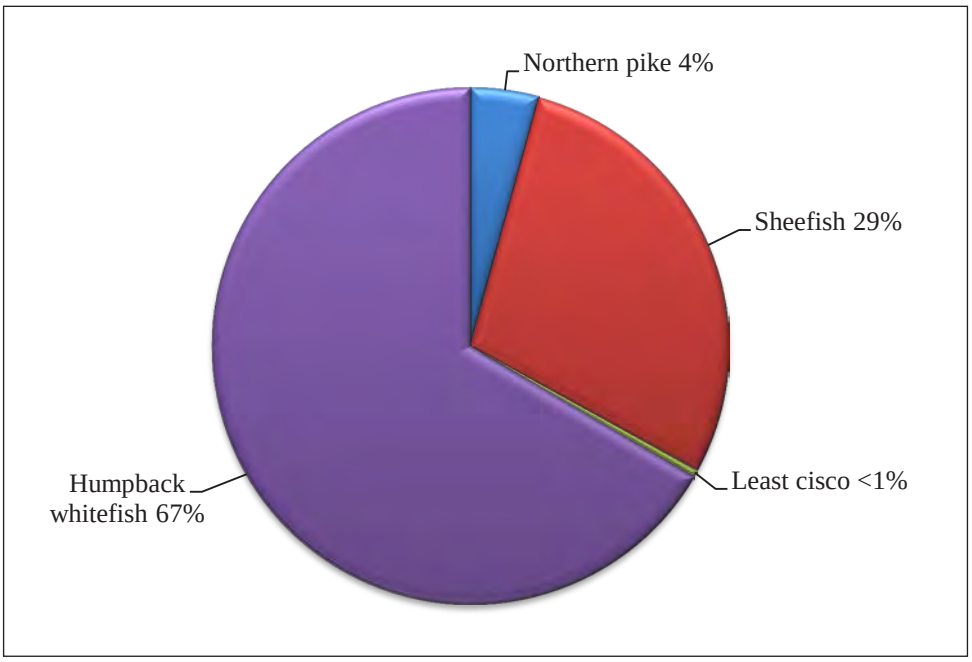


Figure 4-10.–Composition of nonsalmon fish harvest by weight in usable pounds, Stevens Village, 2014.

Nonsalmon Fish

Stevens Village residents reported harvesting 4 species of nonsalmon fish. Humpback whitefish contributed the most by edible weight (67%) to the nonsalmon fish category in 2014. Sheefish was next with 29%. Northern pike contributed 4%, and least cisco accounted for less than 1% (Figure 4-10).

A total of 460 lb of nonsalmon fish was harvested using gillnets exclusively (Table D4-6; Figure 4-11). Stevens Village survey participants reported harvesting 14 (20 lb) northern pike, 22 (132 lb) sheefish, 2 (2 lb) longnose suckers, and 102 (306 lb) humpback whitefish with gillnets in 2014.

No nonsalmon fish species were harvested by Stevens Village households specifically for dog food (Table 4-7).

Large Land Mammals

Stevens Village households did not report harvesting any large land mammals in 2014. However, as stated previously, 75% of surveyed households received and used moose, and 75% hunted moose (Table 4-5). There was no attempted harvest of any other large land mammal in 2014.

Small Land Mammals/Furbearers

In terms of edible weight, beaver was the top contributor to the small land mammals category in 2014 (57%, 75 lb; Table 4-5; Figure 4-12) and was used for both food and fur. Muskrat accounted for 28% of the total small land mammals category and snowshoe hare accounted for 15% (Figure 4-12). Marten and wolverine were used and harvested for fur only (Figure 4-13). Table 4-5 shows that 75% of households used small land mammals, 50% attempted harvest, 50% actually harvested, and 25% received small land mammals in 2014.

Table 4-8 depicts the harvest by month of small land mammals by Stevens Village households in 2014. Beaver was primarily harvested in the spring months of March and April. Muskrats were harvested during the months of April and May. Likely because snowshoe hares are often harvested opportunistically, no known month or months were reported for their harvest. Likewise, households did not specify harvest month or months for martens (12) or wolverines (1).

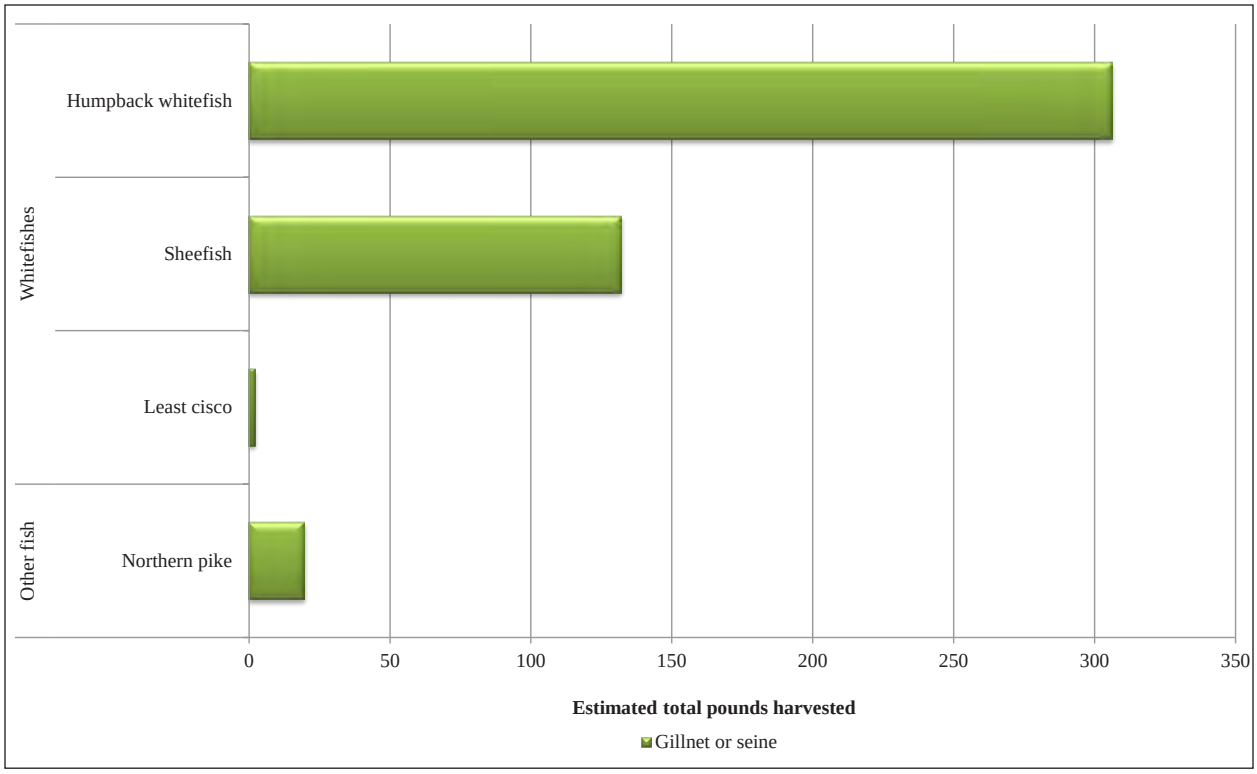


Figure 4-11.–Nonsalmon fish harvests by gear type, Stevens Village, 2014.

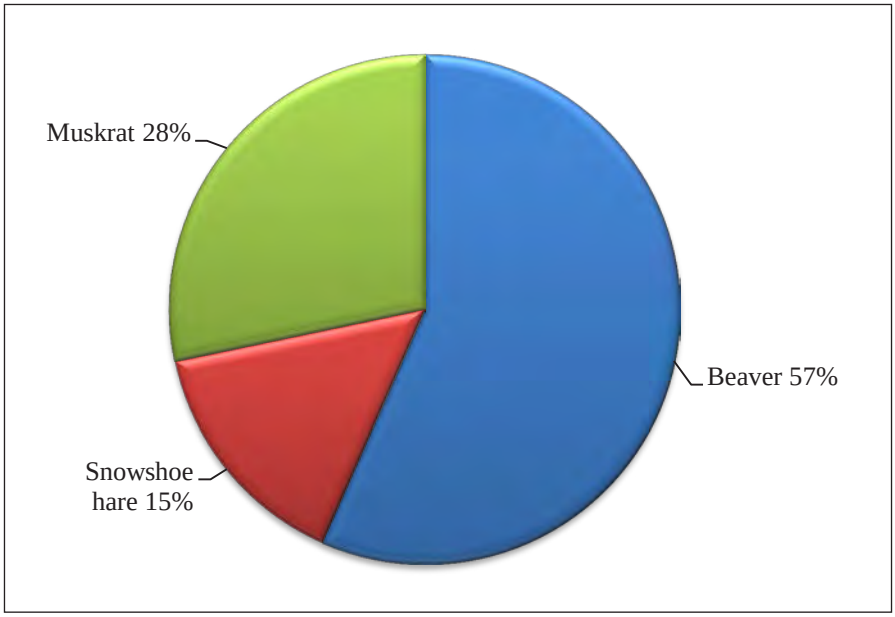


Figure 4-12.–Composition of small land mammal harvest by weight in usable pounds, Stevens Village, 2014.

Table 4-8.–Reported small land mammal/furbearer harvests by month, Stevens Village, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All small land mammals	**0.0**	**0.0**	**1.0**	**21.0**	**20.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**36.0**	**78.0**
Beaver	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	**5.0**
Coyote	0.0	0.0	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–cross phase	0.0	0.0	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–red phase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Snowshoe 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	10.0	**10.0**
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	**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	**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	**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	12.0	**12.0**
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	**0.0**
Muskrat	0.0	0.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	**50.0**
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	**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	**0.0**
Red (tree) 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	**0.0**
Weasel	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**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	1.0	**1.0**

Source ADF&G Division of Subsistence household surveys, 2015.

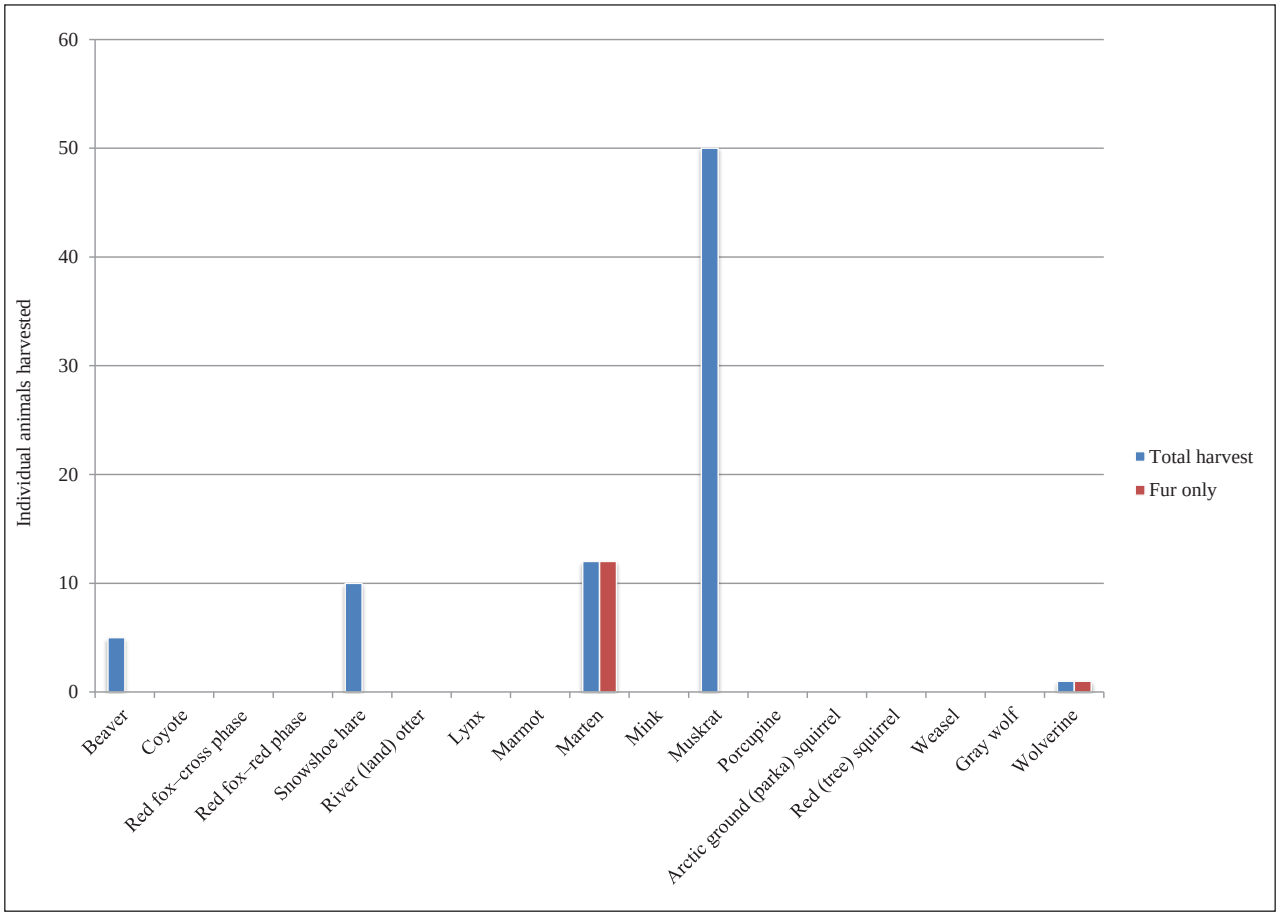


Figure 4-13.–Reported small land mammal harvests for fur or food, Stevens Village, 2014.

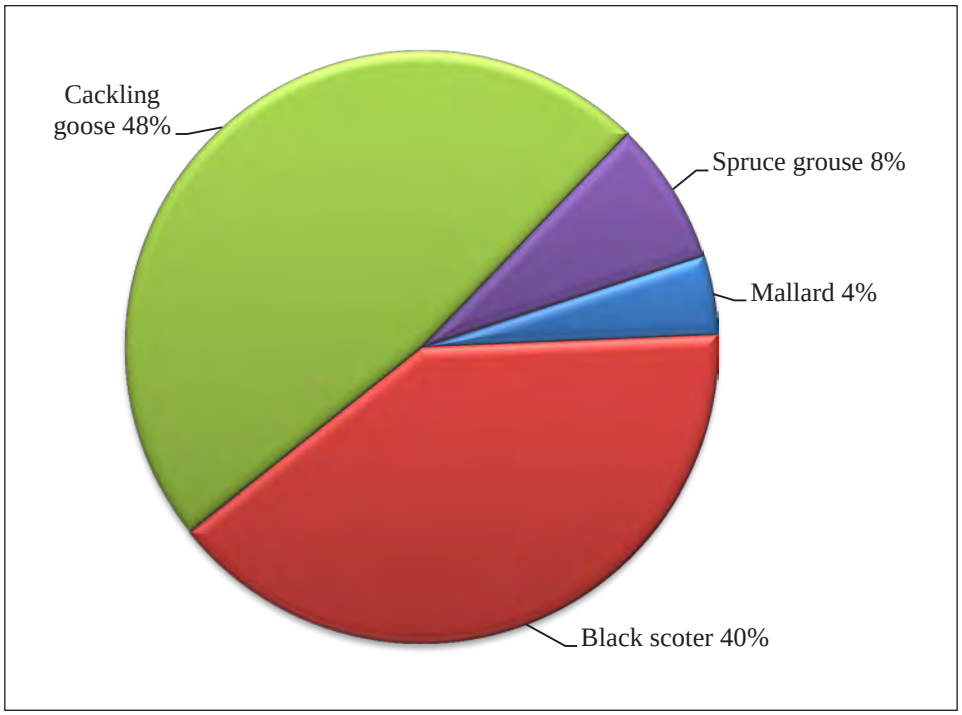


Figure 4-14.–Composition of bird and bird egg harvest by weight in usable pounds, Stevens Village, 2014.

Marine Mammals

There was no harvest of or attempt to harvest marine mammals by Stevens Village households in 2014. However, 25% of households reported receiving and using seal (most likely seal oil; Table 4-5). Seal oil or other seal products are often traded or shared by friends or family from coastal areas of Alaska. The survey, however, did not collect information on the exchange networks present in Stevens Village.

Birds and Eggs

In pounds edible weight, cackling goose accounted for the greatest component (48%, 22 lb) of the birds and eggs category, followed closely by black scoter (40% 18 lb; Table 4-5; Figure 4-14). Spruce grouse (8% of the birds and eggs harvest) and mallard (4%) completed the birds and eggs category. Households did not report any harvest of eggs in 2014. Table 4-5 shows that 75% of households used and harvested cackling goose; 75% of households used and 50% harvested black scoter. Twenty-five percent of households shared both cackling goose and black scoter, but there was no report of sharing of spruce grouse or mallard. Most birds (37) were harvested during the spring migration (Table 4-9). Households reported harvesting 2 cackling geese and 5 spruce grouse during the fall. There was no reported harvest of birds during the summer months.

Marine Invertebrates

Stevens Village households did not report any attempt to harvest, harvest, or use of marine invertebrates in 2014 (Table 4-5).

Table 4-9.–Reported bird harvests by season, Stevens Village, 2014.

	Estimated harvest by season					
Resource	Spring	Summer	Fall	Winter	Season unknown	**Total**
All birds	**37.0**	**0.0**	**2.0**	**5.0**	**0.0**	**44.0**
Canvasback	0.0	0.0	0.0	0.0	0.0	**0.0**
Spectacled eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Goldeneye	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	1.0	0.0	0.0	0.0	0.0	**1.0**
Northern pintail	0.0	0.0	0.0	0.0	0.0	**0.0**
Black scoter	20.0	0.0	0.0	0.0	0.0	**20.0**
Green-winged teal	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown ducks	0.0	0.0	0.0	0.0	0.0	**0.0**
Brant	0.0	0.0	0.0	0.0	0.0	**0.0**
Cackling goose	16.0	0.0	2.0	0.0	0.0	**18.0**
Canada goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown Canada/cackling goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Snow goose	0.0	0.0	0.0	0.0	0.0	**0.0**
White-fronted goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown geese	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	0.0	0.0	0.0	0.0	0.0	**0.0**
Sandhill crane	0.0	0.0	0.0	0.0	0.0	**0.0**
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Spruce grouse	0.0	0.0	0.0	5.0	0.0	**5.0**
Sharp-tailed grouse	0.0	0.0	0.0	0.0	0.0	**0.0**
Ruffed grouse	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown grouses	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown ptarmigans	0.0	0.0	0.0	0.0	0.0	**0.0**
Snowy owl	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2015.

Vegetation

Berries made up the most edible weight (74%) of the vegetation category. Plants and greens accounted for only 26% (Figure 4-15). Blueberries were the only berry that residents reported harvesting or using in 2014. Fifty percent of households used blueberries in 2014. Twenty-five percent attempted to harvest, 25% harvested, and 25% received blueberries during the study year. Blueberries added 20 lb to the total community harvest (Table 4-5).

Of other vegetation (plants, greens, and wood), chaga, a fungus commonly used for tea, was used and harvested by 25% of households. Wood was used by 75% of households, harvested by 75%, and received by 50% of households (Table 4-5). Although wood is not eaten, it is a wild resource used for many purposes including firewood for smoking fish and heating homes. Table 4-10 shows the percentage of Stevens Village residents' home heating needs that were met with the use of firewood.

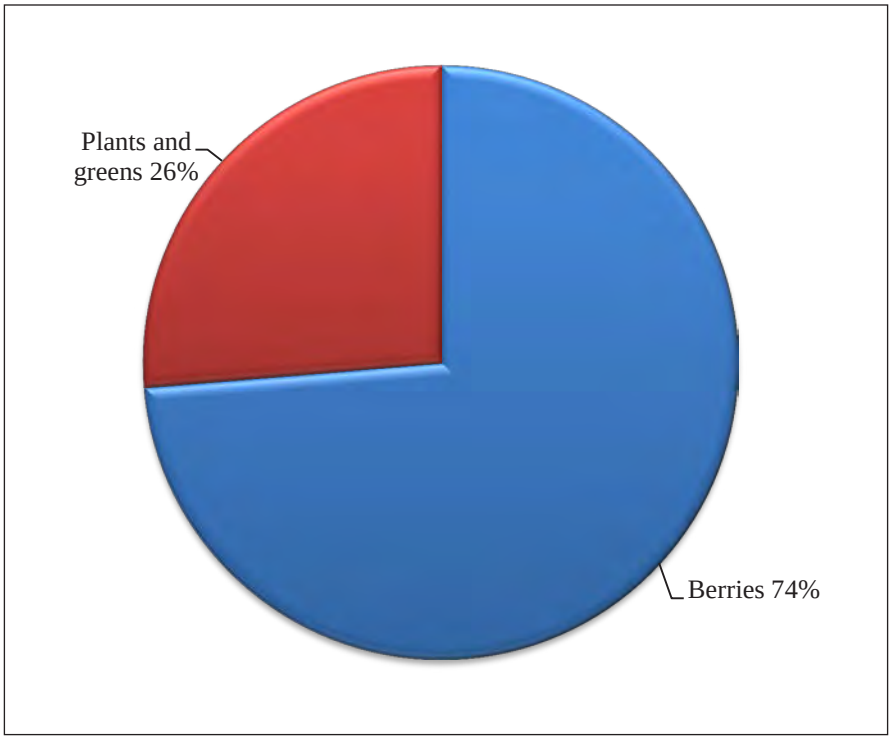


Figure 4-15.–Composition of vegetation harvest by weight in usable pounds, by type of vegetation, Stevens Village, 2014.

Table 4-10.–Use of firewood for home heating, Stevens Village, 2014.

Percentage of home heating from wood	Stevens Village households	
	Number	Percentage
0%	2	50.0
1–25%	0	0.0
26–50%	0	0.0
51–75%	0	0.0
76–99%	0	0.0
100%	2	50.0

Source ADF&G Division of Subsistence household surveys, 2015.

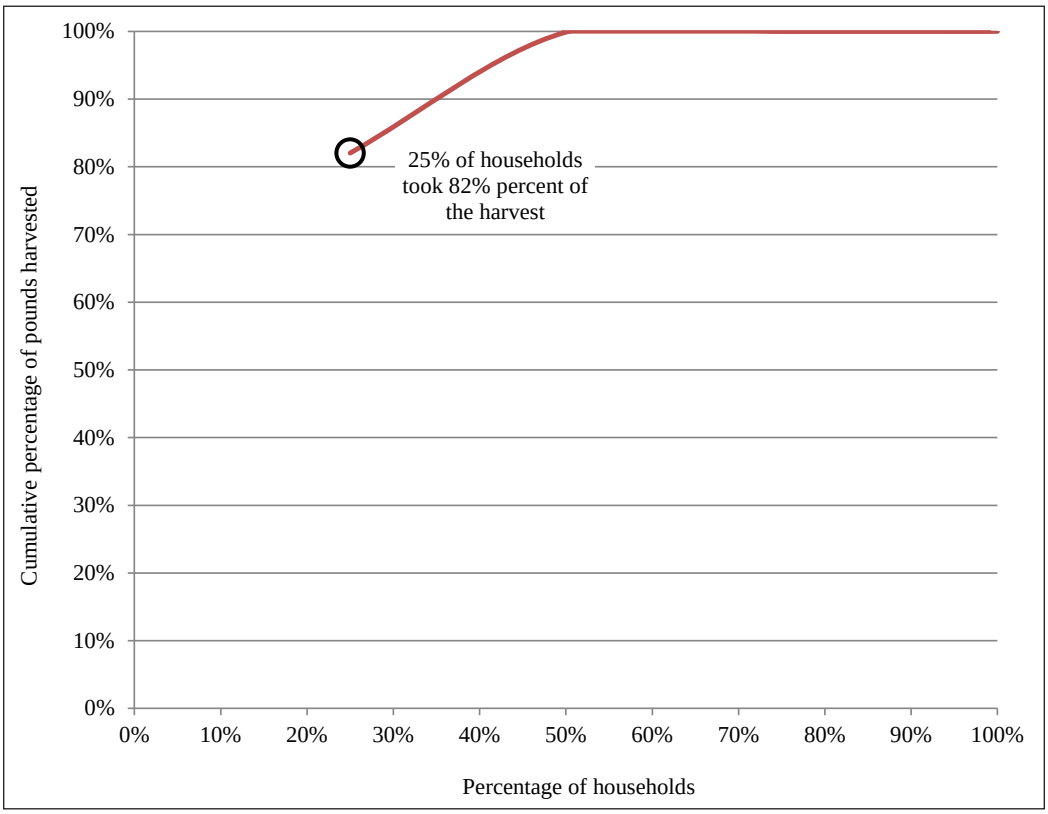


Figure 4-16.–Household specialization, Stevens Village, 2014.

Production and Distribution of Wild Resources

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.

Twenty-five percent of Stevens Village households harvested about 82% of the wild resources taken in 2014 (Figure 4-16).

Income and Cash Employment

Due to a small sample size and issues of household confidentiality, information concerning employment and income are not included in this report.

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). 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

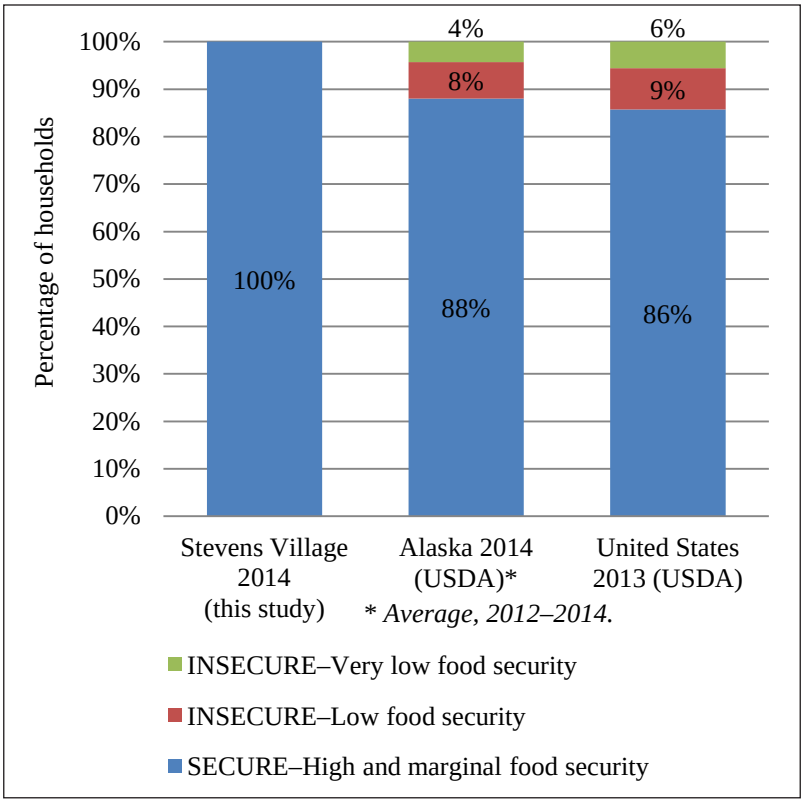


Figure 4-17.–Comparison of food security categories, Stevens Village, 2014.

Table 4-11.–Household descriptions of food eaten in the last 12 months, Stevens Village, 2014.

Statement	Percentage of affirmative responses
Had enough of the kinds of food desired	80.0%
Had enough food, but not the desired kind	0.0%
Somestimes, or often, did not have enough food	0.0%
Missing/No response	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.

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. Overall, 100% of Stevens Village households were classified as food secure, higher than Alaska (88%) and the United States in general (86%; Figure 4-17). Eighty percent of households said that they had enough of the kinds of food that they desired (Table 4-11).

Comparing Harvests and Uses in 2014 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 2 ways: whether they used more, less, or about the same amount of 8 resource categories in 2014 as in the past 5 years, and whether they got "enough" of each of the 8 resource categories. Households were also asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different subsistence resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 4-12, Figure 4-18, and Figure 4-19 provide a broad overview of households' assessments of their harvests in 2014. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions. In general, the majority of Stevens Village households reported getting enough of all resource categories despite using less in some of the categories with the exception of salmon, where the majority of households reported not getting enough. Although Stevens Village households reported no moose harvest, they indicated that they received enough moose meat from others in 2014.

Salmon provided the most weight of all subsistence resource categories used by Stevens Village households (Figure 4-6). Thirty-three percent of responding households explained that they used the same amount of salmon in 2014 as they did in previous years, 33% reported that they used less, and 33% said they used more (Table 4-12; Figure 4-18). Only 1 respondent reported why they got less salmon in 2014 than in prior years: they were working at a paid job and did not have enough time to fish for salmon (Table 4-13). Only 1 household used more salmon in the study year. This household stated that increased effort was their reason for getting more salmon in 2014 (Table 4-14). In Stevens Village, 75% of respondents stated that they did not get enough salmon (Figure 4-19). When asked to evaluate the impact of not getting enough salmon, 1 household described it as not noticeable and 1 household said that the impact was minor (Table 4-15).

Fifty percent (2 households) of Stevens Village households reported that they used about the same amount of nonsalmon fish as they had in recent years (Table 4-12; Figure 4-18). Two households said they did not use nonsalmon fish in 2014. Households said that they got enough nonsalmon fish during the study year.

Large land mammals were not harvested but were used in 2014 (Table 4-5). All households reported using less large land mammals (Table 4-12; Figure 4-18). One household (25%) said that family or personal issues were the reason that they used less large land mammals in 2014 (Table 4-13). Three households (75%) said that they were unsuccessful at hunting. However, 3 households stated that they got enough (Figure 4-19). The 1 household that reported not getting enough large land mammals said that the impact of not getting enough was minor (Table 4-15).

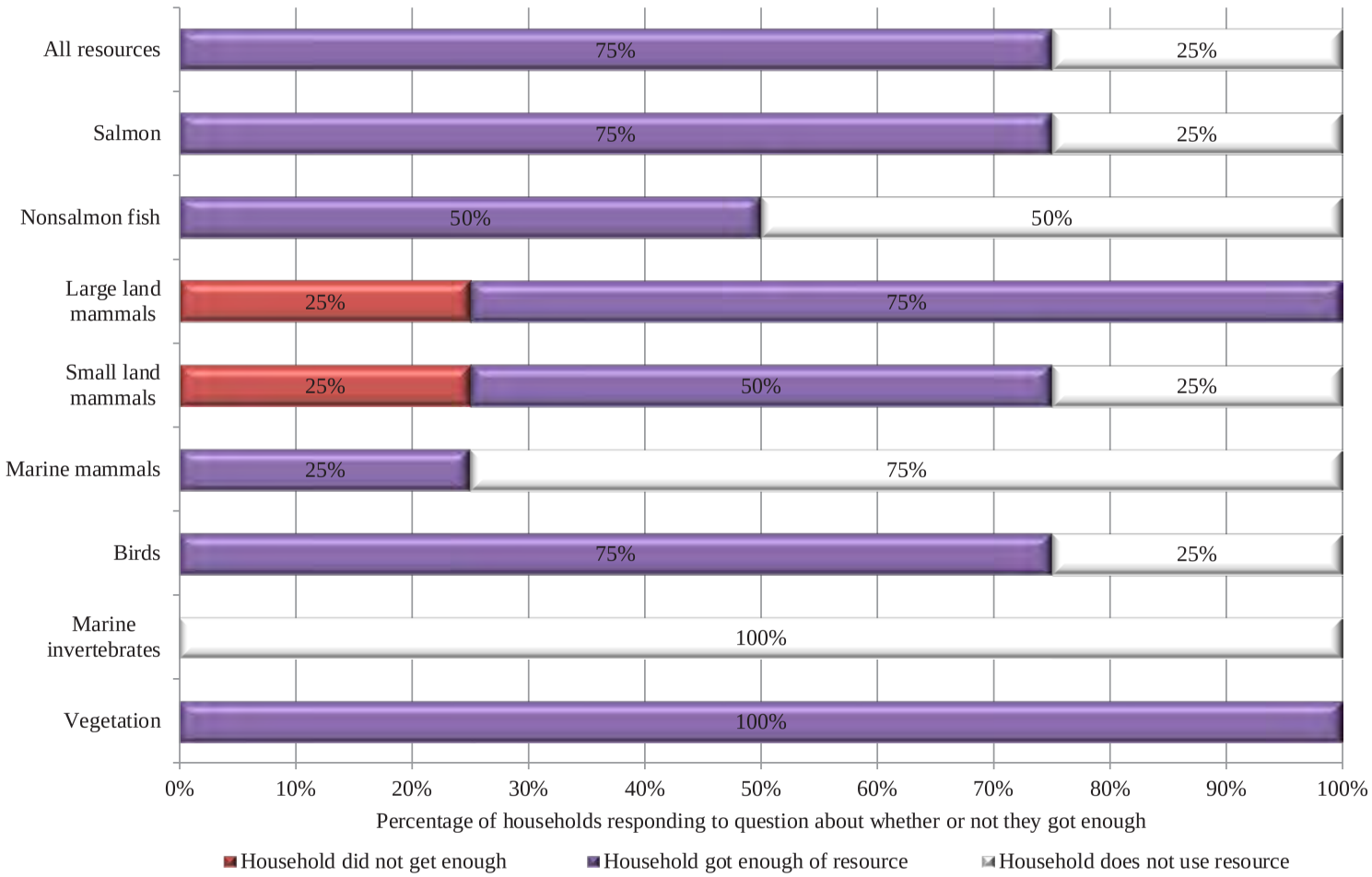
Sixty-seven percent of households said that they used less small land mammals in 2014, and 33% said they used about the same amount (Table 4-12; Figure 4-18). One of these households said that lack of effort was the reason they used less (Table 4-13). Fifty percent (50%) said that they got enough of this resource, and 25% said they did not get enough (Figure 4-19). One household said that they needed more beaver (Table 4-16). The impact of not having enough small land mammals in 2014 was reported by all as being minor (Table 4-15).

Table 4-12.–Changes in household uses of resources compared to recent years, Stevens Village, 2014.

			Households reporting use								Households not using	
	Sampled	Valid	Total households		Less		Same		More			
Resource category	households	responses[a]	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	4	3	3	100.0%	0	0.0%	2	66.7%	1	33.3%	0	0.0%
Salmon	4	3	3	100.0%	1	33.3%	1	33.3%	1	33.3%	0	0.0%
Nonsalmon fish	4	4	2	50.0%	0	0.0%	2	50.0%	0	0.0%	2	50.0%
Large land mammals	4	4	4	100.0%	4	100.0%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	4	3	3	100.0%	2	66.7%	1	33.3%	0	0.0%	0	0.0%
Marine mammals	4	4	1	25.0%	0	0.0%	1	25.0%	0	0.0%	3	75.0%
Birds	4	4	3	75.0%	1	25.0%	1	25.0%	1	25.0%	1	25.0%
Marine invertebrates	4	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	4	100.0%
Vegetation	4	4	4	100.0%	4	100.0%	0	0.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response.



Note Unlabeled percentages are less than 5%.

Figure 4-18.–Percentage of households reporting whether they got enough resources, Stevens Village, 2014.

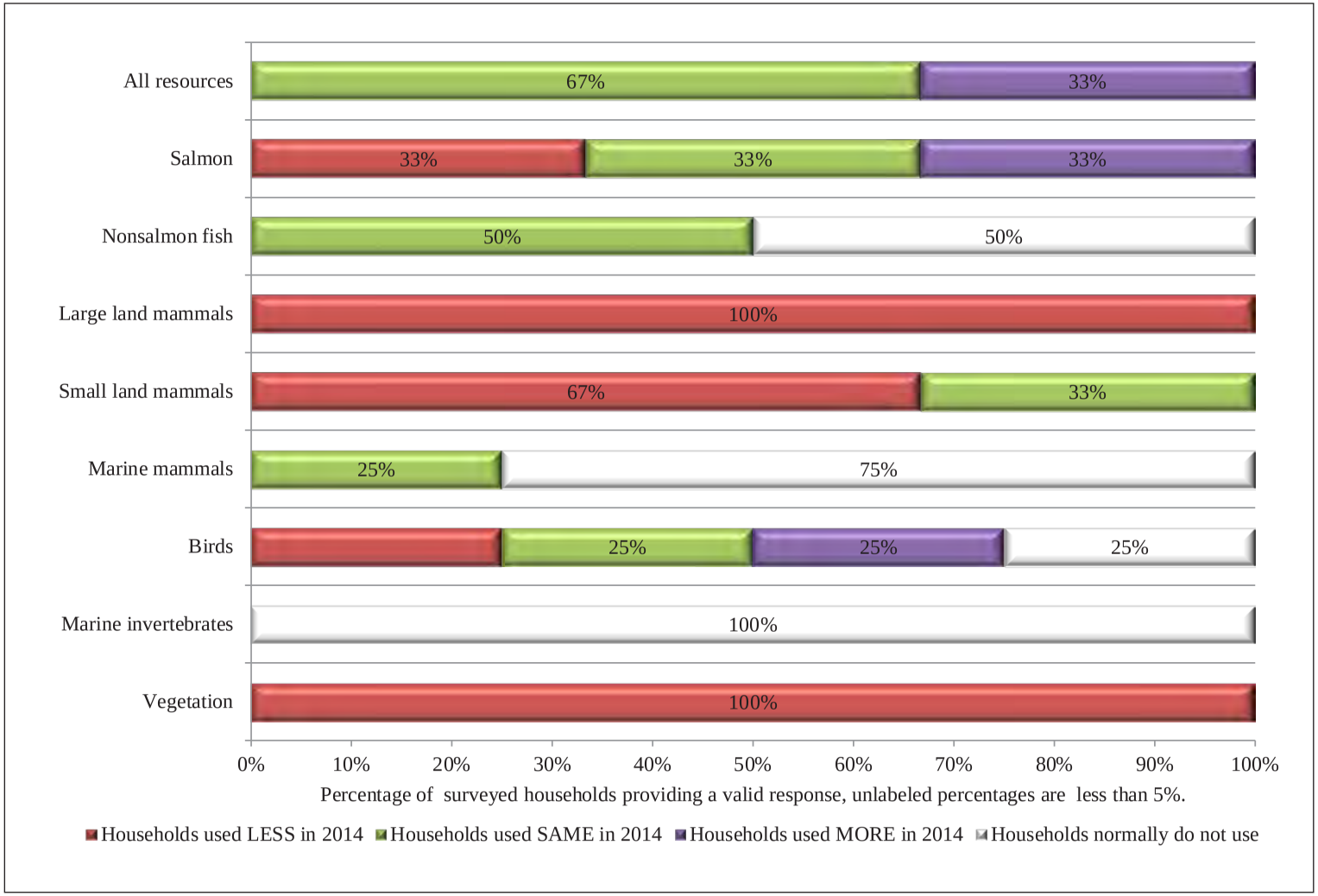


Figure 4-19.–Changes in household uses of resources compared to recent years, Stevens Village, 2014.

Table 4-13.–Reasons for less household uses of resources compared to recent years, Stevens Village, 2014.

Resource category	Valid responses[a]	Households reporting reasons for less use	Family/ personal		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful		Weather/ environment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	3	0	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Salmon	3	1	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Nonsalmon fish	4	0	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Large land mammals	4	4	1	25.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	3	75.0%	0	0.0%
Small land mammals	3	2	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	1	50%	0	0.0%	0	0.0%
Marine mammals	4	0	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Birds	4	1	0	0.0%	1	100%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Marine invertebrates	4	0	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Vegetation	4	4	0	0.0%	2	50%	0	0.0%	0	0%	0	0%	2	50%	0	0.0%	2	50.0%

-continued-

Table 4-13.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Other reasons		Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Equipment/ fuel expense		Used other resources	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	3	0	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	3	1	0	0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	4	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	4	4	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	3	2	0	0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	4	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	4	1	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	4	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	4	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, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never using the resource.

Table 4-14.–Reasons for more household uses of resources compared to recent years, Stevens Village, 2014.

Resource category	Valid responses[a]	Households reporting reasons for more use	Increased availability		Used other resources		Favorable weather		Received more		Needed more		Increased effort		Had more help	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	3	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Salmon	3	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%
Nonsalmon fish	4	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	4	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	3	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	4	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	4	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Marine invertebrates	4	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	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 4-14.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for more use	Other		Regulations		Traveled farther		More success		Needed less		Store-bought expense		Got/ fixed equipment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	3	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	3	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	4	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	4	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	3	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	4	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	4	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	4	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	0.0%	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, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never use.

Table 4-15.–Reported impact to households reporting that they did not get enough of a type of resource, Stevens Village, 2014.

		Households not getting enough ____ .				Impact to those not getting enough _____ .									
	Sample	Valid responses[a]		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
All resources	4	3	75.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	4	3	75.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	4	2	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	4	4	100.0%	1	25.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Small land mammals	4	3	75.0%	1	33.3%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	4	1	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	4	3	75.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	4	4	100.0%	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, 2015.

a. Includes households failing to respond to the question and those households that never used the resource.

Table 4-16.–Resources of which households reported needing more, Stevens Village, 2014.

Resource	Households needing	Percentage of households
Beaver	1	25.0%
Unknown resource	1	25.0%

Source ADF&G Division of Subsistence household surveys, 2015.

Twenty-five percent of households said that they used about the same amount of birds and eggs in 2014, 25% said that they used more, 25% said they used less, and 25% said that they did not use the resource (Table 4-12; Figure 4-18). Seventy-five percent (all houses that used the resource) reported getting enough birds and eggs for 2014 (Figure 4-19).

All of the households reported that they used less vegetation in 2014 (Table 4-12; Figure 4-18). However, all said that they got enough of this resource during the study year (Figure 4-19).

Harvest Data

Changes in the harvest of resources by Stevens Village residents can also be discerned through comparisons with findings from other study years. Sumida (1988) surveyed all of the 30 Stevens Village households (estimated population of 90) in 1984. The total estimated harvest of subsistence foods for the community for that year was 102,485 lb.[6] Household size ranged from 1 to 9 members, with an average of 3 persons per household. During the time of Sumida's study (1984), the population of Stevens Village was much higher than in 2014; most houses were occupied, the school was open, and the community was providing needed services to residents. In 2014, only 4 year-round households existed, most houses were empty, the school was closed, and the community was no longer providing services that it once was able to. It is difficult to compare harvest data from 2 starkly different time periods in the history of this small community, especially in light of the dramatic population decline in Stevens Village since the baseline comprehensive survey. Per capita harvest estimates provide one way of comparing harvest years while controlling for population; however, it is not clear to what extent the extremely low human population in 2014 may have affected

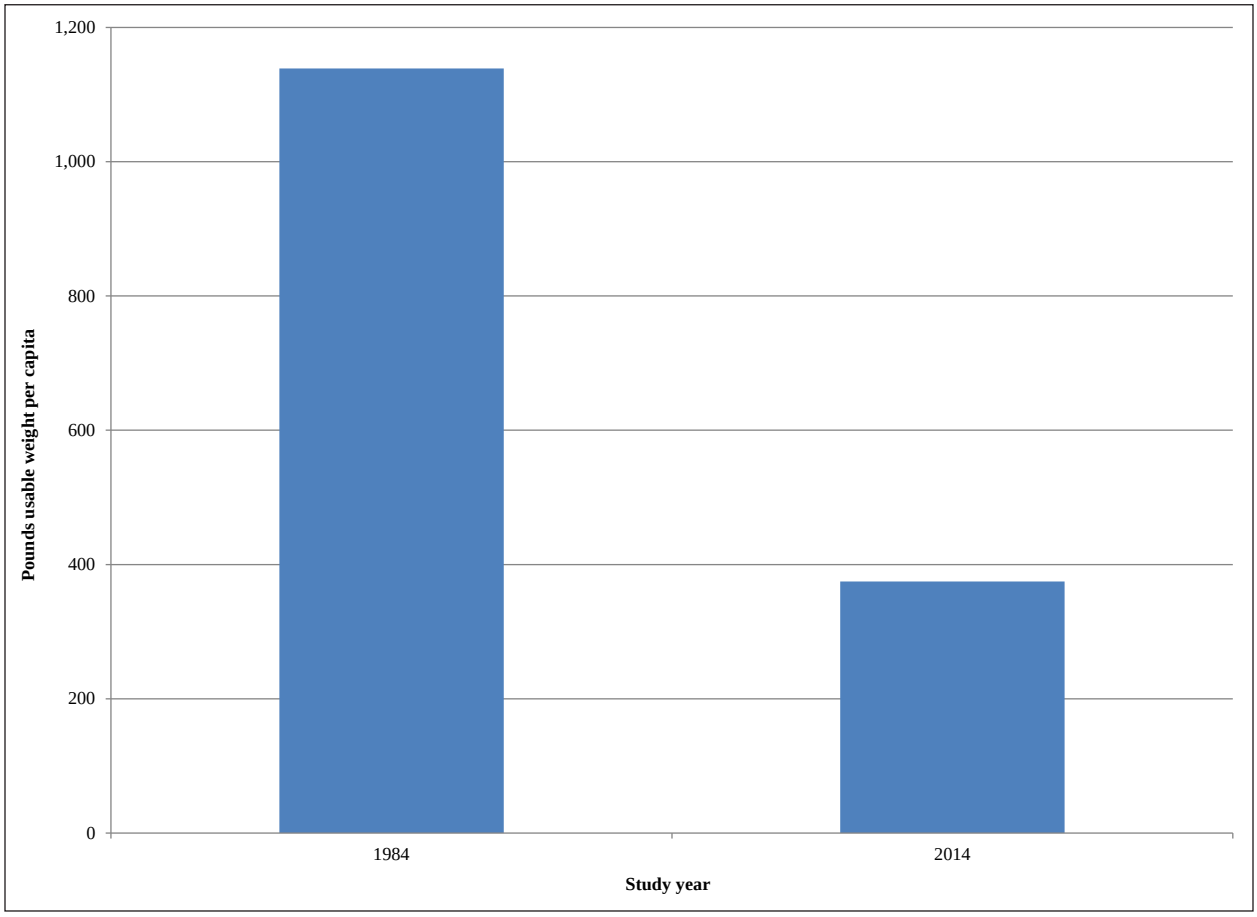


Figure 4-20.–Comparison of per capita harvests, Stevens Village, 1984 and 2014.

6. ADF&G CSIS

Table 4-17.–Comparison of per capita harvests by category, Stevens Village, 1984 and 2014.

Resource category	1984	2014
Salmon	921.7	307.3
Nonsalmon fish	101.7	46.0
Land mammals	94.0	13.3
Marine mammals	0.0	0.0
Birds and eggs	19.6	4.5
Marine invertebrates	0.0	0.0
Vegetation	1.8	3.8
All resources	**1138.7**	**374.8**

Sources Community Subsistence Information System (CSIS) for 1984 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data.

Table 4-18.–Comparison of harvest compositions by category, by weight in usable pounds, Stevens Village,1984 and 2014.

Resource category	1984	2014
Salmon	80.9%	82.0%
Nonsalmon fish	8.9%	12.3%
Land mammals	8.3%	3.5%
Marine mammals	0.0%	0.0%
Birds and eggs	1.7%	1.2%
Marine invertebrates	0.0%	0.0%
Vegetation	0.2%	1.0%

Sources Community Subsistence Information System (CSIS) for 1984 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data.

overall harvest patterns, thus also affecting per capita levels. In 1984, the total per capita estimate for all resources for Stevens Village was 1,139 lb (Figure 4-20; Table 4-17), one of the highest harvest levels for the state at that time. In 2014, the total per capita for all resources was 375 lb, 764 lb lower than in 1984. In addition, in 1984, 97% of households reported harvesting at least 1 type of subsistence foods. In 2014, 75% reported harvest of at least 1 subsistence resource (Sumida 1988).

One statistic that has remained constant has been that of the top resource harvested and used by Stevens Village households. Salmon and nonsalmon fish species together accounted for 90% of the total harvest by weight in 1984, and in 2014, fish species accounted for 94% (Table 4-18). However, a major difference in per capita harvest of salmon is striking. In 1984 the per capita harvest of salmon was 922 lb, while in 2014 the per capita salmon harvest was 307 lb (Table 4-17; Figure 4-21). Part of this difference may be explained by the absence of dog teams in 2014, a major consumer of fish in 1984. In 1984 Stevens Village households reported owning 149 dogs (Sumida 1988:57). The harvest of fish for dogs was substantial at that time, constituting approximately 49% (92,104 lb) of the total community harvest. In order to understand the magnitude of fish harvests for dog food, Sumida removed the dog food harvest estimate from the community harvest total. Without the harvest of fish for dogs, Stevens Village residents harvested 52,049 lb of wild resources, resulting in approximately 578 lb per capita. Comparing this estimate to the 2014 per capita figure (375lb) which does not include any harvest of fish for dogs, the decline in harvest becomes less dramatic. However, the absence of dog teams in Stevens Village does not solely account for the decline in harvest. Without ethnographic data, causes for the decrease are difficult to ascertain.

Figure 4-22 shows the harvest of each salmon species between 1990 and 2014. Data for this figure were gathered by ADF&G Division of Commercial Fisheries during their annual postseason salmon surveys. Orange squares represent Division of Subsistence estimates. As stated above, Stevens Village residents harvested only 2 types of salmon in 2014: Chinook and fall chum salmon. Although the year-to-year pattern of Chinook harvest salmon is erratic from 1984 to 2010, the trendline for Chinook salmon shows a dramatic downward trend. Since 2010, due to lack of the resource and accompanying strict regulations and fishing closures, harvest of Chinook salmon has steadily declined. The trendline for fall chum salmon harvest also shows a downward trend over time. Fewer than 1,000 fall chum salmon per year have been harvested since 2011. Although summer chum and coho salmon were harvested in past years, there was no attempt to harvest either in 2014. The trendlines for both of these types of salmon lead slightly downward over time.

Current and Historical Harvest Areas

Although historical search and harvest area maps exist for Stevens Village (Sumida 1988), current maps are not available from this study. Therefore, comparisons over time cannot be made.

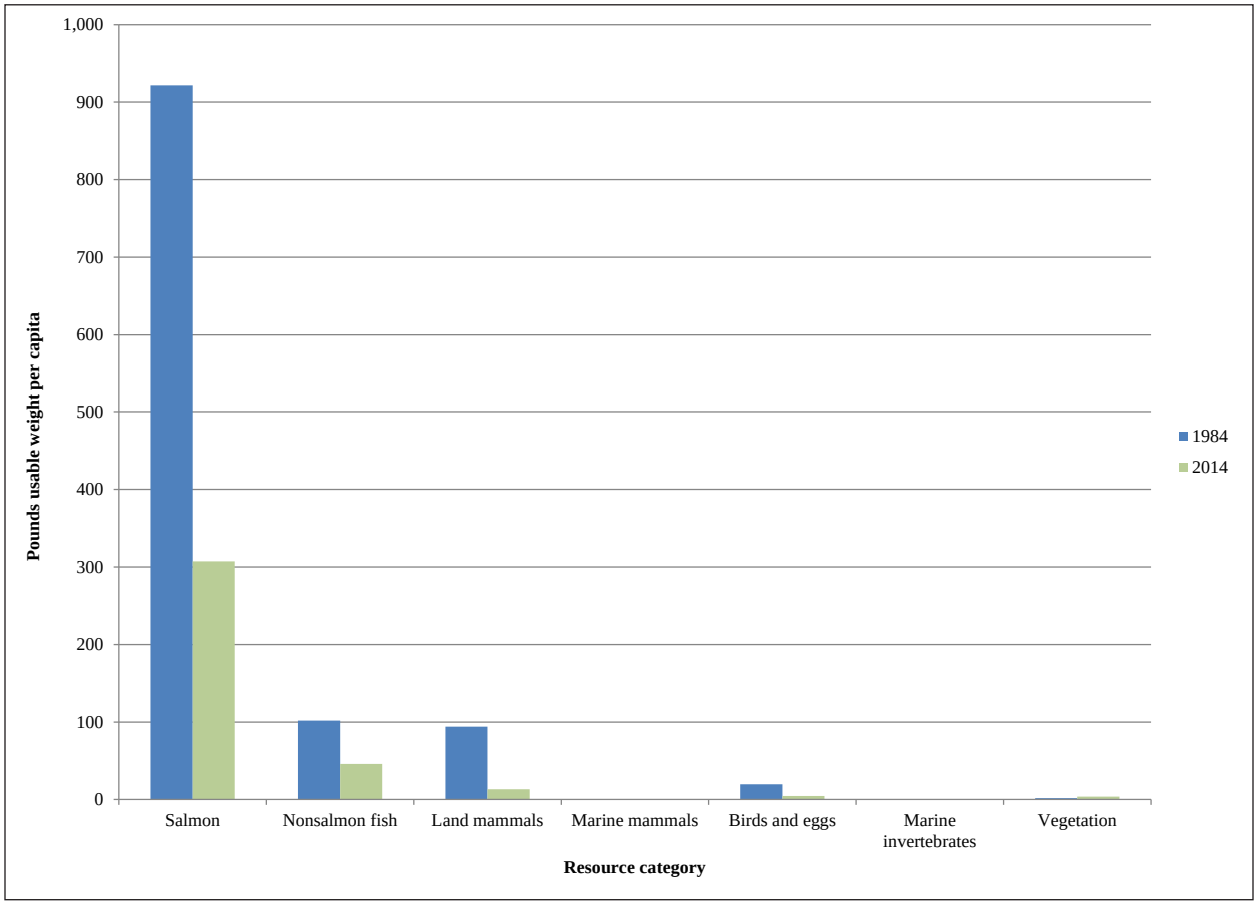


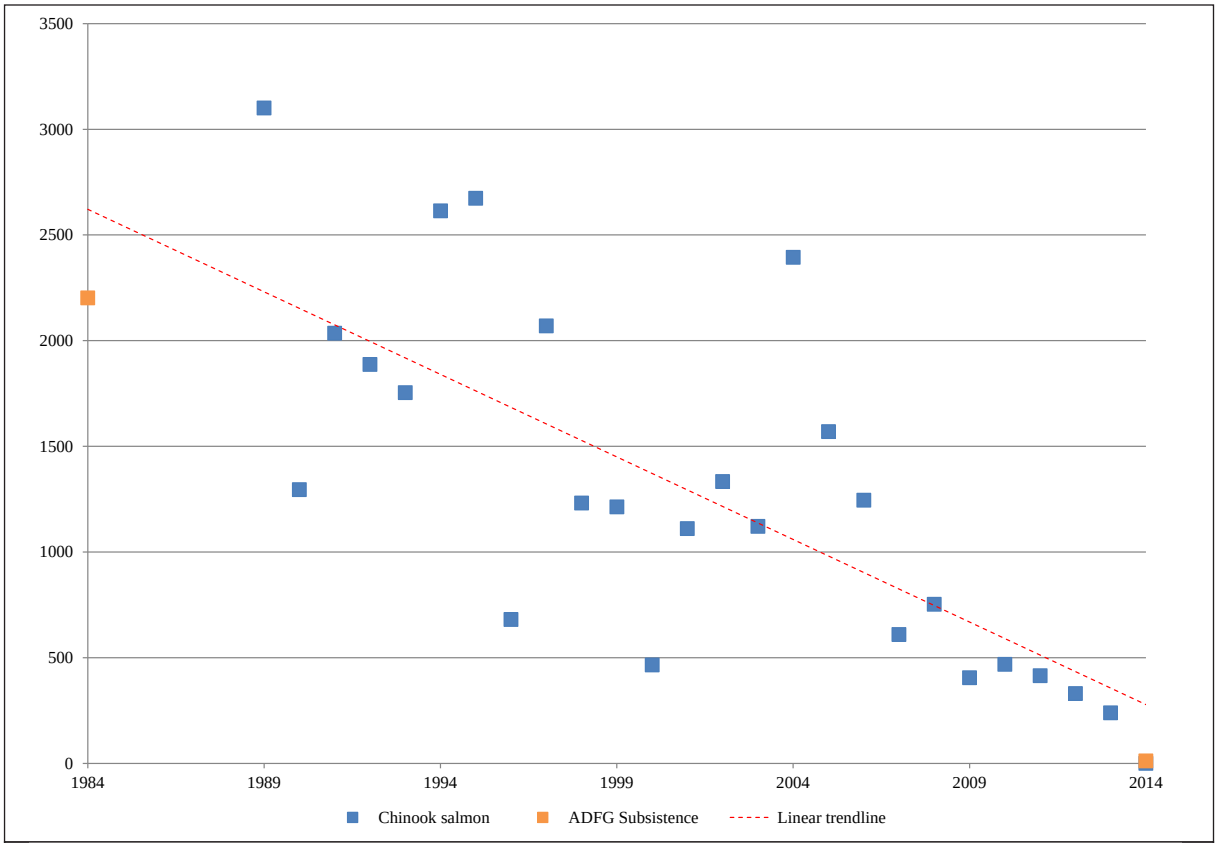
Figure 4-21.–Comparison of per capita harvests by category, Stevens Village, 1984 and 2014.

Local Comments and Concerns

Following is a summary of local observations of wild resource populations and trends that were recorded during the surveys. Some households did not offer any additional information during the survey interviews, so not all households are represented in the summary.

Some respondents were dismayed about the outflow of population, the school closing, and the general inability of the community to thrive. Another major concern was the perceived continued misuse by nonlocals of the Dall River, an area of great importance to residents in terms of culture and subsistence. This misuse of the Dall River was also a major concern in 1984. Specifically, residents expressed concerns that nonlocal hunters and fishers vandalized private property, degraded the area by leaving behind trash, degraded the local fish and wildlife populations, and increased competition with for resources (Sumida 1988:184).

In the survey comments section, one elder respondent said that rabbits and ducks tasted different than when he was a child. He said that trapping was over for the community, and that one could not earn a living at it anymore. He stated that the Dall River used to have a lot of beaver and muskrat houses. He went on to say that the muskrats are gone, but a few muskrat houses are popping up for the first time in years. He noted that the lakes are drying up and water levels are rising. According to him, all the big lakes were gone in the 1990s. Also according to him, the village "dried up" when the school closed a few years back and everyone with kids moved away. Now, he said, "No one is fishing or hunting. It is very quiet."



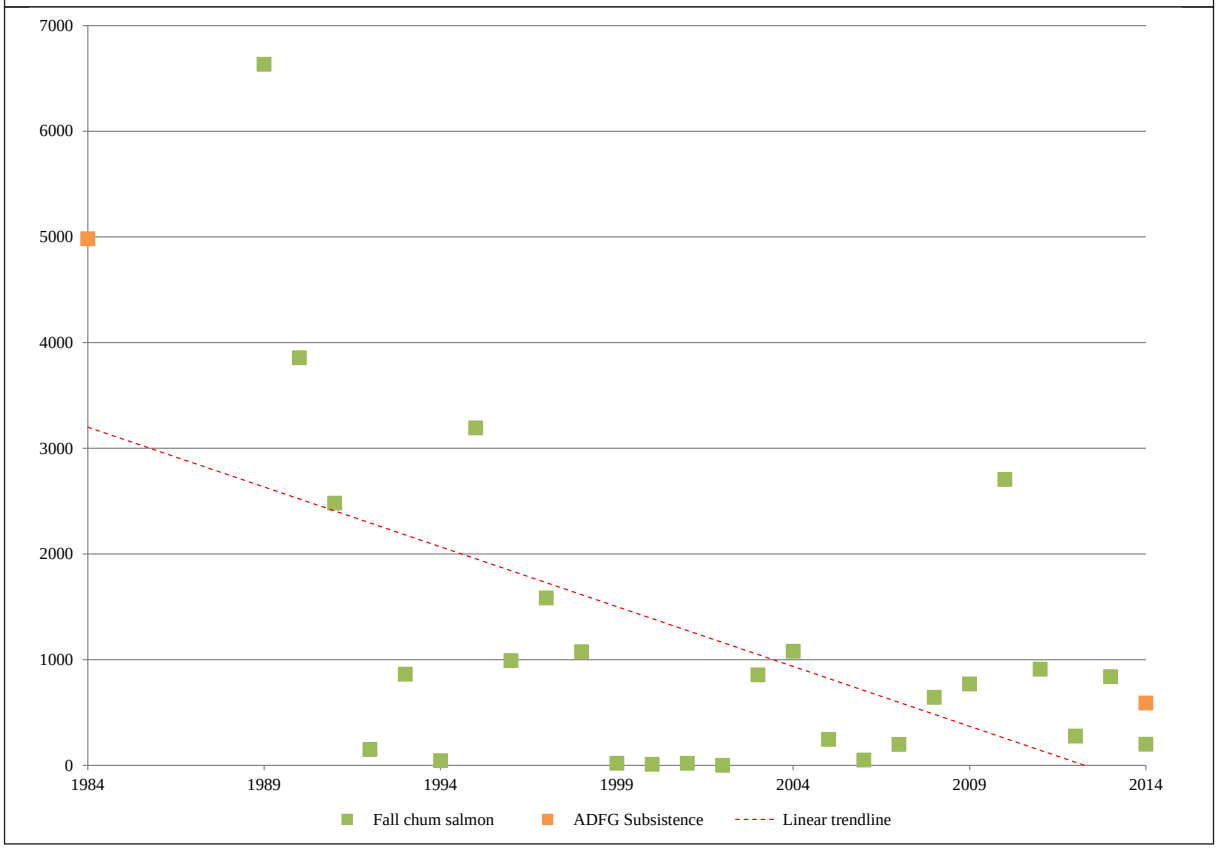
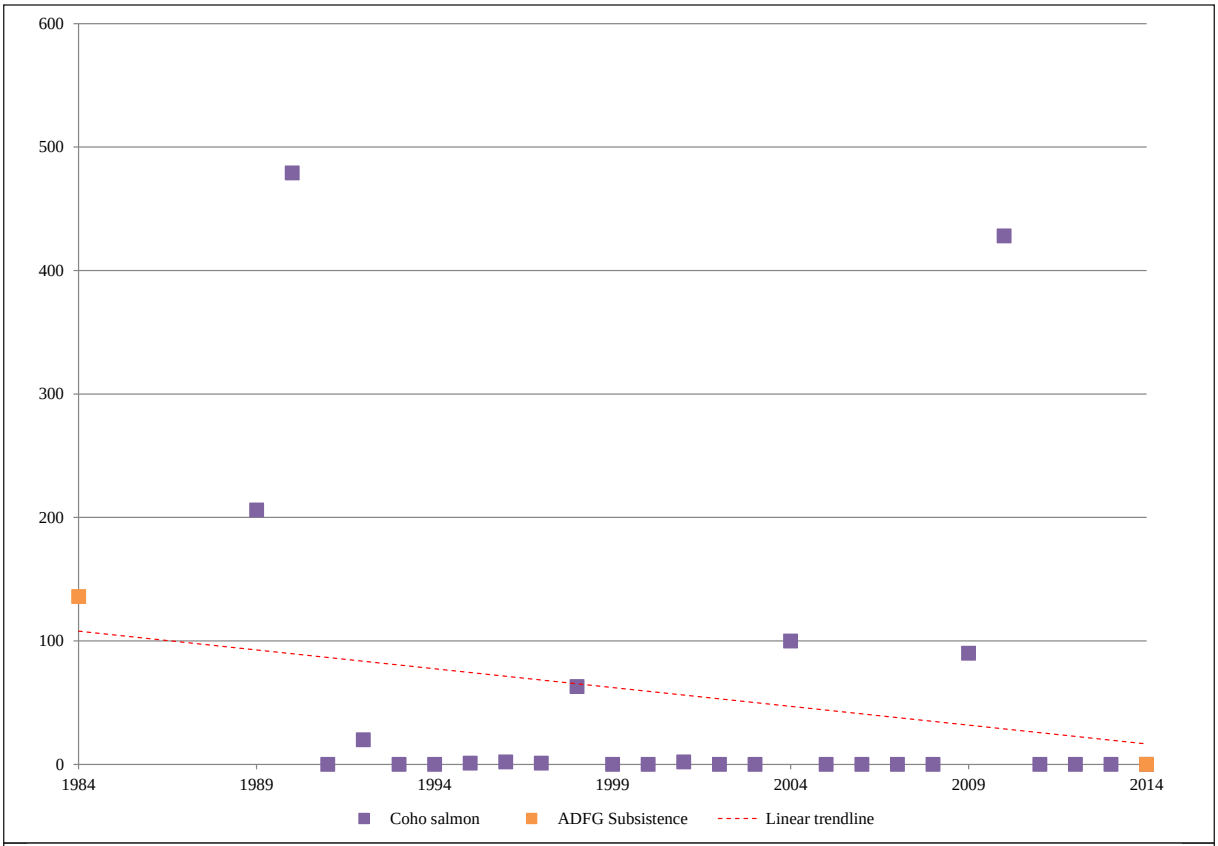


Figure 4-22.–Estimated numbers of Chinook, fall chum, summer chum, and coho salmon harvested, Stevens Village, 1984–2014 (continued on following page).



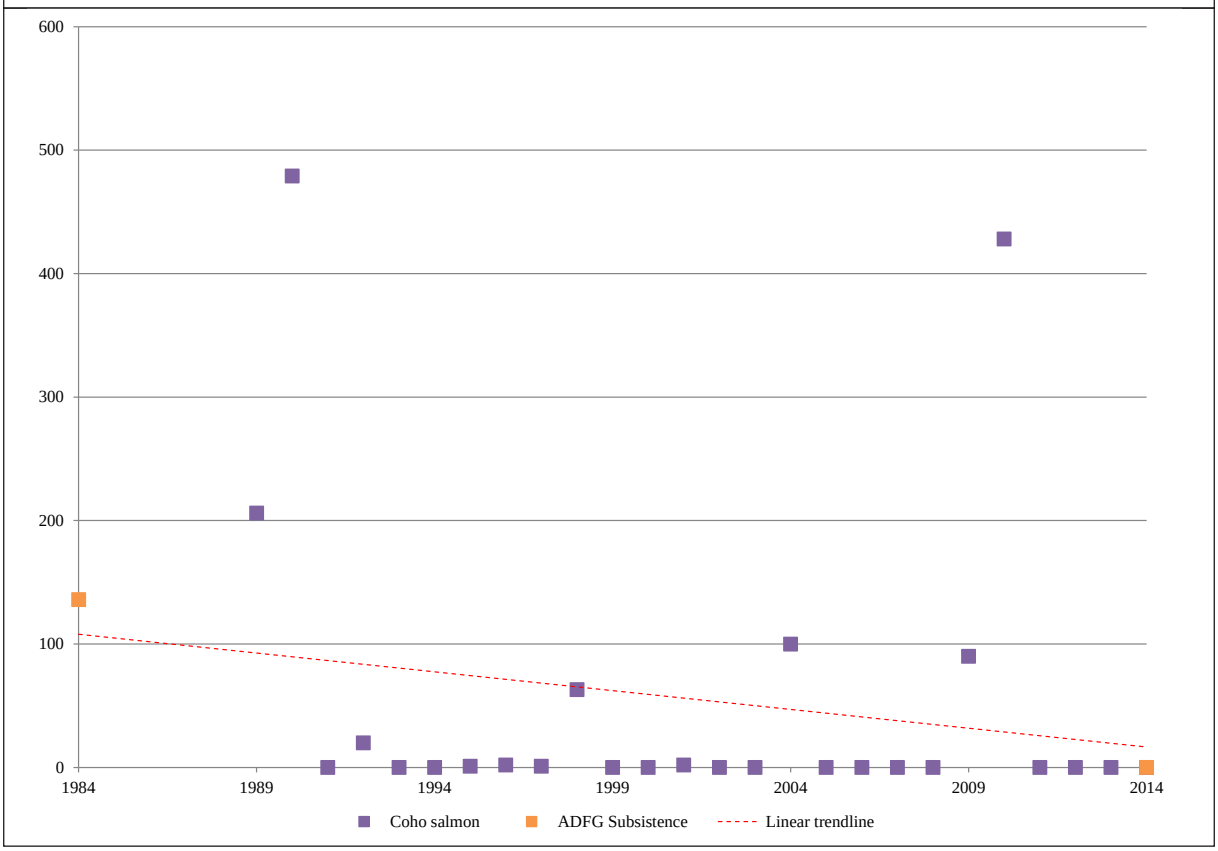


Figure 4-22.–Continued.

Acknowledgements

Researchers would like to thank the Stevens Village Tribal Council and current and former residents of Stevens Village who took the time to share their community with us.

5. HEALY

David M. Runfola

In December 2014, 8 ADF&G researchers surveyed a sample of 127 out of 366 households (35%) in the Healy Census Designated Place (CDP)[1], Alaska (Figure 5-1; Table 1-5). From December 2013 through November 2014[2], residents of Healy harvested an estimated 51,996 lb (± 24%) of edible weight of wild foods (Table 5-1). This estimate represents a mathematical expansion to all households in the community based upon the harvests reported by the households of the sample. The average harvest per household was 142 lb. The estimated total population in the Healy CDP was 1,006 persons (Table 5-2). Based on the population and the estimated total harvest, there was an average of 52 lb of wild foods harvested per person in 2014 (Table 5-1). During the study year, Healy residents reported harvesting an average of 4 different types of wild resources per household.

This chapter summarizes findings from the household surveys, including demographic characteristics, responses to harvest assessment questions, harvest estimates, employment, income, sharing of wild resources, and food security. Additional tables appear in Appendix D. Results from this survey are available online in the Division of Subsistence Community Subsistence Information System (CSIS).[3] In addition to the comprehensive survey, 6 ethnographic interviews were conducted with 8 key respondents. Two respondents were women, and 6 were men. They ranged from 44 to 82 years of age. The ethnographic interviews help to provide context for the quantitative data presented in this chapter. Findings from interviews, historical background information, and comparisons to earlier studies are presented throughout the chapter.

Community Background

Healy is situated in the northern foothills of the Alaska Range in the upper Nenana River drainage. Within approximately 15 miles of the town of Healy, several major early prehistoric sites provide extensive evidence of human settlement in the area, dating the presence of humans in the Nenana River basin to as early as 14,000 years BP (Holmes 2001; Potter 2008). Artifacts and cultural carbon samples from these sites have defined contemporary descriptions of Paleolithic human settlement patterns during the late Pleistocene epoch when inhabitants of Beringia migrated westward into continental North America (Hoffecker 2001). Archaeological evidence indicates that early humans likely moved between the Tanana River valley lowlands and upper Nenana River basin during a period of widespread climatic and ecological changes. Paleolithic humans utilized the upland habitat of this area as Alaska Range ice fields to the south receded and as predominant mammal species shifted from bison and elk of the Arctic steppe to caribou and moose of the boreal forest habitats (Potter 2008). Settlements persisted in the Nenana River basin as human populations increased throughout Interior Alaska during a period from approximately 6,000 to 1,000 years BP (Anderson 1970; Dumond 1977; Hoffecker and Elias 2003). Evidence of early modern settlements in this area have identified the presence of 2 principal groups of people, the Nenana-Toklat and the Wood River bands of Athabascans, who arrived in the area approximately 1,300 to 1,000 years BP (McKennan 1981; Shinkwin and Case 1984). These 2 bands utilized the natural resources of the upper Nenana River basin and, with neighboring bands, shared the lowlands of the Tanana River valley between the Nenana and Wood rivers. As recently as the mid-20th century, Athabascans traveled extensively among their long-established camps and village sites throughout the Nenana River basin and adjacent drainages; however, by the 1940s most of the region's indigenous residents had settled primarily into the communities of Nenana and Minto (Shinkwin and Case 1984).

1 Hereafter *Healy*, except where necessary for clarity.

2 For simplification of discussion throughout this chapter, these dates will hereafter be referred to as the study year of 2014.

3 Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." https://www.adfg.alaska.gov/sb/CSIS. Hereafter *ADF&G CSIS*.

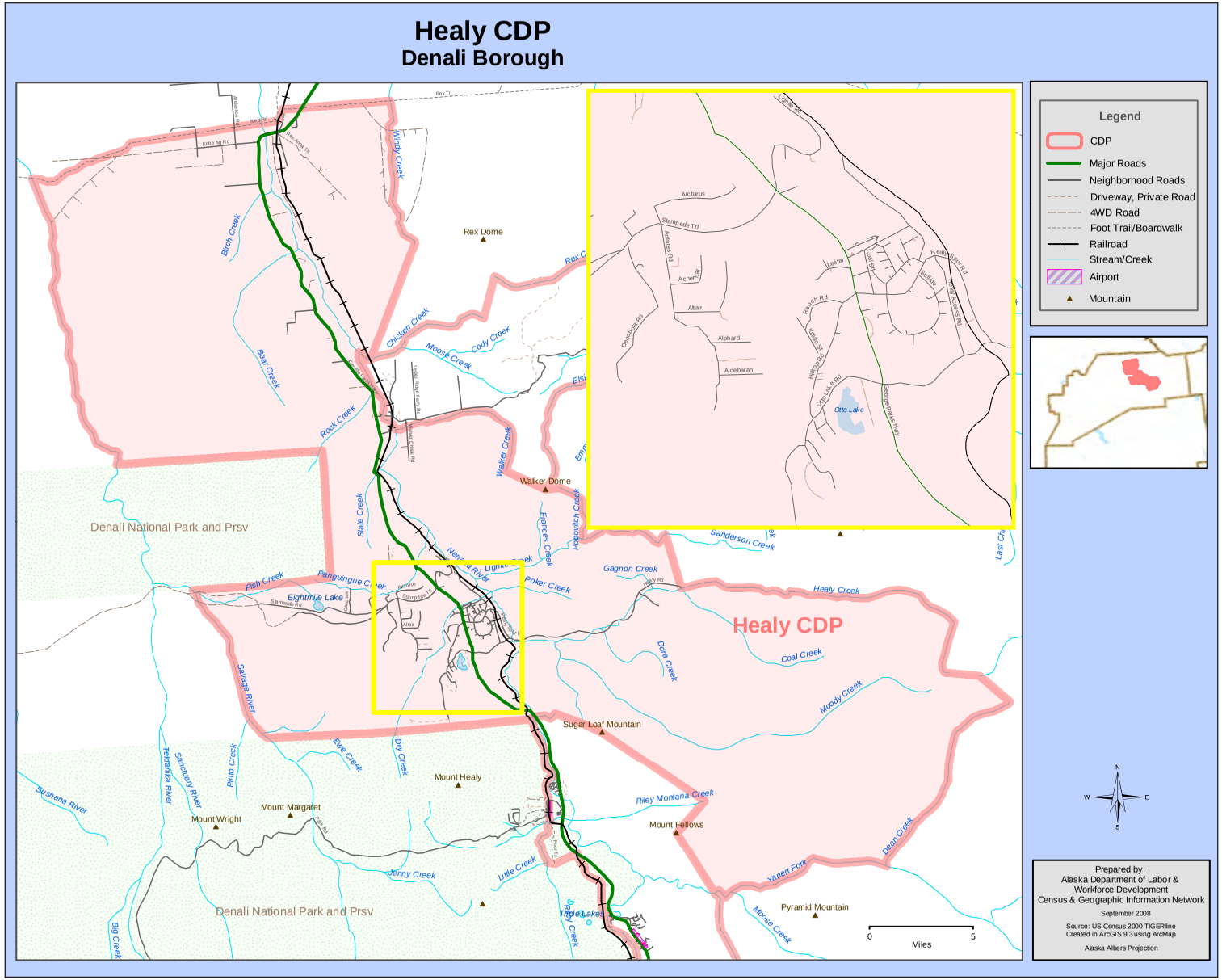


Figure 5-1.–Map of Healy Census Designated Place (ADOL Census and Geographic Information Network 2008)

Table 5-1.–Resource harvest and use characteristics, Healy, 2014.

Characteristic	
Mean number of resources used per household	**5.7**
Minimum	0
Maximum	23
95% confidence limit (±)	11.0%
Median	5.0
Mean number of resources attempted to harvest per household	**5.4**
Minimum	0
Maximum	33
95% confidence limit (±)	14.1%
Median	4.0
Mean number of resources harvested per household	**3.7**
Minimum	0
Maximum	22
95% confidence limit (±)	14.4%
Median	3.0
Mean number of resources received per household	**2.0**
Minimum	0
Maximum	14
95% confidence limit (±)	16.3%
Median	2.0
Mean number of resources given away per household	**0.8**
Minimum	0
Maximum	13
95% confidence limit (±)	29.9%
Median	0.0
Household harvest (pounds)	
Minimum	0
Maximum	1,344
Mean	142.1
Median	15.6
Total harvest weight (pounds)	51,996.2
Community per capita harvest (pounds)	51.7
Percentage using any resource	92%
Percentage attempting to harvest any resource	87%
Percentage harvesting any resource	78%
Percentage receiving any resource	72%
Percentage giving away any resource	38%
Number of households in sample	127
Number of resources asked about and identified voluntarily by respondents	130

Source ADF&G Division of Subsistence household surveys, 2015.

Table 5-2.–Comparison of selected findings, Healy, 2014.

Category	Community Healy
Demography	
Population	1,005.8
Percentage of population that is Alaska Native	2.6%
Percentage of household heads born in Alaska	17.2%
Average length of residency of household heads (years)	19.6
Cash economy	
Average number of months employed	7.9
Percentage of employed adults working year-round	70.4%
Percentage of income from sources other than employment	16.9%
Average household income[a]	$78,061
Per capita income[a]	$28,406
Resource harvest and use	
Per capita harvest (pounds usable weight)	29.4
Average household harvest (pounds usable weight)	80.8
Number of resources used by 50% or more households	4.0
Average number of resources used per household	5.7
Average number of resources attempted to be harvested per household	5.4
Average number of resources harvested per household	3.7
Average number of resources received per household	2.0
Average number of resources given away per household	0.8
Percentage of total harvest taken by top ranked 25% of households	85.9%
Percentage of households that harvested 70% of harvest	14.6%
Per capita harvest by lowest ranked 50% of households (pounds usable weight)	0.6
Percentage of total harvest taken by lowest ranked 50% of harvesting households	1.2%
Average number of resources used by lowest ranked 50% of households	3.6
Average number of resources used by top ranked 25% of households	8.4

Source ADF&G Division of Subsistence household surveys, 2015.
a. Includes income from sources other than employment.

Other settlers migrated into the region in the late 19th and early 20th centuries. Miners, loggers, steamship crews, and market hunters[4], mostly of Euro-American descent, lived and worked throughout the Tanana River valley and the northern foothills of the Alaska Range. Land and resource use conflicts arose between these settlers and the region's Athabascan residents. Local tribal leaders sought resolution of these conflicts and met with Judge James Wickersham in 1915 during what came to be known as the Tanana Chiefs Conference. This was the first significant negotiation between indigenous tribes and the U.S. federal government over land rights and other tribal sovereignty issues in Alaska (Cole 1999). For a decade or more prior to this conference, conservationists had also been aware of excessive big game hunting occurring throughout the Alaska Range's northern foothills and in the headwaters of gold mining streams like the Kantishna River. Commercial hunting was in demand to feed the numerous settlers of the region. By 1915, construction of the Alaska Railroad began, increasing conservationists' fears that commercial hunting would continue to deplete local wildlife resources. In response to conservationists' concerns and in order to eliminate over-harvest of the region's wildlife, Congress established Mt. McKinley National Park in 1917. Formation of the park closed all market hunting; however, permanent residents within and adjacent to the park boundaries were permitted to hunt, fish, and trap for subsistence uses on National Park

4 Legal trafficking of wild game meat, parts, and other products was commonplace in North America through the first decades of the 20th century and significantly influenced development of conservationist wildlife management policies by state and federal governments (Geist 2006).

Service lands under certain circumstances (Brown 1993; Catton 1997). In 1980, the U.S. Congress passed the Alaska National Interest Lands Conservation Act (ANILCA), which greatly expanded the boundary of National Park Service lands in the area and established Denali National Park and Preserve (Brown 1993). Subsistence hunting, fishing, and trapping were prohibited in the Denali Wilderness, which is the portion of Denali National Park and Preserve that was established as Mt. McKinley National Park prior to passage of the ANILCA (50 CFR§100.3(a)). In addition, since 1980 only permanent residents of what are referred to as the Denali National Park and Preserve "resident zone" communities are eligible to subsistence hunt, fish, and trap within Denali National Park and Preserve outside the boundaries of the Denali Wilderness. Although Healy is situated adjacent to the park, it is not a designated resident zone community; as such, Healy residents are not eligible to subsistence hunt, fish, or trap anywhere within the park (36 CFR§13.902).

Coal deposits surrounding the Nenana River near Healy Creek (Figure 5-1) were long known to indigenous inhabitants of the area, and were later observed by miners and others who arrived in the late 19th century. Approximately 3 miles east of the contemporary community of Healy is Suntrana, the site of the first commercial coal mining operation in the region. The Healy Creek mine was established in 1922 during construction of the Alaska Railroad, which shipped coal from this mine to Fairbanks for heat and power generation. Coal mining in the Healy area became critical to the operation of the railroad, and by the 1940s Healy coal mines were supplying utility companies and military bases in Anchorage and Fairbanks (Buzzell 1994). The Usibelli Coal Mine currently operates outside of Healy and provides coal to power generation stations throughout Alaska's road system and to various export markets in Chile and Asia.[5] The company employs approximately 15% of working-age adults in Healy and provides complementary coal to all its employees who choose to use the energy resource for home heating. In addition to Usibelli Coal Mine, Healy's industrial operations include the Alaska Railroad Corporation coal loading terminal and 2 of Golden Valley Electric Association's major power installations: the Healy Unit 2 Power Plant (also known as the Healy Clean Coal Project), and the Eva Creek Wind Project.

The Healy CDP and the community of Healy are located within the Denali Borough, which was incorporated in 1990.[6] Healy is bisected by the George Parks Highway[7], which was completed in 1971[8]. The Parks Highway connects Fairbanks and Interior Alaska to Anchorage with a more direct and shorter route than the previously constructed Richardson and Glenn highways. Since its construction, the highway has become the state's most vital ground transportation corridor and has significantly stimulated Healy's service and retail economy. Healy has a number of lodging facilities, restaurants, convenience stores, and gas stations which serve not only local residents and Parks Highway drivers, but also summer tourists, most of whom travel into the area to visit Denali National Park and Preserve. The community supports a volunteer fire department, and the State of Alaska operates a Trooper post and a Department of Transportation facility in Healy. The Denali Borough School District operates a school in Healy that serves students in grades kindergarten through 12.

Seasonal Round

Figure 5-2 depicts the areas where Healy households searched for and harvested all wild resources in 2014. Healy residents who use wild food resources and actively participate in hunting, fishing, and gathering activities experience an annual seasonal round that largely reflects the patterns of harvest and use that are common to most communities within Interior and Southcentral Alaska's highway system. Harvests typically occur during the open seasons of general hunting, trapping, and sport and personal use fishing. In late winter and early spring, people travel to lakes throughout the Interior to fish through the ice for lake trout, Dolly Varden, burbot, and other nonsalmon fish. Grouses and ptarmigans can be taken in small

5 Usibelli Coal Mine. 2015. Accessed March 3, 2016. http://www.usibelli.com

6 Denali Borough. 2015. Accessed March 3, 2016. http://www.denaliborough.govoffice.com/

7 Hereafter *Parks Highway*.

8 Alaska Department of Natural Resources. 2008. Accessed March 3, 2016. http://dnr.alaska.gov/parks/interp/pdf/georgeparkshwyscenicbyway.pdf

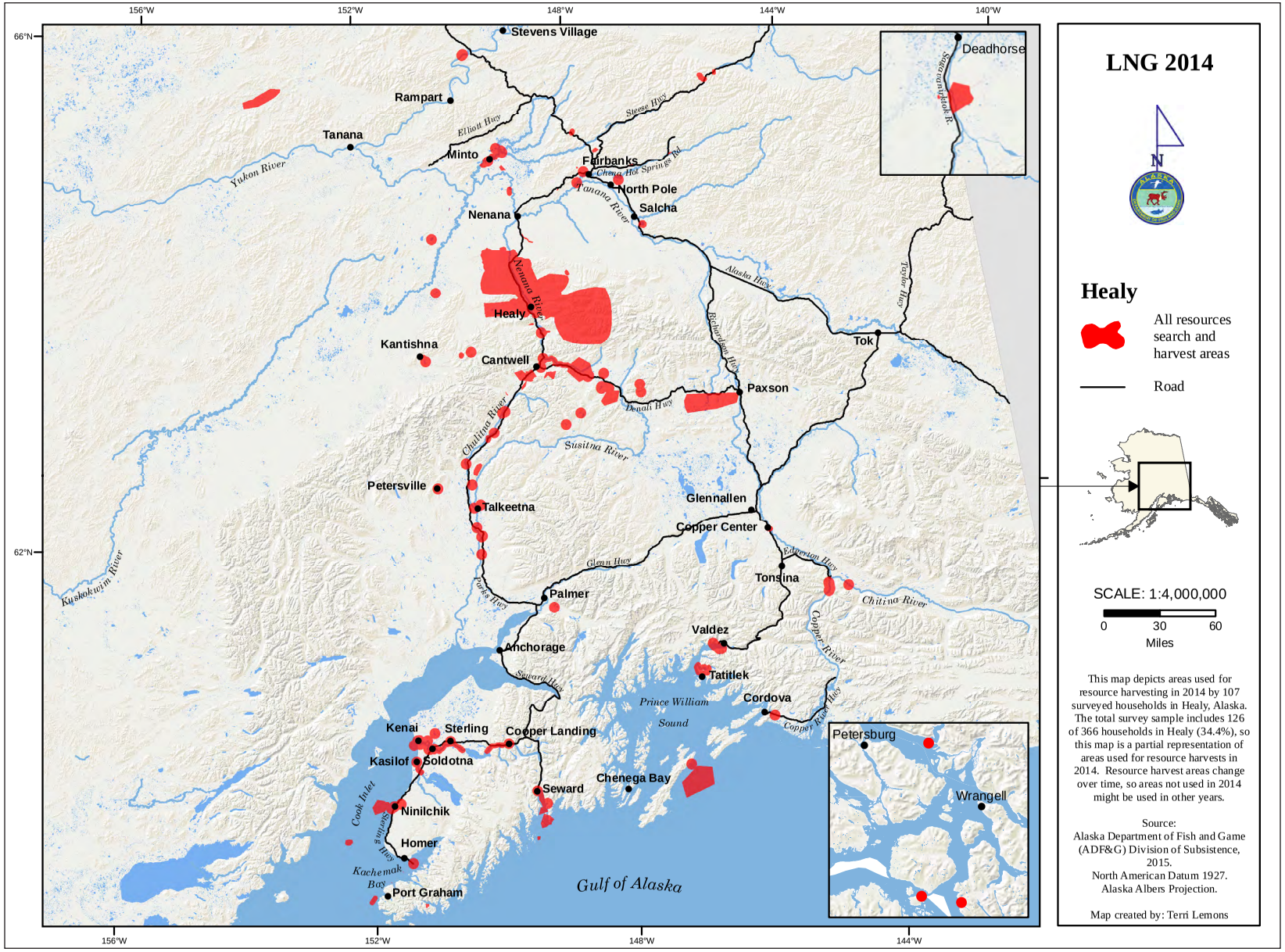


Figure 5-2.–All resources search and harvest areas, Healy, 2014.

numbers during winter and late spring. Some hunters travel long distances to Kodiak Island or the Alaska Peninsula for a spring brown bear hunt.

Like many Alaskans, Healy area residents focus their harvest efforts on fishing in summer months. Fishers travel to the Copper or Kenai rivers to dipnet for sockeye salmon and Chinook salmon. They also may fish in coastal rivers and nearshore waters in the Kenai Peninsula and Prince William Sound for sockeye salmon and Chinook salmon as well as venture further into the sea for Pacific halibut, rockfishes, and lingcod. Other fishing that occurs in summer includes rod and reel fishing for coho salmon and other popular sport fish species such as Arctic grayling, rainbow trout, Dolly Varden, and northern pike.

Berries are the focus of harvest when they are in season during late summer. People will primarily gather blueberries and lowbush cranberries, but pickers will also seek out raspberries, currants, cloudberries, and highbush cranberries. The principal harvest activities of late summer and fall are moose, caribou, and bear hunts. Many hunters travel Interior Alaska roadways to access the backcountry for these hunts. Some travel longer distances into the Yukon River drainage or Minto Flats for fall moose hunts. Other fall hunting includes Dall sheep in the Alaska Range and Sitka black-tailed deer and mountain goat in Prince William Sound or the islands of the coastal Gulf of Alaska. Most birds are taken in fall, including the majority of grouses and ptarmigans and several duck species. Upland game birds are harvested relatively close to Healy and in surrounding roaded areas, and ducks are taken in the wetlands of the Tanana River valley and Minto Flats. Trappers are active in winter months, setting traplines for beavers, foxes, martens, lynx, coyotes, wolves, and wolverines. Hunters may take advantage of a winter moose hunt or harvest small game such as red squirrels and furbearers like foxes and coyotes.

Population Estimates and Demographic Information

Comprehensive household survey results indicate that in 2014 the total estimated Healy population was 1,006 persons residing in 366 households (Table D5-1; Figure 5-3). The estimated total Alaska Native population was 26 persons in 2014, or less than 3% of the total population. The 2010 U. S. Census enumerated a total population of 1,021 persons in 434 households with an Alaska Native population of 43 persons (4%). The U.S. Census Bureau American Community Survey (ACS) estimated a 5-year average population of 1,146 persons and 447 households in Healy from 2010 through 2014, with a total estimated population of 22 Alaska Native persons. Historical records of decennial census counts for Healy have shown a consistent increase in population since 1970, ranging from 79 persons in 1970 to 1,021 persons in 2010 (Figure 5-4). Annual population estimates by the Alaska Department of Labor and Workforce Development (ADLWD) since 1984 have shown a similar increase for the community with estimates ranging from 374 persons in 1984 to 1,083 persons in 2012. The Healy population rose from 79 persons in 1970 to 334 in 1980. This population increase is likely in part a result of the completion of the Parks Highway. The U.S. Census (1990 to 2000) and ADLWD (1999 to 2000) also recorded what appears to be a significant change in the Healy population; however, this increase merely reflects a change in U.S. Census Bureau methodology after 1990. The 2000 U.S. Census was the first census enumeration that included a discrete population count for the geographic area of the Healy CDP. In the 1990 U.S. Census and earlier, the Healy population was enumerated from a much smaller geographic area that only included the settlement of Healy and its immediate surroundings (U.S. Census Bureau 2003).

This research estimated the Healy population in 2014 to be within the range of error of the ACS 2010–2014 estimate and is likely not significantly different from the most recent U.S. Census (2010) and ADLWD (2013) counts. Any discrepancies among these numbers could possibly be due to differences in sampling design, the dates of population counts, and potential error within the methods of expansion from sampled to unsampled households. For example, the U.S. Census Bureau 2010 decennial census count is based upon the number of individuals present in a dwelling on April 15, 2010, whereas the Division of Subsistence population estimate is based upon the number of individuals who resided in a household for at least 3 months during 2014 and is expanded from sampled households to the total number of estimated households in Healy. In addition, a large number of seasonal workers typically reside in Healy during spring and summer months to take advantage of increased employment opportunities during Alaska's tourism season.

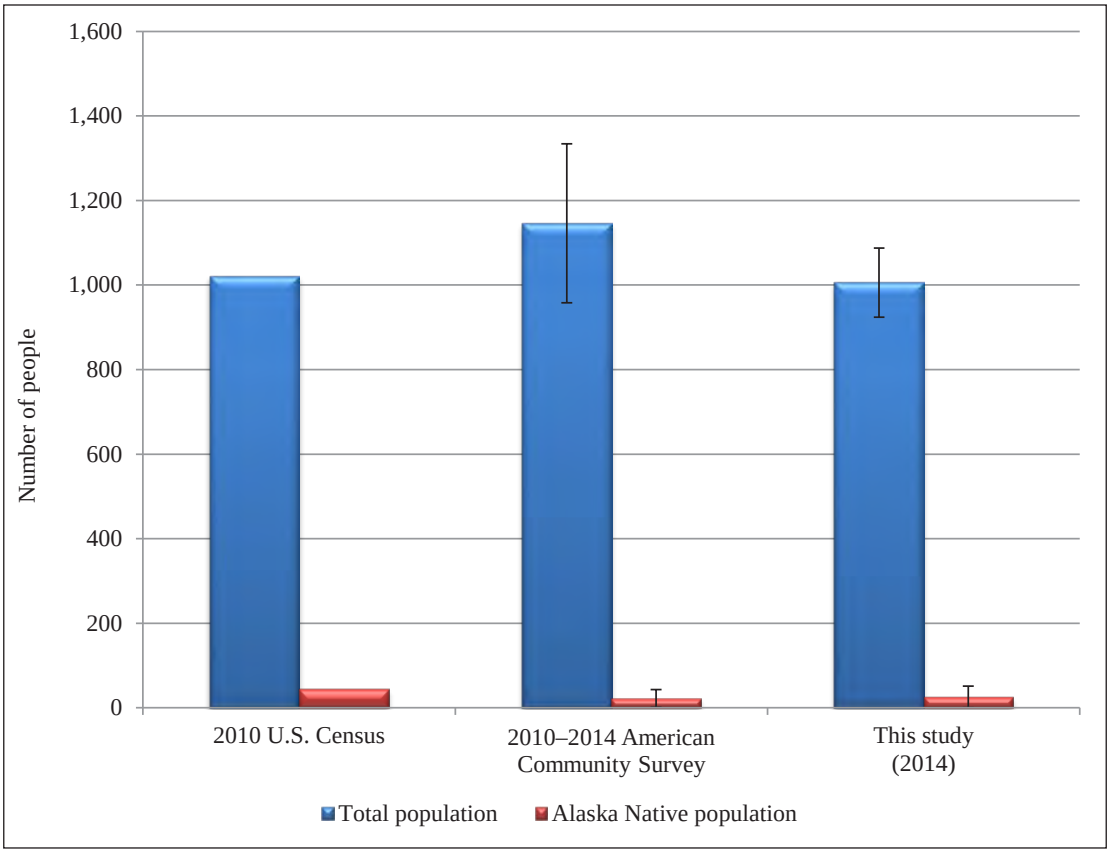


Figure 5-3.–Population estimates, Healy, 2010 and 2014.

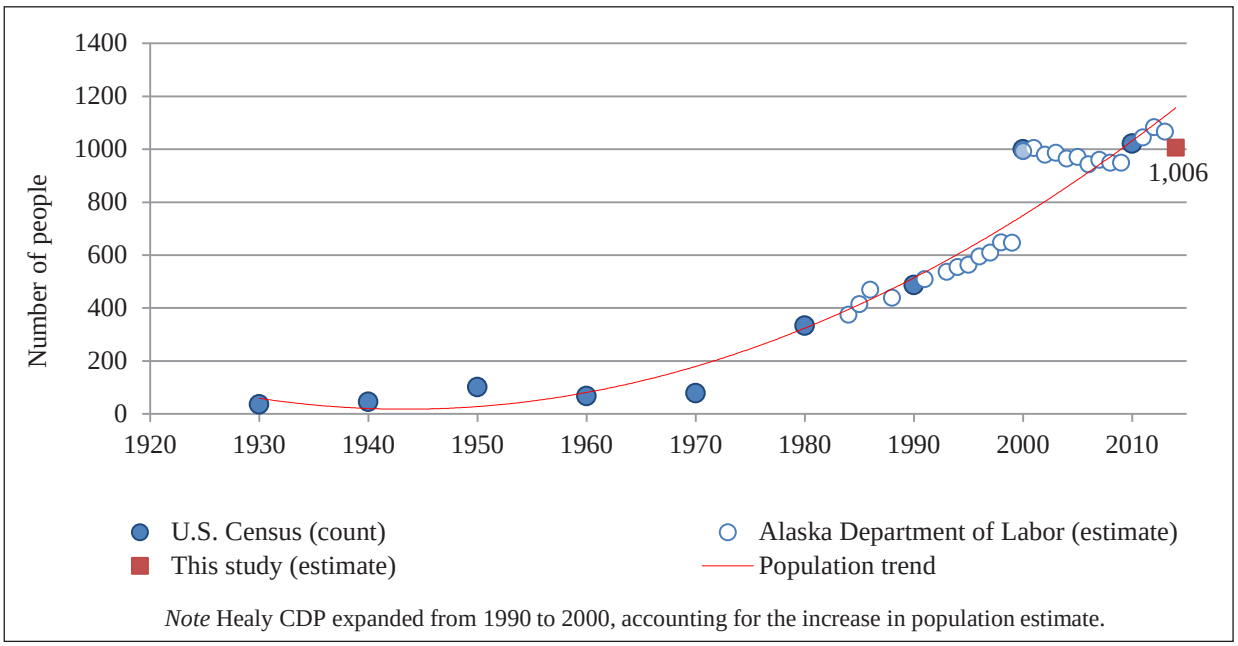


Figure 5-4.–Historical population estimates, Healy, 1930–2014.

Table 3.–Demographic characteristics, Healy, 2014.

Characteristics	Community Healy
Sampled households	127
Eligible households	366
Percentage sampled	34.7%
Sampled population	349
Estimated community population	1,005.8
Household size	
Mean	2.7
Minimum	1.0
Maximum	8.0
Age	
Mean	33.1
Minimum[a]	1
Maximum	84
Median	34.0
Length of residency	
Total population	
Mean	15.7
Minimum[a]	0
Maximum	59
Heads of household	
Mean	19.6
Minimum[a]	0
Maximum	59
Alaska Native	
Estimated households[b]	
Number	14.4
Percentage	3.9%
Estimated population	
Number	25.9
Percentage	2.6%

Source ADF&G Division of Subsistence household surveys, 2015.

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

b. The estimated number of households in which at least 1 head of household is Alaska Native.

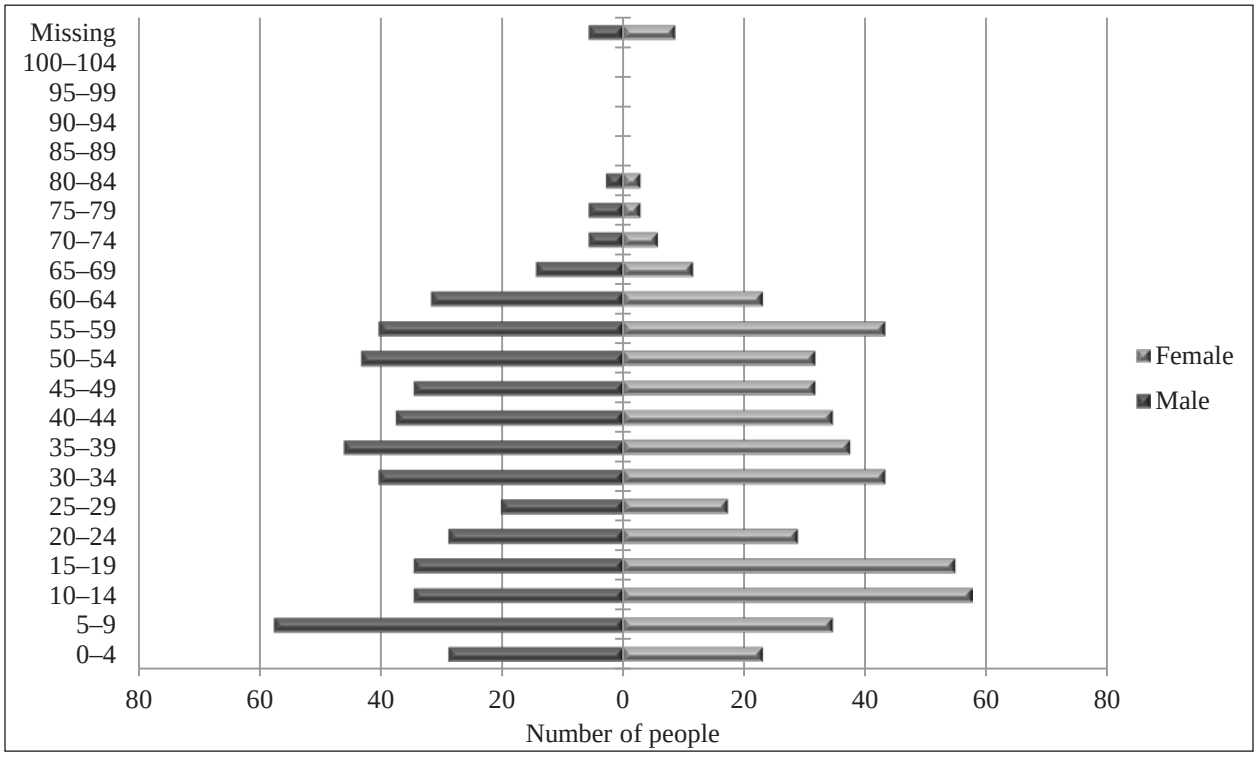


Figure 5-5.–Population profile, Healy, 2014.

The presence or absence of these households will affect a population estimate depending upon the month during which researchers attempt to enumerate the community's residents.

During field operations in Healy, division staff and local research assistants achieved a 35% sample of all eligible households (Table 1-5). Researchers completed surveys in 127 households out of an estimated total of 366 permanent households (adjusted down from an original list of 551 dwelling units, 185 of which were excluded for being vacant or otherwise not eligible). Sampled households included 349 persons. Staff attempted to contact residents of 358 eligible households, 68 of whom declined to be interviewed, resulting in a refusal rate of 35%. Based upon responses to the demographic survey questions, staff determined that 19 households were not eligible to be surveyed due to their status as nonresidents in the community during 2014. Division researchers were unable to contact 163 households, many of which were seasonal dwellings where residents were not present in the community during the survey period.

The mean household size for the community in 2014 is estimated at 3 persons, with a minimum household size of 1 and a maximum of 8 (Table 5-3). The mean age of residents in 2014 is estimated to have been 33 years with a median age of 34 years. The eldest Healy resident sampled was 84 years of age. The average length of residency for all residents in 2014 was 16 years. Among all heads of household, the average length of residency was 20 years. The greatest length of residency among the entire population including all heads of household was 59 years. Comprehensive household survey results estimate the total number of Alaska Native households at 14 in Healy in 2014, or 4% of all households in the community. Of the estimated 2014 population of 1,006 residents, an estimated 513 persons were male (51%) and 493 persons were female (49%; Table D5-2). Figure 5-5 depicts estimated population data as distributed among 5-year age cohorts. The largest estimated cohort of males in 2014 was 58 persons from 5 to 9 years of age, and the largest cohort of females was 58 persons 10 to 14 years of age (Figure 5-5; Table D5-2). The greatest 5-year age cohorts of the entire estimated population were 92 persons from 5 to 9 years of age and 92 persons 10 to 14 years of age. There were 421 Healy residents between the ages of 0 and 29 years and 464 persons between the ages of 30 and 59 years suggesting that over time the Healy population could possibly remain stable or decline slightly, absent any migration into or out of the community.

Table 5-4.–Birthplaces of household heads, Healy, 2014.

Birthplace	Percentage
Anchorage	2.3%
Anderson	0.5%
Cantwell	0.9%
Fairbanks	0.9%
Healy	8.4%
Nenana	0.9%
Nome	0.5%
Palmer	0.5%
Seward	0.5%
Sutton	0.9%
Wasilla	0.9%
Other U.S.	78.1%
Foreign	4.7%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

The comprehensive survey instrument also included questions regarding the birthplaces of residents living in sampled households. Birthplace was determined by the community of residence of a person's parents when he or she was born, not the actual community in which they were born. This allows the survey results to avoid possible misconceptions that some individuals were originally residents of a nearby community with a hospital where mothers frequently give birth to their children (e.g., Fairbanks, Alaska). An estimated 78% of household heads were born U.S. citizens to families that were residents of states other than Alaska (Table 5-4). Other communities of residence at birth for household heads included several communities throughout Interior Alaska, including Healy (8% of household heads' community of residence at birth), Nenana (1%), Fairbanks (1%), Cantwell (1%), and Anderson (0.5%). A number of household heads claimed Southcentral Alaska communities as places of residence at birth including Anchorage (2%), Wasilla (1%), Sutton (1%), Palmer (0.5%), and Seward (0.5%). An estimated 5% of household heads were foreign born. Approximately 58% of the total population was residents of states other than Alaska when they were born, and 29% of persons were residents of Healy when they were born (Table D5-3).

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Figure 5-6 depicts the expanded levels of individual participation in the harvest and processing of wild resources by all Healy residents in 2014. Overall, 81% of Healy residents harvested at least 1 resource and 72% processed 1 wild food resource for storage or later use (Table D5-4). The resource category with the greatest level of participation in 2014 was vegetation; 66% of individuals harvested plant resources and 59% processed them. Approximately one-half (48%) of Healy residents harvested fish and 36% processed that fish. An estimated 38% of Healy residents hunted large land mammals and 33% processed the large land mammals that hunters harvested. Twenty-five percent of Healy residents hunted birds in 2014 and 18% of residents processed birds. Approximately 11% of individuals reported hunting or trapping small land mammals and 9% of residents reported processing these for storage or later use. No household reported that they had used, harvested, or processed any marine mammals.

Harvest and Use of Wild Resources at the Household Level

Figure 5-7 shows by resource category the percentages of households that used wild resources, attempted to harvest, and harvested wild foods. In 2014, vegetation was the most widely used resource by Healy households (78%). More than one-half (53%) of households reported gathering plant resources, and 76% reported attempting to gather plants. An estimated 69% of households reported using large land mammals, 50% attempted to hunt large land mammals, and 20% of households successfully harvested these resources. Approximately 68% of households in Healy used salmon, and 34% successfully harvested the resource in 2014. Thirty-nine percent of households reported attempting to harvest salmon. Similarly, 39% of households attempted to harvest nonsalmon fishes, and 31% were successful in catching them. Approximately one-half (51%) of all households reported using nonsalmon fishes. About one-third (30%) of Healy households reported using birds, 27% harvested the resource, and 35% attempted to harvest. Relatively small percentages of households reported using marine invertebrates (9%) and small land mammals (7%) in 2014. Five percent of Healy households attempted to harvest marine invertebrates in 2014 and 3% were successful. An estimated 6% of households reported harvesting small land mammals,

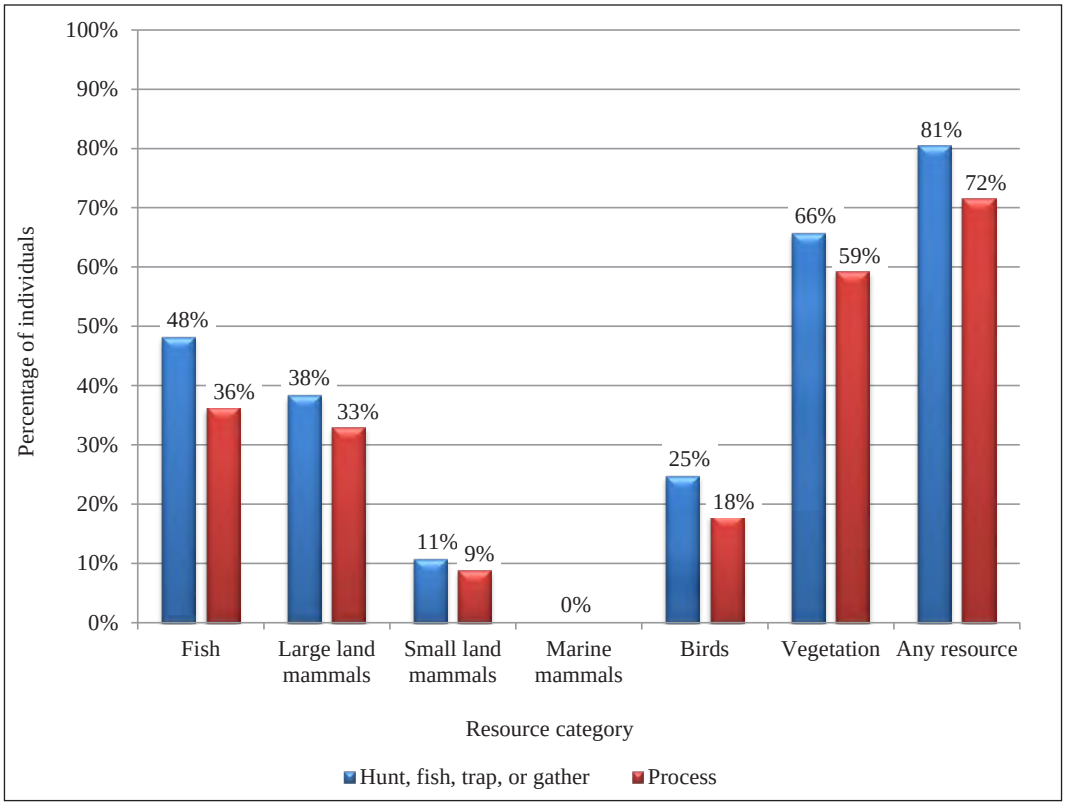


Figure 5-6.–Individual participation in subsistence harvesting and processing activities, Healy, 2014.

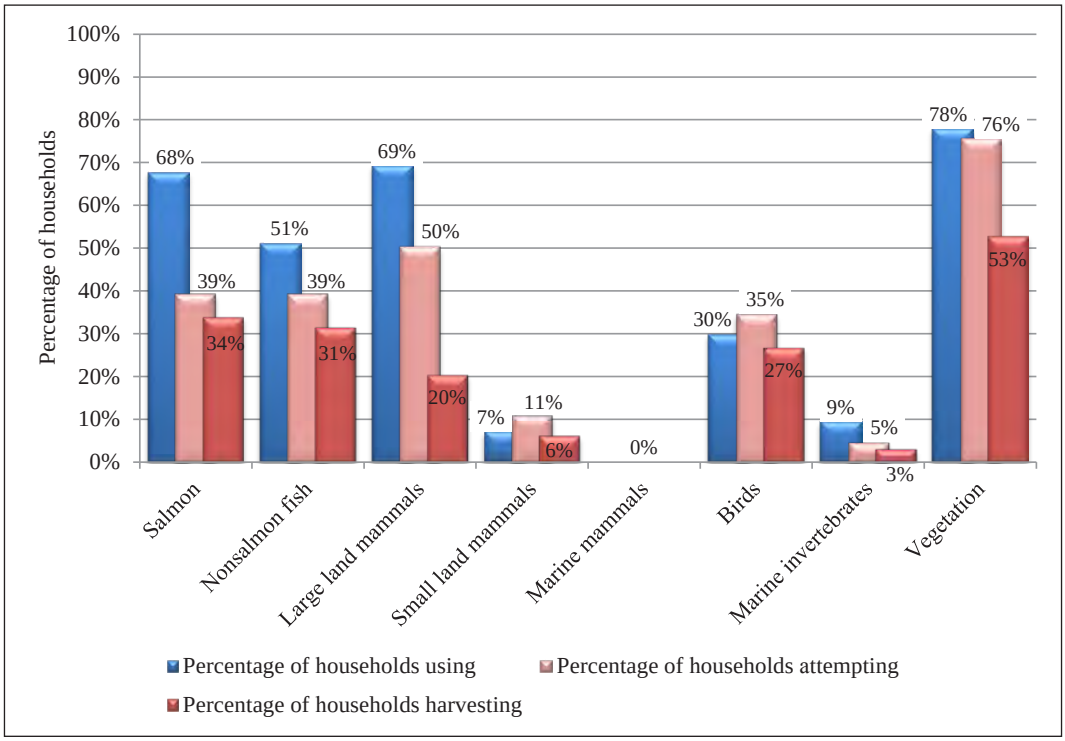


Figure 5-7.–Percentage of households using, attempting to harvest, or harvesting wild resources, by category, Healy, 2014.

and 11% reported attempting to harvest the resource. No Healy households reported using, harvesting, or attempting to harvest marine mammal resources in 2014.

Differences observed between percentages of households harvesting, using, and attempting to harvest wild resources can reveal information about the availability of certain resources or other aspects of the nature of resource use by members of the community. For example, one-half of all Healy households reported hunting for large land mammals in 2014; however, only 20% of households actually harvested moose, caribou, or other large land mammal species. The relatively low success rate for large land mammal hunters in 2014 may be a result of low moose density in the area where Healy residents hunted. Many hunters were active in GMU 20C, which has experienced low moose densities for many years (Hollis 2014). In addition, there is typically a high density of big game hunters within the road system, which can also reduce hunter success rates. Similar to large land mammal hunters, berry pickers experienced a relatively low success rate in 2014. Because the plants are ubiquitous in Alaska, essentially all people who attempt to pick berries usually successfully harvest them. This might not be true in years when berries are in low abundance in areas where pickers of a community usually search for them. Survey respondents and others reported that 2014 was a year when berries were not as plentiful as they usually are. One key respondent reported, "last year…was a bad year for berries because of the weather. We had a late spring. There [weren't] any berries last year" (12112014HLY01).

Table 5-1 summarizes resource harvest and use characteristics for Healy in 2014. The average harvest was 142 lb edible weight per household and 52 lb harvested per capita. During the study year, community households harvested an average of 4 kinds of resources and used an average of 6 kinds of resources. The maximum number of resources used by any household was 22. Harvest surveys also recorded some evidence of sharing of wild resources. Households reported receiving an average of 2 wild food resources from others and giving away an average of 1 resource. Overall, as many as 130 resources were available for households to harvest; this included resources that survey respondents identified but were not asked about in the survey instrument.

Harvest Quantities and Composition

Table 5-5 reports estimated wild resource harvests and uses by Healy residents in 2014 and is organized first by general category and then by species. All edible resources are reported in pounds edible weight (see Appendix C for conversion factors). 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 otherwise used by a household such as resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Purchased foods are not included. Firewood that was gathered or received by Healy households is included in Table 5-5 as a wild resource use. Any categories or species that show a greater use percentage than harvest percentage reflect the common practice of the sharing of resources among households, which results in a wider distribution of wild foods.

In 2014, an estimated 92% of Healy households used wild foods and other natural resources (Table 5-5). An estimated 78% of households reported harvesting wild resources, 72% reported receiving wild resources from other households, and 38% reported giving them away. The wild food resources most commonly received by Healy households included large land mammals (53% of households), salmon (39%), nonsalmon fish (24%), and vegetation (20%). Approximately 21% of households gave large land mammal resources to other households. An estimated 15% of Healy households reported giving vegetation resources to other households, and 13% of households gave away salmon. The remaining resource categories of marine invertebrates, birds, and small land mammals were received or given away by relatively small percentages of households in 2014.

Large land mammals composed 66% of the total wild food harvest in Healy (Figure 5-8). Salmon represented an estimated 18% of total harvest in 2014, and 10% of the harvest was composed of nonsalmon fish. Vegetation and birds constituted relatively small percentages of the total harvest used (4% and 2%, respectively), as did small land mammals and marine invertebrates (<1% each). Table 5-6 lists the top

Table 5-5.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Healy, 2014.

	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
All resources	**92.1**	**87.4**	**78.0**	**72.4**	**37.8**	**51,996.2**	**142.1**	**51.7**	**51,996.2**	**lb**	**142.1**	**24.4**
Salmon	**67.7**	**39.4**	**33.9**	**39.4**	**13.4**	**9,362.4**	**25.6**	**9.3**	**9,362.4**	**lb**	**25.6**	**28.2**
Chum salmon	5.5	4.7	3.9	2.4	0.8	58.2	0.2	0.1	11.6	ind	0.0	78.7
Coho salmon	19.7	13.4	8.7	10.2	1.6	960.6	2.6	1.0	185.9	ind	0.5	94.6
Chinook salmon	8.7	3.9	2.4	7.1	0.8	200.2	0.5	0.2	23.1	ind	0.1	97.3
Pink salmon	7.9	6.3	6.3	1.6	0.0	356.5	1.0	0.4	138.3	ind	0.4	67.6
Sockeye salmon	51.2	29.9	26.0	26.8	12.6	7,762.0	21.2	7.7	1,925.1	ind	5.3	31.2
Landlocked salmon	0.8	0.8	0.8	0.0	0.0	13.0	0.0	0.0	8.6	ind	0.0	159.9
Unknown salmon	6.3	1.6	0.8	4.7	0.0	11.9	0.0	0.0	2.9	ind	0.0	0.0
Nonsalmon fish	**51.2**	**39.4**	**31.5**	**23.6**	**4.7**	**5,341.7**	**14.6**	**5.3**	**5,341.7**	**lb**	**14.6**	**59.3**
Pacific herring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Eulachon (hooligan, candlefish)	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific (gray) cod	2.4	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pacific tomcod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown cod	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Starry flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown flounder	0.8	0.8	0.8	0.0	0.0	6.3	0.0	0.0	5.8	ind	0.0	159.9
Lingcod	5.5	3.9	3.9	1.6	0.0	196.0	0.5	0.2	49.0	ind	0.1	99.4
Pacific halibut	33.9	11.8	11.0	22.8	3.9	3,882.3	10.6	3.9	3,882.3	lb	10.6	79.4
Black rockfish	0.8	0.8	0.8	0.0	0.0	8.6	0.0	0.0	5.8	ind	0.0	159.9
Yelloweye rockfish	1.6	0.8	0.8	0.8	0.0	8.6	0.0	0.0	5.8	ind	0.0	159.9
Unknown rockfish	6.3	3.9	3.9	2.4	0.8	99.4	0.3	0.1	66.3	ind	0.2	86.3
Burbot	0.8	3.9	0.8	0.0	0.0	41.5	0.1	0.0	17.3	ind	0.0	159.9
Dolly Varden	2.4	2.4	1.6	0.8	0.0	41.5	0.1	0.0	46.1	ind	0.1	150.2
Lake trout	12.6	15.0	11.0	0.8	0.0	298.6	0.8	0.3	213.3	ind	0.6	50.7
Arctic grayling	18.9	23.6	17.3	0.8	0.0	477.2	1.3	0.5	530.3	ind	1.4	41.1

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Table 5-5.–Page 2 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Nonsalmon fish, continued												
Northern pike	3.1	5.5	2.4	0.8	0.0	64.6	0.2	0.1	46.1	ind	0.1	109.0
Sheefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Longnose sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Cutthroat trout	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Rainbow trout	7.1	8.7	5.5	1.6	0.0	213.8	0.6	0.2	152.7	ind	0.4	76.9
Unknown trout	0.8	2.4	0.0	0.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Broad whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Least cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Humpback whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Round whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown whitefishes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown nonsalmon fish	0.8	0.8	0.8	0.0	0.0	3.2	0.0	0.0	2.9	ind	0.0	0.0
Large land mammals	**69.3**	**50.4**	**20.5**	**52.8**	**21.3**	**34,399.7**	**94.0**	**34.2**	**34,399.7**	**lb**	**94.0**	**32.1**
Black bear	1.6	3.9	1.6	0.0	1.6	576.4	1.6	0.6	5.8	ind	0.0	112.6
Brown bear	1.6	4.7	1.6	0.0	0.8	812.7	2.2	0.8	5.8	ind	0.0	112.6
Caribou	18.9	10.2	4.7	15.0	4.7	2,743.6	7.5	2.7	20.2	ind	0.1	67.3
Sitka black-tailed deer	3.9	1.6	1.6	2.4	0.0	489.9	1.3	0.5	11.5	ind	0.0	126.1
Mountain goat	2.4	3.1	0.8	1.6	0.8	208.9	0.6	0.2	2.9	ind	0.0	159.9
Moose	63.8	50.4	14.2	44.1	17.3	29,568.2	80.8	29.4	54.8	ind	0.1	36.0
Dall sheep	4.7	11.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Small land mammals	**7.1**	**11.0**	**6.3**	**0.8**	**0.0**	**138.3**	**0.4**	**0.1**	**138.3**	**lb**	**0.4**	**109.0**
Beaver	1.6	3.1	1.6	0.0	0.0	86.5	0.2	0.1	5.8	ind	0.0	159.9
Coyote	3.1	5.5	3.1	0.0	0.0	0.0	0.0	0.0	14.4	ind	0.0	83.8
Red fox–cross phase	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red fox–red phase	1.6	6.3	1.6	0.0	0.0	0.0	0.0	0.0	11.5	ind	0.0	126.1
Snowshoe hare	1.6	4.7	1.6	0.0	0.0	51.9	0.1	0.1	25.9	ind	0.1	118.8
River (land) otter	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Lynx	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marmot	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	2.9	ind	0.0	159.9

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Table 5-5.–Page 3 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Small land mammals, continued												
Marten	2.4	3.9	2.4	0.0	0.0	0.0	0.0	0.0	5.8	ind	0.0	112.2
Mink	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Muskrat	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Porcupine	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic ground (parka) squirrel	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	57.6	ind	0.2	159.9
Red (tree) squirrel	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	43.2	ind	0.1	159.9
Weasel	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gray wolf	0.0	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Wolverine	0.8	3.1	0.8	0.0	0.0	0.0	0.0	0.0	2.9	ind	0.0	159.9
Marine mammals	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Fur seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Harbor seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown seals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sea otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Steller sea lion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Birds and eggs	**29.9**	**34.6**	**26.8**	**2.4**	**0.0**	**702.2**	**1.9**	**0.7**	**702.2**	**lb**	**1.9**	**36.0**
Canvasback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spectacled eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Goldeneye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	1.6	2.4	1.6	0.0	0.0	123.6	0.3	0.1	63.4	ind	0.2	120.0
Northern pintail	1.6	1.6	1.6	0.0	0.0	30.3	0.1	0.0	20.2	ind	0.1	113.8
Black scoter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Green-winged teal	0.8	1.6	0.8	0.0	0.0	3.0	0.0	0.0	5.8	ind	0.0	159.9
American wigeon	0.8	0.8	0.8	0.0	0.0	11.3	0.0	0.0	8.6	ind	0.0	159.9
Unknown ducks	0.8	0.8	0.0	0.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Cackling goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Canada goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 5-5.–Page 4 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Unknown Canada/cackling goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Snow goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
White-fronted goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown geese	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tundra (whistling) swan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sandhill crane	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spruce grouse	18.9	22.8	17.3	0.8	0.0	191.8	0.5	0.2	274.0	ind	0.7	38.5
Sharp-tailed grouse	3.9	5.5	3.1	0.0	0.0	34.3	0.1	0.0	49.0	ind	0.1	101.2
Ruffed grouse	9.4	10.2	9.4	0.0	0.0	134.1	0.4	0.1	191.5	ind	0.5	58.0
Unknown grouses	0.8	1.6	0.8	0.0	0.0	12.1	0.0	0.0	17.3	ind	0.0	159.9
Unknown ptarmigans	13.4	15.0	11.8	1.6	0.0	161.7	0.4	0.2	231.0	ind	0.6	47.7
Unknown duck eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown goose eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown gull eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine invertebrates	**9.4**	**4.7**	**3.1**	**8.7**	**1.6**	**131.1**	**0.4**	**0.1**	**131.1**	**lb**	**0.4**	**86.2**
Butter clams	0.8	0.8	0.8	0.0	0.0	21.6	0.1	0.0	7.2	gal	0.0	159.9
Freshwater clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pinkneck clams	0.8	0.8	0.8	0.8	0.0	4.3	0.0	0.0	1.4	gal	0.0	159.9
Razor clams	3.9	2.4	1.6	3.1	0.8	64.8	0.2	0.1	21.6	gal	0.1	118.8
Unknown clams	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Dungeness crab	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
King crab	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tanner crab	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Octopus	0.8	0.8	0.8	0.0	0.0	11.5	0.0	0.0	2.9	ind	0.0	159.9
Oyster	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Scallops	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Shrimp	3.1	0.8	0.8	3.1	0.8	28.8	0.1	0.0	14.4	gal	0.0	159.9

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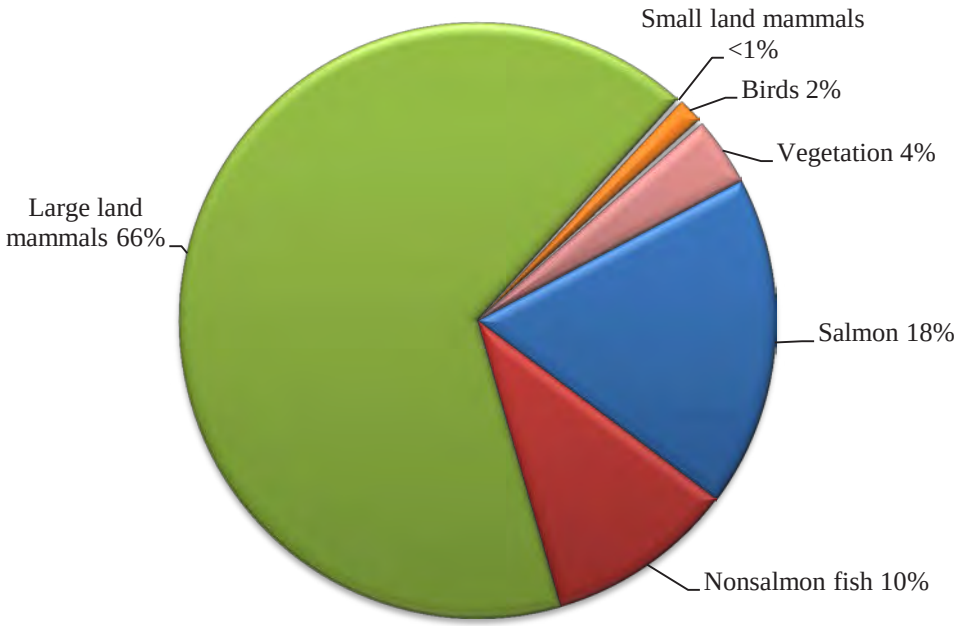
Table 5-5.–Page 5 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Vegetation	**78.0**	**75.6**	**52.8**	**19.7**	**15.0**	**1,920.8**	**5.2**	**1.9**	**1,920.8**	**lb**	**5.2**	**29.5**
Blueberry	51.2	51.2	43.3	5.5	5.5	858.8	2.3	0.9	214.7	gal	0.6	25.4
Lowbush cranberry	26.8	31.5	23.6	2.4	4.7	407.4	1.1	0.4	101.9	gal	0.3	50.2
Highbush cranberry	7.1	7.9	4.7	0.8	0.8	49.0	0.1	0.0	12.2	gal	0.0	87.2
Crowberry	5.5	5.5	5.5	0.8	0.0	16.2	0.0	0.0	4.1	gal	0.0	72.9
Currants	3.1	3.9	2.4	0.8	0.8	72.0	0.2	0.1	18.0	gal	0.0	130.4
Cloudberry	3.9	4.7	3.9	0.8	1.6	31.7	0.1	0.0	7.9	gal	0.0	87.0
Raspberry	8.7	11.0	7.1	2.4	1.6	86.5	0.2	0.1	21.6	gal	0.1	67.9
Salmonberry	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other wild berry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Beach asparagus	0.8	0.8	0.8	0.8	0.0	2.9	0.0	0.0	0.7	gal	0.0	159.9
Wild rhubarb	0.8	0.8	0.8	0.0	0.0	2.9	0.0	0.0	0.7	gal	0.0	159.9
Devils club	1.6	1.6	1.6	0.8	0.0	3.2	0.0	0.0	3.2	gal	0.0	113.3
Fiddlehead ferns	0.8	0.8	0.8	0.0	0.0	1.4	0.0	0.0	1.4	gal	0.0	159.9
Nettle	0.8	0.8	0.8	0.0	0.8	2.9	0.0	0.0	2.9	gal	0.0	159.9
Hudson's Bay (Labrador) tea	3.1	3.1	3.1	0.0	0.0	22.2	0.1	0.0	22.2	gal	0.1	112.1
Wild rose hips	3.9	3.9	3.1	0.0	1.6	51.9	0.1	0.1	13.0	gal	0.0	112.6
Yarrow	0.8	0.8	0.8	0.0	0.0	1.4	0.0	0.0	1.4	gal	0.0	159.9
Other wild greens	7.1	7.1	7.1	0.0	2.4	106.8	0.3	0.1	106.8	gal	0.3	76.5
Unknown mushrooms	9.4	7.9	7.9	3.1	1.6	167.1	0.5	0.2	167.1	gal	0.5	80.1
Fireweed	2.4	2.4	2.4	0.0	0.8	24.9	0.1	0.0	24.9	gal	0.1	148.5
Chaga	0.8	0.8	0.8	0.0	0.8	11.5	0.0	0.0	11.5	gal	0.0	159.9
Wood	52.8	46.5	45.7	11.8	7.9	0.0	0.0	0.0	0.0	lb	0.0	0.0
Roots	0.8	0.8	0.8	0.0	0.8	0.0	0.0	0.0	0.0	lb	0.0	0.0
Birch sap	0.8	0.8	0.8	0.0	0.8	0.0	0.0	0.0	0.0	lb	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2015.

Note Resources where the percentage using is greater than the combined received and harvest indicate use from resources obtained during a previous year.

Note For small land mammals, species that are not typically eaten show a nonzero harvest amount with a zero harvest weight. Harvest weight is not calculated for species harvested but not eaten.



Note Categories having 0 lb of usable weight are not included.

Figure 5-8.–Composition of harvest by resource category, by weight in usable pounds, Healy, 2014.

ranked species used by Healy households; 64% of households reported that they used moose in 2014. Approximately one-half of all households reported using sockeye salmon (51%) and blueberries (51%). Approximately one-third of all households (34%) used Pacific halibut. An estimated 27% of households reported using lowbush cranberries in 2014. Other species used by similar percentages of households included coho salmon (20%), Arctic grayling (19%), caribou (19%), and spruce grouse (19%). Ptarmigans[9] were used by 13% of households.

Figure 5-9 depicts the 10 principal wild food resources harvested in average pounds of edible weight per capita. This figure shows the relative importance of various food sources in terms of weight harvested (and presumably consumed), as opposed to how commonly the resources were reported to have been used. Therefore, this figure may depict the relative value of each resource as a dietary staple in 2014 better than does Table 5-6. Although the figure may also suggest other aspects of importance, such as nutritional value, cultural value, or significance to family traditions, it is primarily intended to represent what was harvested by Healy households in 2014. On average, an estimated total of 52 lb of wild foods were harvested for each resident of the community (Table 5-5). Of this total, 57% of the per capita harvest was composed of moose (Figure 5-9). Sockeye salmon was the next most harvested species at 15% of the total weight of wild foods per capita in 2014. Pacific halibut and caribou represented smaller portions of the total per capita harvest at 7% and 5%, respectively. Other principal species harvested included coho salmon (2% of the total per capita harvest), blueberry (2%), and brown bear (2%). Black bear, deer, and Arctic grayling composed smaller portions of the per capita harvest at 1% each. All other wild food resources constituted 7% of the total weight harvested per capita.

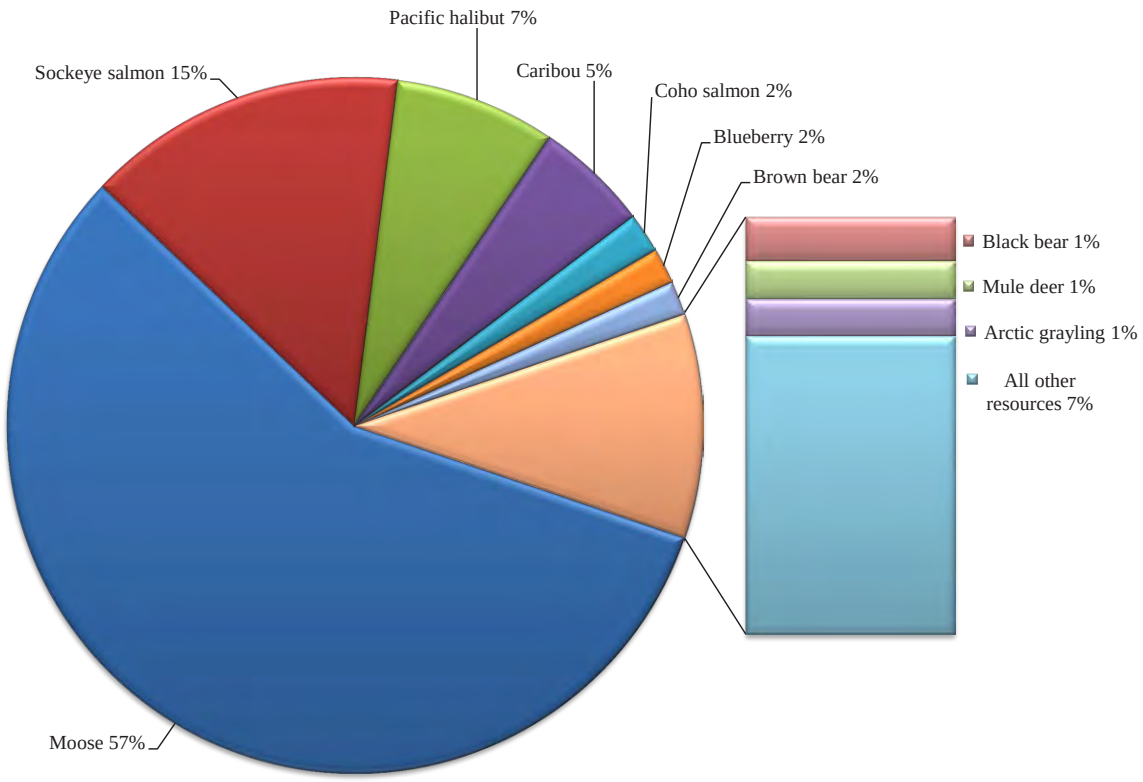
9 The survey instrument did not ask respondents to identify ptarmigan harvests by species. The 3 species of ptarmigans present in Alaska are willow ptarmigan *Lagopus lagopus*, rock ptarmigan *L. muta*, and white-tailed ptarmigan *L. leucura*. These species are typically difficult to distinguish from each other.

Table 5-6.–Resources most commonly used by households, Healy, 2014.

Rank[a]	Resource	Percentage of households using
1.	Moose	63.8%
2.	Sockeye salmon	51.2%
2.	Blueberry	51.2%
4.	Pacific halibut	33.9%
5.	Lowbush cranberry	26.8%
6.	Coho salmon	19.7%
7.	Arctic grayling	18.9%
7.	Caribou	18.9%
7.	Spruce grouse	18.9%
10.	Unknown ptarmigans	13.4%

Source ADF&G Division of Subsistence household

a. Resources used by the same percentage of households share the lowest rank value instead of having sequential rank values.



Note The "all other resources" category represents all species that contributed less than 1% to the total harvest.

Figure 5-9.–Top resource harvests by weight in usable pounds per capita, Healy, 2014.

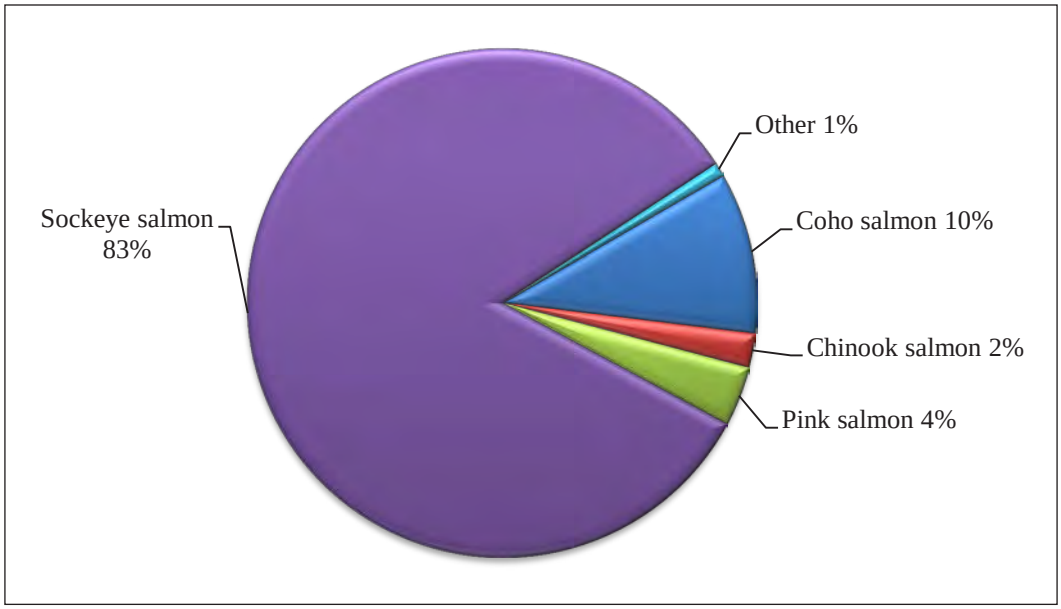


Figure 5-10.–Composition of salmon harvest by weight in usable pounds, Healy, 2014.

Salmon

A total of 9,362 lb of salmon were harvested by Healy households in 2014 (Table 5-5). The total harvest of all species of salmon in 2014 comprised 26 lb of edible weight per household and 9 lb per capita. (Figure 5-10). The majority of the salmon harvest (83%) was composed of 7,762 lb of sockeye salmon (Table 5-5; Figure 5-10). This represented an average of 21 lb per household and 8 lb per capita (Table 5-5). Approximately 26% of households reported harvesting sockeye salmon. Twenty-seven percent reported receiving sockeye salmon from other households and 13% reported giving it away. Most of the remaining harvest of salmon was composed of 961 lb of coho salmon (10% of the salmon harvest by weight), 357 lb of pink salmon (4%), 200 lb of Chinook salmon (2%), and 58 lb of chum salmon (less than 1%; Table 5-5; Figure 5-10). In total, these 4 species represented an average of 4 lb per household or approximately 2 lb per capita (Table 5-5). These species were also received and given away by survey respondents, but with much less frequency than sockeye salmon.

Healy fishers reported using 2 gear types when harvesting salmon in 2014. An estimated 1,706 salmon (6,819 lb) were taken using dip nets (Table D5-5). An additional 581 salmon (2,502 lb) were harvested using rod and reel gear. The majority of the dip net harvest was represented by 1,660 sockeye salmon, which totaled 6,693 lb. Approximately 43 pink salmon and 3 chum salmon were also harvested with dip nets. Healy fishers harvested 265 sockeye salmon with rod and reel, or 1,069 lb. Other species harvested with rod and reel included 183 coho salmon (946 lb), 95 pink salmon (245 lb), and 23 Chinook salmon (200 lb). Figure 5-11 is a visual representation of the weight of salmon harvested by gear type.

Although the majority of salmon fishers reported using rod and reel and dip nets, at least one key respondent described his family's decades-long experience harvesting salmon with gillnets in the Tanana River.

> Most of the time we fish with gillnets in the Tanana River…We've had dog teams…since 1981, and we've been fishing in Nenana probably since '87 or '88. We put up dog food, and there is some good fish among the [chum] salmon and silver salmon. So we put up some for ourselves and the rest for the dogs…We put up probably 2,000 fish a year… Chums and silvers [except in 2014, when our son caught fish for us]. We don't do any of the kings. (12112014HLY02)

This demonstrates some additional variety among the methods used by Healy fishers.

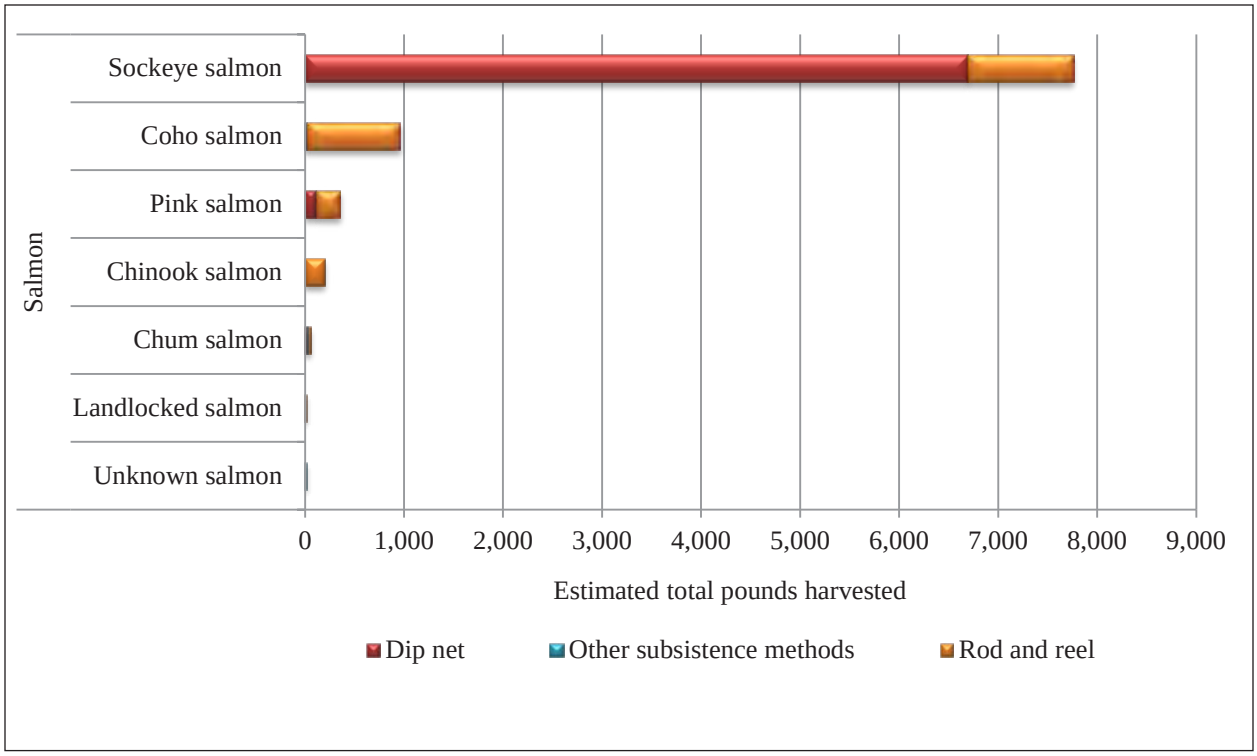


Figure 5-11.–Salmon harvests by gear type, Healy, 2014.

Healy residents harvested salmon in 2014 throughout roaded areas of the state within Southcentral Alaska (Figure 5-12). Salmon fishing occurred at sites within the Susitna River drainage including the upper Susitna River and along the Parks Highway in the Chulitna and Talkeetna rivers. One salmon fishing site was located in the Knik River near Palmer. Healy fishers harvested salmon in the Chitina and Copper rivers, including near Cordova. Some salmon were also harvested in Port Valdez. Several fishing sites were located on the Kenai Peninsula including near Kasilof, at Cooper Landing, and elsewhere in the Kenai River in the vicinity of Sterling, Soldotna, and Kenai. Healy fishers also harvested salmon in Resurrection Bay near Seward, Kachemak Bay near Homer, and in Cook Inlet west of Ninilchik.

Nonsalmon Fish

A total of 5,342 lb of nonsalmon fish were harvested by Healy households in 2014 (Table 5-5). The total harvest of all nonsalmon species in 2014 comprised 15 lb of edible weight per household and 5 lb per capita. An estimated 73% of the nonsalmon harvest was composed of Pacific halibut; the harvest of Pacific halibut in 2014 totaled 3,882 lb (Table 5-5; Figure 5-13). This represented an average of 11 lb per household and 4 lb per capita (Table 5-5). Approximately 34% of households reported using Pacific halibut, and 11% of households reported harvesting the species. Twenty-three percent reported receiving Pacific halibut from other households, and 4% reported giving it away. Arctic grayling represented 9% of the total nonsalmon harvest by weight, lake trout 5%, and rainbow trout and lingcod, 4% each (Figure 5-13). Rockfishes *Sebastes* spp. composed 2% of the total nonsalmon fish harvest. Arctic grayling was the second most-harvested nonsalmon fish at a total of 477 lb (Table 5-5). An estimated 19% of households used Arctic grayling, and 17% harvested this fish. Healy fishers also harvested an estimated 299 lb of lake trout caught by 11% of households and 196 lb of lingcod caught by 4% of households. Approximately 3 lb of nonsalmon fish were fed to dogs by Healy residents in 2014 (Table 5-7).

Healy fishers harvested nearly all nonsalmon fish with rod and reel gear in 2014. Of the total nonsalmon harvest of 5,342 lb, an estimated 5,258 lb were taken using this gear type (98% of the total edible weight; Table D5-6). The remaining 83 lb of nonsalmon fish harvests were taken by ice fishing with a hook and line

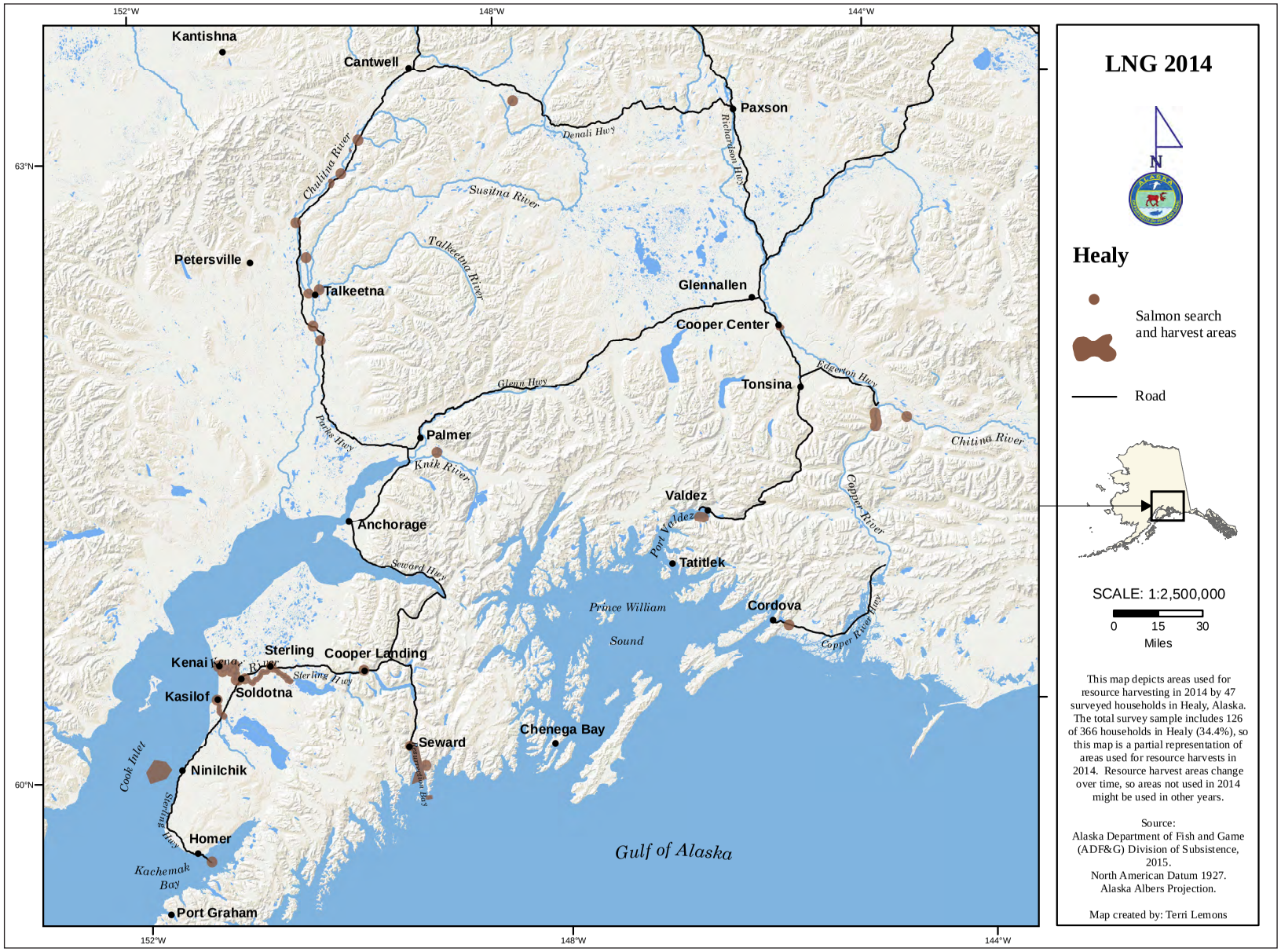


Figure 5-12.–Salmon fishing areas, Healy 2014.

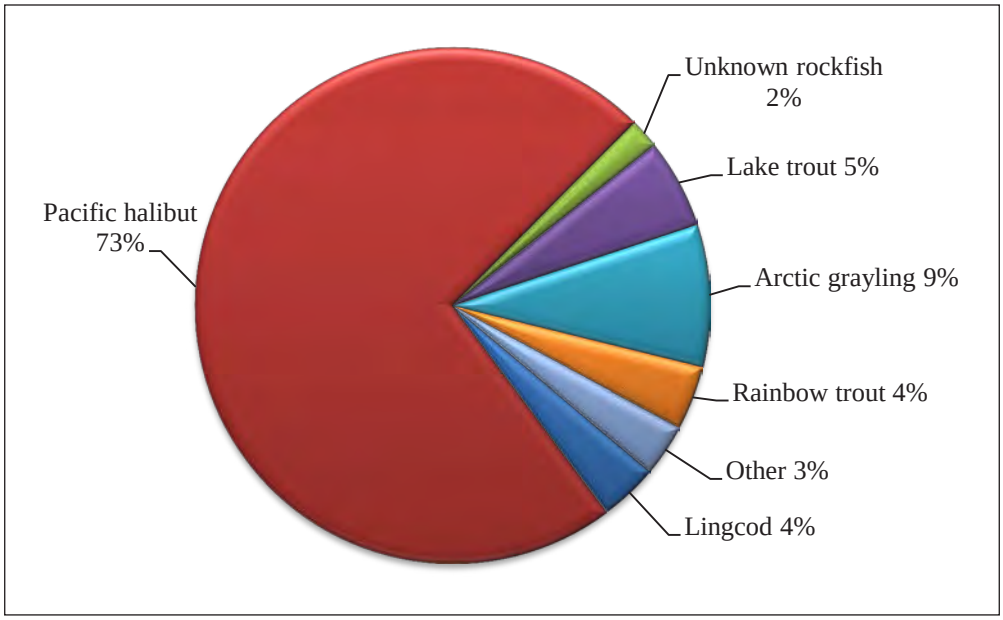


Figure 5-13.–Composition of nonsalmon fish harvest by weight in usable pounds, Healy, 2014.

attached to a rod or pole, as well as other fishing methods either not known or otherwise not identified by survey respondents. Figure 5-14 depicts the weight of nonsalmon fish harvested by gear type.

Figure 5-15 depicts areas where Healy residents harvested nonsalmon fish in 2014. A significant part of the seasonal round of wild food harvests for Healy residents includes traveling to coastal areas to harvest Pacific halibut and other marine fish species. Fishers harvested marine fish in Cook Inlet near the communities of Port Graham, Homer, Ninilchik, and Kenai. They also harvested marine fish at Resurrection Point near Seward, in the Gulf of Alaska east of Montague Island, in Port Valdez, and in Clarence Strait near the community of Wrangell. Other nonsalmon fish were harvested in freshwater near Kenai and Cooper Landing. Elsewhere in Southcentral Alaska, Healy residents harvested throughout the upper Susitna River drainage in the vicinity of the Denali Highway and in areas south of it. Healy fishers also harvested nonsalmon fish adjacent to the Parks Highway in the lower Susitna River, the Chulitna River, and in the Nenana River drainage near Healy and downstream from there. Additional nonsalmon harvests occurred in the Kantishna River drainage, in the Tolovana River near the community of Minto, and in the Tanana River drainage in the vicinity of Fairbanks.

Large Land Mammals

Moose represented an estimated 86% of the weight of Healy residents' 2014 large land mammal harvests (Figure 5-16). Caribou constituted 8% of the large land mammal harvest by weight, and brown and black bears, 2% each. The remaining 2% was composed of Sitka black-tailed deer and mountain goat. The total 2014 large land mammal harvest for Healy residents was an estimated 34,400 lb, which resulted in 94 lb per household or 34 lb per capita (Table 5-5). The majority of these harvests were represented by moose at 29,568 lb, or 81 lb per household and 29 lb per capita. Healy hunters took approximately 55 moose. An estimated 52 of these were bulls harvested in September, and 3 were cows harvested in January (Table 5-8). Approximately 64% of Healy households reported using moose in 2014; 14% of households harvested moose, and 50% attempted to harvest it (Table 5-5). Forty-four percent of households reported receiving moose, and 17% gave moose to other households.

Caribou harvests totaled 2,744 lb of edible weight in 2014, or 8 lb per household and 3 lb per capita (Table 5-5). Nineteen percent of households reported using caribou in 2014 with 5% of households harvesting caribou. Approximately 15% received caribou from other households and 5% gave caribou away. An

Table 5-7.–Estimated harvests of fish for consumption by dogs, Healy, 2014.

Resource	Amount	Pounds
Nonsalmon fish		
Unknown nonsalmon fish	2.9 ind	3.2 lb
Total	**2.9 ind**	**3.2 lb**

Source ADF&G Division of Subsistence household surveys, 2015.

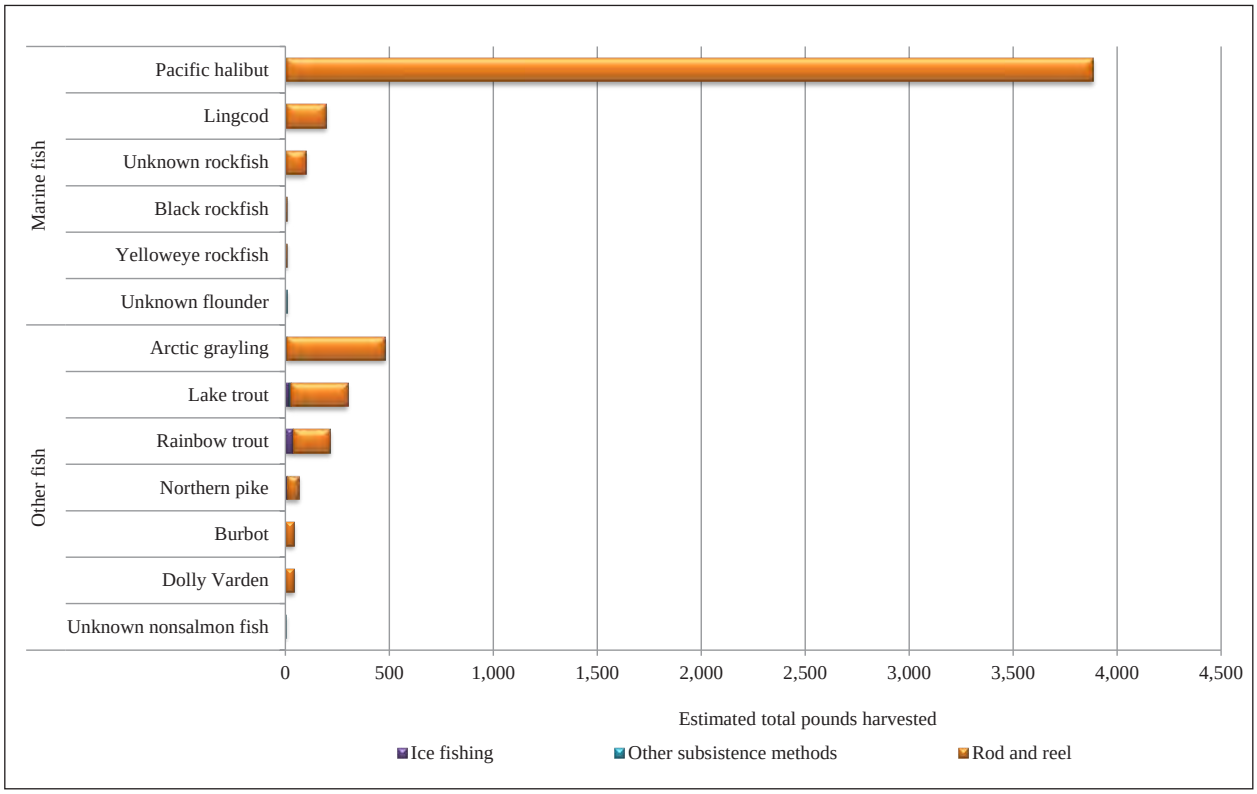


Figure 5-14.–Nonsalmon fish harvests by gear type, Healy, 2014.

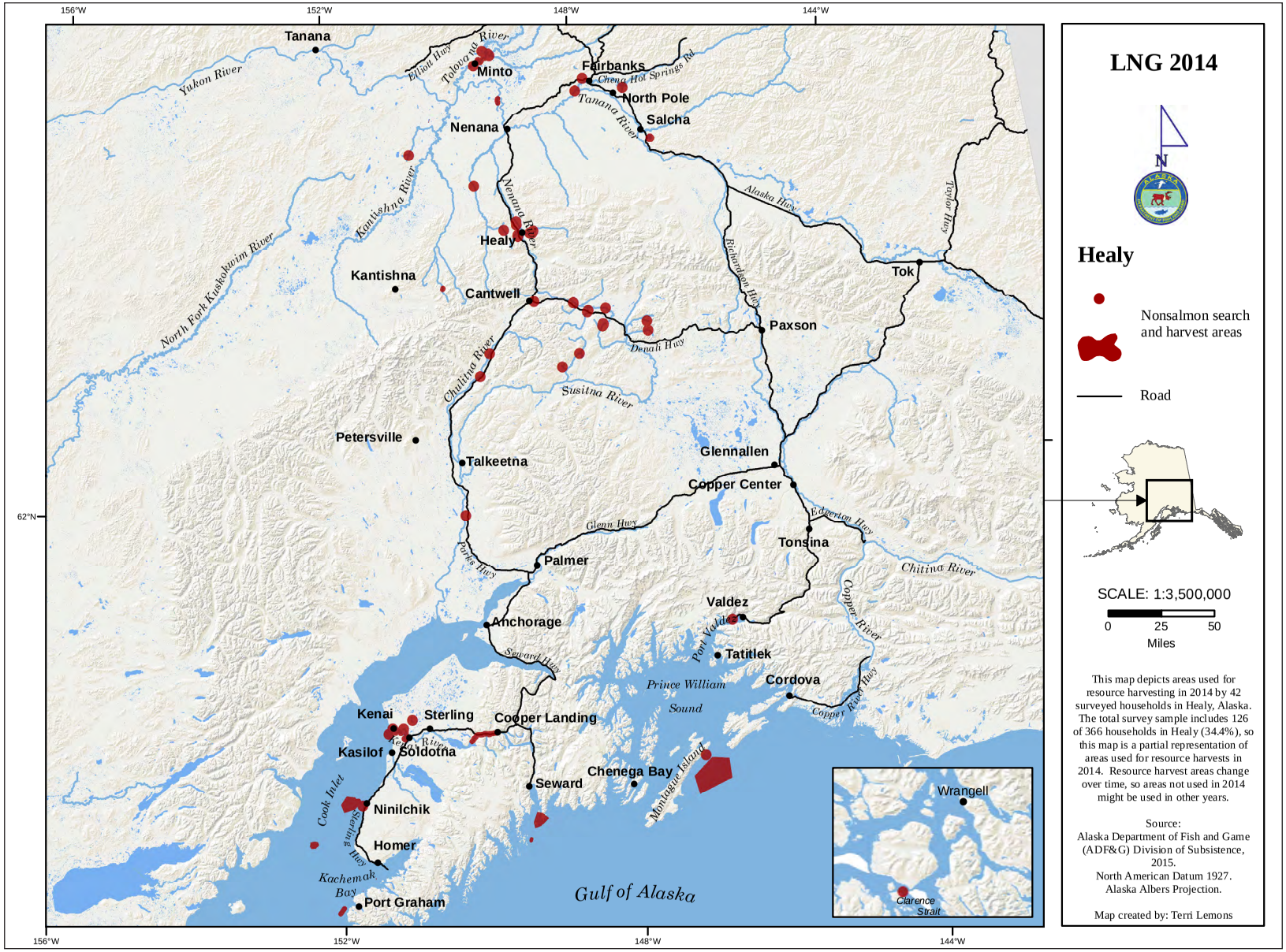


Figure 5-15.–Nonsalmon fishing areas, Healy, 2014.

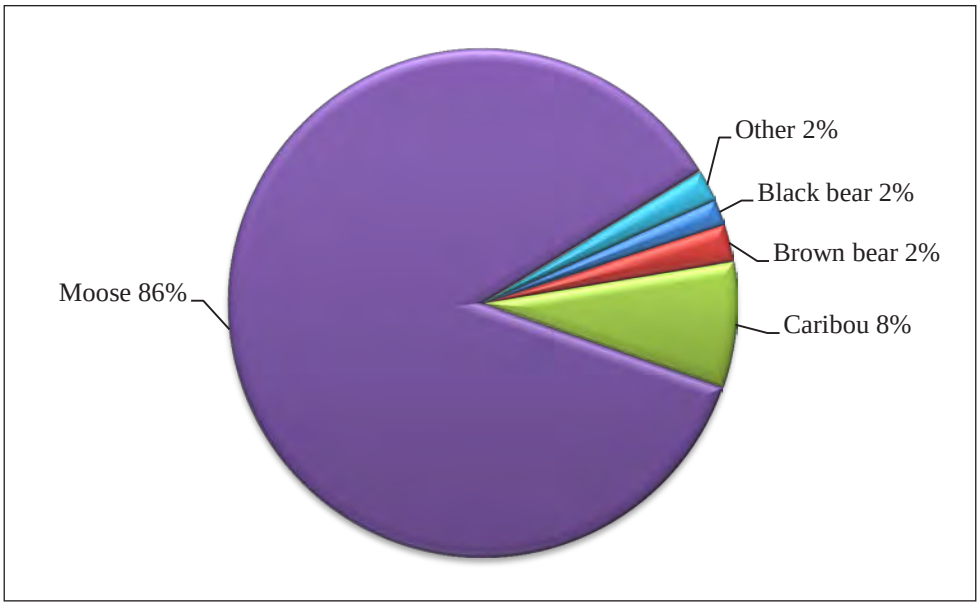


Figure 5-16.–Composition of large land mammal harvest by weight in usable pounds, Healy, 2014.

estimated 12 bulls were harvested in August, 3 in September, and 3 in October of 2014 (Table 5-8). Three caribou cows were harvested in August. Approximately 813 lb of brown bear, 576 lb of black bear, and 490 lb of Sitka black-tailed deer were harvested (Table 5-5). An estimated 3 mountain goats were harvested, totaling 209 lb of edible weight. Hunters harvested black bears in May and June, and they took brown bears in May and September. Deer were harvested in October and November, and mountain goats were harvested in September (Table 5-8). Eleven percent of households searched for Dall sheep but none were harvested by surveyed Healy hunters (Table 5-5). Despite the lack of harvest among the community, 5% reported using Dall sheep and 4% reported receiving the resource.

A number of key respondents discussed local changes in population abundance of various big game species over time. One key respondent described the historical abundance of caribou and their apparent decline in the area.

> I don't know what happened to the caribou. I used to live at Otto Lake and they used to cross in the winter time. January, December, they'd cross the back of that lake and there would be hundreds of them. And there ain't any here anymore. I'll go up on this ridge back here and see a few. In the winter I might see 3 or 4…I don't know what happened to them. When I was a kid…my uncle [and I] went into…Thistle and Shuttle Creek. I had a caribou tag…We got back there. There was caribou everywhere. They looked like ants on the hills. Everywhere you looked there was a caribou running around. But them caribou aren't there anymore. And they used to be everywhere, up the Healy River. And to me there was so many caribou then. Maybe they changed their migration. But, there were so many caribou then that the hunting pressure couldn't have done it. There wasn't enough people hunting to change that population like that. I don't know what did it…There ain't any caribou around here anymore compared to when I was a kid. (12112014HLY03)

Healy hunters searched for and harvested moose in an area approximately 50 miles wide east to west and 30 miles north to south on either side of the Parks Highway (Figure 5-17). Moose hunters were also active in the Nenana River upstream of Cantwell and along the Parks Highway for 10 miles southwest of that community. Other moose search and harvest areas included a portion of the Melozitna River, sites on the Tolovana and Chena rivers, and north of Fairbanks between the Elliott and Steese highways. Hunters

Table 5-8.–Estimated large land mammal harvests by month and sex, Healy, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All large land mammals	**2.9**	**0.0**	**0.0**	**0.0**	**5.8**	**2.9**	**0.0**	**14.4**	**60.5**	**11.5**	**2.9**	**0.0**	**0.0**	**100.9**
Black bear	0.0	0.0	0.0	0.0	2.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**5.8**
Black bear, unknown sex	0.0	0.0	0.0	0.0	2.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**5.8**
Brown bear	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	**5.8**
Brown bear, unknown sex	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	**5.8**
Caribou	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	2.9	2.9	0.0	0.0	0.0	**20.2**
Caribou, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	2.9	2.9	0.0	0.0	0.0	**17.3**
Caribou, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	**2.9**
Caribou, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Sitka black-tailed deer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	2.9	0.0	0.0	**11.5**
Sitka black-tailed deer, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	2.9	0.0	0.0	**11.5**
Mountain goat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	**2.9**
Mountain goat, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	**2.9**
Moose	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.9	0.0	0.0	0.0	0.0	**54.8**
Moose, bull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.9	0.0	0.0	0.0	0.0	**51.9**
Moose, cow	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.9**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep, unknown sex	0.0	0.0	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, 2015.

searched for and harvested caribou in an area south of the Denali Highway west of Paxson, and further west along the same route. In addition, caribou were hunted along the Saganavirktok River approximately 20 miles south of Deadhorse. Hunters also searched for and harvested caribou in an area northeast of Healy in the Alaska Range foothills. Hunters searched for Dall sheep in these foothills in an area approximately 30 miles in diameter. Hunters searched for and harvested brown bears in an area of the Denali Highway approximately 25 miles east of Cantwell, south of Cantwell along the Parks Highway, and in an area near Healy approximately 30 miles east to west and less than 10 miles north to south. Hunters searched for and harvested black bears in similar areas as brown bears, and they hunted for mountain goats in an area near Tatitlek (Prince William Sound) and east of Port Graham in West Arm (Cook Inlet).

Key respondents also described historical moose hunting locations for Healy residents. One key respondent stated, "As far as the locals are here, we used to hunt moose right here where we're sitting; out in the hills, the foothills right here, on the park boundary" (06162015HLY04). Another lifelong Healy resident described the difficulty of moose hunting in his family's historical hunting territory due to antler restrictions.

> There ain't even 4-brow-tine bulls over there anymore. I shot one this year and I looked at that moose, I studied that moose for 3 or 4 hours and I had to keep getting closer because it had a brow tine on it that couldn't tell if it was longer than it was wide. And I kept getting closer and closer…you know, and that's what you got to do to hunt over there. You got to make sure you know what you are pulling the trigger on. But, you know when I finally shot it, it ended up being an inch and three quarters long. It was legal, but it's too dang close for me. I don't like doing that. I don't like having to guess. And you have to do that at some point when you are hunting those brow tine areas and you need to know what you are doing. But there's a lot of guys that don't know what they are doing. I've hunted moose all my life and it's still hard for me to tell if a moose is 50 inches. I don't care who says, I can't do it…I've seen all kinds of moose; but I can't tell you [if] that moose is [legal]. (12112014HLY03)

Historically, moose and other big game species have been the primary source of wild foods for many Healy households. The community's location on the Parks Highway and adjacent to Denali National Park and Preserve has resulted in a variety of conflicts that affect Healy hunters' ability to get the moose they need. In 2014 many surveyed households and key respondents discussed their concerns regarding challenges facing

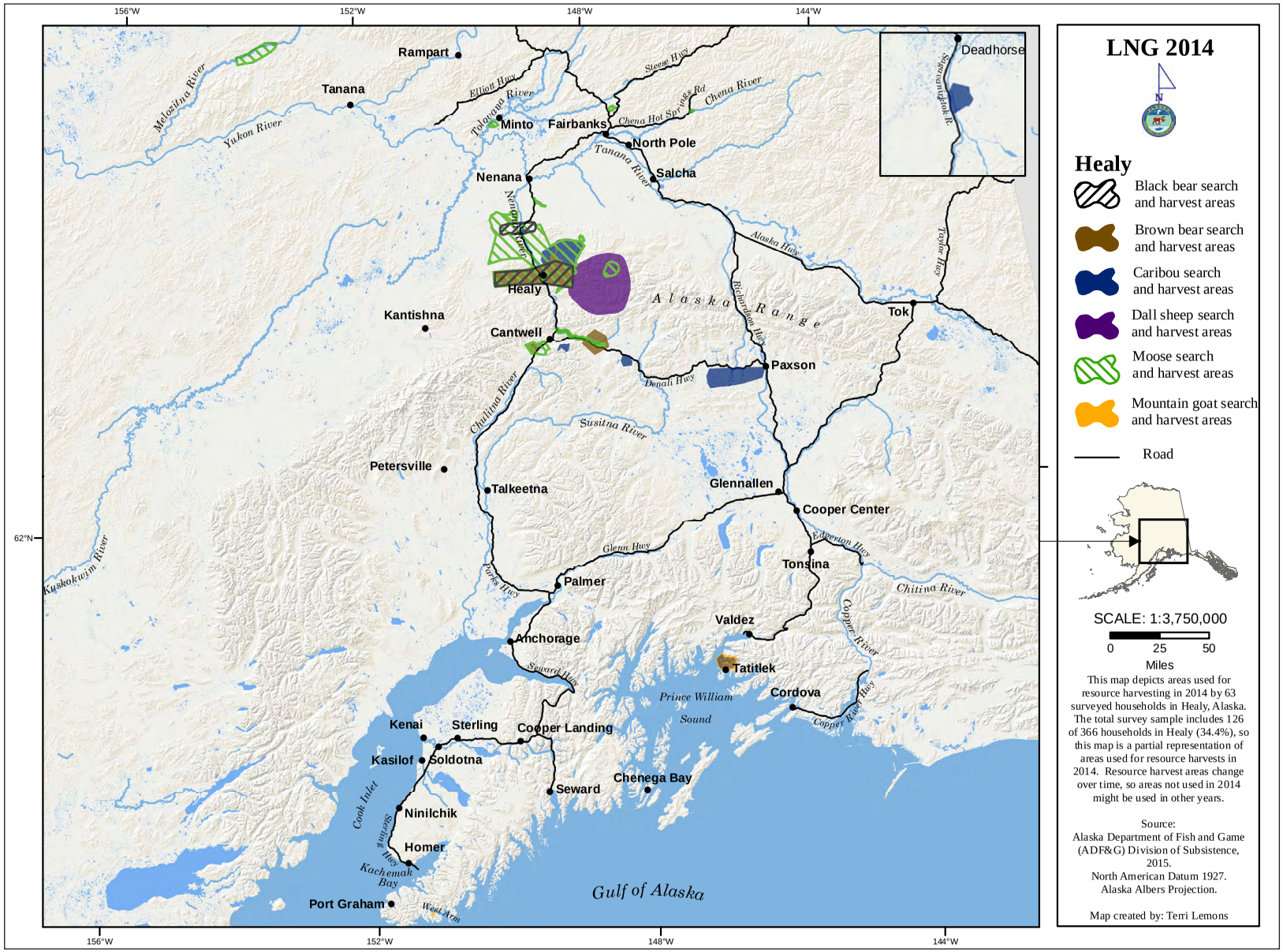


Figure 5-17.–Large land mammal hunting areas, Healy, 2014.

big game hunters. These comments are summarized in the Local Comments and Concerns section at the conclusion of this chapter. Concerns expressed by many survey respondents suggest that hunting regulations, wildlife population management, and competition with nonlocal hunters all create an environment of controversy and discord for many big game hunters in Healy.

Small Land Mammals/Furbearers

In 2014 Healy hunters and trappers harvested a total of 138 lb of small land mammals for food (Table 5-5). These included 87 lb of beaver (6 beavers) and 52 lb of snowshoe hare (26 hares). By weight, 69% of the small land mammals harvested for food were snowshoe hares and 31% were beavers (Figure 5-18). An estimated 2% of households harvested beavers and 2% harvested snowshoe hares (Table 5-5). The beavers were caught in January, May, and October, and the snowshoe hares were harvested in January and December (Table 5-9). Figure 5-19 depicts the comparisons between furbearers that were harvested for food or for food and fur and those that were harvested for fur only. Species harvested for fur but not eaten included 3 wolverines, 6 martens, 14 coyotes, 12 red foxes, 58 Arctic ground squirrels, and 43 red squirrels (Table 5-5). Most of these furbearers (138 animals) were taken in January, with some taken in February and November (Table 5-9). Beavers were taken in October and snowshoe hares in December. Hunters and trappers searched for and harvested small land mammals in various sites and short trap lines in the immediate vicinity of Healy within a 5 to 10 mile radius (Figure 5-20). Others were actively searching for and harvesting these species in a region approximately 35 miles east to west and 25 miles north to south. This area's northern margin is approximately 10 miles north of Healy on either side of the Parks Highway.

Several key respondents shared experiences of trapping. A key respondent discussed the species he and his family prefer to target in their traps.

> We trap lynx and marten and fox. Wolverine occasionally. Wolf occasionally. But I'm not really going for wolf now…I run a dog team. What I do is I set, set the line with a snow-machine, then I check it with dog team, to get exercise for me and for the dogs. I'm not really trying to make money at it, but get lynx and stuff to make hats. Marten we sell outright, and most of time we don't make hats with them. Right now they are worth so much money…the hats would be so expensive, we couldn't really sell the hats. (12112014HLY02)

Table 5-9.–Estimated small land mammal/furbearer harvests by month, Healy, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All small land mammals	**138.3**	**5.8**	**0.0**	**0.0**	**2.9**	**0.0**	**0.0**	**2.9**	**0.0**	**5.8**	**8.7**	**8.6**	**2.9**	**175.8**
Beaver	2.9	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	**11.5**
Coyote	5.8	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	2.9	**14.4**
Red fox–cross phase	0.0	0.0	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–red phase	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	**11.5**
Snowshoe hare	17.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	0.0	**25.9**
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	**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	**0.0**
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	**2.9**
Marten	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	**5.8**
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	**0.0**
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	**0.0**
Arctic ground (parka) squirrel	57.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**57.6**
Red (tree) squirrel	43.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**43.2**
Weasel	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Wolverine	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.9**

Source ADF&G Division of Subsistence household surveys, 2015.

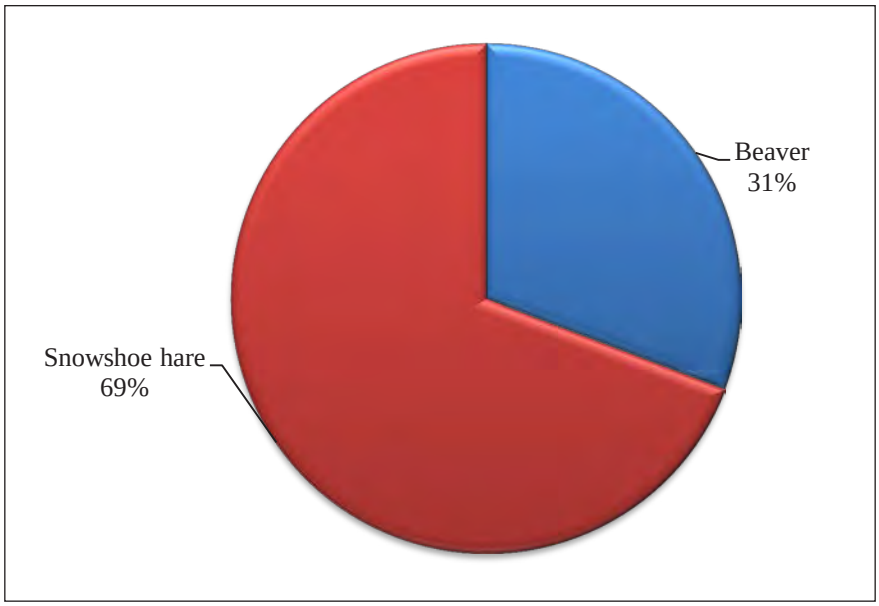


Figure 5-18.–Composition of small land mammal harvest by weight in usable pounds, Healy, 2014.

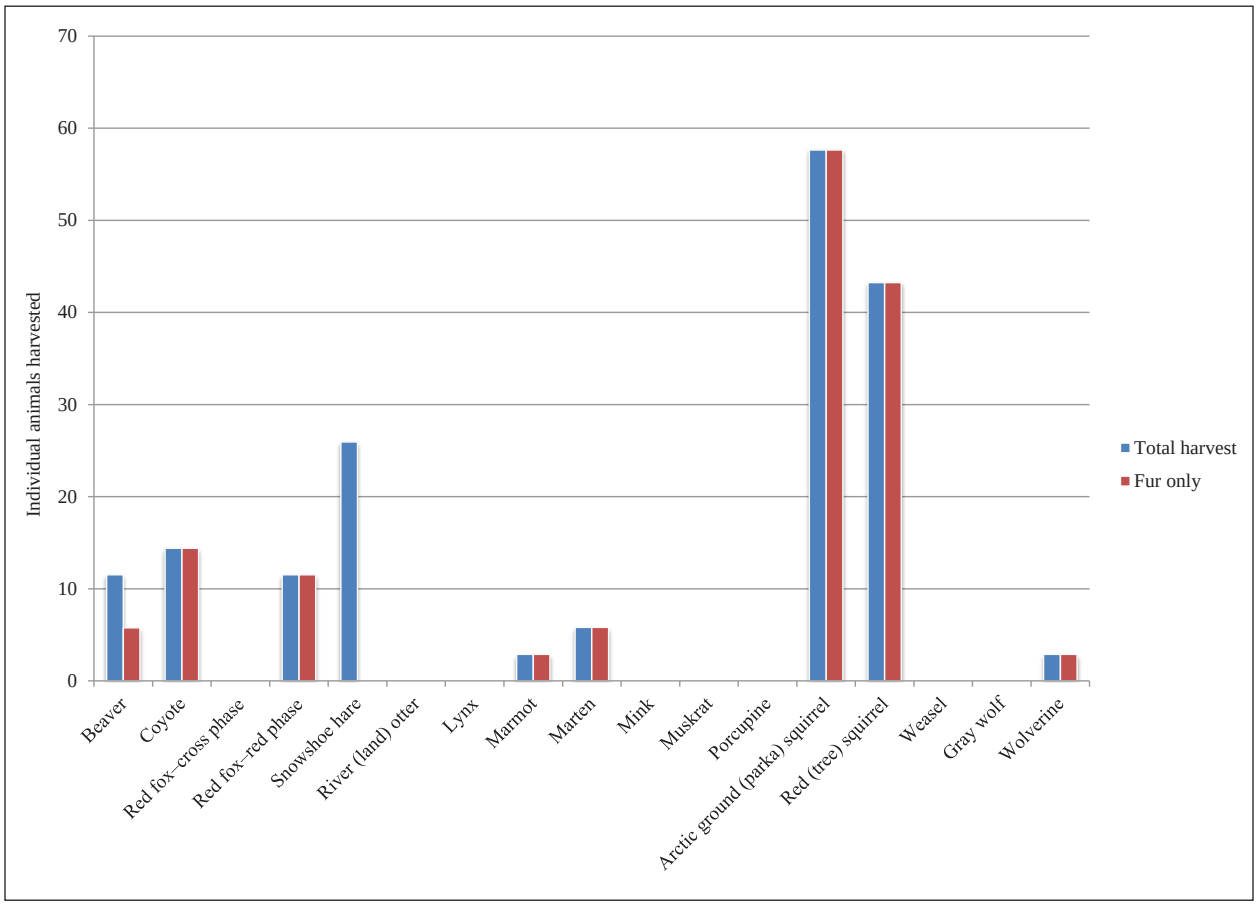


Figure 5-19.–Estimated small land mammal harvests for fur or food, Healy, 2014.

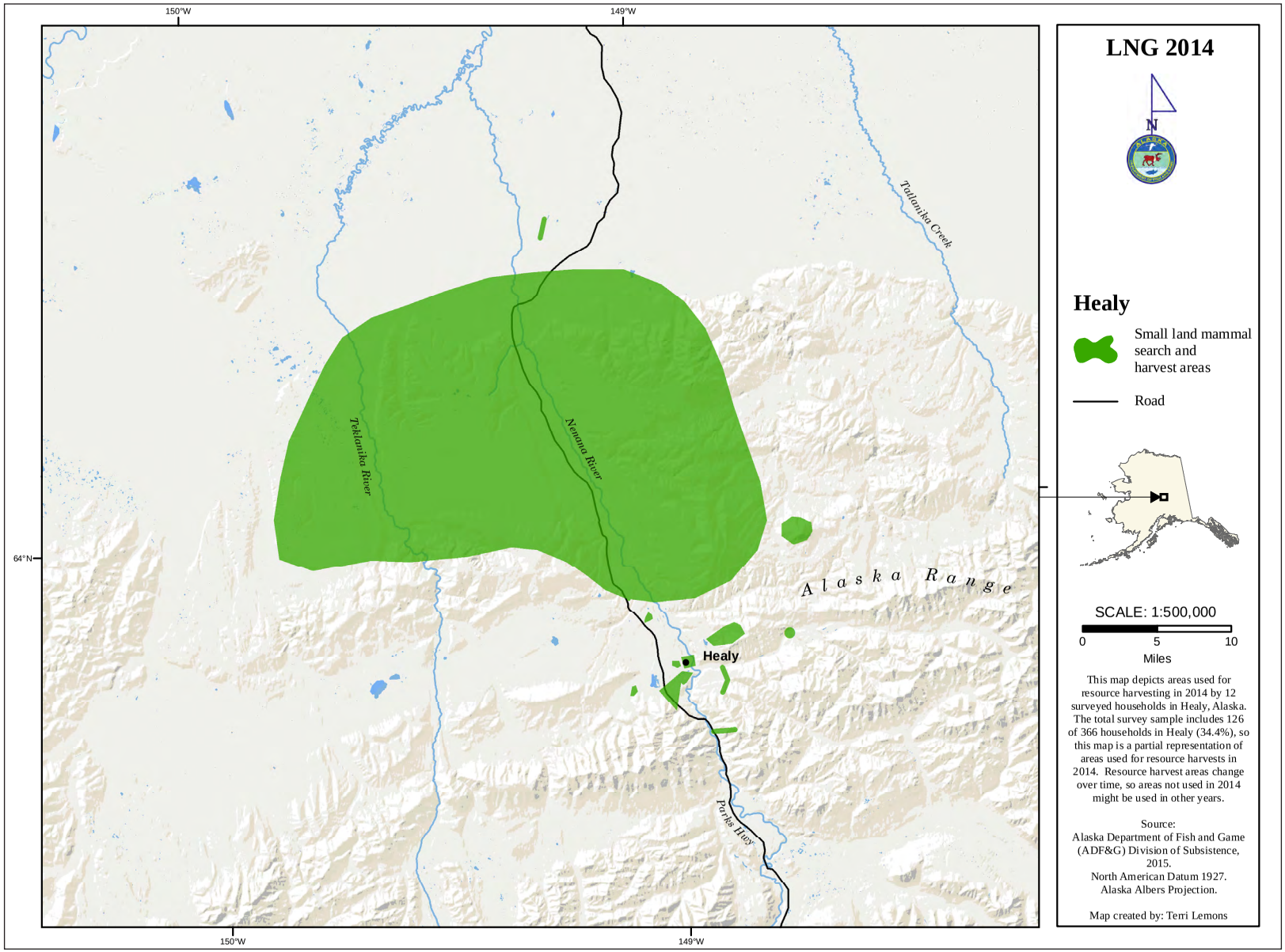


Figure 5-20.–Small land mammal hunting areas, Healy, 2014.

He also described one popular method of trapping wolves known as a trail set. He does not practice this method because he feels it is potentially hazardous for his dog teams.

> [A trapper will] cut a hole in the snow in the trail, and he'll set his trap inside that thing so it's level with the [trail surface]. There is no bump or anything. You don't drive back over the thing again. You put a light piece of wax paper over it, so the snow doesn't fill up around it in the toggle. Then you just let a little bit of snow drift over it and stuff. Then when a wolf just runs down the trail, he'll get caught in that…But you can't do that with dog team, because you'll get your dogs. Unless you make a side, little side trail, some mushers do that. They'll make a little side loop off [the trail] through some brush or something and set traps or snares in that loop. That way they can still run on the main trail and check and see if [they've] gotten a wolf in that. And the wolves will go in that side track just out of curiosity. (12112014HLY02)

One key respondent discussed the effect that trapping of wolves can have upon wildlife populations.

> There was a pack of 16 out there. I knocked them down to where there was 4 in that pack…and then I left them alone the next winter. They stuck around. The pack built back up and I left them for that winter and I trapped on the other side of the mountains. Come back [the next winter] and that pack was back up. I think there were 10 or 12 in that pack. I just kept doing that. So I was working a couple of packs on the north side of the mountains here, and then I'd work a couple on the south side. It worked damn good. There was some mountains out in there you just didn't see sheep…After a few years of working the wolves like I did, you start to see sheep showing up out there on those mountains. (06162015HLY04)

He went on to discuss the productivity of wolves that he has experienced as a long time trapper. He described an incident when he killed a number of wolves from a large pack that inhabited an area of the community within a few miles west of the Parks Highway. He explained,

> That wolf pack had 16 in it at that time and I killed 5. And the next spring they had 17 wolves in that pack, after they had a litter…They'll bounce right back. When there's plenty of food…out there, they'll have a good litter…They can have up to 10 or so pups. They can bounce back really quick. (06162015HLY04)

Wolf hunting and trapping has long been a controversial subject in the Healy area due to its proximity to Denali National Park and Preserve. Trappers and hunters have historically been very active in the areas adjacent to the park boundaries. As such, many conflicts have arisen among trappers, hunters, conservationists, and the state and federal agencies that manage the natural resources of the area. A so-called "wolf buffer zone" had been instituted in the past to protect park wolves from being harvested on State of Alaska lands adjacent to Denali National Park, presumably to protect wolves from harvest in recognition of the National Park Service goal of preserving park wildlife for tourism and viewing opportunities. One key respondent discussed this buffer zone as an attempt by the State of Alaska to institute "an emergency closure to the taking of wolves in the old Stampede [Road] corridor…That was the buffer, a wolf buffer zone…It went out with [a previous governor's] administration, and hopefully they're not going to get it back…It [destroyed] my trapline" (06152015HLY05).

Marine Mammals

No Healy survey respondents reported using or attempting to harvest marine mammal resources in 2014.

Birds and Eggs

Healy respondents reported harvesting an estimated total of 702 lb of birds in 2014, resulting in 2 lb per household and less than 1 lb per capita (Table 5-5). No households reported harvesting or using wild bird eggs in 2014. Twenty-nine percent of households reported using birds and 27% reported harvesting the resource. More than three-quarters of the harvest by weight was composed of upland game birds: spruce

grouse represented 27% of the total edible pounds of birds harvested; ptarmigans, 23%; ruffed grouse, 19%; sharp-tailed grouse, 5%; and 2% of the harvest, grouses of species that were unknown to respondents (Figure 5-21). The remaining bird harvests were ducks, including mallards (18% of the total weight harvested) and northern pintails (4%), as well as American wigeons and green-winged teals. Of the upland game birds, harvests of spruce grouse totaled 192 lb. Hunters harvested approximately 162 lb of ptarmigans, 134 lb of ruffed grouse, and 34 lb of sharp-tailed grouse. The remaining weight of the harvest was mostly composed of mallard at 124 lb, followed by 30 lb of northern pintail, and 11 lb of American wigeon. Most of the grouses were harvested in fall (408 birds); 92 were harvested in winter and 32 harvested in spring and summer (Table 5-10). Ptarmigans were mostly hunted in winter (115 birds); 61 birds were caught in fall, 17 in summer, and 38 in spring. All ducks were hunted in fall.

Hunters searched for and harvested ptarmigans and grouses in an area surrounding Healy approximately 35 miles from east to west on either side of the Parks Highway (Figure 5-22). These birds were also hunted in an area approximately 20 to 30 miles northwest of Healy in the Teklanika and Nenana river drainages near the Parks Highway. Other ptarmigan and grouse search areas were on Tatlanika Creek, on Chena Hot Springs Road, and at sites on the Elliott and Steese highways. Healy hunters searched for and harvested all ducks in areas southeast of Minto near the Tanana River and in the Tolovana River drainage downstream of Minto.

Marine Invertebrates

Nearly three-quarters of all marine invertebrate harvests by Healy households in 2014 was clams. Of these shellfish, razor clams constituted 49% of the total weight of marine invertebrates harvested, butter clams were 17%, and pinkneck clams were 3% (Figure 5-23). Approximately 22% of the harvest of marine invertebrates was represented by shrimp, and 9% of the total weight of the harvest was octopus. Marine invertebrate harvests totaled 131 lb, which included 65 lb of razor clams, 22 lb of butter clams, 29 lb of shrimp, and 12 lb of octopus (Table 5-5). Four percent of households reported using razor clams, and 3% reported using shrimp. Healy respondents who reported marine invertebrate harvests described harvesting these resources primarily in Prince William Sound out of Valdez and Whittier and in Resurrection Bay out of Seward. One respondent reported harvesting marine invertebrates at locations in Southeast Alaska.

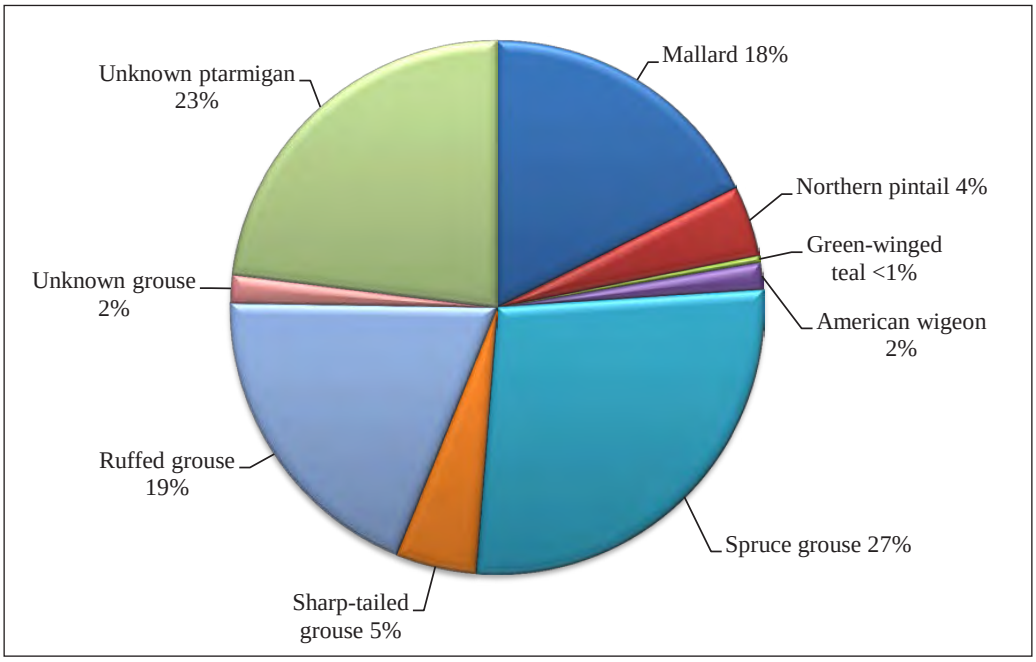


Figure 5-21.–Composition of bird harvest by weight in usable pounds, Healy, 2014.

Table 5-10.–Estimated bird harvests by season, Healy, 2014.

	Estimated harvest by season					
Resource	Spring	Summer	Fall	Winter	Season unknown	**Total**
All birds	**57.6**	**28.8**	**566.8**	**207.5**	**0.0**	**860.8**
Canvasback	0.0	0.0	0.0	0.0	0.0	**0.0**
Spectacled eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Goldeneye	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	0.0	0.0	63.4	0.0	0.0	**63.4**
Northern pintail	0.0	0.0	20.2	0.0	0.0	**20.2**
Black scoter	0.0	0.0	0.0	0.0	0.0	**0.0**
Green-winged teal	0.0	0.0	5.8	0.0	0.0	**5.8**
American wigeon	0.0	0.0	8.6	0.0	0.0	**8.6**
Unknown ducks	0.0	0.0	0.0	0.0	0.0	**0.0**
Brant	0.0	0.0	0.0	0.0	0.0	**0.0**
Cackling goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Canada goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown Canada/cackling goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Snow goose	0.0	0.0	0.0	0.0	0.0	**0.0**
White-fronted goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown geese	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	0.0	0.0	0.0	0.0	0.0	**0.0**
Sandhill crane	0.0	0.0	0.0	0.0	0.0	**0.0**
Spruce grouse	14.4	11.5	196.2	51.9	0.0	**274.0**
Sharp-tailed grouse	0.0	0.0	28.8	20.2	0.0	**49.0**
Ruffed grouse	5.8	0.0	165.6	20.2	0.0	**191.5**
Unknown grouses	0.0	0.0	17.3	0.0	0.0	**17.3**
Unknown ptarmigans	37.5	17.3	61.0	115.3	0.0	**231.0**

Source ADF&G Division of Subsistence household surveys, 2015.

Vegetation

An estimated 79% of the weight of the 2014 vegetation harvest in Healy was represented by berries (Figure 5-24). Additionally, various plants and greens accounted for 12% of the harvest by weight, and 9% was composed of mushrooms. In 2014, Healy households harvested a total weight of 1,921 lb of vegetation (Table 5-5). This represented 5 lb per household and 2 lb per capita of these resources. Healy households gathered 859 lb of blueberries, 407 lb of lowbush cranberries, 87 lb of raspberries, 72 lb of currants, and 50 lb of highbush cranberries. Other plants included 107 lb of various wild greens, 52 lb of wild rosehips, 25 lb of fireweed, and 22 lb of Labrador tea. Healy respondents also gathered fungi, such as 167 lb of mushrooms and 12 lb of chaga[10]. Fifty-one percent of households reported using blueberries, and 43% reported harvest. Approximately 27% used lowbush cranberries and 24% reported harvesting them. The survey did not quantify firewood harvests; however, it did ask about firewood use. An estimated 53% of Healy households reported using firewood, 46% reported harvesting firewood, and 12% of households received firewood from someone else. A small number of households used firewood for 100% of their home heating (Table 5-11).

Healy households harvested berries, greens, and mushrooms in a variety of areas in Interior and Southcentral Alaska, primarily close to the road system. Vegetation was harvested in the vicinity of Healy in areas immediately to the west and to the northeast of the community, locations along the Parks Highway approximately 10 miles south of Healy, as well as along the banks of the Nenana River upstream of the Parks Highway near Cantwell (Figure 5-25). Harvesters also picked at sites along the Denali Highway

10 Chaga *Inonotus obliquus* is a parasitic fungus that is found growing on paper birch trees in Alaska. It is often dried and ground into a powder which is used to make a tea. Also known as "clinker fungus," it can be used effectively as a fire starter (Pilz 2004; Pilz et al. 2006).

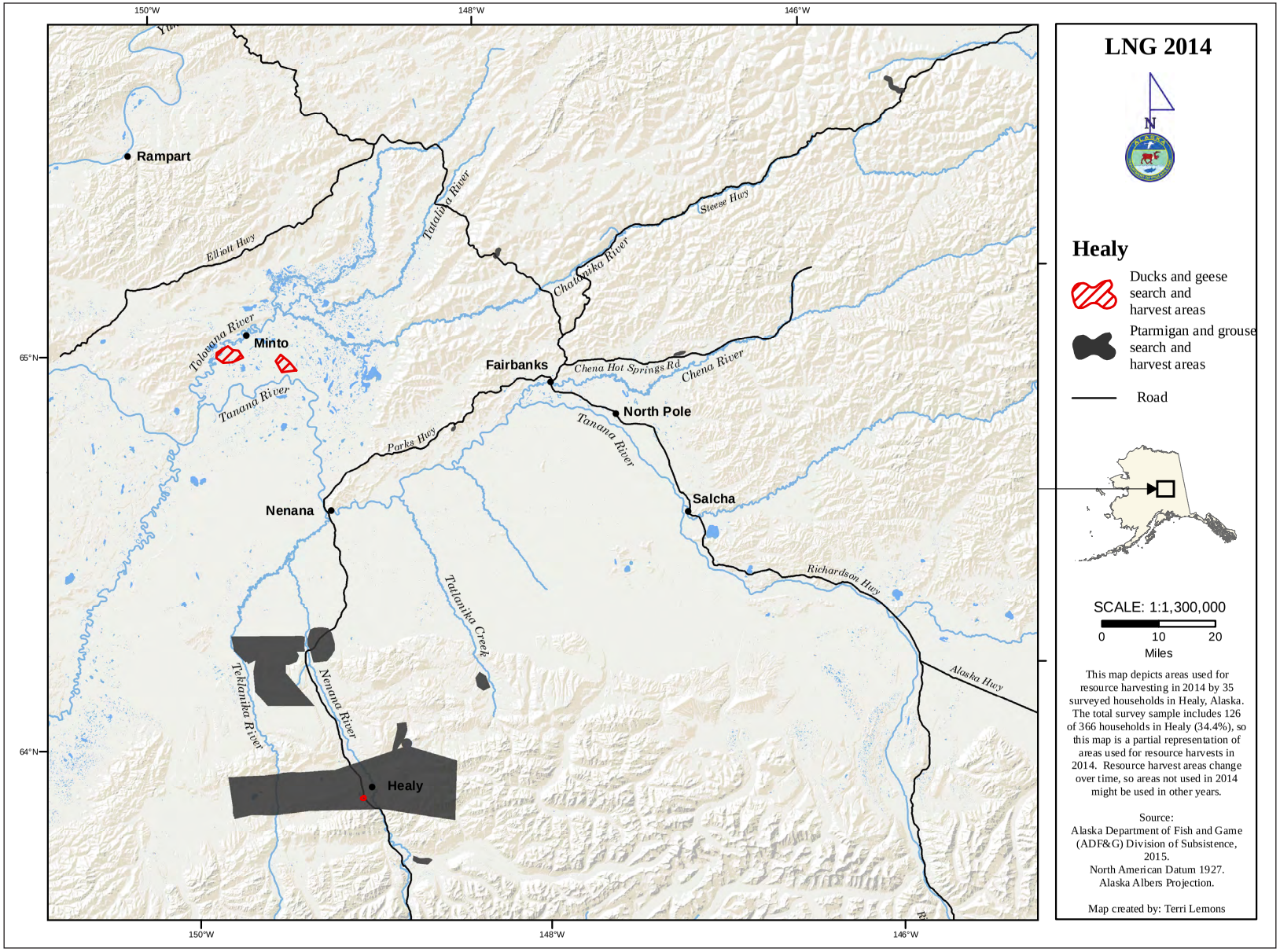


Figure 5-22.–Bird hunting areas, Healy, 2014.

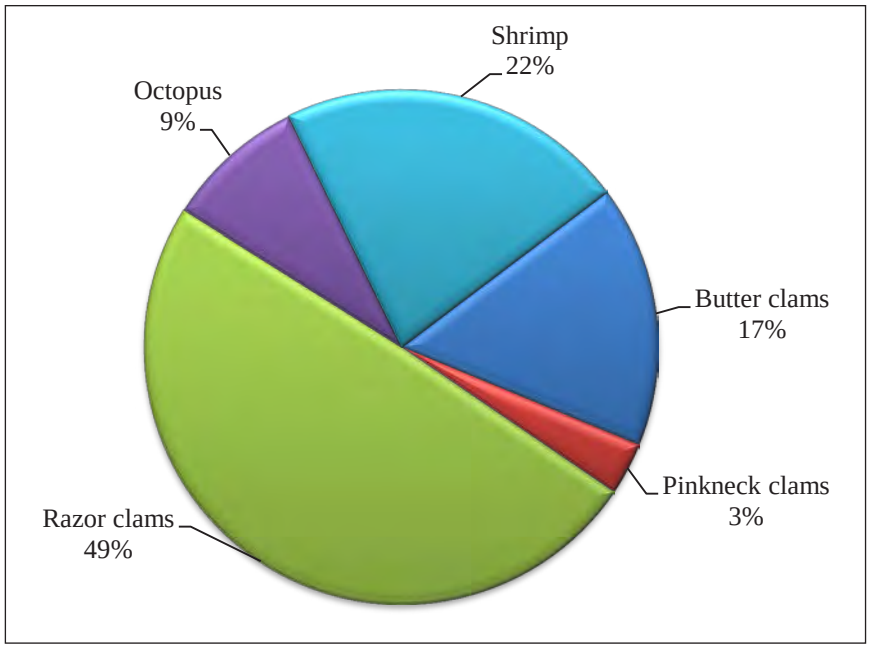


Figure 5-23.–Composition of marine invertebrates harvest by weight in usable pounds, Healy, 2014.

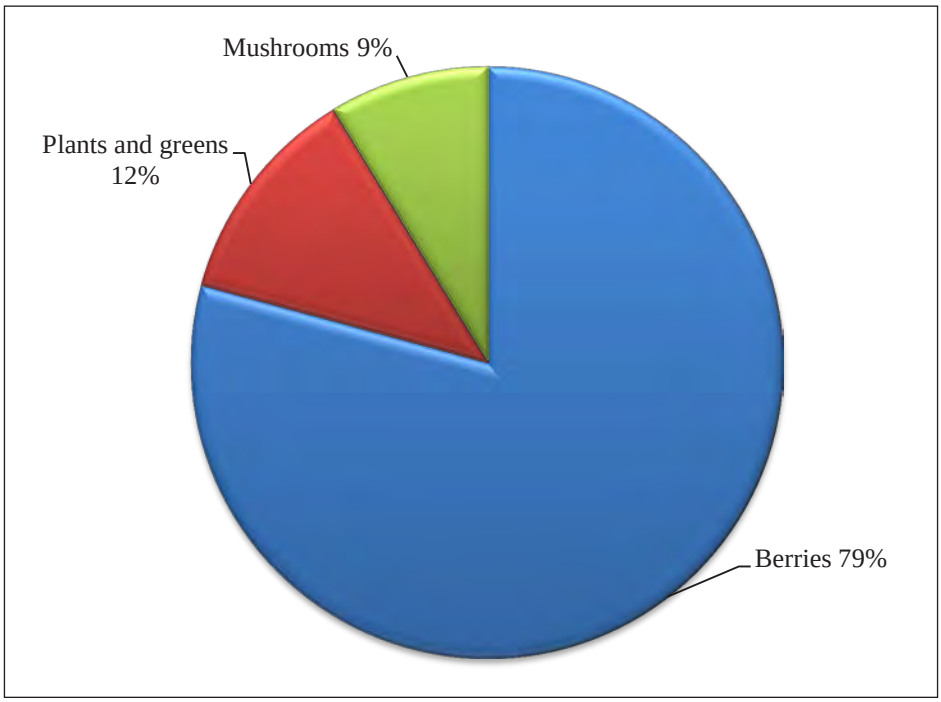


Figure 5-24.–Composition of vegetation harvest by weight in usable pounds, by type ov vegetation, Healy, 2014.

Table 5-11.–Use of firewood for home heating, Healy, 2014.

Percentage of home heating from wood	Healy households	
	Number	Percentage
0%	66	52.8
1–25%	24	19.2
26–50%	5	4.0
51–75%	11	8.8
76–99%	16	12.8
100%	3	2.4

Source ADF&G Division of Subsistence household surveys, 2015.

near the Susitna River crossing and further south in the Susitna River drainage around Petersville and south of Talkeetna. Other vegetation harvest areas were in the Kantishna River drainage, along the Nenana River upstream of the Teklanika River, and north of Fairbanks.

Production and Distribution of Wild Resources

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.

In the 2014 study year in Healy, about 70% of the harvests of wild resources as estimated in pounds usable weight were harvested by 15% of the community's households (Figure 5-26). The average harvest for the 50% of Healy households with the lowest harvests was 0.6 lb per person (Table 5-2). Further analysis of the study findings, beyond the scope of this report, might identify characteristics of the highly productive households in Healy and the other study communities.

Income and Cash Employment

Survey respondents were asked about both earned income (jobs held and wages earned by all household members 16 years and older) and unearned income from other sources. The survey also asked about months worked and work schedules for employed residents in each household. The principal income sources for Healy in 2014 included employment in mining occupations (33% of all income for the community), employment in the federal government (14%), and service industry jobs (9%; Figure 5-27). Other income sources included jobs in transportation, communications and utilities (8% of all income), construction jobs (8%), and local government jobs (6%). Pensions and retirement represented 8% of all Healy income and the Alaska Permanent Fund dividend constituted 6%.

Table 5-12 shows all reported sources of income by employment occupation and other sources as percentages of total income in 2014. The estimated total of all earned and unearned income was $28,563,902 for all Healy households in 2014. Employment earnings accounted for $23,744,565 of this total, or 83% of all income. In addition, Healy households received $4,819,337 of other income from other sources. The average total income per household for 2014 was $78,043. This included an average earned income of $64,876 per household and an average unearned income of $13,168. Income from local mining jobs totaled an estimated $9,363,595 with 115 people employed in these jobs in 2014. Federal government jobs resulted in $4,105,231 of wages earned, with 112 individuals holding these jobs. Approximately 138 people held jobs in the service industry and earned a total of $2,642,021. Wages from transportation, communications, and utilities jobs totaled $2,345,430 in 2014. Similarly, construction jobs paid a total of $2,165,187 in wages to Healy workers. Approximately 100 people worked in local government jobs and earned a total of $1,863,898 during the study year. The remaining jobs produced an estimated $1,259,203 in wages for approximately 77 people. The highest category of other income was pension and retirement benefits, which totaled $2,203,246 for 69 Healy recipients. An estimated 329 households received a total of $1,679,727

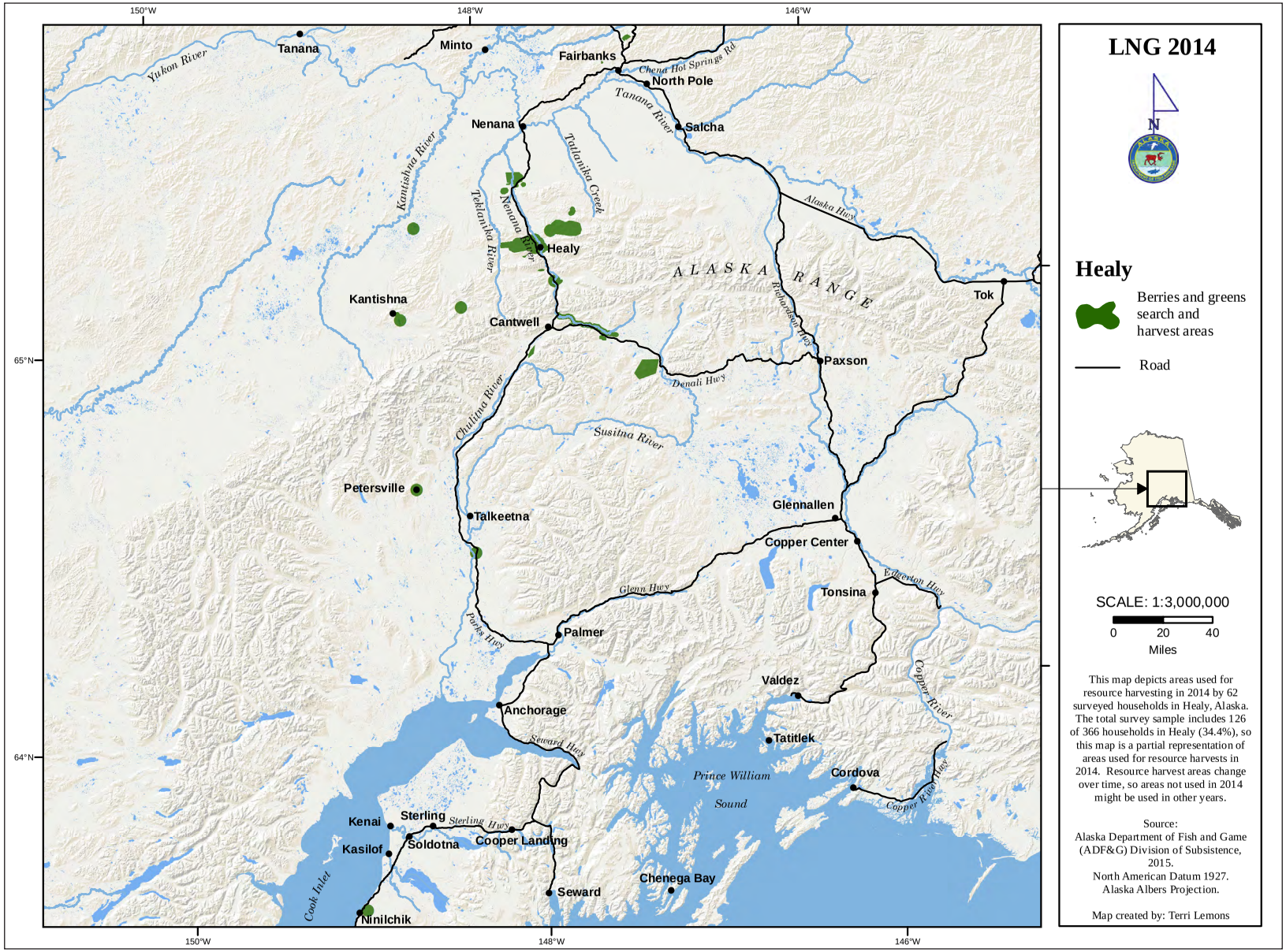


Figure 5-25.–Berries and greens gathering areas, Healy, 2014.

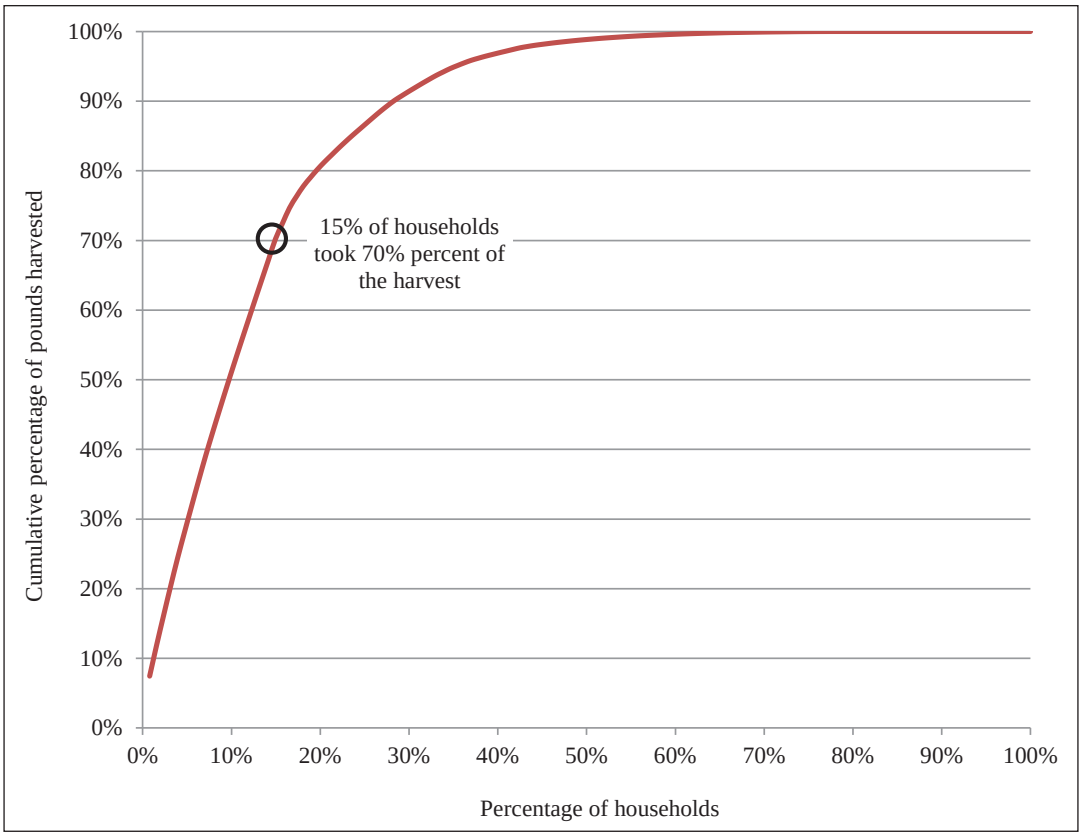


Figure 5-26.–Household specialization, Healy, 2014.

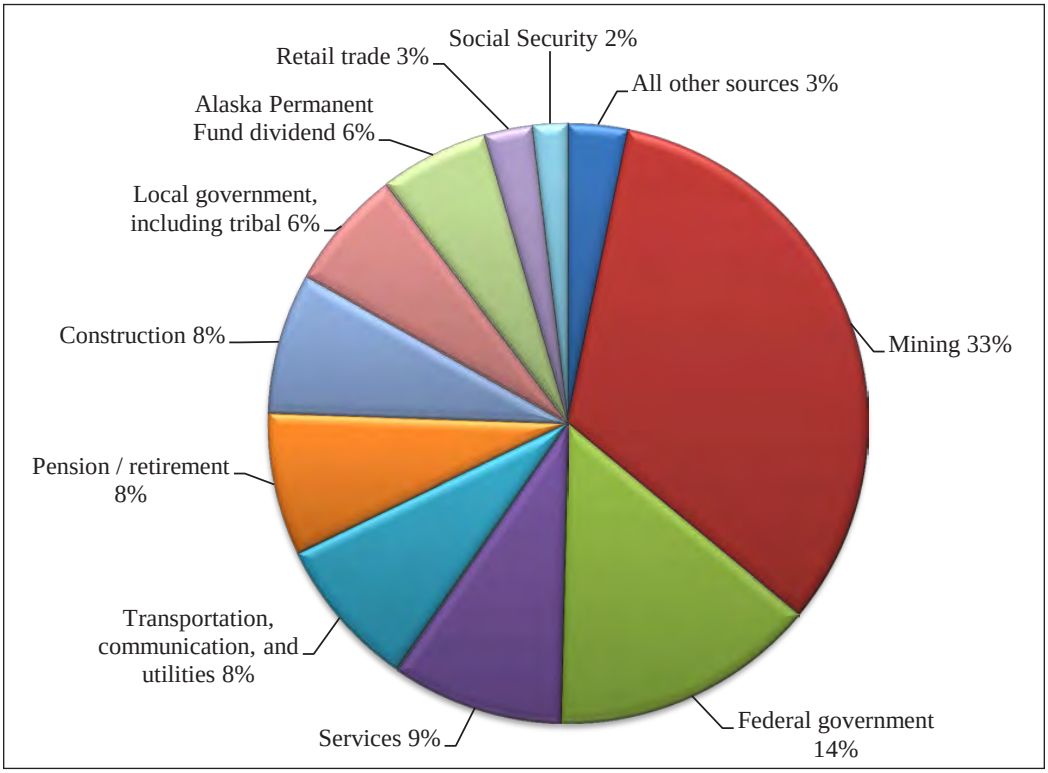


Figure 5-27.–Top income sources, Healy, 2014.

Table 5-12.–Estimated earned and other income, Healy, 2014.

Income source	Number of employed adults	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Mining	115	105	$9,363,595	$6,609,232 – $12,514,792	$25,584	32.8%
Federal government	112	90	$4,105,231	$2,321,362 – $5,986,082	$11,216	14.4%
Services	138	116	$2,642,021	$1,503,499 – $4,094,692	$7,219	9.2%
Transportation, communication, and utilities	41	38	$2,345,430	$995,381 – $3,820,718	$6,408	8.2%
Construction	59	49	$2,165,187	$833,774 – $3,773,968	$5,916	7.6%
Local government, including tribal	100	87	$1,863,898	$986,869 – $2,984,988	$5,093	6.5%
Retail trade	44	38	$743,855	$211,478 – $1,719,870	$2,032	2.6%
State government	15	15	$244,675	$24,312 – $765,077	$669	0.9%
Manufacturing	12	9	$140,170	$64,655 – $309,623	$383	0.5%
Finance, insurance, and real estate	6	6	$130,503	$56,102 – $307,457	$357	0.5%
Earned income subtotal	**557**	**343**	**$23,744,565**	**$19,378,951 – $27,998,056**	**$64,876**	**83.1%**
Other income						
Pension / retirement		69	$2,203,246	$1,206,457 $3,585,559	$6,020	7.7%
Alaska Permanent Fund dividend		329	$1,679,727	$1,486,283 – $1,895,511	$4,589	5.9%
Social Security		55	$532,152	$229,651 – $1,011,075	$1,454	1.9%
Rental income		6	$138,331	$0 – $397,701	$378	0.5%
Child support		12	$74,071	$598 – $210,816	$202	0.3%
Unemployment		23	$67,170	$17,291 – $140,614	$184	0.2%
Disability		14	$42,798	$3,270 – $117,120	$117	0.1%
Supplemental Security Income		3	$28,819	$0 – $57,638	$79	0.1%
Native corporation dividend		6	$14,524	$0 – $43,571	$40	0.1%
Meeting honoraria		6	$11,528	$0 – $31,701	$31	0.0%
Other		6	$7,262	$0 – $21,960	$20	0.0%
Veterans assistance		9	$7,027	$0 – $21,600	$19	0.0%
Longevity bonus		3	$6,052	$0 – $12,104	$17	0.0%
Adult public assistance (OAA, APD)		3	$5,879	$0 – $11,758	$16	0.0%
CITGO fuel voucher		6	$485	$0 – $2,351	$1	0.0%
Bureau of Indian Affairs grants		3	$243	$0 – $1,371	$1	0.0%
Heating assistance		3	$24	$0 – $2,175	$0	0.0%
TANF (Temporary Assistance for Needy Families)		0	$0	$0 – $0	$0	0.0%
Food stamps		0	$0	$0 – $0	$0	0.0%
Workers' compensation / insurance		0	$0	$0 – $0	$0	0.0%
Foster care		0	$0	$0 – $0	$0	0.0%
Other income subtotal		**337**	**$4,819,337**	**$3,676,922 – $6,409,486**	**$13,168**	**16.9%**
Community income total			**$28,563,902**	**$24,457,166 – $32,855,641**	**$78,043**	**100.0%**

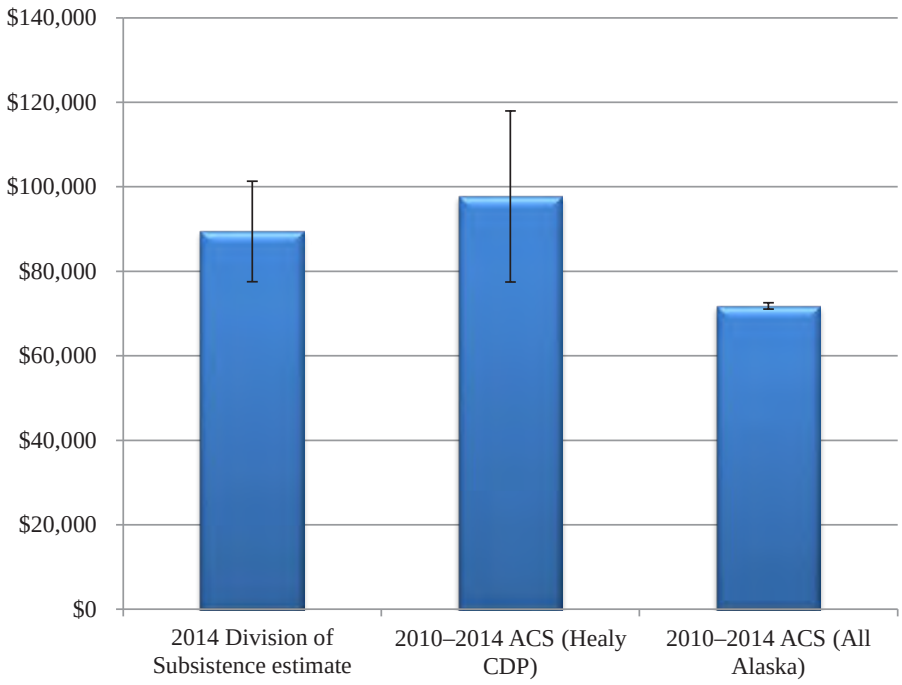
Source ADF&G Division of Subsistence household surveys, 2015.

from the Alaska Permanent Fund dividend[11]. Other important sources of unearned income included 55 households receiving $532,152 of Social Security benefits, 6 households receiving $138,331 in rental income, and 23 households receiving $67,170 from unemployment insurance benefits.

The estimated median household income for Healy residents in 2014 was $89,536, within a 95% confidence interval of $77,536–$101,304 (Table D5-7; Figure 5-28). The estimated median household income from this study also falls within the margin of error of the median income of $77,454–$117,962 as estimated by the American Community Survey in the Healy CDP during 2010–2014. In comparison, the 2010–2014 ACS median income for Healy households was $97,708, while the 2010–2014 ACS median income for all of Alaska households was lower, at $71,829 (Table 5-12).

Survey results indicate an estimated total of 658 jobs in Healy in 2014 (Table 5-13). These jobs were distributed among 557 workers in 343 households. The greatest portion of jobs was found in the service industry (22% of all jobs in the community). An estimated 34% of all households included at least one person employed in the service sector, or 25% of all individuals holding a job. The majority of earned income in 2014 arose from mining jobs (39% of total earned income). Approximately 31% of all households

11 The Alaska Permanent Fund paid a dividend of $1,884 to each eligible Alaska resident in 2014.



Note For 2014, Division of Subsistence estimate does not include categories of income excluded by the 2010–2014 ACS median estimate, including food stamps, housing assistance, and one-time payments.

Figure 5-28.–Comparison of median income estimates, Healy, 2014.

earned wages from employment in mining and 21% of all individuals held a job in the field. Federal and local government jobs each represented 17% of all wage positions in Healy. Roughly one-quarter of all households (26%) included wage earners who worked for the federal government in 2014. Similarly, 25% of households included laborers in local government.

The principal employer in Healy in 2014 was the Usibelli Coal Mine, which employed individuals working in a variety of occupations such as heavy equipment operators, drivers, mining engineers, administrative staff, and mine executives. Most of the federal government jobs existed in Denali National Park, the entrance to which is approximately 10 miles south of Healy on the Parks Highway. Individuals employed in local government worked in the local public school system, grades kindergarten through 12, as well as local government service occupations, administration, and health technician jobs. Occupations in the transportation, communications, and utilities sector primarily included jobs with the Alaska Railroad Corporation and Golden Valley Electric Association. The Alaska Railroad ships coal from Healy to power generation stations in Alaska and to the Seward ship terminal for foreign export. Golden Valley Electric Association operates a recently re-engineered coal generation station that feeds electricity to communities throughout the railbelt.[12]

Of the jobs reported by Healy respondents, 475 (72% of all jobs) were full-time positions, 97 (15%) were part-time, 62 (9%) were on-call or occasional employment, and 12 (2%) were shift positions (Table 5-14). An estimated 445 employed persons (80% of adults with jobs) held full-time positions, 85 employed persons (15%) worked part time, 56 persons (10%) held on-call positions, and 12 persons (2%) worked shift positions. Approximately 302 employed households (88% of households with at least one job) had at least 1 resident with a full-time position, 81 households (24%) included a resident with a part-time job, and 47 households (14%) included a resident with an on-call position. Out of a total of 749 adults residing

12 The railbelt describes the region of the state that is connected by the Alaska Railroad system. The largest communities connected within the railbelt are Fairbanks, Wasilla, Anchorage, and Seward.

Table 5-13.–Employment by industry, Healy, 2014.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**658.0**	**342.6**	**556.8**	**100.0%**
Federal government	**17.0%**	**26.3%**	**20.1%**	**17.3%**
Executive, administrative, and managerial	2.7%	5.1%	3.2%	4.4%
Engineers, surveyors, and architects	0.4%	0.8%	0.5%	0.5%
Natural scientists and mathematicians	1.3%	2.5%	1.6%	1.2%
Teachers, librarians, and counselors	0.9%	1.7%	1.1%	0.8%
Technologists and technicians, except health	0.4%	0.8%	0.5%	0.6%
Marketing and sales occupations	1.3%	2.5%	1.6%	0.3%
Administrative support occupations, including clerical	0.9%	1.7%	1.1%	0.7%
Service occupations	6.3%	10.2%	7.4%	5.5%
Construction and extractive occupations	0.4%	0.8%	0.5%	0.6%
Transportation and material moving occupations	0.9%	1.7%	1.1%	1.3%
Occupation not indicated	1.3%	2.5%	1.6%	1.5%
State government	**2.2%**	**4.2%**	**2.6%**	**1.0%**
Teachers, librarians, and counselors	0.4%	0.8%	0.5%	0.3%
Technologists and technicians, except health	0.9%	1.7%	1.1%	0.2%
Transportation and material moving occupations	0.9%	1.7%	1.1%	0.5%
Local government, including tribal	**16.6%**	**25.4%**	**18.0%**	**7.8%**
Executive, administrative, and managerial	0.9%	1.7%	1.1%	0.9%
Teachers, librarians, and counselors	5.8%	9.3%	6.9%	3.4%
Writers, artists, entertainers, and athletes	0.9%	1.7%	1.1%	0.1%
Health technologists and technicians	1.8%	2.5%	2.1%	0.5%
Marketing and sales occupations	0.4%	0.8%	0.5%	0.2%
Administrative support occupations, including clerical	2.7%	5.1%	3.2%	1.4%
Service occupations	2.7%	4.2%	3.2%	0.9%
Mechanics and repairers	0.4%	0.8%	0.5%	0.0%
Transportation and material moving occupations	0.4%	0.8%	0.5%	0.0%
Handlers, equipment cleaners, helpers, and laborers	0.4%	0.8%	0.5%	0.4%
Mining	**17.5%**	**30.5%**	**20.6%**	**39.4%**
Executive, administrative, and managerial	2.2%	3.4%	2.6%	5.5%
Engineers, surveyors, and architects	0.9%	1.7%	1.1%	2.1%
Natural scientists and mathematicians	0.4%	0.8%	0.5%	1.0%
Technologists and technicians, except health	0.9%	1.7%	1.1%	2.0%
Mechanics and repairers	2.7%	5.1%	3.2%	6.0%
Construction and extractive occupations	3.1%	5.1%	3.7%	7.6%
Precision production occupations	0.9%	1.7%	1.1%	2.0%
Transportation and material moving occupations	4.9%	9.3%	5.8%	11.2%
Handlers, equipment cleaners, helpers, and laborers	0.9%	1.7%	1.1%	0.9%
Occupation not indicated	0.4%	0.8%	0.5%	1.0%

continued

Table 5-13.–Page 2 of 2.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Construction	**9.0%**	**14.4%**	**10.6%**	**9.1%**
Executive, administrative, and managerial	0.9%	1.7%	1.1%	1.6%
Engineers, surveyors, and architects	0.4%	0.8%	0.5%	0.6%
Administrative support occupations, including clerical	0.4%	0.8%	0.5%	0.2%
Construction and extractive occupations	4.0%	7.6%	4.8%	3.8%
Precision production occupations	0.4%	0.8%	0.5%	0.0%
Transportation and material moving occupations	1.3%	2.5%	1.6%	0.9%
Handlers, equipment cleaners, helpers, and laborers	1.3%	2.5%	1.6%	2.0%
Manufacturing	**1.8%**	**2.5%**	**2.1%**	**0.6%**
Writers, artists, entertainers, and athletes	1.3%	1.7%	1.6%	0.4%
Production working occupations	0.4%	0.8%	0.5%	0.1%
Transportation, communication, and utilities	**6.3%**	**11.0%**	**7.4%**	**9.9%**
Executive, administrative, and managerial	1.3%	2.5%	1.6%	2.9%
Technologists and technicians, except health	0.4%	0.8%	0.5%	1.0%
Mechanics and repairers	1.3%	2.5%	1.6%	2.1%
Construction and extractive occupations	0.4%	0.8%	0.5%	0.8%
Precision production occupations	0.9%	1.7%	1.1%	1.9%
Transportation and material moving occupations	0.9%	1.7%	1.1%	0.3%
Occupation not indicated	0.9%	0.8%	1.1%	0.9%
Retail trade	**7.2%**	**11.0%**	**7.9%**	**3.1%**
Executive, administrative, and managerial	4.0%	6.8%	4.8%	2.0%
Marketing and sales occupations	1.3%	2.5%	1.6%	0.4%
Service occupations	1.3%	1.7%	1.1%	0.2%
Mechanics and repairers	0.4%	0.8%	0.5%	0.5%
Finance, insurance and real estate	**0.9%**	**1.7%**	**1.1%**	**0.5%**
Administrative support occupations, including clerical	0.9%	1.7%	1.1%	0.5%
Services	**21.5%**	**33.9%**	**24.9%**	**11.1%**
Executive, administrative, and managerial	3.6%	6.8%	4.2%	2.6%
Social scientists, social workers, religious workers, and lav	1.3%	1.7%	1.6%	0.2%
Registered nurses, pharmacists, dietitians, therapists, and p	0.4%	0.8%	0.5%	0.3%
Marketing and sales occupations	1.3%	2.5%	1.6%	1.2%
Service occupations	10.8%	17.8%	12.7%	4.9%
Mechanics and repairers	0.9%	1.7%	1.1%	0.7%
Construction and extractive occupations	1.3%	2.5%	1.6%	0.2%
Precision production occupations	0.4%	0.8%	0.5%	0.8%
Occupation not indicated	1.3%	2.5%	1.6%	0.2%

Source ADF&G Division of Subsistence household surveys, 2015.

Table 5-14.–Reported job schedules, Healy, 2014.

	Jobs		Employed persons		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	475.0	72.2%	444.8	79.9%	301.9	88.1%
Part-time	97.4	14.8%	85.4	15.3%	81.3	23.7%
Shift	11.8	1.8%	11.8	2.1%	11.6	3.4%
On-call (occasional)	62.0	9.4%	56.0	10.1%	46.5	13.6%
Schedule not reported	11.8	1.8%	11.8	2.1%	11.6	3.4%

Source ADF&G Division of Subsistence household surveys, 2015.

Table 5-15.–Employment characteristics, Healy, 2014.

	Community
Characteristic	Healy
All adults	
Number	748.5
Mean weeks employed	34.3
Employed adults	
Number	556.8
Percentage	74.4%
Jobs	
Number	658.0
Mean	1.2
Minimum	1
Maximum	3
Months employed	
Mean	10.6
Minimum	3
Maximum	12
Percentage employed year-round	70.4%
Mean weeks employed	46.1
Households	
Number	366
Employed	
Number	342.6
Percentage	93.6%
Jobs per employed household	
Mean	1.9
Minimum	1
Maximum	7
Employed adults	
Mean	
Employed households	1.6
Total households	1.5
Minimum	1
Maximum	4
Mean person-weeks of employment	70.1

Source ADF&G Division of Subsistence household surveys, 2015.

in Healy in 2014, an estimated 557 persons held at least one job (74% of adult residents; Table 5-15). On average, adults with jobs worked approximately 11 months per year. Of all employed adults, an estimated 70% worked year-round; the average person worked 46 weeks in the year. Out of 366 total households, an estimated 343 households included at least 1 resident with a job (94% of all households). The number of jobs held per employed household ranged from 1 to 7 with an average of 2 jobs per household and an average of 2 adults with jobs in each household with employed residents. On average, each household with employed adults experienced 70 person-weeks of employment annually.

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). 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).

Researchers asked Healy respondents whether 10 statements regarding food security conditions were ever true for their households during 2014. These 10 food security conditions discussed in the survey and responses from Healy residents are summarized in Figure 5-29. The first condition listed in the figure indicates lowest level of food insecurity (i.e., "Worried about having enough food") and the last condition indicating the

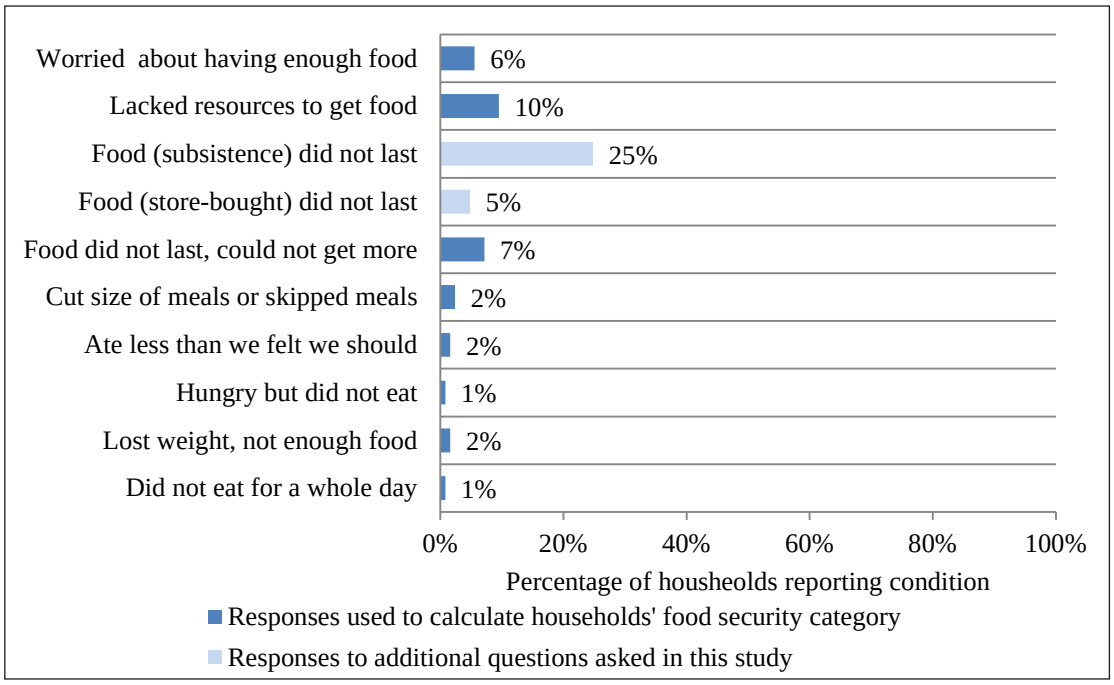


Figure 5-29.–Responses to questions about food insecure conditions, Healy, 2014.

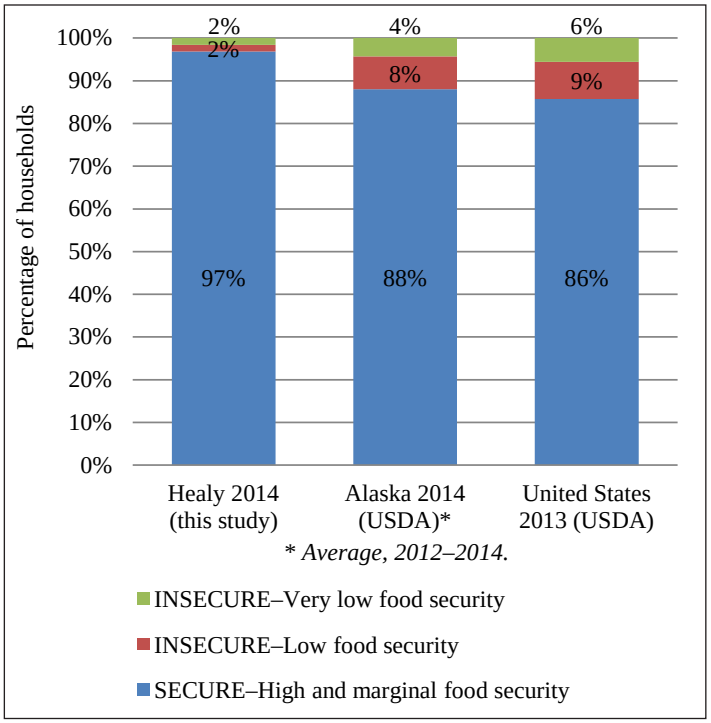


Figure 5-30.–Comparison of food security categories, Healy, 2014.

highest level of food insecurity (i.e., "Did not eat for a whole day"). Perhaps most notable among these responses, 25% of Healy responding households reported that when considering the ability to have enough wild food, their food did not last and they could not get more. Overall, 6% of responding households reported that they were worried about having enough food, and 10% reported that they lacked the resources to get the food they needed. Resources needed to get food could have represented a number of items, including equipment, fuel, hunting and fishing gear, money needed to obtain these resources, or money needed to purchase food. A smaller number of households also indicated high food insecurity conditions when they affirmed that their households' food did not last and they could not get more (7% of responding households). Some households also experienced very high food insecurity conditions. Approximately 2% of responding households cut the size of their meals, eating less than they felt they should, or lost weight due to a lack of food. An estimated 1% of reporting households claimed that they went hungry or did not eat for a whole day. Each of these conditions existed due to a lack of food in the household or a lack of resources needed to get food.

During 2014, 97% of Healy households were classified in the high or marginal food security category (Figure 5-30). Of the remaining households, 2% reported experiencing low food security, and 2% reported experiencing very low food security. In comparison, during the years 2012 through 2014, 88% of Alaska households and 86% of U.S. households were classified as having experienced high and marginal food security. Based upon these survey responses, it is apparent that in 2014 Healy households on average experienced higher food security conditions than did other households throughout Alaska and the U.S. This was also the case for households reporting low—8% in Alaska and 9% in the U.S.—and very low food security conditions—4% in Alaska and 6% in the U.S.

For each of the food insecurity conditions that were true for their household, respondents were also asked to state during which months these conditions existed. Figure 5-31 portrays the mean number of food insecure conditions reported per household by food security category each month in 2014. Households experiencing high and marginal food security reported no instances of food insecure conditions throughout the year. Households that reported low food security conditions experienced on average more than 1 food insecurity condition during the months April through July. Households reporting very low food security conditions indicated that on average they experienced 3 food insecure conditions throughout the year, except in September and October, when they experienced an average of 8 food insecure conditions. Although food insecure conditions did exist for some respondents, it is difficult to draw any community-wide conclusions from these data due to the small sample size.

Figure 5-32 shows the months during which households experienced foods not lasting. Responses referred to wild foods, store-bought foods, and both wild and store-bought foods together. More households reported that wild foods did not last in the months of March through November. Store-bought foods were more likely to have lasted throughout the year for households experiencing low and very low food security conditions; however, store bought foods were slightly more likely not to have lasted during colder months of the

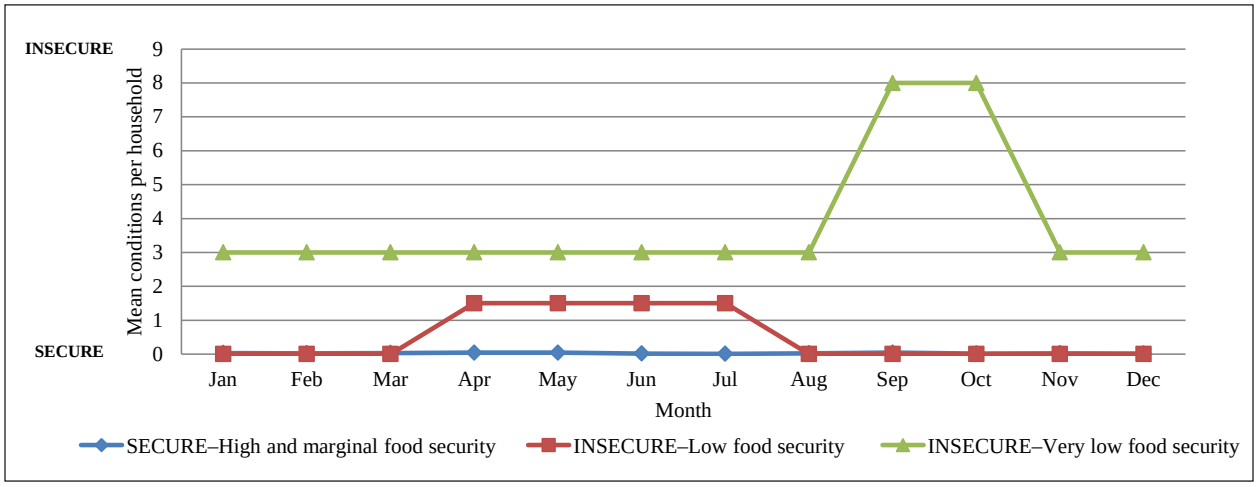


Figure 5-31.–Mean number of food insecure conditions by month and by household security category, Healy, 2014.

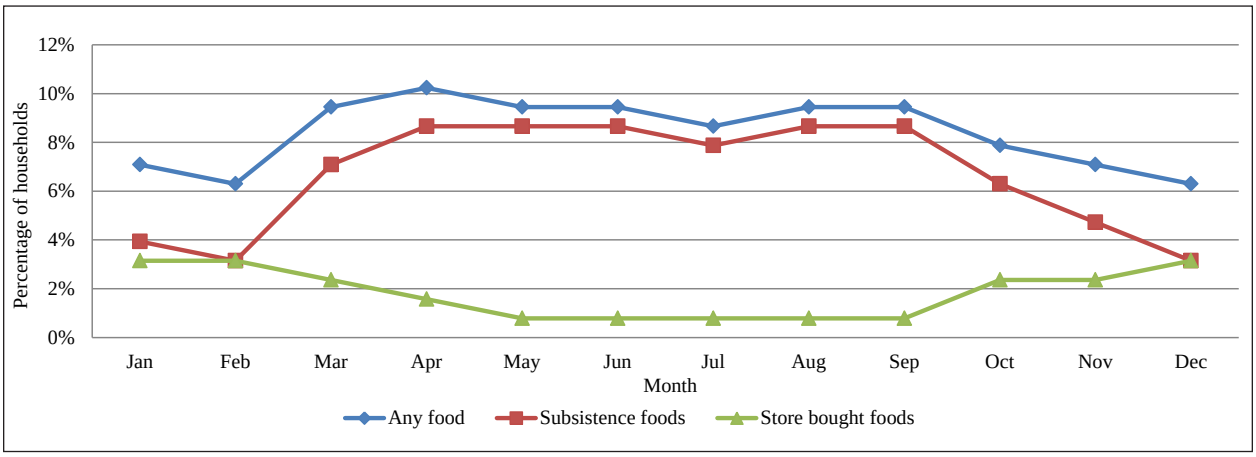


Figure 5-32.–Comparison of months when food did not last, Healy, 2014.

Table 5-16.–Household descriptions of food eaten in the last 12 months, Healy, 2014.

Statement	Percentage of affirmative responses
Had enough of the kinds of food desired	61.9%
Had enough food, but not the desired kind	36.5%
Somestimes, or often, did not have enough food	0.0%
Missing/No response	2.4%

Source ADF&G Division of Subsistence household surveys, 2015.

year: January through March and October through December. Finally, Table 5-16 shows how households may have perceived their overall concerns about food availability in 2014. An estimated 62% of Healy households stated that they had enough of the kinds of food that they desired, and 37% reported that they had enough food but not always the types of food that they desired. No households reported not having enough food.

Comparing Harvests and Uses in 2014 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 2 ways: whether they used more, less, or about the same amount of 8 resource categories in 2014 as in the past 5 years, and whether they got "enough" of each of the 8 resource categories. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different wild food resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 5-17, Figure 5-33, and Figure 5-34 provide a broad overview of households' assessments of their harvests in 2014. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions.

Large land mammals were the most harvested of all wild food resources used by Healy households (Table 5-5). Forty-one percent of responding households explained that they used the same amount of large land mammals in 2014 as they did in previous years, 33% reported that they used less, and 11% said they used more (Table 5-17; Figure 5-33). When asked why they used less, 38% of respondents reported that their hunting efforts were unsuccessful (Table 5-18). Additionally, 20% of respondents reported using less large land mammals because of a lack of effort, 20% reported that less of the resource was shared with their household than in recent years, and 18% reported not having enough time to hunt. For those households that used more large land mammals in the study year, 70% of respondents reported that they needed more of the resource and so, presumably, they increased their effort to increase their harvests of large land mammals. An additional 15% said they had more help hunting or processing large land mammals and so used more of the resource (Table 5-19). In Healy, 28% of respondents stated that they did not get enough large land mammals in 2014 (Figure 5-34). When these households were asked to evaluate the impact of not getting enough large land mammals, 42% described the impact as minor, 33% explained that the impact was major, and 11% stated that the impact of not getting enough large land mammals had a major effect on their household (Table 5-20).

Salmon contributed the second highest harvest in edible pounds of wild food resource categories in Healy in 2014 (Table 5-5). When asked to compare their use of salmon, 26% of responding households explained that they used the same amount of salmon in 2014 as they did in previous years, 15% said they used more, and 45% reported that they used less (Table 5-17; Figure 5-33). When asked why they used less, 38% of respondents reported that this was due to a lack of effort (Table 5-18). In addition, 23% of households reported that they used less salmon because the resource was less available, and another 21% reported that they lacked the time needed to catch more salmon. Among households that used more salmon in the study year, 50% of respondents said that they received more help from others to catch or process salmon. Thirteen percent stated that they needed more, 13% increased their effort to catch salmon, 13% felt that less restrictive regulations allowed them to catch more salmon, and 13% said they needed less salmon (Table 5-19). In Healy, 31% of respondents stated that they did not get enough salmon in 2014 (Figure 5-34). When these households were asked to evaluate the impact of not getting enough salmon, 18% described it as not noticeable, 58% described the impact as minor, 20% explained that not getting enough salmon had a major effect on their household, and 3% stated that the impact was severe (Table 5-20).

Table 5-17.–Changes in household uses of resources compared to recent years, Healy, 2014.

Resource category	Sampled households	Valid responses[a]	Households reporting use: Total households Number	Total households Percentage	Less Number	Less Percentage	Same Number	Same Percentage	More Number	More Percentage	Households not using Number	Households not using Percentage
All resources	127	125	120	96.0%	60	48.0%	46	36.8%	14	11.2%	5	4.0%
Salmon	127	121	103	85.1%	54	44.6%	31	25.6%	18	14.9%	18	14.9%
Nonsalmon fish	127	122	91	74.6%	47	38.5%	37	30.3%	7	5.7%	31	25.4%
Large land mammals	127	123	104	84.6%	41	33.3%	50	40.7%	13	10.6%	19	15.4%
Small land mammals	127	123	22	17.9%	15	12.2%	5	4.1%	2	1.6%	101	82.1%
Marine mammals	127	127	2	1.6%	1	0.8%	1	0.8%	0	0.0%	125	98.4%
Birds	127	123	44	35.8%	16	13.0%	22	17.9%	6	4.9%	79	64.2%
Marine invertebrates	127	125	34	27.2%	20	16.0%	10	8.0%	4	3.2%	91	72.8%
Vegetation	127	124	106	85.5%	54	43.5%	38	30.6%	14	11.3%	18	14.5%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response.

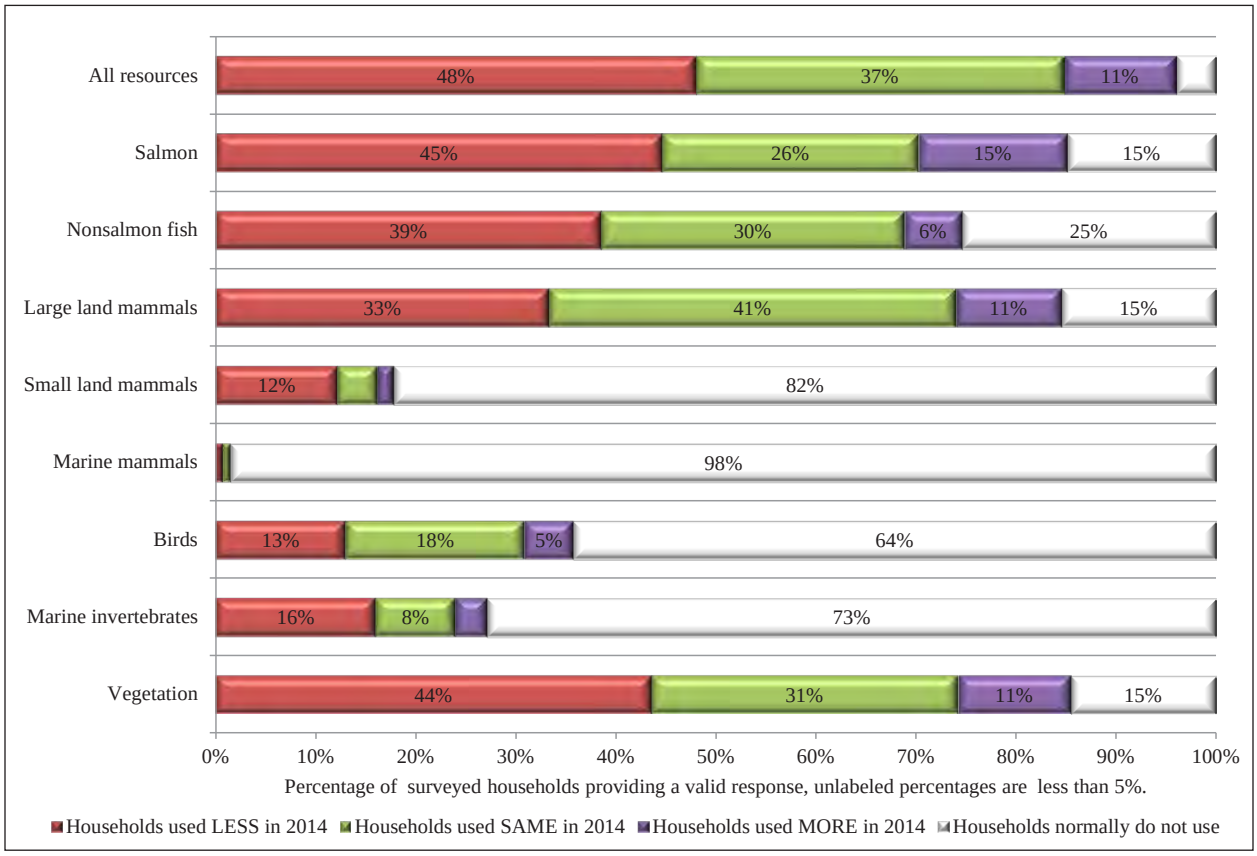


Figure 5-33.–Changes in household uses of resources compared to recent years, Healy, 2014.

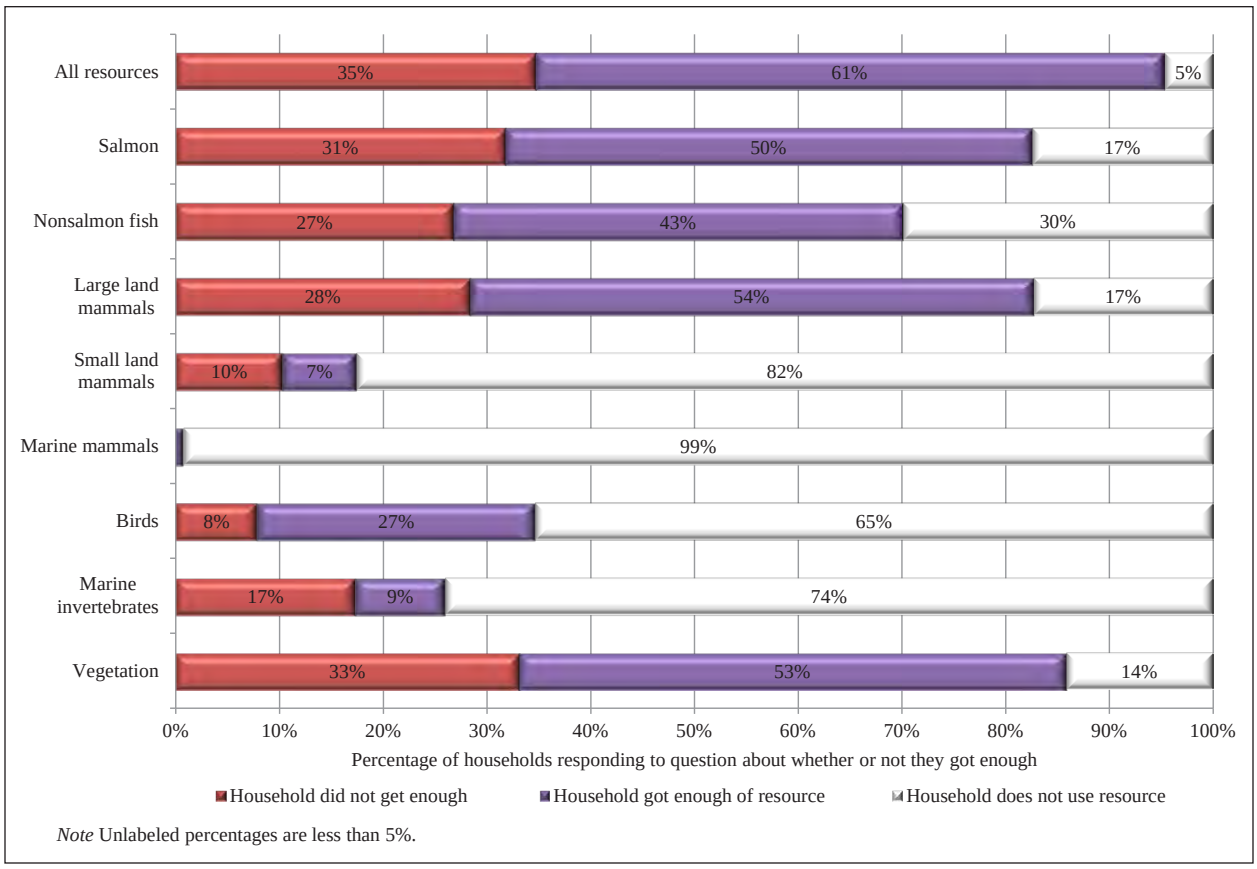


Figure 5-34.–Percentage of households reporting whether they had enough resources, Healy, 2014.

When asked to compare their use of nonsalmon fish, 30% of responding households explained that they used the same amount in 2014 as they did in previous years, 39% reported that they used less, and 6% said they used more (Table 5-17; Figure 5-33). When asked why they used less, 38% of respondents reported that they spent less time fishing in 2014, 21% lacked the time needed to catch more nonsalmon fish, 15% said that nonsalmon fish were less available, and 13% said that they received less from others (Table 5-18). Among households that used more nonsalmon fish in the study year, 43% of respondents reported that they needed more, 29% said they had more help getting nonsalmon fish, 14% stated that regulations permitted their households to catch more, and 14% said that they increased their fishing effort (Table 5-19). Twenty-seven percent of respondents stated that they did not get enough nonsalmon fish in 2014 (Figure 5-34). When these households were asked to evaluate the impact of not getting enough nonsalmon fish, 38% stated that the impact was not noticeable, 53% described the impact as minor, 6% explained that the impact had a major effect on their household, and 3% stated that the impact was severe (Table 5-20).

When asked to assess their harvests of vegetation, approximately 31% of Healy respondents reported that they used the same amount of this resource category in 2014 as they had in recent years, 44% reported using less, and 11% reported using more vegetation (Table 5-17; Figure 5-33). Approximately 79% of respondents that reported using less stated that vegetation resources—berries in particular—were less available (Table 5-18). Others reported that work or other time commitments interfered with their ability to pick berries and greens. Households that reported using more vegetation in 2014 than in recent years generally explained that this was due to the fact that they received more of the resources from others, they increased their effort, or that they had more help (Table 5-19).

Survey respondents who stated that their household did not get enough of any resource category were also asked to report the kinds of wild foods they needed in 2014. Of these households that needed other resources, 29% stated that they needed more moose, 23% needed more Pacific halibut, 21% needed more

Table 5-18.–Reasons for less household uses of resources compared to recent years, Healy, 2014.

Resource category	Valid responses[a]	Households reporting reasons for less use	Family/ personal		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful		Weather/ environment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	125	60	4	6.7%	30	50%	0	0.0%	2	3%	2	3%	10	17%	9	15.0%	5	8.3%
Salmon	121	53	3	5.7%	12	23%	0	0.0%	4	8%	3	6%	20	38%	5	9.4%	0	0.0%
Nonsalmon fish	122	47	2	4.3%	7	15%	0	0.0%	2	4%	6	13%	18	38%	1	2.1%	2	4.3%
Large land mammals	123	40	2	5.0%	3	8%	1	2.5%	0	0%	8	20%	8	20%	15	37.5%	0	0.0%
Small land mammals	123	15	1	6.7%	5	33%	1	6.7%	0	0%	1	7%	5	33%	1	6.7%	2	13.3%
Marine mammals	127	0	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Birds	123	16	0	0.0%	4	25%	0	0.0%	0	0%	0	0%	7	44%	0	0.0%	0	0.0%
Marine invertebrates	125	20	1	5.0%	1	5%	0	0.0%	1	5%	4	20%	13	65%	0	0.0%	0	0.0%
Vegetation	124	52	2	3.8%	41	79%	0	0.0%	0	0%	0	0%	2	4%	0	0.0%	4	7.7%

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Table 5-18.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Other reasons		Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Equipment/ fuel expense		Used other resources	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	125	60	2	3%	16	26.7%	1	1.7%	0	0.0%	0	0.0%	1	1.7%	1	1.7%	0	0.0%
Salmon	121	53	1	2%	11	20.8%	0	0.0%	0	0.0%	1	1.9%	0	0.0%	1	1.9%	0	0.0%
Nonsalmon fish	122	47	1	2%	10	21.3%	1	2.1%	2	4.3%	1	2.1%	1	2.1%	1	2.1%	0	0.0%
Large land mammals	123	40	0	0%	7	17.5%	1	2.5%	0	0.0%	1	2.5%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	123	15	1	7%	1	6.7%	0	0.0%	1	6.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	127	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	123	16	3	19%	0	0.0%	0	0.0%	0	0.0%	2	12.5%	0	0.0%	0	0.0%	1	6.3%
Marine invertebrates	125	20	1	5%	0	0.0%	1	5.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	124	52	0	0%	7	13.5%	0	0.0%	1	1.9%	0	0.0%	2	3.8%	0	0.0%	1	1.9%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never using the resource.

Table 5-19.–Reasons for more household uses of resources compared to recent years, Healy, 2014.

Resource category	Valid responses[a]	Households reporting reasons for more use	Increased availability		Used other resources		Favorable weather		Received more		Needed more		Increased effort		Had more help	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	125	13	0	0.0%	2	15.4%	0	0.0%	1	7.7%	3	23.1%	3	23.1%	4	30.8%
Salmon	121	16	0	0.0%	1	6.3%	0	0.0%	1	6.3%	2	12.5%	2	12.5%	8	50.0%
Nonsalmon fish	122	7	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	42.9%	1	14.3%	2	28.6%
Large land mammals	123	13	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9	69.2%	1	7.7%	2	15.4%
Small land mammals	123	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	100.0%
Marine mammals	127	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	123	6	0	0.0%	1	16.7%	0	0.0%	1	16.7%	0	0.0%	0	0.0%	2	33.3%
Marine invertebrates	125	4	0	0.0%	1	25.0%	0	0.0%	0	0.0%	2	50.0%	0	0.0%	1	25.0%
Vegetation	124	14	0	0.0%	4	28.6%	0	0.0%	2	14.3%	0	0.0%	4	28.6%	3	21.4%

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Table 5-19.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for more use	Other		Regulations		Traveled farther		More success		Needed less		Store-bought expense		Got/ fixed equipment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	125	13	0	0.0%	2	15.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	121	16	0	0.0%	2	12.5%	0	0.0%	0	0.0%	2	12.5%	1	6.3%	0	0.0%
Nonsalmon fish	122	7	0	0.0%	1	14.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	123	13	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	7.7%	0	0.0%	0	0.0%
Small land mammals	123	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	127	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	123	6	2	33.3%	1	16.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	125	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	124	14	0	0.0%	1	7.1%	0	0.0%	0	0.0%	1	7.1%	0	0.0%	1	7.1%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never use.

Table 5-20.–Reported impact to households reporting that they did not get enough of a type of resource, Healy, 2014.

		Households not getting enough _____ .				Impact to those not getting enough _____ .									
	Sample	Valid responses[a]		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
All resources	127	121	95.3%	44	36.4%	4	9.1%	4	9.1%	20	45.5%	12	27.3%	4	9.1%
Salmon	127	104	81.9%	40	38.5%	1	2.5%	7	17.5%	23	57.5%	8	20.0%	1	2.5%
Nonsalmon fish	127	89	70.1%	34	38.2%	0	0.0%	13	38.2%	18	52.9%	2	5.9%	1	2.9%
Large land mammals	127	105	82.7%	36	34.3%	2	5.6%	3	8.3%	15	41.7%	12	33.3%	4	11.1%
Small land mammals	127	22	17.3%	13	59.1%	0	0.0%	4	30.8%	8	61.5%	1	7.7%	0	0.0%
Marine mammals	127	1	0.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	127	44	34.6%	10	22.7%	1	10.0%	3	30.0%	6	60.0%	0	0.0%	0	0.0%
Marine invertebrates	127	33	26.0%	22	66.7%	1	4.5%	9	40.9%	8	36.4%	4	18.2%	0	0.0%
Vegetation	127	109	85.8%	42	38.5%	1	2.4%	8	19.0%	21	50.0%	10	23.8%	2	4.8%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Includes households failing to respond to the question and those households that never used the resource.

Table 5-21.–Resources of which households reported needing more, Healy, 2014.

Resource	Households needing	Percentage of households
All resources	2	1.6%
Fish	7	5.5%
Salmon	18	14.2%
Coho salmon	12	9.4%
Chinook salmon	6	4.7%
Sockeye salmon	27	21.3%
Cod	2	1.6%
Pacific (gray) cod	1	0.8%
Pacific halibut	29	22.8%
Rockfish	1	0.8%
Lake trout	1	0.8%
Arctic grayling	1	0.8%
Northern pike	1	0.8%
Rainbow trout	1	0.8%
Whitefishes	1	0.8%
Land mammals	3	2.4%
Black bear	1	0.8%
Caribou	15	11.8%
Moose	37	29.1%
Dall sheep	4	3.1%
Small land mammals	2	1.6%
Beaver	2	1.6%
Coyote	2	1.6%
Fox	1	0.8%
Red fox	1	0.8%
Red fox–red phase	1	0.8%
Snowshoe hare	1	0.8%
Lynx	8	6.3%
Marten	3	2.4%
Porcupine	1	0.8%
Gray wolf	5	3.9%
Wolverine	2	1.6%
Birds and eggs	1	0.8%
Ducks	1	0.8%
Sandhill crane	1	0.8%
Upland game birds	1	0.8%
Grouse	6	4.7%
Spruce grouse	1	0.8%
Ptarmigan	5	3.9%
Clams	8	6.3%
Razor clams	4	3.1%
Crabs	6	4.7%
King crab	3	2.4%
Scallops	1	0.8%
Shrimp	6	4.7%
Berries	24	18.9%
Blueberry	32	25.2%
Lowbush cranberry	14	11.0%
Crowberry	1	0.8%
Currants	2	1.6%
Raspberry	4	3.1%
Salmonberry	1	0.8%
Other wild berry	1	0.8%
Plants, greens, and	1	0.8%
Wild rose hips	1	0.8%
Wood	5	3.9%
Unknown resource	6	4.7%

Source ADF&G Division of Subsistence household surveys, 2015.

sockeye salmon, and 12% needed more caribou (Table 5-21). Additionally, 25% said that their households needed blueberries and 11% said that they needed more lowbush cranberries.

Harvest Data

In January 1988 the Division of Subsistence conducted comprehensive household surveys in Healy and the surrounding area for wild food harvests and uses that occurred in 1987. The data from these surveys are reported in the CSIS.[13] The division conducted the 1987 surveys in a corridor of the Parks Highway from milepost 220 in the south to milepost 300 in the north.[14] Surveys were conducted in 2014 within the boundaries of the Healy CDP. The boundary of the CDP intersects the Parks Highway at milepost 243 in the south and milepost 280 in the north. Due to differences in the population and demographic characteristics of the study areas in 1987 and 2014, data from these 2 study years are compared by per capita harvest amounts in pounds.

For harvests and uses of wild foods in 1987, Healy residents were asked to report harvests of the various species of salmon, nonsalmon fishes, large land mammals, small land mammals, birds, and vegetation. The total harvest of all wild food resources in 1987 was an estimated 113,575 lb. With an estimated population of 271 households and 860 residents within the study area in 1987, this harvest represented 419 lb per household or 132 lb per capita (Table 5-22; Figure 5-35). This was considerably greater than the estimated harvest of 52 lb per capita in 2014. Salmon and nonsalmon fish were harvested in much greater quantities in 1987 than they were in 2014. Healy households harvested 50,690 lb of salmon or 59 lb per capita in 1987, as opposed

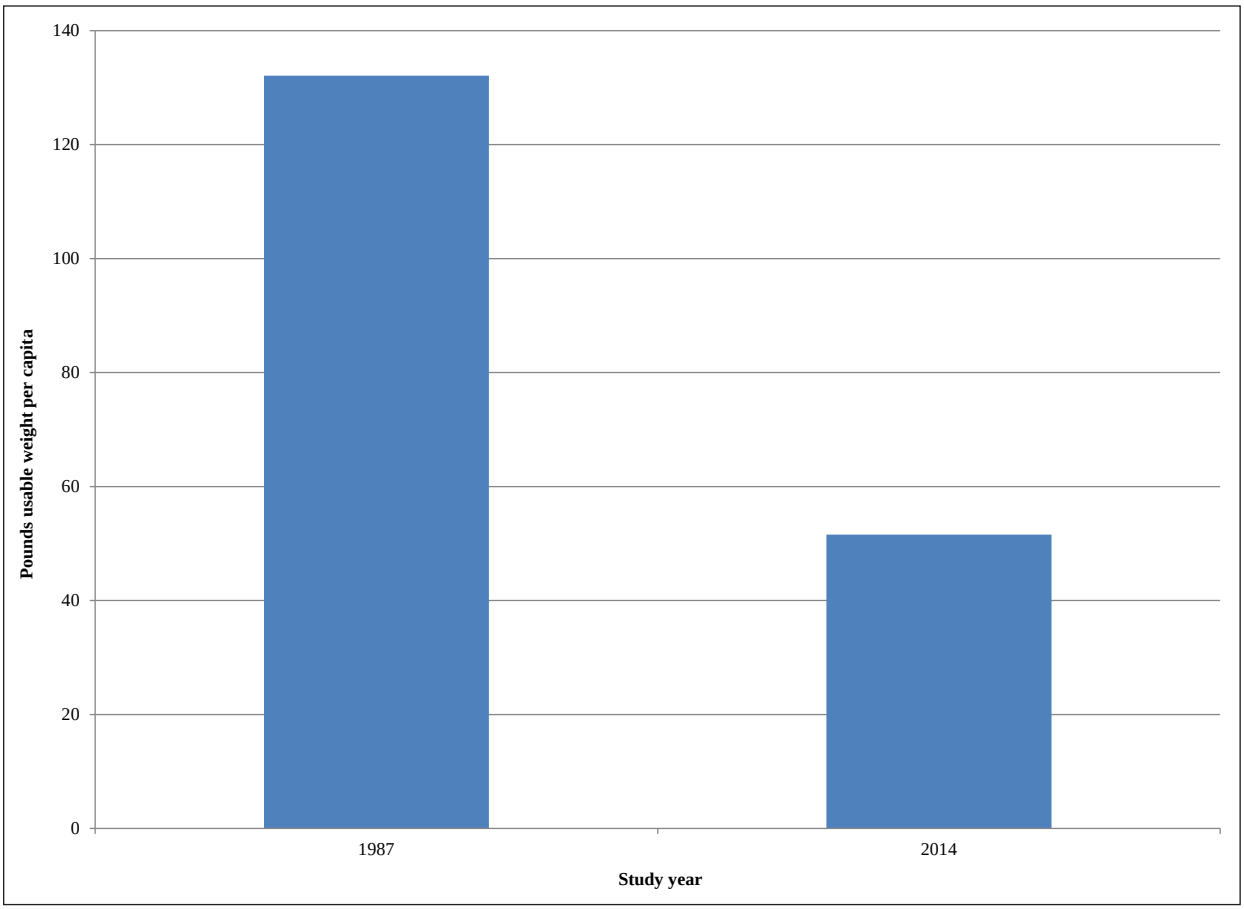

Table 5-22.–Comparison of estimated per capita harvests, Healy, 1987 and 2014.

13 Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." https://www.adfg.alaska.gov/sb/CSIS

14 J. Fall, ADF&G Division of Subsistence Research Director, personal communication, November 2014.

Table 5-23.–Comparison of per capita harvests by category in usable pounds, Healy, 1987 and 2014.

Resource category	1987	2014
Salmon	59.0	9.3
Nonsalmon fish	27.5	5.3
Land mammals	38.4	34.2
Marine mammals	0.0	0.0
Birds and eggs	2.4	0.7
Marine invertebrates	0.4	0.1
Vegetation	4.5	1.9
All resources	**132.1**	**51.6**

Sources Community Subsistence Information System (CSIS) for 1987 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data.

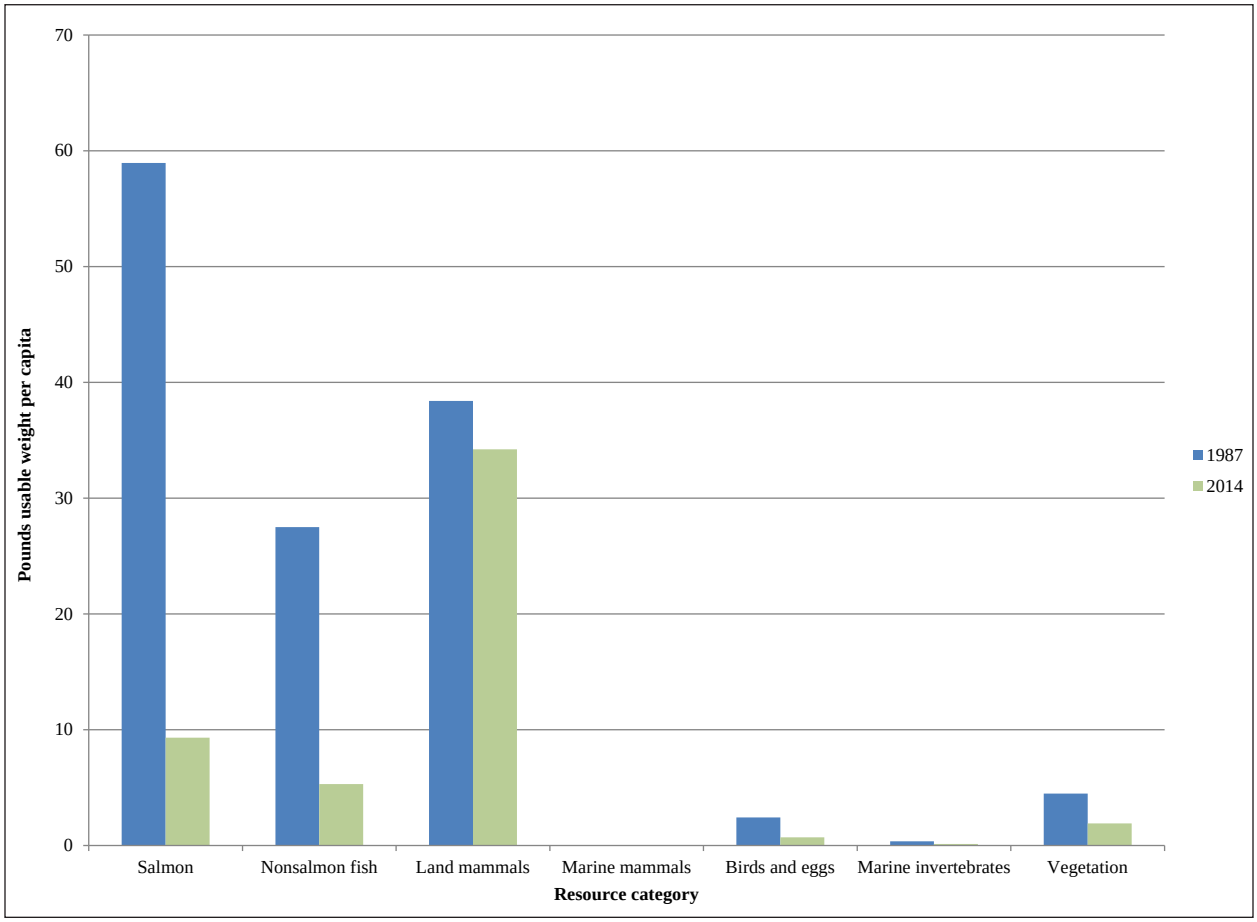

Figure 5-35.–Comparison of per capita harvests by category, Healy, 2014.

Table 5-24.–Comparison of harvest compositions by category, by weight in usable pounds, Healy, 1987 and 2014.

Resource category	1987	2014
Salmon	44.6%	18.0%
Nonsalmon fish	20.8%	10.3%
Land mammals	29.1%	66.3%
Marine mammals	0.0%	0.0%
Birds and eggs	1.8%	1.4%
Marine invertebrates	0.3%	0.3%
Vegetation	3.4%	3.7%

Sources Community Subsistence Information System (CSIS) for 1987 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data.

to 9 lb of salmon per capita in 2014 (Table 5-22; Figure 5-36). In 1987, fishers also caught an estimated 23,648 lb of nonsalmon fish or 28 lb per capita including 7,562 lb of Arctic char and Dolly Varden, 7,347 lb of Pacific halibut, 4,411 lb of northern pike, 3,838 lb of lake trout, and 3,579 lb of Arctic grayling. The historical large land mammal harvests were similar to 2014 harvests. In 1987, residents harvested 30,832 lb or 36 lb per capita, including 25,830 lb of moose (30 lb per capita); in 2014 they harvested 34,400 lb or 34 lb per capita, including 29,568 lb of moose (29 lb per capita). As in 2014, birds, vegetation, and marine invertebrates constituted a relatively small portion of total harvest in 1987.

These changes in harvests show shifts in the composition of harvest by Healy residents. Slightly greater moose harvests in 2014 than in 1987 and lower 2014 harvests of other resource categories suggest possible changes over time in the types of wild resources that are most used in Healy. Large land mammals represented the majority of the composition of harvest in 2014 (66% of total edible weight) as compared to 1987, when the same resource category only represented about one-quarter of the total harvest (27%; Table 5-23). Historical harvests of salmon and nonsalmon fish composed much greater proportions of the total harvest in edible pounds of wild foods as compared to 2014. In 1987, salmon accounted for 45% of the total harvest, and nonsalmon fishes constituted 21% of the total harvest. This compares with a total 2014 harvest by weight of 18% salmon and 10% nonsalmon fish.

Current and Historical Harvest Areas

There are no previous map studies available with which to compare this study year's harvest and use maps.

Local Comments and Concerns

Following is a summary of local concerns that were recorded during the surveys in Healy. Some households did not offer any additional information during the survey interviews, so not all households are represented in the summary. Seventy-four respondents out of a sample of 127 households provided some comment during their surveys. Division staff recorded and reviewed each comment and coded each issue or topic discussed into separate categories. A respondent could have shared multiple issues or topics in one comment, in which case staff coded each topic into its corresponding category.

Twelve respondents stated that they were supportive of construction and operation of a liquid natural gas (LNG) pipeline in a corridor through the Healy area. These individuals did not feel that such a pipeline would have any detrimental effect upon wild resources or residents' ability to access them. Several of these 12 respondents also stated their desire for an LNG pipeline in order to increase jobs and other economic opportunities in Healy. Alternately, 9 respondents expressed concern that a pipeline would negatively affect wildlife and fish resources or that it would restrict or prohibit local stakeholders' access to hunt, fish, trap, and gather vegetation. An additional 7 comments described the concern that an LNG pipeline would result in a greater supply of natural gas in the state, thereby reducing coal consumption and result in a negative economic effect in Healy. Some also stated a general anxiety that a pipeline would have some potentially unknown negative effect in the region.

A Healy key respondent expressed some of this anxiety in terms of the potential conflicts that might arise among hunters if an LNG pipeline were constructed.

> It's just getting harder and harder here to take your kid out and get something. It just is. And I don't know what the solution is…If with this LNG going through, it's just like

> this road construction down here in the summer time. You got a hundred extra guys here that I noticed this year that are looking for a moose. You know, and that's going to be the same way when these guys are building this pipeline and it's hunting season. It's going to affect anywhere that has hunting by the road system. I mean, but, that's their right and that's, I guess that's the price of progress. But, you know, there are costs that you got to weigh when you do this stuff. And I think there's ways to manage them. (12112014HLY03)

The most frequent comments expressed by survey respondents were in regard to concerns over big game hunting regulations and management of wildlife resources. In total, 43 respondents shared concerns related to these issues. Of these 43 respondents, 31 stated that they were concerned with wildlife management policies implemented by ADF&G and that moose populations in particular were not being properly managed in GMU 20C. Many respondents felt that the state should cease cow moose hunts in order to increase moose population productivity. Others felt that bull moose harvests by Alaska resident hunters in GMU 20C should include antler restrictions. Also, among the 43 respondents who discussed wildlife management and hunting regulations, 12 shared concerns regarding their own conflicts with hunters from outside of the Healy area. These individuals felt that wildlife managers should implement regulations to limit access of nonlocal hunters and their guides in order to increase opportunities and decrease competition for local hunters. Three of these 12 respondents also expressed the desire for the National Park Service to identify Healy as a resident zone community, which would permit Healy residents to hunt for subsistence within Denali National Park and Preserve.

Other comments included questions regarding the proposed location of an LNG pipeline, general concerns about the health and abundance of various wild resources in the area, and concerns regarding the negative effects of commercial fishing on Chinook salmon and Pacific halibut populations in Alaskan waters. In addition, 2 respondents described that Healy grocery stores lacked a wide selection of healthy foods and that it was difficult for residents to purchase the foods they needed without driving 100 miles to Fairbanks. These 2 respondents expressed their recommendation for the State of Alaska government to assist the community in development of options to address this concern.

Moose population management was also a common topic discussed by key respondents. One key respondent described habitat conditions that he felt indicated stress among moose in winter.

> When I'm trapping…you go up into those big willow patches where the moose winter, and you'll see those willow branches are broke off as big as your thumb. Typically when there's a good healthy habitat, [the diameter of the browsed twigs] is a lot smaller. They're just eating the tips; where all the nutrition is. And now I see them raking the cottonwood trees, raking the bark off of those, and the big broomstick looking willows. They're eating them down far, you know. Way down there; and that's a good indication that the habitat's [limited], there's a little bit of stress on moose. (06162015HLY04)

Key respondents also discussed conflicts between local and nonlocal hunters. One key respondent described that cow and antlerless moose hunts have increased the numbers of people hunting in the areas that Healy residents have typically hunted.

> Bad thing about the cow hunts [is that they have] brought a whole bunch of people into the country, into this area. And once they were here for a winter cow hunt or whatever… or when they're out looking for antlerless moose, in the meantime they're [seeing] bulls out here. This is a nice area to hunt. And so they didn't have to have a permit the next season, they'd come back and hunt. That's the one drawback to that antlerless [hunt]. It brought a whole bunch of people in. Then it goes back to that respect, you know. So-and-so hunts off this [hill] over here so everybody knows that's their knob and you pick out yours somewhere and whatever. And it's always worked pretty well that way. But now what I see is nobody wants to go out and make the trail for themselves. They see tracks on a trail over here they're gonna go on that one. So you go out to your hunting camp

> or your spot that you've been hunting for 25 years and you pull up and there's 6 four-wheelers and 2 big tents, and people running all over. (06162015HLY04)

Another key respondent described similar experiences in which nonlocal hunters with large tracked vehicles now access terrain that previously was only accessible on foot or on horseback. He described how local hunters can be discouraged by nonlocal hunters who assert such a competitive advantage with their expensive equipment.

> Until a few years ago there were guides with horses going back and guiding people in. In the past there used to be big moose up there…It's [like] a staging area for the moose. That's where the cows and the bulls come and there are lots of ravines to go down this way, and there is a lot of hiding grounds for them. And that's hard to get to with normal vehicles. But those tracked rigs, they are not slowing down. Those big Nodwells™. They just go down [in there]. Sometimes they don't even get off the Nodwell™ to shoot the animal. Then I've seen them take the whole animal with a winch, hook 'em up and then butcher 'em up on the top of the hill. (12112014HLY02)

Another key respondent described conflicts with hunting guides that have significantly changed his family's Dall sheep hunting patterns.

> Up the south fork of the Healy River there's a bus there that hunters have used there for years and my grandfather put that bus there. He probably put that there in about 1967. When I was a kid, you knew everybody who hunted up that river. You knew where everybody camped, you knew where they hunted, and you just didn't see people that you didn't know up there. When I was a kid you would hunt the sheep, shoot them either a quarter of the way up the mountain or half way up the mountain. You never had to go over the mountain to shoot a sheep. You didn't shoot a sheep unless it was close. You know…I haven't hunted sheep in a long time. You can see all these pictures on my walls here, and hunting, for me, is a very important thing for my kids to do. And it's a part of me…That's how I grew up, and I don't enjoy sheep hunting anymore because every drainage in that Healy valley has a guide or an outfitter in it. It's like fishing on the Russian River[15]…I don't know what to do about that…To me it's not enjoyable anymore. That's one thing that I really regret for my kids. I remember when I was a kid, sheep hunting was my most favorite thing to do. I can remember it was like Christmas [on] the 9th of August…I wouldn't sleep that night because I knew we'd be hunting sheep, and I'd be out of school. And so, I think well, my kid's, you'll see here, he's about 2 years old in that picture with that sheep there and that's the last sheep hunt that I went on. (12112014HLY03)

Conflicts among hunters and guides, as well as concerns regarding big game hunting regulations represented the majority of issues discussed by survey respondents and key respondents. Many Healy residents who rely on natural resources for their annual food production expressed concerns that they are significantly affected by these conflicts. Access to big game resources in the areas that hunters wish to harvest them and minimization of competition among hunters and guides are perceived by Healy residents as critical to their ability to get the wild foods their households need.

Acknowledgements

The Division of Subsistence would like to acknowledge the contributions of all of the residents of Healy CDP who participated in our surveys and ethnographic interviews. We could not have achieved our research goals without their generous cooperation. We would also like to express our sincere gratitude to the Denali Borough Assembly. The Division of Subsistence is very grateful for their support and assistance with project

15 This is a reference to rod and reel sport fishers in the Russian River on the Kenai Peninsula competing to catch highly prized king and sockeye salmon. Anglers are frequently so densely-packed in this fishery that there is a great deal of competition for space and salmon among participants. Alaskans often referred to this phenomenon as "combat fishing."

planning. The division would also like to thank the Denali Borough administrative staff whose considerable time and assistance was critical to our work. In particular we would like to express our gratitude for the help of Borough Clerk Gail Pieknik. We also acknowledge the dedication and reliability of the diligent local research assistants who guided division staff and conducted all harvest surveys with them in the field. These local research assistants were Walker Baysinger, Robert Damuth, Stacie DiLorenzo, Justin Ledman, Rene Limeres, Cassidy Owen, Manuel Rodriguez, Davida Stumpf, and Lucas Stumpf.

6. UTQIAĠVIK

Elizabeth H. Mikow and Hiroko Ikuta

In January 2015, 12 researchers surveyed 259 of 833 eligible Utqiaġvik (Barrow) households (16%; Table 1-3). As mentioned in the Introduction, the Division of Subsistence had a pool of 54% of occupied units in Utqiaġvik from which to draw a sample; the remaining 46% were allocated to the North Slope Borough (NSB) Census effort in order to limit research fatigue among households. Expanding for 1,325 unsurveyed households, Utqiaġvik's estimated total harvest of wild foods between January and December 2014 was 1,923,351 edible pounds (Table 6-1). The average harvest per household was 870 lb; the average harvest per capita was 362 lb (tables 6-1 and 6-2).

This chapter summarizes findings from household surveys, including demographic characteristics, responses to harvest assessment questions, harvest estimates, reported employment and income, and responses to food security questions. Harvest numbers are expanded estimates. Results from this survey are available online in the ADFG Community Subsistence Information System (CSIS).[1]

In addition to the comprehensive survey, 17 key respondent interviews were conducted with 17 individuals, including active subsistence users, whaling captains, biologists, and elders. By providing a better understanding of the seasonal round, local history, and subsistence activities in the area, the ethnographic interviews contextualize the quantitative harvest and use data collected in the surveys.

Community Background

Utqiaġvik is the northernmost community in the United States and is widely known as the "top of the world." The community is located 320 miles north of the Arctic Circle at 71° 4' North, 156° 5' West. The Arctic climate in Utqiaġvik is cold and dry; temperatures remain below freezing from October through to May. High winds, between 40 and 60 mph, have been recorded throughout the year. Due to its high latitude, the sun does not set in Utqiaġvik from mid-May to early-August.[2]

Thule people, ancestors of the current Iñupiat, settled in the present Utqiaġvik area approximately 1,000 years ago, although human habitation in the region dates to at least 10,000 years ago (Dumond 1975). The Iñupiaq language belongs to the Eskimo-Aleut language group; dialects are spoken across the North American Arctic, from northwestern Alaska across northern Canada to Greenland. In Iñupiaq, Utqiaġvik either means "Place where we hunt snowy owls," or "Place of gathering wild roots."

Since 1649 when the Anadyrsk post in eastern Siberia was established, Russian and European goods steadily began to appear on the Alaskan side of the Bering Strait (Oswalt 1967:132), yet the major Western contact with Iñupiat began in the mid-19th century when Yankee whalers arrived in the Arctic Ocean. In 1848, the explorer Thomas Roy sailed through the Bering Strait and found a significant population of bowhead whales, which had already been driven to near extinction by commercial whalers in the Eastern Arctic. In reaction to Roy's discovery, numerous whaling ships sailed for the Bering Sea. At first, bowheads were hunted for their oil, which was used as fuel. However by 1875, petroleum had become widely available, and the focus of commercial whaling shifted toward harvesting baleen, which was used in the manufacture of women's clothing such as corsets and full skirt hoops. By the early 1890s, Yankee whalers had established permanent settlements in the mainland coastal villages and employed local Chukchi, Siberian, and St. Lawrence Island Yupik and Iñupiat in commercial whaling (Bockstoce 1986:275; Bodenhorn 1989:28). A permanent whaling station was built in 1886 in Utqiaġvik. Between 1848 and 1914, a total of 2,700 whaling

1. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." https://www.adfg.alaska.gov/sb/CSIS. Hereafter *ADF&G CSIS*.

2. Alaska Department of Commerce, Community, and Economic Development, Community and Regional Affairs. "Utqiaġvik." Accessed March 29, 2016.
https://www.commerce.alaska.gov/dcra/DCRAExternal/community/Details/e5e04958-b820-4acc-a275-6fd306506f01

Table 6-1.–Resource harvest and use characteristics, Utqiaġvik, 2014.

Characteristic	
Mean number of resources used per household	**8.7**
Minimum	0
Maximum	36
95% confidence limit (±)	9.6%
Median	7.0
Mean number of resources attempted to harvest per household	**3.8**
Minimum	0
Maximum	32
95% confidence limit (±)	16.5%
Median	1.0
Mean number of resources harvested per household	**3.1**
Minimum	0
Maximum	30
95% confidence limit (±)	17.7%
Median	1.0
Mean number of resources received per household	**6.2**
Minimum	0
Maximum	24
95% confidence limit (±)	10.1%
Median	4.0
Mean number of resources given away per household	**3.9**
Minimum	0
Maximum	25
95% confidence limit (±)	14.4%
Median	2.0
Household harvest (pounds)[a]	
Minimum	0
Maximum	24,595
Mean	869.5
Median	3.0
Total harvest weight (pounds)[b]	1,923,351
Community per capita harvest (pounds)[b]	361.9
Percentage using any resource	89%
Percentage attempting to harvest any resource	57%
Percentage harvesting any resource	52%
Percentage receiving any resource	87%
Percentage giving away any resource	63%
Number of households in sample	259
Number of resources asked about and identified voluntarily by respondents	138

Source ADF&G Division of Subsistence household surveys, 2015.
a. Values do not include bowhead whale harvests.
b. Values include bowhead whale harvests.

Table 6-2.–Comparison of selected findings, Utqiaġvik, 2014.

Category	Community Barrow
Demography	
Population	5,314.7
Percentage of population that is Alaska Native	67.0%
Percentage of household heads born in Alaska	57.1%
Average length of residency of household heads (years)	28.0
Cash economy	
Average number of months employed	7.4
Percentage of employed adults working year-round	77.7%
Percentage of income from sources other than employment	15.5%
Average household income[a]	$118,709
Per capita income[a]	$35,380
Resource harvest and use	
Per capita harvest (pounds usable weight)	361.9
Average household harvest (pounds usable weight)	1,214.2
Number of resources used by 50% or more households	3.0
Average number of resources used per household	8.7
Average number of resources attempted to be harvested per household	3.8
Average number of resources harvested per household	3.1
Average number of resources received per household	6.2
Average number of resources given away per household	3.9
Percentage of total harvest taken by top ranked 25% of households	96.4%
Percentage of households that harvested 70% of harvest	9.3%
Per capita harvest by lowest ranked 50% of households	0.0
Percentage of total harvest taken by lowest ranked 50% of harvesting households	0.0%
Average number of resources used by lowest ranked 50% of households	4.7
Average number of resources used by top ranked 25% of households	13.7

Source ADF&G Division of Subsistence household surveys, 2015.
a. Includes income from sources other than employment.

vessels sailed through the Bering Strait toward Utqiaġvik. The arrival of outsiders dramatically impacted the local economic systems, social organizations, and traditional whaling practice (Bockstoce 1986:231–254).

In the late 19th century, missionaries followed the routes established by the whalers. In 1885, Sheldon Jackson, a Presbyterian missionary, was appointed to the position of the U.S. General Agent for Education in Alaska by the Secretary of the Interior (Jolles 2002:74). He divided the Alaska Territory among Protestant denominations and contracted them to create schools. Utqiaġvik was delegated to the Presbyterian mission, and the first missionaries arrived there in 1890.

During the Cold War, Utqiaġvik was a strategic location for the activities of the U.S. military. In 1947, the U.S. government built the Naval Arctic Research Laboratory in Utqiaġvik to conduct biological and geological research. In 1954, the U.S. Airforce built the Distant Early Warning line, an integrated chain of radar and communication stations across the North American Arctic from Cape Lisburne, Alaska to Baffin Island in Canada, with one station constructed in Utqiaġvik. In the same year, tourism began in Utqiaġvik. A hotel was built, and Wien Airlines began regular air services and tours to the community (Blackman 1989:28). In order to entertain tourists, the local Iñupiat demonstrated traditional activities such as Eskimo dance, skin sewing, the blanket toss, and theatrical plays about whaling and hunting (Blackman 1989:5). These events provided local people with wage labor opportunities and contributed to the shift from a subsistence hunting way of life to a mixed economy. Many families who lived in small, widely scattered

settlements moved to Utqiaġvik, hoping for a stable cash income and an education for their children. The influx of these families and the military personnel caused the population in Utqiaġvik to jump by 300% between 1939 and 1950 (Blackman 1989:26).

The discovery of oil 200 miles east of Utqiaġvik in Prudhoe Bay prompted the federal government to negotiate land claims with Iñupiat and other Alaska Native peoples. These negotiations culminated in the Alaska Native Claims Settlement Act (ANCSA) of 1971. ANCSA dramatically affected the lives of Alaska Native peoples and their relationships with the land and heritage (Berger 1985). Arctic Slope Regional Corporation (ASRC), an ANCSA corporation that represents 12,000 stakeholders in 8 communities, is based in Utqiaġvik. ASRC received a $52 million cash settlement as well as 4 million acres of land that includes areas of petroleum reserves (Blackman 1989:29; Bodenhorn 1989:41). Because ASRC owns subsurface rights to the land, the petroleum industry must lease the land to drill for oil. In 1972, residents of 8 North Slope communities voted to establish the North Slope Borough (NSB). The new regional government gave Iñupiaq people greater control over territorial decision-making and, perhaps most importantly, the ability to collect taxes on oil field development. Until 2016, Utqiaġvik was known as Barrow, named after Sir John Barrow, Second Secretary of the British Admiralty. The community voted for the name change in a referendum which was held on Indigenous People's Day (October 10)[3].

In the 21st century, Utqiaġvik is a regional hub where archives, museums, and the headquarters of the borough school district and Native regional corporations are located. It is the center of politics, economics, education, and cultural programs for the region. Despite its remoteness, the community has a rich ethnic mixture of Euro-American, Asian, Pacific Islander, Central and South American, and Eastern European people, in addition to indigenous Iñupiat. Local supermarkets carry a variety of food, including fresh fruits and vegetables, as well as ingredients for ethnic cuisines, such as Mexican and Asian. There are 5 hotels, a court of law, a hospital, a senior center, and a women's shelter.

As mentioned in the Introduction chapter, the sampling strategy for this project was altered for this survey effort due to the fact that it occurred during the timeframe chosen by the North Slope Borough (NSB) census to conduct its household surveys in Utqiaġvik. The Division of Subsistence agreed to cooperate with the census by splitting the community into census blocks: 46% of the households in Utqiaġvik were assigned to the NSB census, and the Division drew its sample from the remaining 54% of households. The rationale for this decision was to avoid respondent fatigue for households that might be selected to complete both surveys, as well as to avoid confusion between the 2 survey efforts. The approach may have biased the Division's results towards higher income households based on the geographic breakdown of households available for sampling or the characteristics of households who refused to do the survey.

Seasonal Round

Subsistence activities vary with the seasons and timing of resource availability. The following description of the seasonal subsistence round in Utqiaġvik 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. Figure 6-1 portrays the search and harvest areas for all resources by Utqiaġvik residents in 2014, which cover 13,478 square miles. The grey region of the map displays the boundaries of the National Petroleum Reserve in Alaska. The map only captures land use patterns by surveyed households during the study year and may not be representative of all search and harvest areas by Utqiaġvik residents currently or in the past.

Spring hunting for bowhead whales is the major focus of activity in the late winter and early spring as whaling captains, crew members, and community residents come together in order to prepare for this massive undertaking. Activities include preparing equipment and whaling gear, sewing bearded seal hides with sinew to create the covering for traditional *umiaq* skin boats, and breaking trail across the ocean ice

3. Jason Daley. Smithsonian: Smart News. Dec. 2, 2016 "Goodbye, Barrow, Alaska. Hello Utqiaġvik." Accessed December 28, 2016. http://www.smithsonianmag.com/smart-news/goodbye-barrow-alaska-hello-utqiagvik-180961273/

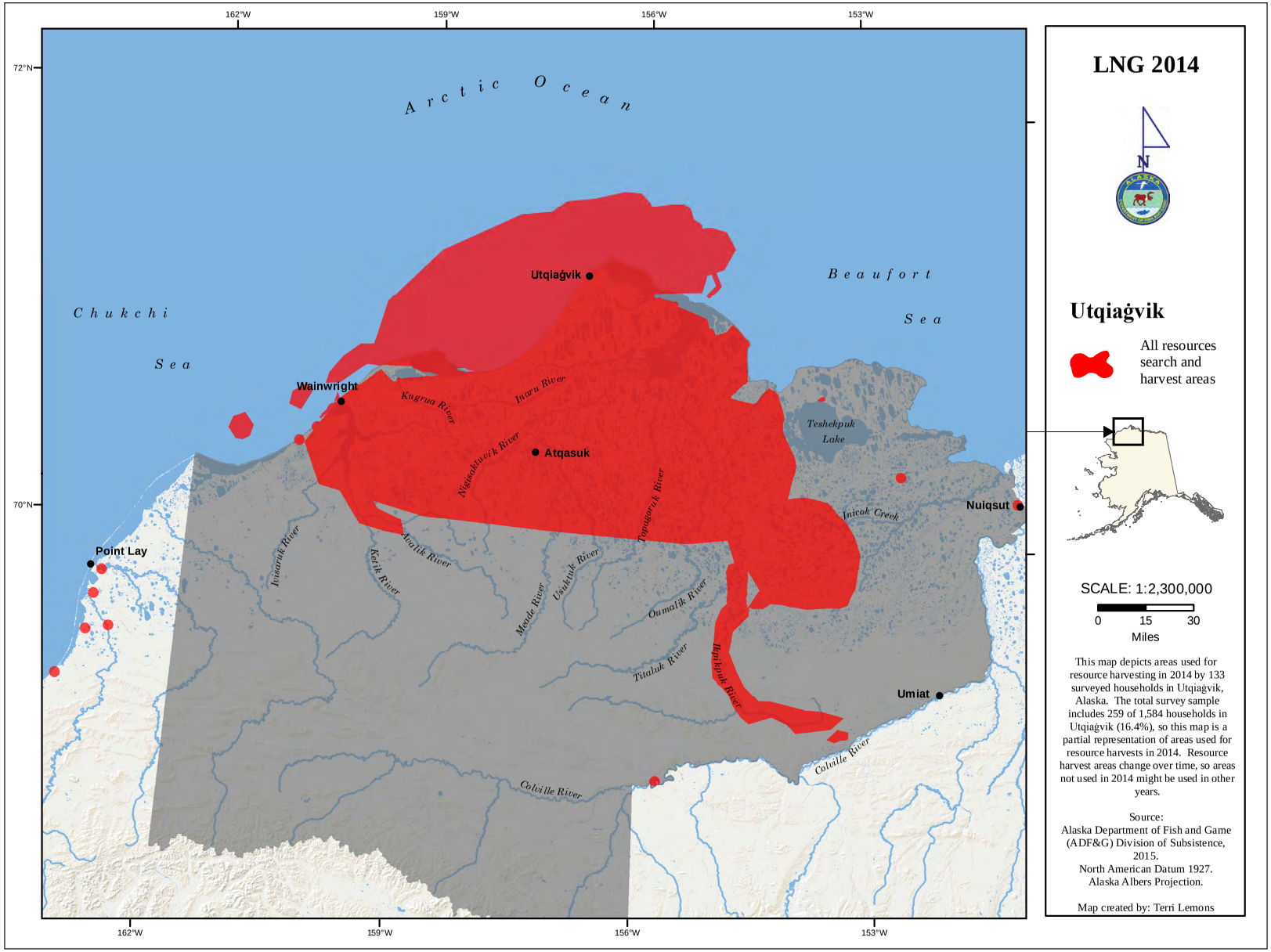

Figure 6-1.–All resources search and harvest areas, Utqiaġvik, 2014.

in preparation for setting up whaling camps on the ice (BRW01291505, BRW0126150, BRW01241502, BRW01271516). One respondent explained the work required to get ready:

> Spring whaling, it's, it's a lot more work than the fall whaling because you know, we're going to go live out on the ice. And we're going to, we need everything to be good, you know, like all the weapons have to be looked at, maintained. All the, like the tent and everything have to be in good order. You have to make sure your heater and everything's all good, your snowmachines are all good, your boat and motor is good, and your skin boat has to be good with no leaks or anything. (BRW01291503)

Crews begin to camp on the ice in mid- to late April, and they stay out on the edge of the ice for 2 to 6 weeks. The condition of the ice dictates the length of time that crews can safely remain in their whaling camps, and it impacts decisions on the size of the whales targeted for harvesting. Several key respondents discussed the impacts of diminishing sea ice and a changing climate on spring whaling activities, a topic that will be discussed in greater detail below (BRW01291505, BRW01241502, BRW01291503, BRW01271508). Spring whaling is a cooperative effort: after landing and butchering their whale, successful crews often remain on the ice to help other crews land and butcher their whales. In mid-June, the whale is shared with the community at the Nalukataq festival. Crew members and relatives prepare the whale and additional food for the festival, and they also hunt returning migratory waterfowl to serve at the feast (BRW01281509).

Hunting for waterfowl is a major activity in the late spring and early summer following whaling. The first migratory birds to arrive are eiders, which appear in the region in May and are hunted primarily from the ice. King eiders arrive first and compose a majority of the duck harvest. Later, residents hunt common eiders as they reach the area. In late May and early June, hunters travel inland to harvest geese, sometimes camping for a week or more. The majority of geese harvested are white-fronted geese, with occasional Canada and snow geese harvests. Later in the month of June, Utqiaġvik residents gather eggs from various species of birds including gulls, geese, ducks, and swans (BRW01241502).

As spring gives way to the short summer months, Utqiaġvik residents engage in a variety of subsistence pursuits. Some fishers target salmon during the summer months of July and August, setting nets along the coast and in nearby river drainages. The main species available for harvest are chum and pink salmon, with occasional catches of Chinook salmon. Several fishers noted that the population of salmon appears to have increased in recent years, and that harvests of some species, notably Chinook salmon, are becoming more common (BRW01241502, BRW01291503, BRW01261515). Marine mammal hunting is an important subsistence activity in the summer months of July and August when hunters target bearded seals, ringed seals, and walrus near ice floes offshore. Bearded seals are important for food and for the skins used to make traditional umiaq boats; the hides of the animals harvested in the summer are saved to be prepared for this purpose during the winter months (BRW01241502, BRW01281509). Although caribou are hunted year round, August is a period of heavy harvest for Utqiaġvik residents (BRW01281509, BRW01241502). Berries and plants are also gathered during the summer months.

In the fall, whaling again becomes a focus of subsistence activity. In September and October, crews travel on open water by boat to search for bowhead whales during their fall migration. Instead of camping for a long period of time, crews make day trips from the community. Caribou are also harvested in the fall, and nets are set under the ice once the rivers freeze to catch whitefishes, Arctic grayling, and burbot. Bird hunting also occurs in the fall months, principally for eiders (BRW01281503, BRW01241502). Although polar bear is not a commonly harvested resource, one key respondent explained that the best season to harvest them begins in November when they are in good condition and the fur is at its whitest (BRW01241502).

Winter is a time of comparatively less subsistence activity. Ringed seals are targeted during this season, and hunters go out to the edge of the ice in pursuit of this resource. Caribou hunting continues into the winter, but is often dictated by the proximity of caribou to Utqiaġvik (BRW01241502). Trapping for furbearing animal begins in December and continues through the early spring months (BRW01271516).

Population Estimates and Demographic Information

Figure 6-2 illustrates the population history of Utqiaġvik from 1929 to 2014, drawing upon decennial estimates from the U.S. Census Bureau (portrayed as blue dots), the yearly estimates provided by the Alaska Department of Labor (portrayed as white dots), and the NSB census in 2003 and 2010 (portrayed as green triangles). According to these data, the population of Utqiaġvik has grown steadily over the past 80 years. As a point of comparison to this study's population estimate of 5,315 inhabitants in 1,584 households (Figure 6-3, Table D6-1), the Alaska Department of Commerce, Community, and Economic Development (DCCED) estimate for 2014 was 4,825 (Hladick 2015); these estimates differ by 10%. Other points of comparison can be found in American Community Survey 5-year estimate for 2010–2014 and the U.S. Census data for 2010 (Figure 6-3, Table D6-1). The U.S. Census counted 1,280 households with 4,212 inhabitants in Utqiaġvik in 2010. The American Community Survey (ACS) estimated 1,312 households with 4,296 inhabitants for its 5 year average; the margin of error range displayed on the figure shows the high end of the range at 1,419 households with 4,418 inhabitants. This study's estimate is 18% higher than the high end of the ACS range. Reasons for this difference can be explained by a number of factors, including differences in survey timing, definitions of residency, refusal rates, and sampling strategies, as mentioned previously in the chapter.

The 259 surveyed households included 869 people (Table 1-4). Expanding for the 1,325 unsurveyed households, the estimated population of Utqiaġvik at the time of the survey was 5,315 individuals. Household sizes ranged from 1 to 11 people, with an average of 3 people per household (Table 6-3). The average age was 30 years old; the oldest person included in the sample was 89 years of age. On average, Utqiaġvik residents had lived in the community for 19 years, and 46% of household heads were born in the community (tables 6-3 and 6-4). Forty-two percent of household heads reported being born outside of Alaska, and other reported birthplaces included 7 different places on the North Slope. For information on birthplaces of other Utqiaġvik residents, see Table D6-2. During the study year, an estimated 67% of the population of Utqiaġvik was Alaska Native, which is similar to estimates of the 2010 U.S. Census (69%) and the ACS 5-year estimate (71%; Figure 6-3; Table D6-1). Figure 6-4 and Table D6-3 portray the population profile of Utqiaġvik, which is characterized by a relatively young population. In 2014, 64% of the population was below the age of 40, with the largest cohorts in the 0–4 and 5–9 year age ranges. According to the profile, 52% of the residents were male and 48% were female.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Figure 6-5 and Table D6-4 report the expanded levels of individual participation in the harvest and processing of wild resources by all Utqiaġvik residents in 2014. Overall, 39% of individuals attempted to harvest resources and 48% of residents helped to process the harvest. In all resource categories with the exception of small land mammals, a greater percentage of people helped to process resources than attempted to harvest wild foods, which illustrates a pattern of sharing and cooperative effort. The categories of marine mammals and large land mammals illustrated the greatest gaps between percentages of individuals who harvested the resource and those who processed the catch. For marine mammals, 17% of individuals attempted to harvest and 34% helped to process; it is likely that targeted species, especially bowhead whale, require a greater effort to butcher and preserve than other resource categories due to their size. For large land mammals, 22% of individuals attempted to harvest and 33% helped to process. Hunting for large land mammals, especially caribou, is often a cooperative effort among households, and family members and other individuals often participate in butchering the catch when the hunters return from the field.

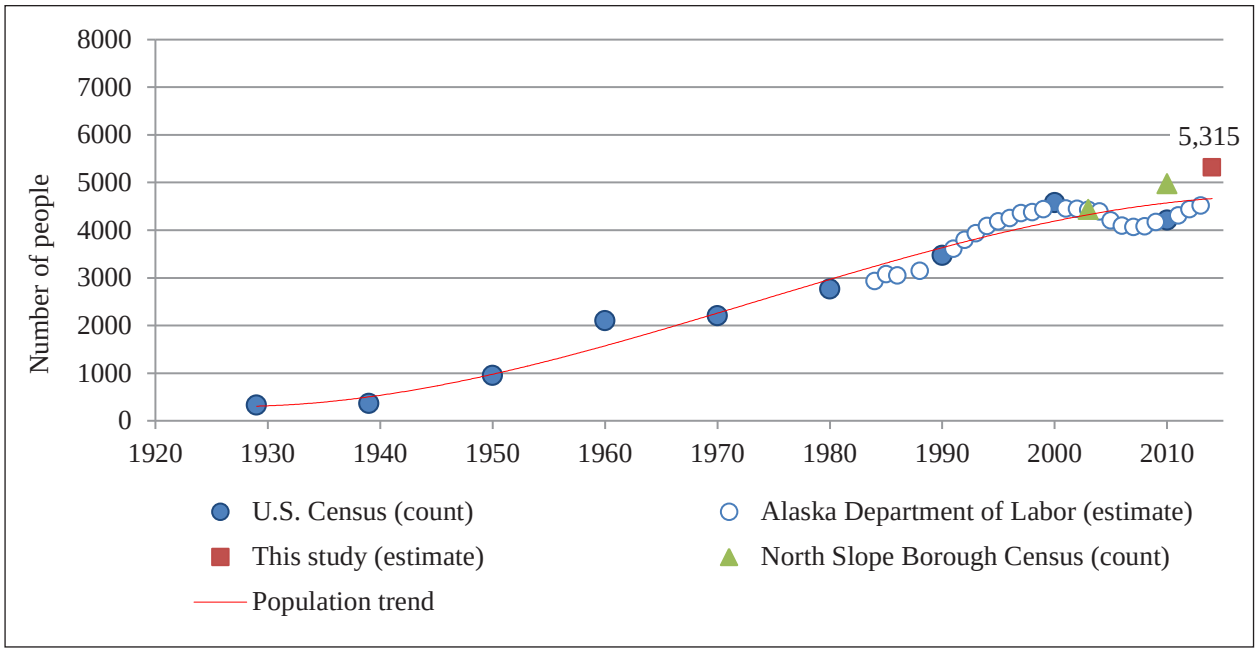

Figure 6-2.–Historical population estimates, Utqiaġvik, 1929–2014.

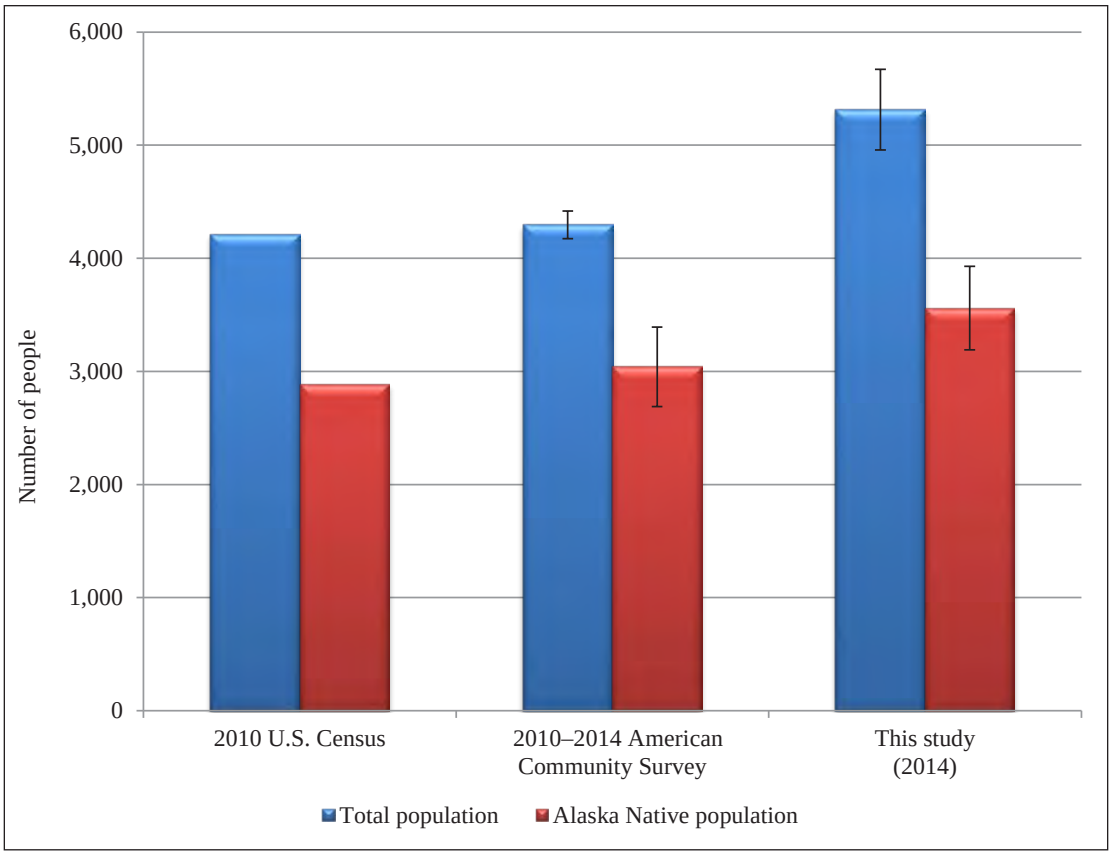

Figure 6-3.–Population estimates, Utqiaġvik, 2010 and 2014.

Table 6-3.–Sample and demographic characteristics, Utqiaġvik, 2014.

Characteristics	Community Barrow
Sampled households	259
Eligible households	1584
Percentage sampled	16.4%
Sampled population	869
Estimated community population	5,314.7
Household size	
Mean	3.4
Minimum	1.0
Maximum	11.0
Age	
Mean	29.8
Minimum[a]	0
Maximum	89
Median	29
Length of residency	
Total population	
Mean	19.4
Minimum	0
Maximum	87
Heads of household	
Mean	28.0
Minimum	1
Maximum	87
Alaska Native	
Estimated households[b]	
Number	978.5
Percentage	61.8%
Estimated population	
Number	3,559.5
Percentage	67.0%

Source ADF&G Division of Subsistence household surveys, 2015.
a. A minimum age of 0 (zero) is used for infants who are less than 1 year of age.
b. The estimated number of households in which at least 1 head of household is Alaska Native.

Table 6-4.–Birthplaces of household heads, Utqiaġvik, 2014.

Birthplace	Percentage
Akiak	0.2%
Anaktuvuk Pass	0.2%
Anchorage	1.0%
Atqasuk	0.2%
Fairbanks	1.7%
Juneau	0.2%
Kaktovik	0.2%
Kenai	0.2%
Kodiak City	0.2%
Palmer	0.2%
Point Hope	1.0%
Ruby	0.2%
Selawik	0.2%
Stebbins	0.2%
Unalakleet	0.2%
Wainwright	1.9%
Wrangell	0.2%
Yakutat	0.5%
Allakaket	0.2%
Colville Village	0.2%
Umiat	0.2%
Utqiaġvik	46.1%
Missing	1.4%
Other Alaska	0.2%
Other U.S.	28.3%
Foreign	14.0%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

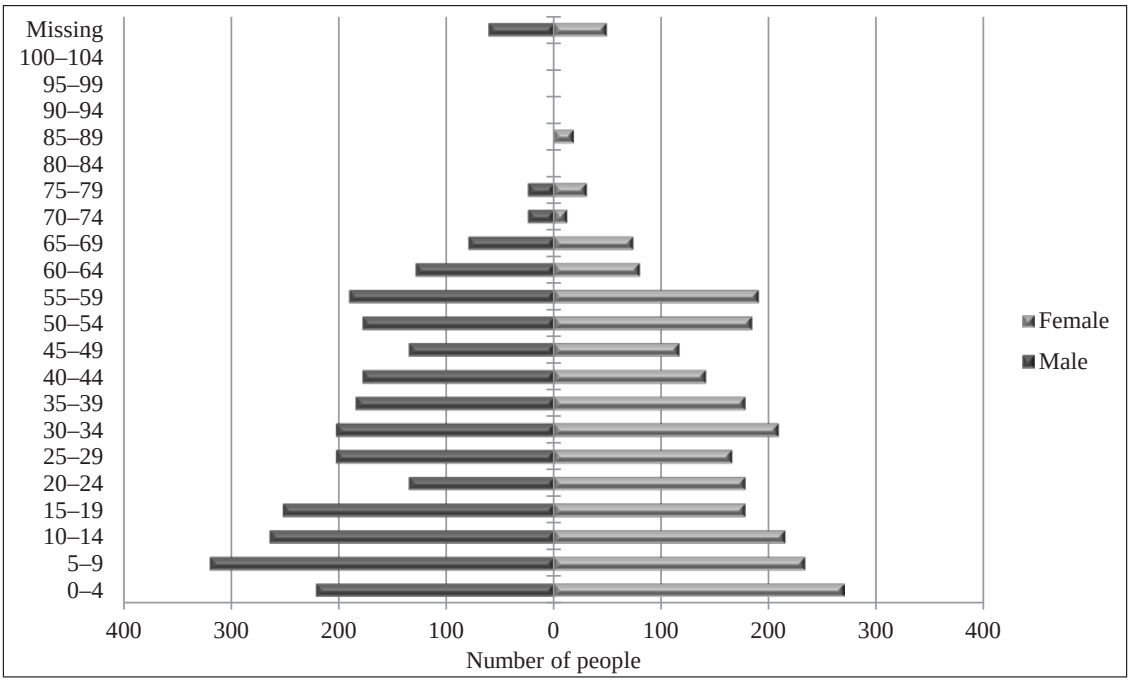

Figure 6-4.–Population profile, Utqiaġvik, 2014.

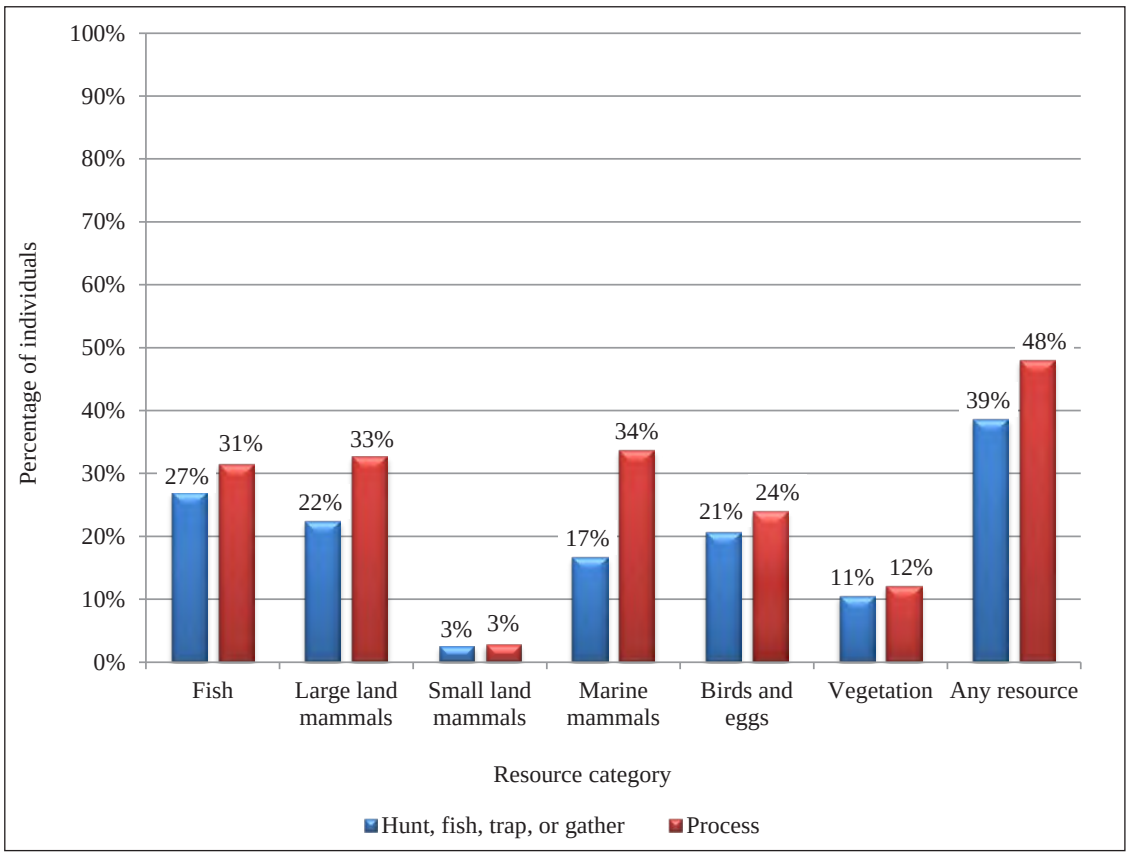

Figure 6-5.–Individual participation in subsistence harvesting and processing activities, Utqiaġvik, 2014.

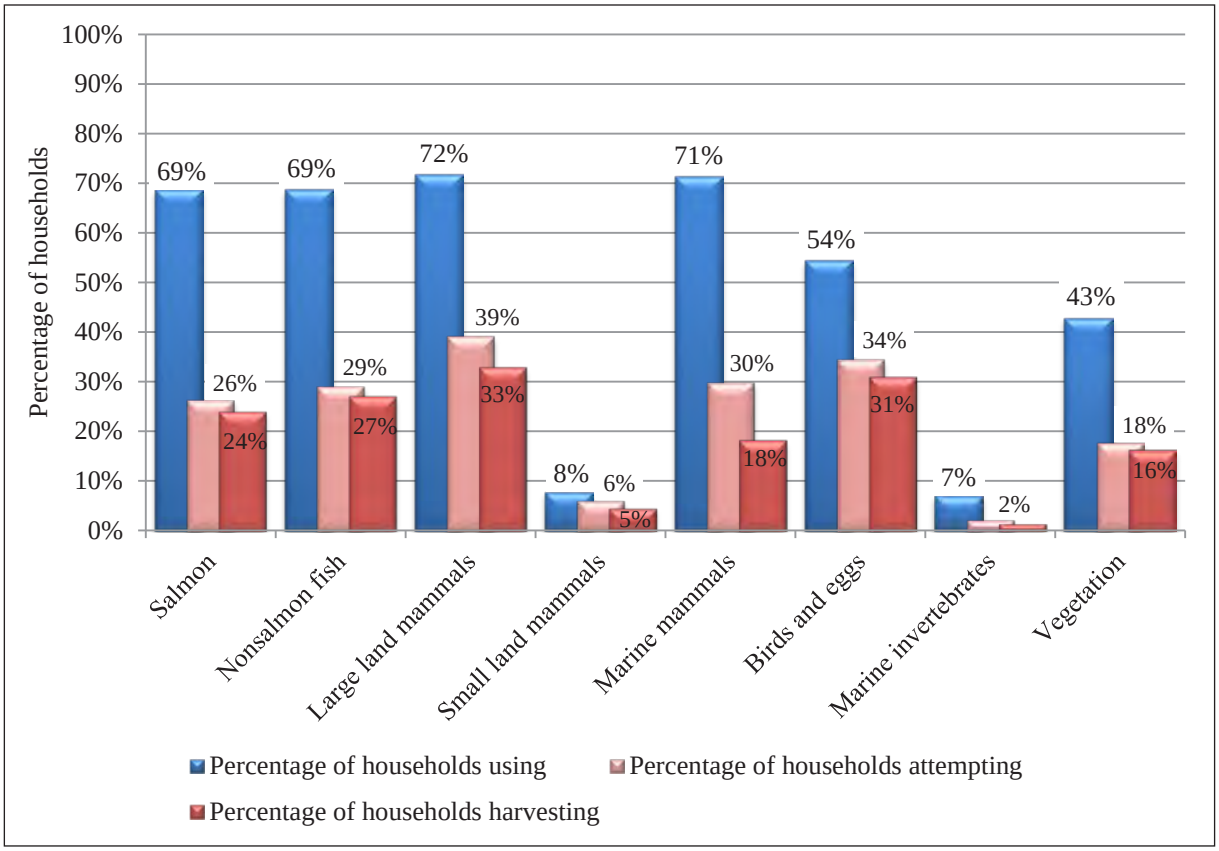

Figure 6-6.–Percentage of households using, attempting to harvest, or harvesting wild resources, Utqiaġvik, 2014.

Harvest and Use of Wild Resources at the Household Level

Figure 6-6 shows by resource category the percentages of households that used wild resources, attempted to harvest and harvested wild foods, and shared wild foods. For 5 of 8 resource categories, over one-half of households reported using subsistence resources in 2014. This ranged from 72% of households using large land mammals to 54% using birds and eggs. Fewer households used vegetation (43%), and small land mammals and marine invertebrate categories were used by less than 10% of households, respectively. In all resource categories, a greater percentage of households used wild foods than those that harvested them. This trend was particularly evident in the case of marine mammals; 71% of households reported using these resources, but only 18% of households reported successfully harvesting marine mammals. The discrepancy between use and harvest levels likely speaks to networks of sharing, trade, and barter that are common in rural Alaska subsistence economies and will discussed in a greater detail in later sections.

Table 6-1 summarizes resource harvest and use characteristics for Utqiaġvik in 2014 at the household level. The average harvest was 870 lb edible weight per household. During the study year, community households harvested an average of 3 kinds of resources and used an average of 9 kinds of resources. The maximum number of resources used by any household was 36. In addition, households gave away an average of 4 kinds of resources. Overall, as many as 138 resources were available for households to harvest in the study area; this included resources that survey respondents identified but were not asked about in the survey instrument.

Harvest Quantities and Composition

Table 6-5 reports estimated wild resource harvests and uses by Utqiaġvik residents in 2014 and is organized first by general category and then by species. All edible resources are reported in pounds edible weight (see

Table 6-5.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Utqiaġvik, 2014.

	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
All resources	**89.2**	**56.8**	**52.1**	**86.9**	**62.5**	**1,923,351.1**	**1,214.2**	**361.9**	**1,923,351.1**	**lb**	**1,214.2**	**22.9**
Salmon	**68.7**	**26.3**	**23.9**	**55.2**	**25.9**	**57,262.3**	**36.2**	**10.8**	**57,262.3**	**lb**	**36.2**	**36.2**
Chum salmon	23.6	13.1	11.2	15.4	9.7	24,312.1	15.3	4.6	4,039.2	ind	2.6	63.7
Coho salmon	24.3	8.5	7.7	19.7	10.0	8,532.1	5.4	1.6	1,659.6	ind	1.0	66.9
Chinook salmon	15.4	5.0	4.6	12.0	6.6	1,474.1	0.9	0.3	169.8	ind	0.1	63.1
Pink salmon	17.0	8.9	7.7	11.6	6.6	3,598.1	2.3	0.7	1,448.5	ind	0.9	67.5
Sockeye salmon	29.3	9.3	8.5	22.8	10.8	18,666.9	11.8	3.5	4,629.7	ind	2.9	60.5
Unknown salmon	8.5	0.8	0.8	7.7	1.5	679.0	0.4	0.1	140.1	ind	0.1	149.4
Nonsalmon fish	**68.7**	**29.0**	**27.0**	**60.2**	**37.1**	**196,049.4**	**123.8**	**36.9**	**196,049.4**	**lb**	**123.8**	**42.6**
Pacific herring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe	0.4	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	gal	0.0	0.0
Capelin (grunion)	1.2	1.2	1.2	0.4	0.0	5,764.2	3.6	1.1	1,773.6	gal	1.1	130.8
Eulachon (hooligan, candlefish)	1.2	0.8	0.8	0.8	0.8	32.5	0.0	0.0	10.0	gal	0.0	143.9
Rainbow smelt	18.5	1.5	1.2	17.8	7.3	1,351.6	0.9	0.3	225.3	gal	0.1	655.8
Unknown smelt	0.4	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	gal	0.0	0.0
Bass	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic cod	0.8	0.8	0.8	0.0	0.0	20.2	0.0	0.0	183.5	ind	0.1	134.0
Saffron cod	3.5	1.5	1.2	2.3	0.8	47.5	0.0	0.0	226.3	ind	0.1	105.0
Arctic flounder	0.8	0.4	0.4	0.4	0.0	6.7	0.0	0.0	6.1	ind	0.0	180.1
Lingcod	1.2	1.2	1.2	0.0	0.8	73.4	0.0	0.0	18.3	ind	0.0	84.7
Pacific halibut	10.0	3.1	3.1	7.7	3.5	7,284.7	4.6	1.4	7,284.7	lb	4.6	97.7
Unknown rockfish	1.2	0.8	0.8	0.4	0.8	64.2	0.0	0.0	42.8	ind	0.0	128.4
Unknown sculpin	1.2	0.8	0.8	0.4	0.8	403.6	0.3	0.1	269.1	ind	0.2	164.5
Burbot	11.2	7.3	6.6	5.0	5.8	3,056.7	1.9	0.6	727.8	ind	0.5	54.3
Arctic char	4.2	1.9	1.9	2.3	1.2	706.4	0.4	0.1	214.1	ind	0.1	111.1
Dolly Varden	4.6	3.1	3.1	1.5	1.5	605.5	0.4	0.1	183.5	ind	0.1	70.8
Lake trout	3.1	0.4	0.4	3.1	1.2	489.3	0.3	0.1	122.3	ind	0.1	180.1
Arctic grayling	27.0	12.7	11.6	16.6	13.5	10,055.6	6.3	1.9	11,172.9	ind	7.1	62.1

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Table 6-5.–Page 2 of 6.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount: Total	Unit	Mean per household	95% confidence limit (±) harvest
Nonsalmon fish, continued												
Northern pike	1.5	1.5	1.5	0.0	0.8	181.6	0.1	0.0	55.0	ind	0.0	111.1
Sheefish	6.2	0.0	0.0	6.2	2.3	0.0	0.0	0.0	0.0	ind	0.0	0.0
Broad whitefish	53.7	21.6	19.7	40.2	28.6	140,678.7	88.8	26.5	43,962.1	ind	27.8	43.1
Arctic cisco	36.3	5.0	4.6	33.2	17.0	12,256.7	7.7	2.3	17,509.6	ind	11.1	128.6
Bering cisco	1.2	0.0	0.0	1.2	0.4	0.0	0.0	0.0	0.0	ind	0.0	0.0
Least cisco	11.2	5.8	5.4	7.3	5.8	9,362.7	5.9	1.8	13,375.3	ind	8.4	126.7
Humpback whitefish	10.8	6.6	6.2	5.4	5.0	3,149.4	2.0	0.6	1,499.7	ind	0.9	67.3
Round whitefish	2.7	1.2	1.2	1.9	1.2	458.1	0.3	0.1	654.4	ind	0.4	121.4
Unknown whitefishes	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown nonsalmon fish	0.8	0.4	0.0	0.8	0.4	0.0	0.0	0.0	0.0	ind	0.0	0.0
Large land mammals	**71.8**	**39.0**	**32.8**	**56.8**	**39.0**	**595,003.7**	**375.6**	**112.0**	**595,003.7**	**lb**	**375.6**	**34.0**
Black bear	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brown bear	1.9	0.8	0.4	1.5	0.4	526.0	0.3	0.1	6.1	ind	0.0	180.1
Caribou	70.3	38.2	32.8	51.7	38.2	587,897.1	371.1	110.6	4,322.8	ind	2.7	34.0
Sitka black-tailed deer	0.4	0.4	0.0	0.4	0.4	0.0	0.0	0.0	0.0	ind	0.0	0.0
Moose	13.5	1.9	0.8	13.1	2.3	6,580.6	4.2	1.2	12.2	ind	0.0	127.1
Muskox	0.4	0.4	0.0	0.4	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dall sheep	2.3	0.0	0.0	2.3	0.8	0.0	0.0	0.0	0.0	ind	0.0	0.0
Small land mammals	**7.7**	**6.2**	**4.6**	**3.5**	**1.9**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Beaver	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic fox	3.5	3.9	3.1	0.4	1.2	0.0	0.0	0.0	1,266.0	ind	0.8	157.0
Red fox	2.3	2.7	1.9	0.4	0.4	0.0	0.0	0.0	116.2	ind	0.1	111.4
Snowshoe hare	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	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	ind	0.0	0.0
Lynx	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic ground (parka) squirrel	0.8	1.2	0.4	0.8	0.0	0.0	0.0	0.0	48.9	ind	0.0	180.1

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Table 6-5.–Page 3 of 6.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Small land mammals, continued												
Gray wolf	1.5	1.5	0.4	1.2	0.8	0.0	0.0	0.0	6.1	ind	0.0	180.1
Wolverine	3.5	3.9	1.9	1.5	0.4	0.0	0.0	0.0	36.7	ind	0.0	84.3
Marine mammals	**71.4**	**29.7**	**18.1**	**69.5**	**45.2**	**1,020,942.6**	**644.5**	**192.1**	**1,020,942.6**	**lb**	**644.5**	**20.5**
Polar bear	6.6	2.3	1.2	5.8	3.1	6,825.3	4.3	1.3	18.3	ind	0.0	103.6
Bearded seal	43.6	21.6	14.7	31.7	27.4	306,097.3	193.2	57.6	1,070.3	ind	0.7	43.5
Ribbon seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ringed seal	18.5	10.0	7.7	11.2	11.2	24,402.2	15.4	4.6	428.1	ind	0.3	60.7
Spotted seal	5.4	3.9	2.7	3.1	2.7	9,589.6	6.1	1.8	97.9	ind	0.1	86.6
Unknown seal	6.2	0.0	0.0	6.2	1.2	0.0	0.0	0.0	0.0	ind	0.0	0.0
Walrus	30.5	11.2	4.2	27.0	16.6	103,602.2	65.4	19.5	134.5	ind	0.1	73.4
Beluga whale	15.4	3.9	0.4	14.3	8.5	24,341.0	15.4	4.6	24.5	ind	0.0	180.1
Bowhead whale[a]	69.9	24.3	12.0	67.2	42.5	546,085.1	344.8	102.8	18.0	ind	0.0	1,101.5
Birds and eggs	**54.4**	**34.4**	**30.9**	**37.5**	**29.7**	**50,021.5**	**31.6**	**9.4**	**50,021.5**	**lb**	**31.6**	**30.1**
Common eider	16.2	8.5	8.5	9.3	8.1	4,095.3	2.6	0.8	1,853.1	ind	1.2	53.8
King eider	25.5	15.8	15.1	13.5	14.7	7,538.7	4.8	1.4	5,271.8	ind	3.3	49.9
Spectacled eider	0.4	0.4	0.4	0.0	0.4	41.3	0.0	0.0	17.0	ind	0.0	1,101.5
Steller's eider	0.4	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eider	0.4	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Merganser	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Long-tailed duck	1.5	1.2	1.2	0.4	0.8	266.0	0.2	0.1	177.4	ind	0.1	114.4
Northern pintail	1.5	0.8	0.8	0.8	0.4	45.9	0.0	0.0	30.6	ind	0.0	148.4
Black scoter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Green-winged teal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Wigeon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown ducks	2.3	1.9	1.2	1.2	1.5	180.6	0.1	0.0	110.1	ind	0.1	114.6
Brant	6.6	3.9	3.5	3.1	1.9	949.2	0.6	0.2	593.2	ind	0.4	101.6
Canada/cackling goose	6.2	3.1	2.7	4.6	1.5	1,412.8	0.9	0.3	428.1	ind	0.3	83.7
Snow goose	6.6	5.0	4.6	1.9	3.1	1,387.1	0.9	0.3	385.3	ind	0.2	68.1
White-fronted goose	39.4	23.2	21.6	22.4	20.1	29,745.2	18.8	5.6	9,595.2	ind	6.1	33.0
Unknown geese	2.7	0.8	0.4	2.3	1.2	2,148.1	1.4	0.4	538.2	ind	0.3	180.1
Unknown swans	3.1	1.2	1.2	2.3	0.0	342.8	0.2	0.1	30.6	ind	0.0	107.7

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Table 6-5.–Page 4 of 6.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Unknown cranes	0.8	0.4	0.4	0.4	0.0	51.4	0.0	0.0	6.1	ind	0.0	180.1
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Whimbrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Godwit	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown shorebirds	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Guillemot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Glaucous gull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sabine's gull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown loons	1.2	0.4	0.4	0.8	0.4	66.5	0.0	0.0	12.2	ind	0.0	180.1
Unknown murres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown terns	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ruffed grouse	0.4	0.4	0.4	0.0	0.0	17.1	0.0	0.0	24.5	ind	0.0	180.1
Unknown ptarmigans	9.3	8.5	7.7	1.2	4.2	620.8	0.4	0.1	886.8	ind	0.6	49.1
Snowy owl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pintail eggs	0.4	0.4	0.4	0.0	0.4	3.7	0.0	0.0	24.5	ind	0.0	180.1
Unknown duck eggs	1.9	0.8	0.4	1.5	0.4	3.7	0.0	0.0	24.5	ind	0.0	180.1
White-fronted goose eggs	1.2	0.8	0.8	0.4	0.4	100.9	0.1	0.0	403.6	ind	0.3	159.7
Unknown goose eggs	9.7	6.6	6.2	4.6	2.3	822.0	0.5	0.2	2,739.9	ind	1.7	122.0
Unknown swan eggs	2.7	2.3	1.9	0.8	0.8	92.5	0.1	0.0	146.8	ind	0.1	101.4
Unknown crane eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Golden plover eggs	0.4	0.4	0.4	0.0	0.4	3.4	0.0	0.0	48.9	ind	0.0	180.1
Godwit eggs	0.4	0.4	0.4	0.0	0.4	9.2	0.0	0.0	18.3	ind	0.0	180.1
Unknown small shorebird eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown gull eggs	2.3	1.5	1.5	1.2	0.4	66.1	0.0	0.0	220.2	ind	0.1	151.5

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Table 6-5.–Page 5 of 6.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Unknown loon eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown murre eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown tern eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown seabird eggs	0.4	0.4	0.4	0.0	0.0	5.9	0.0	0.0	36.7	ind	0.0	180.1
Snowy owl eggs	0.8	0.8	0.8	0.0	0.4	5.6	0.0	0.0	42.8	ind	0.0	156.4
Unknown eggs	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine invertebrates	**6.9**	**2.3**	**1.5**	**5.4**	**1.9**	**1,096.3**	**0.7**	**0.2**	**1,096.3**	**lb**	**0.7**	**122.3**
Razor clams	0.4	0.4	0.4	0.0	0.0	13.8	0.0	0.0	4.6	ind	0.0	180.1
Unknown clams	1.9	1.5	0.8	1.2	0.8	495.4	0.3	0.1	165.1	lb	0.1	167.2
King crab	1.5	0.0	0.0	1.5	0.4	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown crab	2.7	0.4	0.0	2.7	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown mussels	1.2	1.2	0.8	0.4	0.4	587.1	0.4	0.1	391.4	ind	0.2	169.2
Shrimp	0.8	0.0	0.0	0.8	0.4	0.0	0.0	0.0	0.0	ind	0.0	0.0
Vegetation	**42.9**	**17.8**	**16.2**	**34.7**	**14.7**	**2,975.3**	**1.9**	**0.6**	**2,975.3**	**lb**	**1.9**	**72.8**
Blueberry	17.0	4.2	3.5	13.5	5.8	698.7	0.4	0.1	174.7	gal	0.1	128.2
Lowbush cranberry	3.9	1.9	1.9	1.9	0.8	146.8	0.1	0.0	36.7	lb	0.0	96.2
Highbush cranberry	0.8	0.4	0.4	0.4	0.0	24.5	0.0	0.0	6.1	gal	0.0	180.1
Crowberry	3.5	0.4	0.4	3.1	0.8	6.1	0.0	0.0	1.5	gal	0.0	180.1
Elderberry	0.4	0.4	0.4	0.0	0.0	24.5	0.0	0.0	6.1	gal	0.0	180.1
Huckleberry	0.4	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	gal	0.0	0.0
Raspberry	0.8	0.4	0.4	0.4	0.4	6.1	0.0	0.0	1.5	gal	0.0	180.1
Salmonberry	37.1	12.0	9.7	30.1	10.8	1,792.7	1.1	0.3	448.2	gal	0.3	70.3
Strawberry	0.4	0.4	0.4	0.0	0.4	122.3	0.1	0.0	30.6	gal	0.0	180.1
Wild rhubarb	0.4	0.4	0.4	0.0	0.0	3.1	0.0	0.0	0.8	gal	0.0	180.1
Eskimo potato	0.8	1.2	0.8	0.0	0.0	4.6	0.0	0.0	1.1	gal	0.0	120.1
Hudson's Bay (Labrador) tea	2.3	0.8	0.8	1.2	0.8	9.2	0.0	0.0	9.2	gal	0.0	134.0
Sourdock	5.4	3.9	3.9	2.3	1.5	45.4	0.0	0.0	45.4	gal	0.0	87.1
Willow leaves	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other wild greens	1.5	1.5	1.5	0.4	0.0	26.4	0.0	0.0	26.4	gal	0.0	118.3

-continued-

Table 6-5.–Page 6 of 6.

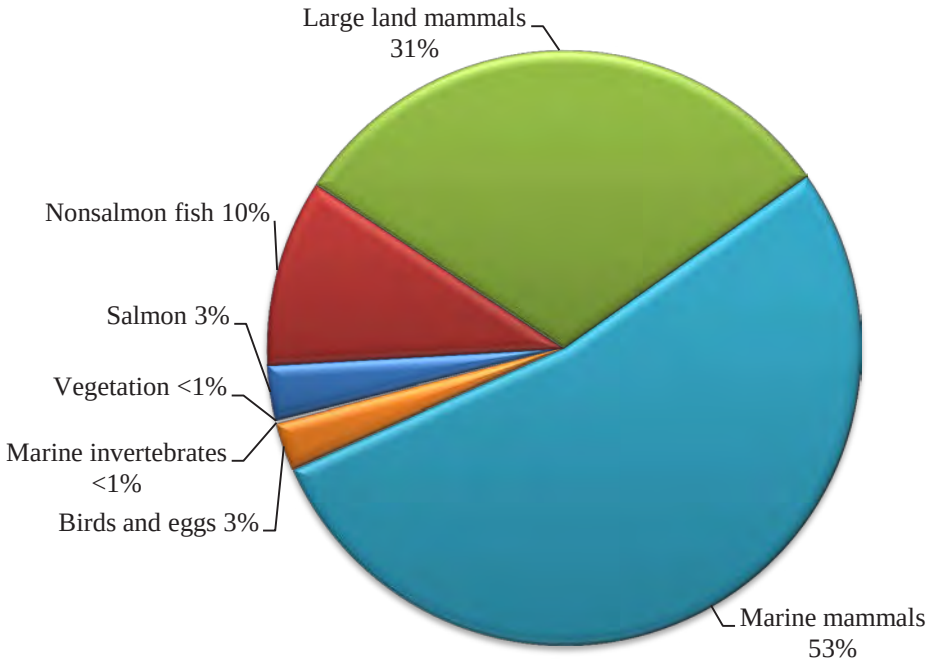
Resource	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Vegetation, continued												
Unknown mushrooms	0.8	0.4	0.4	0.4	0.0	6.1	0.0	0.0	6.1	gal	0.0	180.1
Sorrel	1.2	0.8	0.8	0.4	0.0	18.3	0.0	0.0	18.3	gal	0.0	134.0
Fireweed	0.4	0.4	0.4	0.0	0.4	12.2	0.0	0.0	12.2	gal	0.0	180.1
Stinkweed	3.1	2.3	2.3	1.2	1.2	28.3	0.0	0.0	28.3	gal	0.0	96.3

Source ADF&G Division of Subsistence household surveys, 2015.

Note Resources where the percentage using is greater than the combined received and harvest indicate use from resources obtained during a previous year.

Note For small land mammals, species that are not typically eaten show a nonzero harvest amount with a zero harvest weight. Harvest weight is not calculated for species harvested but not eaten.

a. Bowhead whale harvest is reported value, Alaska Eskimo Whaling Commission, usable weight estimation from North Slope Borough Department of Wildlife Management.



Note Categories having 0 lb of usable weight are not included.

Figure 6-7.–Composition of harvest by resource category by weight in usable pounds, Utqiaġvik, 2014.

Appendix C for conversion factors). 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 a household, and resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Purchased foods are not included. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

Utqiaġvik residents harvested an estimated 1,923,351 lb of wild food in 2014, or 362 lb per capita (Table 6-5). Figure 6-7 shows the composition of Utqiaġvik's harvest by resource category. Marine mammals accounted for the largest component of the total estimated harvest (53%), contributing an estimated 1,020,943 lb, or 192 lb per capita (Table 6-5; Figure 6-7). Large land mammals collectively accounted for 31% of the total harvest: 595,004 lb, or 112 lb per capita. Fish collectively composed 13% of the harvest; salmon contributed 57,262 lb (11 lb per capita) and nonsalmon fish contributed 196,049 lb (37 lb per capita). Utqiaġvik residents reported smaller harvests of bird and eggs (50,022 lb, 9 lb per capita) which accounted for 3% of the harvest. There were limited harvests of marine invertebrates during the study year, an estimated 1,096 lb (0.2 lb per capita; Table 6-5).

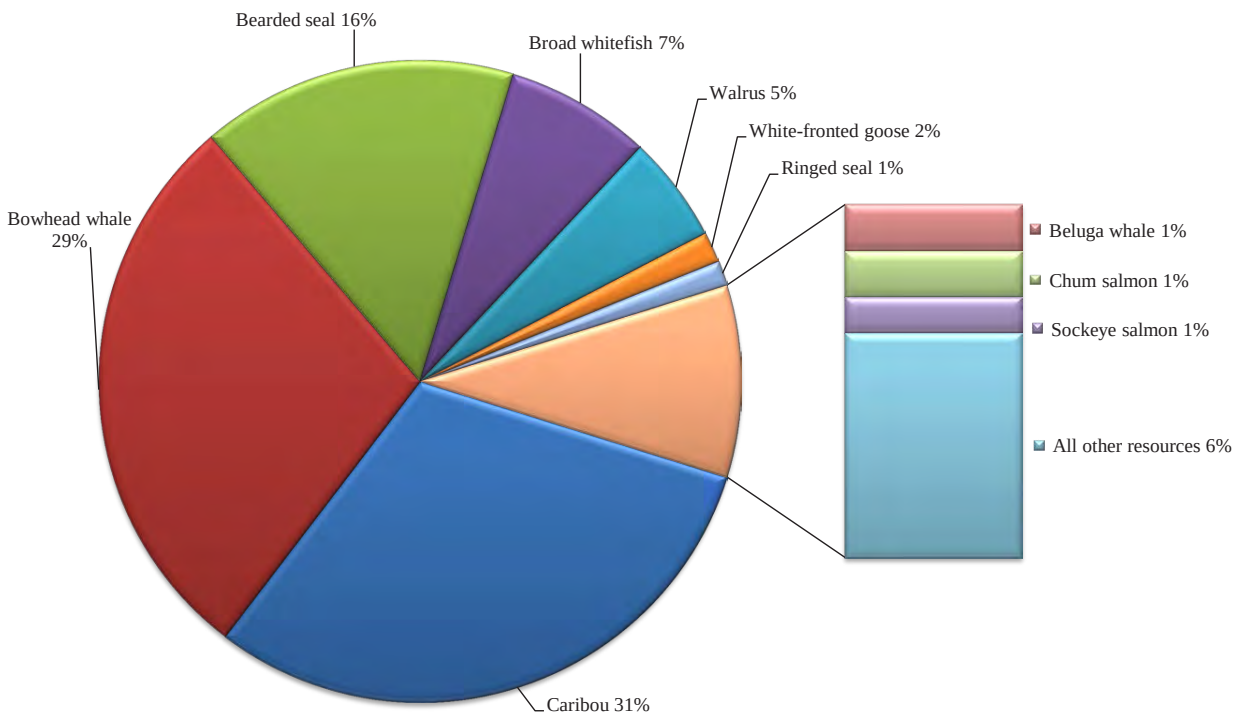
Table 6-6 lists the resources most commonly used by households, and Figure 6-8 shows the species with the highest per capita harvests during the 2014 study year. Caribou was the resource with both the highest levels of use (70% of households) and the highest levels of harvest, contributing 31% to the total per capita harvest of all wild resources (111 lb; tables 6-5 and 6-6; Figure 6-8). Bowhead whale was the second highest used resource by Utqiaġvik residents (70% of households) and also ranked second in per capita harvests; this resource contributed 28% to the total per capita harvest, or 103 lb per person. Broad whitefish were more widely used by residents in comparison with harvest levels; although this resource only contributed 7% to the total per capita harvest (27 lb per capita), it was used by the third highest percentage of households (54%). Bearded seal was the fourth highest used resource during the study year (44%) and was the third greatest contribution to the total per capita harvest (16%, 58 lb per person). Ringed seal, beluga, and chum

Table 6-6.–Resources most commonly used by households, Utqiaġvik, 2014.

Rank[a]	Resource	Percentage of households using
1.	Caribou	70.3%
2.	Bowhead whale	69.9%
3.	Broad whitefish	53.7%
4.	Bearded seal	43.6%
5.	White-fronted goose	39.4%
6.	Salmonberry	37.1%
7.	Arctic cisco	36.3%
8.	Walrus	30.5%
9.	Sockeye salmon	29.3%
10.	Arctic grayling	27.0%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Resources used by the same percentage of households share the lowest rank value instead of having sequential rank values.



Note The "all other resources" category represents all species that contributed less than 1% to the total harvest, not in the top ten per capita.

Figure 6-8.–Top resource harvests by weight in usable pounds per capita, Utqiaġvik, 2014.

salmon all appear in the top 10 resources by per capita harvest, but were not among the most used resources by Utqiaġvik residents in 2014 (Table 6-6; Figure 6-8). In contrast, salmonberries, Arctic cisco, and Arctic grayling were among the most widely used resources, but harvests of these resources each composed less than 1% of the per capita harvests.

Marine Mammals

As mentioned previously, marine mammals collectively composed over one-half (53%) of Utqiaġvik residents' total estimated harvests during the study year (Figure 6-7). Bowhead whale was the single greatest contributor to the marine mammals harvest and accounted for 54% of the total edible weight in this resource category (Figure 6-9). This resource contributed 546,085 lb,[4] and it was the second most used resource during the study year (70% of households; tables 6-5 and 6-6). Spring and fall whaling are important events in communities along the North Slope, and harvesting an animal of this size requires a significant cooperative effort. The highly specialized nature of bowhead whaling is illustrated by the low percentage of households actually harvesting the resource: only 12% of Utqiaġvik households successfully landed a whale during the study year (Table 6-5). Despite this small percentage, the cooperative nature of the activity and the cultural importance of bowhead whale, including feasts to celebrate a successful harvest, lead to it being widely shared throughout the community; 67% of households reported receiving bowhead whale, and 43% reported giving it away.

Spring whaling requires significant preparation and involves a great level of community involvement because crews must prepare to camp on the ice for up to a month during the spring migration of bowhead whales. Although the greatest period of preparation occurs in the months preceding whaling, it is a year-round endeavor. One captain spoke to the effort required to carry out whaling:

> Whaling isn't a one-day event, it's a year-round event, and there's different activities associated with the gathering of resources to conduct whaling…And it, it's ongoing throughout the whole season in terms of what resources are available and gathering some of those resources to be used during whaling season. For example, the bearded seal hunting is done in June and July, majority of it through those 2 months...And then taking the caribou in August, September, trying to get the large bulls for pulling the tendons out to make the thread to sew the skins together. So that, that's another, those are the 2 examples I can give that indicate that this is a year-round process. In preparation for those bearded seal skins we have to prepare them over the course of the summer, let them ferment into the fall and then winter, come January or February we pull them out and thaw them out to remove all the hair. So that, that continues today, and the skins have been identified that are to be used for the covering of the umiak frame. (BRW01271508)

Captains are responsible for providing their crews with all the equipment and supplies needed for whaling, including fuel and food. Subsistence hunting and fishing throughout the year help to provide food for whaling crews: each captain's family stockpiles food in preparation for the whaling effort (BRW01281509, BRW01281507).

As mentioned in the Seasonal Round section, captains, their spouses, their crews, relatives, and community members begin to prepare for whaling in the late winter. Preparation includes checking weaponry, ensuring that snow machines are available and running well, confirming that tents and heaters are in working condition, cleaning ice cellars, and making sure that umiaq boats are ready (BRW01291505, BRW0126150, BRW01241502, BRW01271516). Although umiaq covers only need to be replaced approximately every 5 years, a great deal of effort goes into sewing the bearded seal hides. After the hides have been thawed, they are scraped clean of fur in preparation for sewing. The sinew gathered from bull caribou is prepared earlier in the winter after being frozen for several months. The sinew is split and braided to create the strands used

4. Unlike other resources, bowhead harvests are not expanded from survey data. These data include the known number of bowhead harvests in Utqiaġvik as reported by the Alaska Eskimo Whaling Commission. Conversion factors for weight are based on the size of the individual animals landed by Utqiaġvik hunters as estimated by North Slope Borough Department of Wildlife Management.

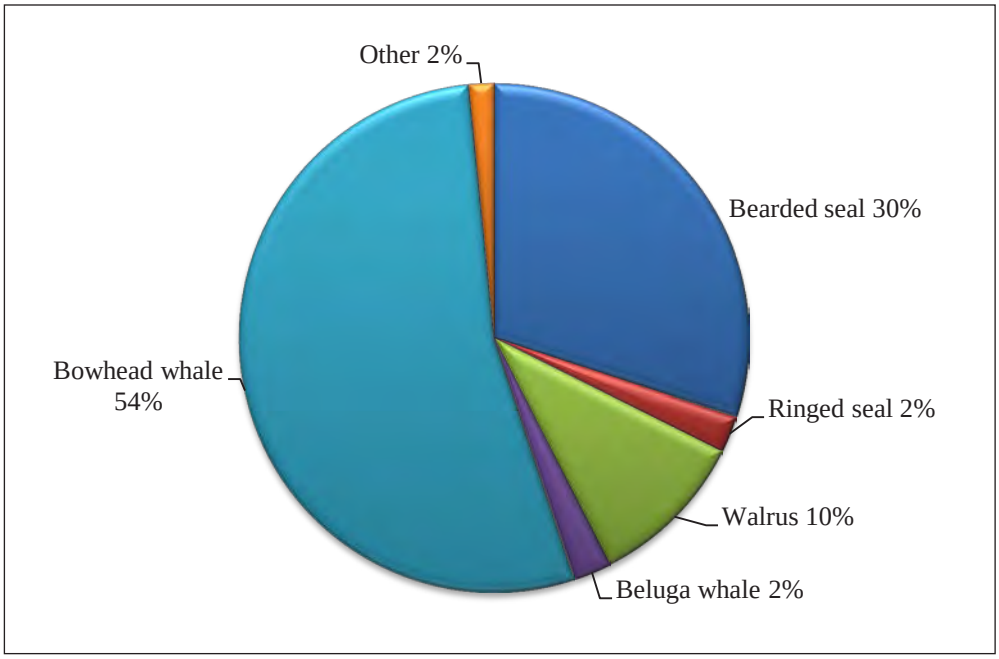


Figure 6-9.–Composition of marine mammal harvest by weight in usable pounds, Utqiaġvik, 2014.

to sew the hides together, and the braiding effort is usually completed by December. In January, a skilled group of women sew the covers for all the crews that need them. The process for a single boat can take as long as 24 hours, although it generally takes 8–12 hours. The sewing process for one boat is done in one sitting; the sewers continue working until the cover is ready to go on the boat frame (BRW01261514). One key respondent explained how the sewing is conducted:

> They usually, it depends on how many [skins] they have. If there's 5 skins, there's 4 sewers on 1 side, 4 sewers on the other side. Because they divide it, 1 seam in half…So half of this belongs to 1 person and there's another person, your partner on the other end. So there is always going to be 10. Ten people sewing. So we'll finish one side and they'll flip, they'll take a break and they'll flip it over and sew the other side. (BRW01261514)

Beginning in March, crews break trail from the beach to open leads. This is often a group effort and can be quite challenging, depending upon the condition of the ice. One key respondent described the cooperative effort required:

> One year it was so bad, we had, the ice build-up probably was like a story high, and the lead was probably like 10, 12 miles out. And there was at least about, all the crews came together. We wanted to make one big trail. So, I think one day there was close to 40 people. So that was really good. It took us a couple weeks to make it to the lead, but we made it. (BRW01241502)

Once the crews begin to camp on the ice, the bustle of preparation turns to patient waiting. They remain poised at the edge of the ice, waiting for the whales to come close enough to strike (BRW01281503). Conditions on the ice can change rapidly, and the captain has the added responsibility of monitoring the weather condition, ocean currents, and wind direction. Large pans of ice can break off, forcing crews to quickly move equipment back to shorefast ice (BRW01271508). Although conditions vary year by year, key respondents noted that poor ice conditions caused by warm spring weather has made whaling more challenging over the last 10 to 15 years. One respondent explained that there used to be a large quantity of multi-year sea ice that was carried by currents from Greenland and Canada and that would ground itself until it was stationary. This multi-year ice would offer a much more stable platform than the young ice that

forms over the course of a single winter. Others noted that pressure ridges have gotten smaller, and that rain events sometimes occur in April and May, thawing the trails and making travel more difficult. The fragility of the ice sometimes a concern when hauling whales onto the ice, particularly larger whales. Despite these challenges, several respondents noted that whaling crews adapt to these environmental conditions by utilizing traditional knowledge to read the ice. Some use new technology, including satellite images of the ice pack in combination with more traditional practices (BRW01281503, BRW01271508, BRW01281509, BRW01251510, BRW01241511).

Once a crew successfully strikes a bowhead whale, a large amount of cooperative effort goes into landing the whale and butchering the animal. One whaling captain explained that it takes well over 100 people to pull the whale onto the ice, making it a community effort (BRW01271508). Other crews and community members aid in the butchering process, and the captain is responsible for dividing the whale into shares and distributing them amongst his crew and the people who help to process the animal. One portion of the whale is reserved to feed the community right after a successful hunt, and prepared under the direction of the captain's spouse and other family members. This task can take 2 to 3 days and involves the preparation of the *muktuk*[5], meat, intestines, and a portion of the internal organs (BRW01261514). A large share is reserved for the Nalukataq festival in July, when successful captains and their spouses and families host another feast for community members. All the portions of the whale are served, as well *mikigaq*, made by thinly slicing muktuk and whale meat and allowing the mixture to ferment. Other foods such as caribou soup, geese, ducks, and desserts are served alongside the whale. Later in the day after all the food has been served, the festival continues with the blanket toss. The blanket is made from bearded seal skins and is often taken from the skin boat of the successful crew; it is stretched taut with ropes, and people gather around to pull on the blanket to throw a person into the air. After the blanket toss, the festival concludes with traditional dancing (BRW01261514).

Fall whaling takes place on open water, instead of from the ice. Crews take day trips from Utqiaġvik by motor boat in pursuit of bowhead whales. Crews sometimes have to travel quite a distance, occasionally 30 or more miles off shore. Once a whale is struck, other boats are called to help tow the animal back to shore and the whale is hauled up with loaders and transported to a butchering site (BRW01281509). The catch is distributed under the captain's supervision to crew members and those that help in the butchering effort, and a portion is reserved to be distributed to the community at holiday feasts such as Thanksgiving and Christmas (BRW01271508).

Several key respondents noted that the environmental challenges of spring whaling have led to heavier harvesting in the fall. This is not ideal due to the importance of festivities that follow spring whaling, but it is necessary to fulfill Utqiaġvik's quota and secure enough whales to feed community members (BRW01281503, BRW01271508, BRW01251510). Of the 18 bowhead whales harvested by Utqiaġvik hunters in 2014, 39% (7 whales) were taken during the spring months of April, May, and June, and the remaining 61% (11 whales) were taken in September and October (Table 6-7). A majority of the bowhead whales harvested during the study year were male (12 animals, 67% of the harvest), and the remaining 6 were female.

Key respondents felt the bowhead whale population was healthy, and many felt it was growing. One key respondent involved with the management of bowhead whales remembered the days of concern over the population, when population estimates were less than 1,000 whales and a moratorium on whaling was imposed by the International Whaling Commission in 1977.[6] He further recalled that working with hunters' knowledge of the movements of bowhead whales and improving survey methods allowed for more accurate counts, and the quota was increased. He went on to explain:

> We had true estimates finally. So they adjusted up the quota. Which made some folks nervous, until I think after 10 years we had clear data that bowheads were increasing

5. Whale skin and blubber.

6. North Slope Borough Department of Wildlife Management. 2016. "TEK and Bowhead Whale Migration." Accessed April 21, 2016 http://www.north-slope.org/departments/wildlife-management/studies-and-research-projects/bowhead-whales

Table 6-7.–Estimated marine mammal harvests by month and sex, Utqiaġvik, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All marine mammals	**0.0**	**12.6**	**18.9**	**22.3**	**59.5**	**426.8**	**931.7**	**223.1**	**28.5**	**13.1**	**24.9**	**0.0**	**30.6**	**1,791.6**
Polar bear	0.0	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	6.1	6.1	0.0	0.0	**18.3**
Seal	0.0	12.6	18.9	19.3	50.4	383.0	827.7	210.9	24.5	0.0	18.8	0.0	30.6	**1,596.2**
Bearded seal	0.0	0.0	0.0	0.0	0.0	270.7	645.9	129.2	0.0	0.0	6.2	0.0	18.3	**1,070.3**
Bearded seal, male	0.0	0.0	0.0	0.0	0.0	0.0	24.5	0.0	0.0	0.0	0.0	0.0	0.0	**24.5**
Bearded seal, unknown sex	0.0	0.0	0.0	0.0	0.0	270.7	621.5	129.2	0.0	0.0	6.2	0.0	18.3	**1,045.8**
Ribbon 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	**0.0**
Ringed seal	0.0	12.6	18.9	19.3	50.4	75.6	151.2	75.6	0.0	0.0	12.6	0.0	12.2	**428.1**
Spotted seal	0.0	0.0	0.0	0.0	0.0	36.7	30.6	6.1	24.5	0.0	0.0	0.0	0.0	**97.9**
Unknown seals	0.0	0.0	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	42.8	79.5	12.2	0.0	0.0	0.0	0.0	0.0	**134.5**
Walrus, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	**6.1**
Walrus, unknown sex	0.0	0.0	0.0	0.0	0.0	42.8	79.5	6.1	0.0	0.0	0.0	0.0	0.0	**128.4**
Whale	0.0	0.0	0.0	3.0	3.0	1.0	24.5	0.0	4.0	7.0	0.0	0.0	0.0	**42.5**
Whale, male	0.0	0.0	0.0	3.0	1.0	1.0	24.5	0.0	3.0	4.0	0.0	0.0	0.0	**36.5**
Whale, female	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	1.0	3.0	0.0	0.0	0.0	**6.0**
Whale, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	24.5	0.0	0.0	0.0	0.0	0.0	0.0	**24.5**
Beluga whale	0.0	0.0	0.0	0.0	0.0	0.0	24.5	0.0	0.0	0.0	0.0	0.0	0.0	**24.5**
Beluga whale, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	24.5	0.0	0.0	0.0	0.0	0.0	0.0	**24.5**
Bowhead whale[a]	0.0	0.0	0.0	3.0	3.0	1.0	0.0	0.0	4.0	7.0	0.0	0.0	0.0	**18.0**
Bowhead whale, male	0.0	0.0	0.0	3.0	1.0	1.0	0.0	0.0	3.0	4.0	0.0	0.0	0.0	**12.0**
Bowhead whale, female	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	1.0	3.0	0.0	0.0	0.0	**6.0**
Bowhead whale, unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2015.
a. Bowhead whale harvest is a reported value, Alaska Eskimo Whaling Commission.

> which is something else the hunters said. Um, so we confirmed that. We confirmed a lot of the things they told us, so. And then, for whatever reason, bowheads are just doing beautifully. (BRW01251504)

The last count of the bowhead population was conducted by the NSB Department of Wildlife Management in 2011, which estimated a population of 17,000.[7] Key respondents involved in whaling efforts also felt the population was thriving, and said that the bowheads they have harvested are in very good condition (BRW01261501, BRW01241502, BRW01281503, BRW01271508, BRW01271516).

Bearded seal contributed the second largest amount to Utqiaġvik's marine mammal harvest in 2014; hunters harvested an estimated 1,070 seals, which provided 306,097 edible pounds (58 lb per capita; Table 6-5). Forty-four percent of households in Utqiaġvik reported using bearded seals during the study year, compared with only 15% of households that reported harvesting them. The resource was shared fairly widely: 32% of households reported receiving bearded seal and 27% reported giving it away. Bearded seals are generally targeted in June, July, and August, when they are commonly found near ice floes (Table 6-7). One key respondent explained that the bulk of the migration generally passes by Utqiaġvik in early July, when seals become plentiful near the community (BRW01281503). Indeed, Utqiaġvik hunters harvested the vast majority of bearded seals (98%) in the summer months, including 60% in July alone; limited harvests were reported in November (6 seals), and some respondents were not able to recall the specific months of harvest for 18 seals (Table 6-7).

Utqiaġvik residents harvested other seal species in smaller quantities during the study year. Ringed seal contributed 2% to the total marine mammal harvest, an estimated 24,402 lb (5 lb per capita; Table 6-5; Figure 6-9). Hunters also reported limited harvest of spotted seal (9,590 lb, 2 lb per capita; Table 6-5). Like bearded seals, summer was the season of highest harvest for other seal species. Hunters harvested 428 ringed seals during the study year; the heaviest period of harvest occurred from May to August (82%).

7. North Slope Borough Department of Wildlife Management. "Bowhead Whale Ice-Based Census." Accessed April 21, 2016 http://www.north-slope.org/departments/wildlife-management/studies-and-research-projects/bowhead-whales/bowhead-whale-population-studies

Ninety-eight spotted seals were harvested from June to September during the study year; the majority of the harvest (69%) occurred in June and July.

Some key respondents said that decreasing sea ice in the summer near the community had negatively impacted seal hunting in recent years. One respondent explained that the sea ice used to come and go in the past, but now less ice is found in the vicinity of Utqiaġvik. The respondent went on to state that further travel is required to get to more productive floes, sometimes a distance of as much as 30 miles. Catching seals, particularly the large bearded seals, is more difficult in open water because they must be towed to land after they are killed; it is easier to haul them onto the ice and butcher them in the field (BRW01271516). Some respondents did mention that there was an unusual sickness in seals several years ago involving hair loss, lesions, and lethargy (BRW01271516, BRW01281503, BRW01241502). In 2011, there were more than 100 cases of diseased seals and walrus documented in northern and western Alaska (NOAA 2014). Affected seals displayed skin lesions and sometimes internal signs of disease and behavioral changes. No cause was ever identified for the disease, and surveillance efforts in 2012 and 2013 discovered no new cases. The respondents who mentioned the sickness in seals did note that they have not seen any further cases, and interviewed biologists felt that the seal population is healthy (BRW01281512, BRW01251504).

Walrus accounted for 10% of the marine mammal harvest in Utqiaġvik in 2014; hunters harvested an estimated 135 walruses, which contributed 103,602 edible pounds (20 lb per capita; Table 6-5; Figure 6-9). This resource was used by 31% of households, and only 4% reported harvesting walrus during the study year. Hunters harvested all walrus during the summer months from June to August (Table 6-7). Similarly to bearded seal, ice conditions have implications for walrus hunting. Several key respondents explained that the window for hunting walrus is shorter, and that the best time to harvest the animals is shortly after the ice breaks up, when floes will be closer to the community. Like the pursuit of seals, hunters sometimes have to travel greater distances searching for productive floes. Hunters are less likely to harvest walruses in open water; due to their immense size, towing the animal back to shore is impractical. Instead walruses are either shot on a floe or hauled onto one for butchering (BRW01251504, BRW01241502, BRW01281509, BRW01271516). One key respondent expressed concern regarding the impact of decreasing ice on the health of the walrus population; this respondent had seen a few animals coming to shore exhausted (BRW01281513).

Beluga accounted for 2% of Utqiaġvik's marine mammal harvest, contributing 24,341 lb (5 lb per capita; Table 6-5; Figure 6-9). Less than 1% of households harvested 25 belugas, all of which were taken in the month of July (tables 6-5 and 6-7).

Utqiaġvik hunters reported limited harvest of polar bears during the study year (6,825 lb, 1 lb per capita; Table 6-5).The reported harvest of polar bears by Utqiaġvik households was 3 bears, which was expanded to a total harvest of 18 animals; this estimate has a high confidence interval of ±103.6%. Because polar bear hunting is generally a highly specialized activity, it is possible that expansion overestimated actual harvest. The U.S. Fish and Wildlife Service Marine Mammals Management office harvest monitoring program counted 7 polar bears harvested by Utqiaġvik in 2014.[8] One key respondent who usually hunts polar bears explained that November through May is the best window of time to harvest the bears, because their coat is at its whitest and they are in the best physical condition (BRW01241502). Polar bear harvests were split evenly between the months of May, October, and November. Most key respondents who generally harvest polar bears felt that populations were stable and that individual animals were healthy, despite poorer ice conditions in the last decade (BRW01241502, BRW01281503, BRW01251504, BRW01261501, BRW01271516). Polar bears are more commonly found near Utqiaġvik in the winter months, particularly when the wind is blowing from the south or west, which brings the pack ice closer to the community. One key respondent recalled that during one of the first years when the multi-year ice did not return, many polar bears came to land in the summer and the fall, and a number of bears came into town. This situation has not repeated itself in recent years despite the continued lack of multi-year ice (BRW01241502).

Figure 6-10 portrays the search and harvest areas used by marine mammal hunters in Utqiaġvik during the study year. Residents reported continuous search areas along the coast from Wainwright east to Admiralty

8. Brad Benter, biologist, USFWS Marine Mammals Management office, personal communication, February 8, 2016.

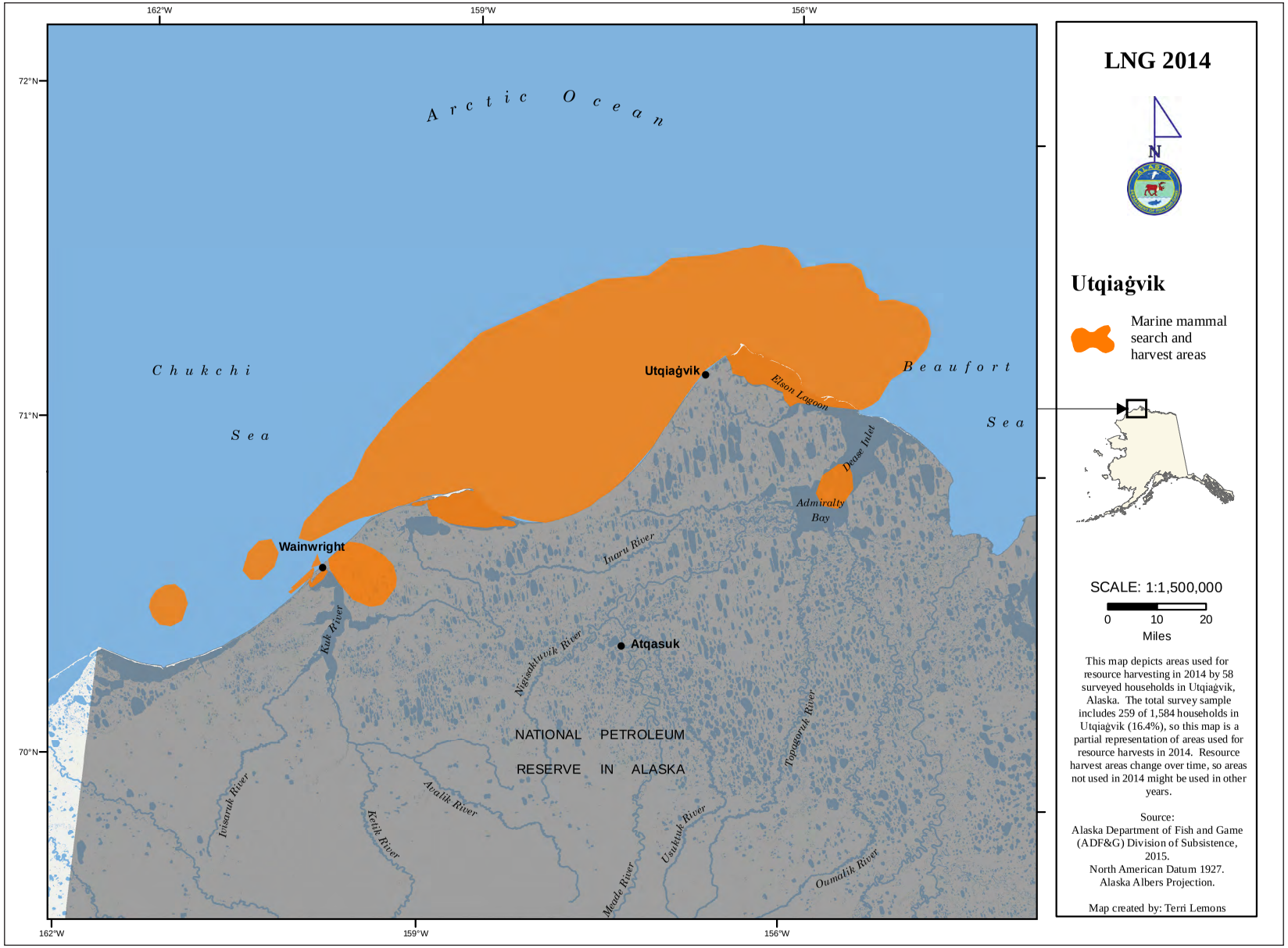


Figure 6-10.–Marine mammal hunting locations, Barrow, 2014.

Bay, a distance of approximately 135 miles. Hunters reported searching as far as 40 miles out to sea, likely in pursuit of bowhead whales. Smaller search and harvest areas for marine mammals were reported near and to the west of Wainwright, and 1 search was reported in the Dease Inlet of Admiralty Bay to the east of Utqiaġvik.

Large Land Mammals

As mentioned previously, large land mammals as a category accounted for 31% of Utqiaġvik's estimated 2014 harvest of wild foods, and caribou was the single most heavily harvested resource in terms of edible weight during the study year (30% of the total harvest; figures 6-7 and 6-8). Figure 6-11 reiterates that caribou composed the vast majority of the large land mammal harvest (99%). This resource contributed 587,897 edible pounds to residents, or 111 lb per person (Table 6-5). Caribou was more widely used by households than any other resource (70%) and was harvested by 33% of households. It was widely shared during the study year: 52% of households reported receiving caribou and 39% gave the resource away. Many key respondents described the importance of caribou as a staple food for Utqiaġvik households and also explained uses for the resource that extended beyond feeding their families. As mentioned earlier, caribou sinew is vital to the construction of umiaq coverings, but the hides are also used for a number of purposes. The skins are useful for keeping hunters warm by insulating them from the cold ground, especially when camping on the ice during whaling. Fur sewers also use the skin from caribou legs when making *mukluks*[9] (BRW01241511, BRW01261514, BRW01261515, BRW01241502).

In total, Utqiaġvik hunters harvested an estimated 4,323 caribou in 2014, a figure that would represent the highest harvest in the community for the 10 years of harvest data that are available (a full discussion of comparative data can be found later in this chapter; Table 6-5). Taking into account the 95% confidence interval of ±34%, the estimated harvest of caribou during the study year ranged from a low of 2,853 caribou to a high of 5,793 caribou. It is possible that the sampling strategy and high refusal rate may have inflated the estimated value. Hunting for this resource occurred in every month of the study period. Over one-half of the harvest (61%) was taken from July to October, and August was the heaviest month of harvest (932 caribou; Table 6-8). Although caribou were not abundant near the community from July to October, there was good access inland along the Meade, Chipp, and Ikpikpuk Rivers.[10] Hunters harvested an estimated 718 caribou (17%) from January to April of the study year (Table 6-8); during this timeframe caribou were readily available near Utqiaġvik, sometimes coming into the community[11]. Forty-six percent of the caribou harvested (1,993 caribou) were bulls during the study year, and 29% were cows (Table 6-8). Utqiaġvik residents were unable to recall the sex of 1,082 caribou, or 25% of the harvest. Uncertainty about month of harvest can be attributed to a number of factors including the length of the study period, the time between harvest of animals and survey administration, the sheer number of animals harvested by a particular hunter or household, and which member of the household answered the survey questions.

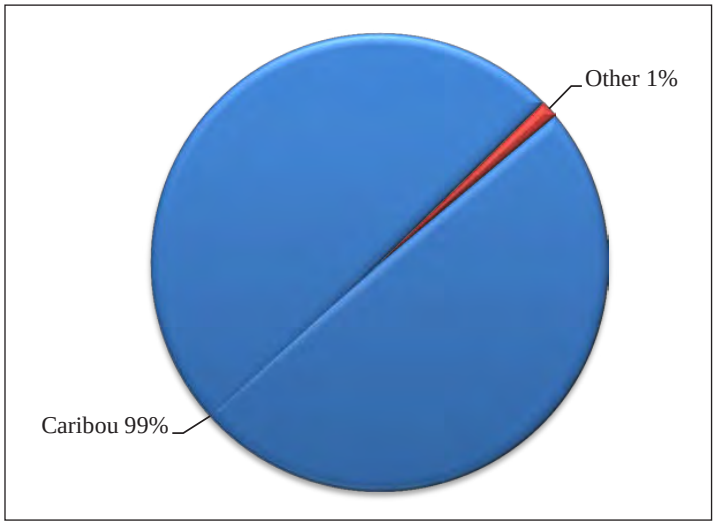


Figure 6-11.–Composition of large mammal harvest by weight in usable pounds, Utqiaġvik, 2014.

As mentioned in the Introduction chapter of this report, the Western Arctic (WAH) and Teshekpuk caribou herds have experienced significant declines in recent years, a

9. Traditional winter boots.

10. Lincoln Parrett and Ryan Klimstra, ADF&G wildlife biologists, personal communication, February 10, 2016.

11. Lincoln Parrett and Ryan Klimstra, ADF&G wildlife biologists, personal communication, February 10, 2016.

Table 6-8.–Estimated large land mammal harvests by month and sex, Utqiaġvik, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All large land mammals	**110.4**	**251.5**	**263.7**	**98.1**	**36.8**	**159.5**	**478.4**	**932.3**	**729.8**	**515.2**	**257.6**	**61.3**	**446.5**	**4,341.1**
Black bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Black bear, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Brown bear	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**6.1**
Brown bear, unknown sex	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**6.1**
Caribou	110.4	251.5	263.7	92.0	36.8	159.5	478.4	932.3	717.6	515.2	257.6	61.3	446.5	**4,322.8**
Caribou, male	49.1	110.4	134.9	0.1	0.1	122.5	355.4	612.9	416.9	98.6	24.8	0.1	67.3	**1,993.2**
Caribou, female	61.2	91.7	104.0	24.5	0.0	6.1	42.8	104.0	183.5	330.3	232.4	42.8	24.5	**1,247.6**
Caribou, unknown sex	0.2	49.3	24.8	67.4	36.7	30.8	80.2	215.4	117.2	86.4	0.4	18.4	354.7	**1,081.9**
Sitka black-tailed deer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Sitka black-tailed deer, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Moose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	**12.2**
Moose, bull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	**12.2**
Moose, cow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Muskox, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep, unknown sex	0.0	0.0	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, 2015.

situation that is of great concern to Utqiaġvik hunters. A key respondent involved in the monitoring of the herd explained that the WAH has been experiencing declines since 2003, but the Teshekpuk herd decline began later and progressed more rapidly. The higher caribou mortality rate appears to be caused by a number of factors including natural cycles, poor weather, and predation. Icing events in recent years have taken their toll on the herds, freezing the ground and making it difficult for them to dig down to their food sources. For the Teshekpuk herd, calf production was very low in 2014: only 30% of collared cows calved. Predation has hastened the decline; the majority of predation comes from wolf populations, but brown bears and wolverines also contribute. Although hunting has not caused the decline, it will begin to have a higher impact as the population of caribou decreases (BRW01271506). Despite the higher natural mortality rates, interviewed hunters overwhelmingly felt that the caribou that they harvested during the study year were in good condition (BRW01241502, BRW01281503, BRW01271508, BRW01281509, BRW01241511, BRW01261515, BRW01271516). This opinion was echoed by biologists, who suggested that the healthy caribou may have benefited from a mild winter prior to the study year, and that a declining population may mean there is less competition among caribou for food (BRW01251504, BRW01271506, BRW01281512).

Hunters reported the decline has affected the availability of caribou, particularly near Utqiaġvik. Several key respondents stated that they had to travel significant distances in pursuit of the resource during fall of the study year, sometimes as far as 50 miles. Beyond the time and travel required, there is also an added financial burden because of the high cost of fuel in the community (BRW01281503, BRW01281509, BRW01271516, BRW01241511, BRW01281512). One key respondent explained that his family and others have chosen to limit their harvests out of concern for the declining population:

> There is the drop in numbers, and if my family really wanted we could have gone out and caught a bunch of cows, but we want to be proactive, you know what I mean. And try to be part of the solution, help it rebound, if it really is possible, if it's not as natural like folks are thinking. So it was a family decision and it was a choice we made…There were many families that didn't harvest because of what the herds are doing now. You know, there are many families that are very concerned about it, and if there's any ways that we could help, and that was one of the ways. (BRW01241511)

Some key respondents also felt that the high volume of air traffic in the region has a negative impact on the caribou by shifting herds and disturbing feeding grounds. Both development and research traffic were implicated, and 1 respondent stated that many hunters in Utqiaġvik are angered by these aerial disturbances (BRW01281512, BRW01251510, BRW01261515, BRW01271508).

Most of the remaining 1% of large land mammal harvests came from moose in 2014. This resource contributed 6,581 edible pounds (1 lb per capita) and was used by 14% of Utqiaġvik households during the study year (Table 6-5). Hunters took an estimated 12 moose; all were bulls taken in the month of September (Table 6-8). Some key respondents said they had harvested moose locally in recent years, but had noticed a significant decline in the population in the region (BRW01281503, BRW01271516, BRW01271506). Indeed, moose populations have recently declined rapidly, likely due to poor nutrition following a late spring and poor summer conditions in 2013. Moose surveys in 2014 indicated the population had dropped to approximately 109 from 400 the previous year. This led ADF&G to close draw permit hunts in GMU 26 and to shorten the general season for residents in Unit 26A by 2 weeks (ADF&G Division of Wildlife Conservation 2014b).

Brown bear was the only other large land mammal harvested by Utqiaġvik residents during the study year, and it contributed 526 lb to the estimated harvest, or 0.1 lb per person (Table 6-5). Although not harvested by residents, small numbers of Utqiaġvik households reported limited use of other large land mammals during the study year, including black bear, muskox, deer, and Dall sheep.

Figure 6-12 shows search and harvest areas used by Utqiaġvik hunters in search of caribou, moose, and brown bears in 2014. Residents covered a wide territory in pursuit of caribou during the study year, ranging approximately 170 miles along the coast from as far west as Wainwright to Teshekpuk Lake, east of Utqiaġvik. Hunters also searched inland for caribou, traveling in some cases as far south as the Ikpikpuk River drainage, approximately 160 miles south of Utqiaġvik. Two major hunting areas were reported for moose: one area was approximately 25 miles south of Utqiaġvik along the Inaru River, and the other larger area was approximately 90 miles to the southeast in along the Ikpikpuk River drainage and in the vicinity of Inicok Creek. Hunters also reported a search and harvest area for brown bear that was nearly as expansive as that for caribou, ranging east from Wainwright to southwest of Utqiaġvik.

Small Land Mammals/Furbearers

Utqiaġvik residents reported limited harvest of small land mammals in 2014, all of which were used for fur and contributed no weight to the total edible harvest (Figure 6-13). The most heavily harvested furbearers during the study year were foxes; hunters harvested an estimated 1,266 Arctic foxes and 116 red foxes, primarily in the winter months (tables 6-5 and 6-9). Hunters also harvested 37 wolverines, 6 gray wolves, and 49 Arctic ground squirrels. Small land mammals as a category were not widely used; only 8% of households reported using these resources, and 5% reported harvesting them. Some key respondents noted that the population of predators, particularly wolves, has increased over the last decade (BRW01251510, BRW01281503).

Figure 6-14 portrays areas used by Utqiaġvik hunters in pursuit of small land mammals during the study year. Hunters and trappers reported searching along the Topagoruk River from the immediate vicinity of Utqiaġvik and to the south, a distance of approximately 22 miles. A larger area was reported from Admiralty Bay south along the Ikpikpuk River and along the lakes and tributaries of the drainage; this search and harvest area was approximately 85 miles in length. Several smaller hunting areas were reported, including one near the Colville River southwest of Umiat.

Salmon

Salmon as a resource category composed 3% of Utqiaġvik's total estimated harvest during the study year; the resource contributed an estimated 57,262 lb (11 lb per capita; Table 6-4; Figure 6-7). Figure 6-15 shows the breakdown of the 2014 salmon harvest by species, the largest portion of which was chum salmon (42%). This resource provided 24,312 lb to the total estimated harvest, or 5 lb per person (Table 6-4). Twenty-four

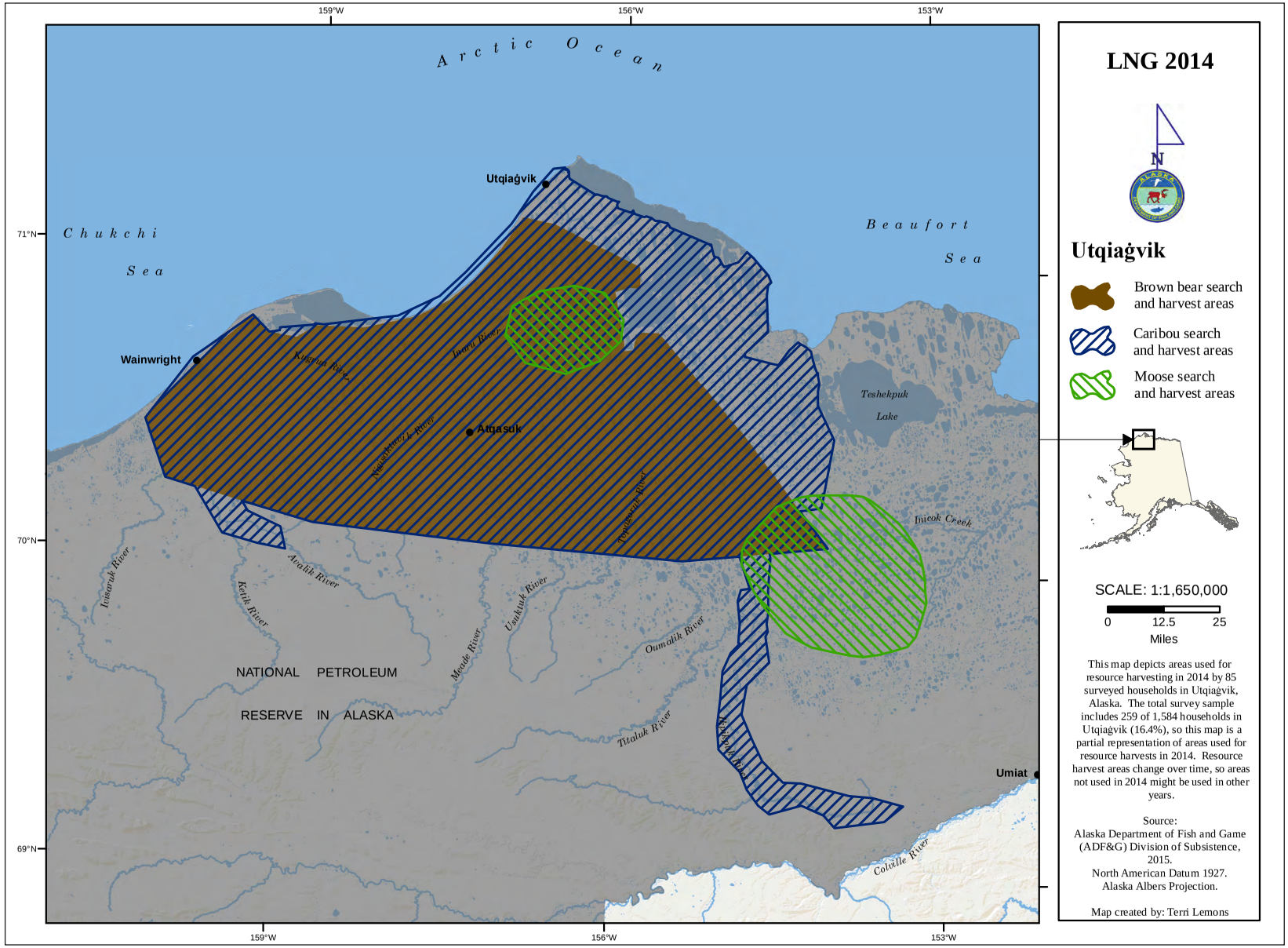


Figure 6-12.–Large land mammal hunting areas, Utqiaġvik, 2014.

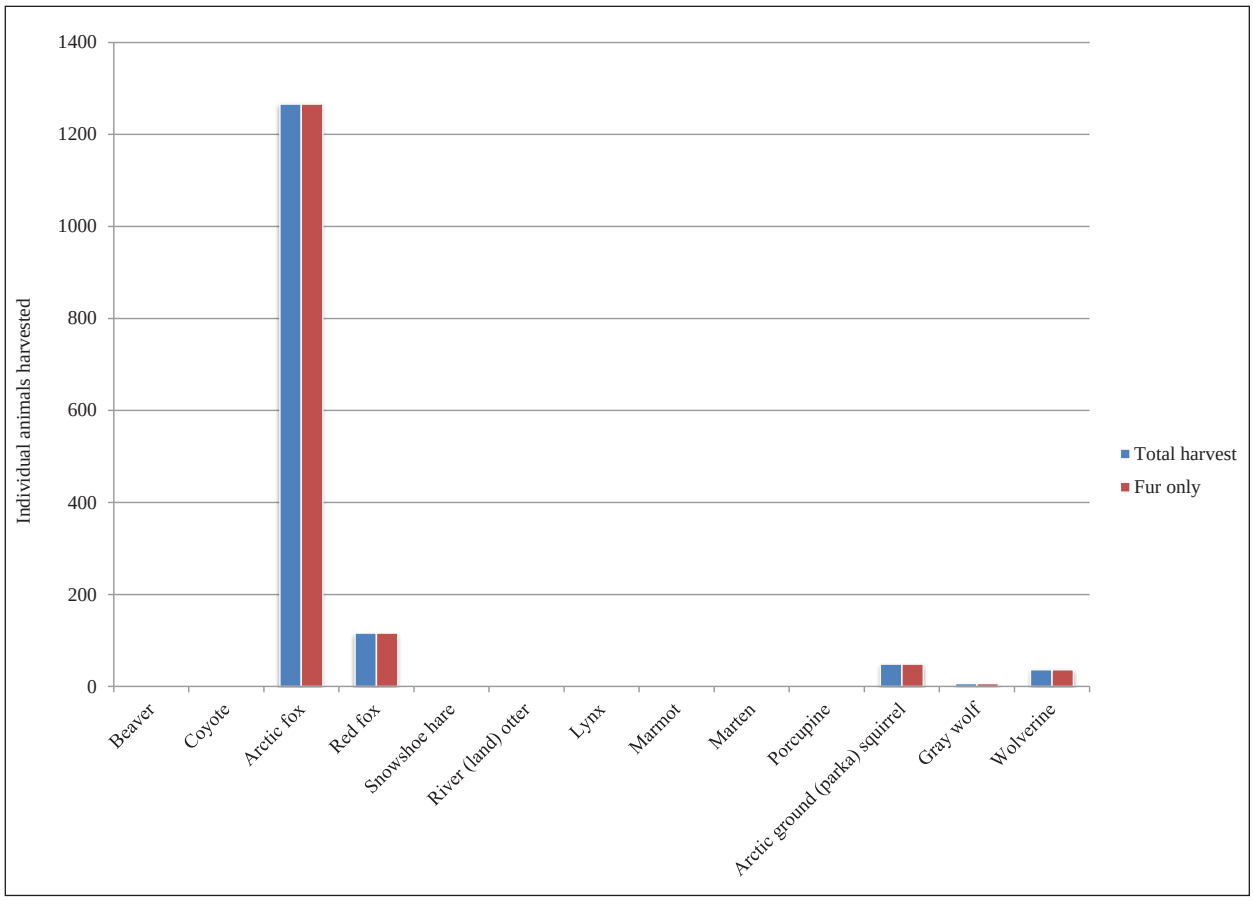


Figure 6-13.–Estimated small land mammal harvests for fur or food, Utqiaġvik, 2014.

Table 6-9.–Estimated small land mammal/furbearer harvests by month, Utqiaġvik, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All small land mammals	**422.0**	**422.0**	**397.5**	**6.1**	**0.0**	**0.0**	**0.0**	**30.6**	**18.3**	**6.1**	**67.3**	**97.9**	**6.1**	**1,473.9**
Beaver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Coyote	0.0	0.0	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 fox	360.8	391.4	366.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.2	79.5	6.1	**1,266.0**
Red fox	61.2	18.3	18.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.3	0.0	**116.2**
Snowshoe 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	**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	**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	**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	**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	**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	**0.0**
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.6	18.3	0.0	0.0	0.0	0.0	**48.9**
Gray wolf	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**6.1**
Wolverine	0.0	6.1	12.2	6.1	0.0	0.0	0.0	0.0	0.0	6.1	6.1	0.0	0.0	**36.7**

Source ADF&G Division of Subsistence household surveys, 2015.

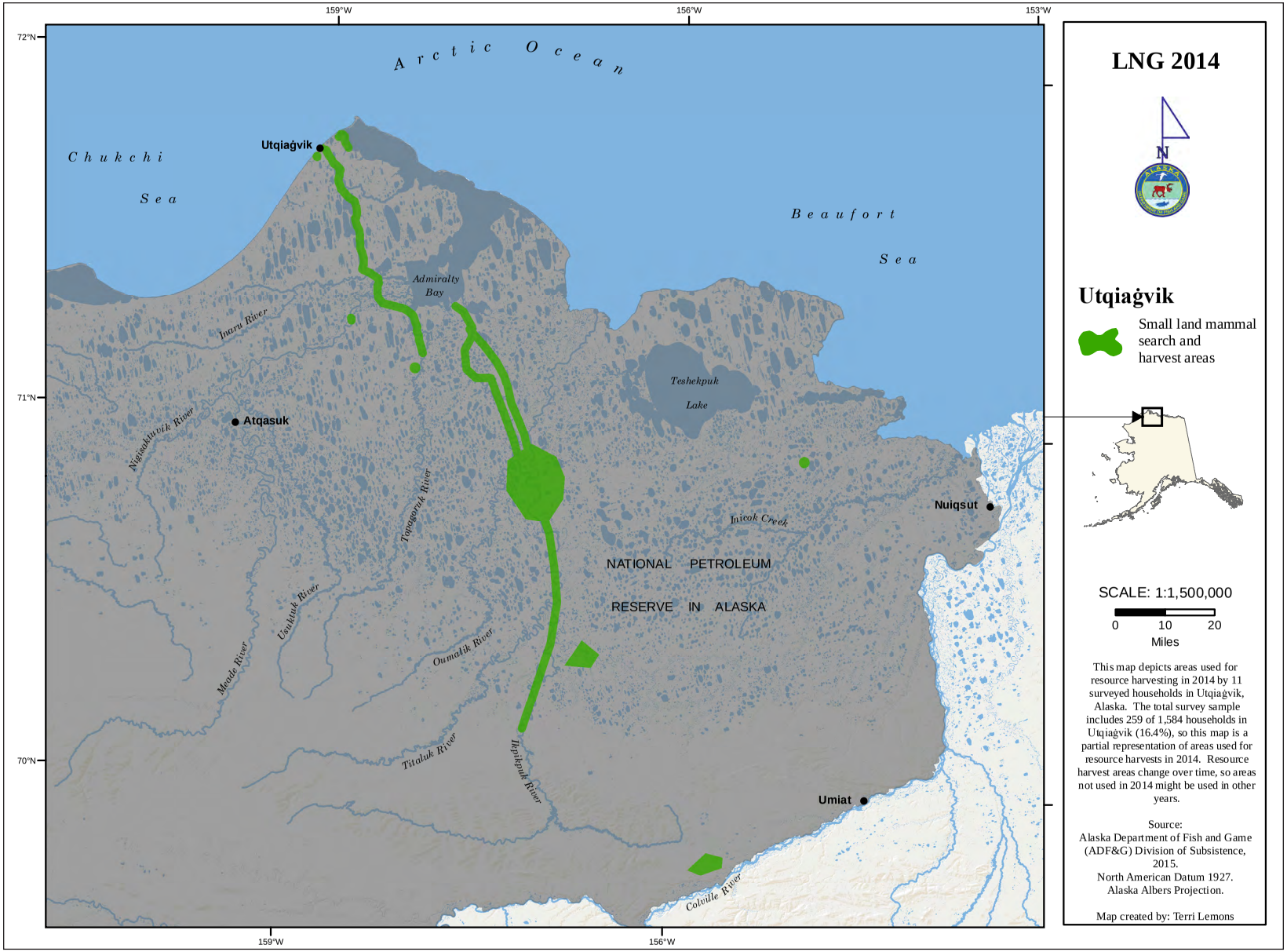


Figure 6-14.–Small land mammal hunting areas, Utqiaġvik, 2014.

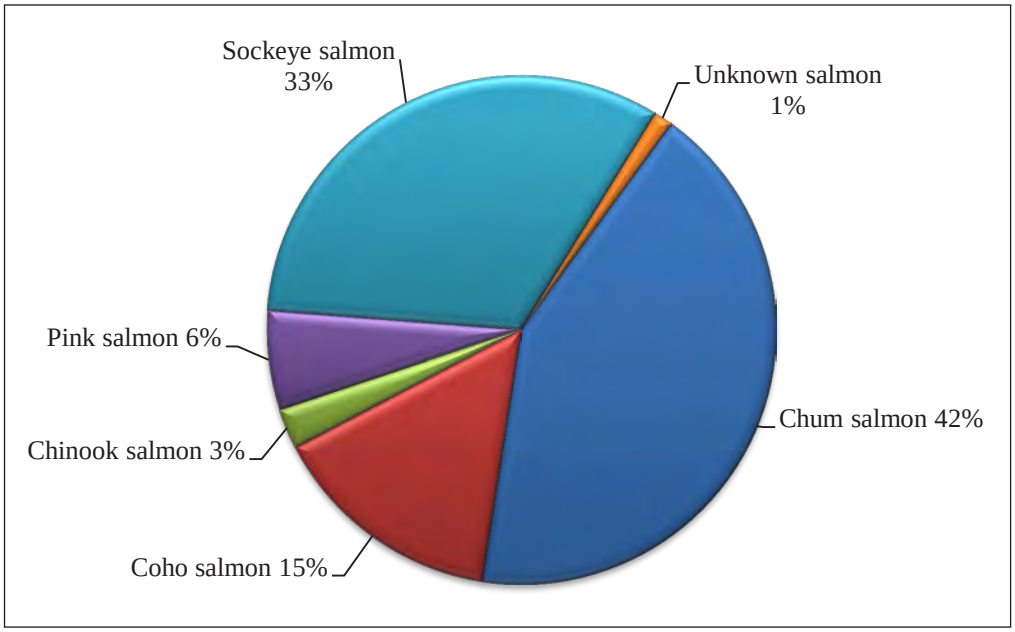


Figure 6-15.–Composition of salmon harvest by weight in usable pounds, Utqiaġvik, 2014.

percent of households reported using chum salmon, and 11% reported harvesting the resource. Sockeye salmon contributed the second highest edible weight to the total salmon harvest (33%), an estimated 18,667 lb (4 lb per capita; Table 6-4; Figure 6-15). Although sockeye salmon are regionally available, they are less common than other species; the total estimated harvest of this resource is likely largely composed of sockeye salmon taken elsewhere in the state. This species was the most heavily used of any salmon species (29% of households) and was more widely shared than any other salmon species (Table 6-4). Utqiaġvik residents also reported lesser harvests of coho salmon (15% of the salmon harvest, 8,532 lb), pink salmon (6%, 3,598 lb), and Chinook salmon (3%, 1,474 lb; Table 6-4; Figure 6-15). Many key respondents felt that salmon populations in the Utqiaġvik region had increased in the last decade and that some uncommon species are showing up in greater abundance (BRW01241502, BRW01281503, BRW01271506, BRW01261515, BRW01271516). Although Chinook salmon have always been present, several fishers noted that they have harvested a larger number in recent years. Some key respondents also noted that sockeye salmon appear to be more abundant and that some salmon are making their way into lakes in the region (BRW01271506, BRW01281503, BRW01271516). One key respondent said that the common perception that salmon are increasing may be tied to a growing interest in fishing for them:

> Salmon was particularly good out of the Utqiaġvik area [during the study year]. And folks are asking, "Well, is it because there's more salmon, or is it because people are targeting them?" and I think it's because people are targeting them, you know. Being that they're there and maybe less caribou so let's get more salmon, I don't know. (BRW01241511)

Salmon identification can also be an issue on the North Slope, where ocean-bright chum salmon are often referred to as "silvers;" this can lead to chum salmon harvests being misreported as coho salmon (BRW01241502).

Figure 6-16 and Table D6-6 show the gear types used to harvest each type of salmon. Fishers in Utqiaġvik harvested 3,886 chum salmon (23,392 lb) using setnets, which accounted for 96% of all chum salmon harvests. The remaining chum salmon (153 fish, 920 lb) was removed from commercial catches in other parts of the state. The largest portion of the coho salmon harvest (35%) also came from setnets: an estimated 577 fish, or 2,967 lb. For coho salmon, the other method bar shows dip net harvests taken in other regions of the state, which accounted for 520 fish (2,673 lb); the limited fish wheel harvests of coho salmon were also taken in the Chitina area (38 fish, 189 lb). Utqiaġvik fishers also harvested coho salmon by rod and reel

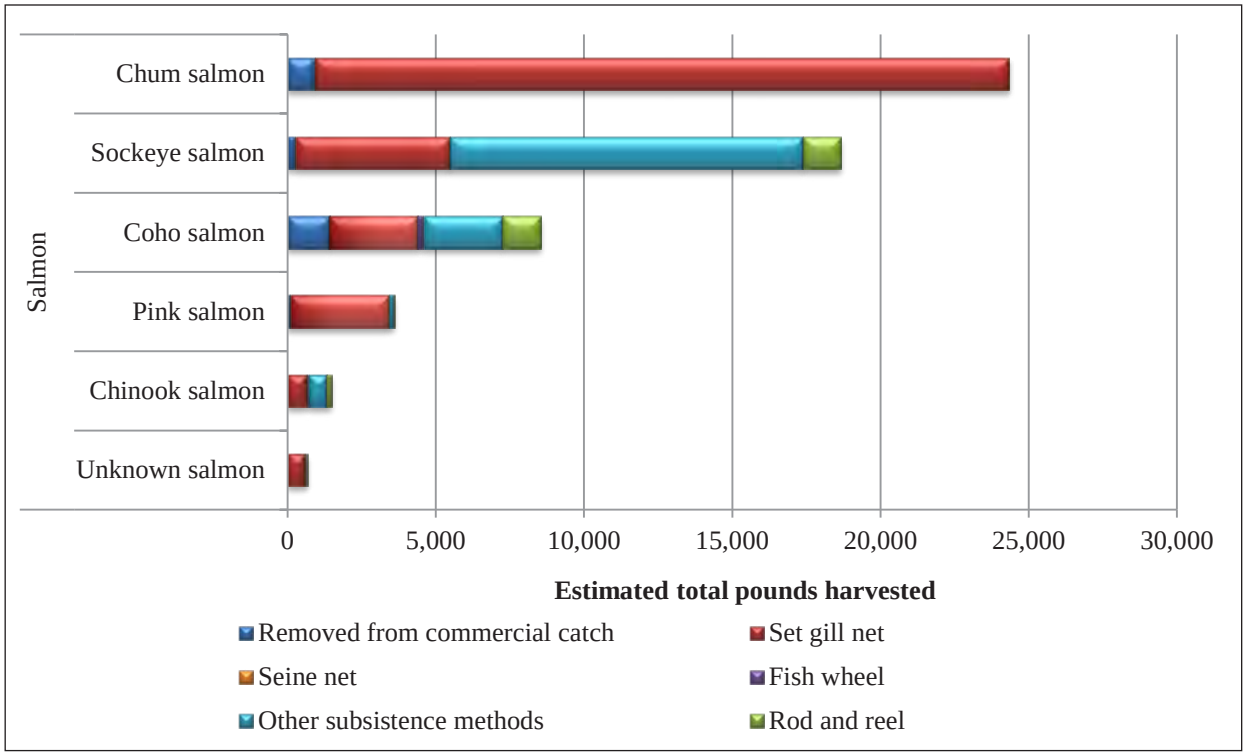


Figure 6-16.–Salmon harvests by gear type, Utqiaġvik, 2014.

(251 fish, 1,289 lb) and removed the resource from commercial catches (275 fish, 1,415 lb). For Chinook salmon, catches were split fairly evenly between setnet (73 fish, 637 lb) and other method, which again refers to dipnetting in other areas of the state (72 fish, 624 lb). Limited catches of Chinook salmon (6 fish, 53 lb) were also harvested by fish wheel in the Chitina region. Utqiaġvik fishers harvested the majority of pink salmon (93%) with setnets, which accounted for 1,345 fish (3,340 lb). Limited harvests were attained with dip nets (other method; 61 fish, 152 lb) and removed from commercial catches (31 fish, 76 lb), both of which occurred in different regions of Alaska. A majority of the sockeye salmon harvest (64%) came from other regions of the state and was taken by dip net: an estimated 2,954 fish (11,910 lb). Utqiaġvik fishers harvested 1,297 sockeye salmon in setnets (5,228 lb), and removed a small number from commercial catches (61 fish, 247 lb).

Table D6-6 shows the estimated salmon harvest for feeding dogs, which was limited in scope in Utqiaġvik during the study year. Residents fed an estimated 12 pink salmon, or 30 lb, to dogs.

Figures 6-17 and 6-18 show search and harvest areas for Utqiaġvik residents in pursuit of all salmon species. Areas for salmon fishing on the North Slope were widespread, with fishing locations as far from the community as Point Lay, along the Kukpowruk and Kokolik Rivers, and along the coast (Figure 6-16). Fishers also reported salmon fishing near the community of Wainwright at the mouth of the Kuk River. Several search and harvest areas were reported near Utqiaġvik, along the coast to the southeast and northwest of town. Scattered areas were reported south of the community, including the Elson Lagoon, the Nigisaktuvik River drainage, Oumalik River drainage, and the Ikpikpuk River drainage. Utqiaġvik residents also reported fishing in other areas of the state along the road system; these include the Copper River, Anchorage, Kenai, Soldotna, Kasilof, and Homer (Figure 6-17).

Nonsalmon Fish

Nonsalmon fish as a resource category contributed 10% to Utqiaġvik's total estimated harvest in 2014, an estimated 196,049 lb (37 lb per capita; Table 6-5; Figure 6-7). Figure 6-19 shows the composition of the nonsalmon fish harvest by edible weight. Broad whitefish composed the vast majority (72%) of the

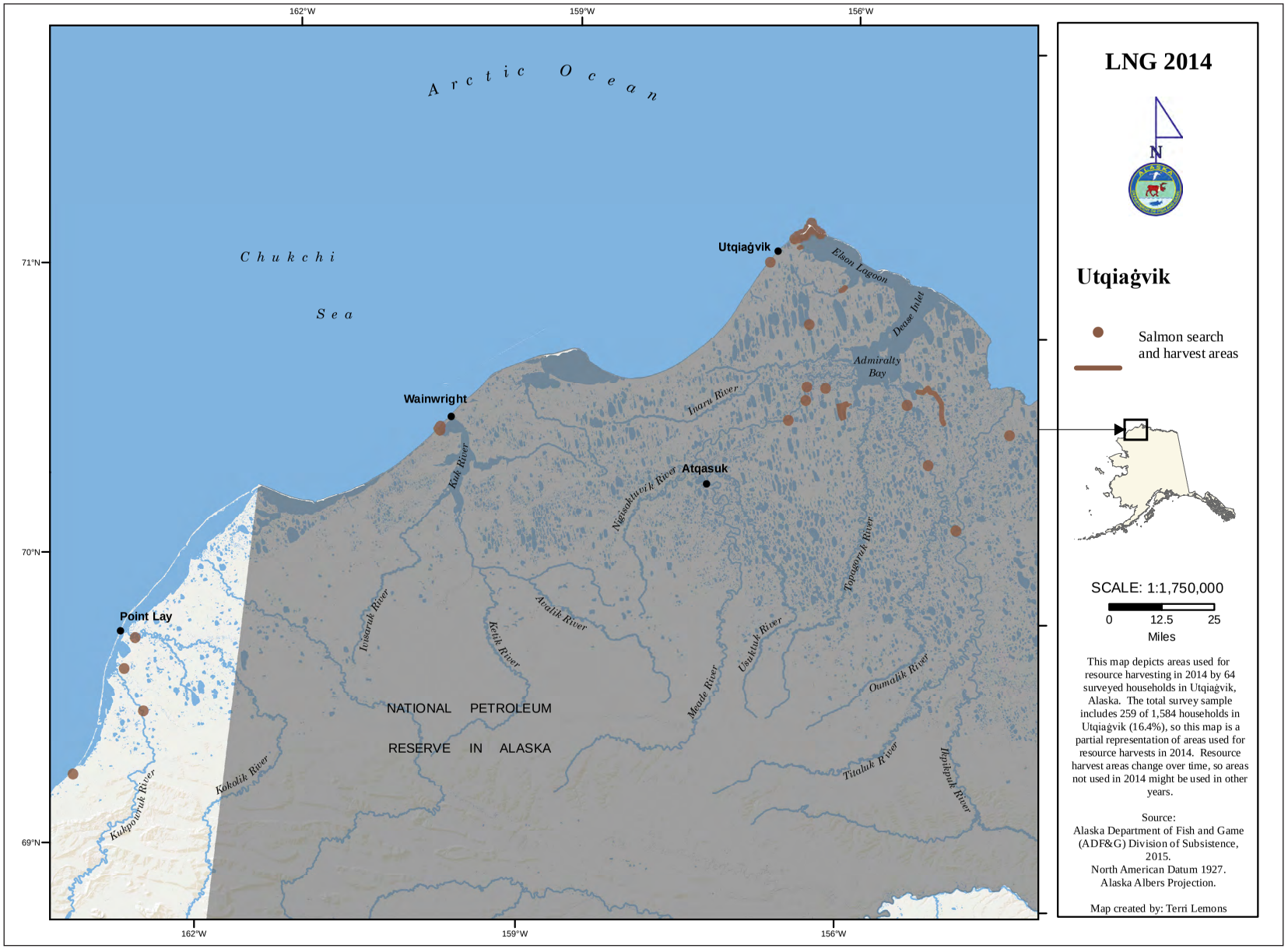


Figure 6-17.–Salmon fishing areas, Barrow, 2014.

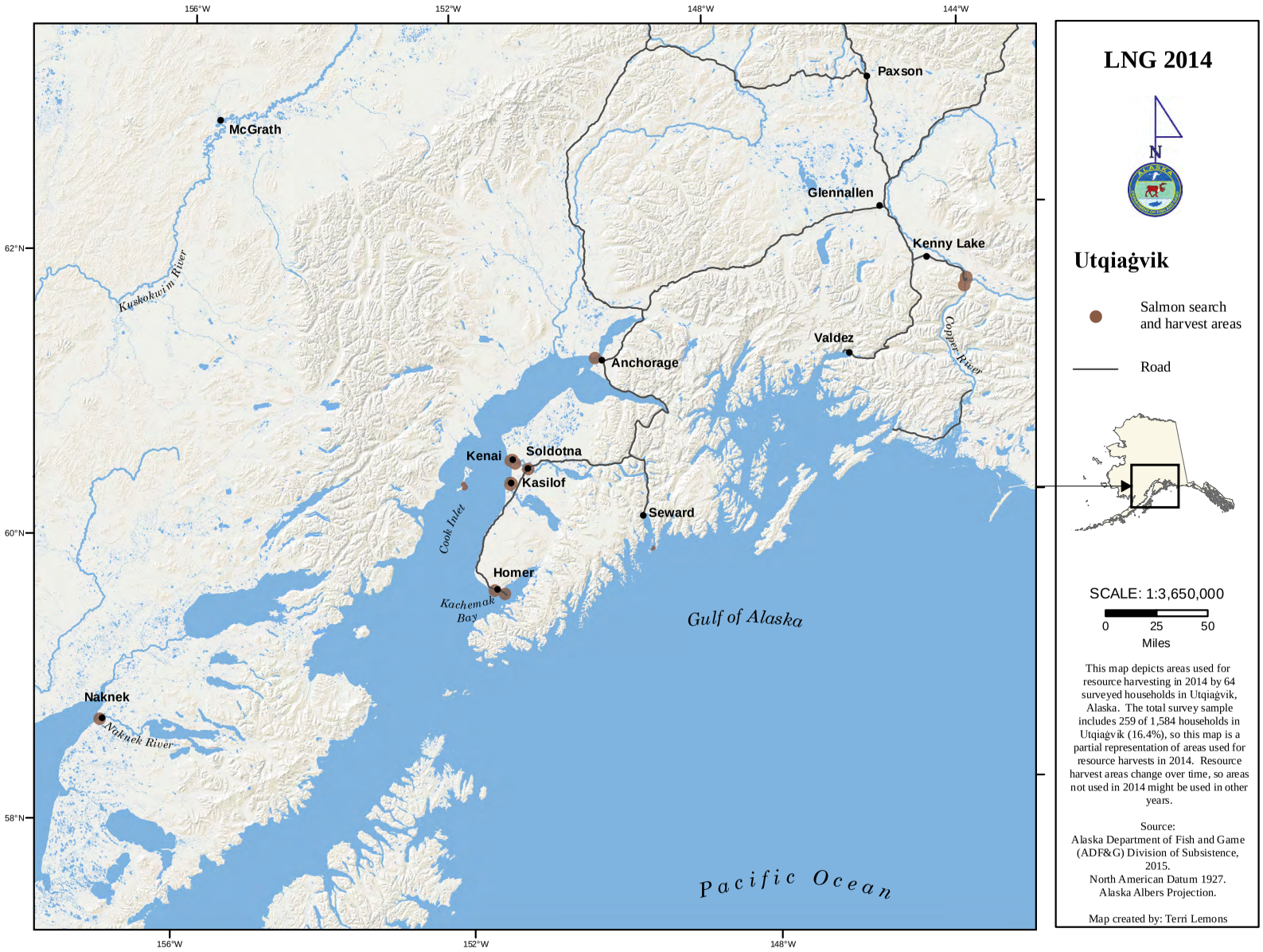


Figure 6-18.–Nonlocal salmon fishing areas, Barrow, 2014.

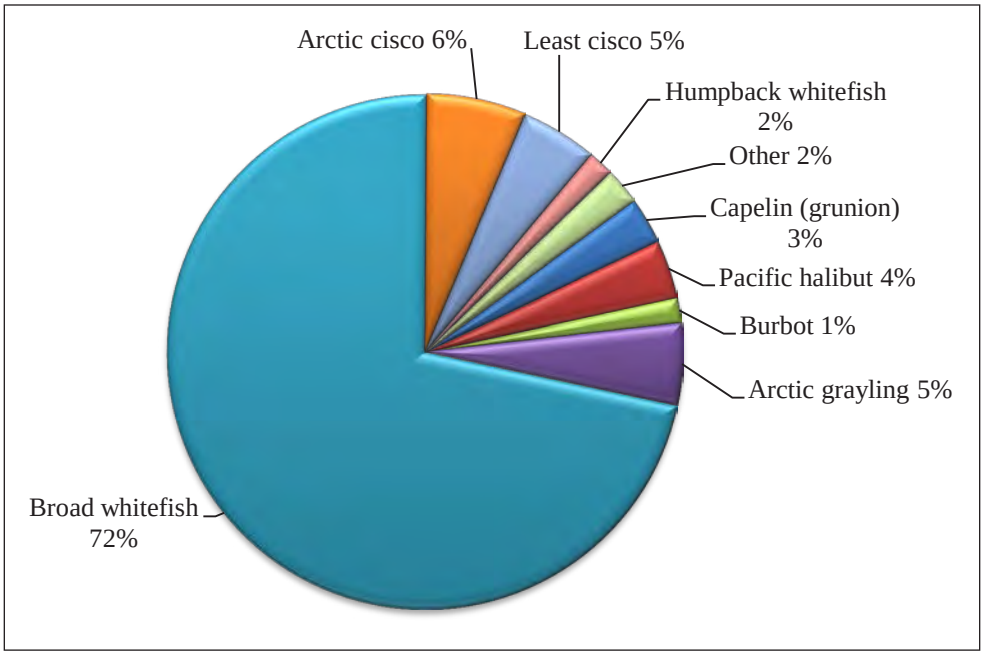


Figure 6-19.–Composition of nonsalmon fish harvest by weight in usable pounds, Utqiaġvik, 2014.

nonsalmon harvest during the study year, an estimated 140,679 lb (27 lb per capita; Table 6-5; Figure 6-19). This resource was the most widely used nonsalmon species during the study year (54% of households), and it was the most widely shared: 40% of households received broad whitefish and 29% gave it away during the study year. Other whitefish species included in the 2014 harvest were Arctic cisco (6% of the nonsalmon fish harvest, 12,257 lb), least cisco (5%, 9,363 lb), and humpback whitefish (2%, 3,149 lb). Arctic grayling contributed 5% to the nonsalmon fish harvest, an estimated 10,056 lb (2 lb per capita). Although not locally available, Pacific halibut composed 4% of the nonsalmon harvest (7,285 lb, 1 lb per capita). Capelin composed 3% of the nonsalmon fish harvest (5,764 lb), and burbot accounted for 1% (3,057 lb). Utqiaġvik residents reported limited use and harvest of other nonsalmon fish species; more detail about these harvests can be found in Table 6-5.

Key respondents highlighted the importance of whitefish, particularly broad whitefish, to the local diet; some respondents described it as a staple food (BRW01281507, BRW01241511). Although most respondents felt that the population overall was healthy, some mentioned occasionally catching broad whitefish that are deformed, and some expressed concern that the water mold that affected fish near Nuiqsut might become a problem in their fishing locations (BRW01261515, BRW01241502, BRW01281503). In 2013, fishers in Nuiqsut reported an unusual skin illness in broad whitefish, which was later identified as saprolegnia fungus brought about by warmer water temperatures (North Slope Borough Department of Wildlife Management 2013).[12] Key respondents also expressed concern about environmental changes, especially the timing of freeze-up on rivers. Because freeze-up is occurring later in the year, it is sometimes not possible to set nets under the ice prior to the fall spawning window for broad whitefish (BRW01281507, BRW01241511). A few key respondents noted that erosion has caused water levels to drop in formerly productive lakes in the region (BRW01271516, BRW01271506).

Figure 6-20 and Table D6-7 show the gear types used to harvest nonsalmon fish species. Setnets were the most commonly used gear to harvest whitefish species; 62,677 whitefish (129,776 lb, 78% of the whitefish harvest by weight) were taken with this method. Most remaining whitefish harvests (21%) were taken with "other method," which in this case refers to jigging and setnets placed under the ice. Limited harvests of

12. North Slope Borough Department of Wildlife. The Towline Newsletter, Fall 2013, Vol. 5 No. 2. http://www.north-slope.org/assets/images/uploads/NSB-DWM_Fall_2013_Newsletter.pdf

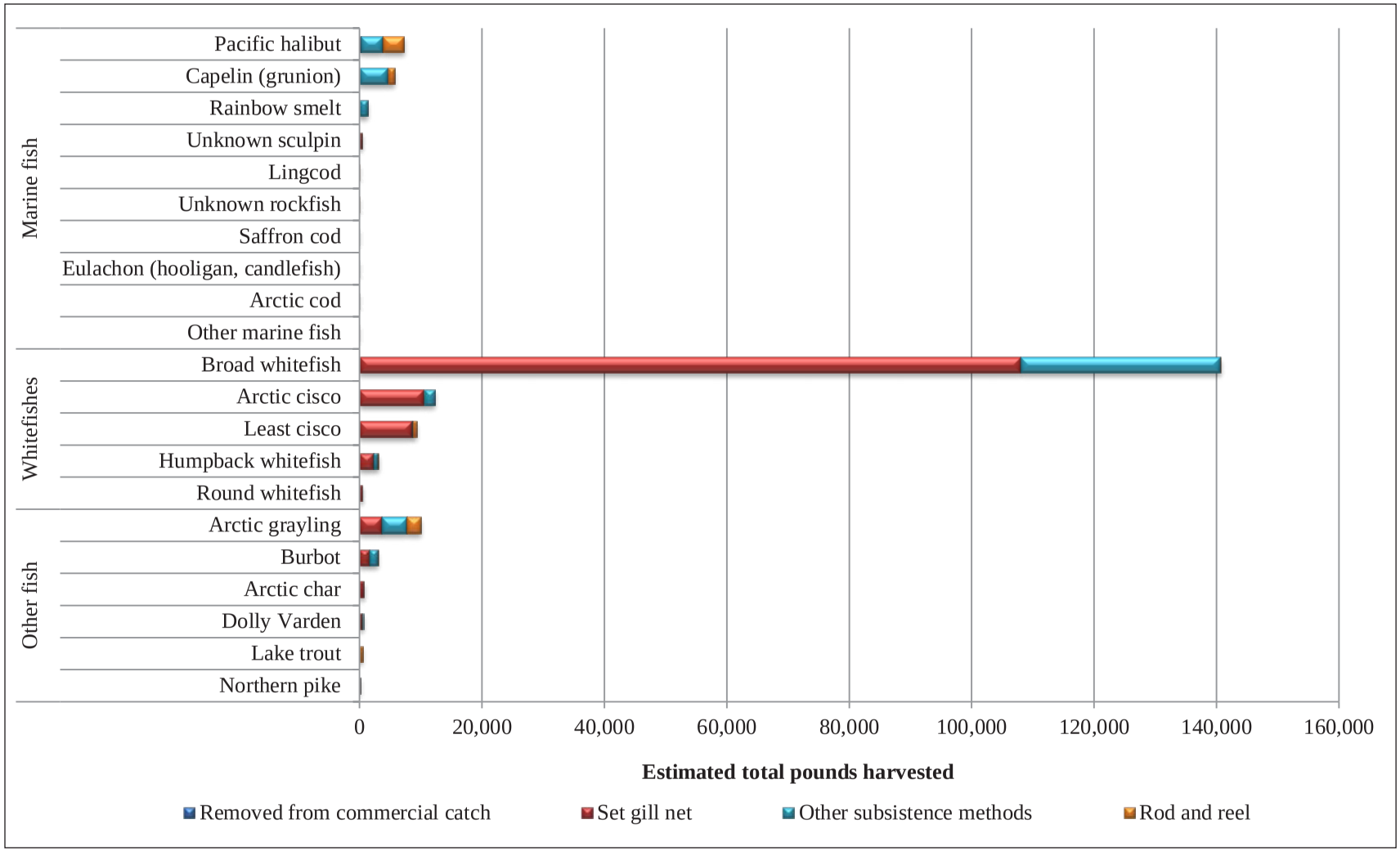


Figure 6-20.–Nonsalmon fish harvests by gear type, Utqiaġvik, 2014.

whitefish were taken with rod and reel. Utqiaġvik fishers employed a variety of methods to harvest Arctic grayling during the study year. The largest component of the Arctic grayling harvest (41%) came from "other methods," primarily jigging through the ice; fishers caught 4,574 fish employing this method, an estimated 4,117 lb. Forty percent (4,024 fish, 3,622 lb) of Arctic grayling harvests were taken by setnet in open water. The remaining harvest of this resource was taken with rod and reel; Utqiaġvik fishers caught 2,575 fish (2,317 lb) with this method. Capelin was largely harvested by dip net (here, "other method"), which accounted for 1,407 fish (4,572 lb). Pacific halibut was the only nonsalmon fish species that was removed from commercial harvests (259 lb).

Table D6-6 shows the estimated nonsalmon fish harvest for feeding dogs, which was limited in Utqiaġvik during the study year. Residents fed 61 saffron cod (13 lb) and 612 least ciscoes (428 lb) to their dogs.

Figure 6-21 shows search and harvest areas used by Utqiaġvik fishers in pursuit of all nonsalmon species. Many of the fishing locations are within 60 miles of the community, and include the drainages of the Inaru, Nigisaktuvik, Topagoruk, and Ikpikpuk rivers. Fishers also reported harvesting nonsalmon species in more distant locations, including the Kuk River near Wainwright and the Meade River near Atqasuk. The map inset shows search and harvest areas in other areas of the state along the road system. Utqiaġvik residents reported fishing areas near Wasilla, Whittier, Seward, and Port Graham during the study year.

Birds and Eggs

Birds and eggs collectively contributed 50,022 lb to Utqiaġvik's total estimated harvest of wild foods during the study year and accounted for 3% of the total harvest (Table 6-5; Figure 6-7). Figure 6-22 shows the breakdown of the bird harvest by edible weight. White-fronted goose composed 59% of the total harvest of birds and eggs, contributing 29,745 lb (5 lb per capita; Table 6-5; Figure 6-22). It was the most widely used avian resource (39% of households), and it was shared more widely than any other species in the category. Other goose species also featured heavily into Utqiaġvik's 2014 harvest of birds and eggs: Canada or cackling geese composed 3% of the total bird and egg harvest (1,413 lb), snow geese contributed 3% (1,387 lb), brant composed 2% (949 lb), and unknown geese accounted for 4% of the harvest (2,148 lb). Key respondents overall felt that geese populations were healthy and abundant, and several mentioned that snow geese have become more plentiful in recent years (BRW01241502, BRW01281503, BRW01261515, BRW01271516).

Two duck species collectively contributed 23% to the total estimated harvest of birds and eggs: king eider and common eider (Figure 6-22). King eider was the second most heavily harvested bird species during the study year, contributing 15% to the total bird harvest (7,539 lb, 1.4 lb per capita; Table 6-5; Figure 6-7). Common eider composed 8% of the harvest, contributing an estimated 4,095 lb (0.8 lb per capita). Key respondents felt that the population of eiders in the region is healthy, although an older key respondent stated that they were even more abundant during his youth (BRW01241502, BRW01281503, BRW01261515, BRW01271516). Hunters take great care not to harvest Steller's and spectacled eiders because they are protected species. One hunter explained that the markings on spectacled eiders make them easy to spot, and Steller's eiders often fly in their own small flocks, which are easily differentiated from the larger flocks of king and common eiders (BRW01241502).

Utqiaġvik hunters also harvested nonmigratory birds and eggs during the study year. Ptarmigans and ruffed grouse collectively contributed 638 lb to the total estimated harvest; hunters harvested 887 ptarmigans and 25 ruffed grouse (Table 6-5). Eggs collectively contributed 1,113 lb, 923 lb of which were geese eggs.

The majority of migratory bird harvests (80%) occurred during the spring months of April, May, and June (Table 6-10). Hunters took 97% of all geese (11,338 birds) during the spring; key respondents explained that geese taste better after their spring migration and are less desirable in the fall months (BRW01241502, BRW01271516). Harvests of ducks occurred primarily in the spring and summer seasons; hunters harvested 53% of ducks (3,956 birds) in the spring and 38% (2,783 birds) in the summer. A majority of nonmigratory bird harvests also occurred in spring; hunters took 697 ptarmigans during this season (77%). Limited harvests of ptarmigans and ruffed grouse occurred in the summer, fall, and winter months.

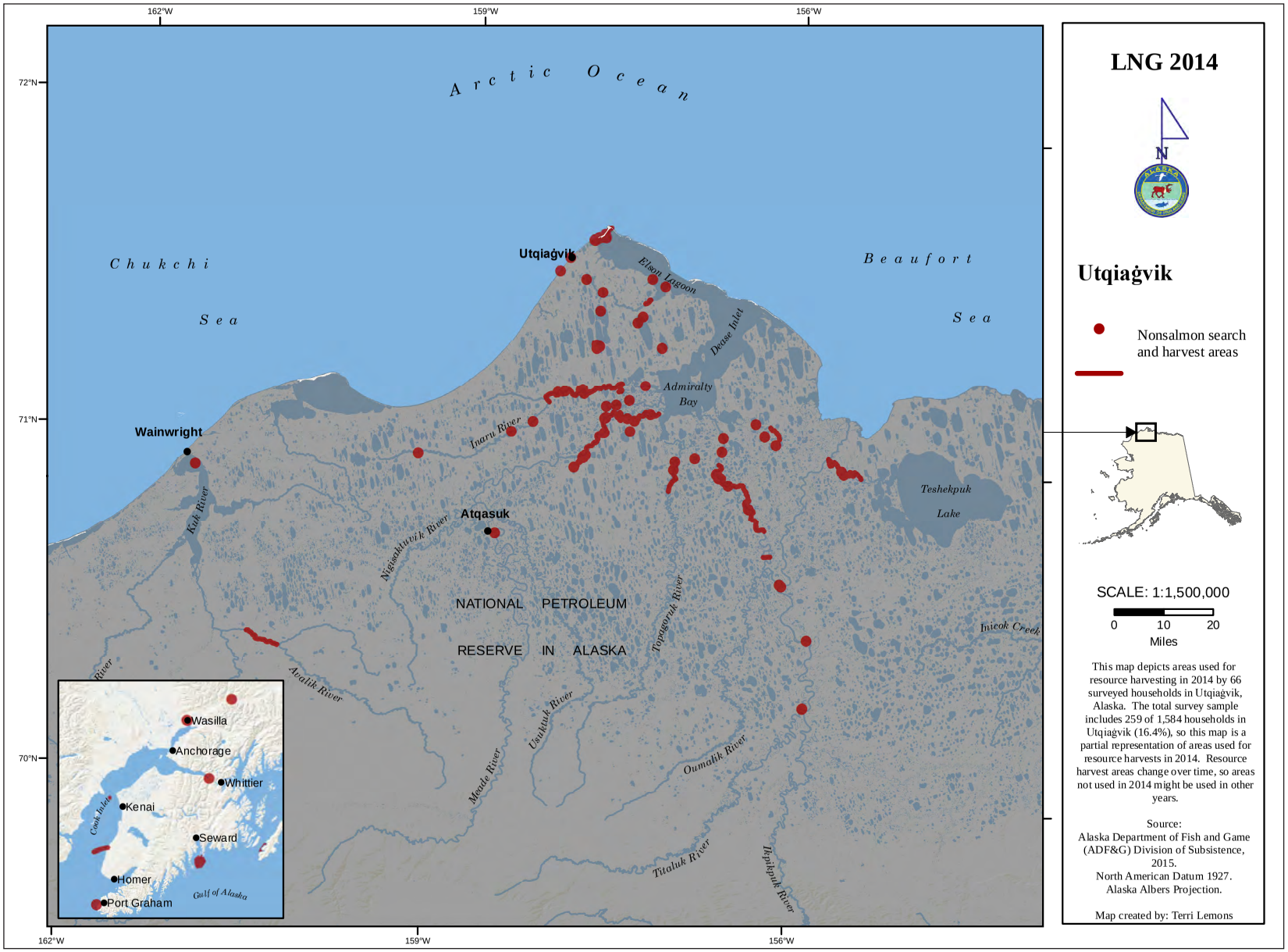
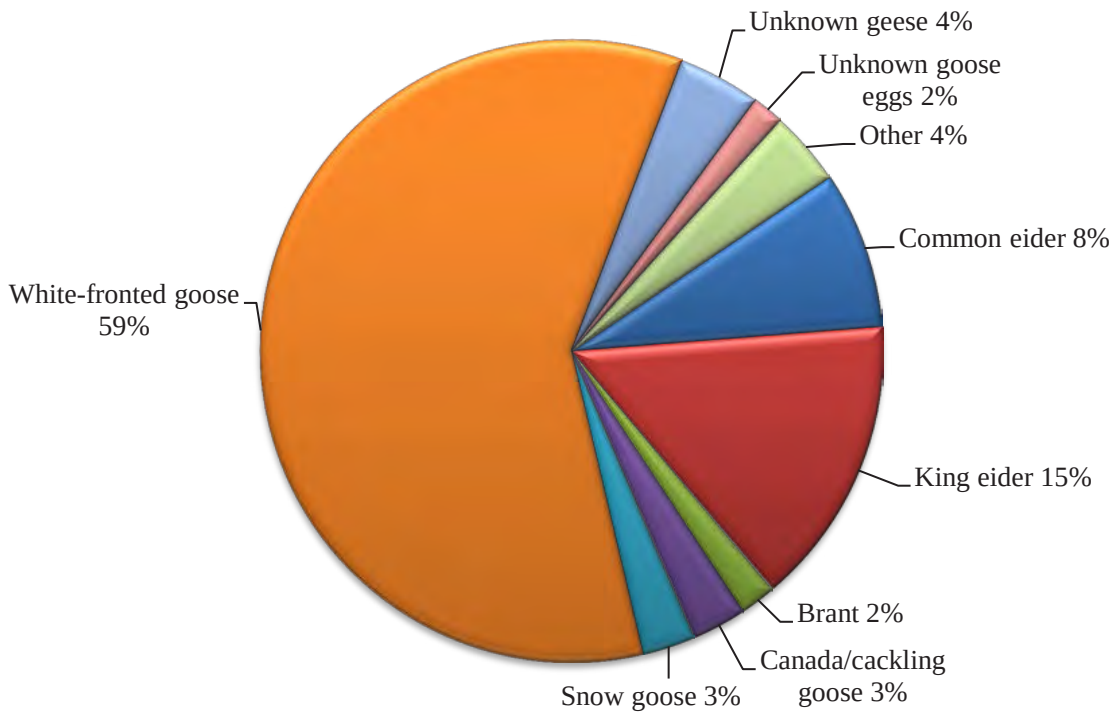


Figure 6-21.–Nonsalmon fishing areas, Utqiaġvik, 2014.



Note The Other category includes species providing less than 1.5% each to the per capita harvest.

Figure 6-22.–Composition of bird and bird egg harvest by weight in usable pounds, Utqiaġvik, 2014.

Figure 6-23 shows the search and harvest areas used by Utqiaġvik hunters in pursuit of ducks and geese, ptarmigans, and eggs during the study year. Several overlapping search and harvest areas for each of these resources occurred within 40 miles of the community. Duck and goose harvest areas extended into the ocean near Utqiaġvik; hunters often target migratory birds on the ice in the spring, sometimes coinciding with whaling activities. All egg search and harvest areas were within 20 miles of Utqiaġvik, with the exception of smaller areas reported along the Inaru River and one about 25 miles east of Atqasuk. Overall, hunters reported ranging farther for migratory bird species during the study year than nonmigratory species, going as far as 90 miles southeast of Utqiaġvik near Teshekpuk Lake. Ptarmigan harvests were largely within 40 miles of the community, although smaller areas were reported on the banks of Teshekpuk Lake and near the Ikpikpuk River about 80 miles south of Utqiaġvik.

Marine Invertebrates

Utqiaġvik residents reported limited harvests of marine invertebrates during the study year; this resource category collectively contributed an estimated 1,096 lb (0.2 lb per capita; Table 6-5). Figure 6-24 shows the breakdown of the 3 species of marine invertebrates harvested by Utqiaġvik households in 2014. Mussels contributed 54% to the marine invertebrate harvest (587 lb), unknown clams contributed 45% (495 lb), and razor clams, taken elsewhere in the state, contributed 1% (14 lb).

Vegetation

Vegetation as a category contributed less than 1% to Utqiaġvik's total estimated harvest in 2014, an estimated 2,975 lb (0.6 lb per capita; Table 6-5; Figure 6-7). Figure 6-25 shows the composition of the vegetation harvest; the weight of the harvest was largely berries (95%) during the study year. Cloudberries composed 60% of the total vegetation harvest and 64% of the total berry harvest; this resource contributed 1,793 lb and was among the top ranked resources used by Utqiaġvik households during the study year (tables 6-5 and 6-6). Blueberries were the second most harvested plant resource during the study year, an estimated

Table 6-10.–Estimated bird harvests by season, Utqiaġvik, 2014.

	Estimated harvest by season					
Resource	Spring	Summer	Fall	Winter	Season unknown	**Total**
All birds	**16,033.8**	**2,905.0**	**923.5**	**97.9**	**0.0**	**19,960.2**
Common eider	880.7	837.9	134.5	0.0	0.0	**1,853.1**
King eider	2,880.6	1,944.8	446.5	0.0	0.0	**5,271.8**
Spectacled eider	17.0	0.0	0.0	0.0	0.0	**17.0**
Steller's eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown eiders	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	0.0	0.0	0.0	0.0	0.0	**0.0**
Merganser	0.0	0.0	0.0	0.0	0.0	**0.0**
Long-tailed duck	61.2	0.0	116.2	0.0	0.0	**177.4**
Northern pintail	30.6	0.0	0.0	0.0	0.0	**30.6**
Black scoter	0.0	0.0	0.0	0.0	0.0	**0.0**
Green-winged teal	0.0	0.0	0.0	0.0	0.0	**0.0**
Wigeon	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown ducks	85.6	0.0	24.5	0.0	0.0	**110.1**
Brant	495.4	6.1	91.7	0.0	0.0	**593.2**
Canada/cackling goose	428.1	0.0	0.0	0.0	0.0	**428.1**
Snow goose	385.3	0.0	0.0	0.0	0.0	**385.3**
White-fronted goose	9,491.2	48.9	55.0	0.0	0.0	**9,595.2**
Unknown geese	538.2	0.0	0.0	0.0	0.0	**538.2**
Unknown swans	30.6	0.0	0.0	0.0	0.0	**30.6**
Unknown cranes	0.0	6.1	0.0	0.0	0.0	**6.1**
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	**0.0**
Whimbrel	0.0	0.0	0.0	0.0	0.0	**0.0**
Godwit	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Guillemot	0.0	0.0	0.0	0.0	0.0	**0.0**
Glaucous gull	0.0	0.0	0.0	0.0	0.0	**0.0**
Sabine's gull	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown loons	12.2	0.0	0.0	0.0	0.0	**12.2**
Unknown murres	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown terns	0.0	0.0	0.0	0.0	0.0	**0.0**
Ruffed grouse	0.0	0.0	18.3	6.1	0.0	**24.5**
Unknown ptarmigans	697.2	61.2	36.7	91.7	0.0	**886.8**
Snowy owl	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2015.

699 lb (Table 6-5). Utqiaġvik residents reported limited harvest of cranberries, crowberries, elderberries, raspberries, and strawberries during the study year. Wild greens composed 5% of the vegetation harvest, collectively contributing 143 lb. The mostly heavily harvested wild greens were sourdock (45 lb) and stinkweed (28 lb). Residents also harvested a small amount of mushrooms.

Utqiaġvik residents reported a large search area for berries and greens during the study year, with no harvests within 5 miles of the community (Figure 6-26). Gatherers ranged as far west as the Point Lay and as far south as 25 miles south of Atqasuk. Residents also reported traveling as far as 95 miles southwest of Utqiaġvik along the Ikpikpuk River drainage in pursuit of vegetation in 2014.

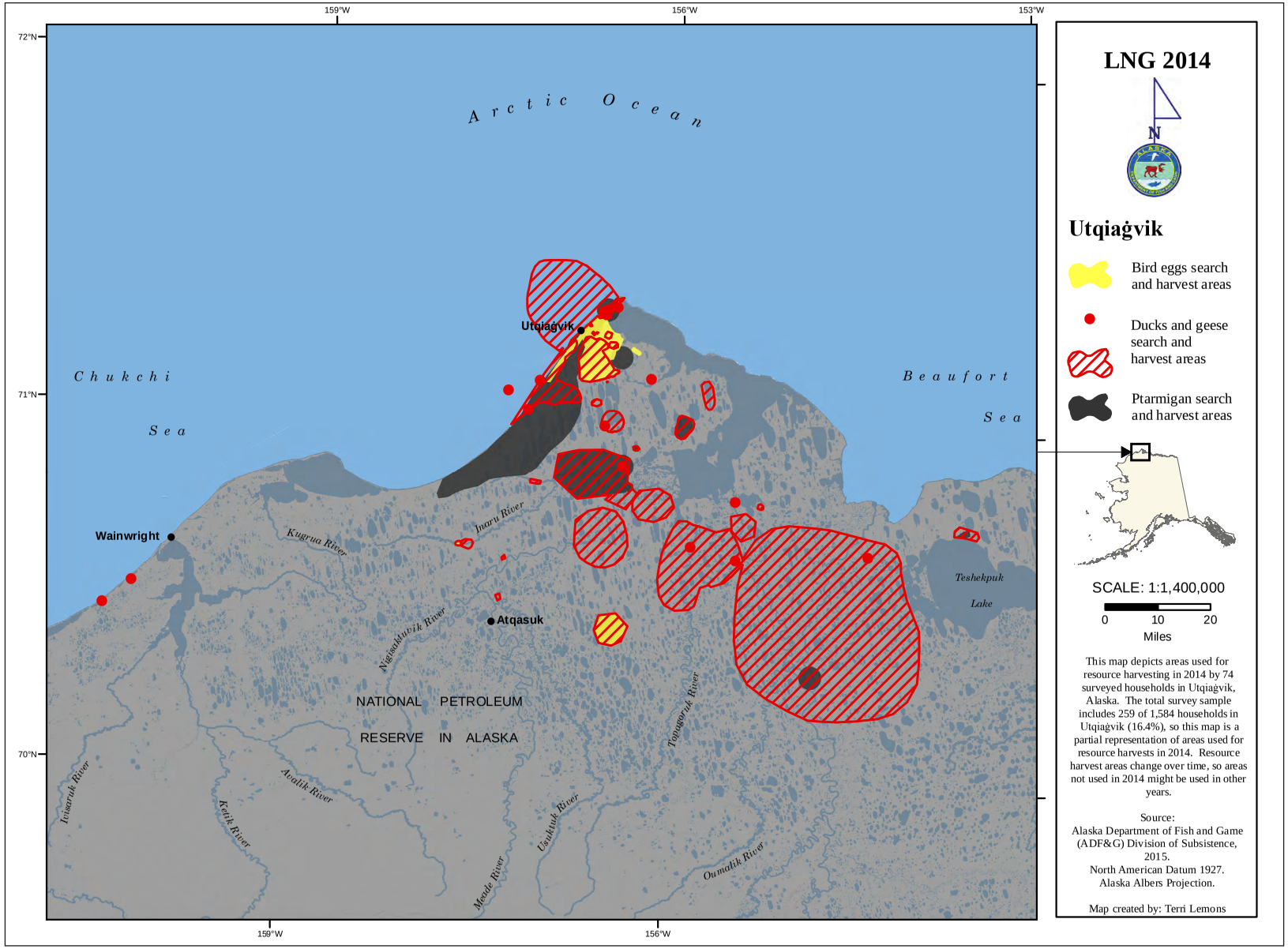


Figure 6-23.–Bird hunting and bird egg gathering areas, Utqiaġvik, 2014.

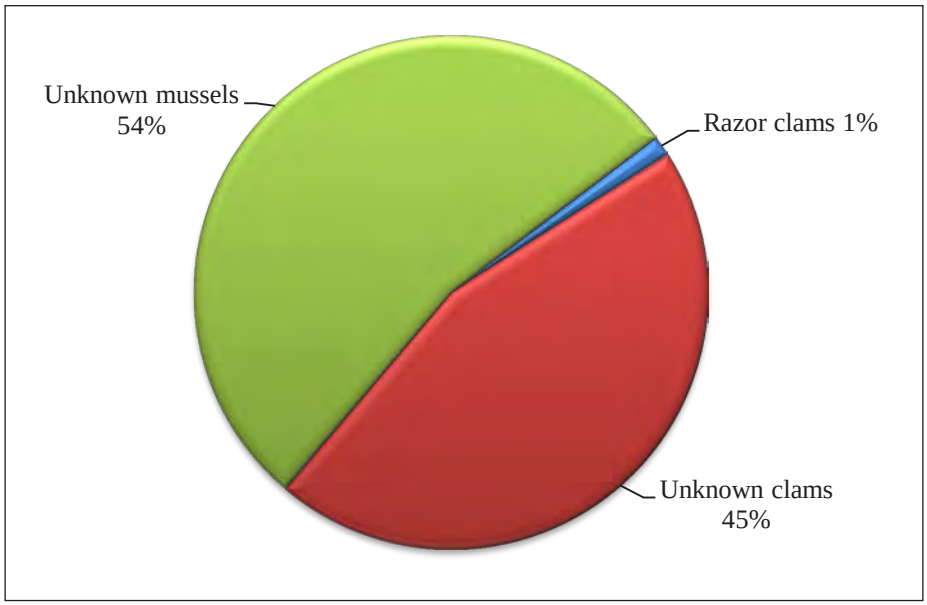


Figure 6-24.–Composition of marine invertebrates harvest by weight in usable pounds, Utqiaġvik, 2014.

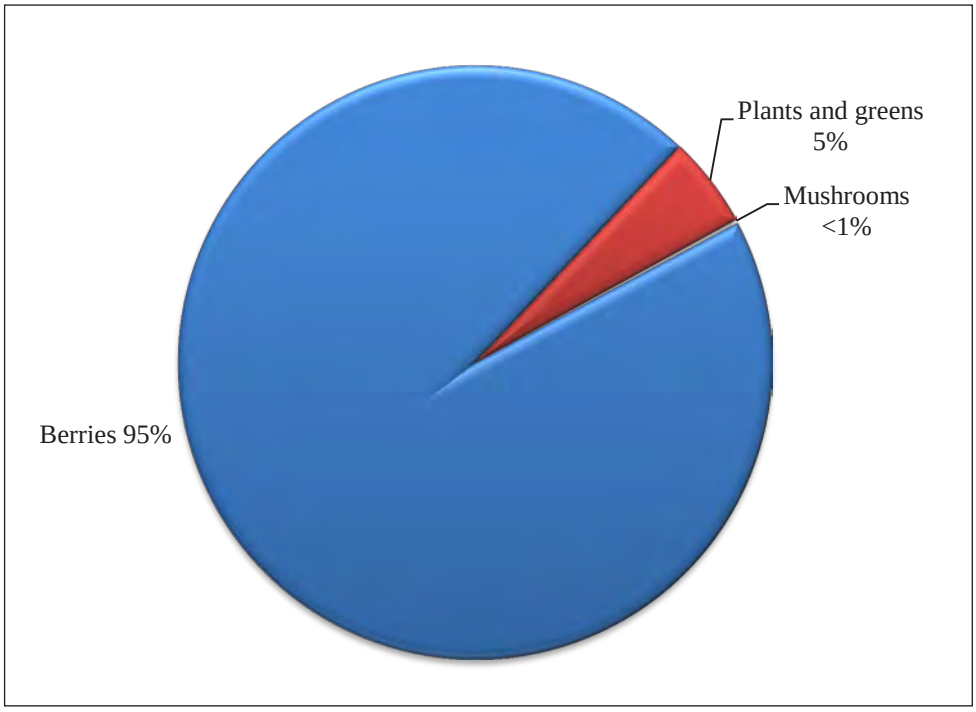


Figure 6-25.–Composition of vegetation harvest by weight in usable pounds, by type of vegetation, Utqiaġvik, 2014.

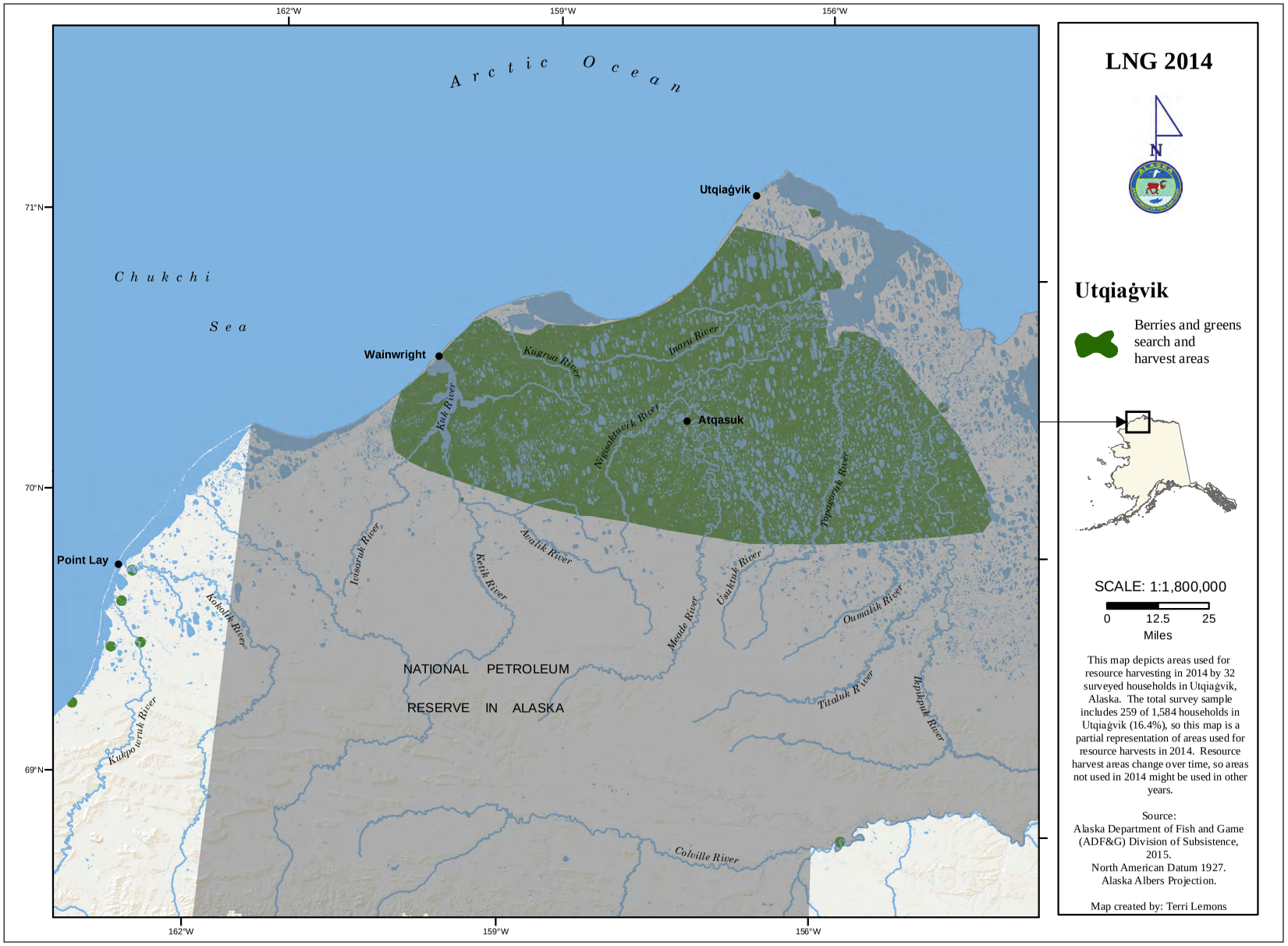


Figure 6-26.–Berries and greens gathering areas, Utqiaġvik, 2014.

Production and Distribution of Wild Resources

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.

In the 2014 study year in Utqiaġvik, about 9% of the harvests of wild resources as estimated in pounds usable weight were harvested by 70% of the community's households (Figure 6-27). The specialization figure excludes bowhead whale harvests, but is still remarkable for the low percentage of households harvesting a majority of the resources. Further analysis of the study findings, beyond the scope of this report, might identify characteristics of the highly productive households in Utqiaġvik and the other study communities.

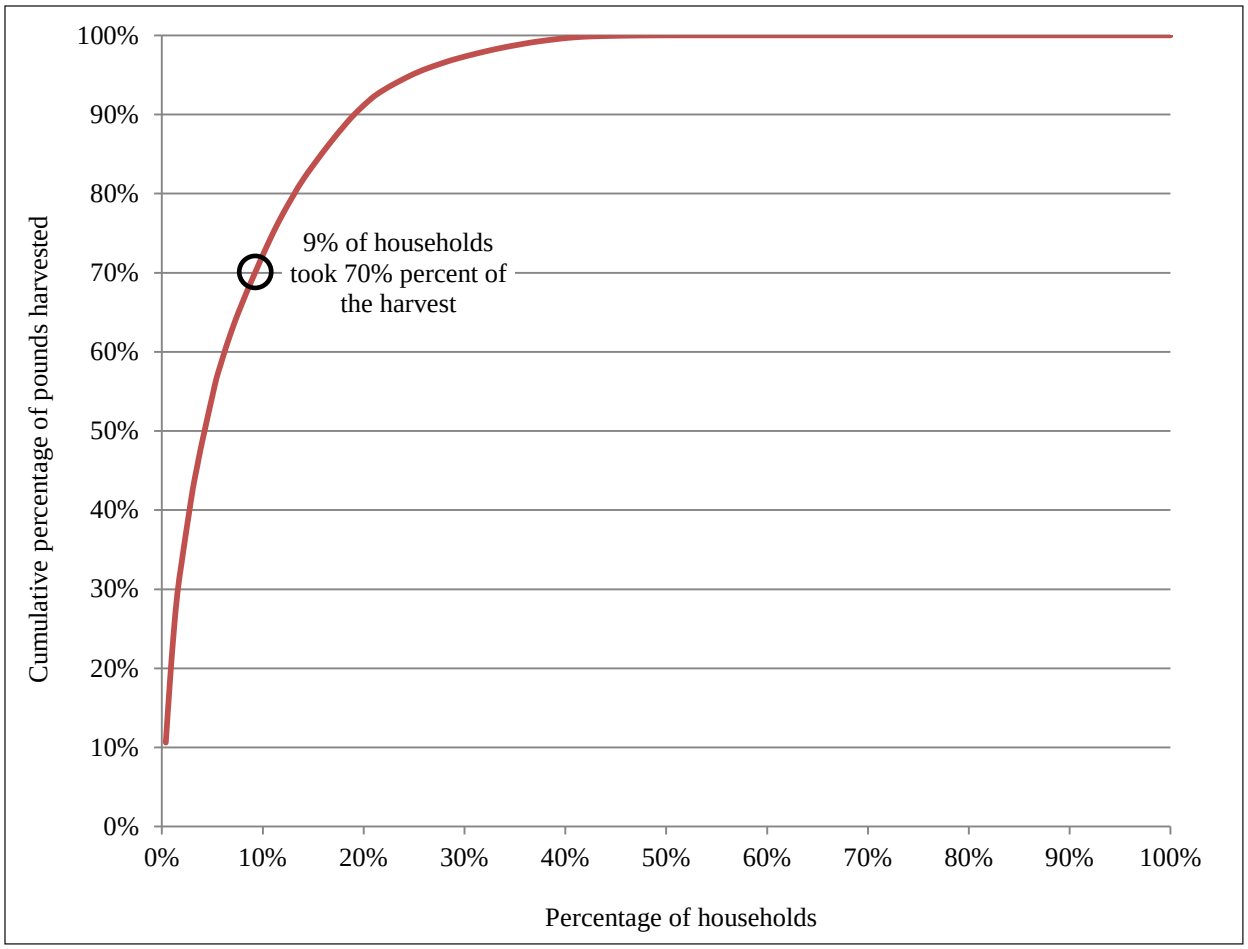


Figure 6-27.–Household specialization, Utqiaġvik, 2014.

Table 6-11.–Estimated earned and other income, Utqiaġvik, 2014.

Income source	Number of employed adults	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government, including tribal	1531	1054	$92,643,072	$76,088,031 – $109,275,674	$58,487	49.3%
Services	543	455	$34,196,565	$22,777,435 – $47,108,082	$21,589	18.2%
Transportation, communication, and utilities	216	204	$16,496,273	$9,770,240 – $27,345,663	$10,414	8.8%
State government	85	79	$4,601,260	$1,691,698 – $8,959,922	$2,905	2.4%
Retail trade	105	92	$3,594,257	$1,507,257 – $7,113,327	$2,269	1.9%
Federal government	59	59	$2,827,346	$829,419 – $5,283,216	$1,785	1.5%
Construction	92	86	$2,130,432	$593,803 – $4,793,908	$1,345	1.1%
Mining	26	26	$1,254,832	$218,728 – $3,308,799	$792	0.7%
Other employment	26	26	$948,653	$145,435 – $2,709,313	$599	0.5%
Manufacturing	33	33	$189,793	$17,894 – $1,251,395	$120	0.1%
Agriculture, forestry, and fishing	20	20	$94,112	$0 – $301,300	$59	0.1%
Earned income subtotal	**2,538.1**	**1,429.5**	**$158,976,595**	**$137,349,850 – $181,520,130**	**$100,364**	**84.5%**
Other income						
Native corporation dividend		923	$15,945,490	$13,386,628 – $19,065,543	$10,067	8.5%
Alaska Permanent Fund dividend		1,394	$8,481,359	$7,704,748 – $9,293,160	$5,354	4.5%
Pension / retirement		122	$1,624,077	$596,597 – $3,047,436	$1,025	0.9%
Social Security		128	$1,364,000	$690,925 – $2,377,186	$861	0.7%
Disability		61	$385,229	$78,715 – $815,698	$243	0.2%
Rental income		12	$315,577	$0 – $888,019	$199	0.2%
Food stamps		73	$278,587	$107,663 – $514,493	$176	0.1%
Other		18	$275,824	$0 – $818,298	$174	0.1%
Meeting honoraria		18	$158,278	$0 – $439,606	$100	0.1%
Unemployment		37	$117,563	$24,463 – $320,498	$74	0.1%
Child support		12	$35,302	$0 – $106,734	$22	0.0%
Supplemental Security Income		6	$35,227	$0 – $70,454	$22	0.0%
Adult public assistance (OAA, APD)		6	$14,678	$0 – $29,356	$9	0.0%
Veterans assistance		6	$14,678	$0 – $29,356	$9	0.0%
Heating assistance		6	$7,339	$0 – $14,678	$5	0.0%
Longevity bonus		6	$14	$0 – $9,559	$0	0.0%
TANF (Temporary Assistance for Needy Families)		0	$0	$0 – $0	$0	0.0%
Workers' compensation / insurance		0	$0	$0 – $0	$0	0.0%
Foster care		0	$0	$0 – $0	$0	0.0%
CITGO fuel voucher		0	$0	$0 – $0	$0	0.0%
Other income subtotal		**1,431.1**	**$29,053,221**	**$13,386,628 – $19,065,543**	**$18,342**	**15.5%**
Community income total			**$188,029,816**	**$166,181,491 – $210,391,717**	**$118,706**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.

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 2014, Utqiaġvik households earned or received an estimated $188 million of which $159 million (85%) was from earned income and approximately $29 million (15%) was from other sources (Table 6-11). The total earned income estimate of this survey ($159 million) was 40% higher than the ADLWD estimate of $106 million in 2014[13]. The 2014 median income for Utqiaġvik as estimated by this study was $106,884, which is higher than the 2010–2014 ACS estimate of $82,976. There is some overlap in the 95% confidence interval between the 2 estimates; the lower end of the Division estimate range overlaps the higher end of the ACS range (Table D6-8, Figure 6-28). Median income estimates for Utqiaġvik by both the ACS and this study are significantly higher than the ACS median income estimate for Alaska as a whole ($71,829); the high cost of living in Utqiaġvik often means that salaries are higher than similar jobs elsewhere in the state.

Figure 6-29 shows the top 10 sources of income for Utqiaġvik residents during the study year. The largest source was local government jobs, which included city, borough, and tribal occupations; this category accounted for 49% of all income in Utqiaġvik, an estimated $92.6 million dollars (Table 6-11; Figure

13. Alaska Department of Labor and Workforce Development (ADLWD) Research and Analysis Section, Juneau. n.d. "Alaska Local and Regional Information: Utqiaġvik city." Accessed March 27, 2016. http://live.laborstats.alaska.gov/alari/

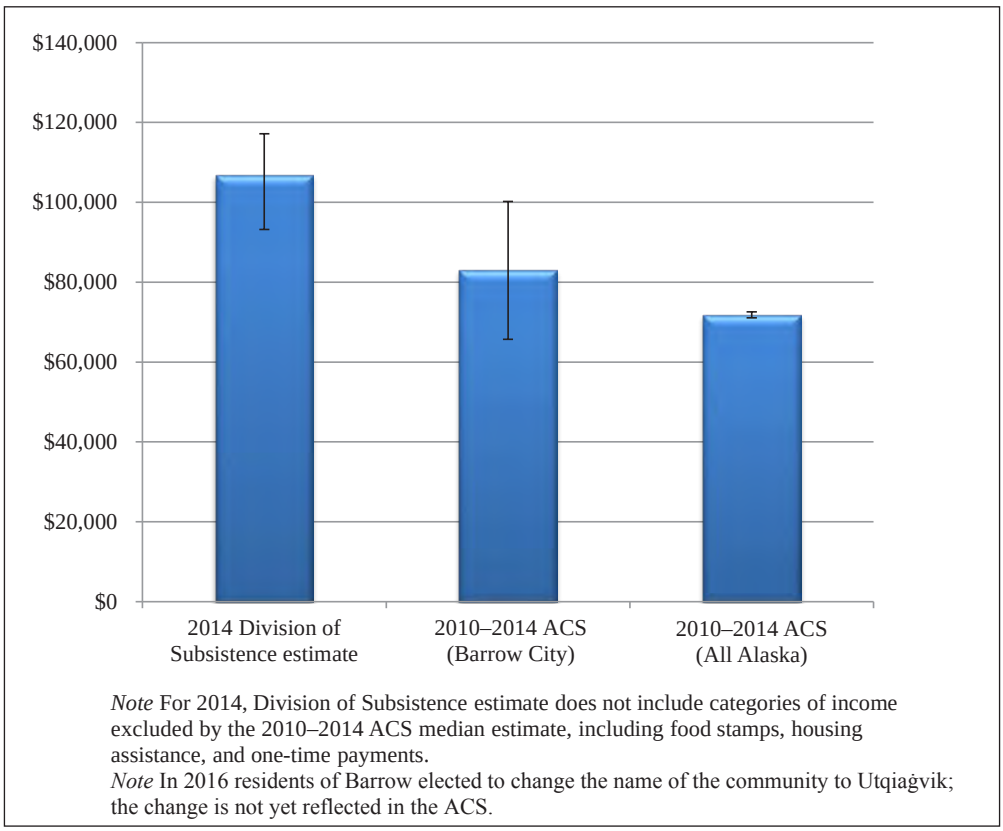


Figure 6-28.–Comparison of median income estimates, Utqiaġvik, 2014.

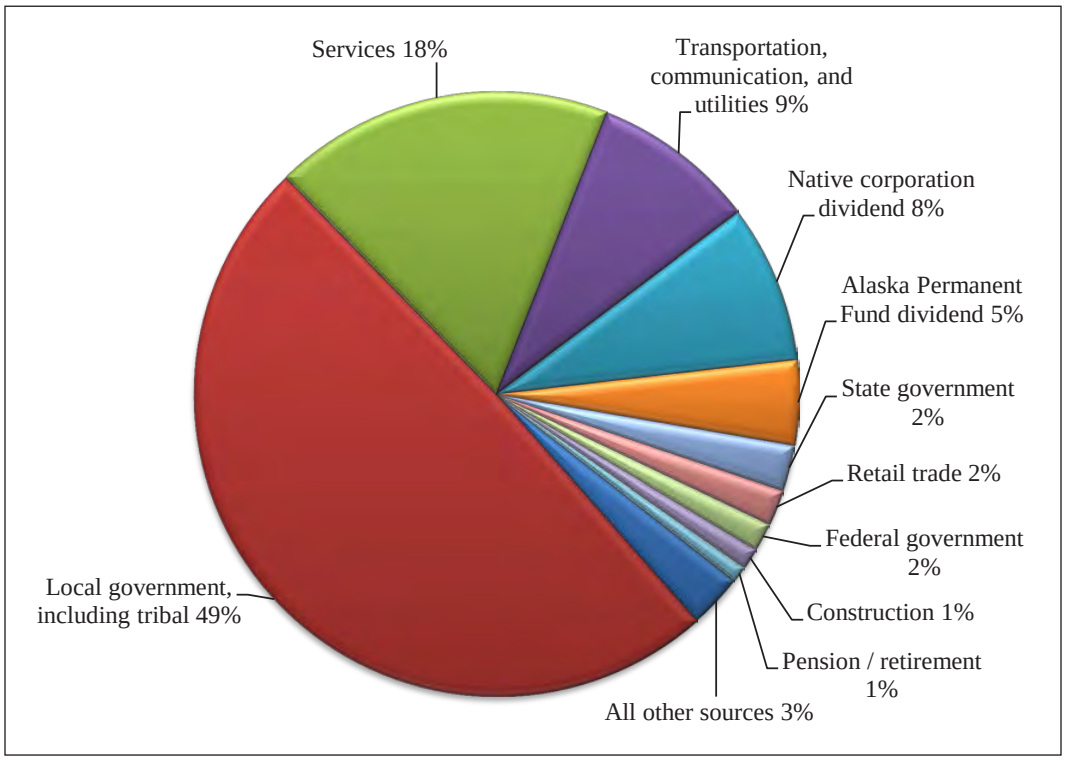


Figure 6-29.–Top income sources, Utqiaġvik, 2014.

6-29). Services, which included health care and social service jobs, was the second largest employment category; jobs in this sector accounted for $34.2 million in wages and composed 18% of the local economy. Jobs in the transportation, communication, and utilities sector contributed $16.5 million (9%) and Native corporation dividends contributed $15.9 million (8%). Other important sources of income included the Alaska Permanent Fund dividend (5%), state government (2%), retail trade (2%), federal government (2%), construction (1%), and retirement income (1%; Figure 6-29).

Over one-half of people (69%) aged 16 and older were employed for some period of time during the study year, and 78% of adults with a job were employed year round (Table 6-12). Of those respondents that disclosed a job schedule, 87% were employed full time, 6% part time, and 6% had an on-call schedule (Table 6-13). The average number of jobs per household was 2, with a maximum of 6 jobs held by a household (Table 6-12). Workers were employed an average of 11 months, which indicates some seasonal employment. For information on employment by industry, see Table 6-14.

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). 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).

Table 6-15 shows the responses to the filter question at the beginning of the food security survey; if households affirmed the statement "We had enough of the kinds of food we wanted to eat," then they were not asked any further food security questions. During the study year, 53% of households reported that they had enough of the kinds of food that they wanted, while 38% indicated that they did not always have access to the kinds of food they wanted, and 5% reported that they sometimes, or often, did not have enough food to eat. For those that described their household without enough food or without the desired kinds of food, core questions and responses from Utqiaġvik residents are summarized in Figure 6-30. The largest source of food insecurity (22% of households) was lacking the resources to get food; a lack of resources could include equipment or supplies needed to hunt, fish, or gather wild foods, as well as money needed to purchase store-bought goods. Twenty percent of households reported that the subsistence food their household had did not last and they could not get more. Fourteen percent of households reported worrying about having enough food, and an equal percentage reported that the food their household had did not last and they could not get more. Fewer households reported more severe food insecurity, but 5% of respondents reported that adults in their house ate less than they thought they should or cut the size of their meals.

Food security results for surveys for Utqiaġvik, the state of Alaska, and the United States are summarized in Figure 6-31. During the study year, 91% of Utqiaġvik households were identified as being food secure. Of the remaining households, 6% exhibited low food security and 3% had very low food security. Utqiaġvik residents were more food secure than the nation and the state of Alaska.

Figure 6-32 portrays the mean number of food insecure conditions per household by food security category by month. Households with very low food security reported the most food insecure conditions from January

Table 6-12.–Employment characteristics, Utqiaġvik, 2014.

Characteristic	Community Barrow
All adults	
Number	3,658.1
Mean weeks employed	32.2
Employed adults	
Number	2,538.1
Percentage	69.4%
Jobs	
Number	2,806.9
Mean	1.1
Minimum	1
Maximum	6
Months employed	
Mean	10.7
Minimum	1
Maximum	12
Percentage employed year-round	77.7%
Mean weeks employed	46.4
Households	
Number	1,584
Employed	
Number	1,429.5
Percentage	90.2%
Jobs per employed household	
Mean	2
Minimum	1
Maximum	6
Employed adults	
Mean	
Employed households	1.8
Total households	1.6
Minimum	1
Maximum	5
Mean person-weeks of employment	74.4

Source ADF&G Division of Subsistence household surveys, 2015.

Table 6-13.–Reported job schedules, Utqiaġvik, 2014.

	Jobs		Employed persons		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full time	2,316.2	82.5%	2,217.5	87.4%	1,304.3	91.2%
Part time	170.1	6.1%	163.5	6.4%	151.5	10.6%
Shift	32.7	1.2%	32.7	1.3%	19.8	1.4%
On call (occasional)	196.3	7.0%	157.0	6.2%	151.5	10.6%
Part time shift	6.5	0.2%	6.5	0.3%	6.6	0.5%
Schedule not reported	72.0	2.6%	65.4	2.6%	65.9	4.6%

Source ADF&G Division of Subsistence household surveys, 2015.

Table 6-14.–Employment by industry, Utqiaġvik, 2014.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**2,806.9**	**1,429.5**	**2,538.1**	
Federal government	**2.1%**	**4.1%**	**2.3%**	**1.8%**
Executive, administrative, and managerial	0.7%	1.4%	0.8%	0.6%
Natural scientists and mathematicians	0.2%	0.5%	0.3%	0.4%
Technologists and technicians, except health	0.5%	0.9%	0.5%	0.5%
Marketing and sales occupations	0.2%	0.5%	0.3%	0.2%
Service occupations	0.2%	0.5%	0.3%	0.0%
Handlers, equipment cleaners, helpers, and laborers	0.2%	0.5%	0.3%	0.0%
State government	**3.0%**	**5.5%**	**3.4%**	**2.9%**
Teachers, librarians, and counselors	0.2%	0.5%	0.3%	0.2%
Technologists and technicians, except health	0.7%	1.4%	0.8%	1.1%
Administrative support occupations, including clerical	1.2%	1.8%	1.3%	1.1%
Service occupations	0.7%	1.4%	0.8%	0.3%
Construction and extractive occupations	0.2%	0.5%	0.3%	0.2%
Local government, including tribal	**56.2%**	**73.7%**	**60.3%**	**58.3%**
Executive, administrative, and managerial	9.6%	17.5%	10.6%	14.7%
Natural scientists and mathematicians	0.9%	1.4%	1.0%	1.3%
Social scientists, social workers, religious workers, and lawyers	1.6%	3.2%	1.8%	1.3%
Teachers, librarians, and counselors	7.7%	13.8%	8.5%	7.3%
Registered nurses, pharmacists, dietitians, therapists, and physicians assistants	0.2%	0.5%	0.3%	0.3%
Writers, artists, entertainers, and athletes	0.7%	1.4%	0.8%	0.7%
Health technologists and technicians	1.2%	2.3%	1.3%	1.3%
Technologists and technicians, except health	2.8%	5.1%	3.1%	2.6%
Marketing and sales occupations	0.7%	1.4%	0.8%	0.6%
Administrative support occupations, including clerical	10.5%	18.4%	11.3%	10.2%
Service occupations	11.4%	19.8%	12.4%	9.8%
Mechanics and repairers	0.2%	0.5%	0.3%	0.2%
Construction and extractive occupations	1.6%	3.2%	1.8%	2.0%
Precision production occupations	0.2%	0.5%	0.3%	0.2%
Transportation and material moving occupations	2.1%	4.1%	2.3%	2.4%
Handlers, equipment cleaners, helpers, and laborers	2.6%	4.6%	2.8%	0.7%
Occupation not indicated	2.1%	3.7%	2.3%	2.6%
Agriculture, forestry, and fishing	**0.7%**	**1.4%**	**0.8%**	**0.1%**
Agricultural, forestry, and fishing occupations	0.7%	1.4%	0.8%	0.1%
Mining	**0.9%**	**1.8%**	**1.0%**	**0.8%**
Executive, administrative, and managerial	0.2%	0.5%	0.3%	0.4%
Administrative support occupations, including clerical	0.2%	0.5%	0.3%	0.2%
Transportation and material moving occupations	0.5%	0.9%	0.5%	0.2%
Construction	**3.3%**	**6.0%**	**3.6%**	**1.3%**
Executive, administrative, and managerial	0.2%	0.5%	0.3%	0.1%
Administrative support occupations, including clerical	0.5%	0.9%	0.5%	0.2%
Construction and extractive occupations	1.6%	3.2%	1.8%	0.6%
Precision production occupations	0.2%	0.5%	0.3%	0.3%
Transportation and material moving occupations	0.2%	0.5%	0.3%	0.2%
Occupation not indicated	0.5%	0.5%	0.5%	0.0%
Manufacturing	**1.2%**	**2.3%**	**1.3%**	**0.1%**
Writers, artists, entertainers, and athletes	0.9%	1.8%	1.0%	0.1%
Precision production occupations	0.2%	0.5%	0.3%	0.0%

-continued-

Table 6-14.–Page 2 of 2.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Transportation, communication, and utilities	**7.7%**	**14.3%**	**8.5%**	**10.4%**
Executive, administrative, and managerial	0.9%	1.8%	1.0%	1.0%
Technologists and technicians, except health	0.5%	0.9%	0.5%	0.6%
Administrative support occupations, including clerical	0.7%	1.4%	0.8%	1.1%
Service occupations	0.2%	0.5%	0.3%	0.1%
Construction and extractive occupations	0.9%	1.4%	1.0%	3.3%
Precision production occupations	1.2%	2.3%	1.3%	1.9%
Transportation and material moving occupations	2.1%	4.1%	2.3%	1.1%
Handlers, equipment cleaners, helpers, and laborers	0.9%	1.4%	1.0%	0.9%
Occupation not indicated	0.2%	0.5%	0.3%	0.3%
Retail trade	**3.7%**	**6.5%**	**4.1%**	**2.3%**
Executive, administrative, and managerial	0.9%	1.4%	1.0%	0.8%
Marketing and sales occupations	1.6%	3.2%	1.8%	1.1%
Service occupations	0.2%	0.5%	0.3%	0.0%
Handlers, equipment cleaners, helpers, and laborers	0.5%	0.9%	0.5%	0.3%
Occupation not indicated	0.5%	0.9%	0.5%	0.1%
Services	**20.3%**	**31.8%**	**21.4%**	**21.5%**
Executive, administrative, and managerial	3.3%	5.1%	3.4%	6.2%
Natural scientists and mathematicians	0.2%	0.5%	0.3%	0.4%
Social scientists, social workers, religious workers, and lawyers	0.7%	1.4%	0.8%	1.4%
Teachers, librarians, and counselors	0.5%	0.9%	0.5%	0.0%
Health diagnosing and treating practitioners	0.5%	0.9%	0.5%	2.8%
Registered nurses, pharmacists, dietitians, therapists, and physicians assistants	0.7%	1.4%	0.8%	0.8%
Writers, artists, entertainers, and athletes	0.9%	1.4%	0.8%	0.1%
Health technologists and technicians	0.2%	0.5%	0.3%	0.1%
Technologists and technicians, except health	1.4%	2.8%	1.5%	1.0%
Marketing and sales occupations	0.5%	0.9%	0.5%	0.0%
Administrative support occupations, including clerical	3.7%	7.4%	4.1%	3.0%
Service occupations	3.0%	5.5%	3.4%	2.2%
Mechanics and repairers	0.5%	0.9%	0.5%	0.5%
Construction and extractive occupations	0.5%	0.9%	0.5%	0.3%
Production working occupations	0.2%	0.5%	0.3%	0.0%
Transportation and material moving occupations	0.7%	0.9%	0.8%	0.5%
Handlers, equipment cleaners, helpers, and laborers	1.4%	2.3%	1.5%	0.8%
Occupation not indicated	1.4%	2.8%	1.5%	1.3%
Industry not indicated	**0.9%**	**1.8%**	**1.0%**	**0.6%**
Executive, administrative, and managerial	0.7%	1.4%	0.8%	0.5%
Administrative support occupations, including clerical	0.2%	0.5%	0.3%	0.1%

Source ADF&G Division of Subsistence household surveys, 2015.

Table 6-15.–Household descriptions of food eaten in the last 12 months, Utqiaġvik, 2014.

Statement	Percentage of affirmative responses
Had enough of the kinds of food desired	52.9%
Had enough food, but not the desired kind	37.5%
Sometimes, or often, did not have enough food	5.4%
Missing/No response	5.0%

Source ADF&G Division of Subsistence household surveys, 2015.

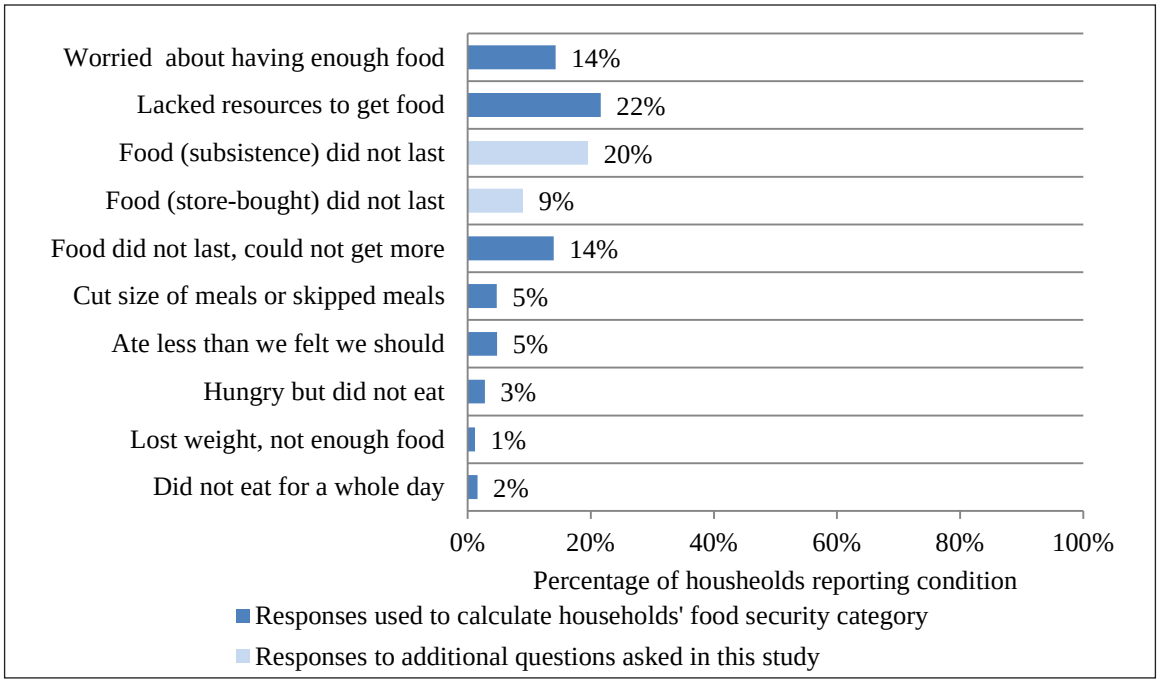


Figure 6-30.–Responses to questions about food insecure conditions, Utqiaġvik, 2014.

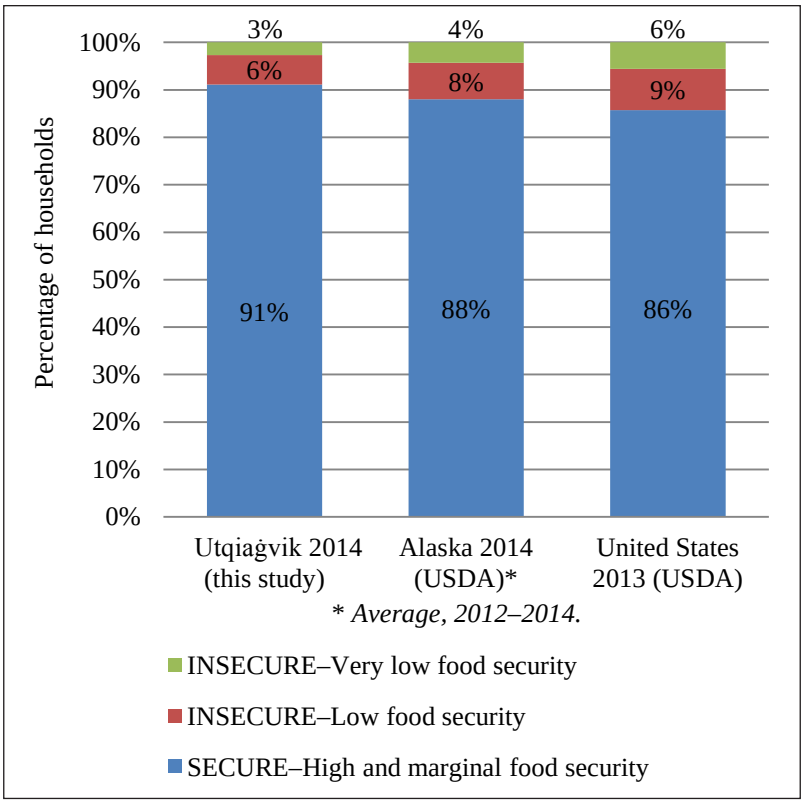


Figure 6-31.–Comparisons of food security categories, Utqiaġvik, 2014.

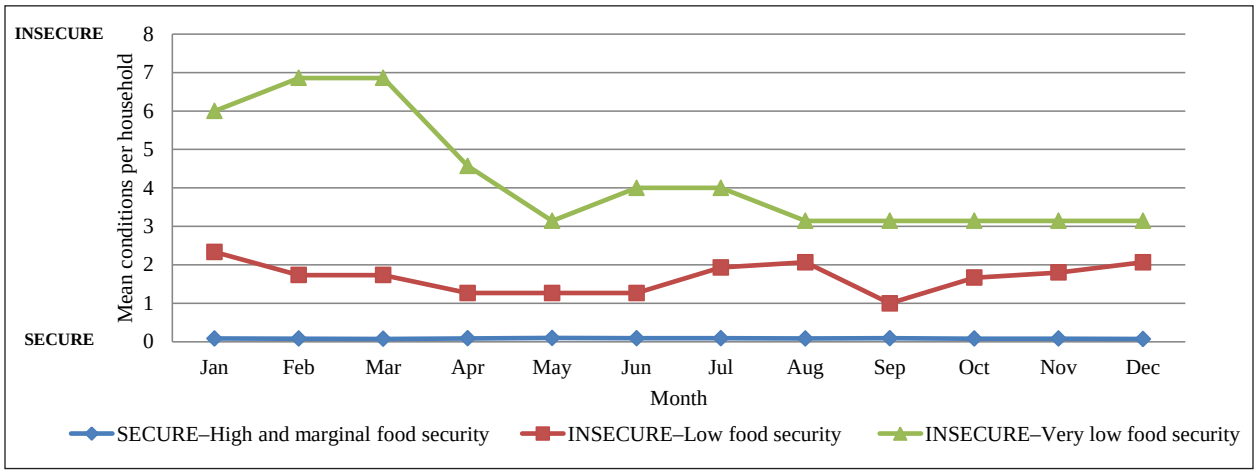


Figure 6-32.–Mean number of food insecure conditions by month and by household security category, Utqiaġvik, 2014.

to March. The number of conditions decreased until June, when they increased slightly and then dropped in August through the end of the year. Households with low food security also showed elevated levels of food insecurity during January, which decreased through the spring to lower levels in April through the month of June. The number of food insecure conditions increased again in July and August, and then dropped to the lowest levels in September before increasing again through the winter months. It is not immediately apparent what influenced levels of food insecurity, but increased conditions in the winter months for households with low and very low food security may be in part due to the added financial stress of heating oil during the coldest months of the year; households may be forced to spend less on store-bought foods and subsistence pursuits in order to keep their homes warm.

Figure 6-33 shows in which months households reported foods not lasting. For all 3 categories (any food, subsistence foods, and store-bought foods) the highest percentages of households reported food not lasting during the month of January. Higher percentages of households reported store-bought foods not lasting in the winter months; fewer households reported this condition during the spring and summer. Higher percentages of households reported subsistence foods not lasting throughout the year in comparison to store-bought foods; and this category had less variation in conditions by month. When considering both store-bought and subsistence foods together, a higher percentage of households reported that food in general did not last during the study year than that either individual type of food did not last. Higher percentages of households reported that food did not last during the late winter months of January through March and the summer months of July and August.

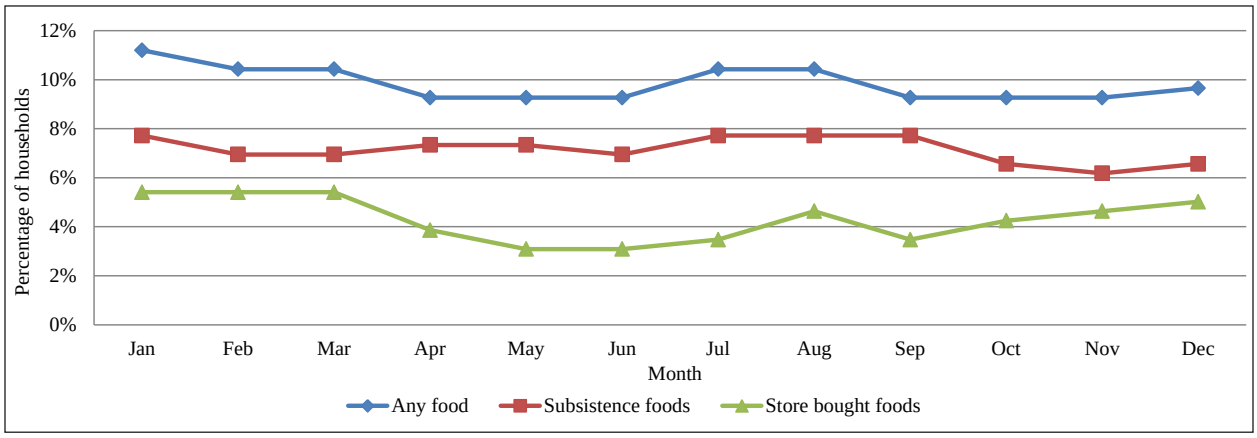


Figure 6-33.–Comparison of months when food did not last, Utqiaġvik, 2014.

Comparing Harvests and Uses in 2014 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 2 ways: whether they got more, less, or about the same amount of 8 resource categories in 2014 as in the past 5 years, and whether they got "enough" of each of the 8 resource categories. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different subsistence resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 6-16, Figure 6-34, and Figure 6-35 provide a broad overview of households' assessments of their harvests in 2014. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions.

Marine mammals was the most harvested of all subsistence resource categories by Utqiaġvik households (192 lb per capita; Table 6-5). Thirty-four percent of responding households explained that they used the same amount of marine mammals in 2014 as they did in previous years, 24% reported that they used less, and 13% said they used more (Table 6-16; Figure 6-34). When asked why they used less, 20% of respondents reported that they did so due to less sharing of these resources with their household (Table 6-17). Other stated reasons for using less marine mammals included a lack of effort to harvest the resources (17%), "other reasons" that were unspecified (15%), and unsuccessful hunting (12%). Of those households that used more marine mammals in the study year, 61% said this was due to an increased need for the resource by their households (Table 6-18). In Utqiaġvik, 15% of respondents stated that they did not get enough marine mammals (Figure 6-35). When asked to evaluate the impact of not getting enough marine mammals, 3% described it as not noticeable, 36% described the impact as minor, 44% explained that not getting enough marine mammals had a major effect on their household, and 15% stated that the impact was severe (Table 6-19). When asked what kind of marine mammals their household needed, the highest percentage of respondents (9%) said they needed more bearded seal (Table 6-20).

Large land mammals was the second most harvested of all subsistence resource categories during 2014 (112 lb per capita; Table 6-5). Twenty-five percent of responding households reported they used the same amount of large land mammals during the study period has they had in recent years, 35% reported that they used less, and 15% said they used more (Table 6-16; Figure 6-34). When asked why they used less, 32% of households cited resource availability as the reason (Table 6-17). Other reasons for using less large land mammals included lack of hunting effort (17%), less sharing of these resources (16%), and lack of time or work schedule (15%). For those households that used more large land mammals during the study year, 59% reported that this was due to an increased need for the resource in their household (Table 6-18). In

Table 6-16.–Changes in household uses of resources compared to recent years, Utqiaġvik, 2014.

			Households reporting use								Households not using	
			Total households		Less		Same		More			
Resource category	Sampled households	Valid responses[a]	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	259	241	216	89.6%	85	35.3%	94	39.0%	37	15.4%	25	10.4%
Salmon	259	255	189	74.1%	71	27.8%	74	29.0%	44	17.3%	66	25.9%
Nonsalmon fish	259	251	177	70.5%	56	22.3%	80	31.9%	41	16.3%	74	29.5%
Large land mammals	259	256	192	75.0%	90	35.2%	63	24.6%	39	15.2%	64	25.0%
Small land mammals	259	257	34	13.2%	18	7.0%	10	3.9%	6	2.3%	223	86.8%
Marine mammals	259	256	181	70.7%	62	24.2%	87	34.0%	32	12.5%	75	29.3%
Birds	259	254	133	52.4%	55	21.7%	62	24.4%	16	6.3%	121	47.6%
Marine invertebrates	259	259	29	11.2%	12	4.6%	8	3.1%	9	3.5%	230	88.8%
Vegetation	259	254	119	46.9%	52	20.5%	49	19.3%	18	7.1%	135	53.1%

Source ADF&G Division of Subsistence household surveys, 2015.
a. Valid responses do not include households that did not provide any response.

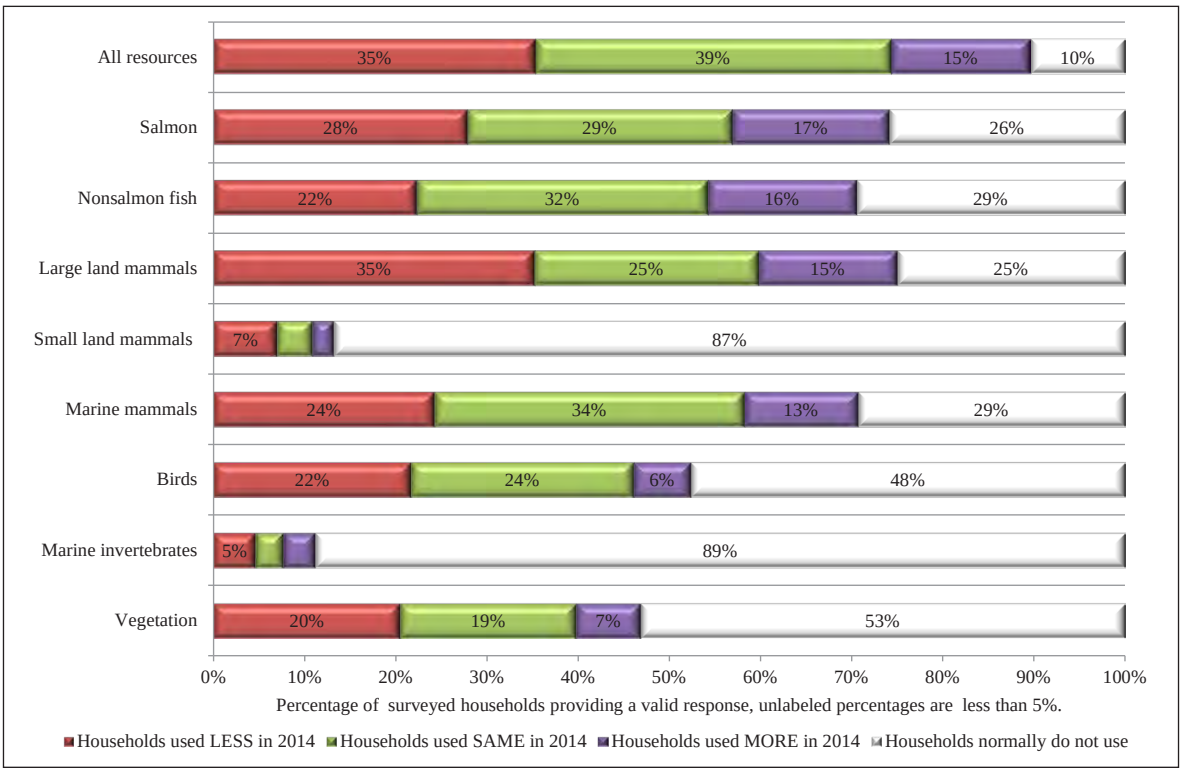


Figure 6-34.–Changes in household uses of resources compared to recent years, Utqiaġvik, 2014.

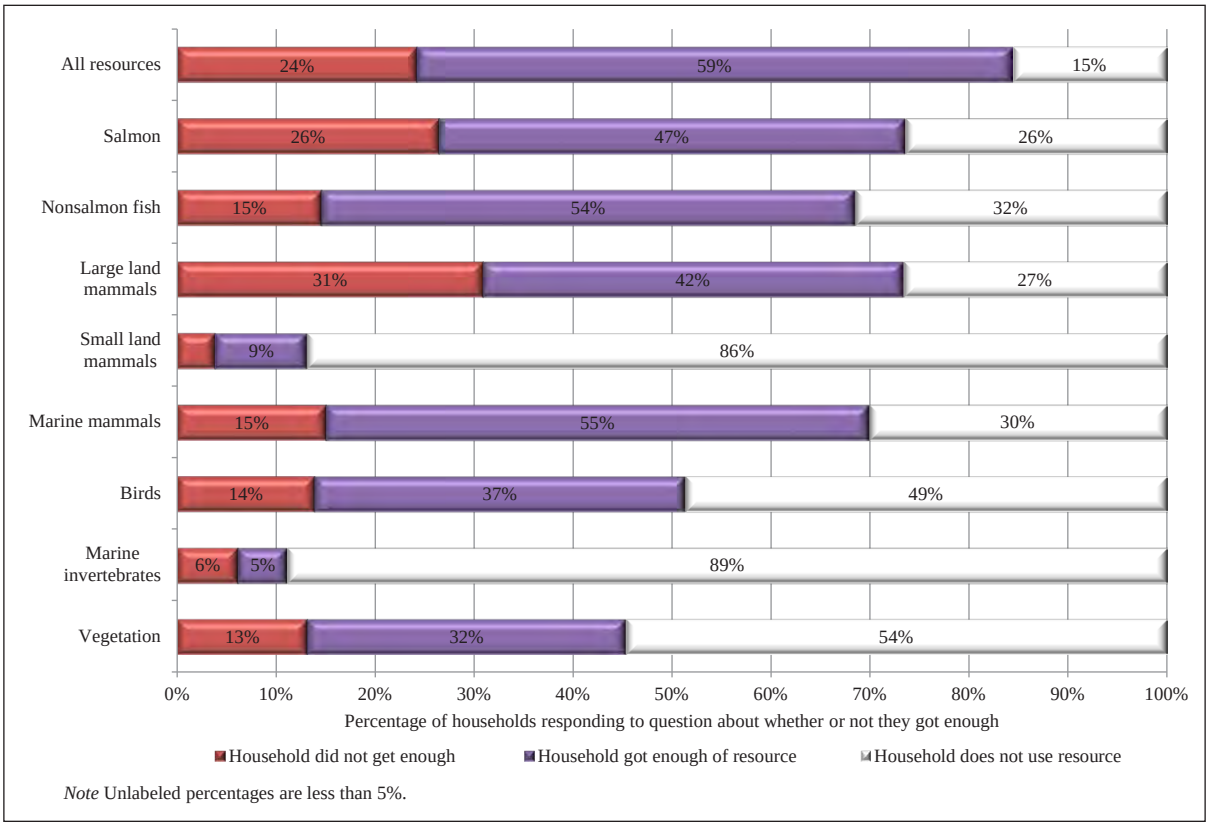


Figure 6-35.–Percentage of households reporting whether they got enough resources, Utqiaġvik, 2014.

Table 6-17.–Reasons for less household uses of resources compared to recent years, Utqiaġvik, 2014.

Resource category	Valid responses[a]	Households reporting reasons for less use	Family/ personal		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful		Weather/ environment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	241	84	12	14.3%	13	15%	3	3.6%	4	5%	14	17%	20	24%	4	4.8%	12	14.3%
Salmon	255	67	4	6.0%	7	10%	0	0.0%	2	3%	29	43%	14	21%	3	4.5%	4	6.0%
Nonsalmon fish	251	54	3	5.6%	2	4%	1	1.9%	2	4%	24	44%	8	15%	2	3.7%	2	3.7%
Large land mammals	256	87	13	14.9%	28	32%	9	10.3%	4	5%	14	16%	15	17%	4	4.6%	6	6.9%
Small land mammals	257	17	1	5.9%	3	18%	0	0.0%	1	6%	2	12%	6	35%	1	5.9%	0	0.0%
Marine mammals	256	60	3	5.0%	5	8%	0	0.0%	2	3%	12	20%	10	17%	7	11.7%	4	6.7%
Birds	254	53	6	11.3%	1	2%	1	1.9%	2	4%	10	19%	18	34%	3	5.7%	10	18.9%
Marine invertebrates	259	12	1	8.3%	0	0%	0	0.0%	0	0%	6	50%	0	0%	0	0.0%	1	8.3%
Vegetation	254	48	5	10.4%	12	25%	0	0.0%	1	2%	16	33%	8	17%	1	2.1%	8	16.7%

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Table 6-17.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Other reasons		Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Equipment/ fuel expense		Used other resources	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	241	84	6	7%	17	20.2%	0	0.0%	0	0.0%	1	1.2%	1	1.2%	2	2.4%	1	1.2%
Salmon	255	67	4	6%	7	10.4%	1	1.5%	1	1.5%	1	1.5%	1	1.5%	0	0.0%	0	0.0%
Nonsalmon fish	251	54	3	6%	8	14.8%	0	0.0%	0	0.0%	1	1.9%	2	3.7%	1	1.9%	0	0.0%
Large land mammals	256	87	5	6%	13	14.9%	1	1.1%	0	0.0%	1	1.1%	0	0.0%	1	1.1%	1	1.1%
Small land mammals	257	17	2	12%	1	5.9%	0	0.0%	0	0.0%	1	5.9%	1	5.9%	0	0.0%	0	0.0%
Marine mammals	256	60	9	15%	6	10.0%	1	1.7%	1	1.7%	1	1.7%	5	8.3%	2	3.3%	0	0.0%
Birds	254	53	6	11%	8	15.1%	2	3.8%	0	0.0%	0	0.0%	2	3.8%	0	0.0%	0	0.0%
Marine invertebrates	259	12	0	0%	4	33.3%	0	0.0%	1	8.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	254	48	2	4%	2	4.2%	0	0.0%	0	0.0%	0	0.0%	1	2.1%	0	0.0%	1	2.1%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never using the resource.

Table 6-18.–Reasons for more household uses of resources compared to recent years, Utqiaġvik, 2014.

Resource category	Valid responses[a]	Households reporting reasons for more use	Increased availability		Used other resources		Favorable weather		Received more		Needed more		Increased effort		Had more help	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	241	36	0	0.0%	2	5.6%	1	2.8%	0	0.0%	19	52.8%	8	22.2%	7	19.4%
Salmon	255	44	0	0.0%	3	6.8%	0	0.0%	2	4.5%	24	54.5%	5	11.4%	7	15.9%
Nonsalmon fish	251	40	0	0.0%	3	7.5%	0	0.0%	0	0.0%	25	62.5%	1	2.5%	8	20.0%
Large land mammals	256	39	0	0.0%	6	15.4%	0	0.0%	0	0.0%	23	59.0%	6	15.4%	4	10.3%
Small land mammals	257	6	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	16.7%	0	0.0%	2	33.3%
Marine mammals	256	31	0	0.0%	0	0.0%	1	3.2%	2	6.5%	19	61.3%	3	9.7%	3	9.7%
Birds	254	15	0	0.0%	0	0.0%	0	0.0%	0	0.0%	7	46.7%	0	0.0%	5	33.3%
Marine invertebrates	259	9	0	0.0%	0	0.0%	0	0.0%	0	0.0%	8	88.9%	0	0.0%	1	11.1%
Vegetation	254	16	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9	56.3%	0	0.0%	4	25.0%

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Table 6-18.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for more use	Other		Regulations		Traveled farther		More success		Needed less		Store-bought expense		Got/ fixed equipment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	241	36	0	0.0%	3	8.3%	0	0.0%	0	0.0%	2	5.6%	0	0.0%	1	2.8%
Salmon	255	44	2	4.5%	2	4.5%	1	2.3%	0	0.0%	3	6.8%	0	0.0%	0	0.0%
Nonsalmon fish	251	40	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	7.5%	1	2.5%	0	0.0%
Large land mammals	256	39	2	5.1%	1	2.6%	0	0.0%	1	2.6%	1	2.6%	0	0.0%	1	2.6%
Small land mammals	257	6	0	0.0%	1	16.7%	0	0.0%	0	0.0%	1	16.7%	1	16.7%	0	0.0%
Marine mammals	256	31	1	3.2%	2	6.5%	0	0.0%	0	0.0%	3	9.7%	0	0.0%	0	0.0%
Birds	254	15	0	0.0%	2	13.3%	0	0.0%	0	0.0%	3	20.0%	0	0.0%	0	0.0%
Marine invertebrates	259	9	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	254	16	0	0.0%	1	6.3%	0	0.0%	0	0.0%	3	18.8%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never use.

Table 6-19.–Reported impact to households reporting that they did not get enough of a type of resource, Utqiaġvik, 2014.

		Households not getting enough _____ .				Impact to those not getting enough _____ .									
	Sample	Valid responses[a]		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
All resources	259	216	83.4%	62	28.7%	4	6.5%	3	4.8%	30	48.4%	17	27.4%	8	12.9%
Salmon	259	189	73.0%	68	36.0%	7	10.3%	19	27.9%	27	39.7%	12	17.6%	3	4.4%
Nonsalmon fish	259	178	68.7%	38	21.3%	6	15.8%	5	13.2%	13	34.2%	13	34.2%	1	2.6%
Large land mammals	259	190	73.4%	80	42.1%	2	2.5%	6	7.5%	35	43.8%	29	36.3%	8	10.0%
Small land mammals	259	34	13.1%	10	29.4%	0	0.0%	2	20.0%	6	60.0%	0	0.0%	2	20.0%
Marine mammals	259	181	69.9%	39	21.5%	1	2.6%	1	2.6%	14	35.9%	17	43.6%	6	15.4%
Birds	259	133	51.4%	36	27.1%	3	8.3%	6	16.7%	16	44.4%	7	19.4%	4	11.1%
Marine invertebrates	259	29	11.2%	16	55.2%	4	25.0%	2	12.5%	8	50.0%	0	0.0%	2	12.5%
Vegetation	259	117	45.2%	34	29.1%	6	17.6%	5	14.7%	14	41.2%	7	20.6%	2	5.9%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Includes households failing to respond to the question and those households that never used the resource.

Table 6-20.–Resources of which households reported needing more, Utqiaġvik, 2014.

Resource	Households needing	Percentage of households
All resources	5	1.9%
Fish	10	3.9%
Salmon	20	7.7%
Chum salmon	10	3.9%
Coho salmon	21	8.1%
Chinook salmon	19	7.3%
Pink salmon	4	1.5%
Sockeye salmon	18	6.9%
Nonsalmon fish	4	1.5%
Smelt	2	0.8%
Rainbow smelt	3	1.2%
Pacific halibut	7	2.7%
Arctic char	2	0.8%
Dolly Varden	1	0.4%
Arctic grayling	5	1.9%
Trout	1	0.4%
Whitefishes	10	3.9%
Broad whitefish	10	3.9%
Arctic cisco	7	2.7%
Humpback whitefish	2	0.8%
Caribou	81	31.3%
Deer	1	0.4%
Moose	5	1.9%
Red fox–cross phase	1	0.4%
Lynx	1	0.4%
Gray wolf	7	2.7%
Wolverine	7	2.7%
Marine mammals	4	1.5%
Polar bear	4	1.5%
Seal	7	2.7%
Bearded seal	24	9.3%
Ringed seal	4	1.5%
Unknown seal oil	1	0.4%
Walrus	9	3.5%
Whale	1	0.4%
Beluga whale	2	0.8%
Bowhead whale	13	5.0%
Birds and eggs	3	1.2%
Migratory birds	2	0.8%
Ducks	7	2.7%
Eiders	3	1.2%
Common eider	1	0.4%
King eider	4	1.5%
Geese	15	5.8%
Canada/cackling goose	1	0.4%
Canada goose	3	1.2%

continued

Table 6-20.–Continued.

Resource	Households needing	Percentage of households
White-fronted goose	6	2.3%
Ptarmigans	2	0.8%
Bird eggs	1	0.4%
Goose eggs	3	1.2%
Clams	5	1.9%
Razor clams	1	0.4%
Unknown clams	1	0.4%
Crabs	4	1.5%
King crab	5	1.9%
Unknown crab	1	0.4%
Mussels	3	1.2%
Unknown mussels	1	0.4%
Shrimp	1	0.4%
Berries	11	4.2%
Blueberry	4	1.5%
Crowberry	2	0.8%
Cloudberry	8	3.1%
Salmonberry	14	5.4%
Plants, greens, and	3	1.2%
Sourdock	2	0.8%
Willow leaves	1	0.4%
Sorrel	1	0.4%
Stinkweed	3	1.2%
Unknown resource	16	6.2%

Source ADF&G Division of Subsistence household surveys, 2015.

2014, 31% of households said they did not get enough large land mammals (Figure 6-35). When asked to evaluate the impact, 8% said it was not noticeable, 44% described it as minor, 36% said not getting enough large land mammals had a major effect on their household, and 10% said it was severe (Table 6-19). When asked what kind of large land mammals their household needed, the most common answer was caribou (31%; Table 6-20).

Overall, 39% of responding households reported they used the same amount of all subsistence resources in 2014 as they had in recent years, 35% reported using less, and 15% reported using more wild foods (Table 6-16; Figure 6-34). For households that used less resources, 24% said it was due to a lack of effort, and 20% said it was due to lack of time or their work schedule (Table 6-17). For those who used more, 53% reported that their household had an increased need for wild foods (Table 6-18). During the study year, 59% of responding households said they got enough of all subsistence resources (Figure 6-35). For those households that did not get enough wild food, 48% percent said it had a minor impact, 27% said it was major, and 13% described a severe impact to their household (Table 6-19). More households (31%) said they needed more caribou than any other resource during the study year (Table 6-20).

Harvest Data

Changes in the harvest of resources by Utqiaġvik residents can also be discerned through comparisons with findings from other study years. In total, Utqiaġvik has had 9 other comprehensive survey efforts conducted in the community since 1987. Braund and Associates conducted 3 separate studies spanning the years 1987–1989 (Braund and Associates 1993); harvest information for these reports can also be found in the ADF&G CSIS[14]. The NSB Department of Wildlife Management conducted a comprehensive harvest survey in Utqiaġvik in 1992 (Fuller and George 1999rev.), and has collected data for the years 1995–1996 and 2000–2003 (Bacon et al. 2011rev.). As mentioned in the Introduction chapter, conversion factors for edible weights have varied between studies; to control for these differences comparisons will be discussed in terms of individual animals per capita when possible (see Appendix E for further detail). With the exception of bowhead whales, this discussion will be limited to species that can be compared across a majority of study years. It will also focus on resources that have consistently featured heavily in Utqiaġvik's total estimated harvest across study years or on resource categories as a whole. For resource categories, comparison for per capita harvests in terms of edible weight is available for 5 of the 9 study years (tables 6-21 and 6-22; figures 6-36 and 6-37).

Marine Mammals

Marine mammals as a category as accounted for more than one-half of Utqiaġvik's harvest in the 5 study years available for comparison (Table 6-21). These resources composed between 51% of the harvest in 1987 to 73% in 1992. Utqiaġvik residents harvested over 100 edible pounds per capita of marine mammal

Table 6-21.–Comparison of per capita harvests by category in usable pounds, Utqiaġvik, 1987–1989, 1992, and 2014.

	1987	1988	1989	1992	1995–1996[a]	1996–1997[a]	2000[a]	2001[a]	2003[a]	2014
Salmon	0.4	0.2	4.1	2.1	0.3	0.5	1.9	0.4	5.1	10.8
Nonsalmon fish	22.3	16.8	35.2	22.5	9.1	9.0	26.1	2.2	8.2	36.9
Land mammals	70.9	68.6	71.2	64.1	70.4	37.1	100.6	56.2	64.7	107.1
Marine mammals	104.9	110.8	168.5	253.7	-	-	-	-	-	186.8
Birds and eggs	7.4	7.4	9.8	6.1	7.4	3.0	10.2	5.0	5.2	11.8
Marine invertebrates	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.1	0.2
Vegetation	0.1	0.1	0.4	0.3	0.0	0.003	0.1	0.0	0.1	0.6
All resources	**205.9**	**203.8**	**289.2**	**349.0**	**-**	**-**	**-**	**-**	**-**	**354.1**

Sources Community Subsistence Information System (CSIS) for 1985–2003 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data

a. Utqiaġvik harvested known numbers of bowhead whales in this study year, but no estimates of weight available to convert to edible pounds

14. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." Accessed March 15, 2016. https://www.adfg.alaska.gov/sb/CSIS

Table 6-22.–Comparison of harvest compositions by category, by weight in usable pounds, Utqiaġvik, 1987–1989, 1992, and 2014.

	1987*	1988*	1989*	1992*	2014
Salmon	0.2%	0.1%	1.4%	0.6%	3.0%
Nonsalmon fish	10.8%	8.2%	12.2%	6.4%	10.2%
Land mammals	34.4%	33.7%	24.6%	18.4%	30.9%
Marine mammals	50.9%	54.3%	58.3%	72.7%	53.1%
Birds and eggs	3.6%	3.6%	3.4%	1.8%	2.6%
Marine invertebrates	0.0%	0.0%	0.0%	0.1%	0.1%
Vegetation	0.0%	0.0%	0.2%	0.1%	0.2%

Sources Braund et al. 1993 for 1987–1989 data; Fuller and George 1997 for 1992 data; ADF&G Division of Subsistence household surveys, 2015 for 2014 data.

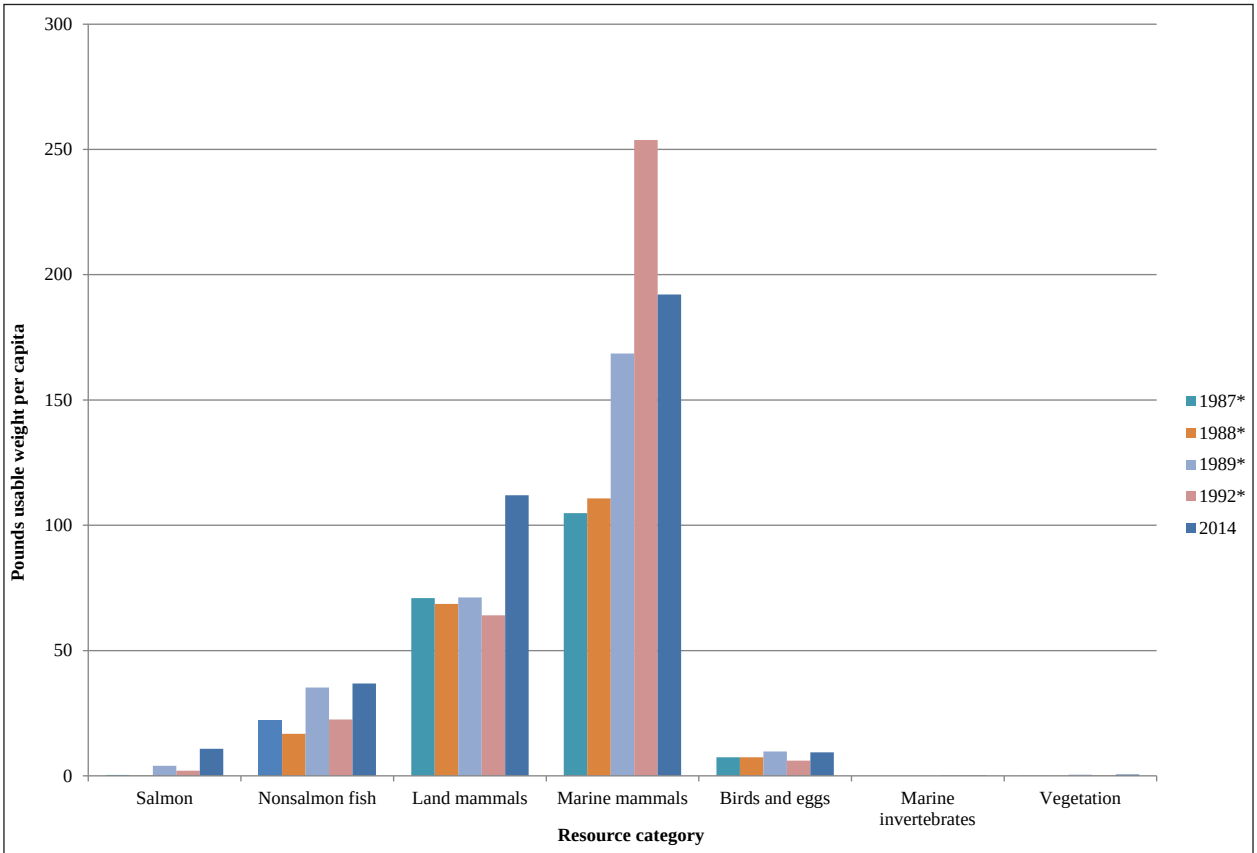
*Edible weights calculated by multiplying estimated numbers of harvest by conversion factors used in this study.

resources in every study year, ranging from a low harvest of 105 lb per capita in 1987 to 254 lb in 1992 (Table 6-22; Figure 6-36). 2014 represents the second highest per capita harvest of this resource category over the 5 study years.

As mentioned throughout this chapter, bowhead whaling is one of the most important subsistence activities for Utqiaġvik residents and provides a significant amount of edible weight to the community. Although harvest numbers of individual bowhead whales are known for the 10 study years, edible weights were not estimated for the 1995–1996, 2000, 2001, and 2003 study years. Bowhead whale harvests in Utqiaġvik range from a low of 7 whales landed in 1987 to a high of 27 whales landed in 2001, with an average harvest over the 9 study years of 17 whales per year (Bacon et al. 2011rev.:60). Conversion factors vary between studies based on the sizes of the whales harvested and the calculations used by each study to arrive at edible weight. Braund's (1993) estimates show 61 lb per capita in 1987 (7 whales), 77 lb in 1988 (11 whales), and 125 lb in 1989 (10 whales). Fuller and George (1999rev.:52) estimated that 22 bowhead whales contributed 187 lb of edible weight per capita. This study's estimate is within the range of the other estimates: 18 bowhead whales contributed 103 lb per capita.

Utqiaġvik is considered to be at the northeastern periphery of the range of the Pacific walrus, and harvests by Utqiaġvik residents can vary greatly among study years dependent upon the relative abundance and distribution of the resource near the community. Harvests range from a low of 61 walruses harvested in 1988 to a high of 313 harvested in 2003; however, the 2003 estimate may be inflated due to sampling issues (Bacon et al. 2011rev.; Braund et al. 1993; Fuller and George 1997; Table 6-4). Controlling for population size, Utqiaġvik residents harvested on average 0.03 walrus per capita over the 10 study years, ranging from 0.02 walrus per capita in 1988, 1995–1996, and 1996–1997 to 0.07 walrus per capita in 2003. This study falls within the 10 year average with an estimated a total harvest of 135 walruses, or 0.03 walrus per capita in 2014.

Bearded seal harvest information is also available for all 10 study years. Overall harvest estimates range from a low of 109 bearded seals harvested in 1989 to a high of 1,070 during the 2014 study year (Bacon et al. 2011rev.; Braund et al. 1993; Fuller and George 1997; Table 6-4). Controlling for population size, Utqiaġvik residents harvested on average 0.11 bearded seals per capita over all study years, ranging from 0.07 bearded seals per capita in 2001 to 0.20 in 2014. Although the per capita value for the 2014 study year is 58% higher than the 10 year average, it is similar to the values for 2000 (0.16 bearded seals per capita) and 2003 (0.18 per capita). Also, the 95% confidence interval of this study's estimate of ±43.5% yields an estimated harvest range of 605–1,536 bearded seals; the lower end of the range is 0.11 per capita, equal to the 10 year average.



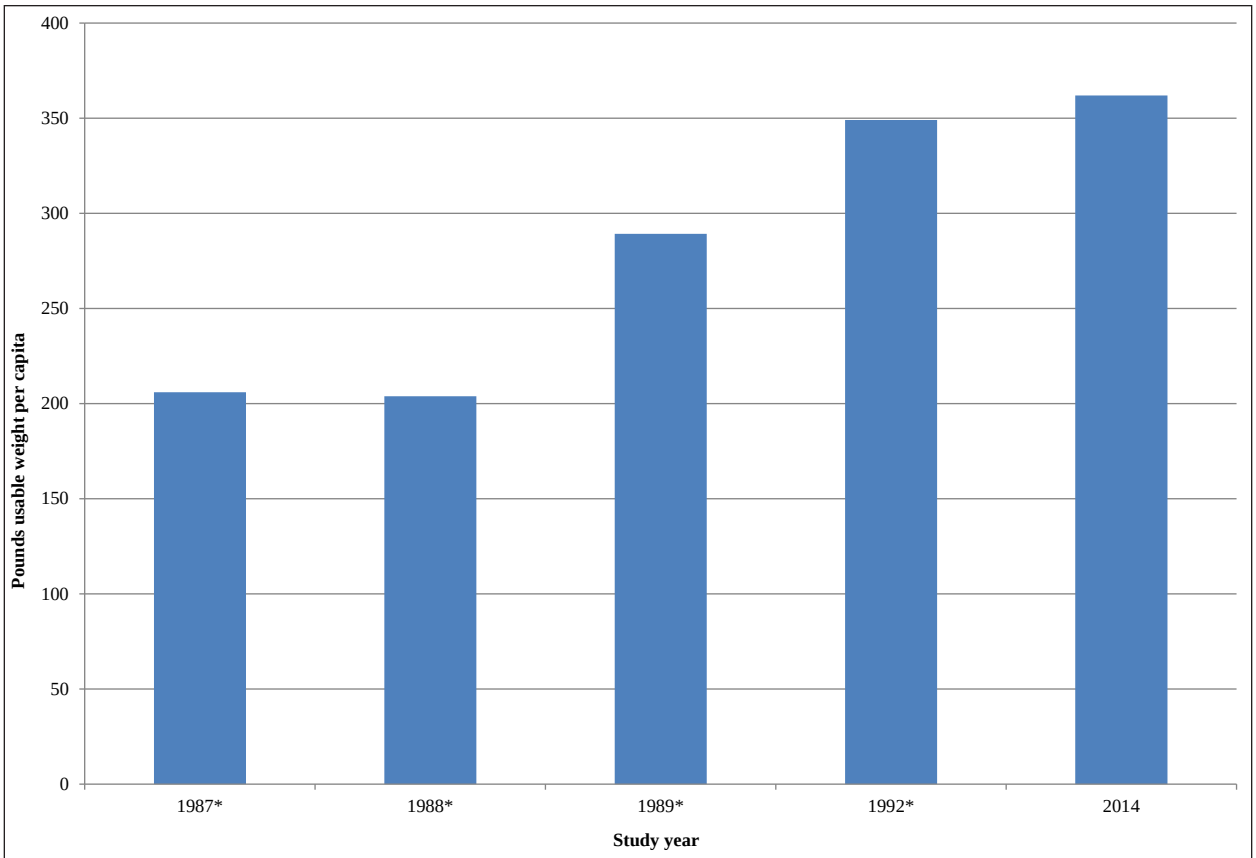
Note * Indicates edible weights calculated from by multiplying estimated numbers of harvest by conversion factors used in this study.

Figure 6-36.–Comparison of per capita harvests by category, Utqiaġvik, 1987–1989, 1992, and 2014.

Large Land Mammals

Land mammals as a resource category was second only to marine mammals in its contribution to the total harvest among the 5 study years with comparable data; this resource category composed between 25% of the harvest in 1989 and 34% in 1987 (Table 6-21). Utqiaġvik residents had a low harvest of 64 lb per capita in 1992 in comparison with the highest harvest of 107 lb during the 2014 study year (Table 6-22; Figure 6-36). Although land mammals accounted for a smaller percentage of the total harvest (30%) in 2014 in comparison to other years, per capita harvests are significantly larger than in previous years (Table 6-21; Figure 6-36).

Caribou harvests can vary year to year depending upon the distribution of the herds and their relative proximity to the community throughout the study period. As mentioned previously, this study's estimate of 4,323 caribou represents the highest harvest for the 10 years of data that are available. The lowest harvest occurred in 1996–1997, when Utqiaġvik hunters took an estimated 1,158 caribou (Bacon et al. 2011rev.; Braund and Associates 1993; Fuller and George 1999rev.). Taking into account the population of the community, Utqiaġvik hunters harvested an average of 0.55 caribou per person; taking out the 2014 value, the average harvest is 0.51 caribou per person. Per capita harvests ranged from a low of 0.27 in 1996 to a high of 0.81 during this study year (Bacon et al. 2011rev.; Braund et al. 1993; Fuller and George 1997; Table 6-5). Although the per capita value for the 2014 study year is 38% higher than the 9-year average, it is similar to the harvest numbers in 2000 (3,359 caribou, 0.73 per capita). Taking into account the 95% confidence interval of ±34%, the estimated harvest of caribou during the study year ranged from a low of 2,853 caribou to a high of 5,793 caribou (Table 6-5). If the lower end of the range is considered,



Note * Indicates edible weights calculated from by multiplying estimated numbers of harvest by conversion factors used in this study.

Figure 6-37.–Comparison of estimated per capita harvests, Utqiaġvik, 1987–1989, 1992, and 2014.

the per capita harvest would be 0.54; this is only slightly higher than the 9-year average per capita harvest excluding the current study year.

Nonsalmon Fish

Nonsalmon fish as a category composed a similar percentage of the total estimated harvest across the 5 study years, ranging from 6% of the harvest in 1992 to 12% in 1989 (Table 6-21). Per capita harvests ranged from a low of 17 lb in 1988 to 37 lb in 2014 (Table 6-22; Figure 6-36). Although slightly higher, the 2014 harvest was similar to 1989, when Utqiaġvik residents harvested an estimated 35 lb per capita.

Broad whitefish composed 7% of Utqiaġvik's total estimated harvest during the 2014 study year, and have consistently been one of the highest harvested nonsalmon fish across the 10 study years (Bacon et al. 2011rev.; Braund et al. 1993; Fuller and George 1997; Figure 6-8). Harvests have ranged from a low of 2,176 broad whitefish in 2001 to a high of 43,962 during this study year (Bacon et al. 2011rev.; Braund et al. 1993; Fuller and George 1997; Table 6-5). On average, Utqiaġvik fishers harvested 4.3 broad whitefish per capita across all 10 study years. Per capita values ranged from a low of 0.6 broad whitefish per person in 2001 to a high value of 10.9 per person in 1989. Although this study's estimate of 8.3 broad whitefish per person is 62% higher than the 10-year average, it is similar to the 1989 (10.9 fish per person) and 1992 (6.3) values. The lowest per capita values fall within the years studied by Bacon et al. (2011rev.), and the authors acknowledge that the reported fish harvests in this study may not represent typical harvests by Utqiaġvik residents (Bacon et al. 2011rev.:39).

Salmon

Per capita and harvest composition information are available for 5 of the 10 study years (tables 6-21 and 6-22; Figure 6-36). Salmon as a resource category composed a higher percentage of the total harvest in 2014 (3%) compared to the other 4 study years (Table 6-21). Likewise, per capita harvests are significantly higher in 2014 than any other year; salmon contributed 11 lb per capita in 2014, far greater than the second highest harvest of 4 lb per person in 1989 (Table 6-22; Figure 6-36).

For the sake of comparison across all 10 study years, salmon species will be combined and considered as a category. As mentioned previously, identification of salmon species can be problematic on the North Slope; likewise, in a number of study years a portion of the salmon harvest is reported without species-specific information. Salmon harvest in terms of individual fish is available for every study year (Bacon et al. 2011rev.; Braund et al. 1993; Fuller and George 1997; Table 6-5). Salmon harvests in Utqiaġvik range from a low of 80 fish harvested in 1988 to a high of 12,087 during the 2014 study year. Controlling for population, per capita harvests range from 0.03 salmon per person in 1988 to 2.3 salmon per person in 2014. The average number of salmon Utqiaġvik fishers harvested across the 10 study years was 0.5 per person. This study year's harvest is 123% higher than the 8-year average and 71% higher than the next highest harvest year of 2003 (1.1 salmon per capita). As mentioned previously, key respondents overwhelmingly felt that salmon abundance has been increasing in the Utqiaġvik region in recent years (BRW01241502, BRW01281503, BRW01271506, BRW01261515, BRW01271516). One key respondent who was not convinced that the salmon population had increased felt that people were targeting them in much greater numbers in recent years (BRW01241511). Both of these factors could account for the much larger harvest of all salmon during the study year.

Birds and Eggs

Harvests of birds and eggs by residents have remained relatively stable across the 5 study years (Table 6-22; Figure 6-36). Per capita harvests of this resource category have ranged from a low of 6 lb in 1992 to a high of 12 lb in 2014, with an average harvest of 8.5 lb per person. Birds and eggs composed between 2% and 4% of the total estimated harvest in the 1987–1989, 1992, and 2014 study years (Table 6-21).

White-fronted goose composed 2% of the total estimated harvest of wild foods in Utqiaġvik in 2014 and was consistently one of the most heavily harvested avian resources across all 9 study years (Bacon et al. 2011rev.; Braund et al. 1993; Fuller and George 1997; Figure 6-8). White-fronted goose harvests range from a low of 1,852 in 1996–1997 to a high of 9,595 in 2014. Controlling for population, per capita harvests range from 0.4 white-fronted geese per person in 1996 to 1.8 in 2014. The average harvest of white-fronted geese across the 10 study years was 0.9 per person. The study's estimated harvest is 67% greater than the 10-year average and 12% higher than the next highest study year, which was 2000.

All Resources

Overall, Utqiaġvik residents' total estimated per capita harvests of wild resources across the 5 available study years have varied, while the composition of the total harvest in terms of resource category has remained similar over time (tables 6-21 and 6-22). The lowest per capita harvest of all resources was 204 lb in 1988, compared with the highest harvest of 354 lb per capita in 2014 (Table 6-22). The 5-year average harvest was 280 lb of wild food per person.

Current and Historical Harvest Areas

The subsistence areas used by Utqiaġvik residents have been extensively documented over a number of study years (Braund and Associates 2010a, 1993; Pedersen 1979).[15] Data are presented differently in each study year. In the 1993 report harvest locations were documented without search areas, while search and harvest areas presented in 2010 and 2011 show density of use information. Data in the 1993 report were gathered for 3 study years (1987–1989); data from the 2010 report were gathered for a 12-month period in 2006; and data presented in the 2011 report combine a number of sources and cover lifetime use areas as well as mapping for the periods 1987–1989 and 1997–2006. Although there are some differences in data presentation and time period of documentation, these earlier studies allow for historical comparison to the 2014 study year. When comparing mapping data from the 2014 study year to earlier projects, it is apparent that Utqiaġvik residents have relied on the same general areas for decades.

For all resources combined, Utqiaġvik residents had similar land use patterns for all study years for which this mapping is available (Braund and Associates 1993; Pedersen 1979).[16] As mentioned earlier in this report, Utqiaġvik residents reported a vast search and harvest area for all resources in 2014, encompassing 13,478 square miles. Hunters traveled as far east as the vicinity of Point Lay and as far west as Nuiqsut, with search areas dictated by the availability of targeted resources. Mapping information from earlier studies shows a similarly extensive range of land use, with some variation. A majority of the harvest locations in 1987–1990 fall within the 2014 search and harvest area, although some harvest locations occurred further south along the Colville River and further east past Nuiqsut (Braund and Associates 1993:43). Search and harvest areas combined over 13 study years also show a high degree of similarity to the 2014 study year, particularly those areas presented as higher density use areas. Less densely used areas of the 13 study years do show a greater land use area, however these were reported by fewer respondents.[17]

For caribou, 2014 search and harvest areas were somewhat smaller than in previous studies. In 1987–1989, Utqiaġvik residents reported harvest locations extending farther to the east near Nuiqsut, although a majority of recorded harvest locations fall within the boundaries of what was reported during 2014 (Steven R. Braund & Associates 2014:134). Likewise, mapping information gathered over the course of 13 different study years shows a greater search area to the south and the east, with search areas as far east as Prudhoe Bay. The highest density use areas, however, are well within the bounds of those reported in this study.[18] Utqiaġvik residents also reported searching further from the community in 2006, including areas south of the Colville River and east of Nuiqsut. Like the data presented for 13 study years, however, the highest density areas of land use overlap with information collected in 2014 (Braund and Associates 2010a:31).

For marine mammal search and harvest areas, directly comparable data are available for 1987–1989. Both Braund (1993) and the 2014 study year present mapping of marine mammals collectively, while the 2010 study with marine mammal harvest information presents harvest areas for particular species. A majority of the 1987–1989 harvest locations fall within the boundaries of those reported in 2014, with the exception of a few locations farther to the east of the community (Braund and Associates 1993:91). The 2014 study, in contrast, shows search areas extending further west past Wainwright. For both the time frame 1997–2006 and a 12-month period in 2006, a majority of marine mammal search and harvest areas also fall within the boundaries of use areas reported in 2014. Utqiaġvik hunters reported search areas for ringed seal, bearded seal, walrus, and bowhead whale in 2006 and 1997–2006. Prior harvest areas in proximity to the coast for all of these species fall within what was reported in 2014; Utqiaġvik households did report search areas further out from the coast in the earlier study, however these areas were some of the least densely used (Braund and Associates 2010a).

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15. S.R. Braund and Associates. *In Prep*. "Subsistence use area and traditional knowledge studies: Anaktuvuk Pass, Utqiaġvik, and Nuiqsut." Prepared for Three Parameters Plus, Inc. and Alaska Department of Transportation and Public Facilities, Palmer and Fairbanks. Hereafter *Braund in prep.*

16. Braund *in prep.*

17. Braund *in prep*.

18. Braund *in prep*: 55.

Local Comments and Concerns

Following is a summary of local observations of wild resource populations and trends that were recorded during the surveys in Utqiaġvik. Some households did not offer any additional information during the survey interviews, so not all households are represented in the summary. In addition, respondents expressed their concerns about wild resources during the community review meeting of preliminary data. These concerns have been included in the summary.

Development

Key respondents and responding households held varied views regarding the impact of development to their community and to subsistence practices in the region. Three major topics regarding development issues came up both on survey comments and interviews—the proposed liquid natural gas (LNG) pipeline, the potential for off-shore drilling, and traffic.

LNG Pipeline

Respondents had mixed opinions on the proposed LNG pipeline development. Those who support the development felt that increased revenue in the North Slope Borough and more employment opportunities for local workers would benefit resident communities. Several of those respondents who support the pipeline expressed that local input is necessary to ensure responsible development that will protect the environment, and many felt that residents of the North Slope Borough should be given hiring preference. Several key respondents and surveyed households felt that the smaller communities without natural gas needed to benefit from the pipeline (BRW01261515, BRW01271508, BRW01291505):

> Not necessarily [worried about] the impacts on subsistence, being that it's gonna mirror TAPS. So we're not necessarily worried about that, but all this money's going to be going into this pipeline and, you know, not benefiting our people in any way. We're not getting any heat out of it. So, yeah, there's those concerns, you know, whether they're gonna have spurs off, if they could get something to Anaktuvuk Pass, or if they could have a bottling facility on the North Slope so they could truck or ice-road out to the villages, you know. (BRW01241511)

Those opposed to the LNG pipeline were most concerned about the impacts to wildlife, particularly the caribou. Several survey respondents were concerned about impacts to wildlife migration. One survey respondent wrote:

> We all know what's going to happen if the pipeline happens for caribou and migratory birds. You'd be blind not to know…I have a camp at Cape Simpson—have camped there since I was 2 years old. Now there are tankers, equipment. We don't see caribou there anymore.

Other respondents pointed to the ability of caribou to adapt to new infrastructure. Many of the respondents who were in favor of the pipeline also stated some concern over the environmental impact and felt that the development would need to be approached responsibly. One respondent explained that lessons learned during the creation of the Trans-Alaska pipeline would need to be applied to the proposed LNG pipeline:

> We've had development now for 40-plus years. Where we see Prudhoe Bay, massive oil field being discovered and pipeline being built and the naysayers back then that were against the building of the pipeline. What were they saying back then? How much it's going to negatively impact our Native way of life, the subsistence, the traditional way of life, and it's going to affect the caribou and the populations, and the fish and the rivers and the lakes and waterfowl. That argument continues today. But when you look at a "lessons-learned" approach, what was industry able to do working closely with the government and the local people? That's a major accomplishment. The building of the Trans-Alaska Pipeline. (BRW01291505)

Offshore Drilling

Although opinions were also varied regarding the possibility of offshore drilling near Utqiaġvik, a majority of key respondents and surveyed households said they were against this kind of development (BRW01241502, BRW01291503, BRW01281507, BRW01271508, BRW01251510, BRW01261515, BRW01241511, BRW01271516). Several respondents felt that drilling for oil on land should be the primary method, because proven mitigation measures are already in place. Many questioned the readiness of companies to launch a full clean-up effort should a spill occur, particularly in the winter months when the sea ice is present and the weather is severe. One key respondent explained his view on the matter:

> They shouldn't do it. I don't believe in offshore drilling. They can't contain an oil spill in the Gulf of Mexico or Gulf of—down there, how are they going to do it here? I use this as an example. They had a dredge here that supposedly would take any kind of weather that the Arctic Ocean would throw at them. And yet, our ocean, the currents, the wind, the waves—they ripped them anchors right out of the ground and beached that boat and actually split that boat open. (BRW01291503)

Several respondents questioned what an oil spill would do to the marine environment and shared their concerns about potentially devastating impacts to subsistence. One key respondent explained these concerns:

> We don't have any infrastructure. No ice-breaking capability vessels on, in Alaska… There's some equipment. I can't say we don't have anything. There's some equipment, very limited number as to how far it can go out to, to provide any kind of assistance to a situation that arises offshore. No infrastructure in place. And yet they want to continue and seek and support offshore oil and gas development when we don't have any real mitigation efforts that could reassure us that this is an activity that could be conducted out here. And it puts a lot of our marine mammals in jeopardy. The very resources that we've been depending on for hundreds of years. (BRW01271508)

Those that supported offshore drilling point to the economic benefits and clarified that such development would need to be undertaken in a responsible way in order to protect the environment (BRW01281513, BRW01281509, BRW01291505). One respondent explained that other countries, particularly Russia, will be developing the Arctic and that the regulations in the U.S. are much more rigid (BRW01281513). Another summed up the complexity of balancing development and protecting the environment:

> I think that if safe and sustainable healthy development is possible, I think there is—you will find a large proportion in the community of Utqiaġvik that will agree. But you will also find the opposite that say we cannot control it, we should not tamper with it, we don't understand it. And some people have said no, we can handle an oil spill on land, but we cannot control one in the ocean at this point…It's being stewards of the ocean because people are stewards of the animals. Whether they are the bowhead—and I think that's central for up here. And the other animals that are being hunted. Taking care of the bowhead means taking care of the ocean. (BRW01281512)

Traffic

Many key respondents and surveyed households shared their concern regarding the high volume of air traffic in the region and its impacts on hunters and the animals they are pursuing (BRW01271506, BRW01271508, BRW01251510, BRW01271516). Although oil exploration and research was implicated by a number of respondents, others said traffic from scientific research was also a major issue. The main concern was the impact this traffic has on animal populations, particularly caribou. One respondent explained that the traffic "spooks" the caribou and disrupts them on their feeding grounds. One survey respondent stated: "Caribou numbers have dropped dramatically. Because of the impact of transport, so much traffic that they can't rest and feed their young." One key respondent went into detail regarding the impacts to hunters:

> There's been a shift in caribou movements and availability of caribou is, it's shifted to over the climate change impacts, too much activity in terms of research projects out in the

> field, shifting caribou and moving caribou with aircraft. The use of aircraft, helicopters, airplanes moving up and down to where caribou should be grazing…So that's been a problem for the last 3 or 4 years, I've noticed. And just from my hunting area, those researchers not coming in to communicate in terms of their activity and not getting permits to conduct their activities, they're just basically freelancing out there to do their research without any careful consideration of impacts to user groups. (BRW01271508)

Environmental Change

As mentioned throughout this report, key respondents expressed concern regarding the warming climate and its impacts to subsistence activities. Those involved with spring whaling explained the challenges brought about by thinner ice conditions, and hunters discussed how less local ice makes hunting for seals and walrus in the summer months more challenging. Biologists and hunters pointed to rain in the winter months that has frozen the tundra and impacted the health of caribou herds. Fishers explained that later freeze-up has impacted their ability to place setnets under the ice to harvest spawning whitefish. Some respondents noted that formally productive lakes have drained due to erosion. Several fishers noted that salmon appear to be more abundant in recent years. Surveyed households echoed these concerns:

> Fishing—don't get ice as early as we used to. Freeze up used to happen at end of September, but now don't get good ice until the end of December. Whaling—conditions bad in 2014, ice conditions have changed a lot in the last 10 years. Ice is thin, leads form close to shore but break open quickly.

> Ice thinning, harder for whaling. Whale hunter usually stay out for 1–2 weeks. Ice gets thin, keeps people from going out, sometimes forced to go back. Walrus—ice goes out early, have to travel further to hunt. [They] sometimes land on beach due to lack of ice.

> Started to see a lot more salmon. Birds arrived early this year and stayed late until end of September or early October.

Cost of Living

Many surveyed households mentioned the cost of living as a major concern for subsistence, particularly the cost of fuel and equipment. Several respondents discussed the cost of fuel in terms of resource availability, and explained how difficult it can be to purchase fuel and not have success while hunting; a majority of these comments were made in regard to caribou hunting and a lack of caribou close to the community. Several respondents explained that the traffic makes it more difficult for them to successfully harvest the resources they need, which drives up the cost of hunting:

> It's just, the cost of living, high cost of gas, high cost of ammo, high cost of maintaining your snowmachine or boat…and it adds up…So, you spend $3- to $4,000 on grub, gas, and whatnot to go out for 10 days or 2 weeks to harvest caribou before the long winters and yet, you know, there's no caribou. You come home empty. Sometimes you just get a couple due to a lot of activities happening up here. (BRW01261515)

Responding households also discussed the cost of store-bought food and the high cost of feeding their families. On key respondent explained the importance of subsistence harvesting in terms of the cost of purchased food:

> And I think [the cost of store bought goods], it causes people more and more to live off the land. Like when I was growing, I mean, I grew up with my grandparents, and we just ate Native food all the time, 'cause that's what we ate. I mean, there was just was no other food in the house...There was no AC store. AC store didn't exist…and that was not that long ago. (BRW01281513)

Importance of Subsistence

Surveyed household and key respondents highlighted the importance of subsistence activities for feeding their families, but also explained the role of hunting, fishing, and gathering in terms of cultural significance. One key respondent explained how the role of subsistence has not changed even though technology has:

> So the ways and means have changed over the years. But the spirit of the cultural hunt and the harvesting is still alive. So, that hasn't changed. We as Iñupiaq people like to identify ourselves by, speaking for ourselves especially, being Iñupiaq, being able to live a rich cultural lifestyle while at the same time being able to provide for my family, for the community, living a productive life. And never forgetting the deeply rooted responsibility of a community leader, such as being a whaling captain. And whaling has been the central part of our culture since time immemorial (BRW01291505).

Several respondents explained that the term subsistence does not capture the true nature of its importance. As one key respondent explained:

> It's really more a way of life. As you know, subsistence is an unfortunate term, it's really a lifestyle. And gathering wild foods and that sort of thing, is, is super important in a lot of cultures, but definitely here. And you know you hear the cliché that whaling brings the community together. It's true, it really is true. It's amazing. People that have been campaigning against each other, all this kind of rough stuff, when a whale is caught all that goes away and food is shared. And that sharing hasn't changed. In fact, that is probably the single most impressive, or important, let's say, aspect of the way things are done here. Is that it's, it's sort of communal hunting. And the way people distribute food is really amazing. And you can tell it's absolutely genuine. (BRW01251504)

Acknowledgements

The authors would like to express gratitude to the residents of Utqiaġvik who participated in our study and shared with us their subsistence harvests, observations, and opinions. We would also like to thank our key respondents, whose knowledge provides rich context to our survey findings as well as invaluable descriptions of their history doing subsistence activities, observations of environmental change and resource health. We also thank them for sharing their concerns and opinions on a variety of topics. We would also like to thank the City of Utqiaġvik for taking time to consult with us in gaining approval for this study. Other entities that provided excellent feedback on the design of our study include the Native Village of Utqiaġvik, and the Alaska Eskimo Whaling Commission. The North Slope Borough, particularly the Department of Wildlife Management, provided important cooperative and logistical support to our staff, as well as providing insight on the research design. Last but not least, we would like to thank our local research assistants, without whom this project would not have been possible: Charlotte Ambrozek, Tracy Benson, Reynold Joe Aveoganna, VanDerrick Edwardsen,Vernon Elavgak, Gilbert Leavitt, Jr., Isaac Leavitt, Andrew Nashoalook, Walter Nayakik, Harold Nungasak, Jr., Nathaniel Olemaun, Dolly Patterson, William Saganna, Sr., Danielle Simmonds, and Joseph Skin.

7. NUIQSUT

Chris R. McDevitt

From March 25 to April 1, 2015, 7 researchers surveyed 58 of 108 eligible households (54%; Table 1-3). The refusal rate was 31%, and division staff was unable to contact 22%, or 24 households. Expanding for 50 unsurveyed households, Nuiqsut's estimated total harvest of wild foods between January and December 2014 was 371,992 edible pounds (Table 7-1). The average harvest per household was 2,073 lb; the average harvest per capita was 896 lb (Table 7-2).

This chapter summarizes findings from household surveys, including demographic characteristics, responses to harvest assessment questions, harvest estimates, reported employment and income, and responses to food security questions. Harvest numbers are expanded estimates. Results from this survey are available online in the ADF&G Community Subsistence Information System (CSIS).[1]

In addition to the comprehensive survey, 7 key respondent interviews were conducted with 8 individuals, all of whom were active subsistence users. Key respondents shared their knowledge and experiences, comments, and concerns and provided researchers with a great deal of information regarding specific changes in subsistence activities over time. By providing a better understanding of the seasonal round, local history, and subsistence activities in the area, the ethnographic interviews contextualize the quantitative harvest and use data collected in the surveys.

Community Background

The community of Nuiqsut is located on the lower Colville (Kuukpik) River, approximately 136 miles southeast of Utqiaġvik and 60 miles west of Deadhorse (Plate 7-1). It is situated on the west bank of the Nigliq channel, the westernmost of 3 main channels flowing into Harrison Bay on the Beaufort Sea. The community is approximately 20 miles inland from the coast within the central Arctic coastal plain, a landscape composed of slow growth vegetation including varieties of sedges, tussocks, grasses, and mosses. The prevalence of dwarf shrubbery (willow, birch, and alder) increases further inland. Polygonal soil patterns are common, as are low lying bluffs and an occasional pingo.[2] Permafrost in and around Nuiqsut is estimated to be several hundred feet thick, thereby preventing surface water penetration. As a result, the landscape is characterized by an extensive network of wetlands (URS Corporation 2005:4.5-2).

Beyond Nuiqsut, the coastal plain stretches several hundred miles to the west, terminating at the shores of the Chukchi Sea near the communities of Point Lay and Wainwright. Eastward, the plain continues beyond the Mackenzie River delta. The Colville River delta and Beaufort Sea lie to the north of Nuiqsut. To the south of the community, the landscape changes, offering numerous bluffs and tall stands of willow (Hoffman et al. 1988). The topography continues to rise, eventually giving way to the foothills of the Brooks Range, approximately 100 river miles south of Nuiqsut.

The Kuukpigmiut[3] have been moving seasonally throughout the Colville River country since prehistoric times (Hoffman et al. 1988:6). Resource availability dictated these movements, as families traveled to and from seasonal camps in search of subsistence resources as well as trade opportunities. The Nigliq site was of particular importance to people of the Colville region.[4] Until the early part of the 20th century, the Nigliq site was host to an annual trade fair that was held each summer between coastal and inland Iñupiat

1. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." https://www.adfg.alaska.gov/sb/CSIS Hereafter *ADF&G CSIS*.

2. Ice-cored earthen dome.

3. Described as people of the lower Colville River in Hoffman (1988:7) based on early 20th century accounts from Steffanson and others. Burch (1980) describes a pre-contact "Colville River Society" of various small settlements located in the lower and middle Colville River drainage with an estimated population around 1840 of 500.

4. Nigliq is approximately 15 miles downriver from Nuiqsut on the Nigliq channel.

Table 7-1.–Resource harvest and use characteristics, Nuiqsut, 2014.

Characteristic	
Mean number of resources used per household	**12.6**
Minimum	1
Maximum	29
95% confidence limit (±)	9.4%
Median	12.0
Mean number of resources attempted to harvest per household	**8.6**
Minimum	0
Maximum	27
95% confidence limit (±)	14.2%
Median	7.0
Mean number of resources harvested per household	**7.5**
Minimum	0
Maximum	26
95% confidence limit (±)	15.4%
Median	5.5
Mean number of resources received per household	**7.4**
Minimum	0
Maximum	24
95% confidence limit (±)	13.6%
Median	6.0
Mean number of resources given away per household	**6.4**
Minimum	0
Maximum	22
95% confidence limit (±)	14.8%
Median	6.0
Household harvest (pounds)[a]	
Minimum	0
Maximum	18,114
Mean	2,073.2
Median	738.3
Total harvest weight (pounds)[b]	371,991.9
Community per capita harvest (pounds)[b]	895.8
Percentage using any resource	100.0%
Percentage attempting to harvest any resource	94.8%
Percentage harvesting any resource	89.7%
Percentage receiving any resource	96.6%
Percentage giving away any resource	91.4%
Number of households in sample	58.0
Number of resources asked about and identified voluntarily by respondents	118.0

Source ADF&G Division of Subsistence household surveys, 2015.
a. Values do not include bowhead whale harvests.
b. Values include bowhead whale harvests.

Table 7-2.–Comparison of selected findings, Nuiqsut, 2014.

Category	Community Nuiqsut
Demography	
Population	415.2
Percentage of population that is Alaska Native	96.0%
Percentage of household heads born in Alaska	90.2%
Average length of residency of household heads (years)	25.9
Cash economy	
Average number of months employed	6.3
Percentage of employed adults working year-round	61.0%
Percentage of income from sources other than employment	36.4%
Average household income[a]	$110,942
Per capita income[a]	$28,855
Resource harvest and use	
Per capita harvest (pounds usable weight)	356.6
Average household harvest (pounds usable weight)	1,371.2
Number of resources used by 50% or more households	8.0
Average number of resources used per household	12.6
Average number of resources attempted to be harvested per household	8.6
Average number of resources harvested per household	7.5
Average number of resources received per household	7.4
Average number of resources given away per household	6.4
Percentage of total harvest taken by top ranked 25% of households	86.0%
Percentage of households that harvested 70% of harvest	19.0%
Per capita harvest by lowest ranked 50% of households (pounds usable weight)	30.7
Percentage of total harvest taken by lowest ranked 50% of harvesting households	5.7%
Average number of resources used by lowest ranked 50% of households	8.4
Average number of resources used by top ranked 25% of households	17.1

Source ADF&G Division of Subsistence household surveys, 2015.
a. Includes income from sources other than employment.

Plate 7-1.–Aerial photo of Nuiqsut.

(Bockstoce 2009:153–156; Brown 1979:10; Hoffman et al. 1988:40). For centuries, an extensive trans-continental trade network from Asia to Arctic North America facilitated a regular seasonal exchange of goods among indigenous peoples of the far north. Centrally located within this network, the Nigliq site was a strategic and convenient location for people to offer their own locally-sourced goods in exchange for resources that were not readily accessible in their respective regions. Coastal Iñupiat families traveled inland from various camps scattered along the coastline, bringing with them maritime resources such as whale bone and oil, seal skins, and walrus tusks. Nunamiut (inland Iñupiat from Anaktuvuk Pass, Chandler Lake, and Killick River areas) families traveled north in the spring, bringing caribou skins, a variety of furs, and a variety of cutting implements. All reached Nigliq in mid-summer. Today, Nigliq remains an important site for Nuiqsut residents' subsistence activities.

Due to a variety of factors, including a growing dependence on commercial goods such as ammunition, and the collapse of the commercial whaling and fur industries, "by the 1950s only one family lived in the Colville River area" (Galginaitis 1990:8). Although very few people remained in the region year round, many of the families that moved away continued to return to traditionally used lands throughout the lower Colville area for their seasonal subsistence round.

Following the passage of Alaska Native Settlement Claims Act (ANCSA), 31 families returned to the lower Colville region in 1973 and resettled, establishing the community of Nuiqsut on lands selected under ANCSA. The establishment was a return to ancestral lands for many families (Galginaitis et al. 1984:72–75).

Some families saw this as an opportunity to revive traditional values in a contemporary context (Brown 1979:3; Galginaitis et al. 1984:84). Families spent the first 12–18 months living out of canvas tents:

> There was nothing out here in 1973 when we first came out here. [In] May 1973 I made my first trip out of Utqiaġvik, bringing stuff in before that whole family came. And we made a round trip from May 1st—we left Utqiaġvik May 1st, came out here May 3, spent a couple—one night here, offload all my stuff like washer and mattresses and whatnot, what we need to bring…We were living in tents along the way also, and when we got out here too we put our tent up, and it was up for about a year and a half I guess. I mean we lived in that tent for about a year and a half, through the whole winter and into next year. It was alright, but for some people, I mean that didn't know how to survive out in the open, they were having problems. But my dad, he always expert, survival expert 'cause he lived out here before. (NUI02221601)

Through financial and logistical aid from the Arctic Slope Regional Corporation (ASRC) and the North Slope Borough (NSB), several homes were constructed and some basic services provided (Galginaitis et al. 1984:19–25).

Because of the vast mineral reserves in the area, the middle and lower Colville River region has a history of development (Braund and Associates 2009a; Fritz 2015; Galginaitis 1990; Galginaitis et al. 1984; North Slope Borough 2015; Pedersen 1995). Research conducted throughout the past several decades has documented Nuiqsut residents' concerns regarding development's impacts on subsistence (Braund and Kruse 2009; Galginaitis 1990; Galginaitis et al. 1984; Pedersen 1995). "People of Nuiqsut see oil exploration and development as one of their major concerns because of its financial benefits and potential environmental and social detriments," researchers noted in a 1984 report (Galginaitis et al. 1984:12, 13).

In 1994, oil was discovered approximately 8 miles north of the community. Development began in 1998, and production started in 2000. By 2010, the Alpine[5] oil field contained more than 140 wells, which produced over 61,000 barrels of oil per day (Plate 7-2).[6] In response to expanding oil and gas development, in 1998 the Bureau of Land Management (BLM) created the National Petroleum Reserve in Alaska (NPR-A)

5. Also known as the Colville River Unit.

6. Alaska Oil and Gas Conservation Commission, 2011. "AOGCC Pool Statistics: Colville River Unit, Alpine Oil Pool." Accessed January 27, 2016. http://doa.alaska.gov/ogc/annual/current/annindex_current.html

Plate 7-2.–Alpine drill site, north of Nuiqsut in February 2016.

Subsistence Advisory Panel (SAP). The panel is composed of 7 individuals, each representing a North Slope community. The primary purpose of the panel is to advise the BLM, the primary land leasing agency, "on how to minimize the possible impacts of oil and gas activities on subsistence activities."[7] In addition to the NPR-A SAP, the Kuukpik Subsistence Oversight Panel (KSOP) provides "ongoing local input and oversight for the protection, promotion and health of the subsistence resources in the area."[8]

More recently, the NSB and the Native Village of Nuiqsut created a development plan for the community. The plan acknowledges that "the impact of oil and gas activities on subsistence may be more significant to Nuiqsut than other communities" and that development will continue to expand into the future (North Slope Borough 2015). The plan's purpose was to promote and protect the interests and goals of the community, through the progression of these anticipated changes:

> Proposed oil and gas development projects will nearly surround the community with the addition of the Greater Moose's Tooth Oil & Gas Development (GMT) to the west and the Umiat prospect to the south…This Comprehensive Development Plan…is designed to assist the community in charting its future as it takes advantage of new opportunities and creates solutions to current and future challenges. (North Slope Borough 2015)

The community has grown considerably since its establishment in 1973. Today, Nuiqsut hosts an airport, a newly constructed pre-kindergarten through grade 12 school, community center, power plant, wastewater treatment center, clinic, post office, hotel, and grocery store. Many Nuiqsut homes are heated with natural gas, which was made available through nearby oil and gas development. Policing and emergency services are provided by the NSB. Local governance is composed of the City of Nuiqsut, Native Village of Nuiqsut, and the NSB. Kuukpik Corporation, the local Native Corporation, oversees several of its own companies. Many of these subsidiaries provide support services such as ice road construction, drilling, and general maintenance for resource development companies. The Kuukpik Corporation owns approximately 146,000 acres in and around Nuiqsut, 32% of which are within NPR-A boundaries.[9]

7. U.S. Department of the Interior, Bureau of Land Management, 2012. "NPR-A Subsistence Advisory Panel Background." Accessed January 27, 2016. www.blm.gov/ak/st/en/res/npra_sap.html

8. Kuukpik Corporation, 2016. "About Us." Accessed January 27, 2016. http://www.kuukpik.com/about-us/

9. North Slope Borough, 2016. "Nuiqsut." Accessed January 30, 2016. http://www.north-slope.org/our-communities/nuiqsut

Seasonal Round

In 2014, Nuiqsut subsistence users utilized an extensive search area, spanning 16,322 square miles across the central Arctic slope (Figure 7-1). Subsistence activities are oftentimes at the mercy of the weather. During fieldwork in 2015, many Nuiqsut residents mentioned an increase in the frequency and intensity of abnormal weather patterns resulting in low water levels, late freeze-ups, and earlier breakups as well as poor ice conditions (i.e., not enough ice):

> We used to have ice all over, all the time. I remember that when I was small. We'd go seal hunting and we wouldn't have to go very far to get to the ice. But, nowadays, [ice] ends up 50 to 100, 150 miles away. (NUI02221602)

At times, these conditions affected Nuiqsut subsistence users' abilities to harvest resources. Notwithstanding these challenges, residents remained persistent in their subsistence activities throughout 2014.

Spring is a welcomed, albeit brief, seasonal change on the North Slope. On the Colville River delta, migratory waterfowl begin returning north to their nesting grounds as warmer temperatures clear the tundra of ice and snow. Many Nuiqsut hunters take advantage of the birds' early arrival and use snowmachines on the frequently snowless tundra in order to reach good hunting locations. Geese and ducks are hunted sporadically spring through fall. The springtime harvest, however, remains the most productive time for bird hunting. With the onset of warmer temperatures, seal hunting also begins: "…in May, April, May, the seals, they start coming out and start basking in the sun. That's when you start getting them" (NUI03271503).

Burbot fishing, which typically begins in March and lasts until breakup, is also an important spring subsistence activity for Nuiqsut residents. Breakup typically occurs in early June, although many respondents during the 2015 survey said that breakup has been happening earlier in recent years. As one key respondent indicated, the Colville River begins to clear up "...after all the water [from the Colville River] gets out into the ocean like 10–15 miles out, I'm guessing it would be 2 weeks, 2 to 3 weeks" (NUI02221604).

As the river clears, Nuiqsut residents begin setting nets for returning broad whitefish *(aanaakliq)*, and typically leave the nets in the river throughout the summer and into early winter. Salmon are also harvested during the summer, though in far lesser amounts than nonsalmon fish.

Many Nuiqsut hunters continue their search for seals after breakup, as well. The hunt at this time is largely dependent on sea ice conditions: "It [successful seal harvest] all depends on how far [out] the ice is" (NUI02221605). Seal hunting continues throughout the summer, and harvests typically peak in July. According to one Nuiqsut elder, timing for seal hunting has not changed: "As long as my father can tell me stories, that's what he did back in the 20s and 30s [July seal hunting]…walk out to the ocean, just get your seal and come back, so that's what we do" (NUI02221601).

Caribou typically return to the North Slope in June. Nuiqsut hunters travel by boat to reach popular hunting areas throughout the Colville River delta frequented by caribou: "The caribous on the west side are always within the same area, you know, by Judy Creek, Fish Creek area" (NUI02221605). Caribou hunting peaks in late summer, during a time of fewer insects and lower temperatures—ideal conditions for preventing meat spoilage. Hunting efforts typically begin to subside prior to the rut in mid- to late September.

For many residents of Nuiqsut, fall time is whaling time. According to one Nuiqsut whaling captain, "open fire" (the opening of the whaling season), is decided by the Nuiqsut Whaling Captain's Association (NWCA) during an annual meeting; the season typically opens during the last week of August. Since the 1990s, whales have been harvested from the end of August into mid- to late September. In the mid- to late 1980s, several bowheads were harvested as late as mid-October.

Residents also harvest a great deal of whitefishes and other types of nonsalmon fishes during the fall. Set nets are used in open water before freeze-up. Following freeze-up, nets are immediately set under the ice and are left in the river until the ice gets too thick to easily manage the net. Moose hunting also occurs during the fall time.

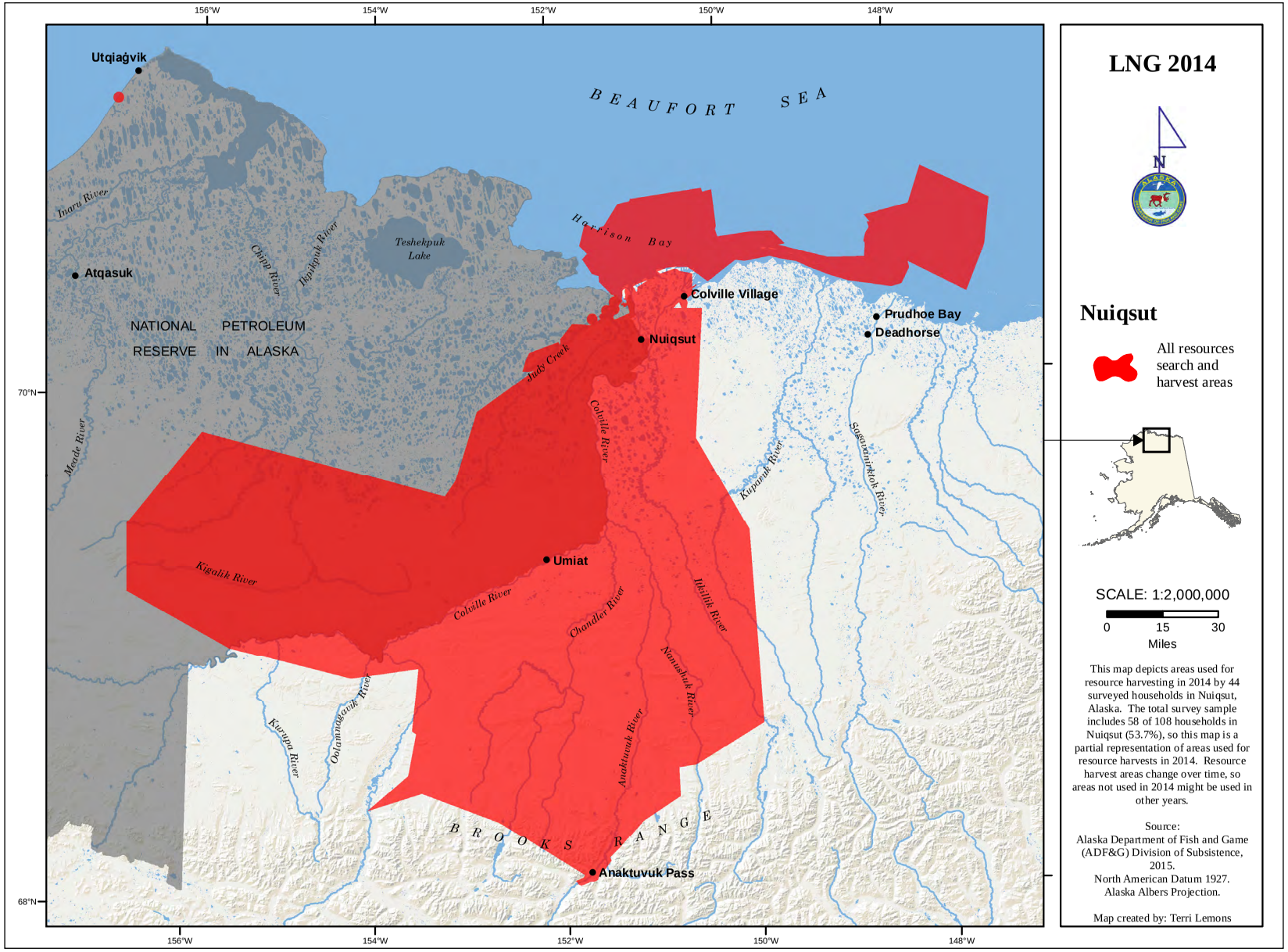

Figure 7-1.–All resources search and harvest areas, Nuiqsut, 2014.

Plate 7-3.–Overwintering caribou near Nuiqsut.

Hunters continue to harvest caribou throughout the winter. According to many respondents, wintertime caribou harvests are primarily as needed for the hunters' own families, extended family members, other communities, or a combination of these. Search and harvest areas for winter caribou hunting are extensive, because the majority of caribou have already headed south to wintering grounds by late fall; however, a small number of caribou do overwinter on the North Slope (Plate 7-3).

A small number of Nuiqsut residents trap and hunt wolves and wolverines throughout the winter, as well. If there is sufficient snow cover, hunters will track the animals. In the event that snow levels are inadequate for tracking, they often use traps and snares.

Population Estimates and Demographic Information

This study estimated that 415 people resided in Nuiqsut in 2014 (Figure 7-2; Table D7-1). The 2010 population of Nuiqsut was 402 residents. Upon resettlement, the 1973 population was 175 residents (Galginaitis et al. 1984:93). There were 144 residents in 1977, and the population has doubled since 1980 (Figure 7-3; Hoffman et al. 1988:10). The highest recorded population of Nuiqsut was 433 residents in 2000.[10] Overall, Nuiqsut's population has remained relatively constant since 1993.

The proportion of males to females has shifted since resettlement. In 1973, females made up 44% of the population; and in 1983, males accounted for 54% of the total population (Galginaitis et al. 1984:93). In 2003, females made up 48% of the population. The 2010 census reflected a slightly higher number of males compared to females, with males accounting for 52% of the population.[11] In 2014, female residents accounted for 52% of the total population (Figure 7-4; Table D7-2).

In 2014, 97 households, or 90% of all households, were headed by one or more Alaska Natives (Table 7-3). The population of Nuiqsut was 96% Alaska Native. The average household size was 4 individuals, and the average age of residents was 26 years old. Heads' of household average length of residency was 26 years; overall, residents had lived there for an average of 17 years.

Most household heads (87%) were born in Alaska (Table 7-4). Forty-two percent were born in Utqiaġvik, and 27% claimed Nuiqsut as their birthplace. The remainder was born in other North Slope communities

10. ADF&G CSIS.

11. U.S. Census Bureau, Washington, D.C., n.d. "American FactFinder: Nuiqsut." Accessed January 28, 2016. http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

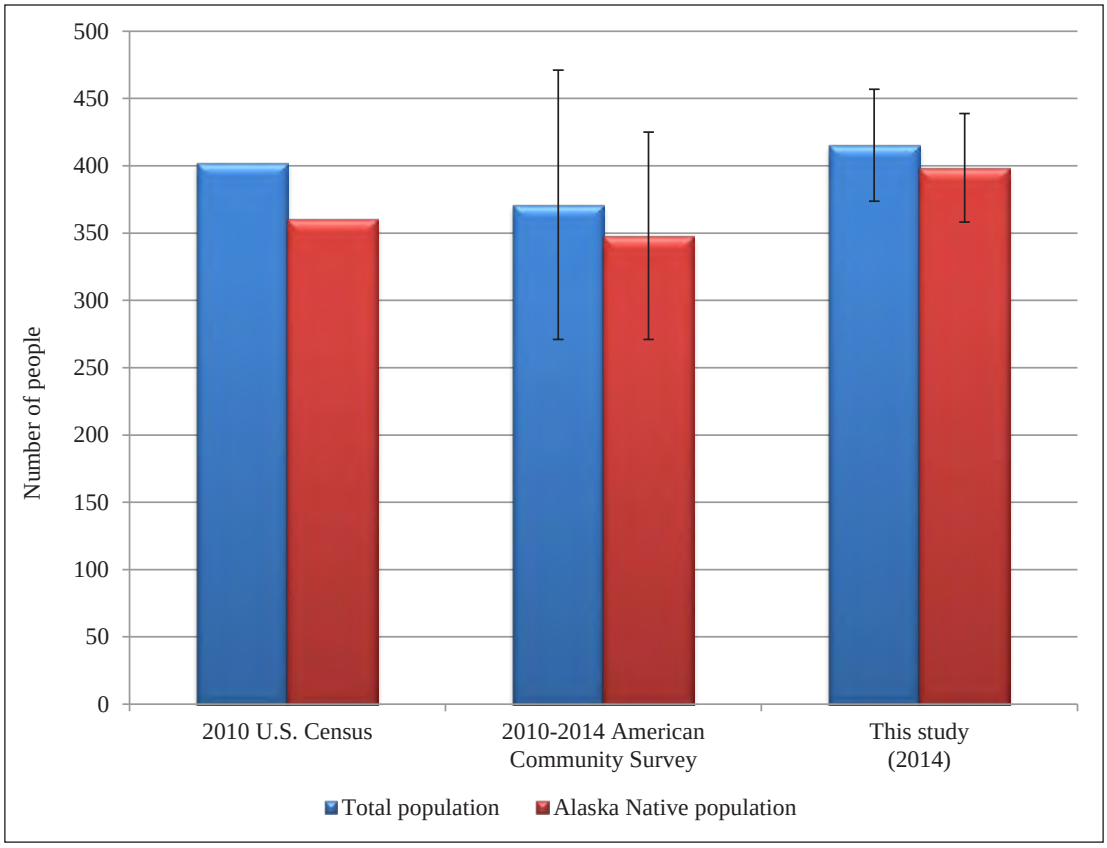

Figure 7-2.–Population estimates, Nuiqsut, 2010 and 2014.

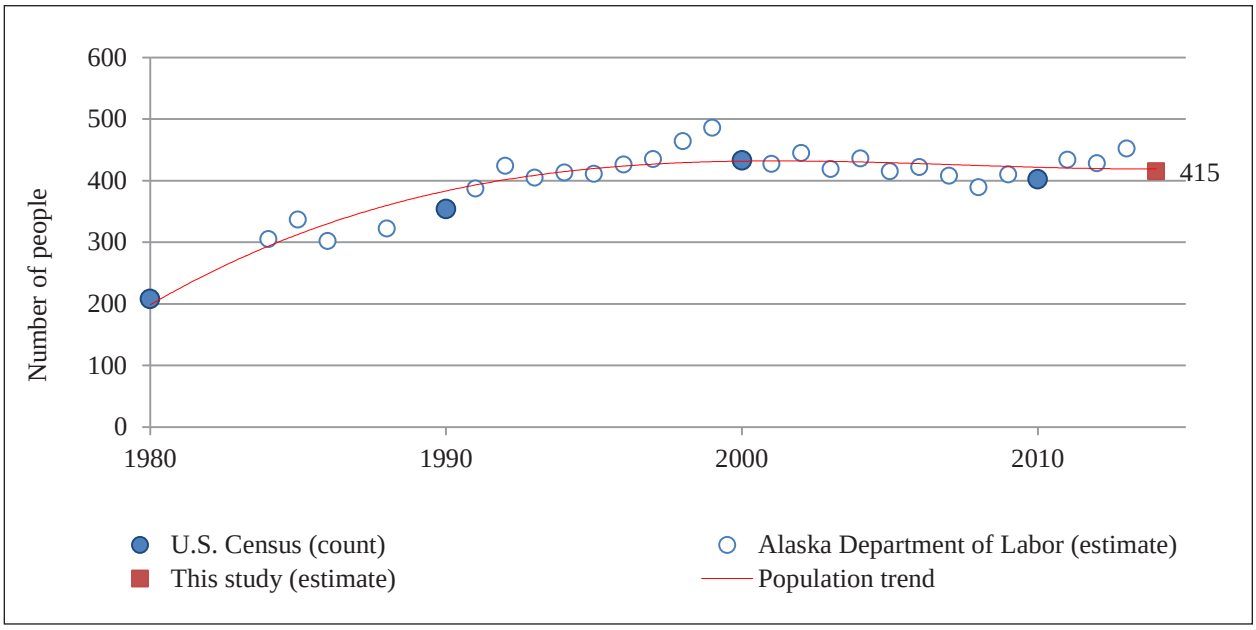

Figure 7-3.–Historical population estimates, Nuiqsut, 1980–2014.

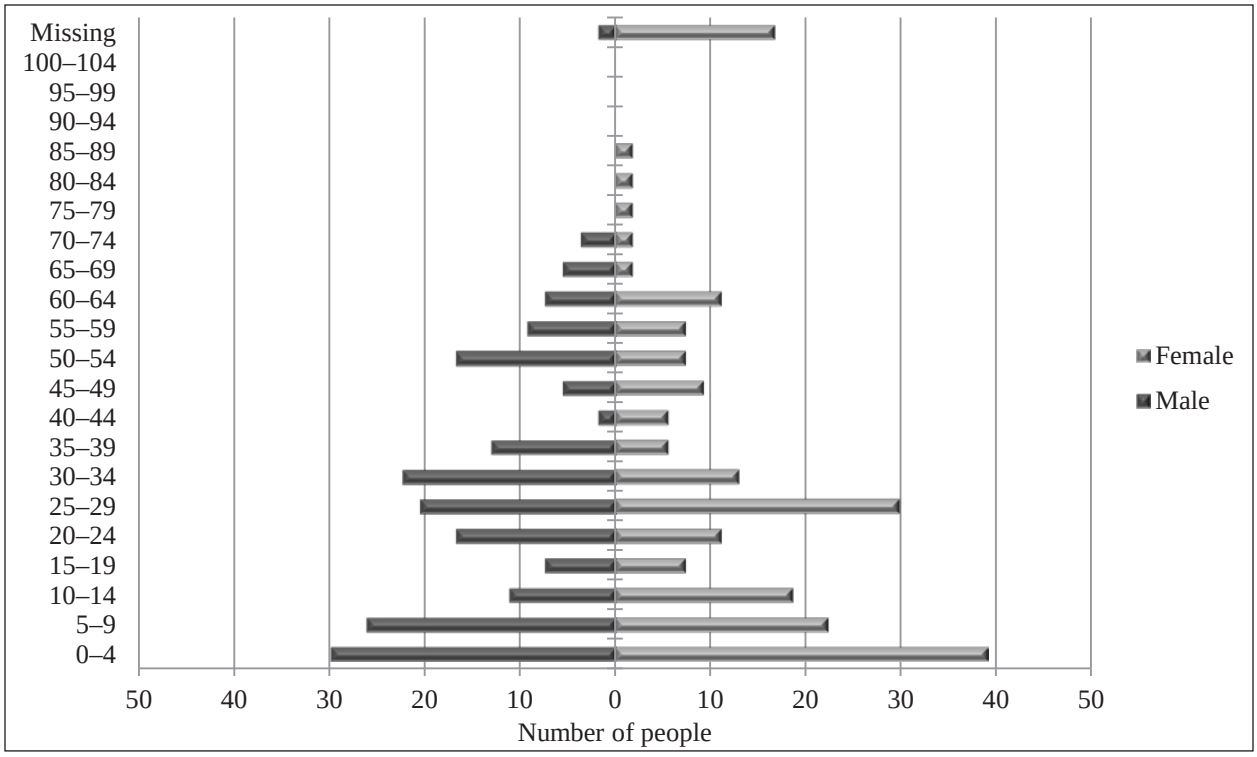

Figure 7-4.–Population profile, Nuiqsut, 2014.

(Anaktuvuk Pass, Atqasuk, Point Hope) as well as other communities across the state (Fairbanks, Anchorage). Overall, 59% of Nuiqsut's population was born in the community, and 23% claimed Utqiaġvik as their birthplace (Table D7-3). Other birthplaces included other North Slope communities, Fairbanks, Anchorage, and other U.S. states.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Figure 7-5 and Table D7-4 report the expanded levels of individual participation in the harvest and processing of wild resources by all Nuiqsut residents in 2014.

Nuiqsut is a highly active, subsistence-based community. Approximately two-thirds of residents attempted to harvest (66%) and process (64%) at least 1 subsistence resource during 2014. The largest gap in individual participation occurred between residents who harvested marine mammals and the individuals who took part in processing marine mammals, while the smallest differentiation occurred between individuals who harvested fish and those who processed fish.

Harvest and Use of Wild Resources at the Household Level

Figure 7-6 shows by resource category the percentages of households that used wild resources, attempted to harvest and harvested wild foods, and shared wild foods. Ninety-five percent of Nuiqsut households attempted to harvest wild foods in 2014, and 90% successfully harvested these resources (Table 7-1). All Nuiqsut households used wild foods during the study period. With the exception of small land mammals and salmon, more than one-half of Nuiqsut households attempted to harvest a variety of subsistence foods, including large land mammals, marine mammals, nonsalmon fish, birds and eggs, and vegetation (Figure 7-6). Additionally, among all categories except marine mammals and small land mammals, more than one-half of Nuiqsut households were successful in harvesting wild foods.

Table 7-3.–Sample and demographic characteristics, Nuiqsut, 2014.

Characteristics	Community Nuiqsut
Sampled households	58
Eligible households	108
Percentage sampled	53.7%
Sampled population	223
Estimated community population	415.2
Household size	
Mean	3.8
Minimum	1.0
Maximum	8.0
Age	
Mean	25.6
Minimum[a]	0
Maximum	86
Median	25.0
Length of residency	
Total population	
Mean	17.0
Minimum	0
Maximum	65
Heads of household	
Mean	25.9
Minimum	1
Maximum	65
Alaska Native	
Estimated households[b]	
Number	96.8
Percentage	89.7%
Estimated population	
Number	398.5
Percentage	96.0%

Source ADF&G Division of Subsistence household surveys, 2015.
a. A minimum age of 0 (zero) is used for infants who are less than 1 year of age.
b. The estimated number of households in which at least 1 head of household is Alaska Native.

Table 7-4.–Birthplaces of household heads, Nuiqsut, 2014.

Birthplace	Percentage
Alakanuk	1.2%
Anaktuvuk Pass	3.5%
Anchorage	1.2%
Atqasuk	1.2%
Emmonak	1.2%
Fairbanks	1.2%
Kotzebue	1.2%
Nuiqsut	27.1%
Point Hope	1.2%
Balance of North Slope Borough	2.4%
Colville Village	1.2%
Utqiaġvik	42.4%
Missing	3.5%
Other Alaska	2.4%
Other U.S.	9.4%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

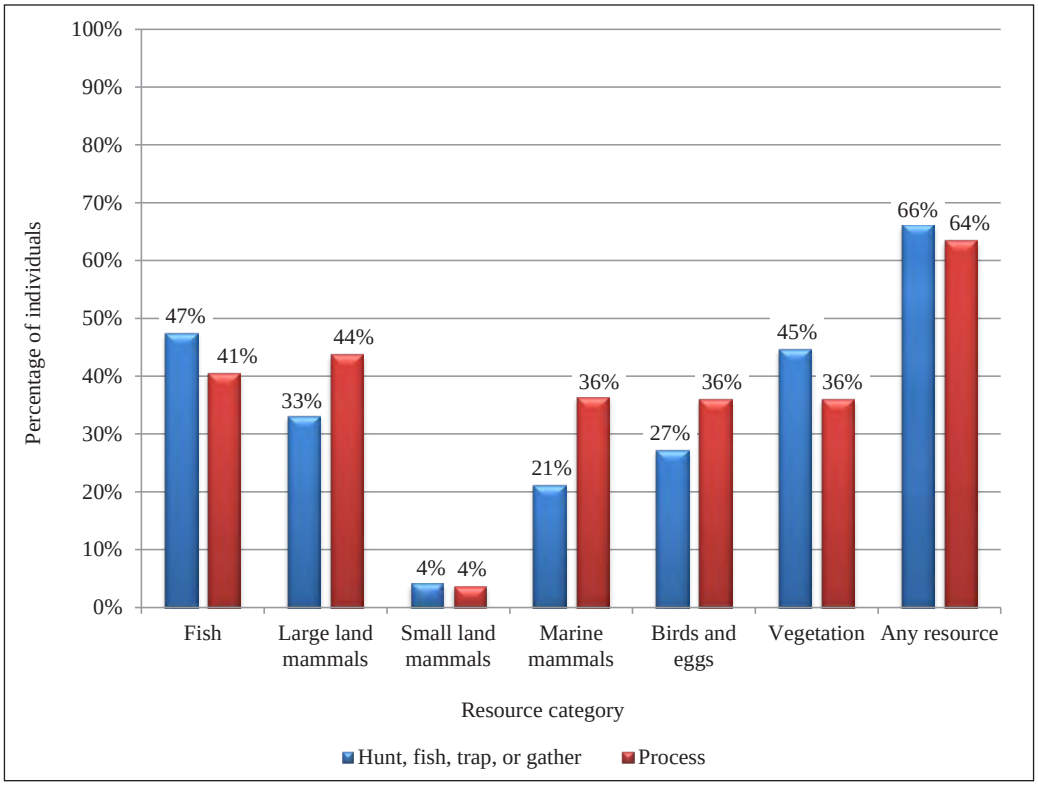

Figure 7-5.–Individual participation in subsistence harvesting and processing activities, Nuiqsut, 2014.

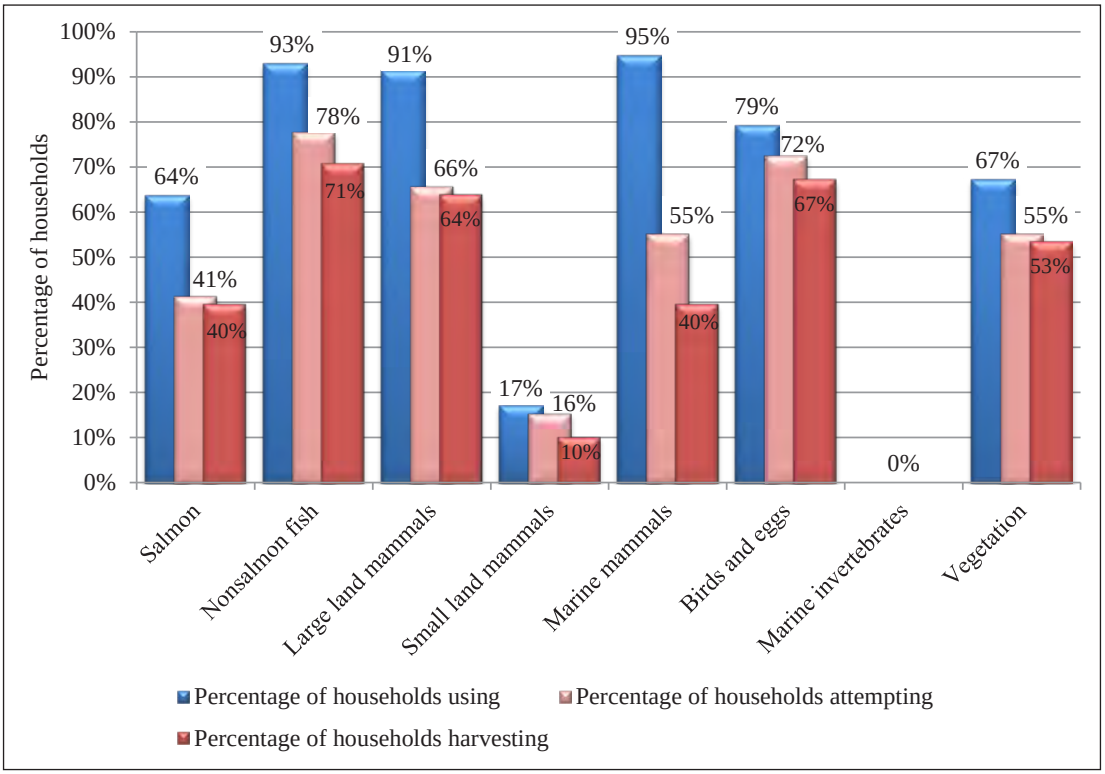

Figure 7-6.–Percentage of households using, attempting to harvest, or harvesting wild resources, by category, Nuiqsut, 2014.

As is typical in rural Alaska communities, in addition to harvesting wild foods, the majority of Nuiqsut households shared their subsistence foods with others, both within the community and with members of other communities:

> I know I have some family members that send muktuk over to Fairbanks. Some churches in Anchorage. Family in Anchorage, Fairbanks, bunch of the whale goes to the Kobuk area, Selawik, Ambler, and Utqiaġvik; ‘cross the Slope. (NUI02221602)

Overall, over 90% of Nuiqsut households shared a portion of their wild foods harvest, and 97% of Nuiqsut households received wild foods (Table 7-1).

Excluding small land mammals and marine invertebrates, over one-half of all Nuiqsut households used resources from each of the subsistence resource categories (Figure 7-6). The most commonly used wild foods were marine mammals, nonsalmon fish, and large land mammals. More households attempted to harvest and successfully harvested the aforementioned resources than all other resources. The highest percentage of households harvested nonsalmon fish.

Table 7-1 summarizes resource harvest and use characteristics for Nuiqsut in 2014 at the household level. The average household harvest was 2,073 lb of edible weight, not including bowhead whale harvests, and 3,454 lb with bowhead included. Households harvested an average of 8 different types of resources, and used an average of 13 different kinds of resources. The maximum number of resources used by any household was 29. In addition, households gave away, on average, 6 kinds of resources. Overall, at least 118 resources were available for households to harvest in the study area; these include resources that survey respondents identified but were not asked about in the survey instrument.

Harvest Quantities and Composition

Table 7-5 reports estimated wild resource harvests and uses by Nuiqsut residents in 2014 and is organized first by general category and then by species. All edible resources are reported in pounds edible weight (see Appendix C for conversion factors). 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 a household, and resources acquired from other harvesters, either as gifts, by barter or trade or through hunting partnerships. Purchased foods are not included. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

Marine mammal harvests accounted for nearly half of the total harvest in 2014. The successful harvest of 5 bowhead whales accounted for the majority of the marine mammal harvest and provided the most edible pounds in this category (Table 7-5; Figure 7-7). Both large land mammals and nonsalmon fish made up the majority of the remaining harvest; caribou and whitefishes harvests contributed the most edible pounds in these categories. Additional categories including birds and eggs, vegetation, and salmon accounted for 3% of the total harvest.

Small land mammal harvests were not included in the total edible weight because these animals were utilized entirely for fur, and not food.

Table 7-6 lists the resources most commonly used by households, and Figure 7-8 shows the species with the highest per capita harvests during the 2014 study year. The 2 most highly used species among Nuiqsut households were bowhead whale and caribou (Table 7-6). Two types of nonsalmon fish, Arctic cisco and broad whitefish, were also among the most widely used resources in 2014 for Nuiqsut households. The remaining highly-used resources in 2014 included white-fronted geese, bearded seal, ringed seal, and cloudberries (locally known as salmonberries).

Bowhead whale, caribou, and whitefishes provided the most edible weight for Nuiqsut households in 2014. Combined, these resources accounted for 89% of the total per capita pounds and provided nearly 800 lb per capita (Table 7-5; Figure 7-8). Overall, 3 marine mammal species (bowhead whale, bearded and ringed seals) provided slightly over 400 edible pounds per capita, or 45% of the total per capita harvest weight.

Table 7-5.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Nuiqsut, 2014.

	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
All resources	**100.0**	**94.8**	**89.7**	**96.6**	**91.4**	**371,991.9**	**3,444.4**	**895.8**	**371,991.9**	**lb**	**3,444.4**	**17.5**
Salmon	**63.8**	**41.4**	**39.7**	**34.5**	**31.0**	**3,888.7**	**36.0**	**9.4**	**3,888.7**	**lb**	**36.0**	**52.2**
Chum salmon	27.6	29.3	27.6	6.9	17.2	3,508.0	32.5	8.4	582.8	ind	5.4	57.1
Coho salmon	6.9	3.4	3.4	3.4	0.0	57.4	0.5	0.1	11.2	ind	0.1	100.8
Chinook salmon	8.6	1.7	0.0	8.6	1.7	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pink salmon	13.8	10.3	8.6	8.6	5.2	263.6	2.4	0.6	106.1	ind	1.0	63.8
Sockeye salmon	10.3	5.2	5.2	5.2	6.9	37.5	0.3	0.1	9.3	ind	0.1	80.5
Unknown salmon	12.1	1.7	1.7	10.3	6.9	22.1	0.2	0.1	3.7	ind	0.0	136.3
Nonsalmon fish	**93.1**	**77.6**	**70.7**	**70.7**	**72.4**	**85,106.3**	**788.0**	**205.0**	**85,106.3**	**lb**	**788.0**	**29.7**
Pacific herring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe/unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Rainbow smelt	24.1	13.8	13.8	17.2	10.3	913.2	8.5	2.2	152.2	gal	1.4	78.3
Arctic cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Saffron cod	6.9	6.9	6.9	0.0	3.4	27.8	0.3	0.1	132.2	ind	1.2	99.3
Unknown cod	1.7	1.7	1.7	0.0	1.7	1.4	0.0	0.0	1.9	ind	0.0	0.0
Arctic flounder	3.4	3.4	3.4	0.0	0.0	24.6	0.2	0.1	22.3	ind	0.2	115.4
Pacific halibut	1.7	1.7	1.7	0.0	1.7	134.1	1.2	0.3	134.1	lb	1.2	136.3
Unknown rockfish	1.7	1.7	1.7	0.0	1.7	2.8	0.0	0.0	1.9	ind	0.0	0.0
Unknown sculpin	1.7	1.7	1.7	1.7	0.0	14.0	0.1	0.0	9.3	ind	0.1	136.3
Burbot	37.9	31.0	25.9	17.2	17.2	1,629.6	15.1	3.9	388.0	ind	3.6	41.7
Arctic char	20.7	17.2	17.2	6.9	8.6	792.7	7.3	1.9	240.2	ind	2.2	54.9
Dolly Varden–unknown	12.1	10.3	10.3	3.4	0.0	1,345.7	12.5	3.2	407.8	ind	3.8	124.4
Lake trout	5.2	1.7	1.7	3.4	1.7	111.7	1.0	0.3	27.9	ind	0.3	136.3
Arctic grayling	22.4	15.5	13.8	8.6	8.6	1,463.6	13.6	3.5	1,626.2	ind	15.1	64.8
Northern pike	8.6	6.9	3.4	6.9	0.0	36.9	0.3	0.1	11.2	ind	0.1	115.4
Sheefish	8.6	0.0	0.0	8.6	5.2	0.0	0.0	0.0	0.0	ind	0.0	0.0
Broad whitefish	72.4	60.3	58.6	39.7	51.7	36,605.3	338.9	88.2	11,439.1	ind	105.9	35.0
Arctic cisco	82.8	51.7	48.3	53.4	58.6	32,394.1	299.9	78.0	46,277.3	ind	428.5	36.9

-continued-

Table 7-5.–Page 2 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Nonsalmon fish, continued												
Bering cisco	1.7	1.7	1.7	0.0	0.0	13.0	0.1	0.0	18.6	ind	0.2	136.3
Least cisco	32.8	27.6	27.6	6.9	19.0	9,332.7	86.4	22.5	13,332.4	ind	123.4	78.2
Humpback whitefish	8.6	6.9	6.9	3.4	5.2	250.3	2.3	0.6	119.2	ind	1.1	71.4
Round whitefish	3.4	3.4	3.4	0.0	0.0	13.0	0.1	0.0	18.6	ind	0.2	95.5
Unknown whitefishes	1.7	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown nonsalmon fish	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Large land mammals	**91.4**	**65.5**	**63.8**	**72.4**	**67.2**	**108,358.8**	**1,003.3**	**261.0**	**108,358.8**	**lb**	**1,003.3**	**43.0**
Brown bear	1.7	3.4	1.7	0.0	0.0	160.1	1.5	0.4	1.9	ind	0.0	136.3
Caribou	89.7	65.5	63.8	58.6	67.2	105,193.2	974.0	253.3	773.5	ind	7.2	43.1
Moose	43.1	32.8	5.2	36.2	6.9	3,005.4	27.8	7.2	5.6	ind	0.1	77.3
Common muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dall sheep	5.2	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Small land mammals	**17.2**	**15.5**	**10.3**	**6.9**	**1.7**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Beaver	1.7	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic fox	3.4	3.4	3.4	0.0	0.0	0.0	0.0	0.0	5.6	ind	0.1	100.8
Red fox	3.4	3.4	3.4	0.0	0.0	0.0	0.0	0.0	20.5	ind	0.2	105.2
Snowshoe hare	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
North American river	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Lynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	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	ind	0.0	0.0
Gray wolf	12.1	13.8	6.9	5.2	1.7	0.0	0.0	0.0	13.0	ind	0.1	83.7
Wolverine	12.1	13.8	8.6	3.4	1.7	0.0	0.0	0.0	27.9	ind	0.3	93.0
Marine mammals	**94.8**	**55.2**	**39.7**	**94.8**	**70.7**	**169,366.5**	**1,568.2**	**407.9**	**169,366.5**	**lb**	**1,568.2**	**4.6**
Polar bear	3.4	1.7	0.0	3.4	1.7	0.0	0.0	0.0	0.0	ind	0.0	0.0
Bearded seal	67.2	37.9	22.4	62.1	39.7	13,846.3	128.2	33.3	48.4	ind	0.4	43.7

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Table 7-5.–Page 3 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Marine mammals, continued												
Ribbon seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ringed seal	51.7	39.7	34.5	32.8	38.6	6,156.0	57.0	14.8	108.0	ind	1.0	38.1
Spotted seal	6.9	6.9	3.4	5.2	3.4	1,277.4	11.8	3.1	13.0	ind	0.1	104.2
Unknown seal	6.9	0.0	0.0	6.9	1.7	0.0	0.0	0.0	0.0	ind	0.0	0.0
Walrus	31.0	1.7	0.0	31.0	19.3	0.0	0.0	0.0	0.0	ind	0.0	0.0
Beluga whale	15.5	0.0	0.0	15.5	8.6	0.0	0.0	0.0	0.0	ind	0.0	0.0
Bowhead whale[a]	93.1	29.3	20.7	91.4	56.9	148,086.8	1,371.2	356.6	5.0	ind	0.0	0.0
Birds and eggs	**79.3**	**72.4**	**67.2**	**37.9**	**53.4**	**4,857.2**	**45.0**	**11.7**	**4,857.2**	**lb**	**45.0**	**23.1**
Common eider	8.6	6.9	6.9	3.4	6.9	107.0	1.0	0.3	48.4	ind	0.4	69.8
King eider	36.2	24.1	22.4	19.0	17.2	276.9	2.6	0.7	193.7	ind	1.8	43.8
Spectacled eider	3.4	1.7	1.7	1.7	1.7	45.2	0.4	0.1	18.6	ind	0.2	136.3
Steller's eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	1.7	0.0	0.0	1.7	1.7	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red-breasted merganser	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pintail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Black scoter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Green-winged teal	1.7	1.7	1.7	0.0	1.7	19.4	0.2	0.0	37.2	ind	0.3	136.3
Wigeon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown ducks	1.7	1.7	0.0	1.7	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brant	15.5	12.1	12.1	6.9	8.6	140.0	1.3	0.3	87.5	ind	0.8	61.1
Unknown	29.3	25.9	24.1	12.1	17.2	798.8	7.4	1.9	242.1	ind	2.2	65.8
Snow goose	27.6	27.6	24.1	5.2	12.1	395.5	3.7	1.0	109.9	ind	1.0	48.2
White-fronted goose	74.1	60.3	55.2	34.5	44.8	2,909.3	26.9	7.0	938.5	ind	8.7	22.8
Unknown geese	1.7	1.7	1.7	0.0	0.0	14.1	0.1	0.0	3.7	ind	0.0	136.3
Tundra (whistling) swan	1.7	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sandhill crane	1.7	1.7	1.7	0.0	0.0	15.6	0.1	0.0	1.9	ind	0.0	136.3
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Whimbrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Godwit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 7-5.–Page 4 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Unknown shorebirds - small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Black guillemot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Glaucous gull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sabine's gull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown loon	3.4	1.7	1.7	1.7	0.0	20.3	0.2	0.0	3.7	ind	0.0	136.3
Unknown murre	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic tern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown ptarmigan	15.5	12.1	12.1	5.2	8.6	78.2	0.7	0.2	111.7	ind	1.0	61.4
Snowy owl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown duck eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brant eggs	1.7	1.7	1.7	0.0	1.7	3.3	0.0	0.0	13.0	ind	0.1	136.3
Unknown goose eggs	5.2	3.4	3.4	1.7	3.4	33.5	0.3	0.1	111.7	ind	1.0	97.5
Tundra swan eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown swan eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sandhill crane eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown crane eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown small shorebird eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown gull eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown loon eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown murre eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic tern eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown tern eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine invertebrates	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Unknown clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown king crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown mussels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 7-5.–Page 5 of 5.

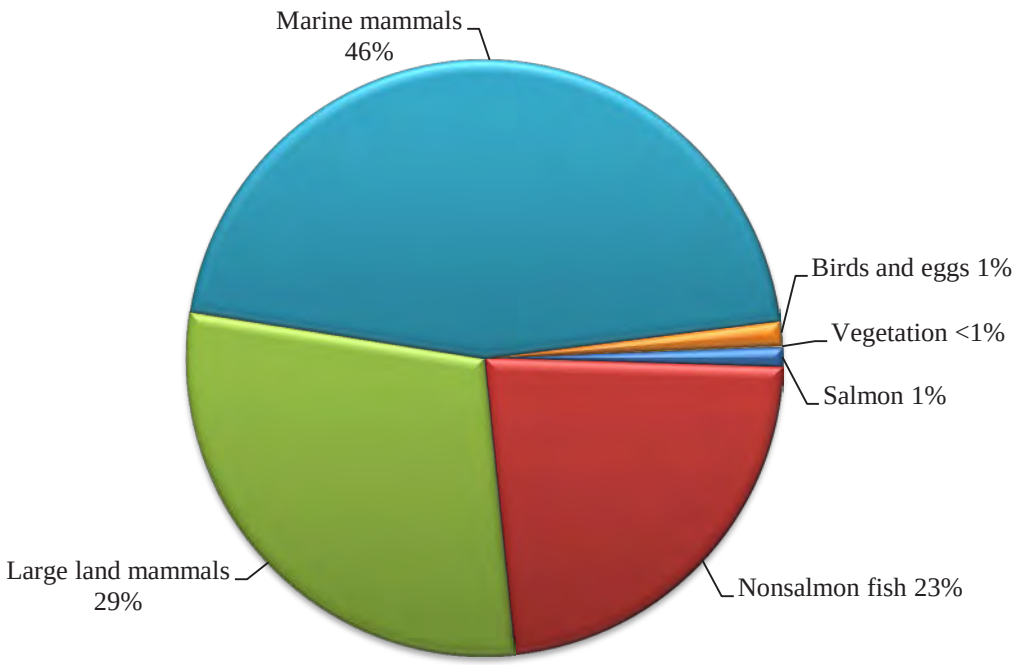
Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Vegetation	**67.2**	**55.2**	**53.4**	**37.9**	**20.7**	**414.4**	**3.8**	**1.0**	**414.4**	**lb**	**3.8**	**23.7**
Blueberry	39.7	29.3	29.3	15.5	8.6	61.9	0.6	0.1	15.5	gal	0.1	36.2
Lowbush cranberry	12.1	8.6	8.6	5.2	3.4	20.0	0.2	0.0	5.0	gal	0.0	74.9
Highbush cranberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Crowberry	8.6	6.9	6.9	1.7	1.7	5.6	0.1	0.0	1.4	gal	0.0	94.1
Cloudberry	62.1	55.2	53.4	29.3	15.5	320.3	3.0	0.8	80.1	gal	0.7	25.1
Other wild berry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Hudson's Bay (Labrador) tea	3.4	1.7	1.7	3.4	0.0	3.7	0.0	0.0	3.7	gal	0.0	136.3
Sourdock	10.3	5.2	5.2	6.9	1.7	2.8	0.0	0.0	2.8	gal	0.0	99.1
Willow leaves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other wild greens	3.4	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown mushrooms	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Stinkweed	1.7	0.0	0.0	1.7	1.7	0.0	0.0	0.0	0.0	gal	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2015.

Note Resources where the percentage using is greater than the combined received and harvest indicate use from resources obtained during a previous year.

Note For small land mammals, species that are not typically eaten show a nonzero harvest amount with a zero harvest weight. Harvest weight is not calculated for species harvested but not eaten.

a. Bowhead whale harvest is reported value, Alaska Eskimo Whaling Comission, usable weight estimation from North Slope Borough Department of Wildlife Management.



Note Categories having 0 lb of usable weight are not included.

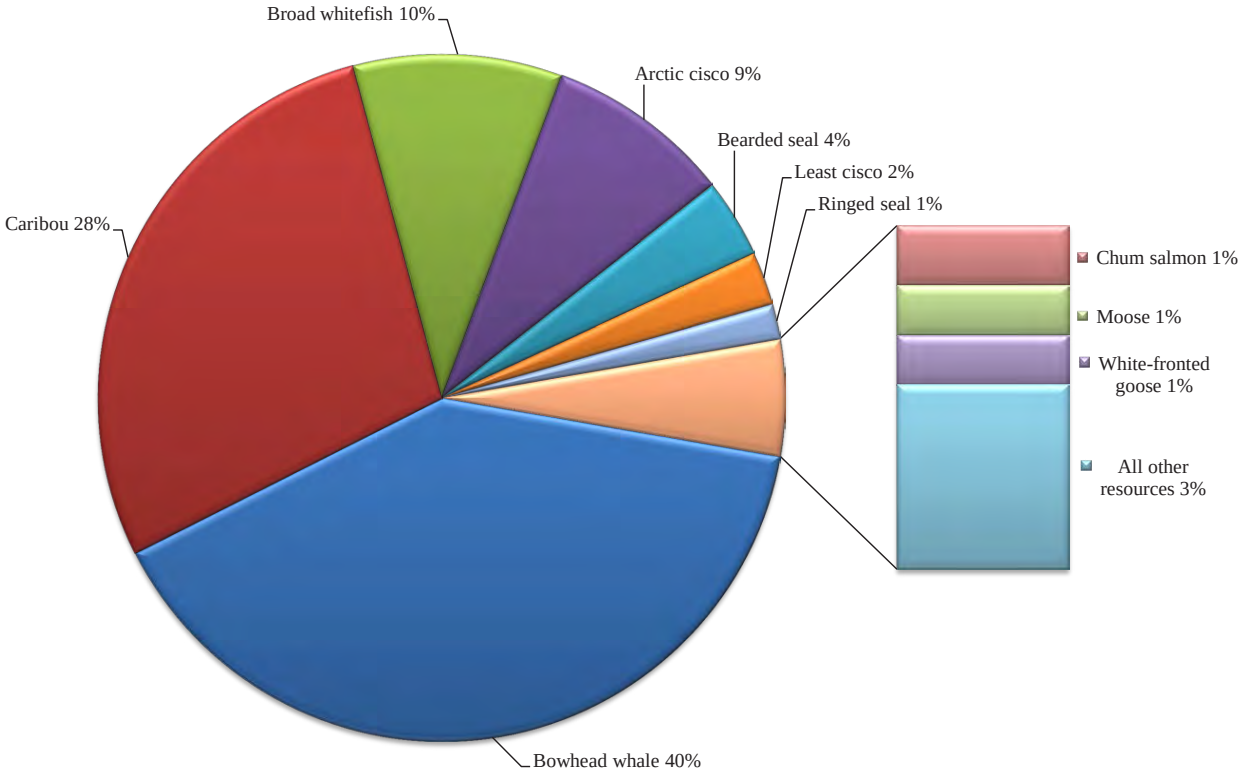
Figure 7-7.–Composition of harvest by resource category, by weight in usable pounds, Nuiqsut, 2014.

Table 7-6.–Resources most commonly used by households, Nuiqsut, 2014.

Rank[a]	Resource	Percentage of households using
1.	Bowhead whale	93.1%
2.	Caribou	89.7%
3.	Arctic cisco	82.8%
4.	White-fronted goose	74.1%
5.	Broad whitefish	72.4%
6.	Bearded seal	67.2%
7.	Cloudberry	62.1%
8.	Ringed seal	51.7%
9.	Moose	43.1%
10.	Blueberry	39.7%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Resources used by the same percentage of households share the lowest rank value instead of having sequential rank values.



Note The "all other resources" category represents all other resources that contributed less than 1% to the total harvest.

Figure 7-8.–Top resource harvests by weight in usable pounds per capita, Nuiqsut, 2014.

Caribou and moose harvests accounted for 29% of the total per capita harvest weight, and Arctic cisco and broad whitefish provided 19% of the total per capita harvest weight for Nuiqsut residents in 2014.

Marine Mammals

"The main reason why I go whaling is to feed my people" (NUI 02221602).

The harvest of marine mammals accounted for 46% of the total wild foods harvest in edible pounds for Nuiqsut in 2014 (Figure 7-7). Harvested species included bowhead whale, as well as bearded, ringed, and spotted seals. Marine mammals were the top harvested resource as well as the most shared food in 2014—95% of Nuiqsut households received marine mammals, and close to 71% of households shared their marine mammal harvest (Table 7-5).

Alaska Eskimo Whaling Commission (AEWC) allocations allowed Nuiqsut a quota of 4 bowhead whales in 2014; this quota has been in place since 1995 (Galginaitis 2014:104). In addition, the communities of Wales and Point Lay each transferred one of their eligible bowhead harvests to Nuiqsut during the 2014 fall whaling season. As a result, 5 bowhead whales were harvested in the fall of 2014: 2 harvests occurred in August, and 3 harvests occurred in September (Table 7-7). The bowhead harvest totaled 148,087 lb, which provided an estimated 357 lb per capita and 87% of the total marine mammal harvest by weight (Figure 7-9).

Nuiqsut hunters harvested an estimated 48 bearded seals, which accounted for 8% of the total edible pounds for marine mammals, or 13,846 lb (Table 7-5; Figure 7-9). Per capita estimates equated to over 33 edible pounds per resident (Table 7-5). Bearded seals were harvested during the summer months, June through

Table 7-7.–Estimated marine mammal harvests by month and sex, Nuiqsut, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All marine mammals	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**11.2**	**91.2**	**67.2**	**4.9**	**0.0**	**0.0**	**0.0**	**0.0**	**174.4**
Polar bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Seal	0.0	0.0	0.0	0.0	0.0	11.2	91.2	65.2	1.9	0.0	0.0	0.0	0.0	**169.4**
Bearded seal	0.0	0.0	0.0	0.0	0.0	5.6	27.9	14.9	0.0	0.0	0.0	0.0	0.0	**48.4**
Ribbon 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	**0.0**
Ringed seal	0.0	0.0	0.0	0.0	0.0	5.6	52.1	48.4	1.9	0.0	0.0	0.0	0.0	**108.0**
Spotted seal	0.0	0.0	0.0	0.0	0.0	0.0	11.2	1.9	0.0	0.0	0.0	0.0	0.0	**13.0**
Unknown seals	0.0	0.0	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	**0.0**
Whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.0	0.0	0.0	0.0	0.0	**5.0**
Whale, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	**1.0**
Whale, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.0	0.0	0.0	0.0	0.0	**4.0**
Whale, unknown sex	0.0	0.0	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	**0.0**
Bowhead whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.0	0.0	0.0	0.0	0.0	**5.0**
Bowhead whale, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	**1.0**
Bowhead whale, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.0	0.0	0.0	0.0	0.0	**4.0**
Bowhead whale, unknown sex	0.0	0.0	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, 2015.

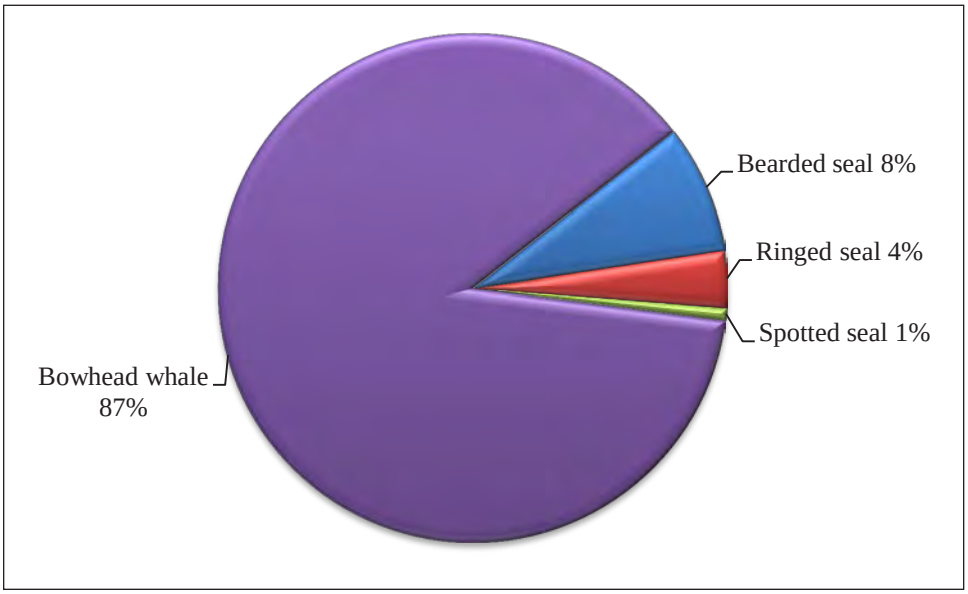


Figure 7-9.–Composition of marine mammal harvest by pounds usable weight, Nuiqsut, 2014.

August (Table 7-7). The largest bearded seal harvest occurred in July (28 seals); during June and August, hunters harvested an additional 6 and 15 bearded seals, respectively.

Ringed (6,156 lb) and spotted seals (1,277 lb) combined provided 5% of the total marine mammal harvest in edible pounds (Table 7-5). Combined, the 2 species provided 18 lb of edible weight per resident. Ringed and spotted seal harvests also occurred throughout the summer season. Hunters harvested a total of 100 ringed seals in July (52) and August (48), and 13 spotted seals July (11) and August (2; Table 7-7).

Three different whaling crews were responsible for the 5 bowhead harvests in the fall of 2014; 2 crews each harvested 2 whales, and the third crew harvested 1 whale.[12] Close to 30% of Nuiqsut households had members that participated in whaling, and 21% were on successful crews (Table 7-5). Thirty-eight percent of Nuiqsut households attempted to harvest bearded seals in 2014, and 22% successfully harvested these animals. Forty percent of households attempted to harvest ringed seals, and 35% of households successfully harvested these animals. The least harvested marine mammal, spotted seal, saw 7% of households attempting to harvest and close to one-half that percentage of households actually harvesting these animals.

Marine mammal hunting was primarily concentrated in 2 areas. The first area was in Harrison Bay, between Atigaru Point and Oliktok Point, including a northward extent of approximately 50 miles beyond the Colville River delta (Figure 7-10). The second area was east of the delta between Prudhoe and Foggy Island bays, which includes an approximately 100 square mile area surrounding the Midway Islands, McClure Islands, and Cross Island.

Cross Island is a barrier island in the Beaufort Sea, approximately 70 miles northeast of Nuiqsut and 10 miles north of the Sagavanirktok River mouth and Prudhoe Bay. Nuiqsut whalers based all of their activities from Cross Island, and the whaling search and harvest areas were concentrated north of the island in 2014. Nuiqsut whaling crews have utilized the island as a base camp for whale hunting since 1986 (Galginaitis 2014:104). The island is advantageously situated near the fall bowhead whale migration route. Despite the close proximity to the migration route, the large amount of open water coupled with unpredictable weather, both typical of the fall whaling season, has presented challenges for Nuiqsut whaling crews (Galginaitis 2014).

In addition to Harrison Bay, seal hunting search areas included a 30-mile stretch northeast of Nuiqsut, between the Colville and Kuparuk rivers, near Simpson Lagoon and Jones Islands.

Large Land Mammals

Caribou are the most commonly harvested large land mammal species for Nuiqsut and made up the majority (97%) of the large land mammal harvest in 2014 (Figure 7-11; Plate 7-4). The caribou harvest for Nuiqsut provided an estimated 105,193 edible pounds (Table 7-5). Hunters harvested 774 caribou during the study year, which amounted to 253 edible pounds per person. The vast majority of households (90%) used caribou in 2014. A substantial percentage (67%) of households shared caribou and moose with others in 2014; 72% of Nuiqsut households received large land mammals from other individuals. Nuiqsut hunters also share a significant amount of caribou meat with other communities, primarily Anaktuvuk Pass. Nuiqsut hunters delivered over 2,000 lb of caribou meat to Anaktuvuk Pass residents in 2014.[13]

In 2014, Nuiqsut residents harvested caribou in all months except May (Table 7-8). The most productive months were June (114), July (189), and August (215). Harvests sharply declined after August; only 73 caribou were harvested in September. The fewest caribou were taken in April (2) and November (4). Harvest timing for 43 caribou was unknown.

Of the caribou harvested in 2014, 72% were bulls. The majority of bull caribou were harvested June–August. An estimated 166 cows were harvested, 45% of which were harvested in January and February.

12. North Slope Borough Department of Wildlife Management, December 4, 2015. "Estimated weights of bowhead whales taken at Point Hope, Kaktovik and Nuiqsut in 2014." Unpublished document.

13. Native Village of Nuiqsut Tribal Council members, personal communication during community review meeting, February 20, 2016, Nuiqsut, AK.

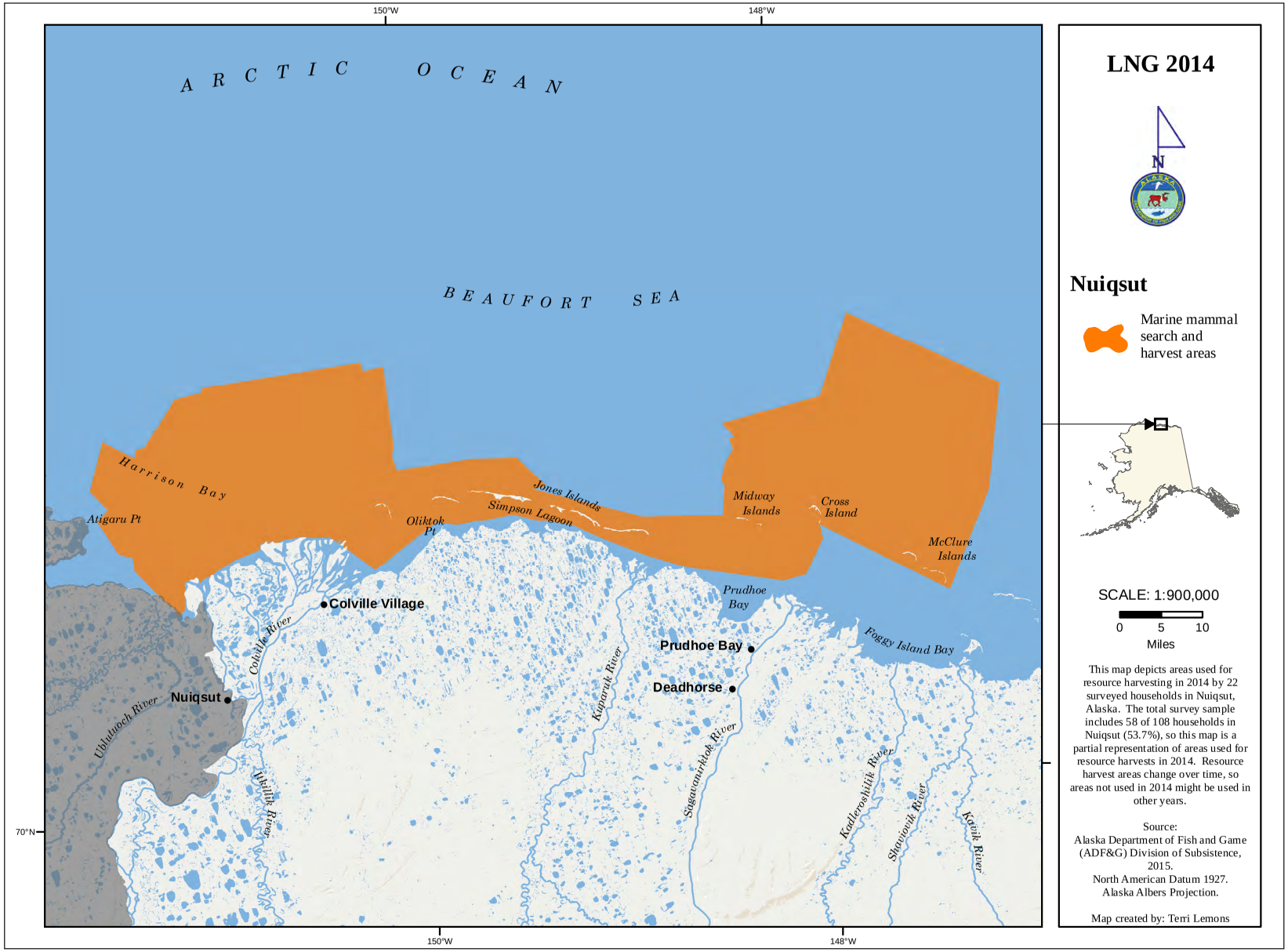


Figure 7-10.–Marine mammal hunting areas, Nuiqsut, 2014.

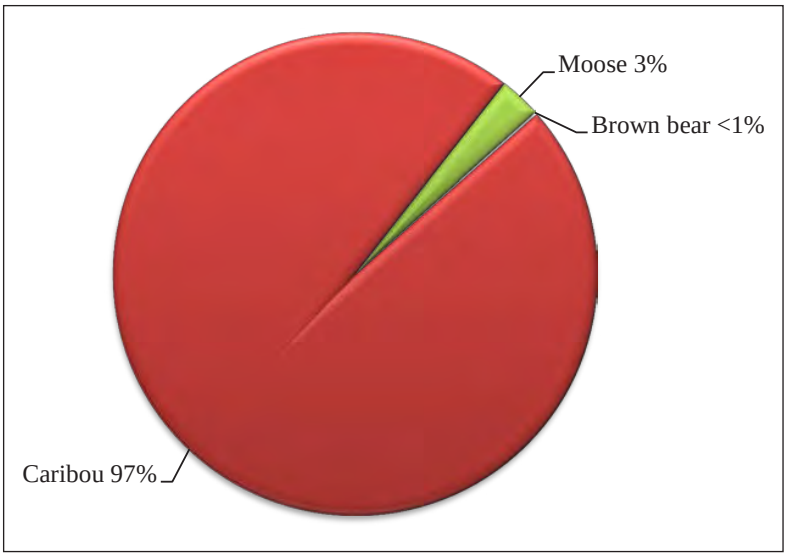


Figure 7-11.–Composition of large land mammal harvest by weight in usable pounds, Nuiqsut, 2014.

The remaining cow caribou harvests occurred in smaller numbers between July and December.

In 2014, Nuiqsut hunters harvested an estimated 6 bull moose, which provided 3,005 lb edible weight, or 7 lb per resident (Table 7-5). The harvests occurred in August and September (Table 7-8). Forty-three percent of Nuiqsut households used moose in 2014, and more than one-third received moose. One-third of households hunted moose in 2014, and 5% were successful. In addition, 2 brown bears were harvested in September.

Nuiqsut hunters covered a substantial amount of ground in their search for large land mammals in 2014. Caribou search areas were the most expansive of the 3 species mapped (Figure 7-12). Beginning at the Colville River delta north of the community, the caribou search area fanned out to the southwest and southeast, encompassing several tributaries of the Colville River. The western edge of the search area extended approximately 50 miles west of Umiat, and the eastern portion extended to the middle Kuparuk River. The southern portion of the search area spanned approximately 100 miles west to east. The furthest southwestern edge of the search area began near Siksikpak Ridge and included portions of the lower Killik River. The southeastern edge ended approximately 8 miles west of Toolik Lake. The caribou search area extended over 150 miles north to south, from the Beaufort Sea coast to the foothills of the Brooks Range.

Moose hunting was primarily concentrated along the Colville River corridor, beginning near the community and extending upriver, several miles above Umiat; a distance of approximately 120 miles. Additional search

Plate 7-4.–Caribou near Nuiqsut in February 2016.

Table 7-8.–Estimated large land mammal harvests by month and sex, Nuiqsut, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All large land mammals	**48.7**	**30.0**	**13.1**	**1.9**	**0.0**	**114.3**	**189.2**	**217.3**	**78.7**	**22.5**	**3.7**	**18.7**	**42.8**	**780.9**
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	**1.9**
Brown bear, sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	**1.9**
Caribou	48.7	30.0	13.1	1.9	0.0	114.3	189.2	215.4	73.1	22.5	3.7	18.7	42.8	**773.5**
Caribou, male	0.3	0.2	0.1	0.0	0.0	114.3	179.9	189.4	63.8	7.6	0.0	7.6	0.0	**563.1**
Caribou, female	48.4	26.1	13.0	1.9	0.0	0.0	9.3	22.3	9.3	14.9	3.7	11.2	5.6	**165.7**
Caribou, unknown sex	0.0	3.7	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	37.2	**44.7**
Moose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	3.7	0.0	0.0	0.0	0.0	**5.6**
Moose, bull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	3.7	0.0	0.0	0.0	0.0	**5.6**
Moose, cow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Muskox, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep, unknown sex	0.0	0.0	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, 2015.

areas included the lower portion of the Itkillik River corridor, approximately 60 miles upstream from its confluence with the Colville River.

The brown bear search and harvest area was approximately 50 miles south of Nuiqsut, near the confluence of the Colville and Chandler rivers.

Small Land Mammals/Furbearers

Small land mammal species harvested in 2014 included Arctic and red foxes, gray wolves, and wolverines. Foxes and wolverine accounted for most of the harvest: 26 foxes and 28 wolverines were harvested (Table 7-5). Wolf harvests also made a noteworthy contribution to the total, with an estimated 13 wolves harvested. The least harvested small land mammal was Arctic fox. The harvested small land mammals were used entirely for fur; none of the animals were used as food (Figure 7-13).

Seventeen percent of Nuiqsut households used small mammals in 2014 (Table 7-5). Over 15% attempted to harvest small land mammals, and 10% were successful. Seven percent of households received small furbearers, and 2% shared their catch.

Small land mammal harvests occurred throughout the winter and into early spring (Table 7-9). Of the estimated 28 wolverines caught in 2014, 23 were harvested in March and April; the remaining wolverines were taken in November, and some specific harvest times were unknown to respondents. The majority of red fox harvests occurred in December; close to one-half of the total were caught during that particular month. The remaining harvests were evenly distributed January through March. Harvest timing was unknown for an estimated 6 animals. More than one-half (7 of 13) wolf harvests occurred during March. The remaining harvests took place in November, January, and April. Arctic fox harvests were evenly distributed in February, March, and December; 2 individual foxes were harvested during each month.

The 2014 search and harvest area for small land mammals and furbearers was extensive, covering several hundred square miles from the Beaufort Sea coast to the Brooks Range (Figure 7-14). Nuiqsut hunters searched for small land mammals and furbearers in the same general vicinity as for large land mammals (figures 7-12 and 7-14). Search and harvest areas extended beyond the Brooks Range foothills and into the mountains near Anaktuvuk Pass. In addition, the small land mammal search and harvest area included the Titaluk and Kigalik river drainages, approximately 100 miles west of Umiat.

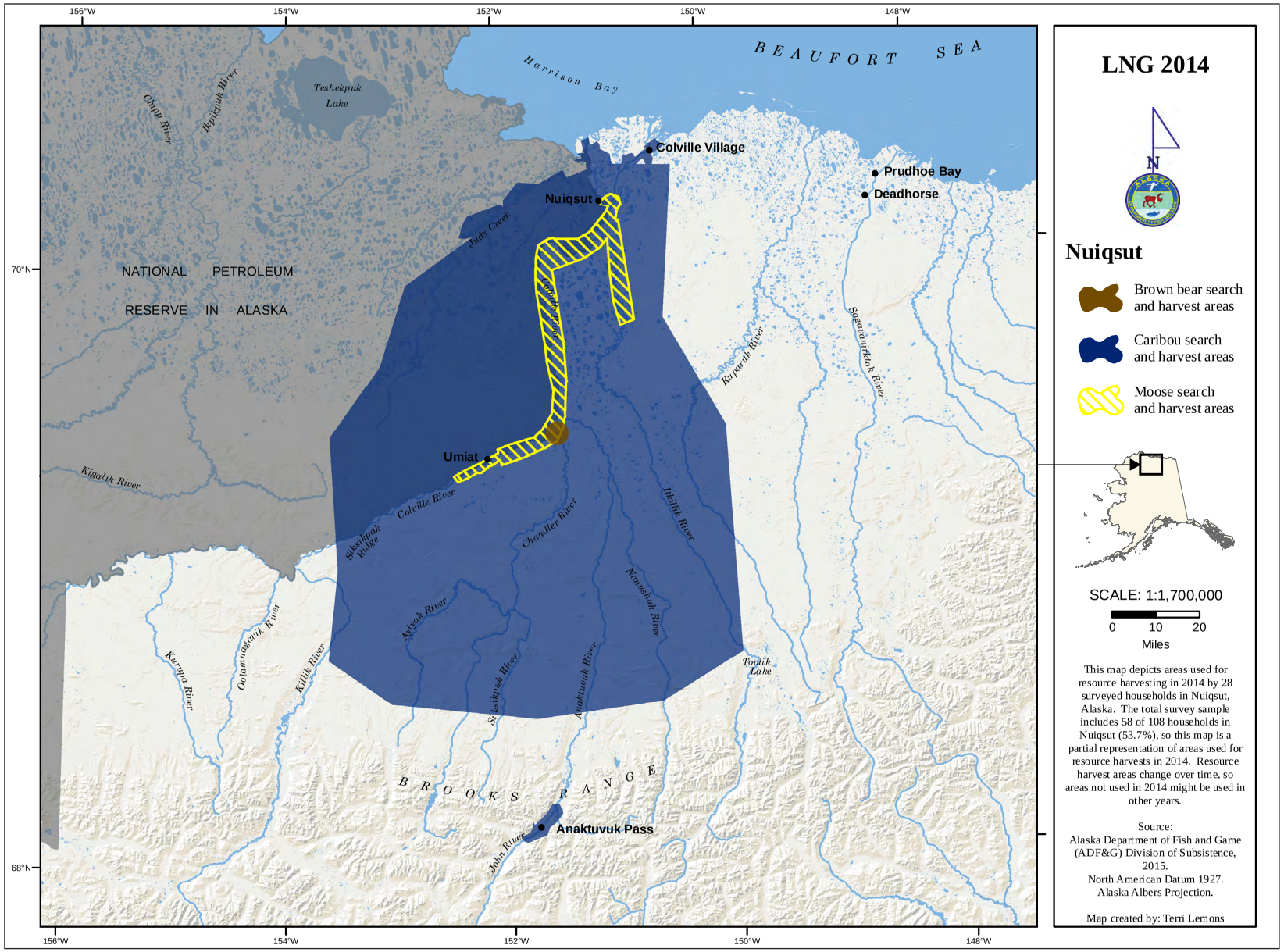


Figure 7-12.–Large land mammal hunting areas, Nuiqsut, 2014.

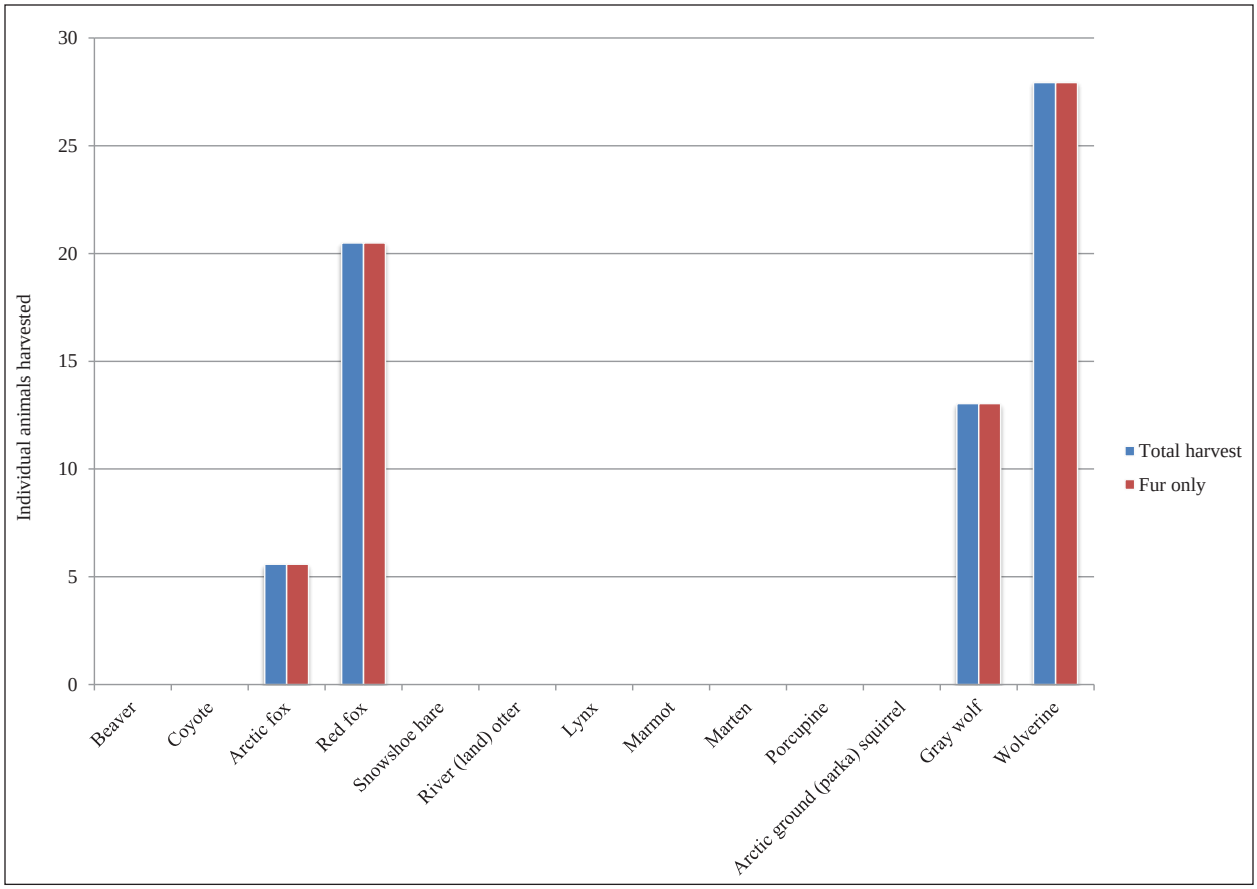


Figure 7-13.–Estimated small land mammal harvests for fur or food, Nuiqsut, 2014.

Table 7-9.–Estimated small land mammal/furbearer harvests by month, Nuiqsut, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All small land mammals	**3.7**	**3.7**	**26.1**	**11.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**3.7**	**11.2**	**7.4**	**67.0**
Beaver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Coyote	0.0	0.0	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 fox	0.0	1.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	**5.6**
Red fox	1.9	1.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	5.6	**20.5**
Snowshoe 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	**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	**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	**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	**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	**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	**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	**0.0**
Gray wolf	1.9	0.0	7.4	1.9	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	**13.0**
Wolverine	0.0	0.0	14.9	9.3	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	1.9	**27.9**

Source ADF&G Division of Subsistence household surveys, 2015.

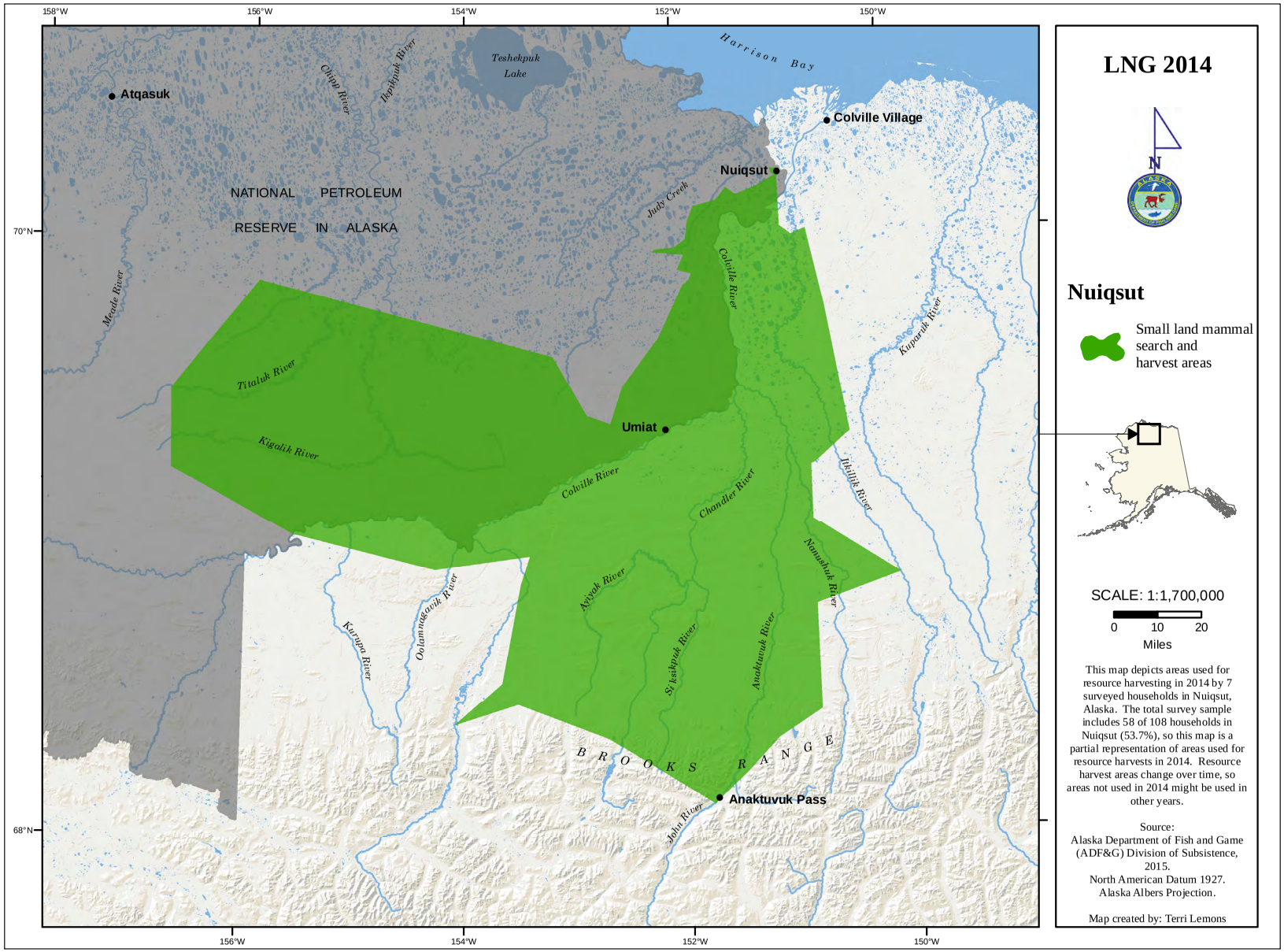


Figure 7-14.–Small land mammal hunting areas, Nuiqsut, 2014.

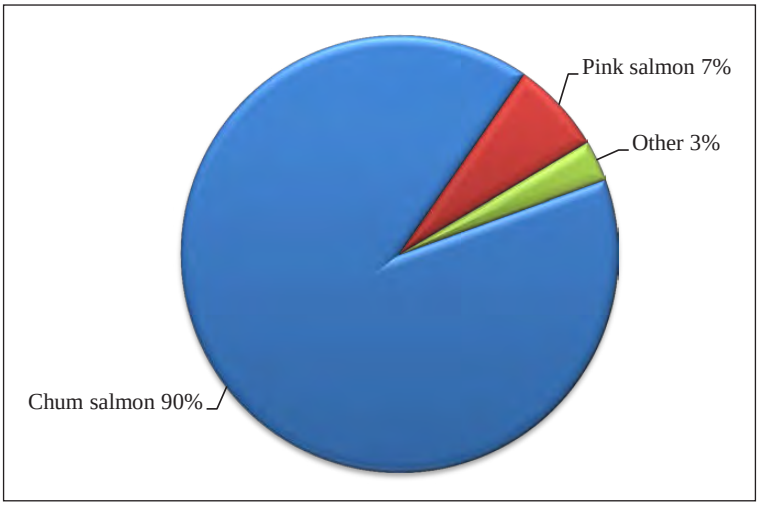


Figure 7-15.–Composition of salmon harvest by weight in usable pounds, Nuiqsut, 2014.

Salmon

Chum and pink salmon are the most common salmon species found on the Arctic slope. Overall however, salmon are far less prevalent compared to the relatively high abundance of nonsalmon fish. As is evident in Table 7-5, nonsalmon fish are targeted a great deal more than salmon. However, a significant percentage of Nuiqsut households used salmon in 2014 (64%; Table 7-5). Over one-third (35%) received salmon, and 31% shared their catch with others. Chum salmon harvests made up the majority (90%) of the total salmon harvest with an estimated 3,508 lb of edible weight, or 8 lb per capita (Table 7-5; Figure 7-15). Although considerably less than the chum salmon harvest, pink salmon was the second most harvested salmon species and accounted for 7% of the estimated salmon harvest in pounds (Figure 7-15). Per capita, pink salmon provided just over one-half pound (0.6) of edible weight (Table 7-5). A small number of coho and sockeye salmon were also harvested, and fishers harvested some salmon that could not be identified by respondents.

An estimated 475 salmon (2,476 lb) were taken using set gillnets, including 64% of the chum salmon (Table D7-5 and Figure 7-16). The remaining setnet-harvested salmon species included coho, pink, sockeye, and "unknown" salmon. All pink salmon caught in 2014 were taken with setnets, as were all "unknown" salmon. The remaining species, coho and sockeye salmon, accounted for 1% of the total salmon harvest by setnet.

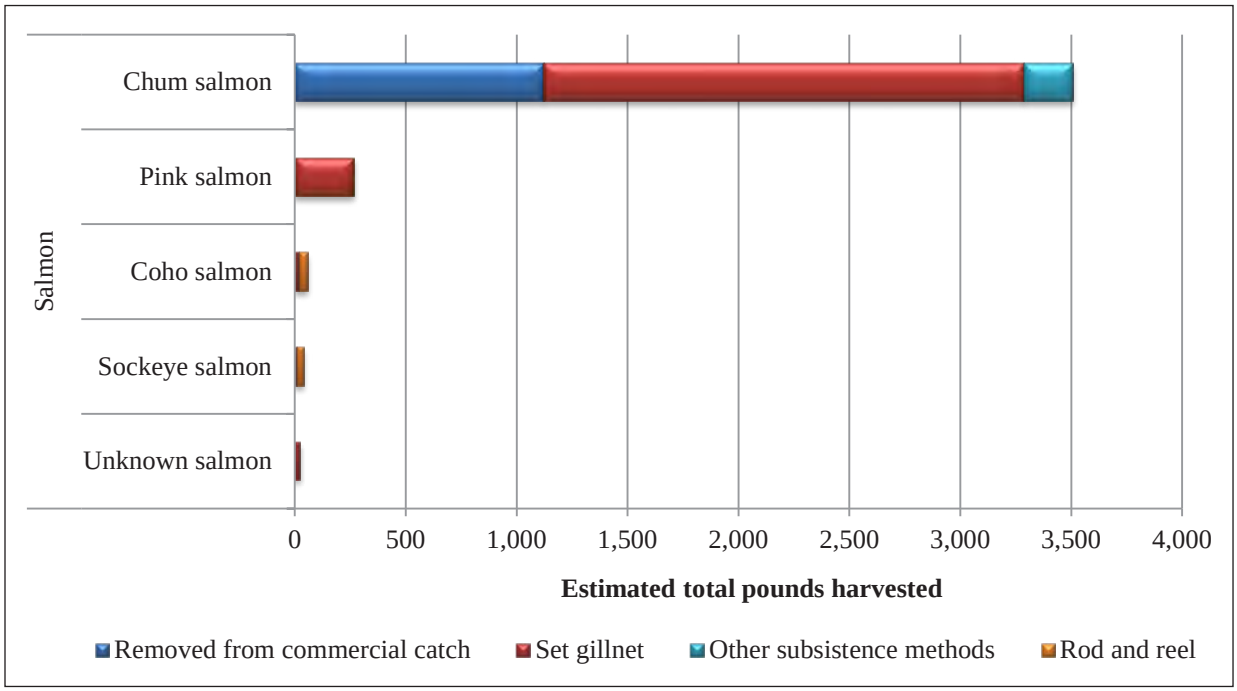


Figure 7-16.–Salmon harvests by gear type, Nuiqsut, 2014.

Over 186 chum salmon (1,121 lb) were removed from commercial harvests for personal use; some Nuiqsut households participate in commercial fisheries elsewhere in Alaska. This represented 32% of the total chum salmon harvest. Chum salmon taken for subsistence was harvested with gillnets in open water, and to a lesser degree, set under the ice, which were placed in the river immediately after freeze-up. The majority of sockeye and coho salmon were harvested with rod and reel.

A total of 2 chum salmon were used as dog food in 2014 (Table D7-6).

Salmon fishing among Nuiqsut households in 2014 was primarily concentrated along the Nigliq Channel, beginning at the community and extending downriver to the mouth of the channel (Figure 7-17). Salmon fishers also used a few areas along the Colville River upriver from the community. The most distant fishing area was approximately 40 miles upstream of Nuiqsut.

Nonsalmon Fish

Nonsalmon fish is an extremely important subsistence resource for Nuiqsut residents; this resource accounted for nearly one-quarter of the total subsistence harvest in 2014 (Figure 7-7). During the study period, more Nuiqsut residents participated in fishing than in any other subsistence activity. Seventy-eight percent of Nuiqsut households attempted to catch nonsalmon fish in 2014, and 71% were successful (Table 7-5). In addition, 72% shared their catch with others, and over 70% received nonsalmon fish. The estimated total nonsalmon fish harvest by edible weight for Nuiqsut households in 2014 was 85,106 lb, or 205 lb per resident.

Nonsalmon fish harvests were dominated by several varieties of whitefish, including broad whitefish, Arctic cisco, and least cisco. Broad whitefish provided the most edible pounds of all nonsalmon fish species, 36,605 lb, or 88 lb per capita, and made up 43% of the total nonsalmon fish harvest (Table 7-5; Figure 7-18). Arctic cisco accounted for 38% of the entire nonsalmon fish harvest in edible pounds, an estimated 32,394 lb, or 78 lb per capita. The estimated community-wide least cisco harvest equated to 9,333 lb, or 11% of the total nonsalmon harvest weight in edible pounds, providing 23 lb per capita. Arctic grayling provided 1,464 lb, and burbot provided 1,630 lb to the total nonsalmon harvest. The remaining nonsalmon species provided 4% to the total harvest weight in edible pounds. The largest contributors among the remaining species included Dolly Varden (1,346 lb), rainbow smelt (913 lb), Arctic char (793 lb), and humpback whitefish (250 lb).

Nuiqsut fishers utilized 3 different gear types for harvesting nonsalmon fish in 2014 (Table D7-7; Figure 7-19). Set gillnets were utilized during periods of open water as well as under the ice. In fact, set gillnets were the most widely used type of fishing gear for Nuiqsut fishers during the study year. Other gear types and methods used by Nuiqsut fishers included rod and reel and ice fishing (locally referred to as hooking, and also known as jigging). Hooking typically involves using a short (16–20 in) stick with line and hook attached. The line is wrapped around the end of the rod, and lengths are unraveled depending on water depth and where fish are believed to be staged among different water columns. Lastly, a small portion of the nonsalmon harvest was removed from commercial harvests.

Over 41,000 lb of nonsalmon fish, or 48% of the total nonsalmon harvest, was caught using "other subsistence methods." The majority of the remaining nonsalmon fish were caught using set gillnets in open water. This gear type accounted for 50% of the total harvest.

Nearly 84% of Arctic cisco was harvested by hooking and setting under-ice nets. The remaining Arctic cisco harvest (16%) was caught using setnets in open water. The least cisco harvest was proportional to the Arctic cisco harvest in respect to amount harvested by gear type. Close to 85% of the total least cisco catch for 2014 was harvested by "other subsistence methods," and approximately 15% of the total harvest was caught using setnets in open water.

Nuiqsut households primarily used setnets in open water to catch broad whitefish in 2014. An estimated 94% of all broad whitefish were caught using this method. The remainder of the harvest was caught using "other subsistence methods."

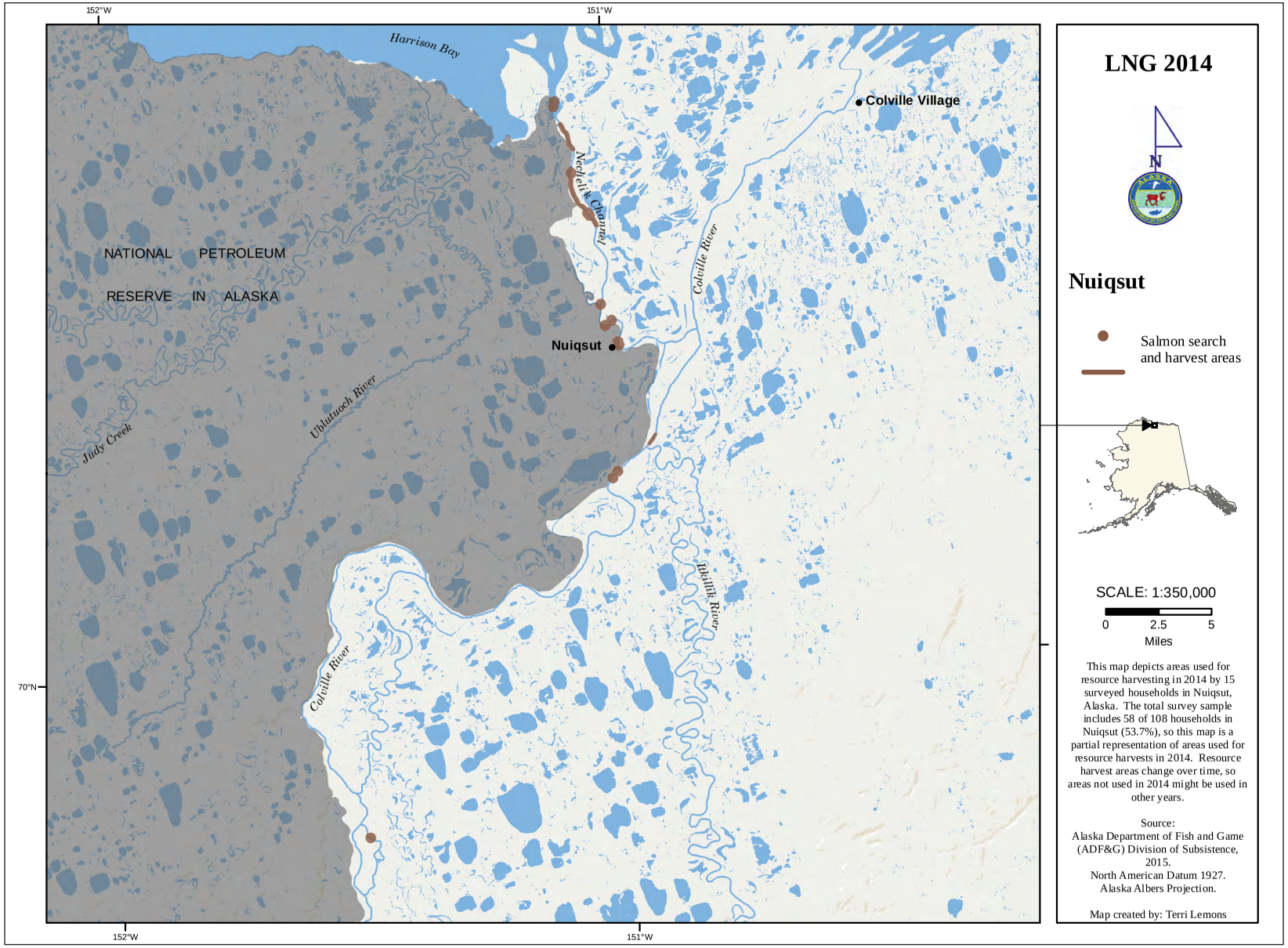


Figure 7-17.–Salmon fishing areas, Nuiqsut, 2014.

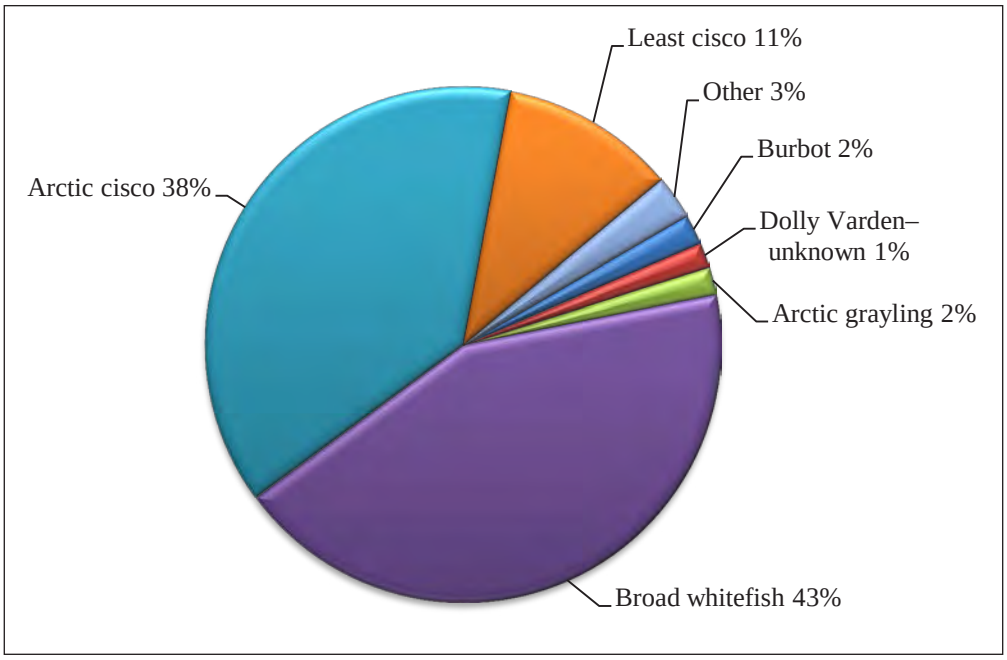


Figure 7-18.–Composition of nonsalmon fish harvest by weight in usable pounds, Nuiqsut, 2014.

Nuiqsut households caught more Arctic grayling by rod and reel than through the use of any other method, in 2014. Close to 80% of Arctic grayling were caught using rod and reel gear, while slightly over 20% were caught using "other subsistence methods." Several Nuiqsut household respondents indicated that Arctic grayling were often caught by jigging through the ice.

The majority of Nuiqsut's 2014 burbot harvest was harvested using "other subsistence methods." According to many respondents, hooking was (and has always been) the preferred method for catching burbot; approximately 95% of the burbot harvested in 2014 were caught using this method and gear. The majority (91%) of the Dolly Varden harvest was also caught using "other subsistence methods," and approximately 81% of Arctic char was harvested by use of open-water setnet.

Close to 76% of the total harvest of rainbow smelt caught in 2014 was harvested by use of "other subsistence methods." The remainder of the smelt harvest was caught using setnets in open water.

With the exception of Arctic flounder, the remaining nonsalmon fish species were all harvested by "other subsistence methods" as well as through the use of setnets in open water. These species accounted for less than 1% of the total harvest of nonsalmon fish for Nuiqsut households in 2014.

Over 8,000 lb of nonsalmon fish harvested by Nuiqsut households in 2014 was used as dog food (Table D7-6). Least cisco was the top species fed to dogs, both in individual number and pounds provided. Approximately 68% of all the fish used as dog food was least cisco. Broad whitefish and Dolly Varden provided 27% of dog food. Smaller amounts of Arctic cisco, rainbow smelt, burbot, lake trout, northern pike, Arctic grayling, and round whitefish were utilized as dog food as well.

Nonsalmon fish search and harvest areas for Nuiqsut households in 2014 were primarily concentrated along the Colville River, especially along the Nigliq Channel (Figure 7-20). One continuous search and harvest area extended from the community to the coast along the Nigliq Channel. Other important search and harvest areas included Fish and Judy creeks, approximately 10 miles northwest of the community. Some household search and harvest areas extended as far upriver as the confluence of the Colville and Anaktuvuk rivers, as well as areas along the Colville's Kupigruak Channel, immediately east and northeast of Nuiqsut.

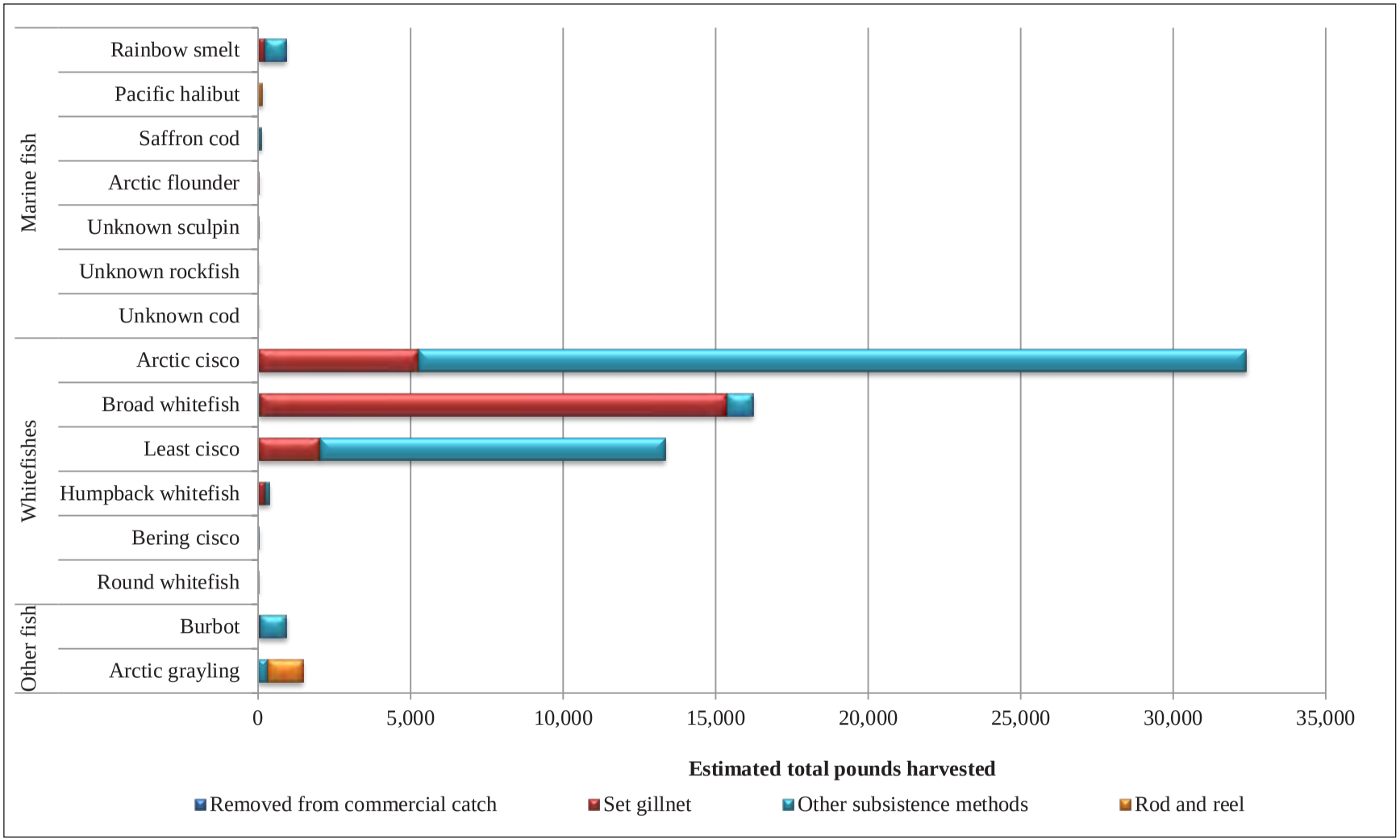


Figure 7-19.–Nonsalmon fish harvests by gear type, Nuiqsut, 2014.

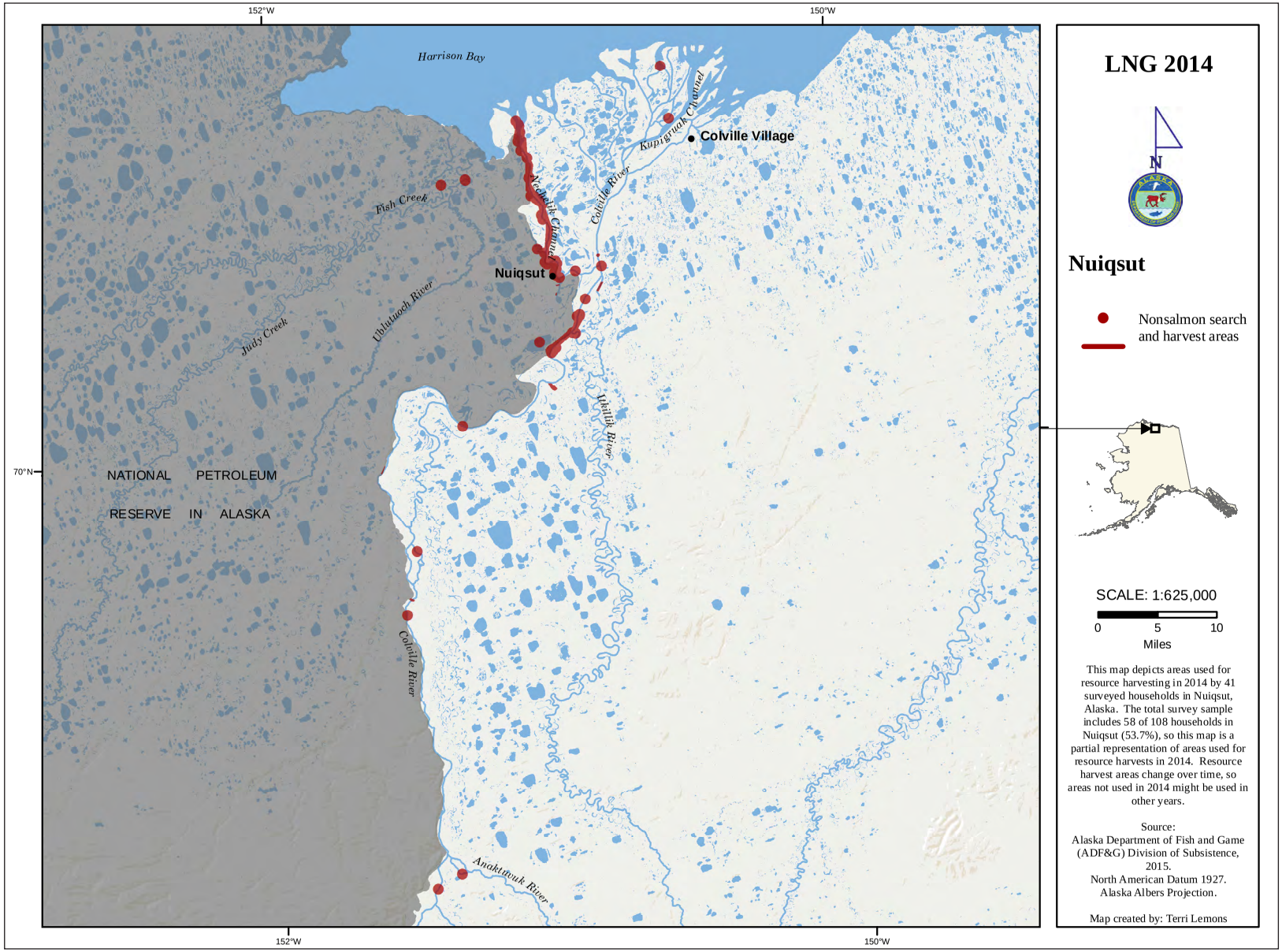
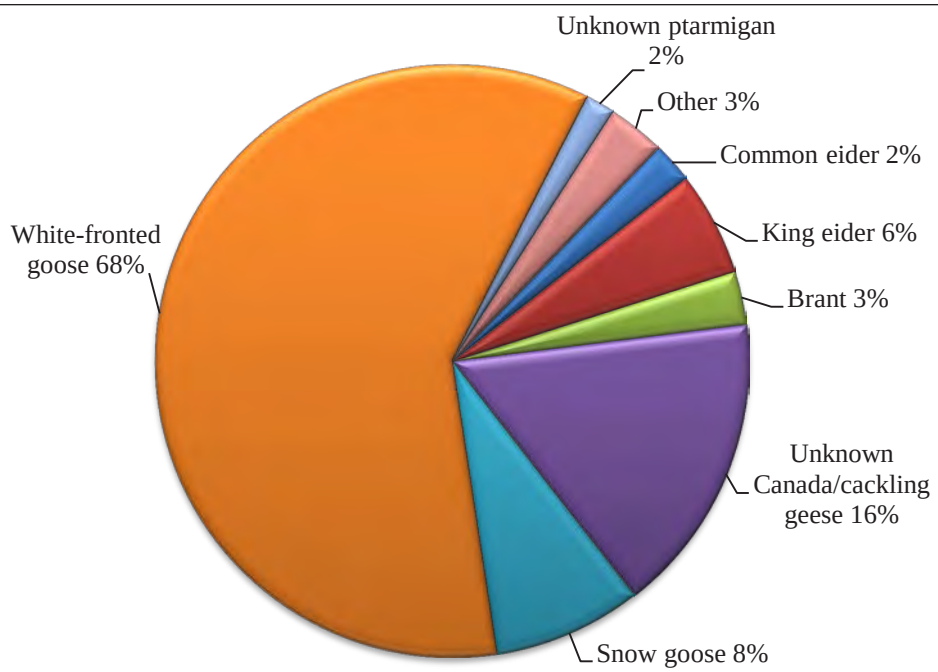


Figure 7-20.–Nonsalmon fishing areas, Nuiqsut, 2014.



Note The other category includes species providing less than 1.5% each to the per capita harvest.

Figure 7-21.–Composition of bird and bird egg harvest by weight in usable pounds, Nuiqsut, 2014.

Birds and Eggs

Seventy-nine percent of Nuiqsut households used birds and eggs in 2014. Over 72% of households attempted to harvest and over 67% successfully harvested birds and eggs (Table 7-5). Over one-half (53%) shared their bird and egg harvest with other individuals in 2014. Thirty-eight percent of households received birds and eggs, as well. The estimated total weight for bird and egg harvests among Nuiqsut households in 2014 was 4,857 lb, or 12 lb of edible weight per resident.

The 2014 bird and egg harvest for Nuiqsut households was dominated by geese. By weight, white-fronted goose made up 68% of the total bird and egg harvest (Figure 7-21). This 2,909 lb harvest represented 7 lb per capita (Table 7-5). Seventy-four percent of households used white-fronted geese in 2014, over 60% of households attempted to harvest, and 55% successfully harvested them. In addition, 3 other species of goose—brant, snow goose, and Canada goose—accounted for 27%, while king and common eiders provided 8% to the total bird and egg harvest. Ptarmigans, spectacled eider, loons, green-winged teal, sandhill crane, and "unknown" geese (harvested geese that could not be identified to the species level) accounted for approximately 3% of the total bird and egg harvest in edible pounds.

Nuiqsut households harvested 37 lb of goose eggs in 2014. Brant eggs made up 91% of the total egg harvest. The harvested geese eggs were not identified with any particular species.

Approximately 89% of all bird and egg harvests occurred during the springtime, and nearly 97% of the remaining bird and egg harvests took place in the summer and fall (Table 7-10).

Nuqisut households primarily focused their geese and ducks search and harvesting efforts within Harrison Bay and the Colville River delta (Figure 7-22). Household search and harvest areas for ducks, geese, and ptarmigans also included some areas in close proximity to the community, as well as upstream along the Colville to the Ocean Point area. Households also searched and harvested along Judy and Fish creeks, northwest of the community. Lastly, egg harvests occurred in 2 areas on opposite sides of the Colville River delta, near the coast, within 20 miles north and northeast of Nuiqsut.

Table 7-10.–Estimated bird harvests by season, Nuiqsut, 2014.

	Estimated harvest by season					
Resource	Spring	Summer	Fall	Winter	Season unknown	**Total**
All birds	**1,601.4**	**113.6**	**5.6**	**76.3**	**0.0**	**1,796.9**
Common eider	39.1	9.3	0.0	0.0	0.0	**48.4**
King eider	83.8	104.3	5.6	0.0	0.0	**193.7**
Spectacled eider	18.6	0.0	0.0	0.0	0.0	**18.6**
Steller's eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	0.0	0.0	0.0	0.0	0.0	**0.0**
Red-breasted merganser	0.0	0.0	0.0	0.0	0.0	**0.0**
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Northern pintail	0.0	0.0	0.0	0.0	0.0	**0.0**
Black scoter	0.0	0.0	0.0	0.0	0.0	**0.0**
Green-winged teal	37.2	0.0	0.0	0.0	0.0	**37.2**
Wigeon	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown ducks	0.0	0.0	0.0	0.0	0.0	**0.0**
Brant	87.5	0.0	0.0	0.0	0.0	**87.5**
Canada/cackling goose	242.1	0.0	0.0	0.0	0.0	**242.1**
Snow goose	109.9	0.0	0.0	0.0	0.0	**109.9**
White-fronted goose	938.5	0.0	0.0	0.0	0.0	**938.5**
Unknown geese	3.7	0.0	0.0	0.0	0.0	**3.7**
Tundra (whistling) swan	0.0	0.0	0.0	0.0	0.0	**0.0**
Sandhill crane	1.9	0.0	0.0	0.0	0.0	**1.9**
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	**0.0**
Whimbrel	0.0	0.0	0.0	0.0	0.0	**0.0**
Godwit	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown small shorebirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Black guillemot	0.0	0.0	0.0	0.0	0.0	**0.0**
Glaucous gull	0.0	0.0	0.0	0.0	0.0	**0.0**
Sabine's gulle	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown loons	0.0	0.0	0.0	3.7	0.0	**3.7**
Unknown murres	0.0	0.0	0.0	0.0	0.0	**0.0**
Arctic tern	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown ptarmigans	39.1	0.0	0.0	72.6	0.0	**111.7**
Snowy owl	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2015.

Marine Invertebrates

There was no reported harvest or use of marine invertebrates among Nuiqsut households in 2014 (Table 7-5).

Vegetation

Nuiqsut households harvested a total of 414 lb of vegetation in 2014 (Table 7-5). Sixty-seven percent of households used berries and edible greens, and slightly more than 50% attempted to harvest berries and edible greens. Close to 38% of Nuiqsut households received berries or edible greens, and 20% of households shared their harvest with others. Many respondents reported that 2014 was a poor year for berry harvesting; low harvests may have impacted sharing capabilities.

Berries made up 98% of the vegetation harvest by edible weight (Figure 7-23). Cloudberries (locally known as salmonberries) accounted for over 77% of the total harvest weight of edible vegetation and were also the

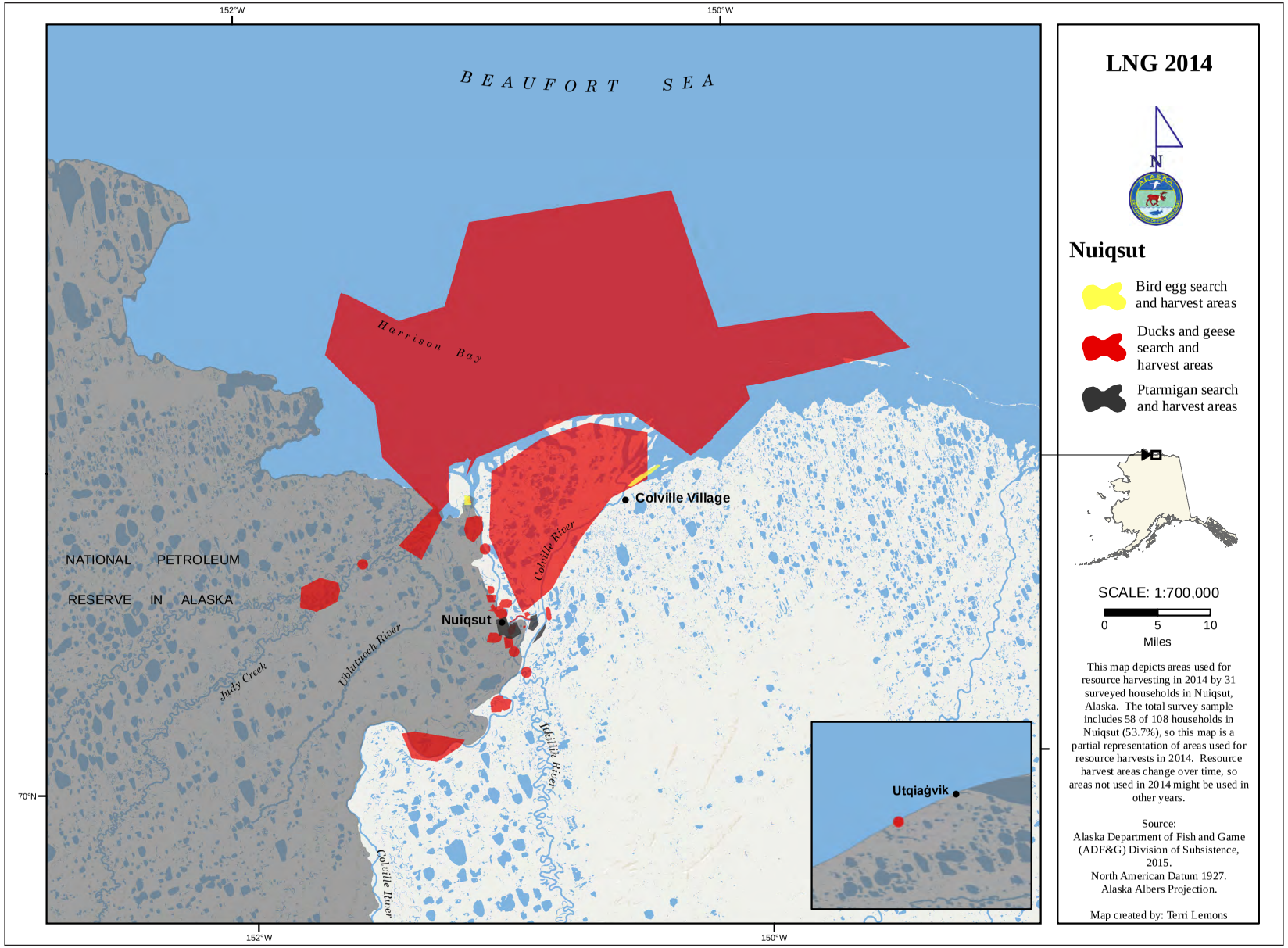


Figure 7-22.–Bird hunting and bird egg gathering areas, Nuiqsut, 2014.

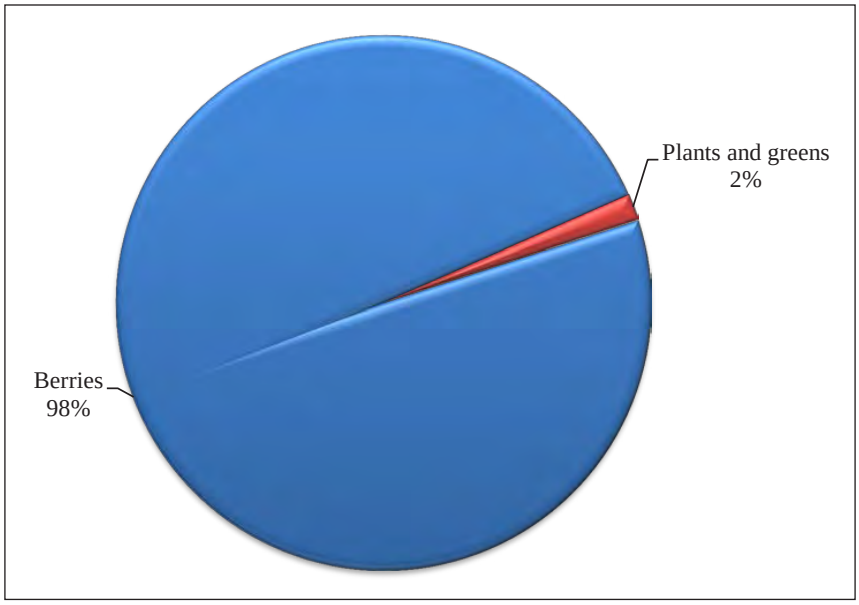


Figure 7-23.–Composition of vegetation harvest by weight in usable pounds, by type of vegetation, Nuiqsut, 2014.

most commonly used type of vegetation (Table 7-5). Blueberries were the next largest contributor by weight (15%), followed by lowbush cranberries. Crowberries, Labrador tea, and sourdock together accounted for 3% of the harvest. Labrador tea and sourdock were the only greens harvested in 2014.

Nuiqsut households searched for and harvested berries and edible greens along the lower Colville River corridor in 2014 (Figure 7-24). Search and harvest areas were concentrated near the community and extended continuously over 90 miles upriver. Residents also gathered plants and berries in 2 large inland concentrations (approximately 20 square miles) between Ocean Point and Itkillik River, approximately 30 miles upriver of Nuiqsut, as well as an area near the Colville's confluence with the Anaktuvuk River.

Production and Distribution of Wild Resources

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.

In the 2014 study year in Nuiqsut, about 69% of the wild resource harvests, excluding bowhead whales, as estimated in pounds edible weight were harvested by 19% of the community's households (Figure 7-25). Further analysis of the study findings, beyond the scope of this report, might identify characteristics of the highly productive households in Nuiqsut and the other study communities.

Income and Cash Employment

Nuiqsut maintains a mixed subsistence and cash economy supported by wage employment and subsistence activities. A strong component of the community's subsistence economy includes an extensive network of sharing, bartering, and trade of Native foods, furs, and skins both within the community as well as with residents of other communities throughout the state. In addition, the making and selling of handicrafts is also a part of Nuiqsut's cash economy (Brown 1979; Galginaitis 1990; Galginaitis et al. 1984).

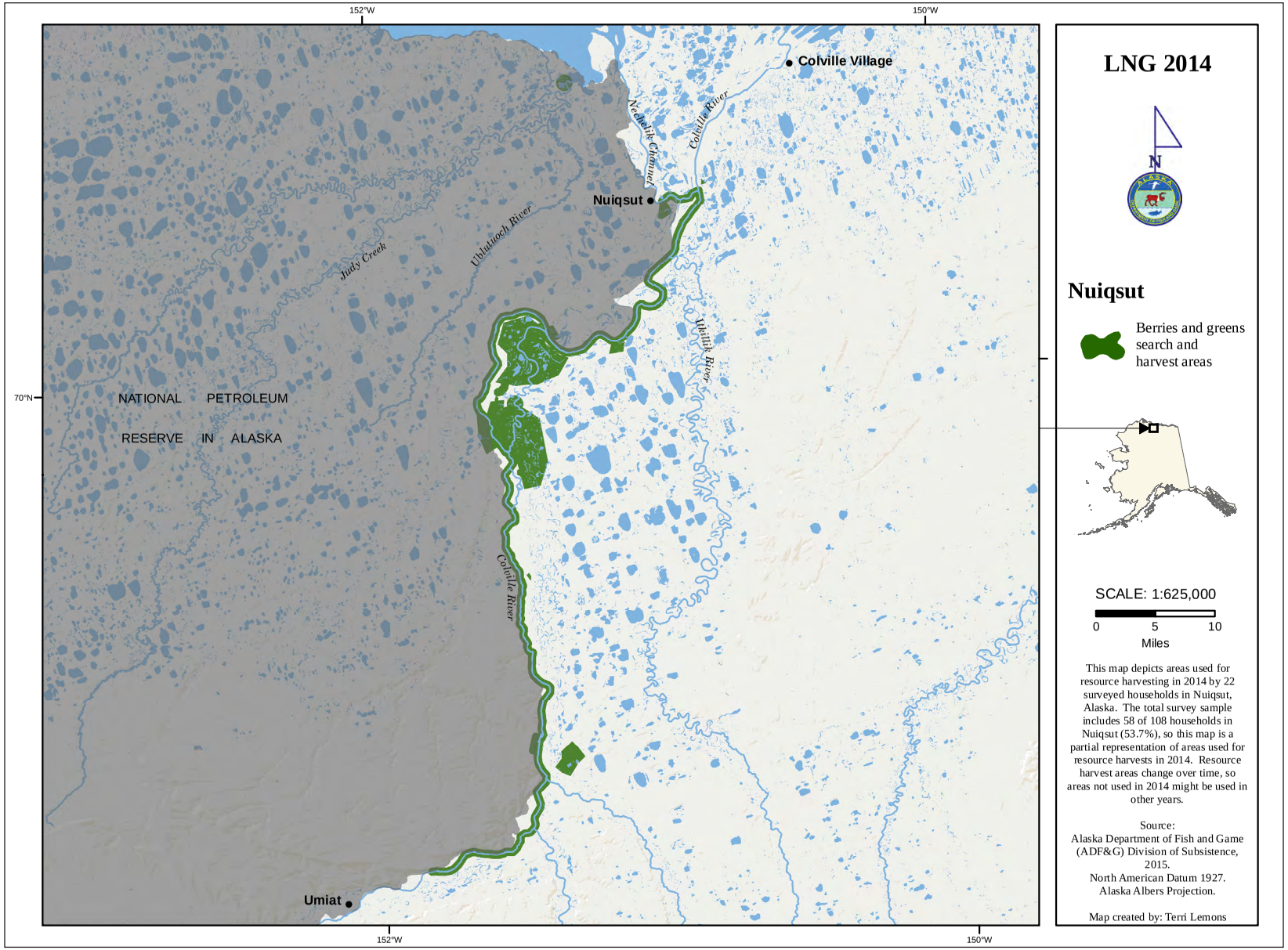


Figure 7-24.–Berries and greens gathering areas, Nuiqsut, 2014.

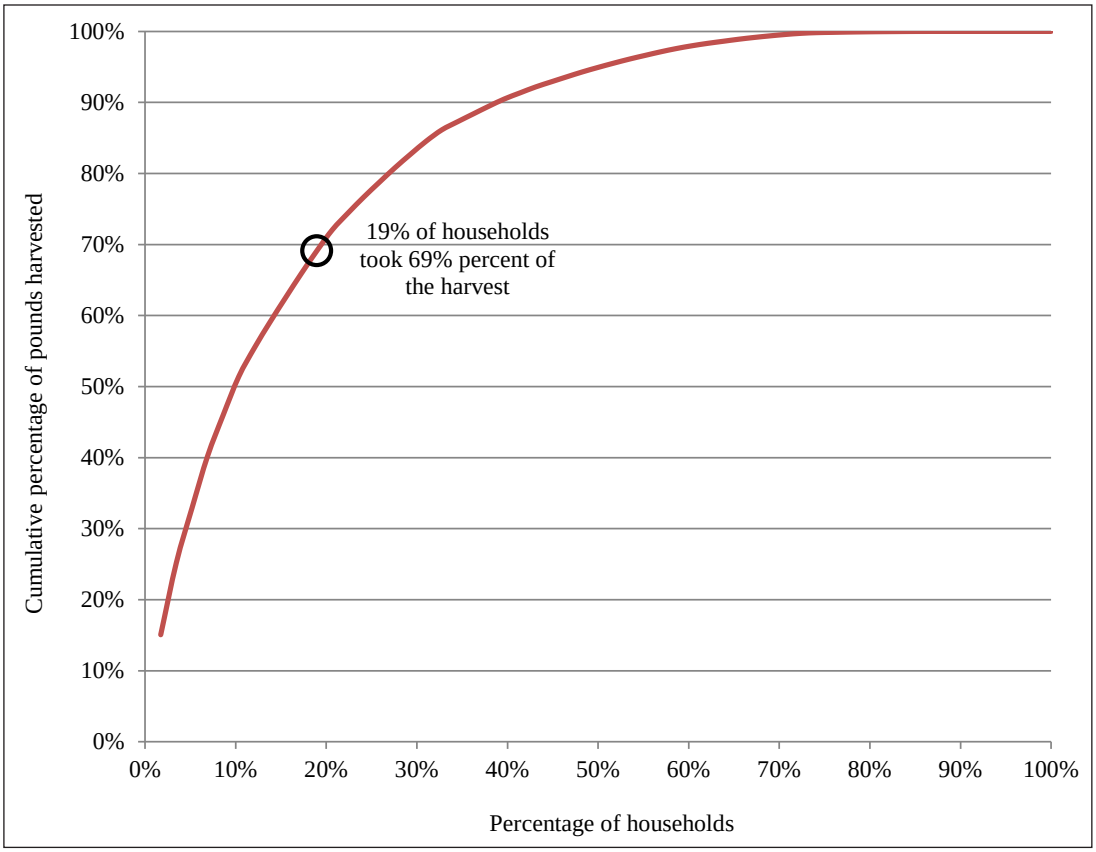


Figure 7-25.–Household specialization, Nuiqsut, 2014.

In 2014, the total income for all Nuiqsut households was approximately $11,981,752 (Table 7-11). Earned income accounted for 64% of the total income from all sources. The largest contributor to earned income was local government, which accounted for 59% of earned income or 37% of total community income (Table 7-12; Figure 7-26). Local government employers included the City of Nuiqsut, Native Village of Nuiqsit, and North Slope Borough. The Kuukpik Corporation and its subsidiaries, as well as the private companies in the oil and gas development sector, composed the majority of the remaining earned income sources, accounting for approximately 38% of the total earned income (Table 7-12). Many of these jobs fall under the services category.

Other income provided 36% of the total income from all sources (Table 7-11). These income sources included state and corporation dividends, which together made up 84% of other income or 31% of total community income (Table 7-11; Figure 7-26). Additional income sources in this category included Social Security, meeting honoraria, and pensions, as well as several different types of state and federal aid.

Approximately 66% of adults in Nuiqsut were employed for an average of 28 weeks during 2014 (Table 7-13). There was an average of 2 jobs per household, and 93% of households had members who were employed. Most employed individuals (75%) worked in full-time positions (Table 7-14). Local government employers provided over one-half of the total number (212) of jobs available in 2014 (Table 7-12). Sixty-two percent of employed adults worked in local government in a variety of capacities. Nuiqsut's second largest employment category, the service industry, accounted for 20% of total available jobs in 2014 and employed 21% of working adults.

The mean household earned income was $70,577, and the average of other household income was $40,366 (Table 7-11). The median household income for 2014 was $81,622, which was over $10,000 greater than the median income for all of Alaska, and within the margin of error of the U.S. Census Bureau's American Community Survey (ACS) estimate for Nuiqsut alone (Figure 7-27; Table D7-8).

Table 7-11.–Estimated earned and other income, Nuiqsut, 2014.

Income source	Number of employed adults	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government, including tribal	106.1	74.3	$4,465,482	$3,184,199 – $7,319,750	$41,347	37.3%
Services	36.7	28.1	$1,807,479	$691,307 – $3,728,998	$16,736	15.1%
Transportation,	8.2	8.0	$514,083	$162,857 – $1,260,110	$4,760	4.3%
Mining	10.2	8.0	$489,236	$83,515 – $1,412,456	$4,530	4.1%
Federal government	4.1	4.0	$118,528	$41,659 – $299,574	$1,097	1.0%
Construction	4.1	4.0	$104,008	$27,085 – $261,258	$963	0.9%
Retail trade	8.2	8.0	$66,968	$20,515 – $166,959	$620	0.6%
Agriculture, forestry, and	4.1	4.0	$27,780	$10,007 – $76,084	$257	0.2%
State government	4.1	4.0	$23,150	$12,612 – $55,769	$214	0.2%
Manufacturing	2.0	2.0	$5,556	$4,513 – $10,424	$51	0.0%
Earned income subtotal	**171.4**	**100.3**	**$7,622,270**	**$5,656,047 – $10,766,486**	**$70,577**	**63.6%**
Other income						
Native corporation dividend		95.0	$2,999,760	$2,139,757 – $3,872,627	$27,776	25.0%
Alaska Permanent Fund dividend		89.4	$652,514	$522,713 – $768,282	$6,042	5.4%
Social Security		16.8	$200,244	$67,437 – $385,464	$1,854	1.7%
Meeting honoraria		13.0	$192,086	$16,971 – $601,389	$1,779	1.6%
Pension / retirement		9.3	$160,734	$33,338 – $407,242	$1,488	1.3%
Other		46.6	$70,868	$44,967 – $104,200	$656	0.6%
Food stamps		7.4	$36,863	$5,586 – $86,022	$341	0.3%
Child support		7.4	$19,393	$2,274 – $52,560	$180	0.2%
Unemployment		5.6	$13,453	$0 – $38,571	$125	0.1%
CITGO fuel voucher		33.5	$7,714	$3,120 – $13,129	$71	0.1%
Longevity bonus		1.9	$2,927	$0 – $11,288	$27	0.0%
Disability		1.9	$2,927	$0 – $11,776	$27	0.0%
TANF (Temporary Assistance for Needy Families)		0.0	$0	$0 – $0	$0	0.0%
Adult public assistance (OAA, APD)		0.0	$0	$0 – $0	$0	0.0%
Supplemental Security Income		0.0	$0	$0 – $0	$0	0.0%
Heating assistance		0.0	$0	$0 – $0	$0	0.0%
Workers' compensation / insurance		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		**95.0**	**$4,359,482**	**$3,357,595 – $5,548,916**	**$40,366**	**36.4%**
Community income total			**$11,981,752**	**$9,716,949 – $15,437,502**	**$110,942**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.

Table 7-12.–Employment by industry, Nuiqsut, 2014.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**212.2**	**100.3**	**171.4**	
Federal government	**1.9%**	**4.0%**	**2.4%**	**1.6%**
Executive, administrative, and managerial	1.9%	4.0%	2.4%	1.6%
State government	**1.9%**	**4.0%**	**2.4%**	**0.3%**
Technologists and technicians, except health	1.0%	2.0%	1.2%	0.1%
Handlers, equipment cleaners, helpers, and laborers	1.0%	2.0%	1.2%	0.2%
Local government, including tribal	**57.7%**	**74.0%**	**61.9%**	**58.6%**
Executive, administrative, and managerial	5.8%	10.0%	6.0%	20.3%
Social scientists, social workers, religious workers, and lawyers	1.0%	2.0%	1.2%	0.8%
Teachers, librarians, and counselors	6.7%	12.0%	7.1%	9.8%
Health technologists and technicians	1.0%	2.0%	1.2%	0.8%
Administrative support occupations, including clerical	4.8%	10.0%	6.0%	4.2%
Service occupations	21.2%	34.0%	25.0%	10.2%
Mechanics and repairers	1.9%	4.0%	2.4%	1.9%
Precision production occupations	6.7%	14.0%	8.3%	6.7%
Transportation and material moving occupations	1.0%	2.0%	1.2%	1.0%
Handlers, equipment cleaners, helpers, and laborers	3.8%	8.0%	4.8%	1.3%
Occupation not indicated	3.8%	8.0%	4.8%	1.5%
Agriculture, forestry, and fishing	**2.9%**	**4.0%**	**2.4%**	**0.4%**
Executive, administrative, and managerial	1.0%	2.0%	1.2%	0.1%
Agricultural, forestry, and fishing occupations	1.9%	4.0%	2.4%	0.2%
Mining	**4.8%**	**8.0%**	**6.0%**	**6.4%**
Technologists and technicians, except health	2.9%	6.0%	3.6%	3.2%
Precision production occupations	1.0%	2.0%	1.2%	2.1%
Handlers, equipment cleaners, helpers, and laborers	1.0%	2.0%	1.2%	1.1%
Construction	**1.9%**	**4.0%**	**2.4%**	**1.4%**
Construction and extractive occupations	1.9%	4.0%	2.4%	1.4%
Manufacturing	**1.0%**	**2.0%**	**1.2%**	**0.1%**
Writers, artists, entertainers, and athletes	1.0%	2.0%	1.2%	0.1%
Transportation, communication, and utilities	**3.8%**	**8.0%**	**4.8%**	**6.7%**
Executive, administrative, and managerial	1.0%	2.0%	1.2%	1.2%
Transportation and material moving occupations	1.9%	4.0%	2.4%	4.2%
Handlers, equipment cleaners, helpers, and laborers	1.0%	2.0%	1.2%	1.3%
Retail trade	**3.8%**	**8.0%**	**4.8%**	**0.9%**
Marketing and sales occupations	1.9%	4.0%	2.4%	0.5%
Handlers, equipment cleaners, helpers, and laborers	1.9%	4.0%	2.4%	0.4%
Services	**20.2%**	**28.0%**	**21.4%**	**23.7%**
Executive, administrative, and managerial	2.9%	6.0%	3.6%	3.4%
Health technologists and technicians	1.0%	2.0%	1.2%	1.4%
Technologists and technicians, except health	2.9%	6.0%	3.6%	4.2%
Administrative support occupations, including clerical	4.8%	8.0%	6.0%	6.8%
Service occupations	3.8%	8.0%	4.8%	2.5%
Transportation and material moving occupations	2.9%	6.0%	3.6%	4.5%
Occupation not indicated	1.9%	4.0%	2.4%	1.0%

Source ADF&G Division of Subsistence household surveys, 2015.

Table 7-13.–Employment characteristics, Nuiqsut, 2014.

Characteristic	Community Nuiqsut
All adults	
Number	258.5
Mean weeks employed	27.5
Employed adults	
Number	171.4
Percentage	66.3%
Jobs	
Number	212.2
Mean	1.2
Minimum	1
Maximum	3
Months employed	
Mean	9.6
Minimum	1
Maximum	12
Percentage employed year-round	61.0%
Mean weeks employed	41.5
Households	
Number	108
Employed	
Number	100
Percentage	92.9%
Jobs per employed household	
Mean	2.1
Minimum	1
Maximum	6
Employed adults	
Mean	
Employed households	1.7
Total households	1.6
Minimum	1
Maximum	4
Mean person-weeks of employment	65.8

Source ADF&G Division of Subsistence household surveys, 2015.

Table 7-14.–Reported job schedules, Nuiqsut, 2014.

	Jobs		Employed persons		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full time	134.6	63.5%	128.5	75.0%	88.3	88.0%
Part time	28.6	13.5%	28.6	16.7%	26.1	26.0%
Shift	4.1	1.9%	4.1	2.4%	4.0	4.0%
On call (occasional)	32.6	15.4%	22.4	13.1%	20.1	20.0%
Schedule not reported	12.2	5.8%	6.1	3.6%	4.0	4.0%

Source ADF&G Division of Subsistence household surveys, 2015.

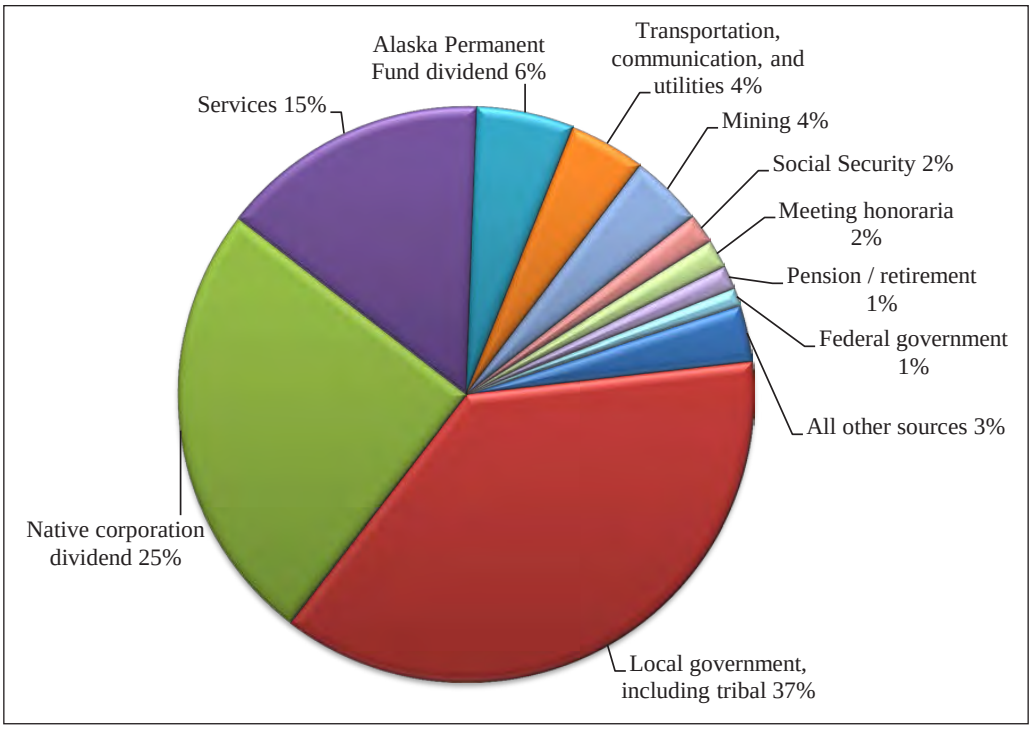


Figure 7-26.–Top income sources, Nuiqsut, 2014.

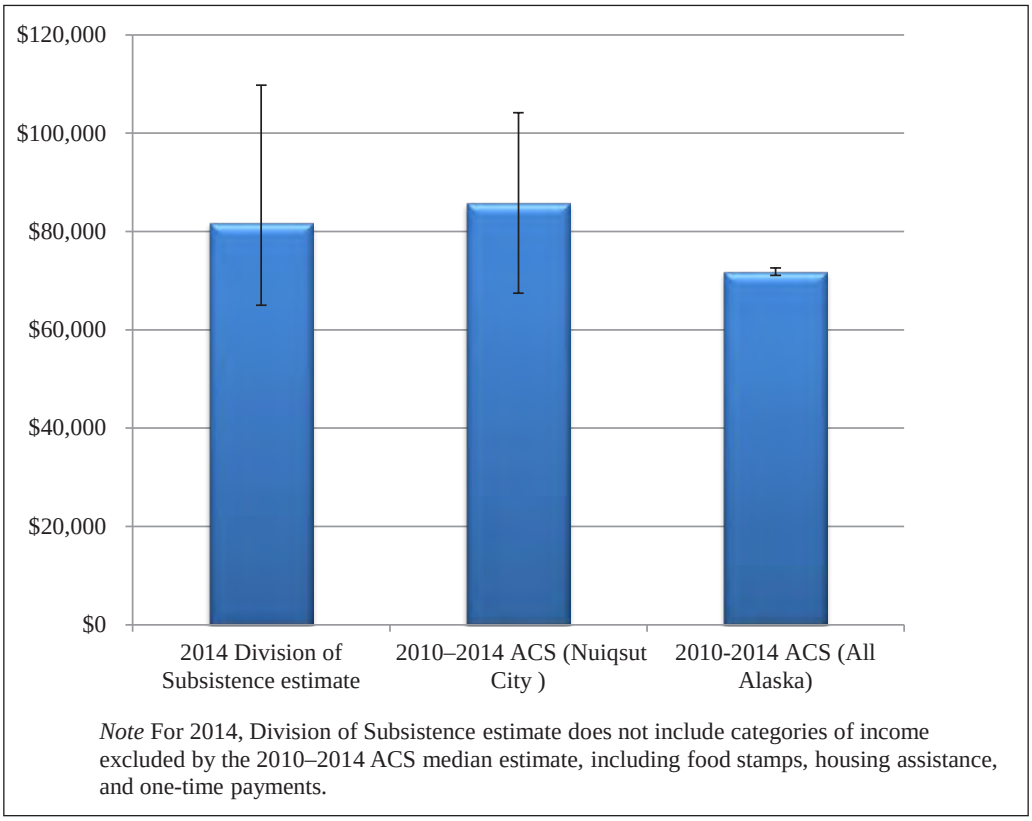


Figure 7-27.–Comparison of median income estimates, Nuiqsut, 2014.

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). The food security questions were modeled after those developed by the U.S. Department of Agriculture (USDA) but modified by ADFG 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).

Twelve-percent of Nuiqsut households worried about having enough food at one or more points during 2014, and approximately 26% of households reported that they lacked resources (i.e., time, money, equipment) to obtain either subsistence or store-bought foods (Figure 7-28). Nineteen-percent of households stated that their store-bought food did not last at one or more points throughout the year, and 16% of households stated that their subsistence foods did not last at one or more points throughout the year. Approximately 14% of households expressed that their food supply, store-bought and subsistence, did not last throughout the year, and that they were unable to get more food. Far fewer households indicated decreases in food intake. Close to one-half of households (47%) claimed that they had enough of the kinds of foods they desired and 41% said that the household had enough food, but not necessarily the kinds of food they wanted to eat (Table 7-15).

Food security results for Nuiqsut, the state of Alaska, and the United States are summarized in Figure 7-29. Nuiqsut had a marginally higher percentage of people in the high and marginal food security category

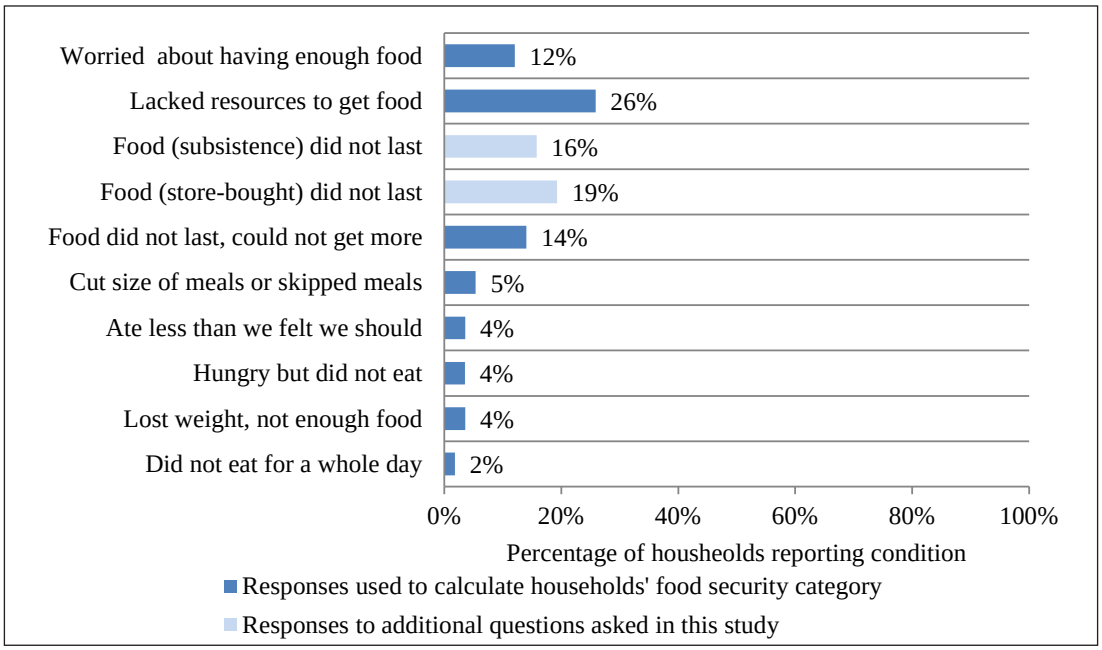


Figure 7-28.–Responses to questions about food insecure conditions, Nuiqsut, 2014.

Table 7-15.–Household descriptions of food eaten in the last 12 months, Nuiqsut, 2014.

Statement	Percentage of affirmative responses
Had enough of the kinds of food desired	46.6%
Had enough food, but not the desired kind	41.4%
Somestimes, or often, did not have enough food	6.9%
Missing/No response	5.2%

Source ADF&G Division of Subsistence household surveys, 2015.

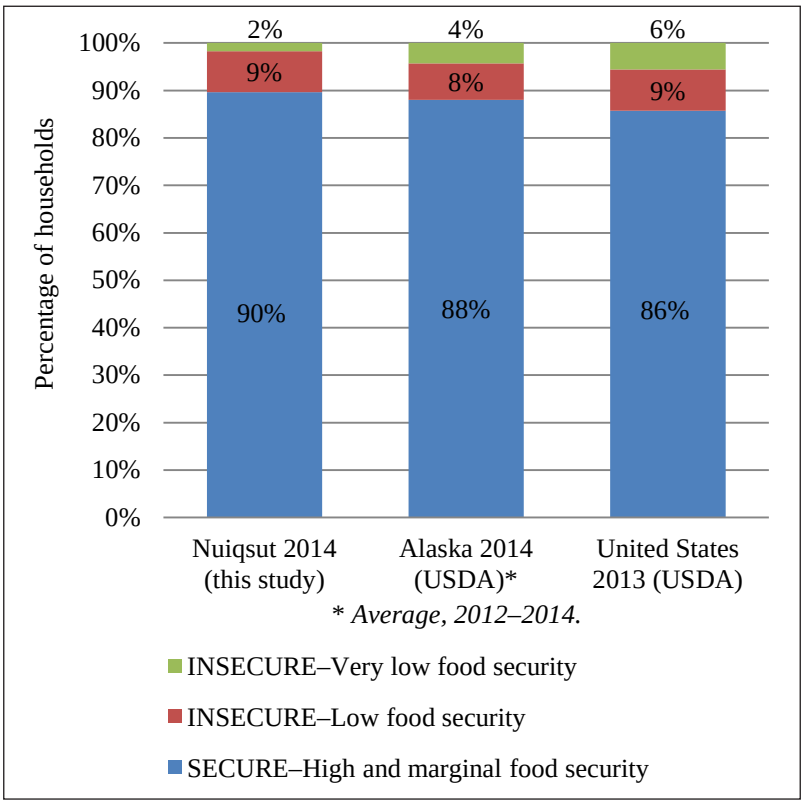


Figure 7-29.–Comparison of food security categories, Nuiqsut, 2014.

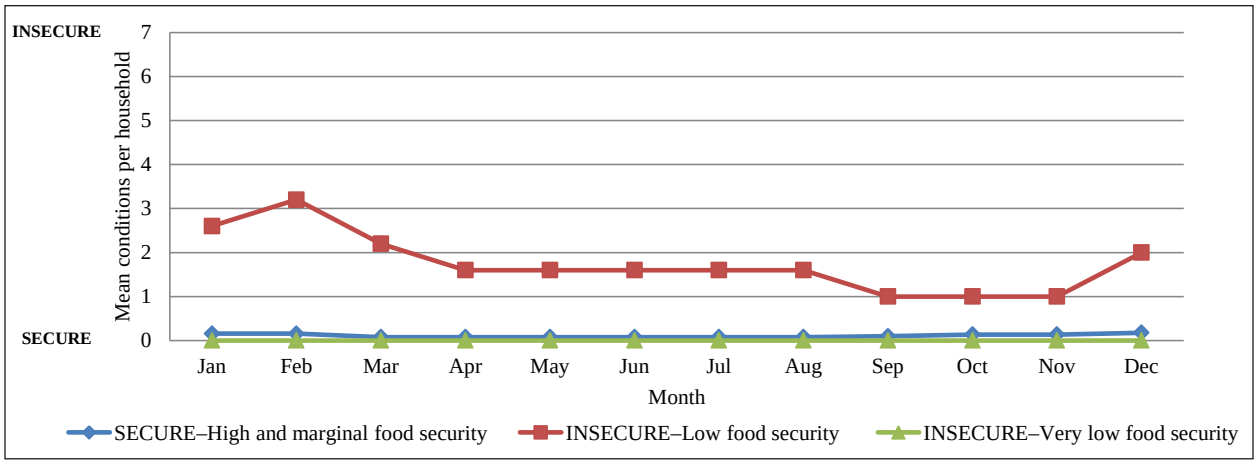


Figure 7-30.–Mean number of food insecure conditions by month and by household security category, Nuiqsut, 2014.

(90%) than both the nation and the state. In addition, a smaller percentage of people occupied the very low food security category for Nuiqsut (2%) in comparison to Alaska and the nation.

Figure 7-30 portrays the mean number of food insecure conditions per household by food security category and by month. Households with high to marginal food security reported very few instances of food insecure conditions throughout the year for their store-bought and subsistence foods. The greatest percentage of households in the low food security category experienced food insecure conditions from mid- to late winter for both types of foods. Households in the very low food security category did not provide responses.

Figure 7-31 shows in which months households reported foods not lasting. A greater percentage of Nuiqsut households reported that all types of food did not last during the mid- to late winter months than during other times of year. Fewer households reported food not lasting during the spring, summer, and fall. This may correspond to a higher intensity of subsistence activities among households, as well as an influx in seasonal employment opportunities.

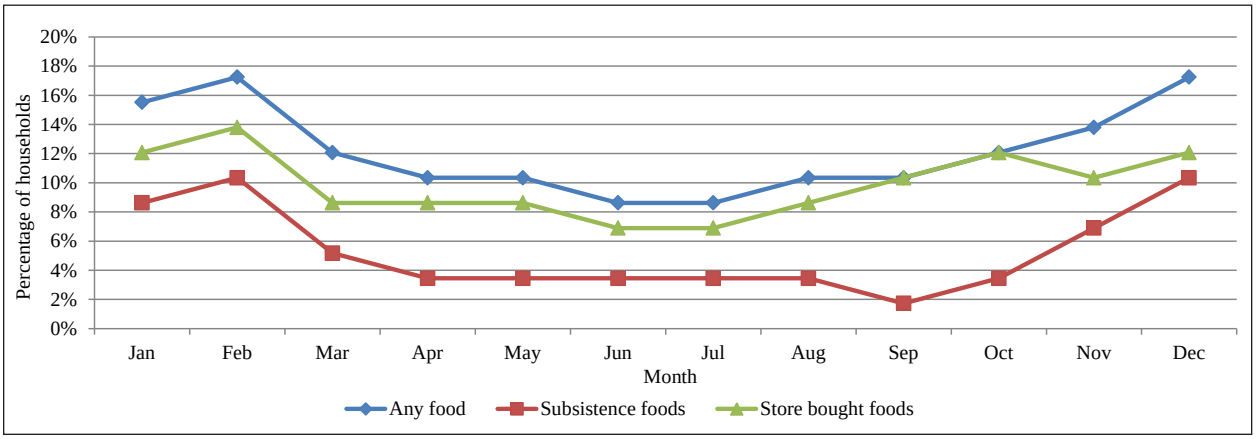


Figure 7-31.–Comparison of months when food did not last, Nuiqsut, 2014.

Comparing Harvests and Uses in 2014 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 3 ways: whether they used more, less, or about the same amount of 8 resource categories in 2014 as in the past 5 years, and whether they got "enough" of each of the 8 resource categories. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different subsistence resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 7-16, Figure 7-32, and Figure 7-33 provide a broad overview of households' assessments of their harvests in 2014. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions.

Forty percent of households reported using the same amount of subsistence resources in 2014 as in recent years, while over one-third of households reported using less (Table 7-16; Figure 7-32). Close to one-quarter of households indicated that they used more subsistence resources in 2014 when compared to previous years.

More Nuiqsut households used marine mammals than any other subsistence resource in 2014 (Table 7-5). Over one-half of households reported using the same amount of marine mammals in 2014, while 17% used more (Table 7-16; Figure 7-32). The primary reason for less use was less sharing of the resource (Table 7-17).

Although a significant percentage of the community used large land mammals in 2014, more than one-half of households reported using less large land mammals. The primary reasons for less use were a lack of effort, and that hunters had to travel too far to find caribou (Table 7-17). Twelve percent of households indicated that they used more large land mammals, and 30% claimed that they used the same amount compared to previous years. Reasons for using more included "increased effort" and "regulations" (Table 7-18).

As mentioned earlier, 31% of households did not use salmon in 2014 (Table 7-5). One-third of Nuiqsut households indicated that they used the same amount of salmon, 26% used less, and 11% used more salmon in 2014 (Table 7-16; Figure 7-32).

Approximately 93% of Nuiqsut households used nonsalmon fish in 2014, and over one-half of households reported that they used the same amount of nonsalmon fish as they had used in previous years (tables 7-5 and 7-16; Figure 7-32). Nearly 33% of households, however, used less, and 13% of households used more nonsalmon fish in 2014 (Table 7-16; Figure 7-32).The primary reasons for less usage was small or diseased fish, less sharing, weather, and not having enough time to harvest nonsalmon fish (Table 7-17).

Table 7-16.–Changes in household uses of resources compared to recent years, Nuiqsut, 2014.

			Households reporting use								Households not using	
	Sampled	Valid	Total households		Less		Same		More			
Resource category	households	responses[a]	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	58	56	56	100.0%	20	35.7%	23	41.1%	13	23.2%	0	0.0%
Salmon	58	55	38	69.1%	14	25.5%	18	32.7%	6	10.9%	17	30.9%
Nonsalmon fish	58	55	53	96.4%	18	32.7%	28	50.9%	7	12.7%	2	3.6%
Large land mammals	58	57	53	93.0%	29	50.9%	17	29.8%	7	12.3%	4	7.0%
Small land mammals	58	55	15	27.3%	5	9.1%	6	10.9%	4	7.3%	40	72.7%
Marine mammals	58	52	50	96.2%	14	26.9%	27	51.9%	9	17.3%	2	3.8%
Birds	58	56	46	82.1%	17	30.4%	26	46.4%	3	5.4%	10	17.9%
Marine invertebrates	58	56	1	1.8%	0	0.0%	1	1.8%	0	0.0%	55	98.2%
Vegetation	58	53	37	69.8%	12	22.6%	24	45.3%	1	1.9%	16	30.2%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response.

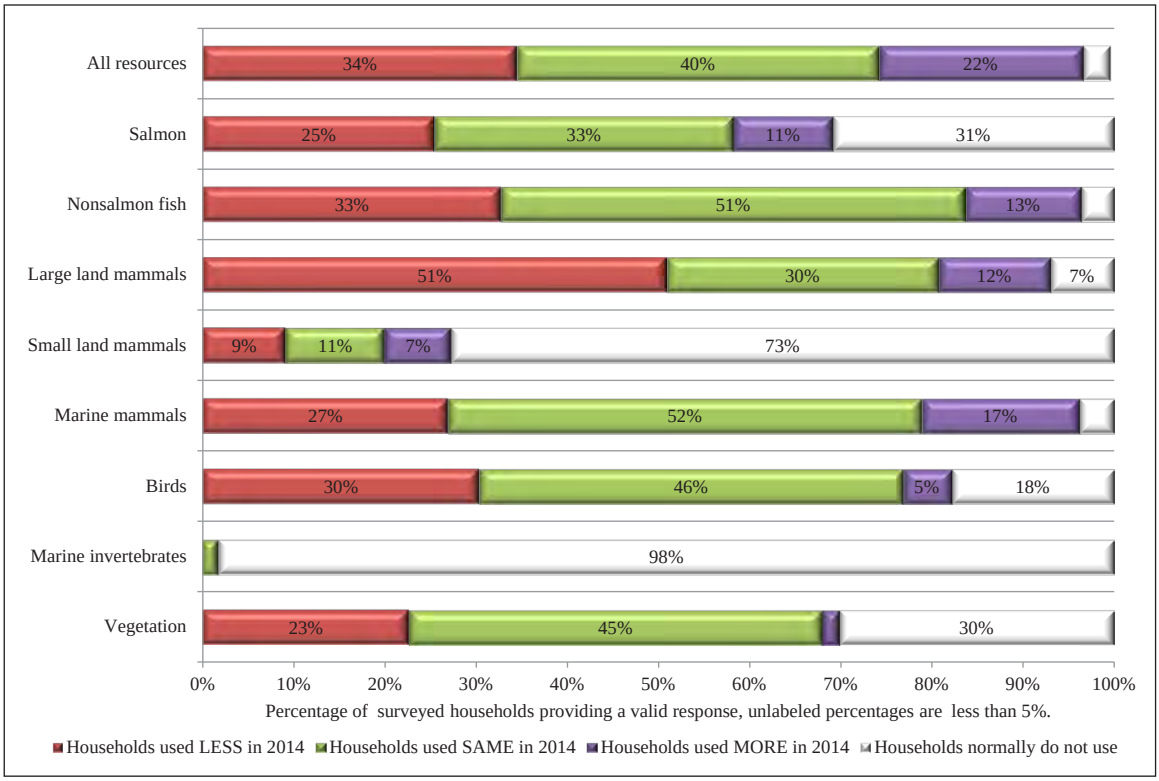


Figure 7-32.–Changes in household uses of resources compared to recent years, Nuiqsut, 2014.

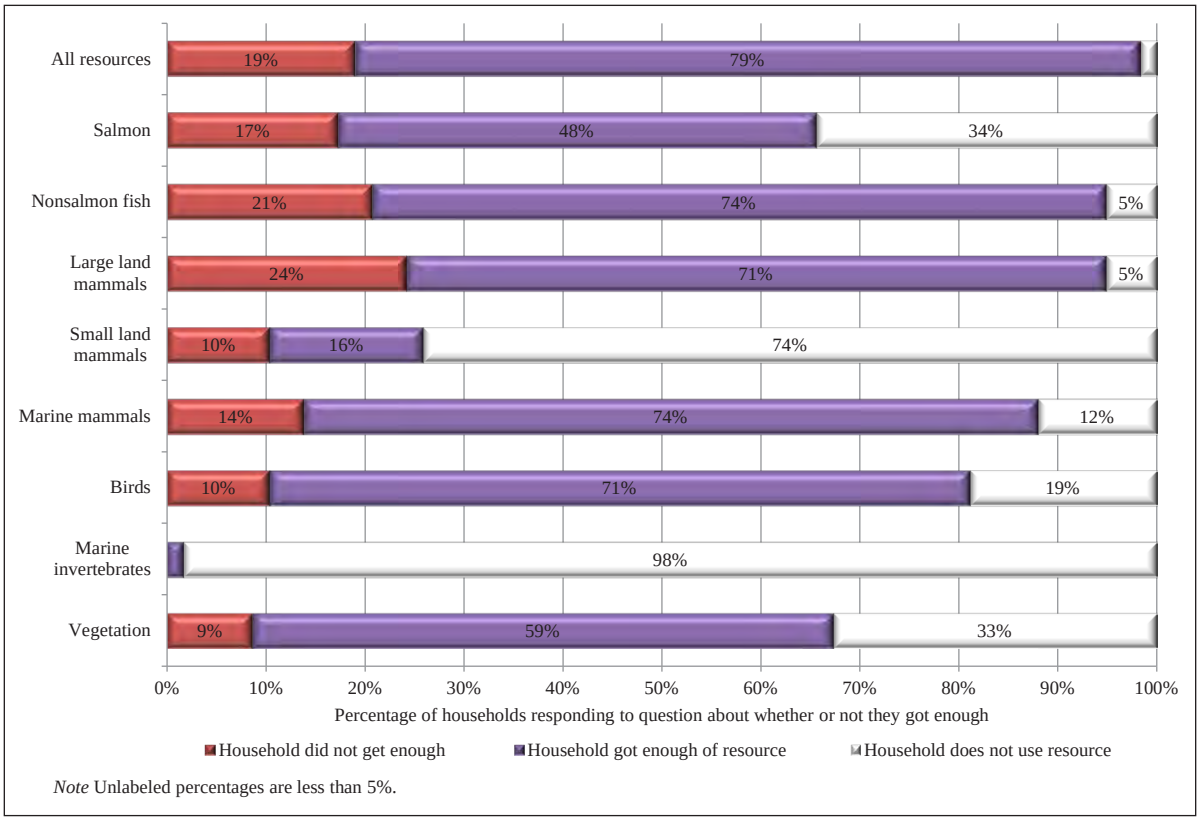


Figure 7-33.–Percentage of households reporting whether they got enough resources, Nuiqsut, 2014.

Table 7-17.–Reasons for less household uses of resources compared to recent years, Nuiqsut, 2014.

Resource category	Valid responses[a]	Households reporting reasons for less use	Family/ personal		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful		Weather/ environment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	56	17	4	23.5%	4	24%	0	0.0%	1	6%	0	0%	3	18%	0	0.0%	1	5.9%
Salmon	55	12	0	0.0%	3	25%	0	0.0%	0	0%	3	25%	2	17%	0	0.0%	1	8.3%
Nonsalmon fish	55	18	2	11.1%	1	6%	0	0.0%	2	11%	3	17%	2	11%	1	5.6%	3	16.7%
Large land mammals	57	29	6	20.7%	2	7%	7	24.1%	0	0%	3	10%	6	21%	1	3.4%	0	0.0%
Small land mammals	55	5	0	0.0%	1	20%	1	20.0%	0	0%	0	0%	0	0%	1	20.0%	1	20.0%
Marine mammals	52	13	2	15.4%	2	15%	2	15.4%	1	8%	4	31%	0	0%	0	0.0%	4	30.8%
Birds	56	17	4	23.5%	1	6%	1	5.9%	1	6%	1	6%	0	0%	1	5.9%	3	17.6%
Marine invertebrates	56	0	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Vegetation	53	11	0	0.0%	1	9%	0	0.0%	0	0%	0	0%	4	36%	0	0.0%	3	27.3%

-continued-

Table 7-17.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Other reasons		Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Equipment/ fuel expense		Used other resources	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	56	17	8	47%	5	29.4%	0	0.0%	0	0.0%	0	0.0%	1	5.9%	0	0.0%	0	0.0%
Salmon	55	12	2	17%	1	8.3%	0	0.0%	1	8.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	55	18	0	0%	3	16.7%	0	0.0%	5	27.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	57	29	7	24%	5	17.2%	0	0.0%	0	0.0%	0	0.0%	2	6.9%	1	3.4%	0	0.0%
Small land mammals	55	5	1	20%	1	20.0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%	0	0.0%	0	0.0%
Marine mammals	52	13	0	0%	1	7.7%	0	0.0%	0	0.0%	0	0.0%	1	7.7%	0	0.0%	0	0.0%
Birds	56	17	0	0%	5	29.4%	0	0.0%	1	5.9%	0	0.0%	3	17.6%	0	0.0%	0	0.0%
Marine invertebrates	56	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	53	11	0	0%	2	18.2%	0	0.0%	0	0.0%	0	0.0%	1	9.1%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never using the resource.

Table 7-18.–Reasons for more household uses of resources compared to recent years, Nuiqsut, 2014.

Resource category	Valid responses[a]	Households reporting reasons for more use	Increased availability		Used other resources		Favorable weather		Received more		Needed more		Increased effort		Had more help	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	56	13	0	0.0%	1	7.7%	0	0.0%	0	0.0%	6	46.2%	3	23.1%	4	30.8%
Salmon	55	6	0	0.0%	1	16.7%	0	0.0%	0	0.0%	2	33.3%	0	0.0%	2	33.3%
Nonsalmon fish	55	7	0	0.0%	2	28.6%	0	0.0%	0	0.0%	1	14.3%	1	14.3%	3	42.9%
Large land mammals	57	7	0	0.0%	0	0.0%	0	0.0%	0	0.0%	5	71.4%	1	14.3%	0	0.0%
Small land mammals	55	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%	2	50.0%
Marine mammals	52	9	0	0.0%	0	0.0%	0	0.0%	0	0.0%	4	44.4%	1	11.1%	3	33.3%
Birds	56	2	0	0.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	56	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	53	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 7-18.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for more use	Other		Regulations		Traveled farther		More success		Needed less		Store-bought expense		Got/ fixed equipment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	56	13	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	15.4%	0	0.0%	0	0.0%
Salmon	55	6	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	16.7%	0	0.0%	0	0.0%
Nonsalmon fish	55	7	0	0.0%	1	14.3%	0	0.0%	0	0.0%	2	28.6%	0	0.0%	0	0.0%
Large land mammals	57	7	0	0.0%	1	14.3%	0	0.0%	0	0.0%	1	14.3%	0	0.0%	0	0.0%
Small land mammals	55	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	52	9	0	0.0%	0	0.0%	0	0.0%	1	11.1%	2	22.2%	0	0.0%	0	0.0%
Birds	56	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Marine invertebrates	56	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	53	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never use.

Researchers asked household respondents if they got enough of all subsistence resources in 2014. Over three-quarters of households reported getting enough of all resources, and 19% indicated that they did not get enough (Figure 7-33). Over 70% of households indicated that they got enough of 1 or more of the 3 resource categories most commonly used by Nuiqsut residents: marine mammals, large land mammals, and nonsalmon fish. Approximately 24% of household respondents, however, said that they did not get enough large land mammals; this was the highest percentage of households not getting enough of any resource category. Twenty-one percent of households did not get enough nonsalmon fish, and 14% of households indicated that they did not get enough marine mammals.

Residents that reported not getting enough resources were asked about the impact on the household. More than 18% of households that reported not getting enough of all resources said that the impact was severe, while 55% indicated that the impact was major, and 18% claimed that the impact was minor (Table 7-19). Of the households that claimed that they did not get enough nonsalmon fish, over one-third indicated that the impact was major; 38% of households reported a major impact as a result of not getting enough marine mammals.

The greatest percentages of households indicated that they needed caribou, Arctic cisco, and wolf. Households also expressed needing more moose, bearded seal, and wolverine (Table 7-20).

Harvest Data

Changes in the harvest of resources by Nuiqsut residents can also be discerned through comparisons with findings from other study years. A considerable amount of subsistence-oriented research has been conducted in Nuiqsut, primarily because of the community's proximity to surrounding development and ongoing exploration. The following discussion will compare past and present data for different subsistence resources used by Nuiqsut residents. Because the community's human population has grown, comparison will largely be made between per capita values.

Table 7-21 shows per capita values of edible pounds for 7 study years, and Figure 7-34 shows per capita values for 5 study years. Weights of bowhead whales were not available for the 1995–1996 and 2000–2001 study years, so total per capita harvests are not included on the figure. Total per capita values were notably higher in 1993 and in 2014 than in 1985 or 1992. The higher value in 1993 compared to 1985 largely resulted from the successful landing of 3 bowhead whales in 1993 and 5 whales in 2014. Per capita values associated with nonsalmon fish and land mammal harvests were also substantially greater in 1993 and 2014, compared to 1985 and 1992. The 2014 estimated harvest was 124% greater than 1985, and 121% of that in 1993.

Per capita weights in most categories were higher in 1993 and 2014 than other study years (Table 7-21; Figure 7-34). The 2014 per capita salmon harvest (9 lb) was the highest ever documented. Nonsalmon harvests have varied considerably since 1985; the 2014 per capita harvest of 205 lb was the second highest after 1993. Composition of harvest has remained consistent in a few categories such as salmon, birds and eggs, and vegetation (Table 7-22; Figure 7-35). Nonsalmon fish, land mammals, and marine mammals have remained the main sources of wild food over time, although their contribution to total harvests has varied considerably in the case of marine mammals and land mammals.

Marine Mammals

Marine mammals remain a mainstay of Nuiqsut's subsistence diet. Marine mammal harvest numbers have been steadily increasing since Nuiqsut was established as a community in 1973. Marine mammals continue to account for a substantial portion of total subsistence harvests for Nuiqsut.

The total marine mammal harvest in 1985 was an estimated 13,355 lb, or 33 lb per capita, and provided approximately 8% of the total harvest in edible pounds (tables 7-21 and 7-22; Figure 7-35).[14] Harvested species included bearded, ringed, and spotted seals, as well as 1 walrus. Although the bowhead season was open, no bowheads were harvested in 1985 due to inclement weather and poor ice conditions.

14. ADF&G CSIS.

Table 7-19.–Reported impact to households reporting that they did not get enough of a type of resource, Nuiqsut, 2014.

		Households not getting enough _____ .				Impact to those not getting enough _____ .									
	Sample	Valid responses[a]		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
All resources	58	57	98.3%	11	19.3%	0	0.0%	1	9.1%	2	18.2%	6	54.5%	2	18.2%
Salmon	58	38	65.5%	10	26.3%	3	30.0%	4	40.0%	2	20.0%	0	0.0%	1	10.0%
Nonsalmon fish	58	55	94.8%	12	21.8%	2	16.7%	3	25.0%	3	25.0%	4	33.3%	0	0.0%
Large land mammals	58	55	94.8%	14	25.5%	3	21.4%	3	21.4%	5	35.7%	2	14.3%	1	7.1%
Small land mammals	58	15	25.9%	6	40.0%	0	0.0%	4	66.7%	2	33.3%	0	0.0%	0	0.0%
Marine mammals	58	51	87.9%	8	15.7%	2	25.0%	0	0.0%	3	37.5%	3	37.5%	0	0.0%
Birds	58	47	81.0%	6	12.8%	0	0.0%	2	33.3%	3	50.0%	1	16.7%	0	0.0%
Marine invertebrates	58	1	1.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	58	39	67.2%	5	12.8%	1	20.0%	3	60.0%	1	20.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Includes households failing to respond to the question and those households that never used the resource.

Table 7-20.–Resources of which households reported needing more, Nuiqsut, 2014.

Resource	Households needing	Percentage of households
All resources	1	1.7%
Salmon	5	8.6%
Chum salmon	3	5.2%
Chinook salmon	2	3.4%
Pink salmon	1	1.7%
Nonsalmon fish	2	3.4%
Burbot	1	1.7%
Broad whitefish	4	6.9%
Cisco	1	1.7%
Arctic cisco	8	13.8%
Land mammals	1	1.7%
Caribou	13	22.4%
Moose	5	8.6%
Gray wolf	6	10.3%
Wolverine	5	8.6%
Marine mammals	2	3.4%
Bearded seal	5	8.6%
Walrus	2	3.4%
Bowhead whale	1	1.7%
Birds and eggs	1	1.7%
King eider	1	1.7%
Geese	1	1.7%
White-fronted goose	3	5.2%
Blueberry	2	3.4%
Cloudberry	4	6.9%
Unknown	2	3.4%

Source ADF&G Division of Subsistence household surveys, 2015.

Fall and Utermohle (1995) estimated the total marine mammal harvest for 1993 to be 85,216 lb, which translated to approximately 236 lb per capita. Marine mammal harvests provided 32% of edible pounds for all resources (Table 7-22). Three bowhead whales were harvested in the fall of 1993 (Fall and Utermohle 1995). Other harvested species included bearded, ringed, and spotted seals, as well as 1 polar bear. The 1993 harvest was considerably higher than the 1985 harvest due to the successful landing of 3 bowhead whales.

Information provided for the study year July 1994–June 1995 indicated that marine mammals provided 2% to the total harvest in edible pounds—a 30% decrease from the 1993 marine mammal harvest (Brower and Opie 1998rev.:28). This was largely because no bowheads were harvested during the study period. Marine mammal species harvested during 1994–1995 included 23 ringed seals and 1 polar bear, which translated to approximately 4 lb per capita (Table 7-21). The report did not indicate any reasons for the decreased seal harvest.

The marine mammal harvest for the period July 1995–June 1996 included 4 bowheads, 155 ringed seals, 17 bearded seals and 1 polar bear (Bacon et al. 2011rev.). The bowhead quota increased from 3 to 4 whales during the fall 1995 season.

A report documenting the study period 2000–2001 indicated that 4 bowhead whales were harvested in the fall of 2000, as well as 25 ringed seals, 1 bearded seal and 1 polar bear (Bacon et al. 2011rev.).

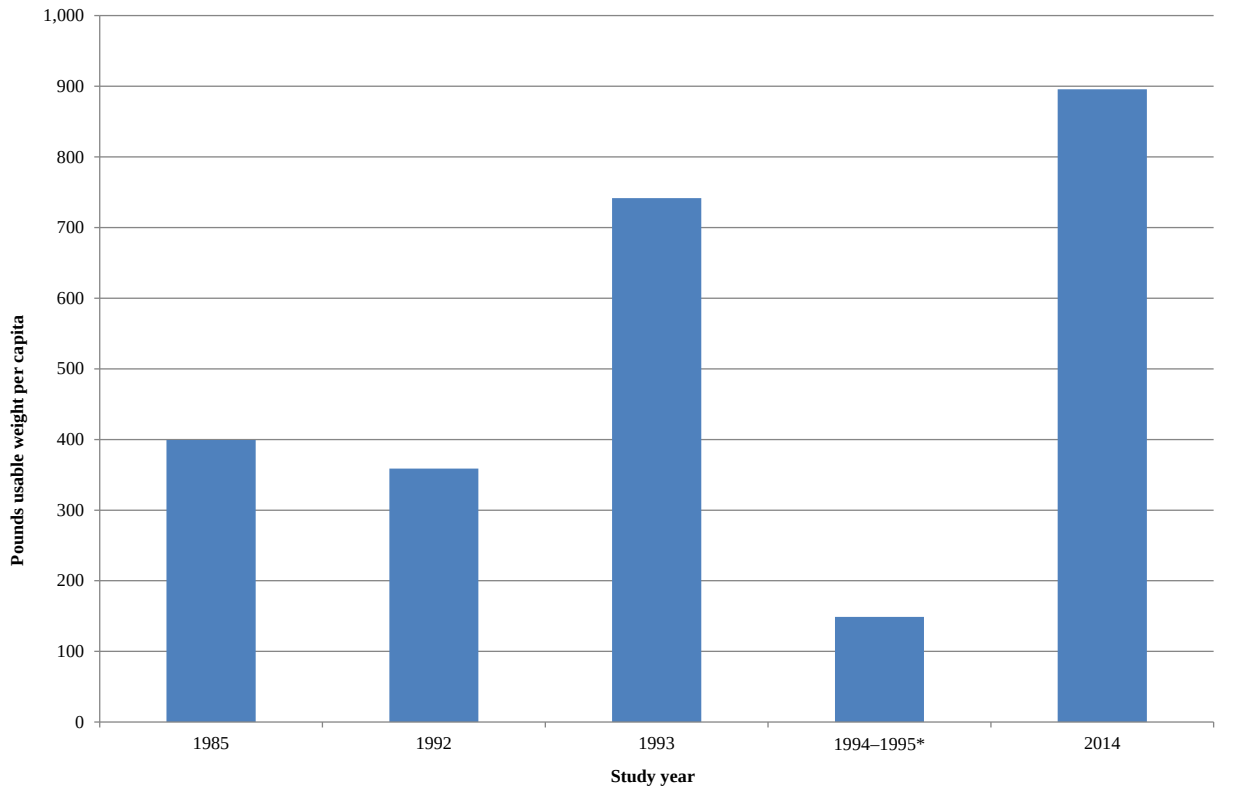
For the period 1996–2012, Nuiqsut whaling crews harvested a total of 55 bowheads, compared to a total of 6 bowheads harvested for the period 1973–1989 (Galginaitis 2014:104). Several factors contributed to

Table 7-21.–Comparison of per capita harvests by category in usable pounds, Nuiqsut, 1985, 1992–1996, 2000–2001, and 2014.

Resource category	1985	1992	1993	1994–1995[a]	1995–1996[a]	2000–2001[a]	2014
Salmon	3.4	0.2	2.8	0.1	0.5	0.1	9.4
Nonsalmon fish	172.7	123.9	247.8	48.0	39.1	70.2	205.0
Land mammals	169.3	99.0	242.0	91.5	122.9	164.5	249.8
Marine mammals	33.3	126.2	236.0	4.2	**	**	407.9
Birds and eggs	20.0	9.4	12.0	5.1	5.0	11.0	14.1
Marine invertebrates	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vegetation	0.4	0.2	1.1	0.1	0.1	0.0	1.0
All resources	**399.2**	**358.8**	**741.7**	**149.0**	**202.0**	**250.6**	**887.1**

Sources Community Subsistence Information System (CSIS) for 1985 and 1993 data; Fuller and George (1999rev.) for 1992 data; Brower and Opie (1998rev.) for 1994–1995 data; Bacon et al. (2011rev.) for 1995–1996 and 2000–2001 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data.

a. In 1995–1996 and 2000–2001 Nuiqsut harvested known numbers of bowhead, however, no estimated weights are available to calculate edible pounds.



Note * Indicates edible weights calculated by multiplying estimated numbers of harvest by conversion factors used in this study. Per capita pounds calcuated using ADOL population estimates.

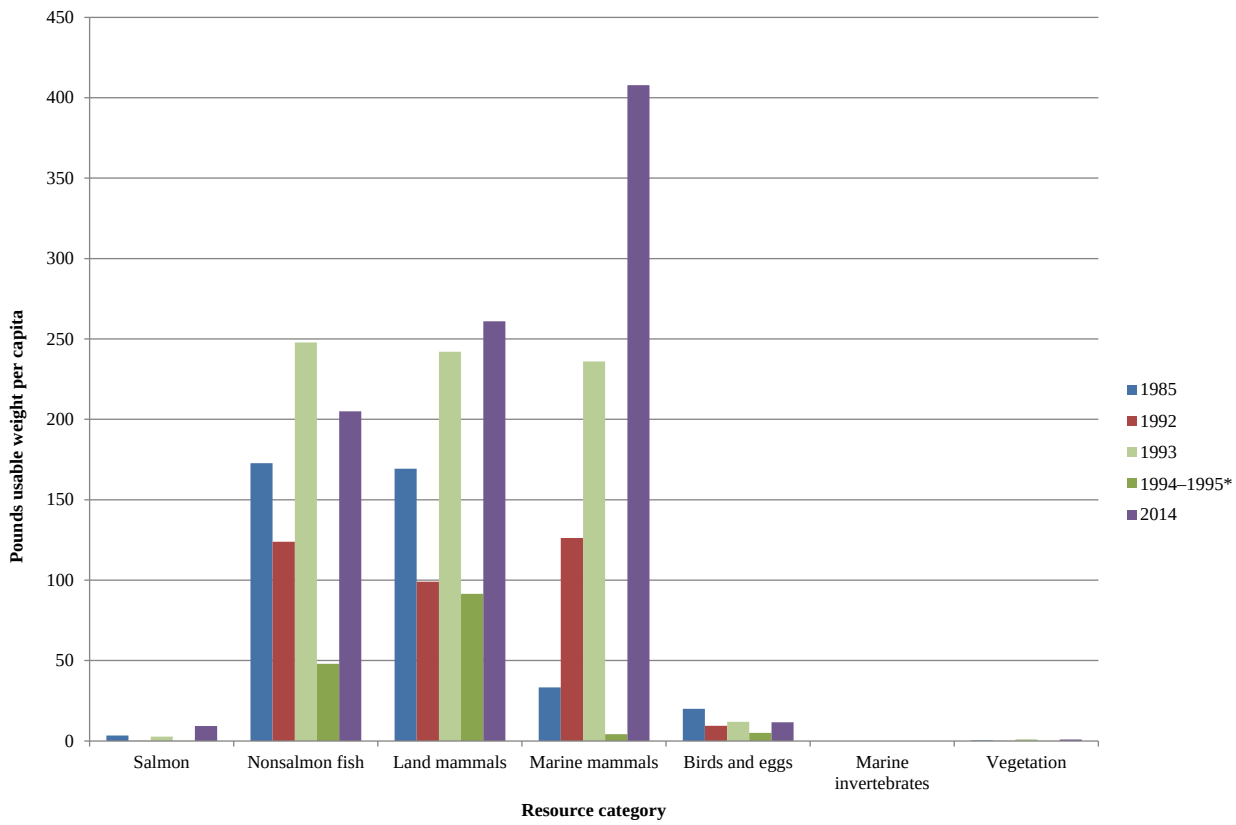
Figure 7-34.–Comparison of per capita harvests, Nuiqsut, 1985, 1992–1995, and 2014.

Table 7-22.–Comparison of harvest compositions by category, by weight in usable pounds, Nuiqsut, 1985, 1992–1995, and 2014.

Resource category	1985	1992	1993	1994–1995*	2014
Salmon	0.9%	0.0%	0.4%	0.0%	1.0%
Nonsalmon fish	43.3%	34.5%	33.4%	32.2%	22.9%
Land mammals	42.4%	27.6%	32.6%	61.4%	29.1%
Marine mammals	8.3%	35.2%	31.8%	2.8%	45.5%
Birds and eggs	5.0%	2.6%	1.6%	3.4%	1.3%
Marine invertebrates	0.0%	0.0%	0.0%	0.0%	0.0%
Vegetation	0.1%	0.0%	0.1%	0.1%	0.1%

Sources Community Subsistence Information System (CSIS) for 1985 and 1993 data; Fuller and George (1997) for 1992 data; Bacon et al. (2009) for 1994–1995 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data.

* Edible weights calculated from by multiplying estimated numbers of harvest by conversion factors used in this study. Pounds per capita calcuated using ADOL population estimates.



Note * Indicates edible weights calculated by multiplying estimated numbers of harvest by conversion factors used in this study. Per capita pounds calcuated using ADOL population estimates.

Figure 7-35.–Comparison of per capita harvests by category, Nuiqsut, 1985, 1992–1995, and 2014.

the difference in harvest numbers during this period. Bowhead hunting during 1973–1985 was generally characterized as a period of cold, ice, and adverse weather (Galginaitis 2014:103). After the quota was increased in 1995, Nuiqsut whaling crews fulfilled the entire allotted quota of 4 bowheads during 8 of the 17 seasons throughout the period 1996–2012 (Bacon et al. 2011rev.).

No comprehensive subsistence harvest surveys were conducted in Nuiqsut 2002–2014; no seal harvest information exists for these years.

In 2014 marine mammals accounted for over 45% of the total harvest in edible pounds, which translated to 169,367 lb, or 408 lb per capita, the largest per capita weight of the 4 study periods in which comprehensive survey data that include bowhead weights exists—and a direct result of 2 additional bowhead harvests, compared to 1993 (tables 7-5, 7-21 and 7-22; Figure 7-35). The marine mammal harvest in 2014 also included bearded, ringed, and spotted seals (Table 7-5). The overall composition of marine mammal harvests has experienced little change over the course of 30 years. Nuiqsut hunters continue to harvest the same 3 species of seal, as well as bowhead whale. However, the contribution of marine mammals to the total subsistence harvest has increased significantly.

Most patterns associated with the usage of marine mammals have remained relatively constant for the past several decades. Marine mammal harvests continue to be the work of fewer households. Household usage of marine mammals had historically been high (100% in 1985; 97% in 1993), and it remains so today (95%; Table 7-5; Fall and Utermohle 1995).[15] The harvesting of marine mammals continues to be a vital subsistence activity for Nuiqsut households, both for sustenance and cultural maintenance. Lack of a bowhead harvest in certain years (1983–1985, 1988, 1994) did affect the total per capita harvest and the overall contribution of marine mammals to the total harvest weight for all resources. Relatively high household usage during low harvest years may be attributed to the extensive sharing networks between communities.

Large Land Mammals

Caribou is the predominantly harvested large land mammal species for the community of Nuiqsut (Plate 7-5). Hunters primarily harvest caribou from the Teshekpuk and Central Arctic herds, however they also harvest from the other 2 herds found on the North Slope (Western Arctic and Porcupine herds; Braem et al. 2011:8, 9). Harvest numbers have fluctuated since researchers first began collecting harvest information in 1985; Nuiqsut caribou harvest information was collected for 17 years between 1985 and 2014.

ADF&G conducted caribou-specific studies in Nuiqsut from 2002–2007, and researchers with Stephen R. Braund & Associates have been conducting caribou studies in Nuiqsut for several years (2008–2013). However, researchers did not use the same conversion factors throughout the years, and instead relied on 3 different edible weight estimates—117 lb,[16] 122 lb,[17] and 136 lb[18]—per individual caribou. The following discussion will include values associated with total caribou harvested and numbers of individual caribou per capita in addition to total harvest weight and pounds per capita values as reported by the researchers. Land mammal harvests composed 42% (67,866 lb, 169 lb per capita) of the total harvest weight for all resources in 1985, second only to nonsalmon fish harvests (43%; Table 7-22; Figure 7-35).[19] Caribou made up 96% of the large land mammal harvests for 1985; other harvested species included brown bear and moose.[20]

Results from the 1993 ADF&G comprehensive subsistence harvest survey estimated that large land mammals made up 33% of the total harvest of all subsistence resources (Table 7-22; Figure 7-35). The

15. ADF&G CSIS.

16. ADF&G CSIS for study year 1985; Fuller and George (1999rev.) for 1992; Brower and Opie (1998rev.) for 1994–1995; Bacon et al (2011rev.) for 1995–1996 and 2000–2001; Braem et al (2011) for 2003–2007; and Braund and Associates (2013b) for 2010–2013.

17. Fall and Utermohle (1995) for 1993.

18. This study for 2014; Pedersen S. 2000. Documentation of large mammal harvest levels in Nuiqsut, June 1999 through May 2000. Unpublished report. ADF&G Division of Subsistence, Fairbanks.

19. ADF&G CSIS.

20. ADF&G CSIS.

Plate 7-5.–Caribou feeding at sunset near Nuiqsut.

overall large land mammal harvest was 242 lb per capita. Caribou harvests alone accounted for 31% of the total harvest weight for all resources, and 94% of the total large land mammal harvest in 1993 (Fall and Utermohle 1995).[21] Nuiqsut hunters harvested an estimated 672 caribou, which provided approximately 82,169 lb of edible weight. The 1993 caribou harvest translated to 228 lb of edible weight per resident.

Nuiqsut hunters harvested the fewest caribou (249) during 1994–1995. Hunters reported having to travel farther in search of caribou compared to previous years (Brower and Opie 1998rev.:29, 30, 37, 38). They also noted greater numbers of muskoxen in the region, which they believed impacted caribou range and herd dispersal. Hunters explained that caribou were afraid of muskoxen and avoided areas where muskoxen were present; subsequently increasing the distance hunters had to travel to search for caribou (Brower and Opie 1998rev.:30, 37). In addition, hunters also indicated that some portions of their traditional caribou hunting grounds were now closed to hunting as a result of "oil and gas exploration and development," which may have also contributed to hunters having to travel further in their search for caribou (Brower and Opie 1998rev.:37, 38). Hunters also mentioned increased aircraft traffic, and that planes were scaring caribou away (Brower and Opie 1998rev.:38). One hunter cited poor health among caribou as a possible contributing factor to the decreased harvest.

The second lowest harvest year was 1992, when 278 caribou were harvested (Fuller and George 1999rev.). The highest caribou harvest estimates were for 1993 and 2014 (Fall and Utermohle 1995; Table 7-5). The mean annual harvest for 1985–2000 was 416 caribou, with a low harvest of 258 in 1994–1995 and a high harvest of 672 caribou in 1993 (Bacon et al. 2011rev.; Brower and Opie 1998rev.; Fuller and George 1999rev.).[22] The mean annual harvest for the years 2000–2014 was 519 caribou, with a low harvest of 363 in 2005–2006 and a high harvest of 774 in 2014 (Bacon et al. 2011rev.; Braem et al. 2011; Table 7-5).[23] The 2014 estimate was based on a 54% sample achievement, and is likely higher than the actual harvest amount for the entire community.

21. Researchers used 122 lb per caribou conversion factor.

22. ADF&G CSIS.

23. ADF&G CSIS.

Although far less harvest information is available for other large land mammal species, moose harvests have remained relatively consistent, with a high harvest of 18 animals in 1992[24] and a low harvest of 2 moose in 1995–1996 (Bacon et al. 2011rev.; Fuller and George 1999rev.). Combining all estimates from the available harvest information, the mean moose harvest for Nuiqsut was 8 moose for the period 1985–2014 (Bacon et al. 2011rev.; Brower and Opie 1998rev.; Fuller and George 1999rev.).[25] Brown bear harvests have declined considerably from 10 bears in 1985 and 1993 to an estimated 2 bears in 2014 (Fall and Utermohle 1995; Table 7-5) .[26]

Small Land Mammals

Due to the large expanses of the virtually treeless terrain across the central Arctic slope, Nuiqsut hunters usually track small land mammals, in addition to trapping them. Small land mammals are typically used for fur, and not food. However, according to one key respondent, some elders used to eat ground squirrels as well as using the fur. In 1985, hunters harvested at least 5 different species of small land mammals.[27] These included red and Arctic foxes, Arctic ground squirrel, gray wolf, and wolverine. Arctic ground squirrels were the most harvested species during 1985 and made up 87% of the total small land mammal harvest by number of animals (315 of 362).

In 1993, Nuiqsut hunters harvested a total of 408 small land mammals. Arctic ground squirrels were the predominantly harvested species and made up 56% of the total small land mammal harvest by individual number (Fall and Utermohle 1995). Arctic and red foxes accounted for 34% of the total small land mammal harvest during this study year. Wolf, wolverine, and weasel were also harvested.

In 2014, wolverine, gray wolf, and foxes were the only small land mammals harvested by Nuiqsut residents (Table 7-5). Wolverine made up 41%, fox harvests provided 40%, and wolves contributed 19% to the total small land mammal harvest by number of animals harvested.

Small land mammal harvest numbers have experienced significant changes throughout the past several decades, and the primary species harvested has shifted from Arctic ground squirrels to foxes. According to one resident, hunting ground squirrels in the past was primarily done as a form of pest control:

> Cause the elders of my day, of my youth days, totally thought they were pests and they were tearing up our ground and say, “Go get as many as you can.” They didn’t mind that. Now days they, people don’t study these things like that anymore. They don’t see what, why back in our day they let us go do that. (NUI02191606)

Small land mammal harvests increased by 13% from 1985 to 1993, but they decreased by 84% from 1993 to 2014. A large part of this difference may be attributed to fewer people trapping or hunting small land mammals. According to one key respondent, “It’s pretty hard to sell fur up here unless you can take ‘em down south somewhere where there’s people are buying furs” (NUI 02221601).

Salmon

Historically, Nuiqsut households have harvested far less salmon than nonsalmon fish, primarily due to less resource availability. The most commonly harvested salmon species are chum and pink salmon. The total salmon harvest was about 3 lb per capita in 1985 and 1993, and 9 lb per capita in 2014 (Table 7-21). Despite the increase in per capita values from 1993 to 2014, salmon harvests have consistently provided a relatively insignificant portion to the total harvest (Table 7-22; Figure 7-35).

24. The estimated moose harvest of 18 individuals was “very likely much higher than the actual harvest” (Fuller and George 1999rev.).

25. ADF&G CSIS.

26. ADF&G CSIS.

27. ADF&G CSIS.

The total salmon harvest of 1985 was an estimated 441 fish (1094 lb), or slightly over 1 fish per resident.[28] Pink salmon made up the entire salmon harvest for that year. In 1993, salmon harvests included 272 fish, 59% (397 lb) of which were pink salmon; Nuiqsut fishers also caught chum, coho, and Chinook salmon (Fall and Utermohle 1995).

The 2014 harvest provided 3 times as many pounds per capita as the 1985 harvest. The composition of the harvests has changed as well. In earlier reports, pink salmon was the predominantly harvested species; in 2014, chum salmon made up the majority of the salmon harvest (90%; Figure 7-15).

Nonsalmon Fish

As the results of this study demonstrate, nonsalmon fish continue to provide a significant contribution to the overall Nuiqsut annual harvest. When compared to past data, the importance of nonsalmon fish to Nuiqsut households has not changed since subsistence harvest information began being documented over 30 years ago. Nonsalmon fish harvests have remained in the top 3 harvested resources categories since 1985 (Figure 7-20). Historically, the primary nonsalmon fish species harvested by Nuiqsut residents included 4 species of whitefish—Arctic and least ciscoes and broad and humpback whitefishes—as well as Arctic grayling and burbot.

Prior researcher collected several years of information about Nuiqsut's annual harvest of a number of nonsalmon fish species.[29] As was the case with caribou, there are inconsistencies with conversion factor values. Consequently, the following discussion will include total numbers of nonsalmon fish and number of fish per capita (when available), in addition to total harvest weight and per capita weight values (when available).

For the 7 study periods between 1985 and 2014 (Table 7-20 and Figure 7-35), harvests varied considerably. The 1993 nonsalmon harvest (248 lb per capita) was 143% of that in 1985, and the highest value ever documented. The 2 studies that followed showed the lowest per capita harvests (48 lb and 39 lb) over 3 decades. The 2014 harvest was second only to 1993.

Nonsalmon fish harvests accounted for ranged from 23–43% of total harvest by weight between 1985 and 2014 (Table 7-22). The portion of total harvest for 1995–1996 and 2000–2001 cannot be calculated because the total weights of harvested bowhead are unknown and thus, not included.

Whitefishes (broad and humpback whitefishes, least and Arctic ciscoes) were the predominantly harvested species in all years. By weight, whitefish harvests accounted for 86% of all nonsalmon fish harvests in 1985 and over 90% in 1993 and 2014 (Figure 7-7).[30] Arctic grayling harvests have declined since the first surveys occurred, with 2014 harvests less than one-half of those recorded prior to the mid-1990s. Burbot harvests have also declined.

Birds and Eggs

Nuiqsut hunters harvest several species of migratory waterfowl as well as ptarmigans. Historically, geese have provided the majority of the birds and eggs harvest among Nuiqsut households. Birds and eggs accounted for 5% of the total harvest for all resources, or 20 lb per capita in 1985 (tables 7-21 and 7-22). The total bird harvest was 3,690 birds; white-fronted geese accounted for 36% of the total, and ptarmigans composed 53% of the total harvest.[31] The remaining harvest also included other types of geese and ducks. In addition to the bird harvests, Nuiqsut residents collected approximately 262 eggs.

Ptarmigans, Canada geese, eiders, and white-fronted geese made up the majority of the bird harvest in 1993; bird harvests as a whole accounted for 2% of the total pounds harvested for all resources (Fall and

28. ADF&G CSIS.

29. ADF&G CSIS for study year 1985; Fuller and George (1999rev.) for 1992; Fall and Utermohle (1995) for 1993; Brower and Opie (1998rev.) for 1994–1995; Bacon et al (2011rev.) for 1995–1996 and 2000–2001; this study for 2014.

30. ADF&G CSIS.

31. ADF&G CSIS.

Utermohle 1995; Table 7-22). The total bird harvest in 1993 was 3,212 birds, and geese accounted for 48%. In addition, a total of 346 eider, goose, and "unknown" eggs were collected in 1993.

In 2014, the bird and egg harvest equated to 12 lb per capita and accounted for 1% of the total harvest in edible pounds (tables 7-21 and 7-22). Geese made up 95% of the bird harvest (Figure 7-19). White-fronted goose was the most harvested species and made up 68% of the bird harvest. Compared to the previously mentioned studies, a relatively small number of eggs were collected in 2014.

Harvesting birds and collecting eggs remains an important subsistence activity for Nuiqsut residents. Individual numbers have fluctuated, but the composition of bird and egg harvests and the proportion of birds and eggs in relation to the total harvest have remained constant for the past several decades.

Vegetation

According to many households, 2014 was a poor berry year in the lower Colville region. Nuiqsut residents collected over 42 gal of berries and edible greens in 1985.[32] Ninety-eight percent of the vegetation harvest was composed of berries (the type was not specified). In 1992, Nuiqsut residents harvested a total of 65 lb of "plants" (Fuller and George 1999rev.). Although the report does not elaborate on the specific composition of the vegetation harvest, it does list salmonberries, blueberries, and cranberries. An estimated 396 lb of vegetation was collected in 1993.[33]

The 1993 vegetation harvest was more than double the 1985 harvest (Table 7-21). In all years, including the period July 1994–June 1995 (Brower and Opie 1998rev.), the vegetation harvest represented less than 1% of the total harvest (Table 7-22).

Bacon et al (2011rev.) provides very little information regarding vegetation harvests. Salmonberries were listed as having been harvested during 1995–1996. For 2000–2001, the report lists blueberries and salmonberries as having been harvested. The estimated total for both types of berries is listed as "1." The information provided in the report is not sufficient for comparison to harvest data from previous studies.

Despite the reportedly poor harvest in 2014, a comparison to past harvests indicates an increase in per capita vegetation harvests (Table 7-21). In all years, the vegetation harvest represented less than 1% of the total harvest by weight (Table 7-22). The composition of the harvest was also constant: cloudberry (locally known as salmonberry or *aqpik*) was the most harvested type of vegetation. Aqpik continues to be the most popularly harvested type of vegetation for Nuiqsut residents.

Current and Historical Harvest Areas

The subsistence use areas of Nuiqsut residents have been thoroughly documented in previous studies. As mentioned earlier in this report, Nuiqsut residents utilize several different areas within the central North Slope region, depending on what resource they are searching for. They have relied on the same general areas for decades. Resource availability and distribution typically direct hunters' intensity of efforts throughout these usage areas. However, significant changes within some traditionally-used areas have occurred over time.

Marine mammal search and harvest areas continue to be concentrated in Harrison Bay and Cross Island, and have been for the past several decades (Bacon et al. 2011rev.). The 1973 and 1982 harvests occurred adjacent to Flaxman Island and approximately 20 miles north of Flaxman Island, respectively (Galginaitis 2012:10). Flaxman Island is approximately 150 miles east of Nuiqsut, considerably farther from the community than Cross Island, which is about 70 miles east of Nuiqsut. As mentioned earlier, Nuiqsut whaling crews have utilized Cross Island as a whaling base camp since 1986. All harvests since 1986 have been in relatively close proximity to Cross Island.

32. ADF&G CSIS.
33. ADF&G CSIS.

Search and harvest areas for large land mammals have changed since 1985 (Braund and Associates 2009). In some respects, Nuiqsut hunters appear to be using the same general area in their search for large land mammals, but not without exceptions. The main concentration for moose search areas remains the Collville River corridor, extending upriver from the community to the vicinity of Umiat. However, the caribou search and harvest area has expanded considerably southward of the community since 1978, now encompassing a greater proportion of the Chandler and Anaktuvuk river drainages. In the past, Nuiqsut hunters searched for and harvested caribou as far east as Deadhorse, including the area of the present day Kuparuk River oil field and as far west as Teshepuk Lake (Galginaitis et al. 1984:14). These areas are somewhat consistent with data collected for the period 1995–2006, although according to some hunters, there has been less focus in areas east and northeast of Nuiqsut (Braund and Associates 2009).

In addition, the eastern extent of the large land mammal search and harvest areas has significantly diminished since the late 1970s, a period in which search areas extended eastward all the way to the Sagavanirktok River (Hoffman et al. 1988:14). Hunters no longer concentrate their search efforts in the same areas as they had in the past, as one key respondent explained:

> …They promised us and told us, "Oh they won't touch this land. Or they won't go here." But then they go on and, go on their word and now they're there. They're here where they said they won't be there. They just, our hunting grounds are being diminished so much. By me saying that is, the corporation why they say they won't be there, they won't be there where we used to go hunt. (NUI02191606)

Nuiqsut hunters have expressed concern that more and more, traditionally used large land mammal search and harvest areas will be diminished in the future as oil and gas development expands to other areas in the lower Colville region. Other hunters note the static nature of other important use search and harvest areas: "The caribous on the west side are always within the same area, you know, by Judy Creek, Fish Creek area…they have always been in those same areas every year I hunt" (NUI02191605).

Nonsalmon fish search and harvest areas have also remained the same across studies, although some respondents for this project indicated that they no longer take fish from the Umiat area, for fear of contaminants. Salmon search and harvest areas have remained the same. Bird and egg harvests have not changed, nor have vegetation search and harvest areas. Search and harvest areas for small land mammals continue to include an expansive area, fanning out from the community proper to the foothills of the Brooks Range. However, small land mammal activity to the east and north east of Nuiqsut has become far less intensive due to development complexes and outlying structures.

Local Comments and Concerns

In addition to subsistence harvest information, Nuiqsut residents shared a multitude of comments and concerns regarding development activity and its impact on subsistence. Approximately 57% of survey respondents reported adverse effects on their household subsistence activities as a result of development activity.[34] These activities and associated impact concerns included helicopters, noise pollution, gas flares, airborne contaminants, and other concerns. Respondents talked about the increase of smog in and around the community; they shared concerns about water quality and possible biomagnification of contaminants. Some respondents offered suggestions as how to mitigate impacts, including the installation of air-quality monitors in and around the community, as well as improving communication between development personnel and hunters in order to better coordinate both groups' activities and mitigate conflicts. Other respondents spoke about positive impacts associated with development, such as an increase in employment opportunities. Many respondents have acknowledged the distinct possibility that current oil and gas operations may continue to expand. Considering Nuiqsut's proximity to oil and gas development, coupled with declining oil production,

34. The 2015 survey instrument included a question asking respondents if "any Alpine-related activities in 2014 make your household's caribou hunting more difficult?" In addition, respondents were asked at the end of the survey for any additional comments, questions, or concerns. Combining the responses for both questions, 57% of respondents indicated adverse effects on their household's 2014 subsistence season that they attributed to the surrounding development.

and the state's eagerness to increase exploration, it is likely that the community will be presented with more challenges in the future (DeMarban 2015; Gov. Bill Walker 2014). "And we'll continue to get surrounded as development moves west and south and Umiat area" (NUI03271503).

Many respondents noted increased air traffic as a major impact. Hunters explained that air traffic had disrupted caribou migration patterns and herd size.

> You know, ever since they started studying the area, so we had choppers for development, is when I noticed, I noticed, as a hunter, is when I noticed that a lot of these change, when it came to the caribou. Because of the chopper activities. They started being dispersed. Clumps and clumps, not big herds no more. The last big herd that I've seen was back in 2000. That's the last biggest herd I've seen come by through here, before they started making the structures, they went right by Nanuq, right around over here and you could see it look like, look like on whole big chunk of land was moving. (NUI03271503)

Increased air traffic was also believed to affect moose behavior.[35] As a result of surrounding development, some subsistence use areas east of Nuiqsut are either restricted or are less used today than they had been in the past:

> We were able to hunt where the pipelines are and stuff. But now it's all built around there and our hunting lands is being diminished because of the pipeline then the oil field productions that are being up. And now I can't even go hunting over there 'cause I don't want to get in trouble for hunting near pipelines or where people are working. And even though there's caribou or animals around there, which I know I can go get, I don't go around those areas. (NUI02191606)

Respondents also expressed concerns about potentially harmful pollutants, contaminants, and the health of fish and wildlife species:

> …The caribou, the fish, that we've been, the problems that we've been having with the fish these past couple years, you know, …the state and the feds are pointing the fingers at each other right now trying to pinpoint whose fault it is because of …the drums that are coming down the Colville River. There's some drums coming down. Last year there was drums coming down and there was a dump site that was found up the Chandler River and one of the hunters that went up there took some pictures of that dump site and it was a lot of drums that were on the river, flowing down. Naval Petroleum PET-4 drums.[36] And there was pictures of old tractors that were right on the river, sideways, because of the erosion that had taken place. That opened up that dump site. When he took pictures, he noticed that he could see nothing but brown. There was no vegetation growing on top where they go that dumpsite and you could clearly see a, a rectangle thing that's brown. Everywhere else it's green. You could see the drums on the side of the river that are just dumping right into the river. (NUI03271503)

Other respondents wondered if the pollution was to be blamed for what many believe to be sick fish and poor fish health in general:

> When I started seeing dark spots in the liver [of burbot], I, I mean I ask questions. 'Cause I know for a fact there's an old dump site just a few miles upriver and lot of it is toxic. So might have something to do with those dark spots showing up on those livers 'cause the liver of a burbot is our delicacy. I mean it's probably the best part of the fish that we go

35. Sam Kunakana, Native Village of Nuiqsut Tribal Council, personal communication, February 20, 2016.

36. Following World War II, the U.S. Navy conducted oil and gas exploratory operations at Umiat, approximately 100 miles upriver from Nuiqsut. Exploration came to a halt in 1953, and the site was abandoned in 1960, but it continued to be used as an industrial landfill until 1973 (Environmental News Network 2001)."When the Navy conducted a cleanup of Umiat in 1973, it buried a reported 409 tons of junk equipment, scrap metal, and 86,600 crushed drums in an approximately 8-acre area of the flood plain" (Fritz 2015:10).

> after. But then after start seeing that dark spots in the liver they might start shying away. Start telling my boys no more from that place. (NUI02221601)

Beginning in 1998, several fish studies were conducted in the Colville River region. Following a 2000 contaminant study, NSB Department of Wildlife Management reported that "fish tested from the Nuiqsut subsistence fishery were considerably lower in PCBs and DDT than Umiat area caught fish" and that "Nuiqsut fish are safe to eat!" [37] A 2005 Conoco Phillips report stated that "to date, no effects from oilfield activities on fishing activities or fish stocks have been identified" (ConocoPhillips 2005). Notwithstanding, respondents continue to express concerns about whether or not locally-caught fish are safe to eat.

Some individuals have stopped fishing in the river altogether:

> There's a lot of social and health impacts because we're connected to the food chain and we eat the fish and caribou and, you know we, for the past 2–3 years we've been having the fish crisis, we're getting more fish that are being sick. I know of an elder family that don't even fish in the rivers no more they now go to the lakes because they know the river's contaminated by the legacy wells that eroded into the river by Umiat coming down and coming from up river going down to the ocean. (NUI02191607)

In addition to comments and concerns regarding caribou and fish, one local whaling captain noted that: "We're starting to have more barges on the Slope. And, that's starting to be a problem [during the fall whaling season]" (NUI02221602). A whaling crew member added:

> We're starting to get disturbed by these barges that comes through. I mean they know that they're not supposed to be barging.[38] But there's so many times when we find 'em breaking the rules and we know when there's barges, the whales disappear. You don't see whales all day for days even 'cause once the barges are going through, they [whales] go more north. (NUI02191606)

Finally, one respondent expressed a desire for greater awareness of the situation in Nuiqsut:

> But, you know, all in all, there's just too much activity going on around our village. And I just want the State of Alaska, Washington DC, to acknowledge that there is a little town called Nuiqsut where they're doing development. (NUI03271503)

Acknowledgements

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37. North Slope Borough Department of Wildlife Management. 2016. "Fish Health Studies" Accessed April 20, 2016. http://www.north-slope.org/departments/wildlife-management/studies-and-research-projects/health-assessment-of-subsistence-resources/

38. According to the respondent, the AEWC and Nuiqsut Whaling Captain's Association (NWCA) have an agreement with oil and gas development companies that operate tugboats and barges in and around Prudhoe Bay. This arrangement includes setting barge schedules and determining when they can and cannot operate; it is intended to mitigate potential impacts from barge operations on the fall whaling season (see Lefevre 2013).

8. ANAKTUVUK PASS

Jeff Park

In April 2015, ADF&G researchers surveyed 53 of 99 households (54%) in Anaktuvuk Pass, Alaska (Table 1-5). Expanding for 46 unsurveyed households, Anaktuvuk Pass's estimated total harvest of wild foods between January and December 2014 was 124,269 lb (Table 8-1). The average harvest per household was 1,255 lb; the average harvest per person was 391 lb (tables 8-1 and 8-2).

Caribou provided 84% of the total edible pounds of wild food harvested in 2014. Other important resources included moose, Dall sheep, and nonsalmon fish such as Arctic char, lake trout, and Arctic grayling. Also, a large number of small land mammals were harvested for their fur including 73 wolves, 22 wolverines, and 248 Arctic ground squirrels.

This chapter summarizes findings from the household surveys, including demographic characteristics, responses to harvest assessment questions, harvest estimates, employment, income, and food security. Harvest numbers are expanded estimates. Additional tables appear in Appendix D. Results from this survey are available online in the Division of Subsistence Community Subsistence Information System (CSIS).[1]

In addition to the comprehensive survey, 5 ethnographic interviews were conducted with 6 people. Respondents included both elders who held a long lifetime of knowledge about living off the land as well as members of younger generations who were among the most currently active hunters, fishers, and gatherers in the community. These ethnographic interviews provided an opportunity to identify valuable information that may not be captured by the survey, including details about the seasonal round, recent changes in subsistence harvesting and processing practices, and insights on how the study year may have differed from a typical year.

Community Background

The community of Anaktuvuk Pass is located in a large valley of the Brooks Mountain Range approximately 60 miles west of the Dalton Highway (Braund and Associates 2013a). It lies south of the divide where the Anaktuvuk River flows north toward the Arctic Ocean and the John River flows south to the Koyokuk River and eventually the Bering Sea (Plate 8-1).

The mountain pass after which the community is named is a wide valley only 2,200 feet above sea level that divides the Brooks Range from north to south (Nelson et al. 1982). The terrain consists of deep valleys and mountains that reach over 7,000 ft above sea level (Plate 8-2). This region marks a transition from subarctic to Arctic climate zones, where temperatures can be less than -50°F in the winter and more than 90°F in the summer. Vegetation in lower elevations consists of forests of white spruce and paper birch as well as willow and alder thickets. An alpine tundra mat of lichens, grasses, and short shrubs dominates the terrain above 3000 ft.

Anaktuvuk Pass is the last remaining settlement of the Nunamiut, an inland Iñupiat group who relied most heavily on terrestrial mammals rather than sea mammals (Bacon et al. 2011rev.). The name Nunamiut has been translated by many anthropologists to mean "inland people" (Hall, Jr. 1976). The Nunamiut historically utilized approximately 66,000 square miles of interior Arctic Alaska (Campbell 1989rep.). They were nomadic small bands consisting of several nuclear families that moved throughout the region taking advantage of seasonal harvest opportunities. Their seasonal travels were guided by the migration of the

1 . Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." https://www.adfg.alaska.gov/sb/CSIS. Hereafter *ADF&G CSIS.*

Table 8-1.–Resource harvest and use characteristics, Anaktuvuk Pass, 2014.

Characteristic	
Mean number of resources used per household	**10.7**
Minimum	0
Maximum	36
95% confidence limit (±)	14.3%
Median	9.0
Mean number of resources attempted to harvest per household	**5.7**
Minimum	0
Maximum	29
95% confidence limit (±)	18.9%
Median	3.0
Mean number of resources harvested per household	**5.3**
Minimum	0
Maximum	27
95% confidence limit (±)	19.1%
Median	3.0
Mean number of resources received per household	**6.5**
Minimum	0
Maximum	30
95% confidence limit (±)	17.1%
Median	5.0
Mean number of resources given away per household	**4.5**
Minimum	0
Maximum	24
95% confidence limit (±)	24.1%
Median	2.0
Household harvest (pounds)	
Minimum	0
Maximum	13,253
Mean	1,255.2
Median	69.0
Total harvest weight (pounds)	124,269.0
Community per capita harvest (pounds)	391.3
Percentage using any resource	98%
Percentage attempting to harvest any resource	91%
Percentage harvesting any resource	89%
Percentage receiving any resource	94%
Percentage giving away any resource	75%
Number of households in sample	53
Number of resources asked about and identified voluntarily by respondents	111

Source ADF&G Division of Subsistence household surveys, 2015.

Table 8-2.–Comparison of selected findings, Anaktuvuk Pass, 2014.

Category	Community Anaktuvuk Pass
Demography	
Population	317.5
Percentage of population that is Alaska Native	84.1%
Percentage of household heads born in Alaska	79.0%
Average length of residency of household heads (years)	33.3
Cash economy	
Average number of months employed	5.6
Percentage of employed adults working year-round	55.4%
Percentage of income from sources other than employment	31.5%
Average household income[a]	$70,044
Per capita income[a]	$21,837
Resource harvest and use	
Per capita harvest (pounds usable weight)	329.6
Average household harvest (pounds usable weight)	1,057.2
Number of resources used by 50% or more households	6.0
Average number of resources used per household	10.7
Average number of resources attempted to be harvested per household	5.7
Average number of resources harvested per household	5.3
Average number of resources received per household	6.5
Average number of resources given away per household	4.5
Percentage of total harvest taken by top ranked 25% of households	93.0%
Percentage of households that harvested 70% of harvest	11.3%
Per capita harvest by lowest ranked 50% of households (pounds usable weight)	2.7
Percentage of total harvest taken by lowest ranked 50% of harvesting households	0.7%
Average number of resources used by lowest ranked 50% of households	5.1
Average number of resources used by top ranked 25% of households	17.8

Source ADF&G Division of Subsistence household surveys, 2015.
a. Includes income from sources other than employment.

caribou through the Brooks Mountain Range every spring and fall (Braund and Associates 2013a).[2] One key respondent interviewed for this project remembered the need for these seasonal travels even into the 1940s:

> Oh yeah, we follow the caribou, we follow them…winter time we follow them down timberline, coming back in spring…And from here we would go either direction. But a lot of them went north to the coast…That's where they spend summer. We follow them to Colville River…Because if we stay here we be starving. (041315AKP4)

By the early 1900s, only a few hundred Nunamiut remained in their traditional range in the interior Arctic. Many Nunamiut moved north to the coast in search of jobs and more reliable sources of wild foods, and by 1920 the interior of Arctic Alaska was largely unoccupied. A key respondent and Anaktuvuk Pass elder heard about this difficult period directly from family members who survived it:

> Yeah, my dad, my grandfather see starvation years. Hardly any caribou, hardly any moose. They'd live off a little bit from ptarmigans, alright. But, lot of people still died just trying to live off of ptarmigan. (041315AKP4)

2. For a more extensive discussion on the history of the Nunamiut and the occupation of the area surrounding Anaktuvuk Pass see Holen et al. (2012).

Plate 8-1.–Anaktuvuk Pass.

Fur prices crashed in the 1930s, taking away a reliable source of income from many of the displaced Nunamiut (Spearman 1979). This, combined with a rebounding Western Arctic caribou herd population, led a few families to return to the Brooks Range (Holen et al. 2012). Here they re-established a semi-nomadic lifestyle, traveling by foot with the aid of pack dogs in the summer and by dog sled in the winter:

> It was a really hard life. No nothing. We had pack dog in summertime. Dog team in winter time. So, that's our transportation. It wasn't easy life, man it was hard. I saw some part of it anyways [laughter]. Some part of it. From here, we'd walk all the way to Wiseman, from Wiseman to Galbraith Lake. Go around to north, then come back here. Lot of work, lot of walking. But that time we had a good time though. Enjoy all the weather, and enjoy, you know, scenery and all that [laughter]. (041315AKP4)

In 1948, several families who had settled in the Killik River valley and the Chandler Lake area consolidated near Tulugak Lake where they could take advantage of a centralized air service and begin a temporary school. This marked the beginning of the community of Anaktuvuk Pass. A key respondent remembered the time and expressed his belief that settling in Anaktuvuk Pass was a good decision: "Now we're here. We're here. Most of the old people are gone now, the ones that establish this place. Even different families established this place. They know what they were doing" (041315AKP4).

Soon after this consolidation, a trader established a post in the community to trade groceries for fur. A key respondent remembered the importance of fur to the community.

> That Irishman trader came from Fairbanks. Then he put out a little store, a trading post, to help the people…He came and wanted to trade groceries for fur. Any kind of fur. Because the fur that time valuable…You name it: caribou, wolf, wolverine, bear, foxes… So, that time the furs really help us out. (041315AKP4)

The community gained a post office and regular mail service in 1951 (Holen et al. 2012; Spearman 1979). By the early 1960s, the community had an airstrip and a permanent school, and the Nunamiut had a permanent settlement.

Plate 8-2.–Aerial view of a Brooks Range valley.

Anaktuvuk Pass is now a second-class city in the North Slope Borough census area.[3] Residents travel throughout the region by all-terrain vehicles in the summer and snowmachines in the winter. The North Slope Borough operates a small airport with a single gravel runway that provides passenger and freight services. Access to Alaska's road system typically requires an airplane ride to Fairbanks. The community is served by the Nunamiut Corporation as well as the Arctic Slope Regional Corporation. The Anaktuvuk Pass Clinic, operated by the Arctic Slope Native Association, provides primary and preventative health care. The North Slope Borough School District operates the Nunamiut School which offers pre-kindergarten through 12th grade education. Electricity is generated by an on-site diesel-fueled power plant operated by North Slope Borough Power and Light System. Public safety is provided by the North Slope Borough Police Department. The City of Anaktuvuk Pass operates the water distribution and wastewater collection systems. The Nunamiut Corporation operates a small hotel and a grocery store. The community also has a post office, a library, a small museum, and a community hall.

Seasonal Round

As one local expert described it, living off the land is more than hunting and fishing:

> It's just basically a way of life, I guess, is how I should put it. It's not something we practice just during the fall or just during the spring. It's a year-long thing. It's something I grew up in, going out with my parents, picking berries and harvesting, hunting and gathering growing up. So, subsistence is basically our way of life. (041415AKP1)

3. 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 February 1, 2016. http://commerce.alaska.gov/dcra/DCRAExternal/community.

Though caribou are the wild food mainstay of Anaktuvuk Pass, a wide variety of other plants, birds, fish, and mammals are harvested throughout the year to supplement and add variety to the diet. Figure 8-1 shows the areas used by Anaktuvuk Pass residents to hunt, fish, gather, and trap subsistence resources in 2014. Many subsistence harvesting opportunities begin to present themselves in the early spring as the days grow longer and the weather warms. Caribou hunting is a common activity at this time of year, as it is most of the year. Also, many hunters wait until April to hunt for ptarmigans, though they can be found throughout the winter. Marmots are hunted in April, and if snow conditions allow, ducks and geese can be hunted for a brief time in late April or early May:

> They stop to rest and they build their numbers and then they continue on. So, we're just kind of like a resting spot. You gotta get within that week and a half period where you just get as much as you can. I know, when you hit 'em right then you can get a lot. So, you just got to time it right. (041515AKP2)

Several plant resources can be harvested at this time of year as well: "Right now it's cottonwood buds coming out. And bark: alder, willow bark. When it starts warming up a little bit" (041415AKP1). Also, Arctic ground squirrel hunting begins in May and continues throughout the summer.

Argo® vehicles—8-wheeled all-terrain vehicles (ATVs)—are the preferred method of transportation in the summer months: "People have families, and so you can fit up to 6 people on the rear of the Argo. You can fit about 1,500 pounds in the back. So you can carry your catch and the kids in the back" (041515AKP2). Hunting caribou in the summer is more time consuming and less cost effective than it is in the spring and winter: "…during the summer we don't get a lot—there's no caribou around here. And so if you do want caribou, you gotta travel really far by 4-wheeler or Argo®, and that's a 6-hour drive" (041515AKP2).

Caribou hunting effort begins to increase in July and is focused on small groups of animals in locations that are accessible by ATV: "The migrating herd doesn't come until August…So, during July—June and July—we go look for stragglers" (041615AKP3). Hunting continues until the herd arrives, at which point large bulls are targeted. Elders have passed down the knowledge that allowing the first wave of migrating caribou to pass through the region will increase the likelihood that the entire herd will follow their path. "We wait 'til the caribou pass. One herd passes and we'll call it the first herd" (041615AKP3).

> I know everybody that hunts around this area, they know not to shoot at the first herd. And they know to be patient and, and if they have a question about is it okay to hunt, they're not going to just say, "I think it's okay to hunt," they're gonna go and ask somebody. So, I don't think there is anybody that's ever hunted the first herd. You see caribou come through, it might be 3 days before somebody goes out. Cause those caribou that go through, they leave a scent. They got glands and when they all walk through they leave a scent for, for all the rest of the caribou that come through and so if you go out and spook 'em and they run around going through a different valley, they're gonna follow that smell. (041415AKP1)

Some residents make summer fishing and camping trips to Chandler Lake via Argo®. "People from the village here, they travel all the way to Chandler with an ATV, 8-wheel. There and back. Just for fishing" (041515AKP5). Lake trout are the primary target on these trips, but other fish can be caught as well: "We got lake trout. I know you can get Arctic char…The year before we got lake trout and grayling" (041515AKP2). People also harvest caribou opportunistically on these summer outings: "Most trips are for fishing, but at the same time they're keeping an eye out for caribou. That's pretty much what we do, is when we go out we always look around just in case we do see caribou, 'cause it's always nice to have fresh caribou" (041515AKP2).

Dall sheep hunting begins in July, but is more challenging in summer than during the fall months: "July they kind of stay high up in the mountains. We can't really see them unless they're feeding in the open. But they'll stay up high at the tops in between the nook and crannies" (041415AKP1). Dall sheep hunting continues through December, at first by ATV and eventually by snowmachine: "We have spots we like to check out certain times of the year in the fall time…We use ATVs, 4-wheelers or Argos®. After the snow

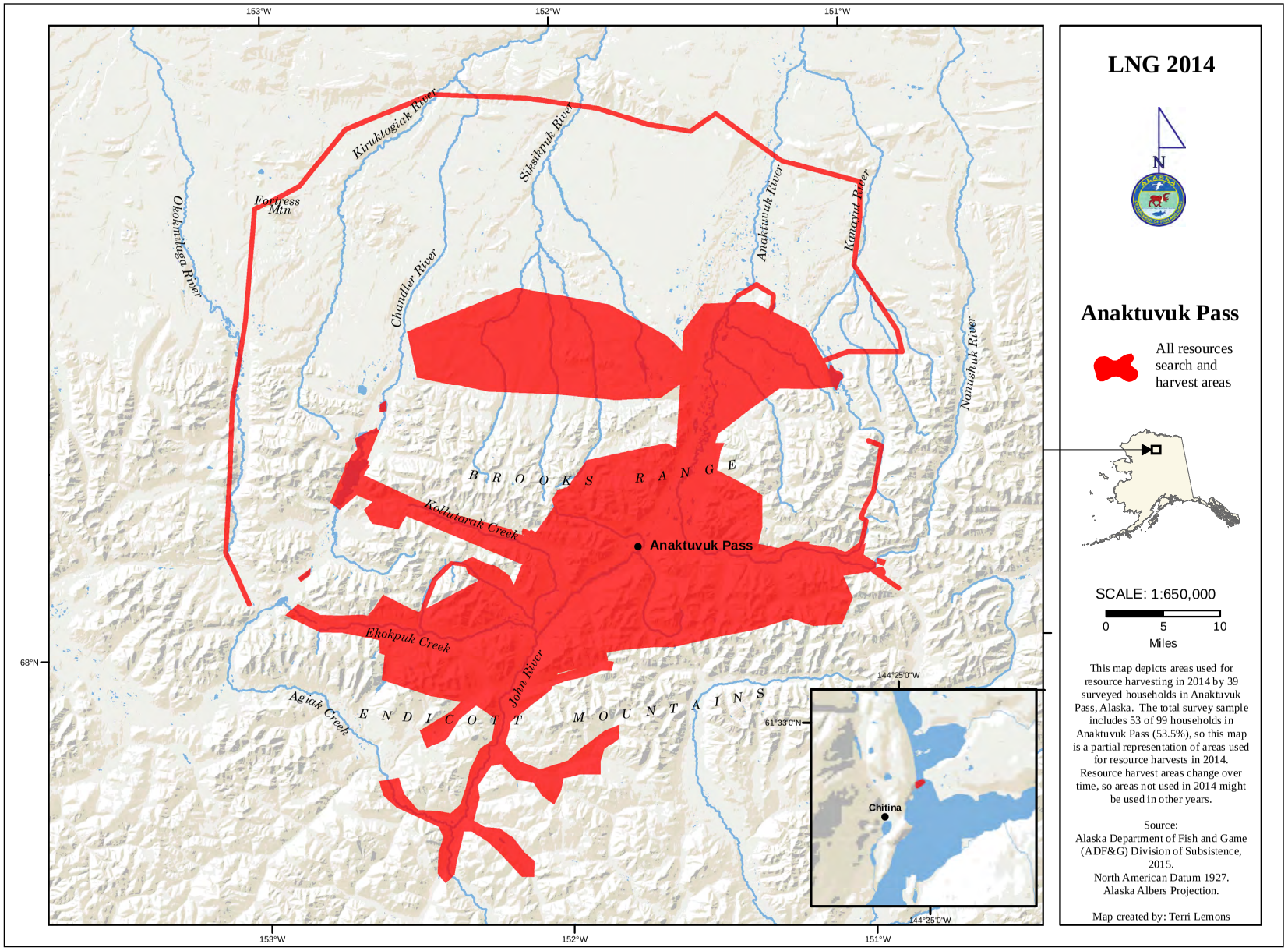

Figure 8-1.–All resources search and harvest areas, Anaktuvuk Pass, 2014.

falls we use snowmachine to go out and look for them" (041415AKP1). Also, Dall sheep hunting becomes easier in the fall as the sheep's feeding patterns become more predictable:

> It all depends on what time of the year…Fall time, that mountain back there is a salt lick. They come down right there, real low to the bottom of the mountain. Later in the fall when it starts getting dark, they're more predictable…they'll come down to the mountain even before it's bright, and they'll feed throughout the morning. Sometimes all I got to do is drive back here and, one of those salt licks, before it gets bright, and just wait around. (041415AKP1)

Moose hunting occurs in September. For some hunters, moose hunting effort is based on their ability to harvest caribou in the fall: "Usually if there isn't any caribou running around, then I'll hunt moose just 'cause we don't have caribou meat" (041415AKP1). A few brown bears are taken at this time as well. One key respondent explained that he hunts grizzly bears in the fall and uses the meat for trapping bait. The family also puts the pelts to good use: "Fall time I usually go specifically for bear. Usually August, more towards September is when I go out and get a bear. We use the skins for *qarraaq*, or sleeping mats" (041415AKP1).

Hunters continue to target bull caribou in September and October as the herd passes through the region: "…down at Masu Creek there could be 12, 14 tents. It's kinda where everybody goes for the fall hunt" (041515AKP2). Many people build racks and make *paniqtaq*—caribou meat preserved by air drying: "…my family, when we go make paniqtaq we go in August…We make paniqtaq racks out of willow…End of August 'til October, we go down south on Masu Creek" (041615AKP3). Arctic grayling fishing is a secondary subsistence activity on these fall camping trips: "It kind of works out if you don't see anything, you just pull out your fishing pole and go fishing" (041515AKP2).

Winter caribou hunting is done by snowmachine, which makes it far more efficient than summer hunting: "I took a trip on Monday and within 5 minutes I seen 12 caribou right up here. But it's easier, it took me 5 minutes to see them caribou versus summertime a couple hours" (041515AKP2). In November, caribou hunters are less focused on the bulls, and by January cows are the prime target: "January through April, we hunt females. Nothing but females" (041615AKP3). Caribou harvested in the winter are preferred for their fur: "…that's what you use for your boots. That's what you use, I mean, in the wintertime you get the thick furs and that's what you use all year long for camping. That's what you sleep on" (041415AKP1).

Hunting and trapping furbearers, such as gray wolves, wolverines, and foxes, begins when the snow conditions allows for snowmachine travel: "The earliest would be December probably. Some people do it in November…There's snow on the ground, but there's still a lot of rocks. You gotta wait for that initial freeze of the snow. That way you're traveling on top of the snow" (041515AKP2).

One trapper focuses his effort close to the community until December when snow conditions allow him to establish a more extensive trapline. "…Early trapping season, I just run traps here along this, this mountainside and I do pretty good early season until I get more snow to really travel around" (041415AKP1).

One respondent said he occasionally harvests a brown bear in the winter: "Sometimes like last winter, there was a couple, couple bears hanging around town, and so that one I shot was a big male just right up on the hill back here" (041415AKP1). Also, some Dall sheep hunters use snowmachines to continue their effort into the winter:

> I usually hunt until about December. But this last winter I didn't hunt any during the winter just 'cause the numbers are down. So I didn't really think about sheep even before Christmas, because before Christmas I try to get at least 1 or 2 for the feast." (041415AKP1)

Other wintertime activities include hunting for snowshoe hares and ptarmigans and fishing for Arctic grayling and Arctic char (locally known as trout): "…You just poke a little hole in the river and start jigging. I mean, they're small fish and people freeze 'em and just eat 'em like that. And it's the same with the trout. They get small trout out there" (041515AKP2).

For many, any wintertime subsistence activity involves keeping an eye out for caribou. One resident described hunting caribou while maintaining a trapline: "…Caribou if we see them. If the caribou are around during the winter, I usually get one and just leave the meat at camp" (041415AKP1).

Population Estimates and Demographic Information

One hundred seventy people lived in the 53 surveyed Anaktuvuk Pass households during the study year (Table 1-5). Expanding for the 46 unsurveyed households results in a total estimated population in 2014 of 318, with 267 (84%) Alaska Natives (Figure 8-2; Table D8-1; Plate 8-3). Figure 8-2 compares this study's population estimate with the most recent U.S. Census. Surveyed households had an average of 3 members (Table 8-3). The largest household surveyed had 12 occupants. The average age of Anaktuvuk Pass residents was 32, and the eldest resident of surveyed households was 79. The average length of residency was 24 years.

Figure 8-3 shows historical population estimates between 1950 and 2014. The community's U.S. Census Bureau count has consistently increased from the first count of 66 in 1950 to 324 in the 2010 census.

Figure 8-4 shows the number of males and females in age groups from 0 to 104. There were approximately 156 females and 162 males in Anaktuvuk Pass in 2014 (Table D8-2). Table 8-4 shows the birthplaces reported by Anaktuvuk Pass household heads. Fifty-one percent reported Anaktuvuk Pass as the place their parents were living when they were born. Twenty-one percent reported birthplaces outside of Alaska. Five percent of household heads were originally from Fairbanks, and 5% were from Utqiaġvik. Also, a few were from the other North Slope communities of Nuiqsut, Kaktovik, and Point Hope. Four percent claimed a birthplace in the Killik River area, a seasonal camp located 70 miles to the west that was used prior to the settlement of Anaktuvuk Pass.

Sixty-nine percent of all residents were originally from Anaktuvuk Pass, and 14% were born outside of Alaska (Table D8-3). Three percent were originally from Fairbanks. Small percentages were from the Killik River area, Utqiaġvik, Nuiqsut, and other communities throughout Alaska.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Figure 8-5 and Table D8-4 report the expanded levels of individual participation in the harvest and processing of wild resources by all Anaktuvuk Pass residents in 2014. Sixty-two percent of people attempted to harvest some subsistence resource, and 61% participated in processing a resource. The percentages of people attempting to harvest and process were similar within most resource categories. For example, 51% of respondents went fishing in the study year, and 47% played a role in processing fish. Large land mammals were processed by significantly more people than hunted them. Meat from these animals, primarily caribou, is shared more extensively throughout the community. Although no one reported hunting for marine mammals, 5% of people processed marine mammals that they received from other communities.

Harvest and Use of Wild Resources at the Household Level

Figure 8-6 shows by resource category the percentages of households that used, attempted to harvest and harvested wild foods. Large land mammals and nonsalmon fish were each used by 89% of households; the highest percentages of all resource categories. Vegetation was the third most widely used resource category; it was used by 75% of households. For all categories, more people used the resources than harvested them. This demonstrates the prevalence of sharing resources among Anaktuvuk Pass households and with other communities. This is particularly true with marine mammals. Although there was no reported harvest of marine mammals, 62% of households used marine mammals. This suggests that even though marine mammals cannot be hunted near the community, they are still an important part of the community's diet and culture.

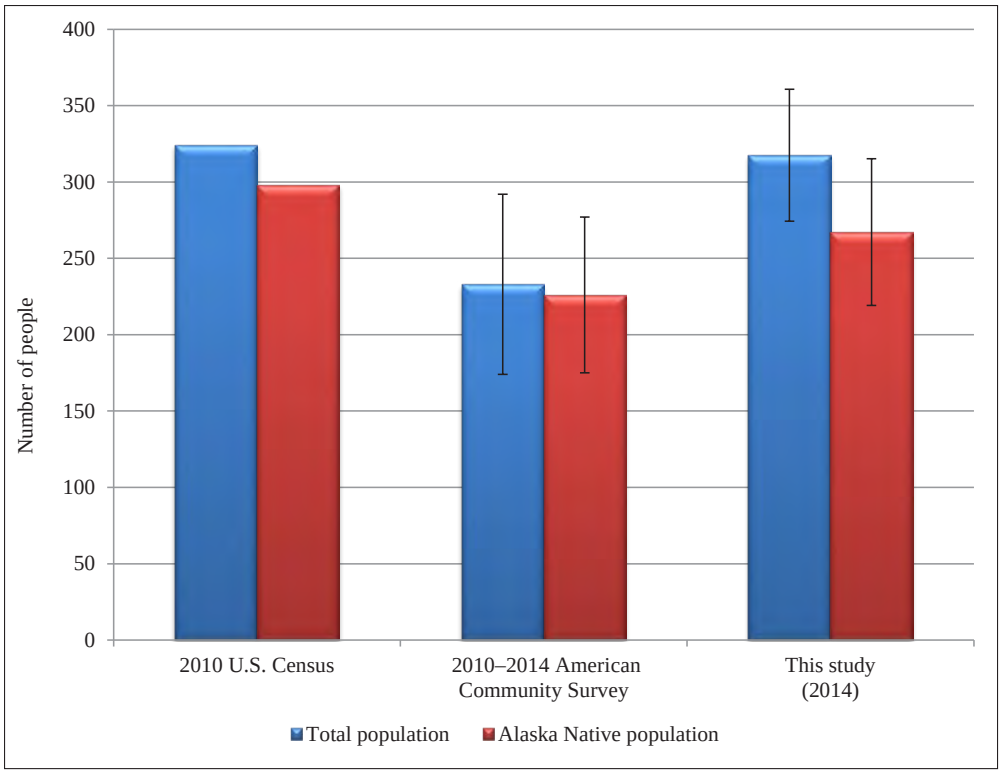

Figure 8-2.–Population estimates, Anaktuvuk Pass, 2010 and 2014.

Plate 8-3.–Anaktuvuk Pass.

Table 8-3.–Sample and demographic characteristics, Anaktuvuk Pass, 2014.

Characteristics	Community Anaktuvuk Pass
Sampled households	53
Eligible households	99
Percentage sampled	53.5%
Sampled population	170
Estimated community population	317.5
Household size	
Mean	3.2
Minimum	1.0
Maximum	12.0
Age	
Mean	31.7
Minimum[a]	0
Maximum	79
Median	32
Length of residency	
Total population	
Mean	23.8
Minimum	0
Maximum	79
Heads of household	
Mean	33.3
Minimum	2
Maximum	78
Alaska Native	
Estimated households[b]	
Number	81.5
Percentage	82.4%
Estimated population	
Number	267.2
Percentage	84.1%

Source ADF&G Division of Subsistence household surveys, 2015.
a. A minimum age of 0 (zero) is used for infants who are less than 1 year of age.
b. The estimated number of households in which at least 1 head of household is Alaska Native.

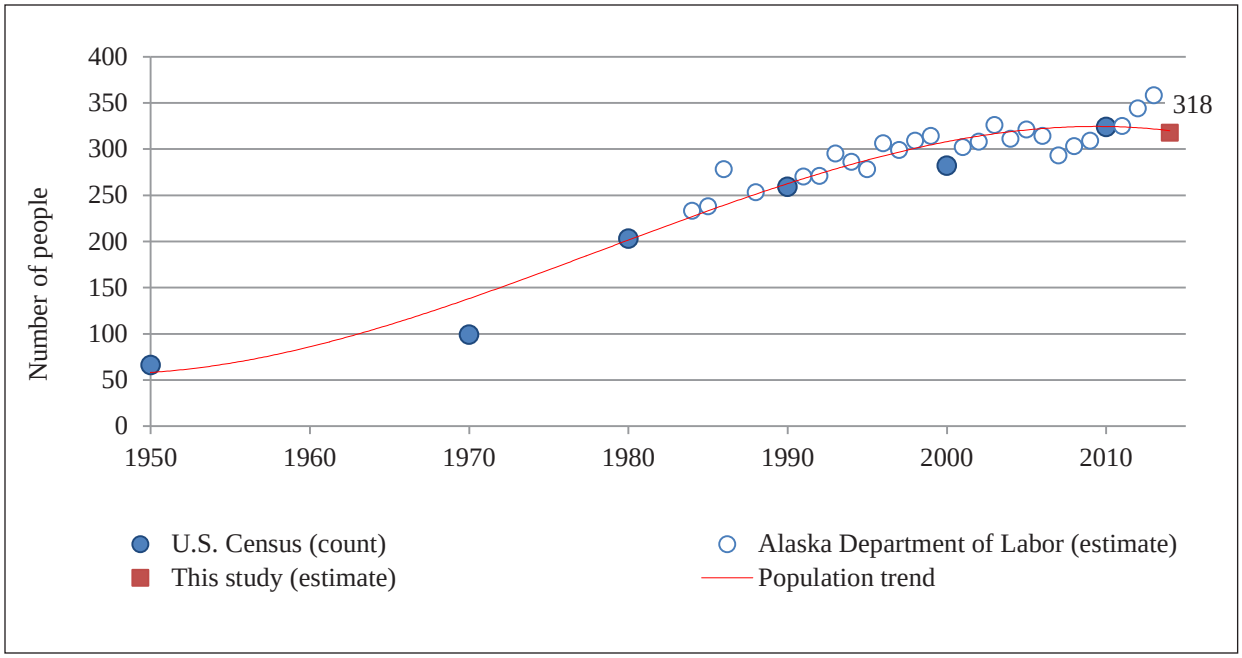

Figure 8-3.–Historical population estimates, Anaktuvuk Pass, 1950–2014.

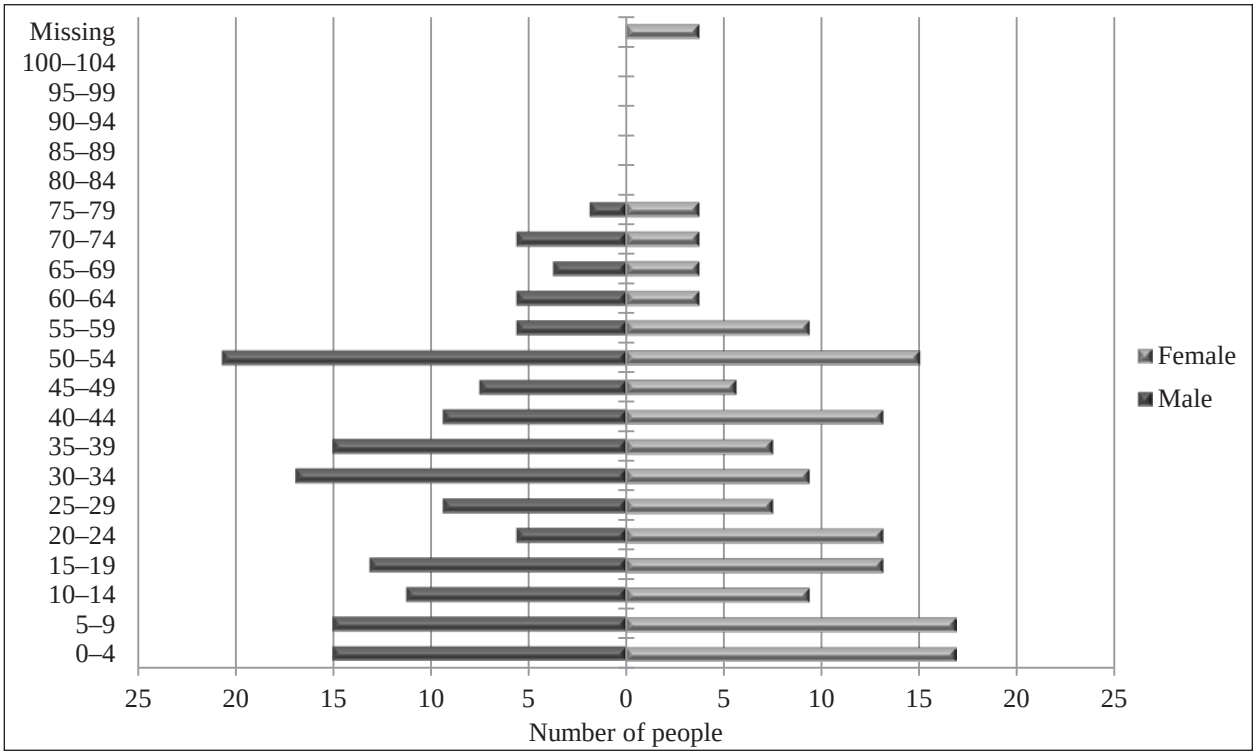

Figure 8-4.–Population profile, Anaktuvuk Pass, 2014.

Table 8-4.–Birthplaces of household heads, Anaktuvuk Pass, 2014.

Birthplace	Percentage
Anaktuvuk Pass	50.6%
Anchorage	1.2%
Fairbanks	4.9%
Huslia	1.2%
Kaktovik	1.2%
Kaltag	1.2%
Kobuk	1.2%
Nuiqsut	2.5%
Point Hope	1.2%
Shungnak	2.5%
Killik River Area	3.7%
Utqiaġvik	4.9%
Other Alaska	2.5%
Other U.S.	21.0%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

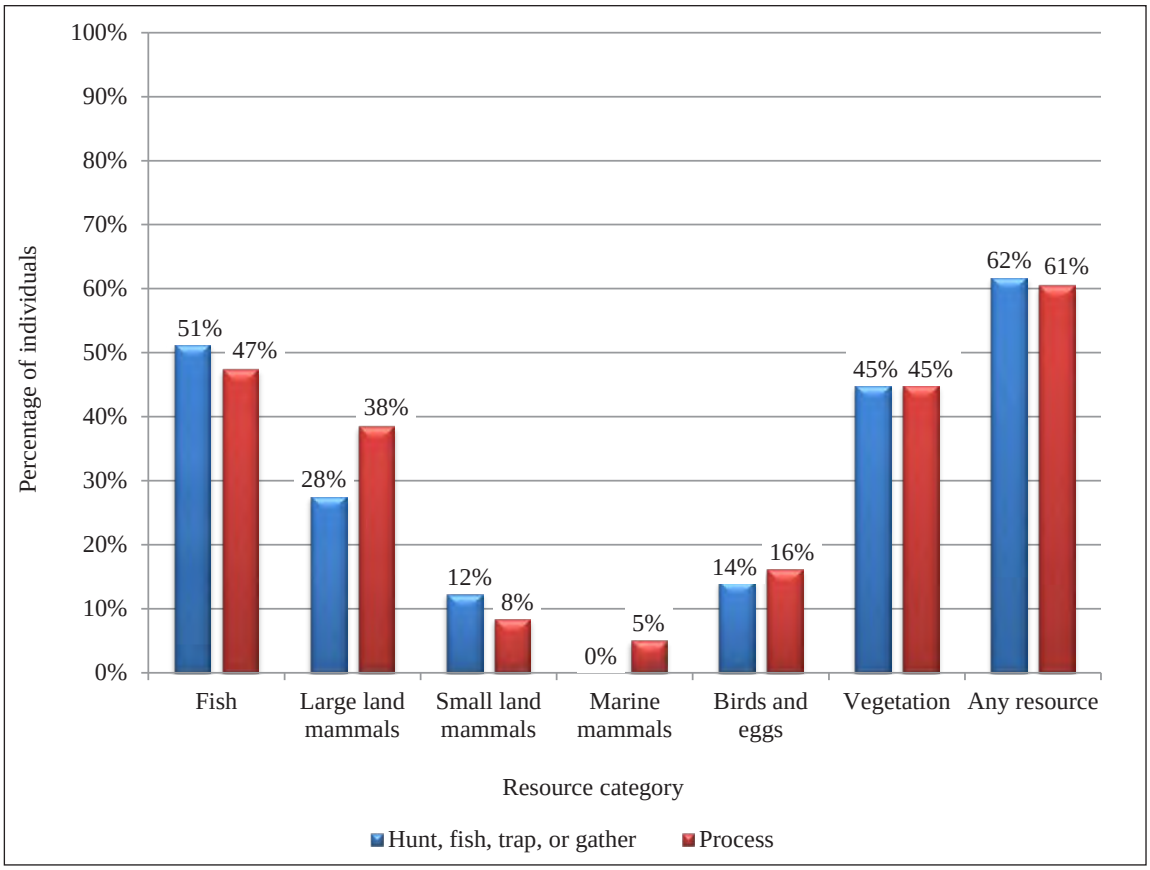

Figure 8-5.–Individual participation in subsistence harvesting and processing activities, Anaktuvuk Pass, 2014.

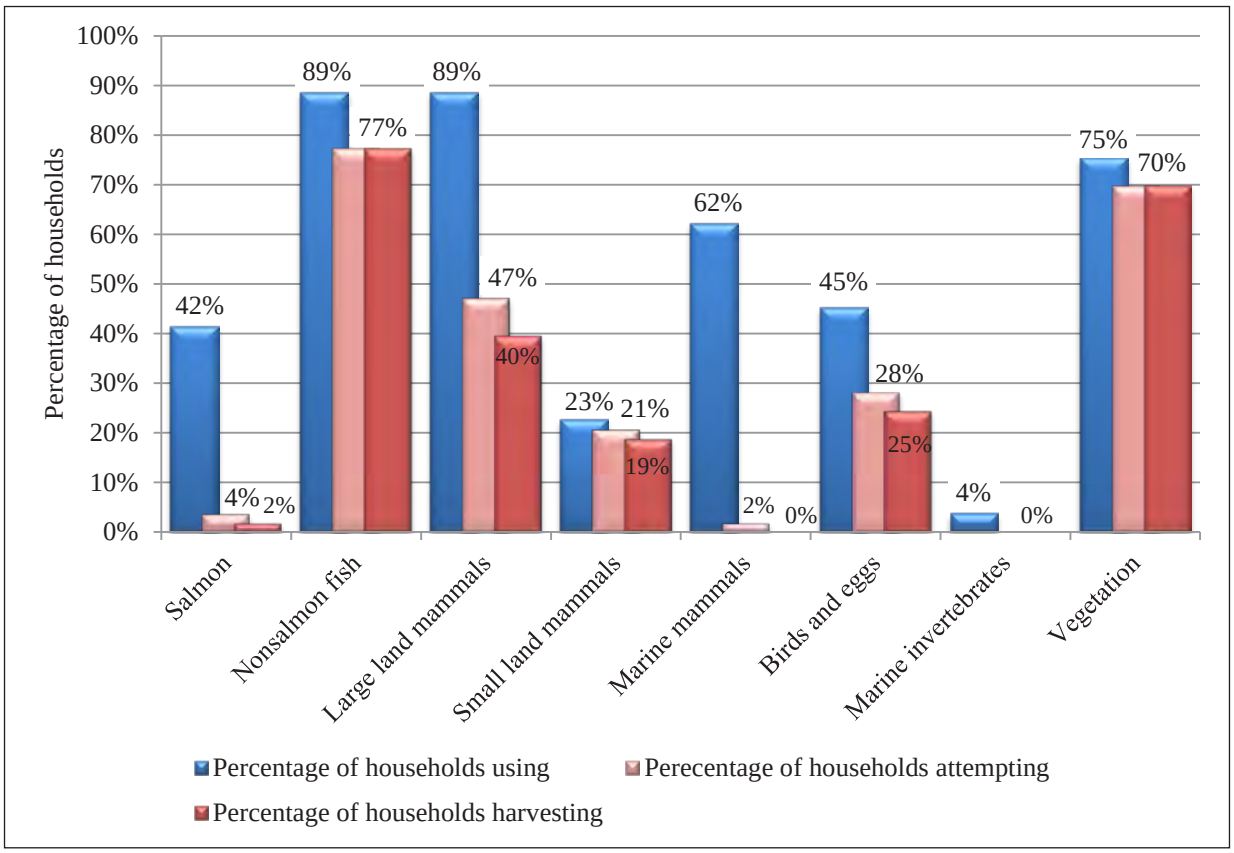

Figure 8-6.–Percentage of households using, attempting to harvest, or harvesting wild resources, by category, Anaktuvuk Pass, 2014.

Similarly, far more households used large land mammals than harvested them. This may be because the effort and resources needed to hunt large land mammals facilitates a greater degree of cooperation and sharing compared to other resource categories. Less disparity is seen between percentages of households using and harvesting other resource categories such as nonsalmon fish and vegetation. A larger portion of the population is able to engage in these less strenuous harvests:

> A lot of my aunts and uncles, they're over 50 now. So they're getting to that age where going out it's more like, maybe berry picking or fishing trips, or something not so strenuous on the back. With them long Argo® rides for hunting caribou, I mean, it's rare to shoot a caribou in close to the village during the summer and fall time. It's always travel, you always gotta travel. (041515AKP2)

Large land mammals was the resource category with the greatest difference between number of households attempting to harvest and those successfully harvesting. However, with 47% of households hunting, and 40% successfully harvesting, it appears that hunters met with a high rate of success in 2014.

Table 8-1 summarizes resource harvest and use characteristics for Anaktuvuk Pass in 2014 at the household level. The average harvest was 1,255 lb edible weight per household and 391 lb per capita. During the study year, community households harvested an average of 5 kinds of resources and used an average of 11 kinds of resources. The maximum number of resources used by any household was 36. In addition, households gave away an average of 5 kinds of resources. Overall, as many as 111 resources were available for households to harvest in the study area; this included resources that survey respondents identified but were not asked about in the survey instrument.

Harvest Quantities and Composition

Table 8-5 reports estimated wild resource harvests and uses by Anaktuvuk Pass residents in 2014 and is organized first by general category and then by species. All edible resources are reported in pounds edible weight (see Appendix C for conversion factors). 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 a household, and resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Purchased foods are not included. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

Anaktuvuk Pass residents harvested 124,269 edible pounds of wild foods; approximately 391 lb per capita (Table 8-5). Figure 8-7 shows the percentage that each subsistence resource category contributed to the community's total harvest in edible pounds. Large land mammals provided the most weight of any resource category. This category, made up almost entirely of caribou, accounted for 90% of the total community harvest. All other resource categories played a much smaller role in the community's subsistence harvest. Nonsalmon fish accounted for 8% of the harvest, vegetation and birds and eggs each provided 1%, and the remaining resource categories each accounted for less than 1%.

Table 8-6 lists the top 10 resources most commonly used by households during the 2014 study year. Caribou was the species most utilized by Anaktuvuk Pass households. Eighty-nine percent reported using caribou in 2014. Dall sheep, used by 40% of households, was the only other large land mammal so widely used. Blueberries was the second most used resource, by 70% of households. Two other berries, salmonberries and crowberries, were also among the most-utilized resources. Many species of nonsalmon fish were among the most-used resources, including Arctic grayling, used by 68% of households, and Arctic char, used by 64%. Bowhead whale was used by 60% of households, and it was the only resource among the 10 most used that was not harvested by the community.

Figure 8-8 shows the species with the highest per capita harvests during the 2014 study year. Caribou accounted for 330 of the 391 total edible pounds per capita (84%). Arctic char, lake trout, Dall sheep, and moose each accounted for 3% of the total harvest. Although moose provided more edible pounds than most species, it was not among species most widely used throughout the community (Table 8-6). This indicates that even though some households harvested moose, the meat was not shared as widely as many species that were harvested in smaller amounts. Arctic grayling accounted for 2% of the total harvest (Figure 8-8). Three plants are found in the top 10 resources: blueberry, cloudberry (locally known as salmonberry), and Eskimo potato. However, each plant species accounts for no more than 1% of the harvest. No bird species is found among the most harvested resources.

Marine Mammals

No marine mammal harvest was reported (Table 8-5), yet 62% of households reported using marine mammals that were received from other households or other communities in 2014. Sixty percent of households received bowhead whale and 25% shared it with other households. Smaller percentages of Anaktuvuk Pass households received beluga whale, walrus, bearded seal, and ringed seal in the study year.

Large Land Mammals

Anaktuvuk Pass residents harvested 111,302 edible pounds of large land mammals in 2014 (Table 8-5). Caribou made up the 94% of this harvest (Figure 8-9; Plate 8-4). The estimated 770 harvested caribou provided 104,664 lb of food to the community, an average of 330 lb per person (Table 8-5). Approximately 6 moose were harvested, amounting to 3,015 edible pounds and making up 3% of the large land mammal harvest (Table 8-5; Figure 8-9). Households also harvested approximately 32 Dall sheep in 2014: 3% of the large land mammal harvest. These sheep amounted to 3,303 edible pounds, or 10 lb per capita (Table 8-5). Finally, 4 brown bears were harvested, amounting to 321 edible pounds, or 1 lb per person.

Table 8-5.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Anaktuvuk Pass, 2014.

	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
All resources	**98.1**	**90.6**	**88.7**	**94.3**	**75.5**	**124,269.0**	**1,255.2**	**391.3**	**124,269.0**	**lb**	**1,255.2**	**39.1**
Salmon	**41.5**	**3.8**	**1.9**	**39.6**	**9.4**	**225.9**	**2.3**	**0.7**	**225.9**	**lb**	**2.3**	**136.8**
Chum salmon	5.7	0.0	0.0	5.7	1.9	0.0	0.0	0.0	0.0	ind	0.0	0.0
Coho salmon	13.2	1.9	0.0	13.2	1.9	0.0	0.0	0.0	0.0	ind	0.0	0.0
Chinook salmon	9.4	1.9	0.0	9.4	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pink salmon	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sockeye salmon	17.0	1.9	1.9	15.1	3.8	225.9	2.3	0.7	56.0	ind	0.6	136.8
Unknown salmon	9.4	0.0	0.0	9.4	3.8	0.0	0.0	0.0	0.0	ind	0.0	0.0
Nonsalmon fish	**88.7**	**77.4**	**77.4**	**66.0**	**54.7**	**10,222.3**	**103.3**	**32.2**	**10,222.3**	**lb**	**103.3**	**51.6**
Pacific herring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Rainbow smelt	24.5	0.0	0.0	24.5	3.8	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific halibut	11.3	1.9	1.9	11.3	1.9	118.8	1.2	0.4	118.8	lb	1.2	136.8
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic char	64.2	50.9	49.1	28.3	30.2	3,866.1	39.1	12.2	1,171.5	ind	11.8	66.3
Dolly Varden	11.3	7.5	5.7	5.7	1.9	92.5	0.9	0.3	28.0	ind	0.3	97.8
Lake trout	54.7	45.3	45.3	26.4	28.3	3,659.8	37.0	11.5	915.0	ind	9.2	59.7
Arctic grayling	67.9	64.2	64.2	28.3	45.3	2,266.7	22.9	7.1	2,518.6	ind	25.4	33.5
Northern pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sheefish	9.4	0.0	0.0	9.4	1.9	0.0	0.0	0.0	0.0	ind	0.0	0.0
Rainbow trout	1.9	1.9	1.9	1.9	1.9	52.3	0.5	0.2	37.4	ind	0.4	136.8
Unknown trout	1.9	1.9	1.9	1.9	1.9	52.3	0.5	0.2	37.4	ind	0.4	136.8
Broad whitefish	30.2	0.0	0.0	30.2	3.8	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic cisco	30.2	0.0	0.0	30.2	5.7	0.0	0.0	0.0	0.0	ind	0.0	0.0
Least cisco	1.9	1.9	1.9	0.0	0.0	13.1	0.1	0.0	18.7	ind	0.2	136.8
Humpback whitefish	7.5	1.9	1.9	5.7	3.8	98.1	1.0	0.3	46.7	ind	0.5	136.8
Round whitefish	3.8	1.9	1.9	1.9	0.0	2.6	0.0	0.0	3.7	ind	0.0	136.8

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Table 8-5.–Page 2 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Large land mammals	**88.7**	**47.2**	**39.6**	**79.2**	**47.2**	**111,302.2**	**1,124.3**	**350.5**	**111,302.2**	**lb**	**1,124.3**	**40.9**
Brown bear	3.8	3.8	3.8	0.0	1.9	321.3	3.2	1.0	3.7	ind	0.0	95.8
Caribou	88.7	45.3	39.6	67.9	47.2	104,663.5	1,057.2	329.6	769.6	ind	7.8	42.7
Moose	28.3	13.2	5.7	22.6	7.5	3,014.8	30.5	9.5	5.6	ind	0.1	77.4
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dall sheep	39.6	15.1	11.3	30.2	11.3	3,302.5	33.4	10.4	31.8	ind	0.3	66.8
Small land mammals	**22.6**	**20.8**	**18.9**	**9.4**	**13.2**	**35.2**	**0.4**	**0.1**	**35.2**	**lb**	**0.4**	**73.4**
Beaver	3.8	1.9	1.9	1.9	1.9	0.0	0.0	0.0	1.9	ind	0.0	136.8
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic fox	1.9	1.9	1.9	0.0	1.9	0.0	0.0	0.0	1.9	ind	0.0	136.8
Red fox	3.8	3.8	3.8	0.0	1.9	0.0	0.0	0.0	9.3	ind	0.1	97.8
Snowshoe hare	3.8	5.7	3.8	0.0	1.9	23.3	0.2	0.1	11.2	ind	0.1	97.8
River (land) otter	1.9	1.9	1.9	0.0	0.0	0.0	0.0	0.0	1.9	ind	0.0	136.8
Lynx	1.9	1.9	1.9	0.0	0.0	0.0	0.0	0.0	1.9	ind	0.0	136.8
Marmot	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	11.4	ind	0.1	135.5
Marten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic ground (parka) squirrel	9.4	9.4	9.4	0.0	5.7	11.9	0.1	0.0	248.4	ind	2.5	108.8
Gray wolf	18.9	13.2	13.2	7.5	9.4	0.0	0.0	0.0	72.8	ind	0.7	65.9
Wolverine	11.3	9.4	9.4	1.9	3.8	0.0	0.0	0.0	22.4	ind	0.2	64.4
Marine mammals	**62.3**	**1.9**	**0.0**	**62.3**	**24.5**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Polar bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Bearded seal	17.0	0.0	0.0	17.0	7.5	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ribbon seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ringed seal	9.4	0.0	0.0	9.4	5.7	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spotted seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown seals	22.6	0.0	0.0	22.6	13.2	0.0	0.0	0.0	0.0	ind	0.0	0.0
Walrus	17.0	0.0	0.0	17.0	11.3	0.0	0.0	0.0	0.0	ind	0.0	0.0
Beluga whale	22.6	0.0	0.0	22.6	13.2	0.0	0.0	0.0	0.0	ind	0.0	0.0
Bowhead whale	60.4	1.9	1.9	60.4	24.5	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 8-5.–Page 3 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs	**45.3**	**28.3**	**24.5**	**30.2**	**20.8**	**806.9**	**8.2**	**2.5**	**806.9**	**lb**	**8.2**	**69.7**
Common eider	1.9	1.9	1.9	0.0	1.9	8.3	0.1	0.0	3.7	ind	0.0	136.8
King eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spectacled eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Steller's eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	11.3	5.7	5.7	7.5	5.7	32.8	0.3	0.1	16.8	ind	0.2	96.4
Merganser	3.8	1.9	1.9	3.8	1.9	26.3	0.3	0.1	14.9	ind	0.2	136.8
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pintail	5.7	3.8	3.8	3.8	3.8	81.3	0.8	0.3	54.2	ind	0.5	127.5
Scaups	1.9	1.9	1.9	1.9	1.9	25.1	0.3	0.1	14.9	ind	0.2	136.8
Black scoter	1.9	1.9	1.9	0.0	0.0	5.0	0.1	0.0	5.6	ind	0.1	136.8
White-winged scoter	1.9	1.9	1.9	1.9	1.9	8.6	0.1	0.0	3.7	ind	0.0	136.8
Green-winged teal	1.9	1.9	1.9	1.9	1.9	3.9	0.0	0.0	7.5	ind	0.1	136.8
Wigeons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown ducks	1.9	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brant	1.9	1.9	1.9	1.9	1.9	59.8	0.6	0.2	37.4	ind	0.4	136.8
Canada/cackling goose	18.9	5.7	5.7	15.1	9.4	104.8	1.1	0.3	31.8	ind	0.3	100.0
Snow goose	15.1	7.5	7.5	9.4	9.4	100.9	1.0	0.3	28.0	ind	0.3	74.1
White-fronted goose	7.5	5.7	5.7	3.8	5.7	92.6	0.9	0.3	29.9	ind	0.3	92.6
Unknown geese	7.5	0.0	0.0	7.5	1.9	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown swans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown cranes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Whimbrel/curlew	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Godwit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown shorebirds - small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Guillemots	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown loons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown terns	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 8-5.–Page 4 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Unknown ptarmigans	34.0	28.3	24.5	11.3	17.0	257.6	2.6	0.8	368.0	ind	3.7	51.2
Snowy owl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown duck eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown goose eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown swan eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sandhill crane eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown crane eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown small shorebird eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown gull eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown loon eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown murre eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown tern eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine invertebrates	**3.8**	**0.0**	**0.0**	**3.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Unknown clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown king crabs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown crabs	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown mussels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Vegetation	**75.5**	**69.8**	**69.8**	**18.9**	**24.5**	**1,676.5**	**16.9**	**5.3**	**1,676.5**	**lb**	**16.9**	**34.4**
Blueberry	69.8	64.2	62.3	11.3	20.8	490.1	5.0	1.5	122.5	gal	1.2	33.9
Lowbush cranberry	28.3	24.5	22.6	3.8	9.4	167.6	1.7	0.5	41.9	gal	0.4	46.1
Highbush cranberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Crowberry	30.2	26.4	26.4	3.8	11.3	235.8	2.4	0.7	59.0	gal	0.6	39.6
Cloudberry	41.5	35.8	34.0	9.4	17.0	348.4	3.5	1.1	87.1	gal	0.9	42.8
Other wild berry	1.9	1.9	1.9	0.0	0.0	7.5	0.1	0.0	1.9	gal	0.0	0.0
Eskimo potato	20.8	18.9	18.9	5.7	13.2	408.4	4.1	1.3	102.1	gal	1.0	100.6
Hudson's Bay (Labrador) tea	1.9	1.9	1.9	0.0	1.9	1.9	0.0	0.0	1.9	gal	0.0	136.8
Sourdock	1.9	1.9	1.9	0.0	0.0	1.9	0.0	0.0	1.9	gal	0.0	136.8
Spruce tips	1.9	1.9	1.9	0.0	0.0	1.9	0.0	0.0	1.9	gal	0.0	0.0

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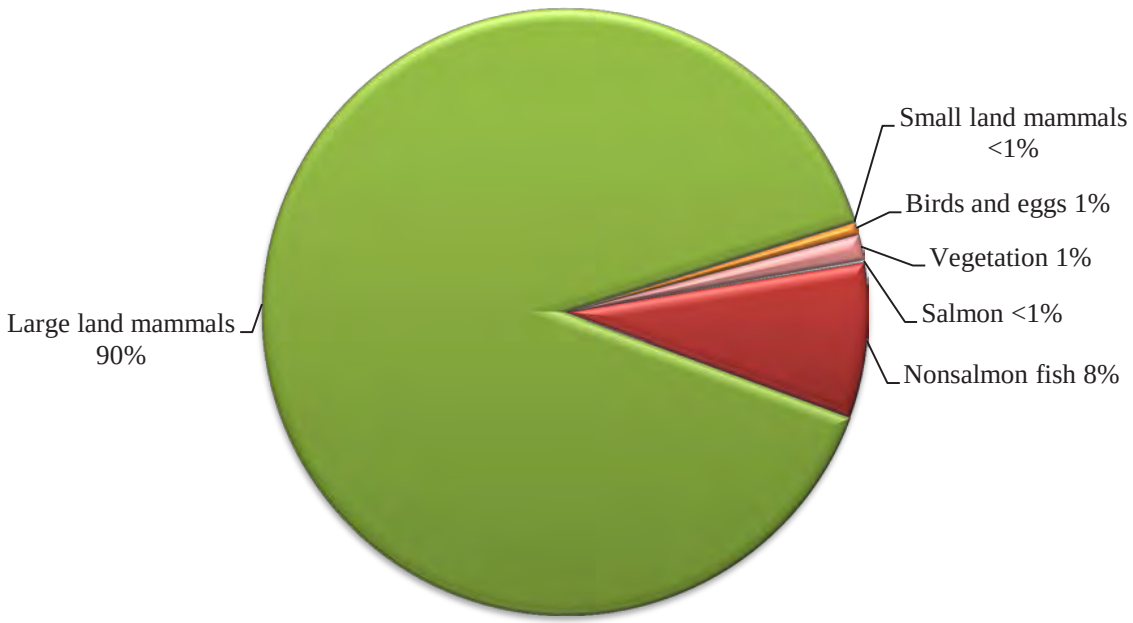
Table 8-5.–Page 5 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Vegetation, continued												
Willow leaves	1.9	1.9	1.9	0.0	1.9	3.7	0.0	0.0	3.7	gal	0.0	136.8
Other wild greens	1.9	1.9	1.9	0.0	1.9	9.3	0.1	0.0	9.3	gal	0.1	136.8
Unknown mushrooms	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Stinkweed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2015.

Note Resources where the percentage using is greater than the combined received and harvested indicate use from resources obtained during a previous year.

Note For small land mammals, species that are not typically eaten show a nonzero harvest amount with a zero harvest weight. Harvest weight is not calculated for species harvested but not eaten.



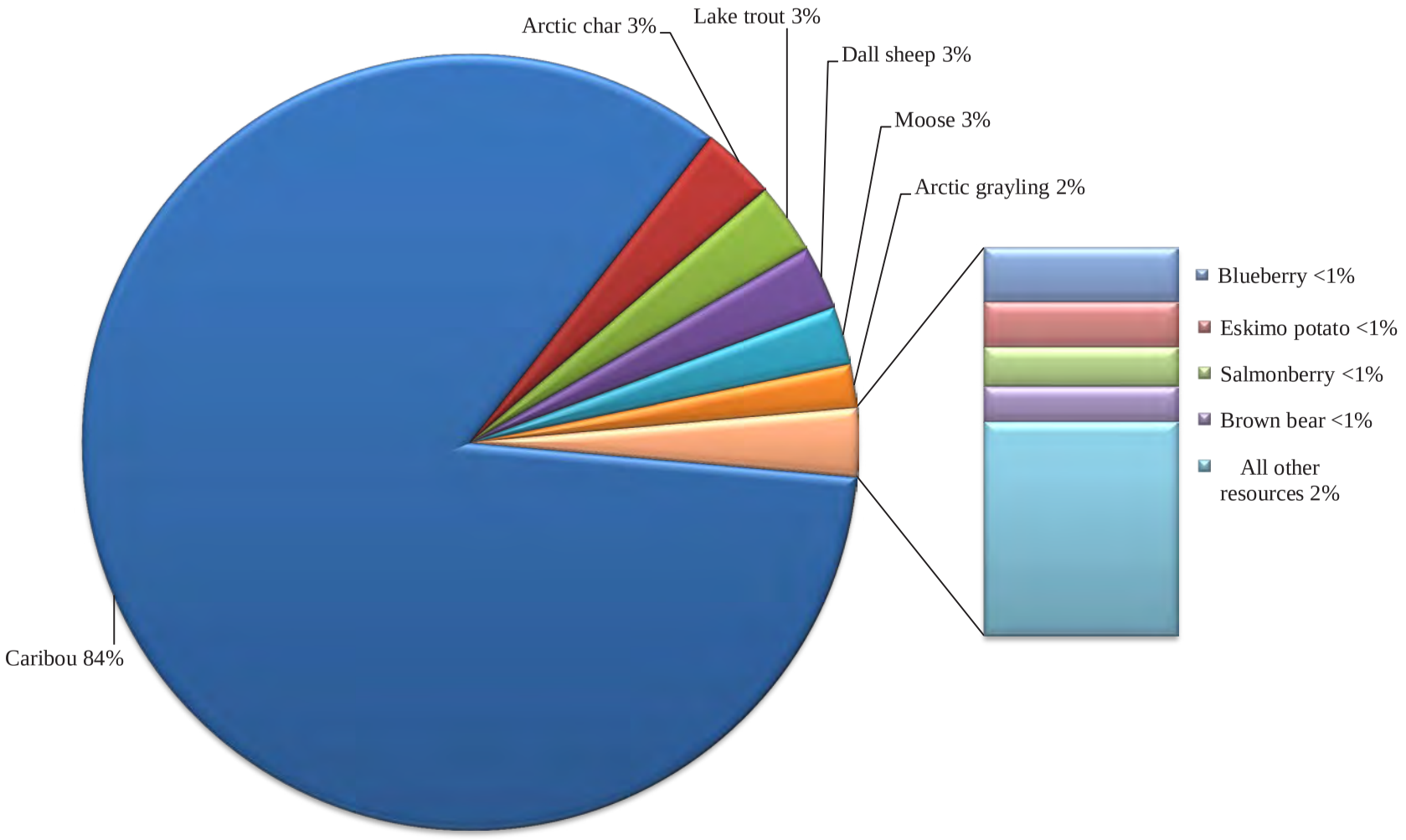
Note Categories having 0 lb of usable weight are not included.

Figure 8-7.–Composition of harvest by resource category, by weight in usable pounds, Anaktuvuk Pass, 2014.

Table 8-6.–Resources most commonly used by households, Anaktuvuk Pass, 2014.

Rank[a]	Resource	Percentage of households using
1.	Caribou	88.7%
2.	Blueberry	69.8%
3.	Arctic grayling	67.9%
4.	Arctic char	64.2%
5.	Bowhead whale	60.4%
6.	Lake trout	54.7%
7.	Cloudberry	41.5%
8.	Dall sheep	39.6%
9.	Unknown ptarmigans	34.0%
10.	Broad whitefish	30.2%
10.	Arctic cisco	30.2%
10.	Crowberry	30.2%

Source ADF&G Division of Subsistence household surveys, 2015.
a. Resources used by the same percentage of households share the lowest rank value instead of having sequential rank values.



Note The "all other resources" category represents all other species that contributed less than 1% to the total harvest, not ranked in the top ten per capita.

Figure 8-8.–Top resource harvests by weight in pounds per capita, Anaktuvuk Pass, 2014.

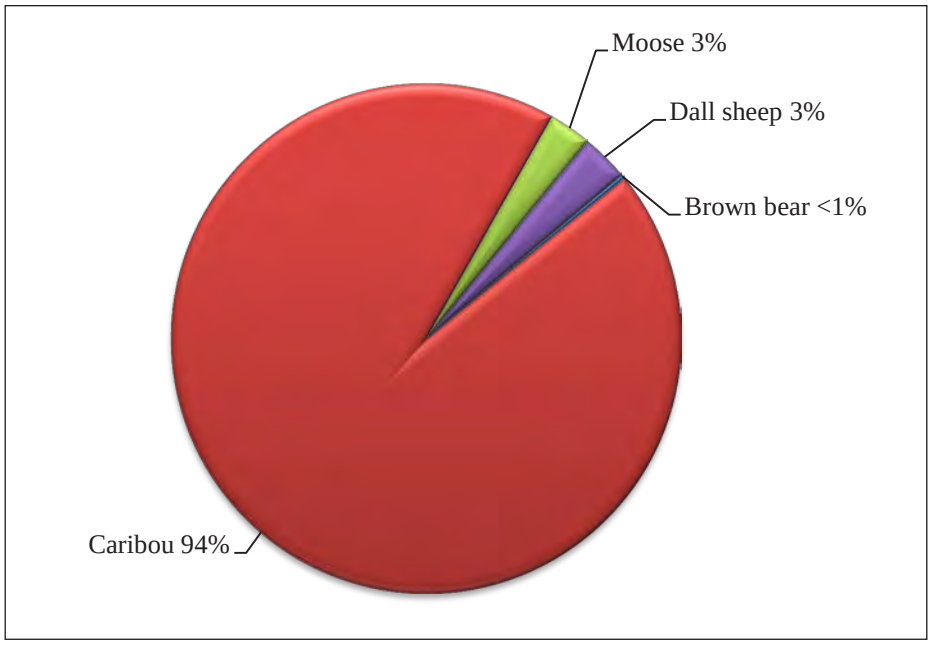


Figure 8-9.–Composition of large land mammal harvest by weight in usable pounds, Anaktuvuk Pass, 2014.

In Anaktuvuk Pass, use of caribou means much more than eating the meat:

> The caribou are central here…that's what you use for your boots. That's what you use in the wintertime—you get the thick furs and that's what you use all year long for camping. That's what you sleep on…I've learned how to do sinew. But they're used for everything. (041415AKP1)

Bull caribou hides are also used to make a style of molded decorative mask that originated in Anaktuvuk Pass. Selling these masks is an important source of income for some: "I know an individual who's passed away, an elder, he paid for an Argo® with his masks. He buy a snowmachine by making masks" (041515AKP5).

Forty-five percent of Anaktuvuk Pass households included at least 1 person who hunted for caribou in 2014 (Table 8-5). Sixty-eight percent of households reported receiving caribou, and 47% shared their caribou with other households—a higher rate of sharing than any other resource. One key respondent summarized how important it is for him to provide caribou to others in the community: "It's tradition around here. You take care of your elders. You take care of your family…a lot of my family they got all girls and so they don't have anybody to hunt for them" (041415AKP1). To make sure the entire community has the caribou it needs, some hunters must harvest many caribou at once when the opportunity arises: "None of our hunts are only to shoot 1 caribou. Because we're putting the time, the money, and who knows when you're going to see caribou again. So it's not just going to take 1 caribou" (041415AKP1).

Forty percent of households used Dall sheep, making it the second-most widely used large land mammal, and the fourth-most widely used of all subsistence resources (Table 8-5). Though Dall sheep is not relied upon to the extent that caribou is, it is an important food source. As one Anaktuvuk Pass elder described, Dall sheep was important in the past as well: "Yeah, old days there was no hardly any caribou so our parents depended on sheep. There were a lot of sheep in this area…That's what saved our hides" (041315AKP4).

Fifteen percent of Anaktuvuk Pass households hunted for Dall sheep in 2014 (Table 8-5). Eleven percent of households harvested Dall sheep, and the same percentage shared the resource with other households. One key respondent explained that providing others with Dall sheep is important because relatively few people hunt them:

Plate 8-4.–Caribou near Anaktuvuk Pass.

> I try to get as many as I can every year. And a lot of the sheep hunting I do, I keep some of the meat, but a lot of it goes to aunts and uncles and the elders. Especially with sheep, because there was guys that do it, but there's only a handful of us guys that go out and hunt sheep. (041415AKP1)

Moose was used by 28% of households (Table 8-5). Thirteen percent of households hunted moose and 6% were successful. One key respondent indicated that there is good moose hunting in the area: "Moose hunting was pretty good up here. You see them. There's some good spots around the village. Just big old valleys like this but just laced with willows along the river bed…I usually see them when I go out hunting in the winter. So they're around" (041415AKP1). However, relatively few Anaktuvuk Pass households took advantage of this harvest opportunity, possibly because caribou require less time and effort to harvest in the winter when they can be accessed by snowmachine. For some Anaktuvuk Pass hunters, moose hunting effort in any given year is determined by the availability of caribou.

> Usually if there isn't any caribou running around, then I'll hunt moose just 'cause we don't have caribou meat. I mean, if we don't, if the caribou hunting is poor in the fall time, then I'll go out and look for moose. But I don't do much. It's nothing I do every year. (041415AKP1)

Four percent of households used, hunted for, and successfully harvested brown bear (Table 8-5). Although 2% shared this resource, no one reported receiving it. Brown bears are valued for their hides and can be used as trapping bait. Although some Anaktuvuk Pass residents will eat brown bear, key respondents indicated that the amount of meat salvaged varies between hunters and depends on the time of year.

> I shot a bear the year before, and it was a good trapping bait. There's people that do [eat them]. I didn't eat any of that meat. I kept the hide and I kept all the meat for trapping. I know out of the bear my brother got they ate the ribs and the feet and they got all the meat off the hindquarters. (041515AKP2)

Table 8-7 shows the estimated large land mammal harvest by sex of the animal and month of harvest. Caribou hunting took place throughout the year. August was the most active month, with approximately 135 caribou harvests taking place, and June was the only month in which no caribou harvests were reported. The majority of caribou harvests occurred in 2 distinct periods: January through April, during which females were targeted almost exclusively; and August through October, when the focus turned to males. One key respondent explained that people prefer bulls in the fall because they are larger and have more fat at that time. Once males have gone through the rutting period, their fat reserves are depleted, making them less desirable than females in the winter (041615AKP3).

Table 8-7.–Estimated large land mammal harvests by month and sex, Anaktuvuk Pass, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All large land mammals	**59.8**	**56.0**	**99.0**	**57.9**	**13.1**	**0.0**	**48.6**	**147.6**	**115.8**	**89.7**	**33.6**	**14.9**	**74.7**	**810.7**
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	**3.7**
Brown bear, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	**3.7**
Caribou	59.8	56.0	99.0	57.9	13.1	0.0	43.0	134.5	93.4	89.7	33.6	14.9	74.7	**769.6**
Caribou, male	0.0	0.0	7.5	13.1	13.1	0.0	43.0	123.3	93.4	85.9	9.3	5.6	0.0	**394.1**
Caribou, female	59.8	56.0	91.5	44.8	0.0	0.0	0.0	11.2	0.0	3.7	24.3	9.3	0.0	**300.7**
Caribou, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	74.7	**74.7**
Moose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	3.7	0.0	0.0	0.0	0.0	**5.6**
Moose, bull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	3.7	0.0	0.0	0.0	0.0	**5.6**
Moose, cow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Muskox, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	5.6	11.2	14.9	0.0	0.0	0.0	0.0	**31.8**
Dall sheep, male	0.0	0.0	0.0	0.0	0.0	0.0	3.7	11.2	14.9	0.0	0.0	0.0	0.0	**29.9**
Dall sheep, female	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	**1.9**
Dall sheep, unknown sex	0.0	0.0	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, 2015.

Nearly all Dall sheep harvested were male (Table 8-7). Dall sheep harvests began in July, however the majority of harvests took place in August and September, when the sheep begin to spend more time in the lower elevations (041415AKP1). All moose were male, and all were taken in August and September during the fall bull hunt (Table 8-7). All brown bear were harvested in September.

Figure 8-10 shows the reported hunting areas for large land mammals in 2014. The caribou search area included a section of the Anaktuvuk River extending approximately 23 miles to the north of the community and a section of the John River extending 18 miles southwest of the community. Other areas include Kollutarak and Masu creeks to the west, and Iknivik and Itikmalakpak creeks to the north. Caribou hunters also searched along a section of the Anaktuvuk River to the east of the community, and in a large area to the north that included sections of the Siksikpuk River as well as Confusion and Tiglukpuk creeks.

Fall caribou hunting areas are determined by the route taken by the migratory herd as they pass through the region. Sometimes this migration comes through the Chandler River valley. However, one key respondent said the herd has passed further to the west in recent years:

> I'm sure their migration pattern's changed…They've been sticking more towards the highway and towards Killik Valley to the west of here, like 100 miles. And they're just totally missing this valley here and Chandler Valley, so it could just be from different migration patterns. (041415AKP1)

A key respondent said this migration route was at times much closer to the community in the 1990s: "You used to be able to get bulls right up here…I remember [at age] 12, 13, 14, growing up, being able to just drive right up here and shoot caribou…That's something that I've noticed the fall hunt is, you got to travel farther" (041515AKP2).

Dall sheep hunting took place in an area extending from and surrounding the community. Hunters tended to focus less on traveling long distances along rivers and creeks compared to other large land mammal hunting:

> Sometimes I just go to this mountain right here. Get a couple sheep. And other times we've gone out 15, 20 miles for sheep to hunting spots we like. It all depends, you know. A lot of guys stick to hunting the close valleys, like Big Contact here, Kongumavik, Little Contact, Masu. Giant Creek right here is a real hot spot. (041415AKP1)

Several nearby mountains and valleys in the search area have mineral deposits that attract Dall sheep:

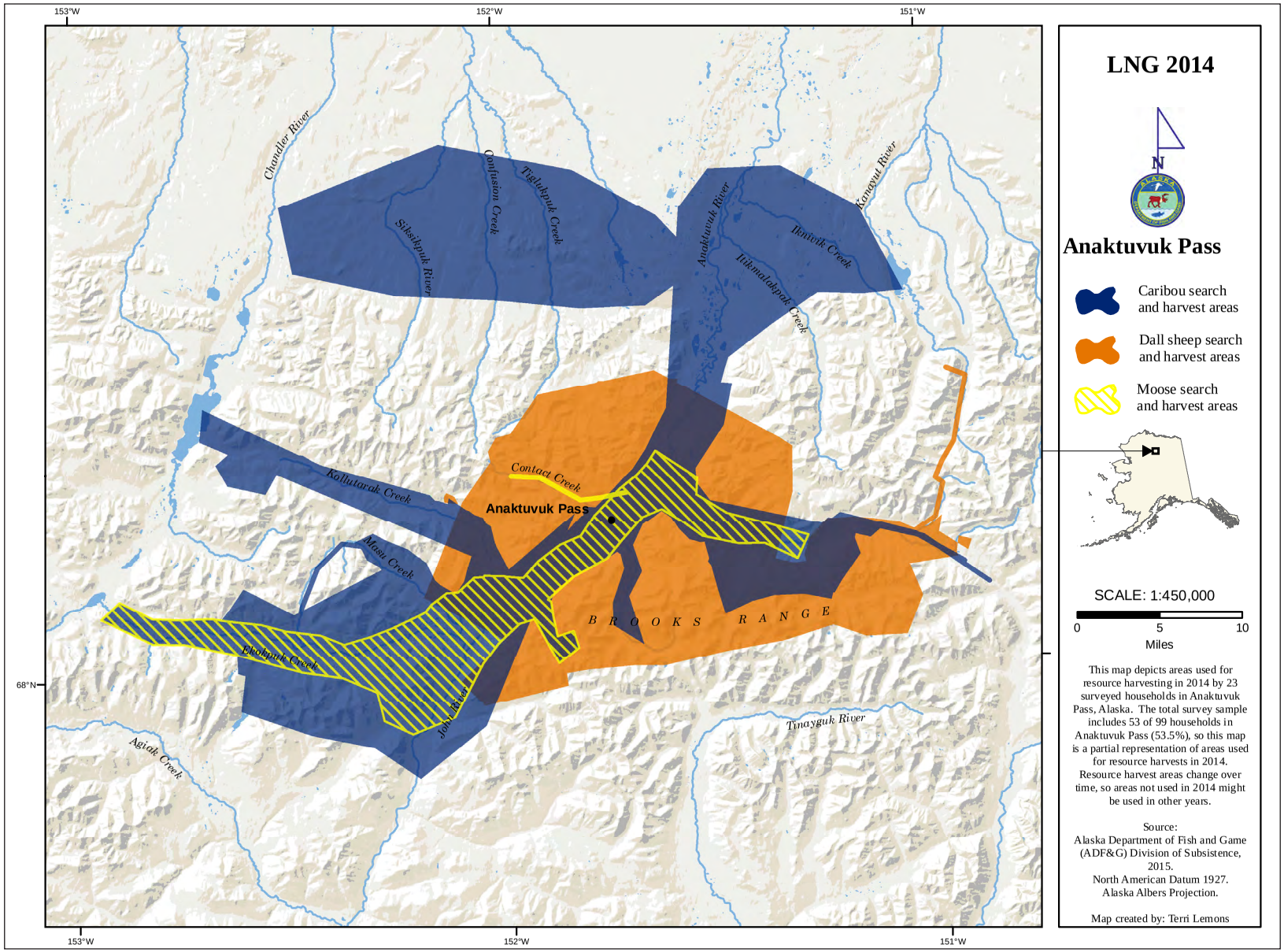


Figure 8-10.–Large land mammal hunting areas, Anaktuvuk Pass, 2014.

> The usual spots we go is Kanumavik, Ernie Pass, Kollutarak Mountains. There are certain mountains that have salt licks…Ben Creek area, there's another hunting spot inside Ben Creek…We know where they are. The sheep, the salt licks, they're there every year. (041615AKP3)

Moose hunting occurred along the valley from the community to approximately 5 miles to the northeast and along the John River to about 16 miles southwest of the community. Hunters also searched for moose along Contact and Ekokpuk creeks and on a section of the Anaktuvuk River to the east of the community.

Small Land Mammals/Furbearers

Anaktuvuk Pass residents harvested 35 edible pounds of small land mammals in 2014 (Table 8-5). Twenty-three (23%) of households reported using small land mammals, and 13% shared them with other households. Twenty-one percent (21%) of households attempted to harvest small land mammals, and 19% successfully hunted or trapped some species in this resource category.

The majority of the small land mammal harvest was used for fur only. This includes 73 gray wolves, 22 wolverines, 11 marmots, and 9 red foxes (Table 8-5; Plate 8-5; Figure 8-11). The edible pounds data in Table 8-5 only reflect those small land mammals that were reported to be eaten. Figure 8-11 shows the composition of the small land mammal harvest that was used for food. Eighty-three percent of the 11 snowshoe hares harvested were eaten (Figure 8-11). This accounts for 66% of the small land mammal edible harvest (Figure 8-12). Ten percent of the 248 Arctic ground squirrels harvested were used for food, providing the remaining 34% of small land mammal harvest by pounds eaten (figures 8-11 and 8-12). Arctic ground squirrels are also harvested for their fur or for use as bait in trapping wolf, wolverine, foxes, and lynx (041515AKP5).

Plate 8-5.–Fox and wolverine pelts taken by an Anaktuvuk Pass trapper.

Nunamiut hunters have been recognized for their wolf hunting and trapping skills (Nelson et al. 1982), and wolves continue to be a primary target for local trappers. For some, trapping involves maintaining an extensive trap line that covers hundreds of miles and requires several nights of camping to check. In addition to trapping wolves, some people hunt them by watching for fresh tracks and pursuing them on snowmachines. Wolf and wolverine are the most valuable furs available in the region and are the species needed to make trapping profitable:

> But, my main source of income is wolf and wolverine. Yeah, there's a bigger market for that. A lot of the furs I got, I sell them to either family members that are looking for ruffs or to fur buyers. And so a lot of times during the winter I'm not working, so that's my source of income is trapping, you know (041415AKP1)

Table 8-8 shows the small land mammal harvest by month. Small land mammals were harvested

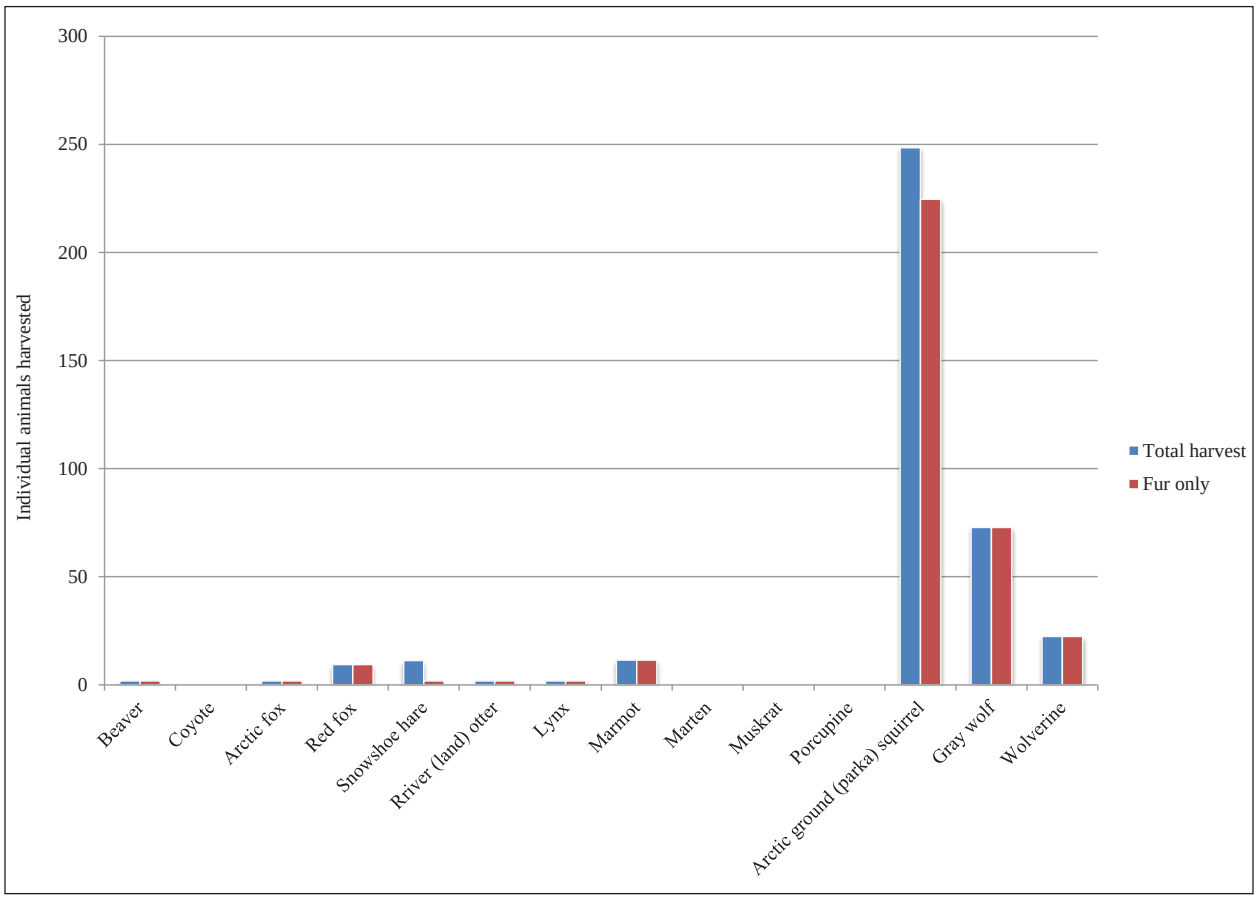


Figure 8-11.–Estimated small land mammal harvests for fur or food, Anaktuvuk Pass, 2014.

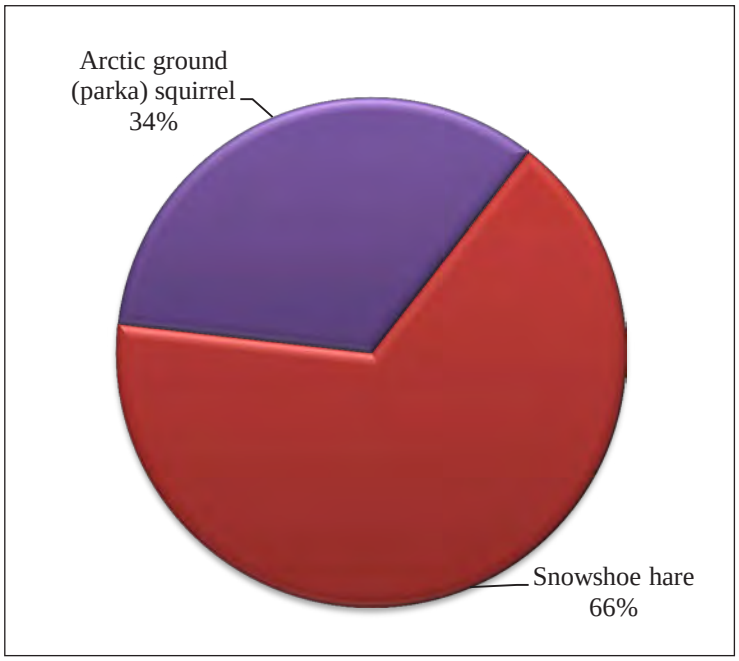


Figure 8-12.–Composition of small land mammal harvest by weight in usable pounds, Anaktuvuk Pass, 2014.

Table 8-8.–Estimated small land mammal/furbearer harvests by month, Anaktuvuk Pass, 2014.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All small land mammals	**24.3**	**31.8**	**16.8**	**52.5**	**59.8**	**46.7**	**46.7**	**82.2**	**0.0**	**0.0**	**1.9**	**5.6**	**14.9**	**383.1**
Beaver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	**1.9**
Coyote	0.0	0.0	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 fox	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.9**
Red fox	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	**9.3**
Snowshoe hare	5.6	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**11.2**
River (land) otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	**1.9**
Lynx	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.9**
Marmot	0.0	0.0	0.0	11.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**11.4**
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	**0.0**
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	**0.0**
Arctic ground (parka) squirrel	0.0	0.0	0.0	11.2	57.9	46.7	46.7	80.3	0.0	0.0	0.0	0.0	5.6	**248.4**
Gray wolf	14.9	24.3	7.5	14.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	1.9	7.5	**72.8**
Wolverine	3.7	7.5	1.9	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	**22.4**

Source ADF&G Division of Subsistence household surveys, 2015.

throughout the year. Harvests of species that are primarily used for their fur, such as gray wolf, wolverine, and red fox, took place from December to April. This corresponds with the furbearer hunting and trapping season and is the time of year when the fur is more dense and has the highest value. Arctic ground squirrel harvest began in April and increased monthly to a peak of 80 animals harvested in August. Snowshoe hare harvest took place in January and March, and all marmots were harvested in April.

Figure 8-13 shows the areas used to search for and harvest small land mammals. Respondents indicated that they searched for small land mammals in an area extending from the community to approximately 10 miles to the north and 7 miles to the west. Respondents also hunted and trapped along the John River from the community to approximately 33 miles to the southwest. Several tributaries of the John River were used as well, including Yenituk Creek and Hunt Fork to the west, as well as Till and Publituk creeks to the east. At least 1 respondent maintained an extensive trapline from the Anaktuvuk Pass to Welcome Creek 30 miles to the northeast then circling to the north and east as far as Fortress Mountain 44 miles northwest of the community.

One Anaktuvuk Pass trapper described the areas he has used to trap, which provides some insight into the amount of time, effort, and expense that can be involved:

> I've gone 100 miles west of here towards Killik. And I've been up towards Umiat about 120 miles north of here trapping…then 60 miles out of the village but down North Fork Valley…I've been trapping up here. Tiglukpuk, Confusion, Siksikpuk and Natuakruak Creek. All the way up to Gunsight, here. This is probably like 50 miles right here as the crow flies, and I had a camp up another 70 miles out on the Chandler River. (041415AKP1)

Salmon

Each of the 5 Pacific salmon species was used by small numbers of Anaktuvuk Pass households, however only sockeye salmon was harvested. Two percent of households harvested a total of 226 edible pounds of sockeye salmon in 2014, which made up less than 1% of the community's total subsistence harvest (Table 8-5; Figure 8-7). All sockeye salmon were harvested at Chitina using a dipnet (Table D8-5; figures 8-14 and 8-15). Forty-two percent of households reported using salmon, the vast majority of which (40% of households) received it from someone else (Table 8-5). No portion of the salmon harvested was used to feed dogs (Table D8-6).

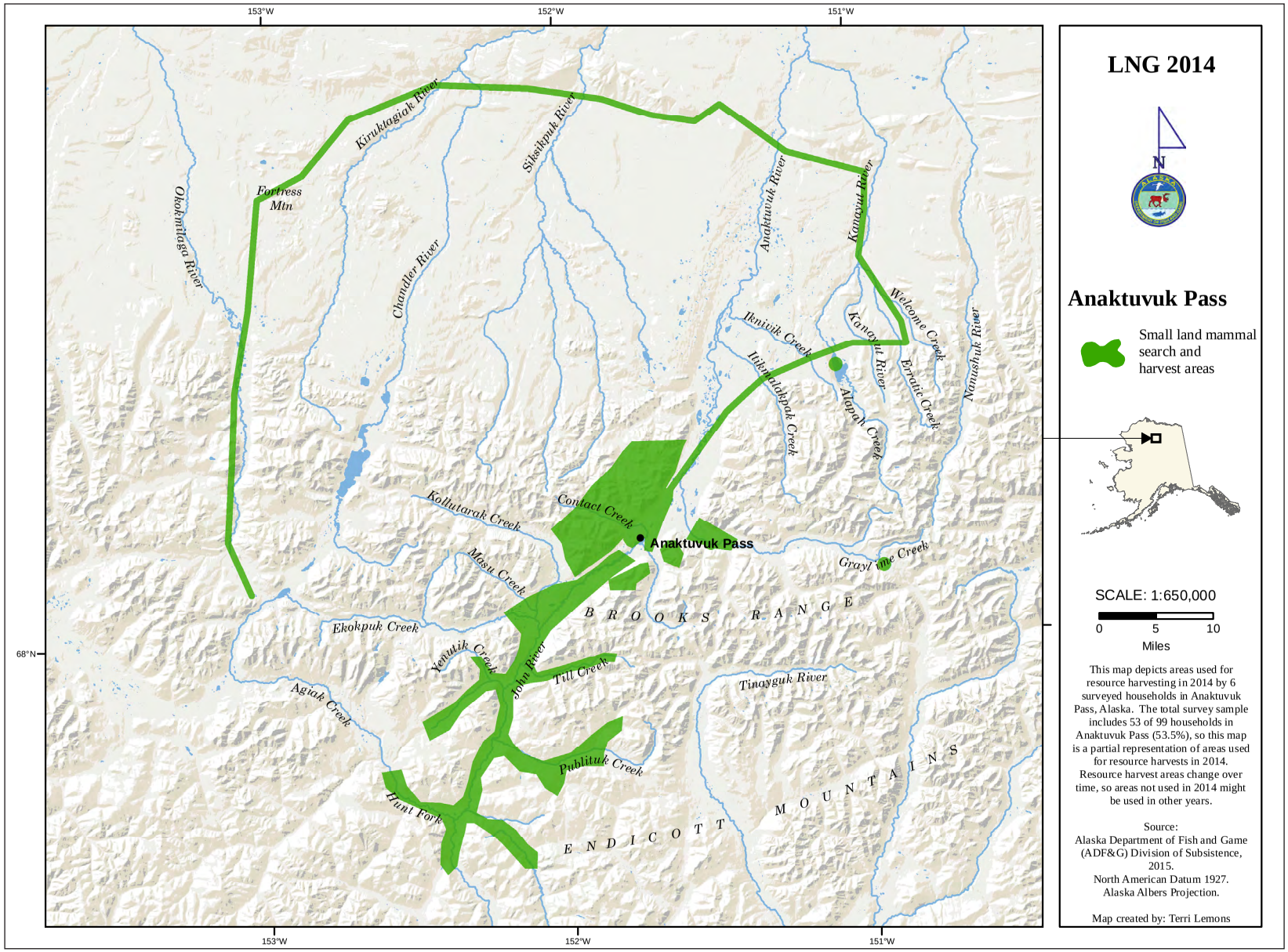


Figure 8-13.–Small land mammal hunting areas, Anaktuvuk Pass, 2014.

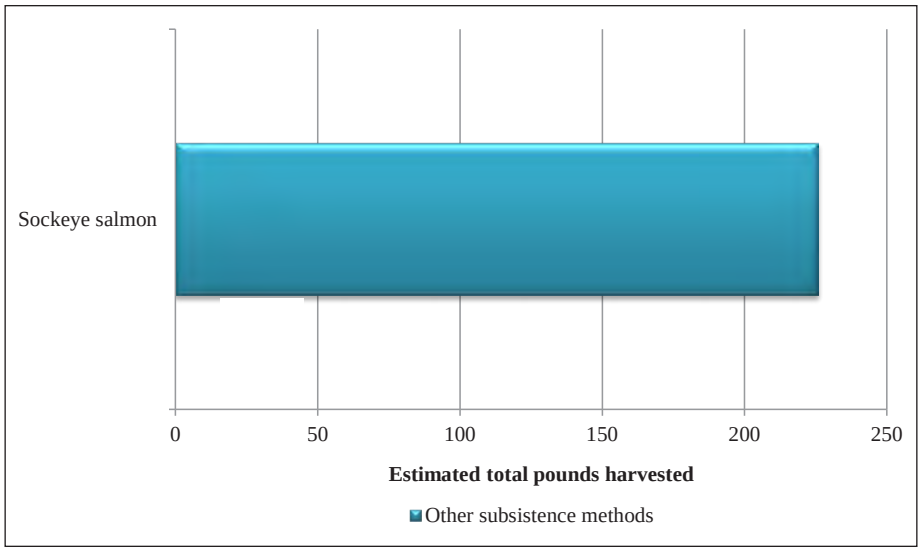


Figure 8-14.–Salmon harvests by gear type, Anaktuvuk Pass, 2014.

Nonsalmon Fish

Anaktuvuk Pass residents harvested a total of 10,222 edible pounds of nonsalmon fish in 2014, which made up 8% of their total subsistence harvest (Table 8-5; Figure 8-7). Figure 8-16 shows the composition of the community's nonsalmon fish harvest. Arctic char accounted for 38% of the nonsalmon fish harvest and provided 3,866 lb to the community harvest, or an average of 12 lb of wild food to each resident (Table 8-5; Figure 8-16). A total of 3,660 lb of lake trout accounted for 36% of the nonsalmon fish harvest (12 lb per capita). Arctic grayling made up 22% of the nonsalmon fish harvest with a total of 2,267 lb or 7 lb per capita. Sixty-four percent of households harvested Arctic grayling, making it the most commonly harvested of all subsistence resource species. A key respondent described her family's use of Arctic grayling: "We eat a lot of grayling here. Like a lot. Frozen. And that's what we eat raw. Dipped in seal oil. The only time we cook them is when they're fresh. Like we just pull them out of the lake or stream and cook them" (041415AKP1). An additional 6 species of nonsalmon fish were harvested in 2014, including humpback whitefish, Pacific halibut, and rainbow trout (Table 8-5). Each of these species contributed less than 1 lb per capita to the edible harvest.

Eighty-eight percent (88%) of Anaktuvuk Pass households reported using nonsalmon fish in 2014 (Table 8-5). Seventy-seven percent (77%) of households fished for nonsalmon fish, and all of those households successfully harvested them. Sixty-six (66%) of households reported receiving nonsalmon fish from another household, and 55% of households shared a portion of their nonsalmon fish with others.

Figure 8-17 and Table D8-7 show the edible weights of nonsalmon fish harvested by each gear type. An estimated 5,154 lb of nonsalmon fish were taken using a rod and reel. This gear type was used to harvest all Dolly Varden, rainbow trout, and Pacific halibut. Rod and reel was also the gear used to catch a large portion of the Arctic char and lake trout, as well as the majority of Arctic grayling. Approximately 4,933 lb of nonsalmon fish was caught by jigging through the ice, noted on Figure 8-17 as "other subsistence methods." Jigging, or ice fishing, was the primary method used to catch Arctic char and lake trout and was also commonly used to catch Arctic grayling. Over 100 lb of nonsalmon fish were caught using a set gillnet. All humpback whitefish and a few Arctic grayling were caught using this gear. Table D8-6 shows the estimated nonsalmon fish harvest for feeding dogs. Anaktuvuk Pass residents only used 29 Arctic grayling and a few lake trout and Arctic char to feed dogs in 2014.

Figure 8-18 shows the locations where Anaktuvuk Pass residents attempted to harvest nonsalmon fish in 2014. These areas include the John River from the community to approximately 13 miles southwest, and along Contact, Ekokpuk, and Inukpasugruk creeks. A key respondent specified that the Ekokpuk River

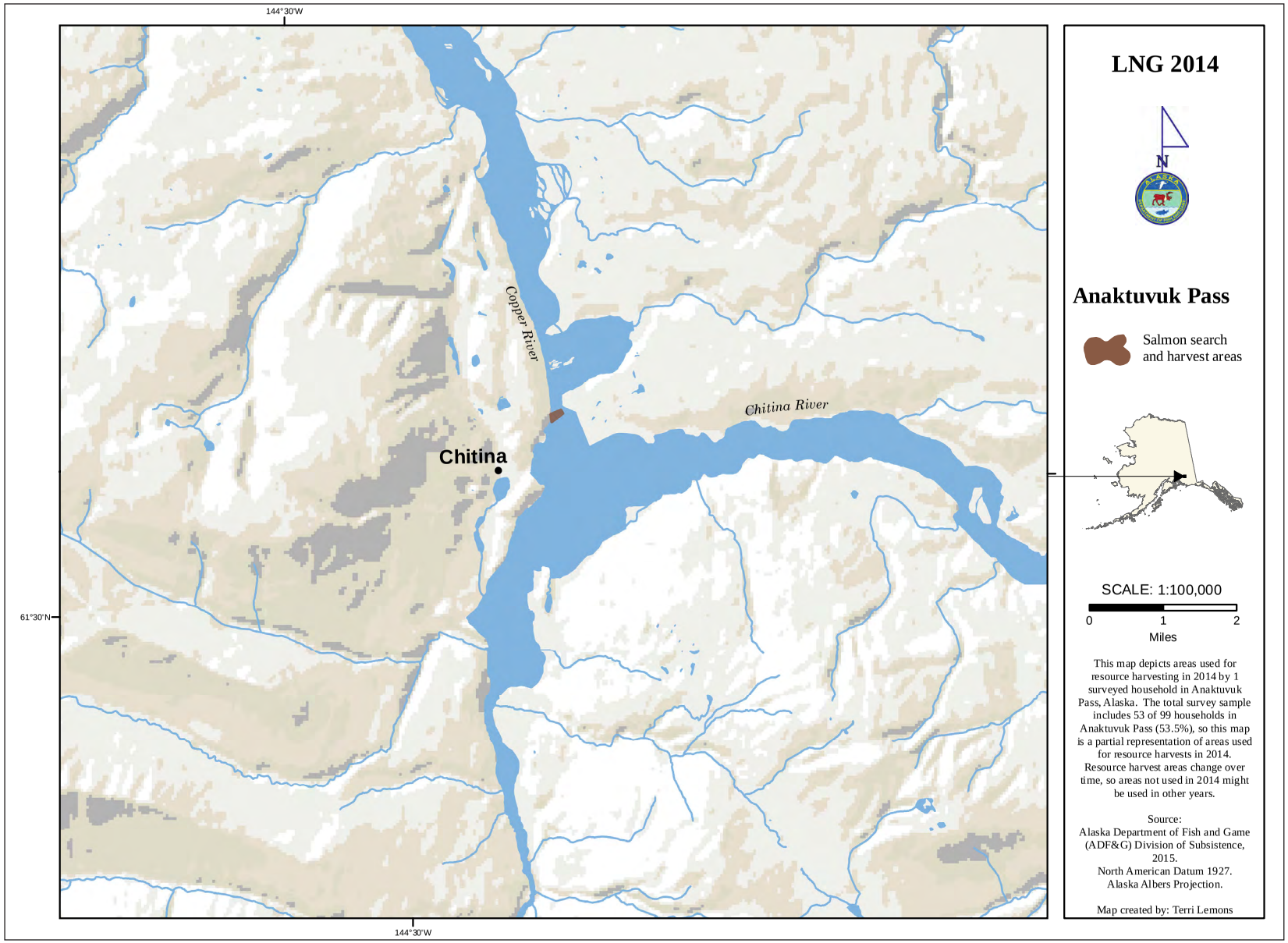


Figure 8-15.–Salmon fishing areas, Anaktuvuk Pass, 2014.

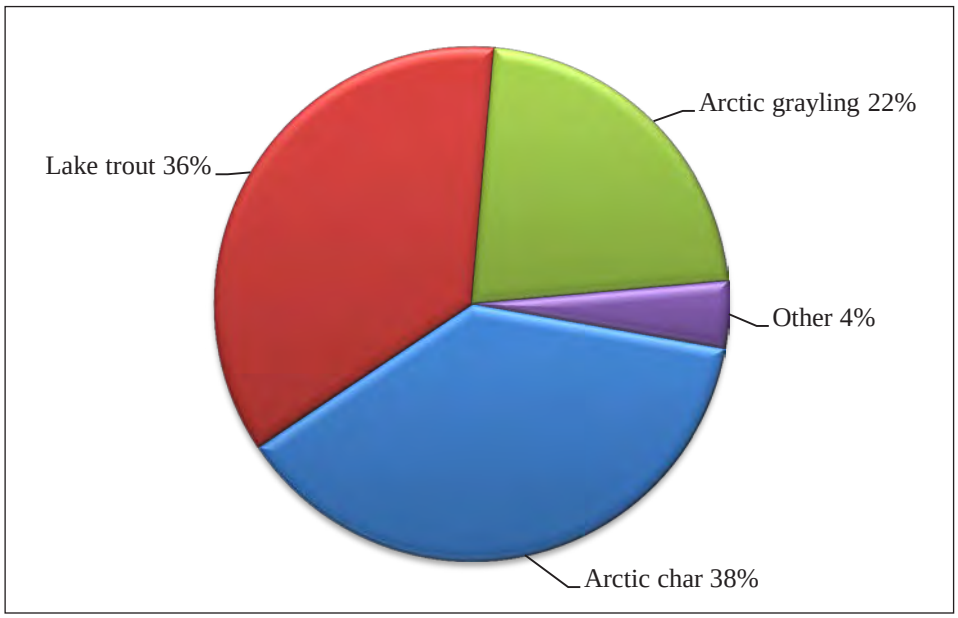


Figure 8-16.–Composition of nonsalmon fish by weight in usable pounds, Anaktuvuk Pass, 2014.

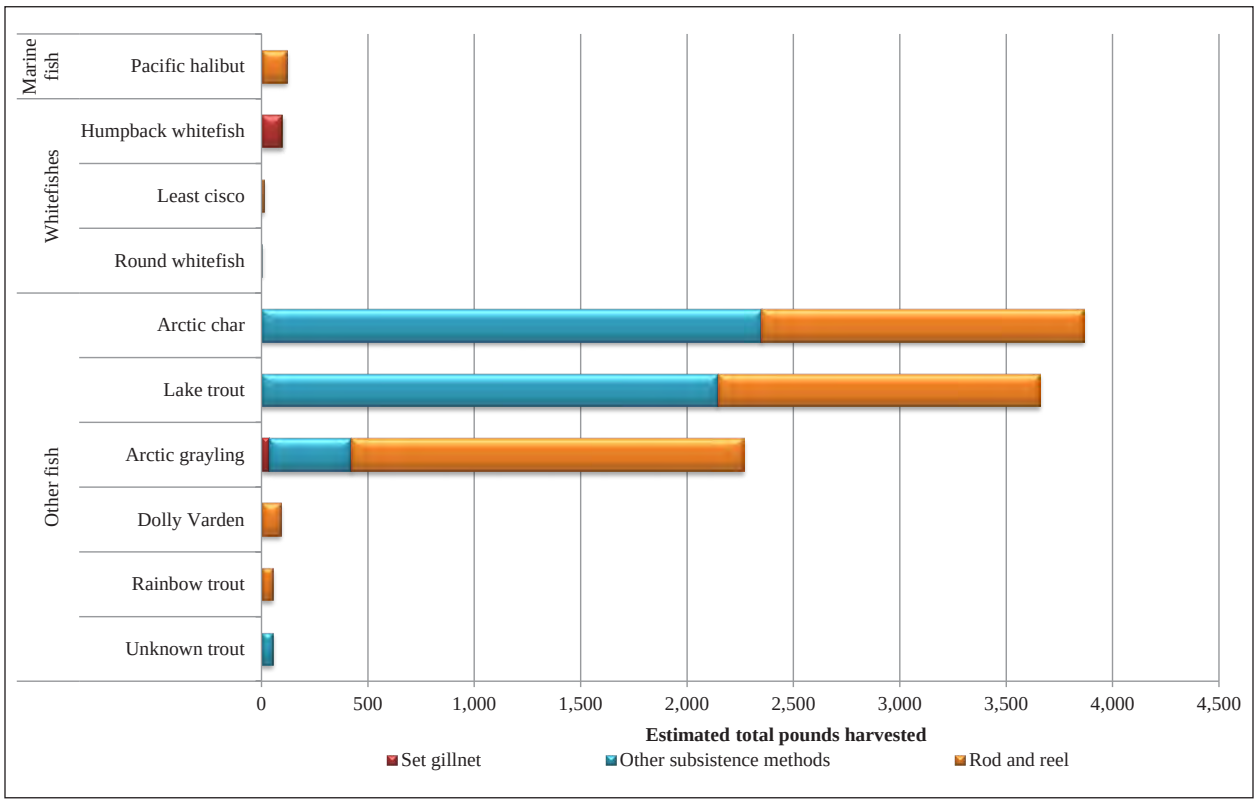


Figure 8-17.–Nonsalmon fish harvests by gear type, Anaktuvuk Pass, 2014.

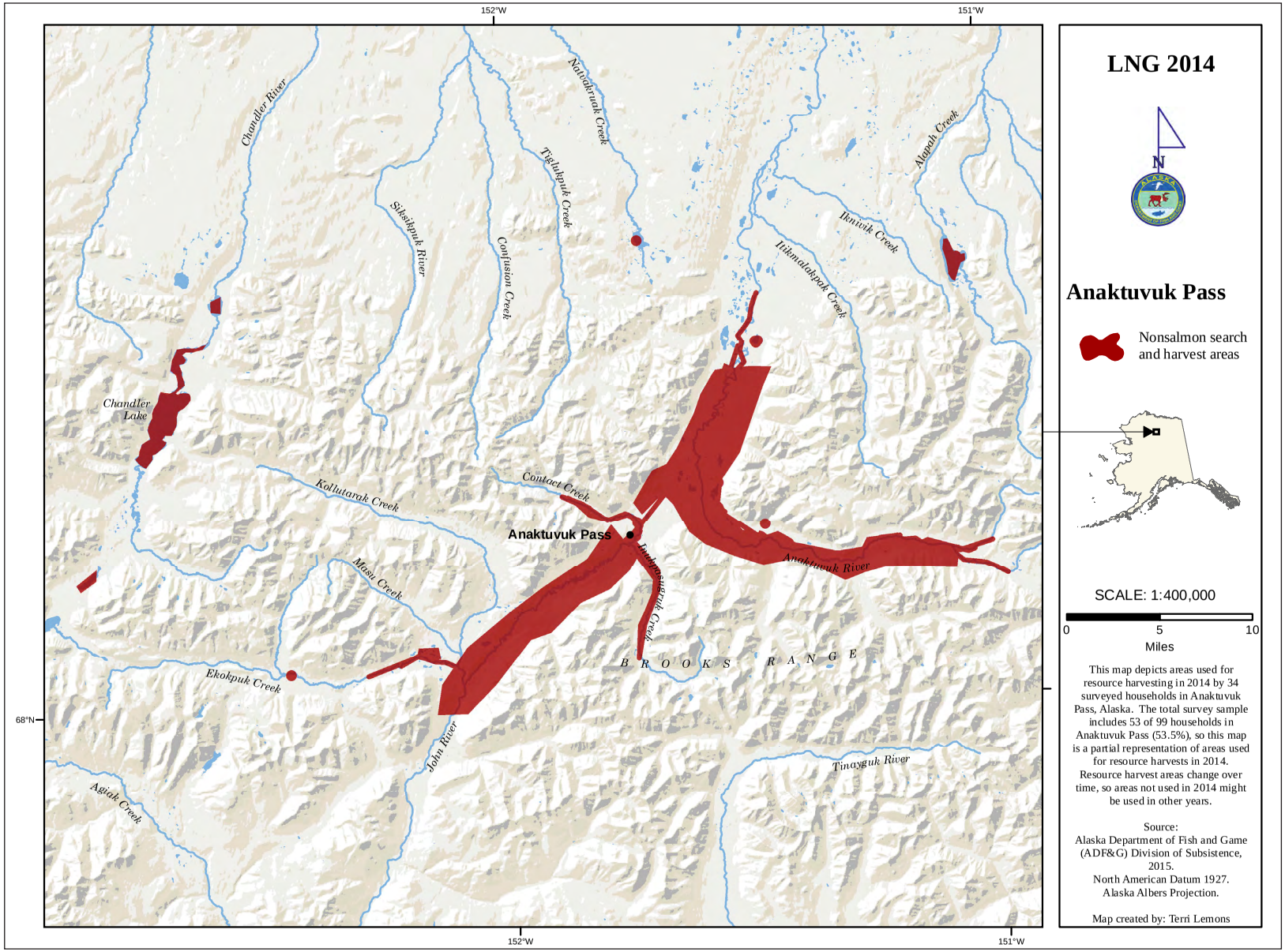


Figure 8-18.–Nonsalmon fishing areas, Anaktuvuk Pass, 2014.

provides good grayling fishing: "The Ekokpuk River is bountiful of grayling…sometimes you could catch over 50 a day" (041615AKP3). People also fished on the Anaktuvuk Pass River to the north and east of town, as well as Chandler Lake and a section of the Chandler River approximately 25 miles west of the community. One key respondent said his family occasionally makes summer camping trips to Chandler Lake specifically to harvest large lake trout (041515AKP2).

Birds and Eggs

Anaktuvuk Pass residents harvested an estimated 806 lb of birds and eggs in 2014 (Table 8-5). Unlike other communities in this study, migratory waterfowl are not a major resource for Anaktuvuk Pass because there is little suitable habitat in the central Brooks Range (Nelson et al. 1982). However, a few local hunters do target waterfowl. One key respondent tries every year to get enough geese to trade with other communities. "Geese season is coming up, so I'm trading for 12-gauge and 20-gauge bullets. I send the cooler out, they just send the cooler back with ammunition" (041515AKP2).

The majority of the bird harvest was made up of ptarmigans (32%) and geese (45%; Figure 8-17). Ptarmigans were the only birds harvested that were not migratory waterfowl (Table 8-5; Plate 8-6). White-fronted geese and snow geese together provided an 25% of the bird harvest (Figure 8-19). Northern pintail had the highest harvest of any duck species (81 lb) and accounted for 10% of the bird harvest (Table 8-5; Figure 8-19). Several other birds were harvested in smaller numbers, including Canada geese and mallards, as well as unknown species of mergansers and scaups.

Forty-five percent of households used some type of bird in 2014 (Table 8-5). Ptarmigans were used by 34% of households, far more than any other bird. Also, far more households (25%) harvested ptarmigans than any other bird. Canada goose was used by 19% of households and harvested by 6%. Snow goose was used by 15% of households, followed by mallard at 11%. None of the surveyed households reported using or attempting to harvest any bird eggs. Table 8-9 shows the bird harvest timing by month and species. With the exception of 6 scoters, all migratory birds were harvested in spring. The majority of ptarmigans were also taken in the spring, however, they were harvested throughout the year as well.

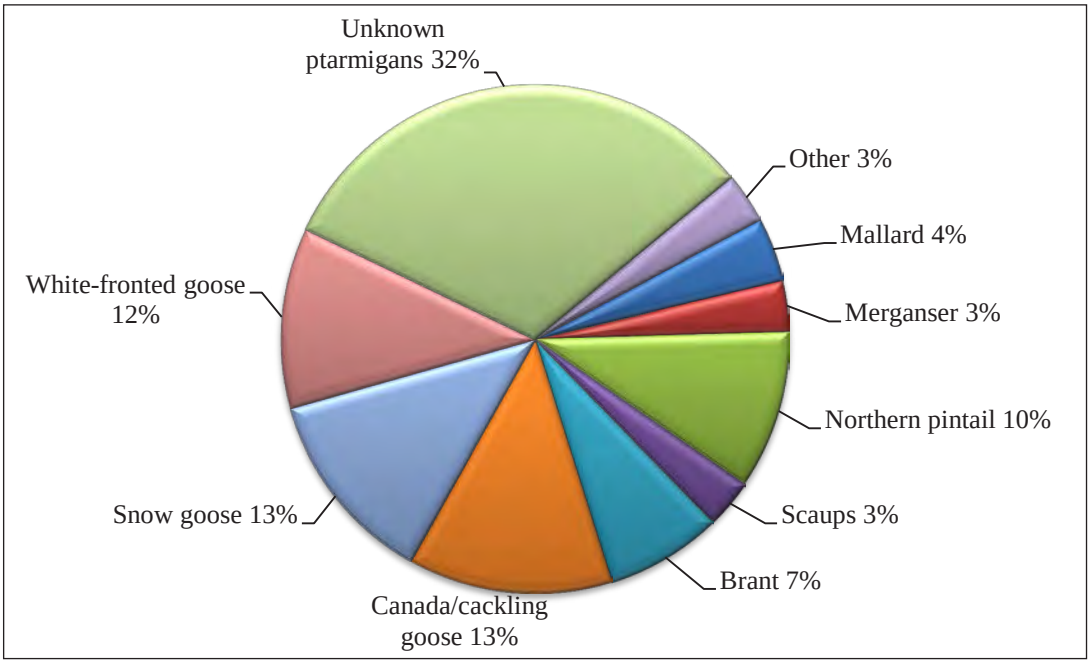


Figure 8-19.–Composition of bird and bird egg harvest by weight in usable pounds, Anaktuvuk Pass, 2014.

Plate 8-6.–Willow ptarmigans near Anaktuvuk Pass.

Figure 8-20 shows areas used to hunt for birds in 2014. All goose and duck hunting took place north of the community. Respondents reported hunting for ducks and geese along the Anaktuvuk River as far as 25 miles north of the community. Residents also hunted for geese and ducks along Irgivik Creek and in an area between Anaktuvuk River and Itikmalakpak Creek approximately 15 miles north northeast of Anaktuvuk Pass. Ptarmigans were hunted surrounding the community and along the lower sections of Contact and Inukpasugruk creeks. Hunters also searched for ptarmigans along the pass, from the community to approximately 5 miles north, and along a 10 mile section of the Anaktuvuk River east of the community.

Marine Invertebrates

Four percent of households reported using some unknown species of crab that was given to them (Table 8-5). No harvest or attempt to harvest of marine invertebrates was reported.

Vegetation

Anaktuvuk Pass residents harvested an estimated 1,677 lb (5 lb per capita) of vegetation in 2014 (Table 8-5). Berries made up 75% of the vegetation harvest by weight, and other edible plants and greens accounted for the remainder (Figure 8-21). Blueberries (490 lb) and cloudberries (348 lb; locally known as salmonberries) accounted for the majority of the berry harvest (Table 8-5). Crowberries (236 lb; also known as blackberries) and lowbush cranberries (168 lb; also known as lingonberries) were also harvested. A key respondent summarized the berry crop of 2014:

> It's been a hard, hard year for berries. It depends. Like berries, I try to get at least ten gallons to last the winter, but last year we got absolutely nothing. Well, we got maybe a gallon. It was crazy. They, we had a hard frost and then it got super warm. So all the lingonberries were like, smooshed…Like, it's winter, and then it wasn't. And it was just a cycle of "let's do horrible things to berries." It was really, really bad. Only ones that we could pick last year were crowberries, or blackberries…they survived. Salmonberries were really bad because it just rained. Rain, rain, rain, rain. And places that are normally like miles of salmonberries were just nothing, or they washed out fast. You know, they went through fast, their cycle. (041415AKP1)

Residents harvested 408 lb of Eskimo potatoes, which made up the majority of the nonberry vegetation harvest. Other types of vegetation, such as Hudson's Bay tea, sourdock, and spruce tips, were harvested in much smaller quantities.

Seventy-six percent of households used some species of vegetation (Table 8-5). Picking berries and gathering other wild plants and greens was a very common subsistence activity among Anaktuvuk Pass residents. Seventy percent (70%) of households harvested vegetation, more than any other resource category except nonsalmon fish.

Table 8-9.–Estimated bird harvests by season, Anaktuvuk Pass, 2014.

	Estimated harvest by season					
Resource	Spring	Summer	Fall	Winter	Season unknown	**Total**
All birds	**480.1**	**37.4**	**33.6**	**65.4**	**0.0**	**616.4**
Common eider	3.7	0.0	0.0	0.0	0.0	**3.7**
King eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Spectacled eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Steller's eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	16.8	0.0	0.0	0.0	0.0	**16.8**
Merganser	14.9	0.0	0.0	0.0	0.0	**14.9**
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Northern pintail	54.2	0.0	0.0	0.0	0.0	**54.2**
Scaup	14.9	0.0	0.0	0.0	0.0	**14.9**
Black scoter	0.0	0.0	5.6	0.0	0.0	**5.6**
White-winged scoter	3.7	0.0	0.0	0.0	0.0	**3.7**
Green-winged teal	7.5	0.0	0.0	0.0	0.0	**7.5**
Wigeon	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown ducks	0.0	0.0	0.0	0.0	0.0	**0.0**
Brant	37.4	0.0	0.0	0.0	0.0	**37.4**
Canada/cackling goose	31.8	0.0	0.0	0.0	0.0	**31.8**
Snow goose	28.0	0.0	0.0	0.0	0.0	**28.0**
White-fronted goose	29.9	0.0	0.0	0.0	0.0	**29.9**
Unknown geese	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown swans	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown cranes	0.0	0.0	0.0	0.0	0.0	**0.0**
Golden/black-bellied plover	0.0	0.0	0.0	0.0	0.0	**0.0**
Whimbrel/curlew	0.0	0.0	0.0	0.0	0.0	**0.0**
Godwit	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown small shorebirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Guillemot	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown loons	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown terns	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown ptarmigans	237.2	37.4	28.0	65.4	0.0	**368.0**
Snowy owl	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2015.

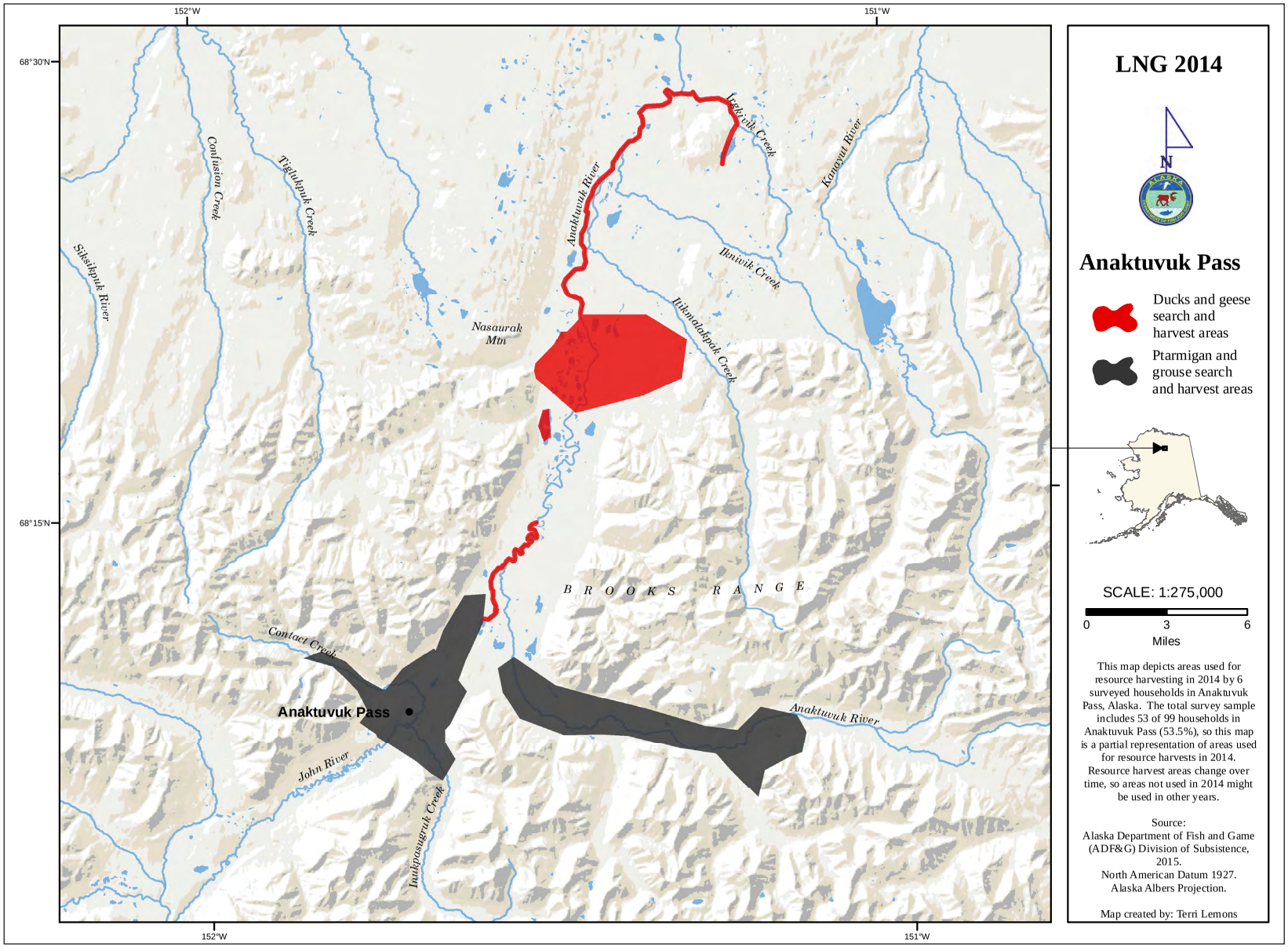


Figure 8-20.–Bird hunting areas, Anaktuvuk Pass, 2014.

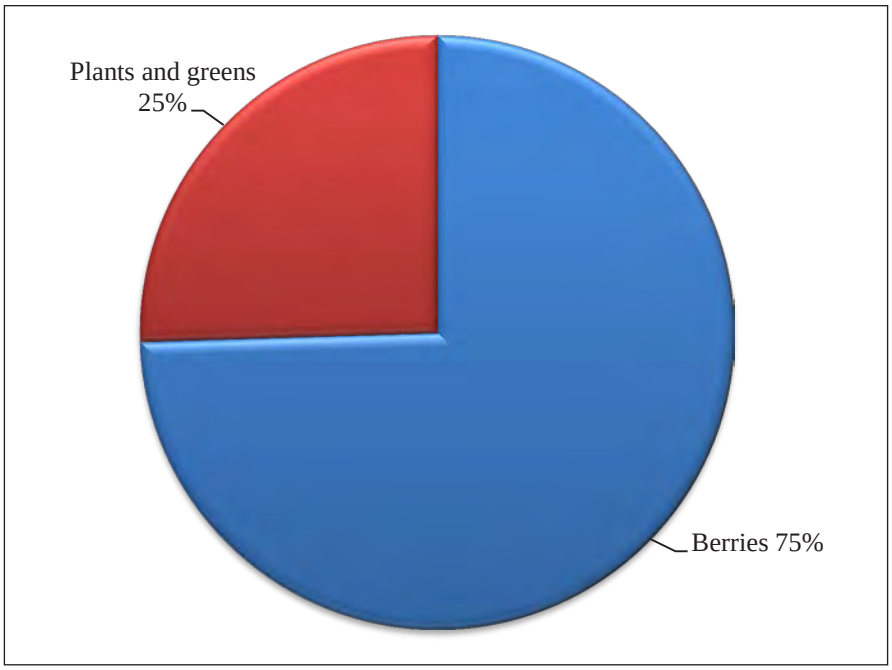


Figure 8-21.–Composition of vegetation harvest by weight in usable pounds, by type of vegetation, Anaktuvuk Pass, 2014.

Although the typical household may only harvest a few plant species, one key respondent described how she makes full use of the many species of vegetation that the region has to offer:

> Yeah, I pick, pick all year long, plants. I make jam, jellies. Everything. Just depends. Like, there's some plants that I pick just for our family and our relatives that we store over the winter. Just for us to eat. Um, there's plants that I just pick for medicinal purposes. I make salves and balms…This place is unique. Incredibly unique. It's like a, it's right on the edge of the tundra so you're getting all the tundra plants, but you're also getting southern plants. Right in the middle, it's like a micro-climate. (041415AKP1)

These less commonly harvested plants include Hudson's Bay tea, sourdock, alder bark, spruce tips, willow leaves, willow bark, cottonwood bark, and various roots.

Figure 8-22 shows the community's reported search areas for vegetation in 2014. Respondents gathered vegetation along the Anaktuvuk Pass River from approximately 9 miles northeast of the community to 14 miles east. Residents also gathered vegetation along the John River from the community to approximately 17 miles southwest and along Kollutarak, Masu, and Ekokpuk creeks.

Production and Distribution of Wild Resources

Household Specialization in Resource Harvesting

Previous studies (Magdanz et al. 2009; 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.

In the 2014 study year in Anaktuvuk Pass, 68% of the harvests of wild resources as estimated in pounds edible weight were harvested by 11% of the community's households (Figure 8-23). Further analysis of

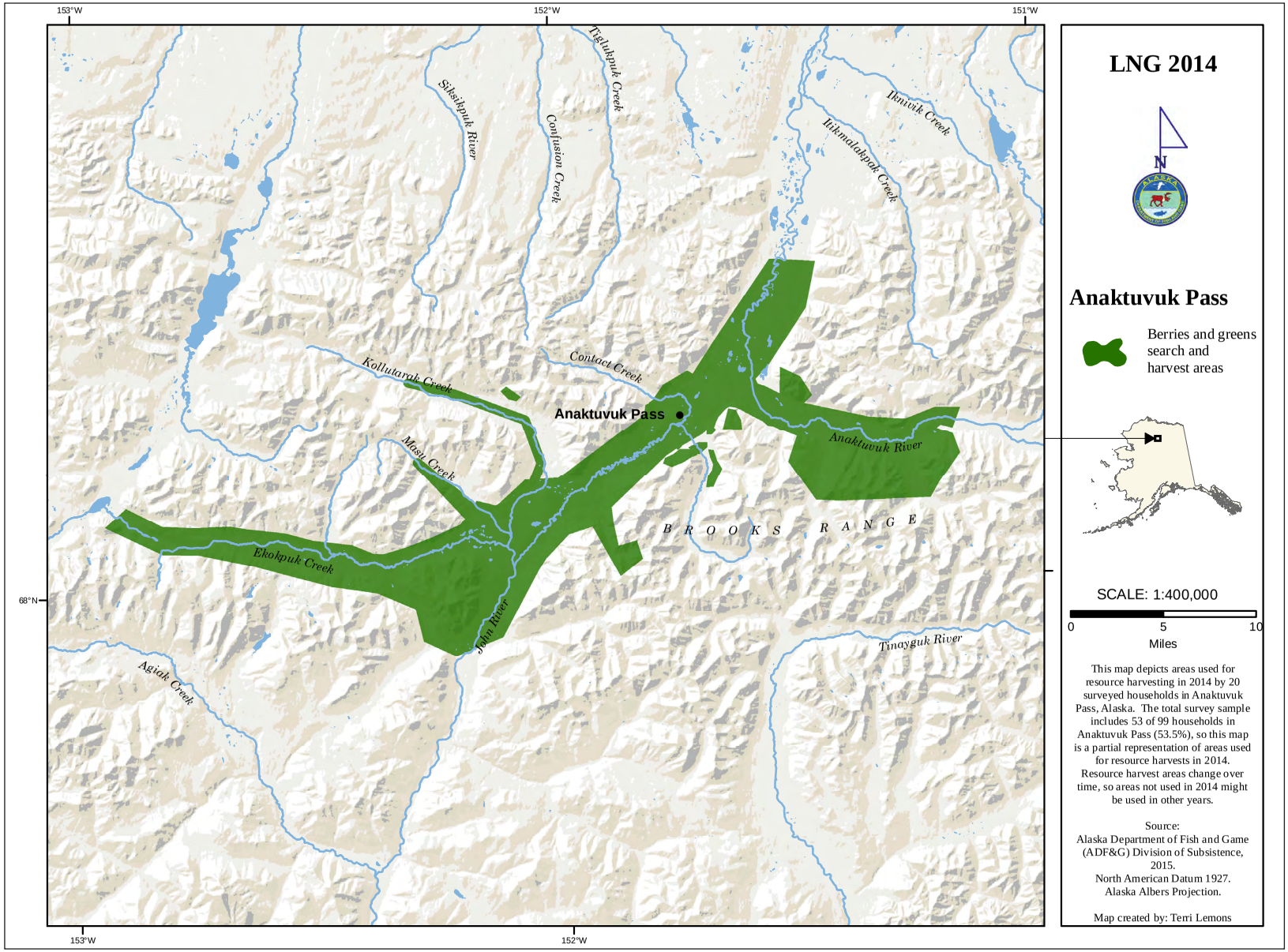


Figure 8-22.–Vegetation gathering areas, Anaktuvuk Pass, 2014.

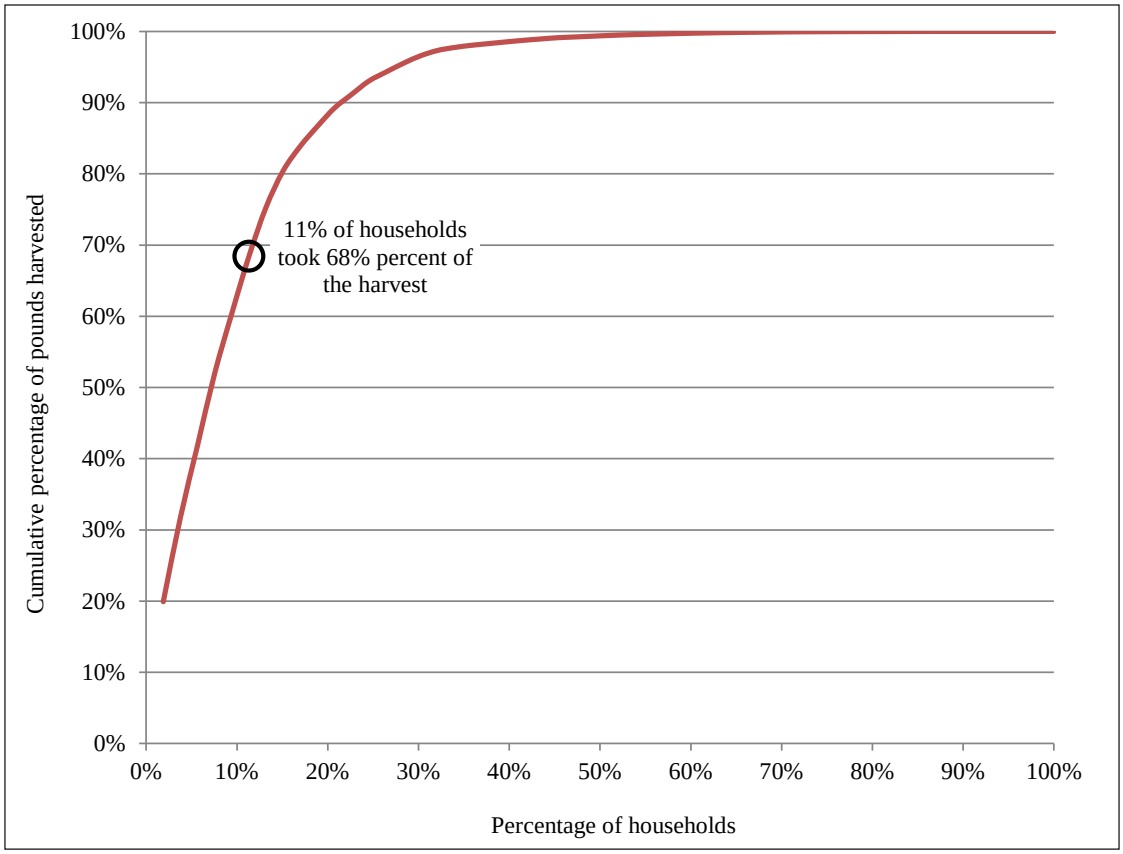


Figure 8-23.–Household specialization, Anaktuvuk Pass, 2014.

the study findings, beyond the scope of this report, might identify characteristics of the highly productive households in Anaktuvuk Pass and the other study communities.

Income and Cash Employment

Respondents were asked about both earned income (jobs held and wages earned by all household members 16 years and older) and unearned income. The survey also asked about months worked and work schedules for employed residents in 2014.

The most significant income source for Anaktuvuk Pass was from employment with local government, which provided 53% of all income to the community (Figure 8-24). Other contributions to the community's income came from a variety of sources including Native corporation dividends (20%), the service industry (9%), and the Alaska Permanent Fund dividend (7%).

Table 8-10 shows all reported sources of income in 2014. The estimated total of all earned and other income was $6,934,306 for the community, or an average of $70,043 per household. Employment earnings provided approximately 69% of the community's income in 2014. Native corporation dividends were the most significant sources of other income, providing an average of $14,027 per household. The Alaska Permanent Fund dividend, providing an average of $4,692 per household, and Social Security ($1,692 per household) were also significant contributors to the community's other income. Income from local government jobs totaled an estimated $3,657,007; these jobs employed 96 people in 2014. An additional 21 residents held service-related jobs and earned a total of $603,809 in wages. Employment in the retail trade industry provided the third largest source of the community's total earned income ($183,467), followed by earnings from construction trades ($91,979).

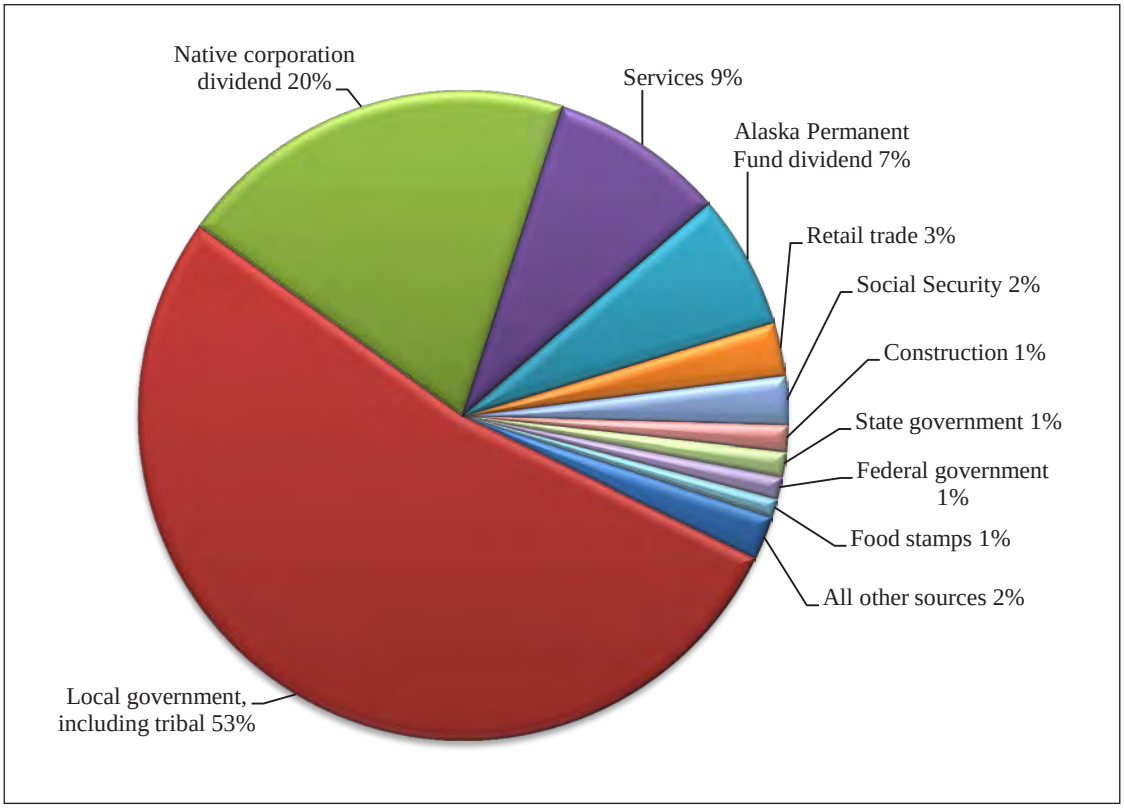


Figure 8-24.–Top income sources, Anaktuvuk Pass, 2014.

The estimated median household income for Anaktuvuk Pass residents in 2014 was $67,075 within a 95% confidence interval of $44,543–$81,525 (Figure 8-25; Table D8-8). This estimated median household income demonstrates that Anaktuvuk Pass's income is comparable with the 2010–2014 ACS median income estimate for all Alaska households ($71,829). The household income estimated by this study differs from the $49,375 median household income estimated by the ACS during 2010–2014, but still falls within its margin of error.

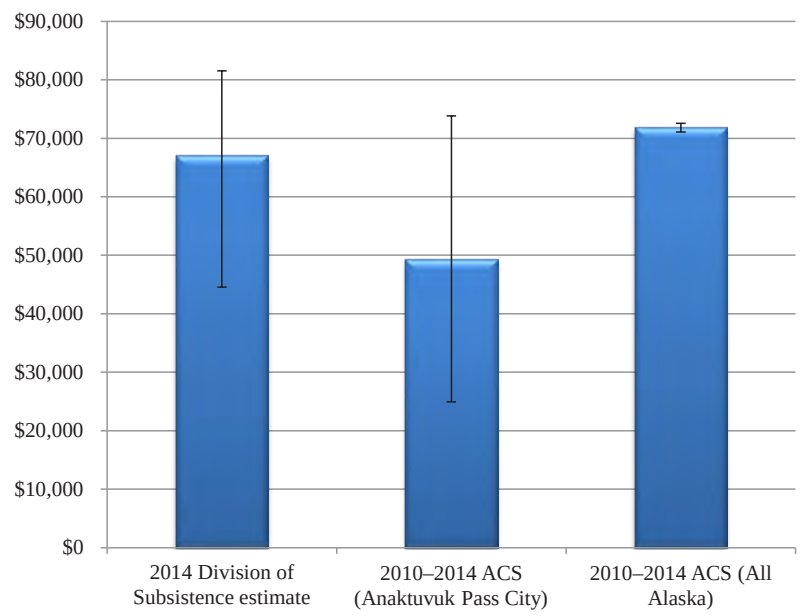
Table 8-11 shows Anaktuvuk Pass's employment characteristics by industry and occupation. Survey results indicate an estimated total of 162 jobs in 2014. These jobs were distributed among 133 workers in 81 households. Local government accounted for 64% of the community's jobs. A total of 72% of employed individuals held employment with the local government in 2014; their earnings made up 77% of the community total. Service industries accounted for 15% of jobs in Anaktuvuk Pass. The total earnings from this industry amounted to 13% of the community total. Retail trade provided 4% of the community's earnings. Each remaining industry accounted for less than 2% of the total earnings in 2014.

Sixty-four percent of the community's jobs were full-time positions, 9% were part-time, and 8% were on-call or occasional employment (Table 8-12). Approximately 67 employed households (83% of households with at least one job) had at least 1 resident with a full-time position, 12 households (15%) included a resident with part-time position, and 10 households (13%) included a resident with an on-call or occasional job. Out of a total of 229 adults residing in Anaktuvuk Pass in 2014, an estimated 133 persons held at least 1 job (58% of adult residents; Table 8-13). On average, employed adults worked approximately 9.7 months in 2014, and an estimated 55% worked year round. Out of 99 total households, an estimated 81 households included at least 1 resident with a job (82% of all households) in 2014. The number of jobs held per employed household ranged from 1 to 6 with an average of 2 jobs per household.

Table 8-10.–Estimated earned and other income, Anaktuvuk Pass, 2014.

Income source	Number of employed adults	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government, including tribal	95.7	69.0	$3,657,007	$2,483,602 – $5,226,114	$36,939	52.7%
Services	20.8	18.3	$603,809	$132,993 – $1,347,615	$6,099	8.7%
Retail trade	16.6	14.2	$183,467	$41,857 – $382,998	$1,853	2.6%
Construction	2.1	2.0	$91,979	$42,867 – $194,026	$929	1.3%
State government	4.2	4.1	$85,209	$27,248 – $206,476	$861	1.2%
Federal government	2.1	2.0	$77,262	$62,257 – $95,597	$780	1.1%
Mining	2.1	2.0	$22,075	$17,852 – $43,766	$223	0.3%
Transportation, communication,	2.1	2.0	$11,037	$8,894 – $21,815	$111	0.2%
Other employment	2.1	2.0	$9,198	$7,438 – $17,169	$93	0.1%
Agriculture, forestry, and fishing	2.1	2.0	$5,519	$4,604 – $10,433	$56	0.1%
Earned income subtotal	**133.2**	**81.2**	**$4,746,561**	**$3,208,444 – $6,361,524**	**$47,945**	**68.5%**
Other income						
Native corporation dividend		76.6	$1,388,624	$1,025,958 – $1,812,048	$14,027	20.0%
Alaska Permanent Fund dividend		84.1	$464,461	$365,858 – $589,391	$4,692	6.7%
Social Security		13.1	$167,536	$4,183 – $383,270	$1,692	2.4%
Food stamps		9.3	$62,118	$3,808 – $183,057	$627	0.9%
Pension / retirement		11.2	$58,269	$5,947 – $191,616	$589	0.8%
Child support		7.5	$26,311	$6,538 – $66,505	$266	0.4%
Sales (property/garage sales, etc.)		1.9	$9,340	$0 – $18,679	$94	0.1%
CITGO fuel voucher		1.9	$3,561	$0 – $16,017	$36	0.1%
Meeting honoraria		1.9	$3,362	$0 – $6,725	$34	0.0%
Longevity bonus		1.9	$1,939	$0 – $7,673	$20	0.0%
Heating assistance		1.9	$1,939	$0 – $8,340	$20	0.0%
Supplemental Security Income		1.9	$286	$0 – $3,598	$3	0.0%
TANF (Temporary Assistance for Needy Families)		0.0	$0	$0 – $0	$0	0.0%
Adult public assistance (OAA,		0.0	$0	$0 – $0	$0	0.0%
Workers' compensation / insurance		0.0	$0	$0 – $0	$0	0.0%
Unemployment		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%
Other		0.0	$0	$0 – $0	$0	0.0%
Foster care		0.0	$0	$0 – $0	$0	0.0%
Other income subtotal		**91.5**	**$2,187,745**	**$1,616,112 – $2,914,808**	**$22,098**	**31.5%**
Community income total			**$6,934,306**	**$5,195,479 – $8,610,660**	**$70,043**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.



Note For 2014, Division of Subsistence estimate does not include categories of income excluded by the 2010–2014 ACS median estimate, including food stamps, housing assistance, and one-time payments.

Figure 8-25.–Comparison of median income estimates, Anaktuvuk Pass, 2014.

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). 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).

Core questions and responses from Anaktuvuk Pass residents are summarized in Figure 8-26. Eight of the 10 statements listed in the figure are used to calculate a household's food security. Twenty-three percent of responding households said that they ran out of store-bought food at some point during the year, and 20% reported that their subsistence food ran out. Twenty-three percent of responses indicated that the household lacked resources, such as equipment, transportation, or money, that they needed to get food. Twelve percent of responding households reported that they had to cut the size of their meals or skip meals at some point in 2014. The most severe responses associated with low food security included household members who were hungry but did not eat (8%), household members who lost weight because they did not have enough food (9%), and those who did not eat for a whole day (6%).

Table 8-11.–Employment by industry, Anaktuvuk Pass, 2014.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**162.3**	**81.2**	**133.2**	
Federal government	**1.3%**	**2.5%**	**1.6%**	**1.6%**
Executive, administrative, and managerial	1.3%	2.5%	1.6%	1.6%
State government	**2.6%**	**5.0%**	**3.1%**	**1.8%**
Construction and extractive occupations	2.6%	5.0%	3.1%	1.8%
Local government, including tribal	**64.1%**	**85.0%**	**71.9%**	**77.0%**
Executive, administrative, and managerial	5.1%	10.0%	6.3%	8.1%
Teachers, librarians, and counselors	14.1%	17.5%	15.6%	21.0%
Writers, artists, entertainers, and athletes	1.3%	2.5%	1.6%	0.2%
Health technologists and technicians	1.3%	2.5%	1.6%	2.3%
Administrative support occupations, including clerical	12.8%	22.5%	15.6%	13.4%
Service occupations	9.0%	15.0%	9.4%	6.4%
Precision production occupations	5.1%	10.0%	6.3%	9.1%
Transportation and material moving occupations	5.1%	10.0%	6.3%	10.0%
Handlers, equipment cleaners, helpers, and laborers	6.4%	12.5%	7.8%	3.1%
Occupation not indicated	3.8%	7.5%	4.7%	3.4%
Agriculture, forestry, and fishing	**1.3%**	**2.5%**	**1.6%**	**0.1%**
Agricultural, forestry, and fishing occupations	1.3%	2.5%	1.6%	0.1%
Mining	**1.3%**	**2.5%**	**1.6%**	**0.5%**
Construction and extractive occupations	1.3%	2.5%	1.6%	0.5%
Construction	**1.3%**	**2.5%**	**1.6%**	**1.9%**
Construction and extractive occupations	1.3%	2.5%	1.6%	1.9%
Transportation, communication, and utilities	**1.3%**	**2.5%**	**1.6%**	**0.2%**
Technologists and technicians, except health	1.3%	2.5%	1.6%	0.2%
Retail trade	**10.3%**	**17.5%**	**12.5%**	**3.9%**
Marketing and sales occupations	6.4%	12.5%	7.8%	3.3%
Administrative support occupations, including clerical	1.3%	2.5%	1.6%	0.4%
Occupation not indicated	2.6%	5.0%	3.1%	0.2%
Services	**15.4%**	**22.5%**	**15.6%**	**12.7%**
Executive, administrative, and managerial	2.6%	5.0%	3.1%	2.3%
Health technologists and technicians	1.3%	2.5%	1.6%	1.9%
Marketing and sales occupations	1.3%	2.5%	1.6%	0.1%
Administrative support occupations, including clerical	2.6%	5.0%	3.1%	2.1%
Service occupations	5.1%	7.5%	4.7%	2.9%
Mechanics and repairers	1.3%	2.5%	1.6%	1.7%
Construction and extractive occupations	1.3%	2.5%	1.6%	1.7%
Industry not indicated	**1.3%**	**2.5%**	**1.6%**	**0.2%**
Miscellaneous occupations	1.3%	2.5%	1.6%	0.2%

Source ADF&G Division of Subsistence household surveys, 2015.

Table 8-12.–Reported job schedules, Anaktuvuk Pass, 2014.

	Jobs		Employed persons		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	104.0	64.1%	91.5	68.8%	67.0	82.5%
Part-time	14.6	9.0%	14.6	10.9%	12.2	15.0%
On-call (occasional)	12.5	7.7%	10.4	7.8%	10.1	12.5%
Schedule not reported	31.2	19.2%	27.0	20.3%	20.3	25.0%

Source ADF&G Division of Subsistence household surveys, 2015.

Table 8-13.–Employment characteristics, Anaktuvuk Pass, 2014.

	Community
Characteristic	Anaktuvuk Pass
All adults	
Number	228.7
Mean weeks employed	24.4
Employed adults	
Number	133.2
Percentage	58.2%
Jobs	
Number	162.3
Mean	1.2
Minimum	1
Maximum	5
Months employed	
Mean	9.7
Minimum	1
Maximum	12
Percentage employed year-round	55.4%
Mean weeks employed	41.9
Households	
Number	99
Employed	
Number	81.2
Percentage	82.0%
Jobs per employed household	
Mean	2.0
Minimum	1
Maximum	6
Employed adults	
Mean	
Employed households	1.6
Total households	1.3
Minimum	1
Maximum	4
Mean person-weeks of employment	56.3

Source ADF&G Division of Subsistence household surveys, 2015.

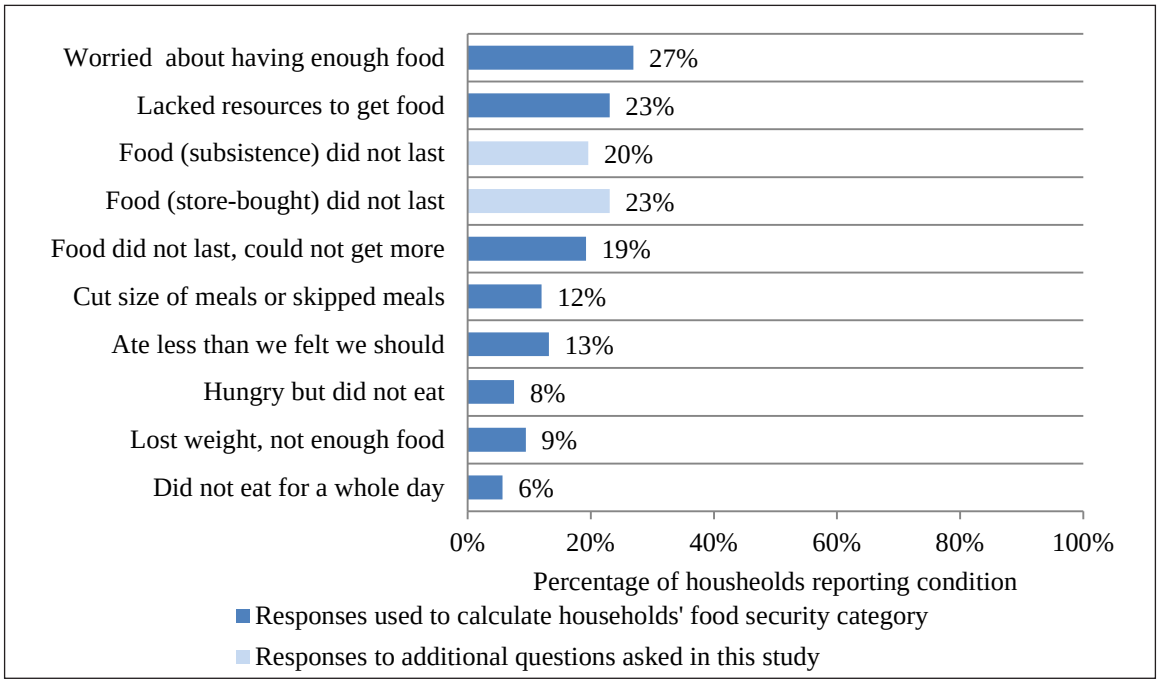


Figure 8-26.–Responses to questions about food insecure conditions, Anaktuvuk Pass, 2014.

Food security results for surveys for Anaktuvuk Pass, the state of Alaska, and the United States are summarized in Figure 8-27. In Alaska, the percentages of households in each food security category were very similar to those in the rest of the United States. For example, 88% of Alaska households, compared to 86% of households in the United States, experienced high to marginal food security in 2014. Also, 4% of Alaska households experienced very low food security compared to 6% of households in the U.S. In Anaktuvuk Pass, however, only 81% of households had high or marginal food security and 9% experienced low food security. Nine percent of households experienced very low food security in 2014, suggesting that food security in Anaktuvuk Pass may be significantly lower than the rest of the state and the nation.

Figure 8-28 portrays the mean number of food insecure conditions per household by food security category by month. Households with high and marginal food security (shown in blue) remained relatively stable throughout the year with less than 1 condition true for any given month. Households with very low food security (shown in green) showed the greatest variation throughout the year. Food insecurity for these households peaked in November and December with an average of 8 food insecure conditions and decreased in January and February to an average of 7. Food insecurity for these households was lowest from March through October, when an average of 5 conditions was reported. Unlike households with very low food security, households with low food security (shown in red), had less variability with an average of 1 to 2 food insecure conditions throughout the year. This graph demonstrates that the fluctuations of food security increase as households become less food secure. Changes in the availability of wild resources, eligibility for food stamps, and access to the resources needed to obtain food, for example, may have impacted households with very low food security more than those with high or marginal food security.

Figure 8-29 shows in which months households reported foods not lasting. In each month more households reported subsistence foods (shown in red) not lasting compared to store-bought foods (shown in green). Throughout the year, the percentage of households reporting that their subsistence foods did not last varied from 11% to 15%, and those who reported store-bought foods not lasting ranged from 8% to 13%. More households reported their food not lasting over the winter months of November through February. Over this period the percentage of households that reported running out of any food ranged from 19% to 23%.

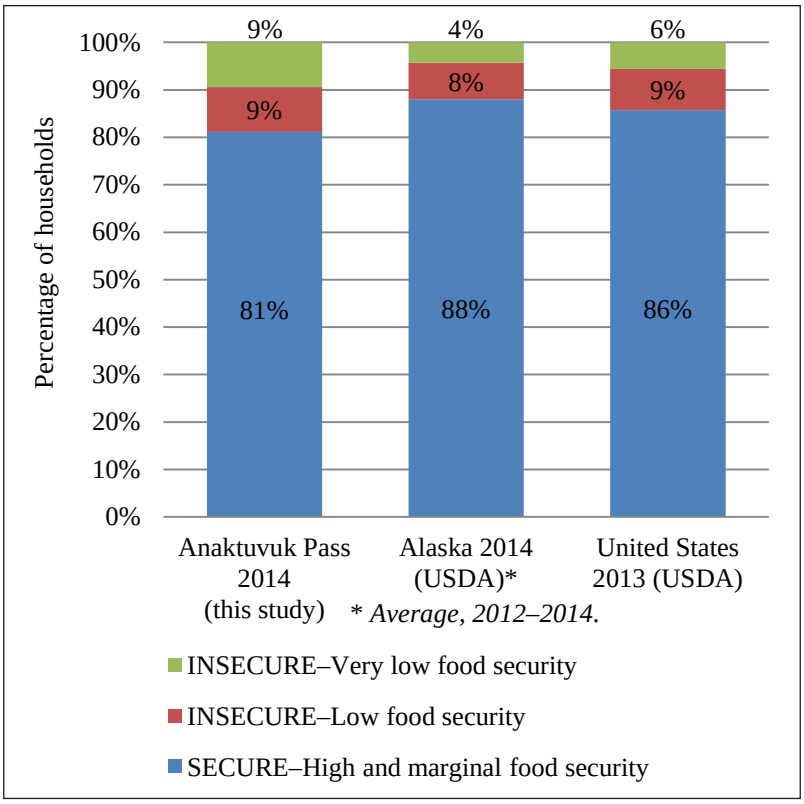


Figure 8-27.–Comparison of food security categories, Anaktuvuk Pass, 2014.

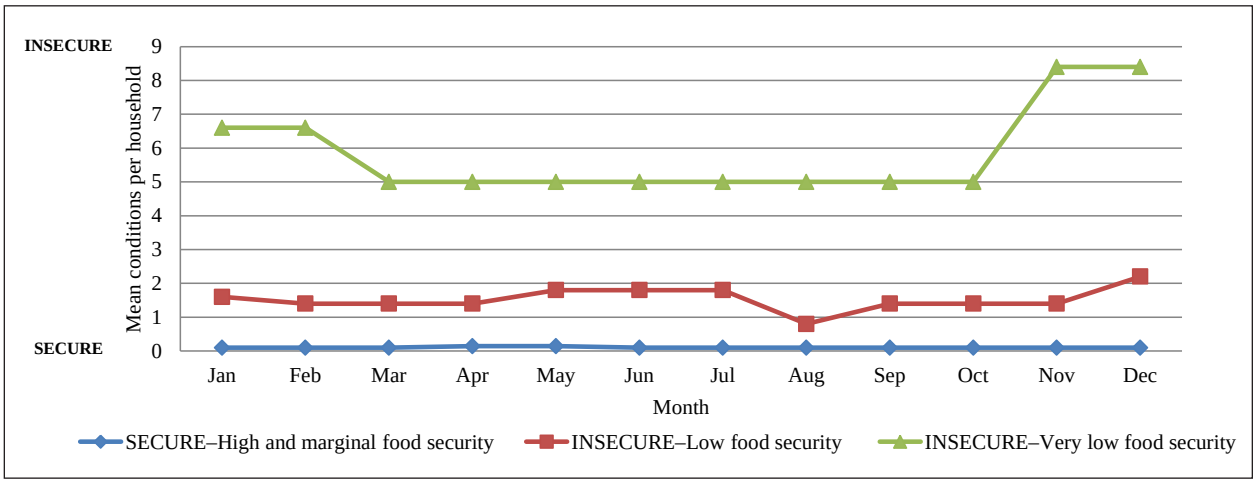


Figure 8-28.–Mean number of food insecure conditions by month and by household security category, Anaktuvuk Pass, 2014.

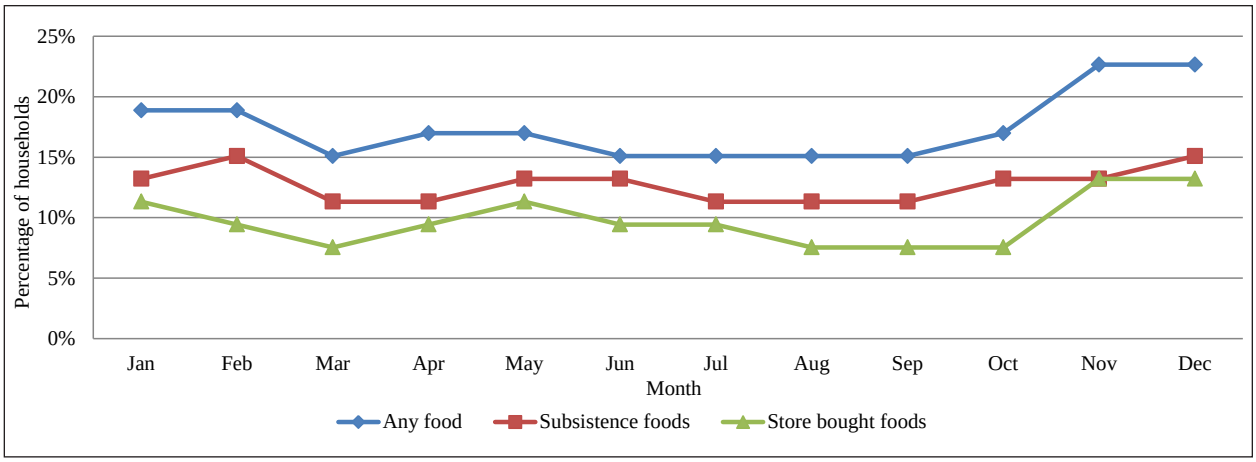


Figure 8-29.–Comparison of months when food did not last, Anaktuvuk Pass, 2014.

Table 8-14 shows whether Anaktuvuk Pass households had enough of the types of food they wanted in the last 12 months. Forty percent of the 46 valid responses indicated that the household had enough of the kinds of food desired. Forty-two percent said they had enough food, but not the desired kind.

Comparing Harvests and Uses in 2014 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 2 ways: whether they used more, less, or about the same amount of 8 resource categories in 2014 as in recent years, and whether they got "enough" of each of the 5 resource categories. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different subsistence resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 8-15, Figure 8-30, and Figure 8-31 provide a broad overview of households' assessments of their harvests in 2014. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions.

Figure 8-30 shows the percentage of households who reported getting less, same, or more of each resource category in 2014 compared to recent years. Fifty-eight percent of households reported using less wild food in 2014. Figure 8-31 reports the percentages of households that reported whether they got enough of each resource category. Sixty-four percent of households got enough wild foods in 2014. The categories with the highest percentages of households getting enough were nonsalmon fish (66%) and large land mammals (64%). Forty-three percent of households got enough vegetation in 2014. Thirty-four percent got enough birds, and only 13% reported getting enough small land

Table 8-14.–Household descriptions of food eaten in the last 12 months, Anaktuvuk Pass, 2014.

Statement	Percentage of affirmative responses
Had enough of the kinds of food desired	39.6%
Had enough food, but not the desired kind	41.5%
Somestimes, or often, did not have enough food	5.7%
Missing/No response	13.2%

Source ADF&G Division of Subsistence household surveys, 2015.

Table 8-15.–Changes in household uses of resources compared to recent years, Anaktuvuk Pass, 2014.

Resource category	Sampled households	Valid responses[a]	Households reporting use: Total households Number	Total households Percentage	Less Number	Less Percentage	Same Number	Same Percentage	More Number	More Percentage	Households not using Number	Households not using Percentage
All resources	53	52	51	98.1%	30	57.7%	14	26.9%	7	13.5%	1	1.9%
Salmon	53	52	25	48.1%	13	25.0%	9	17.3%	3	5.8%	27	51.9%
Nonsalmon fish	53	51	47	92.2%	22	43.1%	16	31.4%	9	17.6%	4	7.8%
Large land mammals	53	53	48	90.6%	24	45.3%	15	28.3%	9	17.0%	5	9.4%
Small land mammals	53	52	13	25.0%	7	13.5%	3	5.8%	3	5.8%	39	75.0%
Marine mammals	53	53	35	66.0%	12	22.6%	15	28.3%	8	15.1%	18	34.0%
Birds	53	52	23	44.2%	12	23.1%	9	17.3%	2	3.8%	29	55.8%
Marine invertebrates	53	53	3	5.7%	2	3.8%	1	1.9%	0	0.0%	50	94.3%
Vegetation	53	46	35	76.1%	20	43.5%	9	19.6%	6	13.0%	11	23.9%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response.

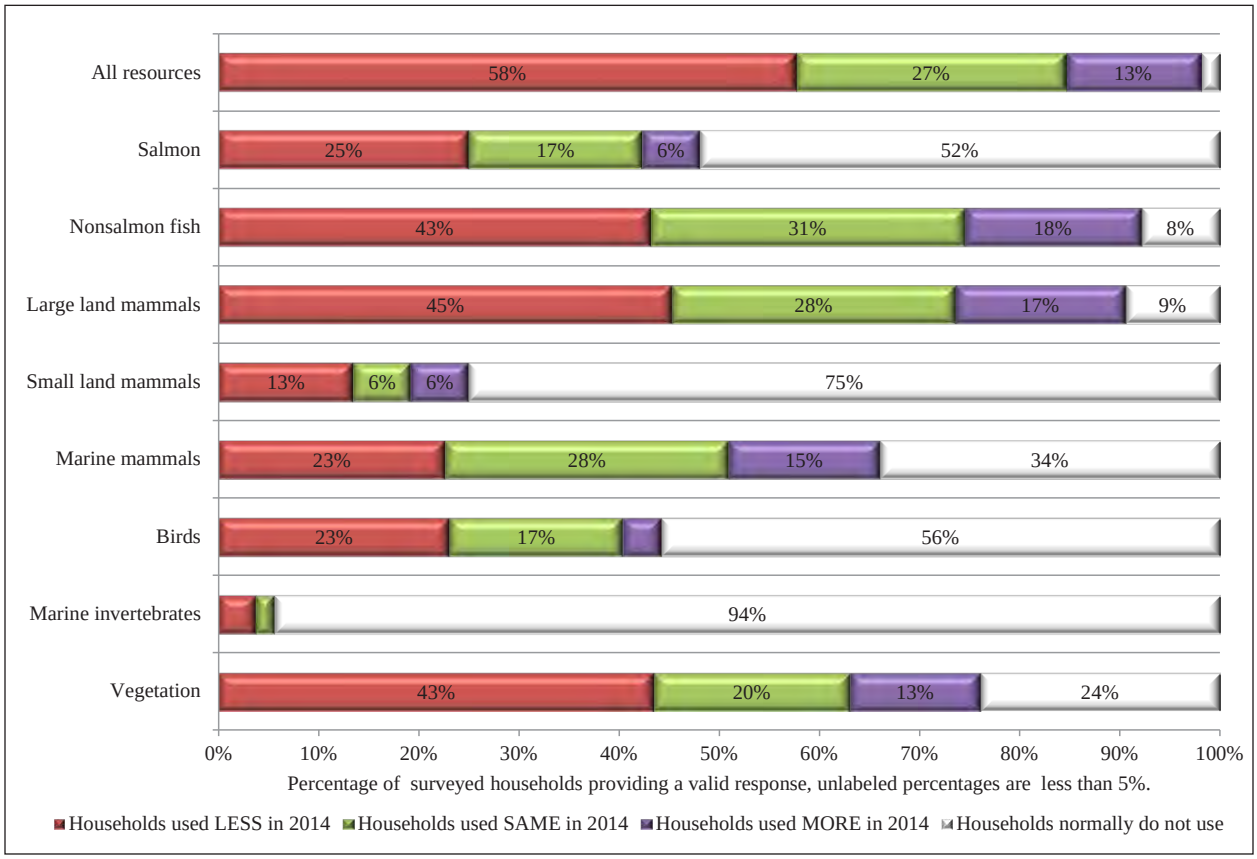


Figure 8-30.–Changes in household uses of resources compared to recent years, Anaktuvuk Pass, 2014.

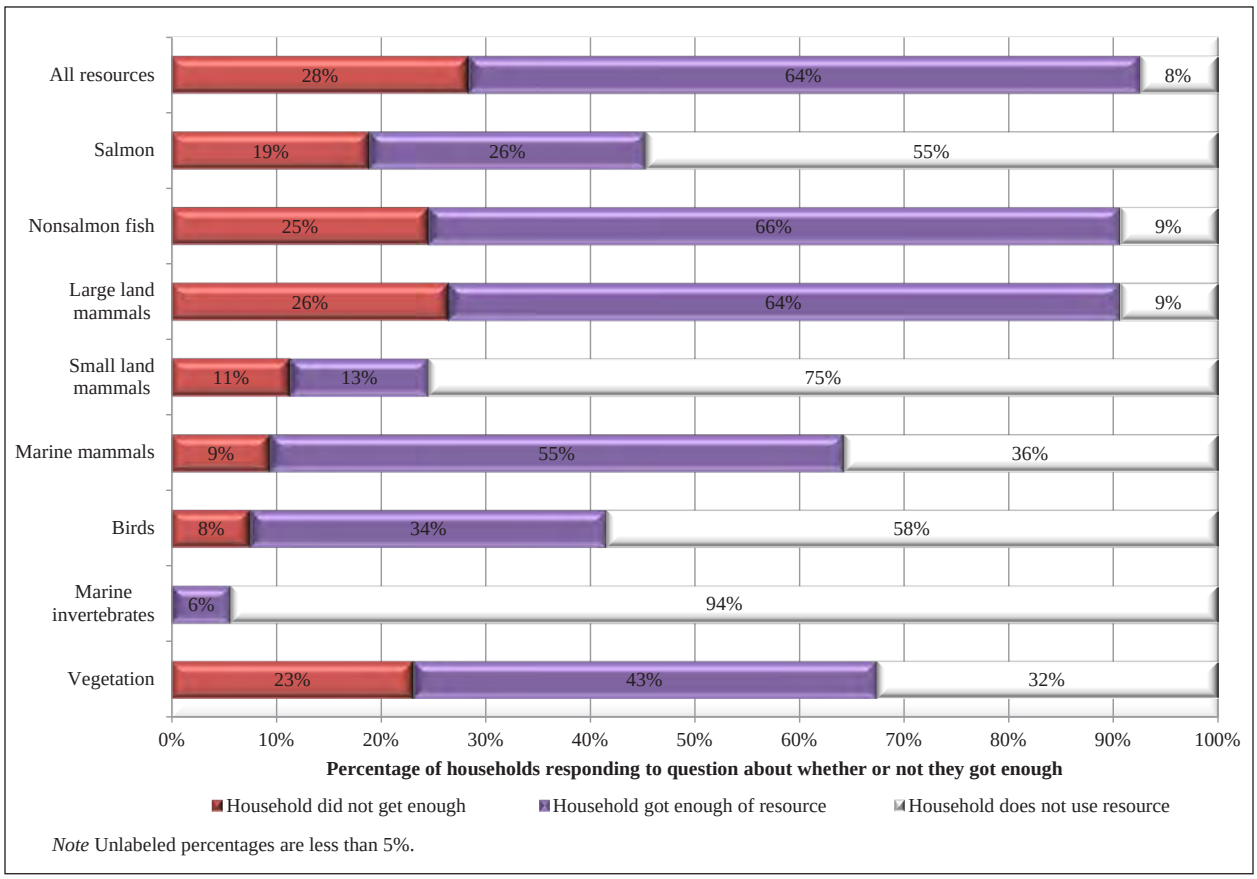


Figure 8-31.–Percentage of households reporting whether they had enough resources, Anaktuvuk Pass, 2014.

mammals; however, in both of these categories, high percentages of households reported that they do not use the resources.

Table 8-16 reports the reasons Anaktuvuk Pass households used less of each resource category. Of households that gave reasons for using less large land mammals in 2014, 48% answered that resource availability was the cause. Much smaller percentages of households cited other reasons such as less sharing, less effort, weather, and regulations. The 3 primary reasons reported for using less nonsalmon fish were less effort (38%), weather (31%), and availability of resource (25%). Sixty-three percent of those reporting a reason for less use of vegetation cited weather as the cause.

Table 8-17 reports the reasons households used more of a resource in comparison to recent years. Six of 9 responding households said they used more large land mammals in 2014 because they needed more. Three households said they used more nonsalmon fish because they needed more, and 2 said it was because they had more help.

Survey respondents who answered that they did not get enough of a resource were asked to assess how severe the resulting impact was to their household. Respondents chose either minor, major, severe, or not noticeable to describe the effect of not getting enough. Nine of the 15 households reporting that they did not get enough subsistence resources in 2014 indicated that it had a major impact (Table 8-18). Fourteen households reported that they did not get enough large land mammals: 5 of these indicated the impact was major, and 5 indicated that it had a severe impact. Eleven of 13 households that did not get enough nonsalmon fish said the impact was minor. Of 10 households not getting enough salmon, 7 indicated that the effect was minor or not noticeable. All those reporting that they did not get enough birds indicated that it had a minor impact.

Table 8-16.–Reasons for less household uses of resources compared to recent years, Anaktuvuk Pass, 2014.

Resource category	Valid responses[a]	Households reporting reasons for less use	Family/ personal		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful		Weather/ environment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	52	24	4	16.7%	10	42%	0	0.0%	1	4%	2	8%	6	25%	0	0.0%	4	16.7%
Salmon	52	10	1	10.0%	3	30%	0	0.0%	0	0%	2	20%	1	10%	0	0.0%	0	0.0%
Nonsalmon fish	51	16	2	12.5%	4	25%	0	0.0%	0	0%	0	0%	6	38%	1	6.3%	5	31.3%
Large land mammals	53	23	2	8.7%	11	48%	0	0.0%	0	0%	3	13%	2	9%	2	8.7%	2	8.7%
Small land mammals	52	6	0	0.0%	2	33%	1	16.7%	0	0%	0	0%	2	33%	0	0.0%	1	16.7%
Marine mammals	53	11	0	0.0%	1	9%	1	9.1%	0	0%	8	73%	0	0%	0	0.0%	0	0.0%
Birds	52	11	1	9.1%	3	27%	1	9.1%	0	0%	4	36%	3	27%	0	0.0%	1	9.1%
Marine invertebrates	53	2	0	0.0%	0	0%	0	0.0%	0	0%	1	50%	1	50%	0	0.0%	0	0.0%
Vegetation	46	19	0	0.0%	4	21%	0	0.0%	1	5%	1	5%	3	16%	0	0.0%	12	63.2%

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Table 8-16.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Other reasons		Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Equipment/ fuel expense		Used other resources	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	52	24	3	13%	0	0.0%	2	8.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	52	10	1	10%	0	0.0%	2	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	51	16	0	0%	2	12.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	6.3%
Large land mammals	53	23	1	4%	0	0.0%	2	8.7%	0	0.0%	0	0.0%	0	0.0%	1	4.3%	0	0.0%
Small land mammals	52	6	1	17%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	53	11	2	18%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	52	11	1	9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	53	2	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	46	19	0	0%	1	5.3%	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, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never using the resource.

Table 8-17.–Reasons for more household uses of resources compared to recent years, Anaktuvuk Pass, 2014.

Resource category	Valid responses[a]	Households reporting reasons for more use	Increased availability		Used other resources		Favorable weather		Received more		Needed more		Increased effort		Had more help	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	52	7	0	0.0%	1	14.3%	0	0.0%	0	0.0%	4	57.1%	0	0.0%	2	28.6%
Salmon	52	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	100.0%	0	0.0%	0	0.0%
Nonsalmon fish	51	8	0	0.0%	1	12.5%	0	0.0%	0	0.0%	3	37.5%	0	0.0%	2	25.0%
Large land mammals	53	9	0	0.0%	0	0.0%	0	0.0%	0	0.0%	6	66.7%	1	11.1%	1	11.1%
Small land mammals	52	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%
Marine mammals	53	8	0	0.0%	0	0.0%	0	0.0%	0	0.0%	7	87.5%	0	0.0%	1	12.5%
Birds	52	1	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	53	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	46	6	0	0.0%	2	33.3%	0	0.0%	2	33.3%	0	0.0%	0	0.0%	2	33.3%

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Table 8-17.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for more use	Other		Regulations		Traveled farther		More success		Needed less		Store-bought expense		Got/ fixed equipment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	52	7	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	52	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	51	8	0	0.0%	1	12.5%	0	0.0%	0	0.0%	2	25.0%	0	0.0%	0	0.0%
Large land mammals	53	9	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	11.1%	0	0.0%	0	0.0%
Small land mammals	52	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	66.7%	0	0.0%	0	0.0%
Marine mammals	53	8	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	52	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	53	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	46	6	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	16.7%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Valid responses do not include households that did not provide any response and households reporting never use.

Table 8-18.–Reported impact to households reporting that they did not get enough of a type of resource, Anaktuvuk Pass, 2014.

		Households not getting enough _____ .				Impact to those not getting enough _____ .									
	Sample	Valid responses[a]		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
All resources	53	49	92.5%	15	30.6%	1	6.7%	0	0.0%	4	26.7%	9	60.0%	1	6.7%
Salmon	53	24	45.3%	10	41.7%	0	0.0%	4	40.0%	3	30.0%	2	20.0%	1	10.0%
Nonsalmon fish	53	48	90.6%	13	27.1%	1	7.7%	0	0.0%	11	84.6%	1	7.7%	0	0.0%
Large land mammals	53	48	90.6%	14	29.2%	0	0.0%	1	7.1%	3	21.4%	5	35.7%	5	35.7%
Small land mammals	53	13	24.5%	6	46.2%	1	16.7%	2	33.3%	2	33.3%	0	0.0%	1	16.7%
Marine mammals	53	34	64.2%	5	14.7%	1	20.0%	1	20.0%	1	20.0%	2	40.0%	0	0.0%
Birds	53	22	41.5%	4	18.2%	0	0.0%	0	0.0%	4	100.0%	0	0.0%	0	0.0%
Marine invertebrates	53	3	5.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	53	35	66.0%	12	34.3%	1	8.3%	1	8.3%	5	41.7%	3	25.0%	2	16.7%

Source ADF&G Division of Subsistence household surveys, 2015.

a. Includes households failing to respond to the question and those households that never used the resource.

Table 8-19.–Resources of which households reported needing more, Anaktuvuk Pass, 2014.

Resource	Households needing	Percentage of households
All resources	1	1.9%
Fish	4	7.5%
Salmon	4	7.5%
Coho salmon	2	3.8%
Chinook salmon	1	1.9%
Pink salmon	1	1.9%
Sockeye salmon	3	5.7%
Nonsalmon fish	1	1.9%
Arctic char	6	11.3%
Dolly Varden	1	1.9%
Lake trout	2	3.8%
Arctic grayling	1	1.9%
Caribou	17	32.1%
Moose	1	1.9%
Dall sheep	2	3.8%
Snowshoe hare	2	3.8%
Marmot	1	1.9%
Arctic ground (parka) squirrel	1	1.9%
Gray wolf	4	7.5%
Wolverine	2	3.8%
Unknown seal oil	2	3.8%
Walrus	1	1.9%
Bowhead whale	2	3.8%
Birds and eggs	1	1.9%
Geese	2	3.8%
Ptarmigan	1	1.9%
Berries	6	11.3%
Blueberry	5	9.4%
Lowbush cranberry	2	3.8%
Crowberry	1	1.9%
Cloudberry	5	9.4%
Plants, greens, and mushrooms	1	1.9%
Unknown	2	3.8%

Source ADF&G Division of Subsistence household surveys, 2015.

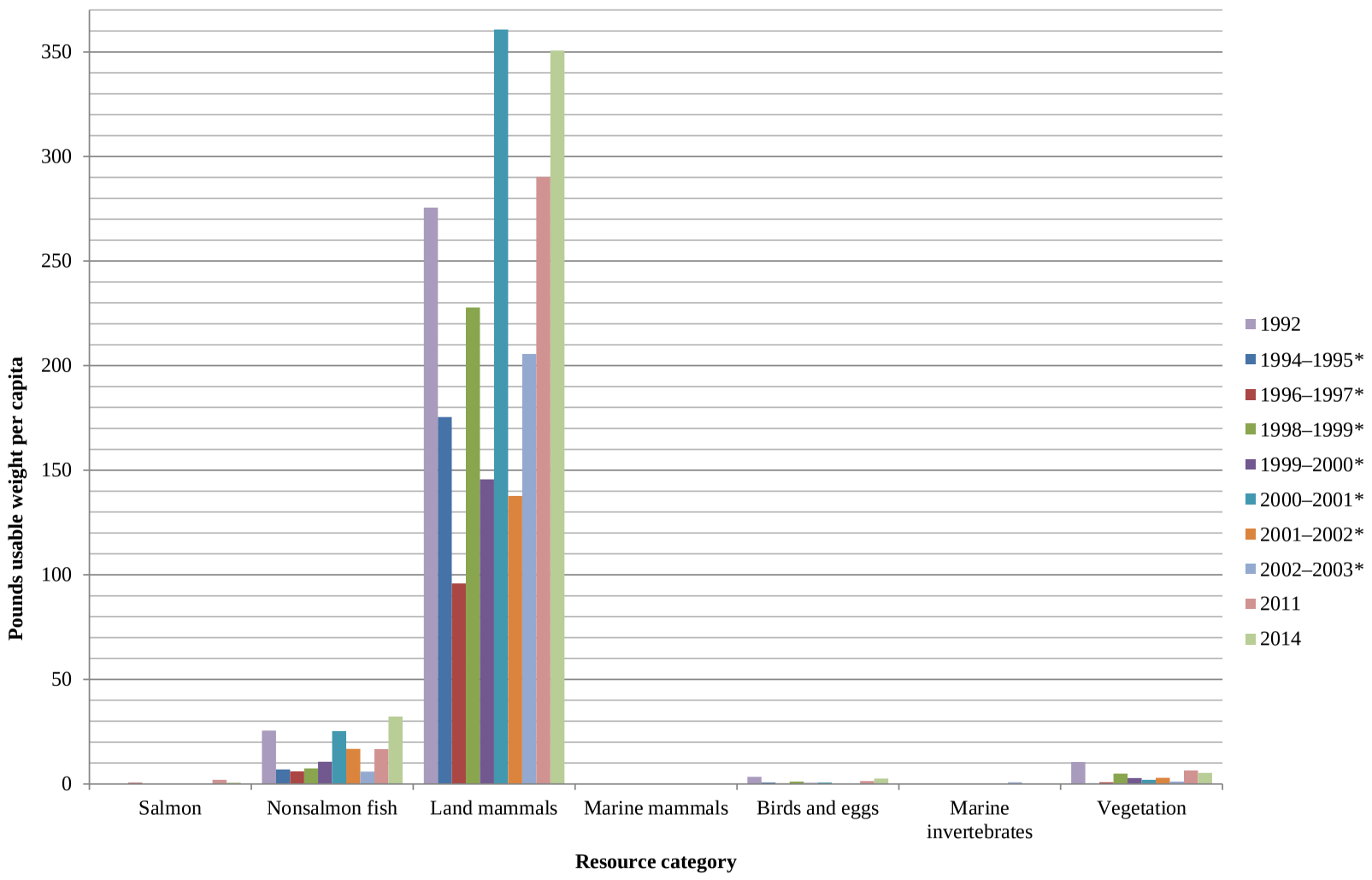
Respondents who indicated that they did not get enough of a resource category were then asked to identify what resources were needed. Table 8-19 shows the resource categories and species of which Anaktuvuk Pass households reported needing more in 2014. Answers to this question varied in specificity; some respondents indicated that they needed more of a general type of resource, such as fish, while others gave more precise answers, indicating that they needed more of a certain resource category, such as salmon, or of a certain species, such as Chinook salmon. Many households gave multiple answers to this question for each resource category, and all answers were recorded on the survey.

Twenty households indicated a need for more large land mammals, 17 of which specified a need for caribou. A total of 26 responses indicated that households needed more fish or certain fish species. Eleven of these responses indicated a need for nonsalmon fish, primarily Arctic char, and 11 indicated a need for salmon. Nineteen households identified a need for berries in 2014, primarily blueberries and cloudberries. Ten responses indicated a need for more small land mammals and furbearers including gray wolf, wolverine, and snowshoe hare.

Harvest Data

Changes or trends in the harvest of resources by Anaktuvuk Pass residents can also be discerned through comparisons with findings from other study years. Nine prior comprehensive surveys have documented annual subsistence harvests of all fish, land mammals, birds, and vegetation in Anaktuvuk Pass (Bacon et al. 2011rev.; Brower and Opie 1996; Fuller and George 1999rev.; Holen et al. 2012). Figure 8-32 and Table 8-20 show the composition of the community's subsistence resource harvest by resource category and edible pounds per capita for previous study years: 1992–2014.[4] Total harvests varied considerably between study years. This study's estimated harvest of 391 edible pounds per capita is the largest to date, but only 2 lb greater than the previous maximum (389 lb in 2000–2001; Figure 8-33). Considering the current study's 95% confidence limit of ±39%, the per capita harvest estimate is comparable to several previous study years.

4. For study years 1994–1995, 1996–1997, 1998–1999, 1999–2000, 2000–2001, 2001–2002, and 2002–2003, original studies cited did not provide estimates of harvest weight. For the purposes of comparison, this project applied the same conversion factors used in this study to estimated numbers of animals harvested and used Alaska Department of Labor population estimates for study populations.



Note * Indicates edible weights calculated from by multiplying estimated numbers of harvest by conversion factors used in this study.

Figure 8-32.– Comparison of per capita harvests by category, Anaktuvuk Pass, 2014.

Table 8-20.–Comparison of per capita harvests by category, in usable pounds, Anaktuvuk Pass, 2014.

Resource category	1992	1994–1995*	1996–1997*	1998–1999*	1999–2000*	2000–2001*	2001–2002*	2002–2003*	2011	2014
Salmon	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	2.0	0.7
Nonsalmon fish	25.5	7.0	6.0	7.4	10.6	25.2	16.7	5.9	16.7	32.2
Land mammals	275.6	175.5	95.8	227.8	145.7	360.7	137.7	205.6	290.3	350.6
Marine mammals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Birds and eggs	3.4	0.7	0.3	1.1	0.4	0.7	0.2	0.0	1.4	2.5
Marine invertebrates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
Vegetation	10.4	0.3	0.7	4.9	2.8	2.0	2.9	1.1	6.5	5.3
All resources	**315.0**	**183.4**	**103.4**	**241.3**	**159.5**	**388.5**	**157.6**	**213.4**	**316.8**	**391.3**

Sources Community Subsistence Information System (CSIS) for 2011 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data.

Sources 1992 data from Fuller and George 1997; 1994–2003 Bacon et al. 2011rev.

* Edible weights calculated by multiplying estimated numbers of harvest by conversion factors used in this study. Pounds per capita calcuated using ADOL population estimates.

In this and previous comprehensive studies, land mammals and nonsalmon fish harvests combined made up the overwhelming majority of harvest by edible weight—96 to 99.5%, and land mammals predominated in all years at 87–96% (Table 8-21). The estimated land mammal harvest ranged from 96 edible pounds per capita in 1996 to 361 lb in 2000 (Table 8-20). The current study's estimate of 351 lb per capita was the second highest of all study years. As in 2014, most land mammal harvest was caribou. The average nonsalmon fish harvest over the 9 previous study years was 14 edible pounds per person. The per capita estimate of 32 lb in 2014 was greater than any other study year. The per capita harvest of birds ranged from 0.2 to 1.4 edible pounds for most years. The current study's estimate of 3 lb per capita was more than double any previous year's data except for 1992. The vegetation harvest has fluctuated greatly across study years. The estimated 2014 vegetation harvest was 5 lb per capita; the average vegetation harvest over the 9 previous study years was 4 lb.

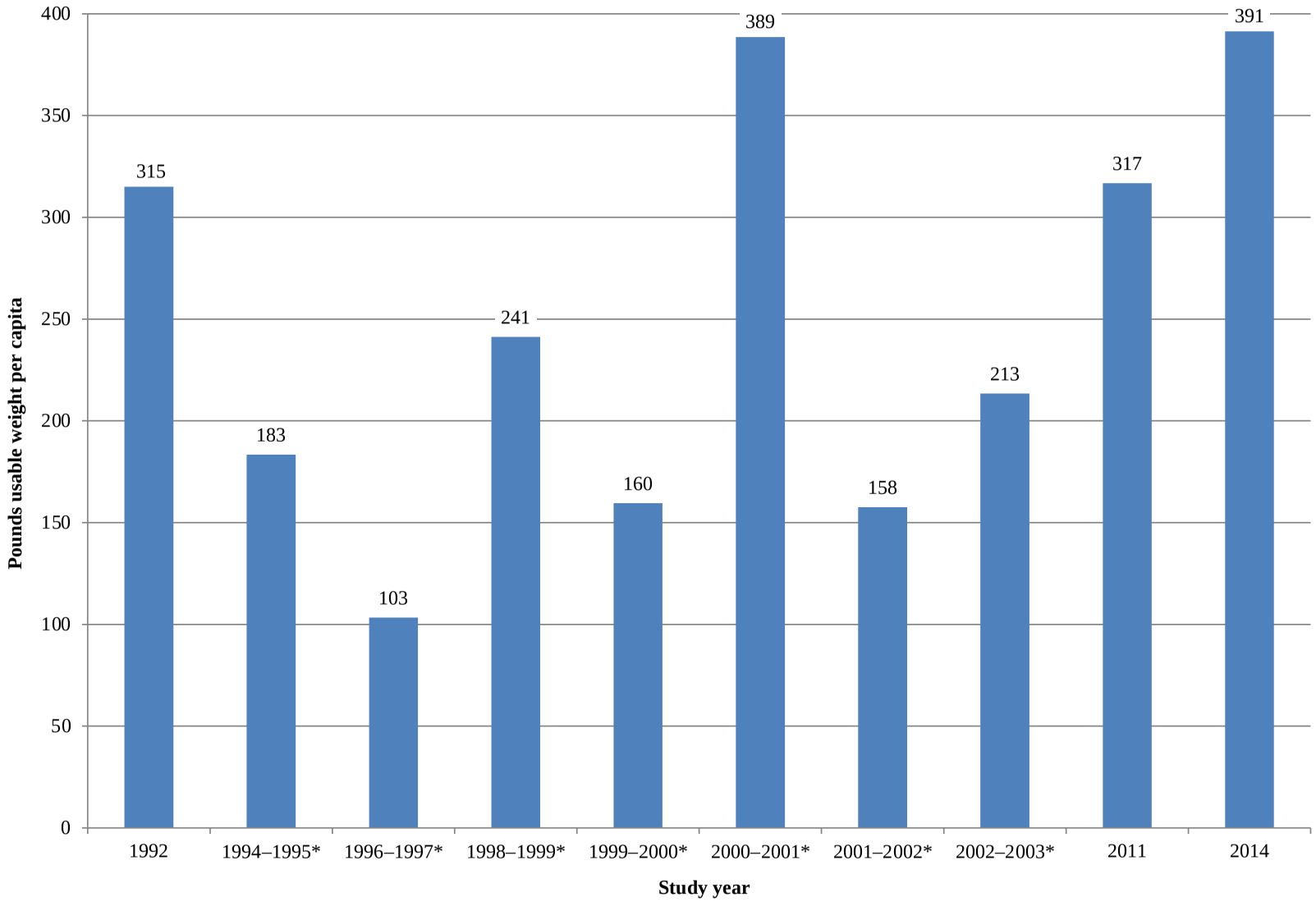
In addition to information collected in comprehensive studies, caribou harvest information for Anaktuvuk Pass was collected by ADF&G in focused studies for 1990–1991, 1991–1992, 1993–1994, and 2006–2007 study periods.[5] Conversion factors for caribou varied between some of these studies, therefore the number of caribou per person is the most accurate way to compare this large dataset. The average number of caribou harvested per Anaktuvuk Pass resident over all studies is 1.7 (Table 8-5; Bacon et al. 2011rev.; Brower and Opie 1996; Fuller and George 1997; Holen et al. 2012).[6] Harvest ranged from 0.7 to 2.6 animals per person. The 2.4 caribou person harvest estimated by the current study is second only to the 2000–2001 study period. Although caribou harvests have fluctuated over the years, these data confirm what would be expected, given what is known about the history of the Nunamiut people: the residents of Anaktuvuk Pass continue to rely heavily on caribou.

Harvests of other species have also varied over time. The average Dall sheep harvest across all previous data is 21 sheep (Table 8-5; Bacon et al. 2011rev.; Brower and Opie 1996; Fuller and George 1997; Holen et al. 2012).[7]. The 2014 estimate of 32 sheep is much more in line with this average than the maximum of 75 sheep in 2011. The 2014 lake trout harvest of 915 fish is the largest of all study years, and is considerably greater than the average of 371 fish over the previous 9 study years. More Arctic grayling were harvested in the last 2 study years than in all previous study years except for 1992: An estimated 2,487 Arctic grayling were caught in 2011, and 2,519 were caught in 2014. A comparison of certain furbearer species over time may be valuable because these species do not necessarily contribute to the edible pounds reported in these data. Seventy-three gray wolves were harvested in 2014: more than in any previous estimate and far more than the average of 31 wolves over the previous study years. The 1994 harvest of 61 wolves was the second highest of all study years. Twenty-two wolverines were harvested in 2014; far more than most previous years, and more than the average of 9 wolverines harvested per year as documented by the existing data.

5. ADF&G CSIS.

6. ADF&G CSIS.

7. ADF&G CSIS.



Note * Indicates edible weights calculated from by multiplying estimated numbers of harvest by conversion factors used in this study.

Figure 8-33.–Comparison of estimated per capita harvests, Anaktuvuk Pass, 2014.

Table 8-21.–Comparison of harvest compositions by category, by weight in usable pounds, Anaktuvuk Pass, 2014.

Resource category	1992	1994–1995*	1996–1997*	1998–1999*	1999–2000*	2000–2001*	2001–2002*	2002–2003*	2011	2014
Salmon	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.2%
Nonsalmon fish	8.1%	3.8%	5.8%	3.1%	6.7%	6.5%	10.6%	2.7%	5.3%	8.2%
Land mammals	87.5%	95.7%	92.7%	94.4%	91.3%	92.8%	87.4%	96.3%	91.6%	89.6%
Marine mammals	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Birds and eggs	1.1%	0.4%	0.3%	0.5%	0.3%	0.2%	0.1%	0.0%	0.4%	0.6%
Marine invertebrates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%
Vegetation	3.3%	0.2%	0.7%	2.0%	1.7%	0.5%	1.9%	0.5%	2.0%	1.3%

Sources Community Subsistence Information System (CSIS) for 2011 data; ADF&G Division of Subsistence household surveys, 2015, for 2014 data.
Sources 1992 data from Fuller and George 1997; 1994–2003 Bacon et al. 2011rev.
* Edible weights calculated by multiplying estimated numbers of harvest by conversion factors used in this study.

Current and Historical Harvest Areas

Subsistence use areas for Anaktuvuk Pass have been documented by several studies, including Pedersen's Regional Subsistence Land Use, North Slope Borough, Alaska (1979; lifetime use areas), 2001–2010 Anaktuvuk Pass subsistence use areas (Braund and Associates 2013a), and 2011 subsistence use areas (Holen et al. 2012).

The caribou search areas documented by this study are vast relative to those documented in 2011 (Holen et al. 2012). In 2011 Anaktuvuk Pass residents reported hunting caribou in just a few small areas southwest of the community near the John River and Ekokpuk Creek. Caribou hunting areas used from 2001 to 2010 extend far beyond those reported in this study and include the Killik River to the east and west to the Dalton Highway (Braund and Associates 2013a).

Moose hunting areas reported in 2011 included a large area surrounding the community. This differs from the results of the current study in which respondents only reported hunting moose along the Anaktuvuk and John Rivers and nearby tributaries in 2015. These 2015 moose hunting areas were very consistent with those reported for 2001–2010, however the 10-year study indicated that hunters traveled further from the community. The 2011 study documented Dall sheep hunting in a larger area surrounding the community than the current study. Reported nonsalmon fishing and migratory waterfowl hunting areas were comparable between studies.

Local Comments and Concerns

Following is a summary of local concerns about subsistence, as well as observations of wild resource populations and trends by Anaktuvuk Pass residents. These comments were recorded during the surveys, ethnographic interviews, and community meetings. Not all households are represented in the summary.

Anaktuvuk Pass respondents were primarily concerned about declining caribou numbers and changing migration patterns that take the herd farther from the community as it comes through the region in the fall (Plate 8-7). When the fall migration does pass through the valley, it can take several days for many thousands of caribou to pass by near the community. This has not happened in recent years:

> I would say within the last 5 years we haven't had a real herd, a real migrating herd come through. About 5 years maybe or so. But we do have caribou still. Stragglers we call 'em. That we do get enough caribou, but we, it would be good to have our real herd. (041615AKP3)

Respondents normally target large bull caribou with a lot of fat in August and September. The meat is cut into strips and preserved by drying (*paniqtaq*). Hunting caribou is more difficult when the migrating herd takes a distant route, and the result is more hunting effort throughout the year, more females taken overall, and less opportunity to dry caribou meat:

> They're supposed to be bulls in there, fat bulls, from fall-time that we're supposed to have harvested. Now we have nothing but females in our freezer. We would have gotten bulls and had way more paniqtaq. But our other freezers, 5 freezers, are usually full of bulls. Bull meat all cut up. But now that's females. (041615AKP3)

Plate 8-7.–Shed caribou antler near Anaktuvuk Pass.

Many respondents felt that nonlocal hunters are diverting the caribou migration by hunting the initial wave of the migrating herd rather than allowing them to pass through the valley as the local residents do.

Respondents feared that activities by these nonlocal hunters north of the community causes the entire herd to change their route and not pass near the community as they have in the past: "The first herd coming that's going to be going through our pass, they go up there and meet them…All of them [caribou] that's coming that's supposed to go through there, they'll stop" (041515AKP5). The migrating herd passes through the Anaktuvuk Pass Controlled Use Area (CUA) where use of aircraft for caribou hunting is prohibited.[8] However, some respondents believe that nonlocal hunters are illegally using planes in the area which contributes to the diversion of the herd:

> There's these little Super Cub planes that come and meet the regular scheduled flights and they take hunters out. You know they're hunters—they're out in their camo and rifle case. It's like, "Who are you hunting with here?" And they're like, "No, we're just going on a guided tour up North." And there's nothing you can do. (041515AKP2)

Not all respondents believed that nonlocal hunters are the cause of the problem. One respondent believes that local residents sometimes divert the herd migration as well: "Even Native people go up there. Kids that's not really learned the fundamentals of hunting, they'll go up there and meet the herd" (041515AKP5). Another key respondent explained that he believes the caribou migration change is caused by natural factors rather than hunters:

> I'm sure their migration pattern's changed…they're just totally missing this valley here and Chandler Valley, so it could just be from different migration patterns. A lot of people say there are sport hunters that fly up there, hunt up there, but not enough to disrupt the whole herd, I guess. (041415AKP1)

This respondent has spoken to sport hunting guides passing through the community who tell him that they cannot be diverting the herd because they are not seeing the caribou along their normal migration path:

8. Refer to the Introduction of this report for more information about the Anaktuvuk Pass CUA.

> I talk with a guide that operates north of here, and he usually seems pretty honest and from what I got, there just hasn't been caribou north of here…he's attended meetings before along with the locals, so he knows not to kill the first ones that come through. But he's been pretty honest and he just hasn't seen the caribou up there. (041415AKP1)

Many respondents are also concerned about sport hunters coming from outside the region, hunting only for trophy antlers, and allowing the meat to go to waste: "That Super Cub cannot carry a whole moose or caribou, I mean you can't take all of it. I don't know where the rest of the meat go, but you can't take your whole moose with you. They just take the horns…" (041315AKP4). Anaktuvuk Pass respondents described this practice as immoral and disrespectful, in addition to illegal. Many respondents feel that hunting guides should bring the meat to the community so that it can be distributed to residents who need it rather than allowing it to go to waste: "We'll see them come with stacks of big bull horns and sheep horns and sheep heads. But no meat. They don't even bring anybody meat" (041615AKP3).

Several respondents said that the Dall sheep population has decreased recently:

> The sheep numbers are going down within the past couple years…you just don't see the daycares anymore—the ewes and the lambs hang out in big groups during the summer. You don't see as much of those around anymore when you're out in the country. You don't see as many little babies running around. (041415AKP1)

This causes great concern for some families who rely heavily on Dall sheep meat when caribou are not available to them.

Some respondents voiced concerns about the high cost of gasoline making it difficult to hunt and fish as much as they had in the past. Also, some respondents are concerned about roads and natural resource development in the area because they believe it could have an irreversible negative impact on their subsistence way of life. Finally, respondents described their concerns about changing climate: "Even the plants are not as abundant as they used to be either…there's a lot of species of plants that are moving north. They're kind of taking over. You know, cottonwoods moving north. It's crazy" (041415AKP1).

Acknowledgements

The author would like to express thanks to the residents of Anaktuvuk Pass for allowing us to explore their community. We would like to thank our key respondents for granting us interviews and freely providing details about their experiences and their way of life. I would like to thank the Anaktuvuk Pass Tribal Council and the Tribal Administrator for facilitating this study. Finally, this research would not have been possible without the help of local research assistant Kilugi Morry, who scheduled and administered surveys and shared her knowledge of the community with us.

9. DISCUSSION AND CONCLUSIONS

Nicole M. Braem and Caroline L. Brown

This report describes the contemporary subsistence uses of fish, wildlife, and plant resources by 4 Interior Yukon River communities and 3 Arctic communities: a relatively widespread assemblage of communities with differing subregional affiliations. Research in the Yukon River communities of Tanana, Rampart, Healy, and Stevens Village provided a partial representation of subsistence harvest and use patterns for the upper-middle Yukon and Tanana rivers area. Research in the communities of Utqiaġvik, Nuiqsut, and Anaktuvuk Pass documented current subsistence harvest and use patterns on Alaska's North Slope. These 2 regions are diverse in terms of community size, history, economy, and subsistence resource base.

Due to the numerous differences between communities in the upper-middle Yukon River and the North Slope, subsistence harvest and use information is discussed separately by region, while demographic, economic, food security, and ethnographic themes are discussed on a broader, comparative scale. After these cross-regional comparisons, this chapter discusses harvest patterns separately for the Interior communities and the Arctic communities on the regional level, by specific resource, and through time.

Cross-regional Comparisons

As discussed in the Introduction, the subsistence bases of Interior communities and Arctic communities have not changed much through time, but differ significantly from each other, with important effects for harvest and use patterns. As small seasonal settlements gave way to more sedentary communities in the mid-1900s in Interior Alaska, residents continued to trap small land mammals and hunt birds in the spring, set up fish camps along the mainstem Yukon River for salmon and other nonsalmon fish species in the summer, and pursue large ungulates like moose in the fall before fishing under the ice for resident nonsalmon fish species. With few exceptions, the riverine, boreal communities of Interior Alaska have largely relied on moose and salmon as the base of their subsistence economies, augmented by trapping small land mammals for food and fur and smaller harvests of birds, vegetation, and nonsalmon fish. In many communities, salmon have accounted for at least one-half of the total subsistence harvest in any given year. With generally stable populations across much of the Interior and supplying approximately 500 lb of meat per animal, moose have also provided for a significant component of total community harvests. According to a recent update on subsistence hunting and fishing across Alaska (Fall 2014, 2016), rural Interior communities harvested an average of 320 lb of wild foods per person. High percentages of households in each community reported harvesting and using wild resources: 75% of Interior Alaska households reported harvesting fish resources, and 92% reported using them. Similar numbers of households reported harvesting and using wild game (69% and 88%, respectively).

High levels of subsistence harvest and use of wild foods is also a hallmark of Arctic communities. According to Fall (2014, 2016), Arctic households harvested 438 lb of wild foods per person. Harvest and use levels were similar to those reported by Interior communities: 78% of households harvested fish resources, and 96% reported using them; 63% of households harvested wild game resources, and 92% reported using them. Although harvesting levels and patterns are similar to the Interior region, the resources harvested and used by Arctic communities differ greatly from Interior communities. Salmon species and moose play much lesser roles in subsistence harvests; marine mammals, caribou and nonsalmon fishes typify North Slope subsistence harvest patterns. Two of the Arctic communities in this study (Utqiaġvik and Nuiqsut) are whaling communities and annually take bowhead whales under quotas established by the International Whaling Commission. Anaktuvuk Pass, located far from the coast, does not harvest marine mammals and as a result depends far more heavily on caribou, moose, Dall sheep, and nonsalmon fish harvests.

Multiple studies have looked at correlations between demography, economics, and subsistence productivity. In this section, we compare the results from participating communities on a regional level to consider some of these correlations. Population histories may be an indicator of general community health by indicating

community growth or decline as metrics of opportunity in a particular community. Generally speaking, coastal Arctic communities tend to be larger than boreal Interior communities and this holds true for the communities included in this study, with the exception of Healy. The communities surveyed in this study—Utqiaġvik, Nuiqsut, and Anaktuvuk Pass, on the North Slope, and Tanana, Rampart, Stevens Village, and Healy in the middle Yukon River region—had a total estimated population of 7,306 individuals (Table 1-1). The Arctic communities ranged in size from 318 to 5,315 people in the regional hub of Utqiaġvik. All of the Arctic community populations in this study were either stable or increasing slightly (Table 1-1; figures 6-3, 7-2, and 8-2). In contrast, populations in the Interior communities ranged from 10 to 204 people and have declined over recent years (Table 1-1; figures 2-2, 3-2, 4-1). The exception to this pattern was Healy, the only community connected to the statewide road system, which had 1,006 residents and was the only Interior study community with an increasing population (Table 1-1; Figure 5-3).

In their work addressing the differences between urban and rural communities, Wolfe and Walker (1986, 1987) found that communities with high percentages of Alaska Natives, farther away from urban centers and not connected to the statewide road system tend to have higher per person subsistence harvests.[1] Indeed, communities along the road system harvested approximately 69% less than communities off the road system (Wolfe and Walker 1987). These earlier works posited that roads connecting to urban centers promote settlement entry (immigration by non-Natives), in turn promoting changes associated with lower subsistence harvests such as increased competition and changes in community economic orientation away from mixed subsistence-wage adaptations. Magdanz et al.'s (2016) reevaluation of subsistence productivity found that the most significant factors were economic region[2] and road access to urban centers. Roads had a significant and strong effect on subsistence harvests, but no significant effect on incomes. The latter study also found that community size influenced *both* income and subsistence production.[3]

In the majority of the 2014 study communities, high levels of residents self-identified as Alaska Native (84% to 100%; tables 2-2, 3-2, 4-2, 7-2, and 8-2). The 2 exceptions were Utqiaġvik, a regional hub community with a 67% Alaska Native population (Table 5-2), and Healy, the largest of the participating Interior communities and, as noted above, the only community on the road system. Only 2.6% of the Healy population reported as Alaska Native (Table 6-2). The highest per capita subsistence harvests documented in this study took place in Nuiqsut (896 lb) and Tanana (969 lb); these were more than double those seen in other off-road communities in this study and were the only communities with notable fish harvests exclusively for dogs (tables 2-4 and 7-4). The per capita harvest in Utqiaġvik (362 lb), a regional hub, was unexpectedly similar to that of Anaktuvuk Pass (392 lb), Stevens Village (375 lb), and Rampart (378 lb) and was also the highest per capita level ever recorded for Utqiaġvik (tables 3-4, 6-4, and 8-4 Braund and Associates 1993; Fuller and George 1997). This may be a result of sampling issues that resulted in very high estimates of certain species, discussed in more detail in the Utqiaġvik chapter. In the few studies completed

1. See also Magdanz et al. (2016).

2. The 2016 reevaluation followed the approach in Goldsmith (2007): dividing the state into economic regions by aggregating census areas based on accessibility and economic characteristics; these regions happen to mirror the distribution of Alaska's indigenous population. "The urban region includes the Anchorage, Matanuska-Susitna, Kenai Peninsula, Fairbanks, and Juneau boroughs. The 'other rural' region includes boroughs and census areas outside urban areas but along the road system, served by a marine ferry system in southeast Alaska, or dominated by commercial fishing or military activities" (Magdanz et al. 2016).

3. "Throughout the study area, substantial differences existed between smaller and larger communities...On the one hand, people in smaller communities harvest 114% more subsistence food (in edible pounds) than people in larger communities, a mean per person subsistence harvest of 373 pounds compared with 175 pounds. On the other hand, people in larger communities have 63% more personal income than people in smaller communities, a per person mean income of $27,674 compared with $16,991. These contrasts in harvests and incomes suggest that community population influences Alaska's small community economies, specifically, that harvests decrease and incomes increase with increases in community population" (Magdanz et al. 2016).

in rural regional hubs, per capita harvests in regional hubs have generally been less than those of the smaller communities surrounding them (Braund and Associates 1993).[4,5]

Studies of the factors affecting community subsistence harvests also found an inverse relationship between mean community incomes and subsistence productivity (Wolfe and Walker 1987; Wolfe et al. 2010). Magdanz et al. (2016:34) confirmed this:

> For 269 projects with valid observations, community mean harvests per household decrease by 2.5% for each 10% increase in community mean income per household. Controlling for household size, the influence of income on harvest is almost twice as strong. Community mean harvests per person decrease by 4.3% for each 10% increase in community mean income per person.

Results from the 2014 surveys are consistent with these analyses to a limited degree, but also point to some inconsistencies in the interplay of all factors described. Mean per capita incomes ranged from $20,130 in Tanana to $35,380 in Utqiaġvik (tables 2-1 and 6-1). Tanana had the highest 2014 per capita harvest (969 lb; Table 2-1) and the lowest mean per capita income, although this relationship may be distorted by the levels of fish harvests for dogs that are included in the per capita estimate. However, the per capita harvests of Anaktuvuk Pass and Utqiaġvik were similar (392 lb and 362 lb, respectively), while their mean per capita incomes varied more broadly ($21,837 and $35,380, respectively; tables 6-1 and 8-1). Although the per capita incomes of Healy ($28,406) and Nuiqsut ($28,855) were similar, Healy had relatively low per capita harvest (52 lb) compared to Nuiqsut (896 lb; tables 5-1 and 7-1). However, Healy residents do not have geographic or legal access to a major North Slope resource: marine mammals; more importantly, other factors likely contribute to this low harvest, including the historical origins of the community, the ethnic make-up of the population, and the relatively long distance to subsistence salmon fisheries. Differences in cost of living or wages between different economic regions can be substantial, confounding cross regional comparisons, and possibly contributing to inconsistencies with earlier findings.

The factors associated with individual household productivity in rural, predominately Alaska Native communities have also been explored (Wolfe et al. 2010). Wolfe et al. (2010) argued that, among Alaska Native households in rural Alaska, income and household subsistence productivity were positively correlated; that is, the higher the household income, the more likely that the household's subsistence production would also be high. Wolfe et al. (2010) identified several factors that correlate with high household productivity, including multiple working-age males, commercial fishing involvement, and higher wage incomes. These high producing households harvested more than necessary for their own needs in order to provide food to others in the community. Further analysis of 2014 data, specifically looking at the relationship between income and household subsistence production, may provide insight into similar patterns.

Relationships between subsistence patterns and household income may also be reflected in levels of food security. Food security scores among the study communities generally mirrored those of Alaska overall (88% food secure) and the United States in general (86% food secure; Figure 9-1); 5 of the 6 study communities had equal or higher percentages of food secure households than the state or nation. The exception was Anaktuvuk Pass, where only 81% of households were categorized as food secure. Of North Slope communities, Anaktuvuk Pass also had the lowest mean household income—approximately $38,000 less than Utqiaġvik, the Arctic community reporting the highest levels of food security (Table 8-9; Figure 8-25). Sources of food insecurity varied as well. Arctic communities mostly reported similar levels of subsistence food and store-bought food not lasting. Interior communities reported very different levels between the 2 types of foods and also much higher levels of subsistence food not lasting. The relationship (if any) between food security scores and per capita harvests is not yet well understood. Rampart, Healy,

4. Braem, Nicole M., D.S. Koster, M. Kostick, A.R. Godduhn, and E.H. Mikow. In prep. Chukchi Sea and Norton Sound Observation Network: Golovin, Noorvik, Point Lay, Stebbins, Diomede, Deering, Kotzebue, Point Hope, and Shishmaref, 2012–2014. Alaska Department of Fish and Game, Division of Subsistence technical paper, Fairbanks.

5. Ikuta, H., D.M. Runfola, A. Brenner, D.S. Koster, M.L. Kostick, and J. Park. *In prep.* Subsistence harvests and uses in Bethel, 2012. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 393.

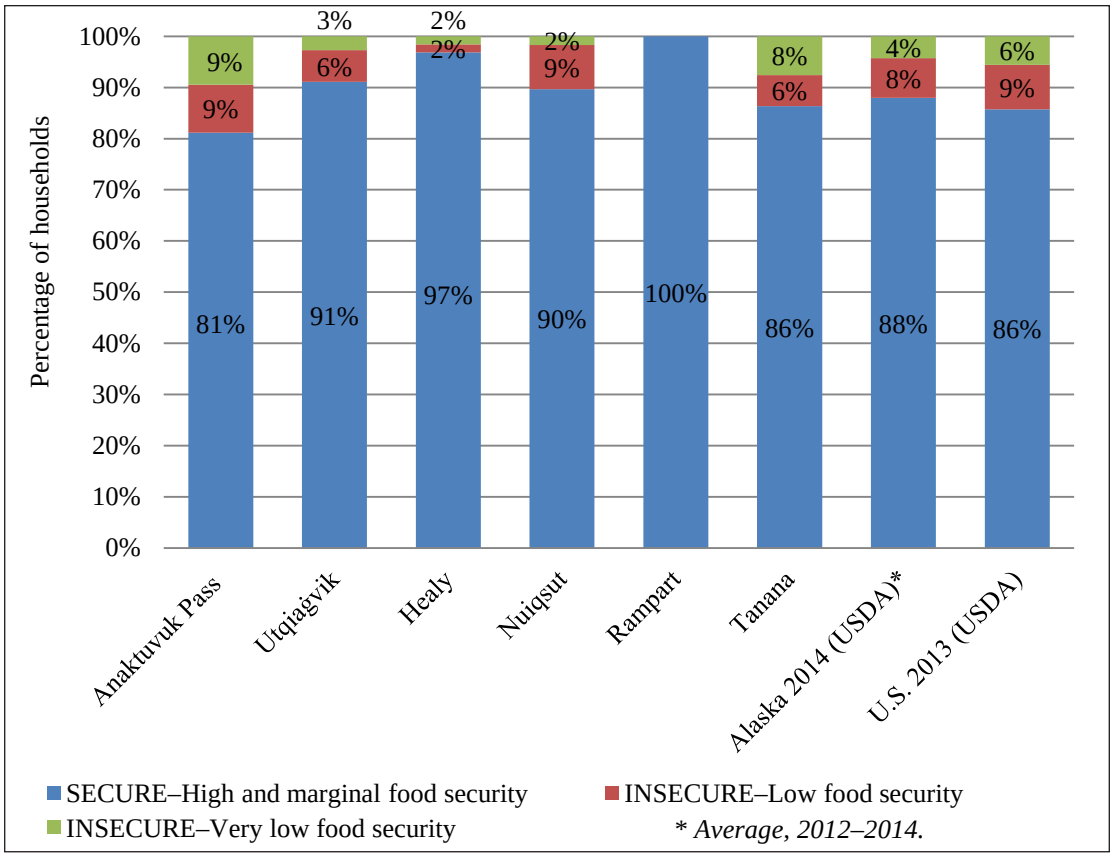


Figure 9-1.–Food security categories, study communities, Alaska, and U.S., 2013 and 2014.

and Utqiaġvik have the highest food security scores as well as the lowest per capita harvests; these data suggest that food insecurity, where it exists, may relate to store-bought food. This is consistent with other recently collected data showing that food security scores and per capita harvests do not always positively correlate (e.g., communities with low food security have relatively high per capita harvests and vice versa; see also Brown et al. 2012, 2013). As authors noted in Magdanz et al. (2016:50):

> Paradoxically, while subsistence harvests in rural areas are more than sufficient to provide for protein needs, high levels of food insecurity and poor diet quality have been reported among rural Northern indigenous populations. Diet quality is measured in part by applying Euro-American diet standards, measuring consumption of grains, vegetables, and fruits (Bersamin et al. 2006), by which standards virtually any traditional northern diet would have been judged "poor." Nonetheless, detrimental effects of increased consumption of fats and sugars are evident (Bersamin et al. 2008). The high harvest-poor diet paradox warrants further attention.

Interior

Prior to 2010, comprehensive subsistence data from middle Yukon area communities were relatively old (>20 years old), especially in the general area of the proposed pipeline. Table 9-1 lists more recent available data on harvest by community and year for the area of the proposed Alaska LNG project. However, 2 important resource categories—salmon and large land mammals, primarily moose—are well documented for most Interior communities. The salmon data from the Yukon River extend back to the 1960s, but because of methodological changes, those data are not comparable with more recent data until 1988, when the methods for the current program were implemented. Additional data sets on large land mammals and nonsalmon fish harvests exist for Tanana. Large land mammal harvest data exist for 1997–2002. This section will begin

Table 9-1.–Comprehensive subsistence harvest surveys in Interior Alaska communities in proposed pipeline corridor, 2011–2015.

Community	Study year	Publication
Allakaket/Alatna	2011	Holen et al. 2012
Bettles	2011	Holen et al. 2012
Coldfoot	2011	Holen et al. 2012
Dot Lake	2011	Holen et al. 2012
Dry Creek	2011	Holen et al. 2012
Evansville	2011	Holen et al. 2012
Healy Lake	2011	Holen et al. 2012
Tok	2011	Holen et al. 2012
Wiseman	2011	Holen et al. 2012
Minto	2012	Brown et al. 2014
Manley	2012	Brown et al. 2014
Healy	2014	Brown et al. *in prep*
Rampart	2014	Brown et al. *in prep*
Stevens Village	2014	Brown et al. *in prep*
Tanana	2014	Brown et al. *in prep*
Nenana*	2015	–
Anderson*	2015	–
Ferry*	2015	–
McKinley Village*	2015	–

Source ADF&G Division of Subsistence, 2016.

* Fieldwork completed in 2016.

with a discussion of general harvest patterns for the study area and year. It will then consider the harvest patterns of these resource categories within an historical context.

Total subsistence harvests appear to have declined for the study communities in the middle Yukon River area and the Nenana River basin. In the 3 communities for which earlier comprehensive data exist, 2014 harvest levels were all 45% or less of mid-1980s levels (Figure 9-2).

Historical Harvest Comparisons by Resource

Moose

Traditionally, moose harvests by local residents have been an essential part of subsistence hunting activities in the middle Yukon River region (Andersen et al. 1998, 2000, 2001, 2004; Brown et al. 2004). According to local knowledge, the number of moose in the middle Yukon River area dramatically increased around the 1940s (Huntington 1993). By the late 1980s and 1990s, moose populations had increased enough to attract many hunters from outside of the local area, and local residents began to express concerns about high levels of hunting activity. Historical reliance on moose as a primary subsistence resource has been supported by variable densities of moose populations throughout GMUs 20, 21 and 25.[6] Specifically in 2014, Tanana residents utilized GMUs 21B and D and GMU 20F; hunters in Rampart also searched for moose in GMU 20F. Residents of Healy used the most GMUs in 2014: the majority of hunting areas fell in GMUs 20A and B with smaller areas located in GMU 20B and GMU 21C.

6. Residents of Stevens Village utilize GMU 25 for moose hunting; however, because of confidentiality issues associated with the small sample in Stevens Village, moose populations and search areas in GMU 25 are not discussed here.

Figure 9-2.–Estimated total community harvests, Tanana, Stevens Village, and Healy, 1984, 1987, and 2014.

Moose in these GMUs are managed as separate populations. Based on a 2008 survey, the moose population in GMU 21B was estimated at 2,317 moose (0.27 moose/mi²), below management objectives of 4,000–6,000 moose (Stout 2010). Because of the lack of human settlements and low harvests, ADF&G does not produce unit-wide moose population estimates in GMU 21C, though a small part of the unit was surveyed as part of a larger study focused on GMU 21D and indicated a lightly harvested, low-density moose population (Pamperin 2014). In GMU 21D, Area Biologist Glenn Stout estimated the 2011 moose population at approximately 8,611, an estimate not significantly different from the earlier surveys (Stout 2014). Although the moose population was stable, it did not yet meet management objectives of 9,000–10,000 moose. In the early 2000s, ADF&G formed the Koyukuk River Moose Hunters' Working Group (KMWG) to provide a forum for local and nonlocal hunters to cooperatively develop management recommendations (ADF&G Division of Wildlife Conservation 2001). Tanana residents reported utilizing GMU 21D, designated as Zone 1 in the planning process. The KMWG's recommendations for Zone 1 resulted in regulatory changes that intended to maintain high moose population densities without allowing an increase in hunter numbers or harvest levels in the area.[7] According to the area biologist, moose densities in GMU 21D declined in the late 1990s, stabilizing at these lower densities by about 2005.[8] Moose harvests have also remained constant since the early 2000s, when the moose populations stabilized. Minimal surveying has occurred in GMU 20F; ADF&G estimates a moose population of approximately 1,000–2,000 moose, or 0.25–0.50 moose/mi^2, based on a 1988–1989 survey (Hollis 2014).

The 1997–2002 data set (Andersen et al. 1998, 2000, 2001, 2004; Brown et al. 2004) can also be considered alongside comprehensive data from other middle Yukon communities. In 1987, Tanana residents reported an estimated moose harvest of 57 moose (40,050 lb harvested or 116 lb per person; Table 2-24; Case and Halpin 1990). Between 1997 and 2002, their harvest of moose ranged from 39 to 60 with an average of 50 moose harvested annually. In 2008, the total harvest was 57 moose (30,600 lb or 137 lb per person; Table 2-24; Wolfe and Scott 2010). And finally in 2014, Tanana hunters reported harvesting 33 moose (17,869 lb or 88 lb per capita; Table 2-24). Multiple factors are at play in understanding moose harvests in the middle Yukon area: Tanana's total community and per capita harvests have declined over time; the human population has also declined from 1987; but the contribution of moose to the total community harvest has increased slightly (5% of the total subsistence harvest in 1987 to 9% in 2014; Figure 2-8; Case and Halpin 1990).

In Healy, where residents primarily accessed GMUs 20A and C, with smaller hunt areas in GMU 20B and GMU 21C, moose harvests accounted for 23% of the total harvest in 1987[9] compared to 57% in 2014 (Figure 5-9). This change likely results from a shift in the total harvest composition. In 2014, Healy residents reported slightly higher moose harvests (34 lb per capita in 2014; 30 lb per capita in 1987) but much lower salmon harvests (9 lb per capita; 59 lb per capita) than in 1987 (Table 5-4).[10] In GMU 20A east of the Tanana River around Healy, moose populations appear to have stabilized around the intensive management goal of 12,000 moose after the implementation of liberal antlerless hunting opportunities to reduce the high-density, nutritionally-stressed population throughout the 2000s (Young Jr. 2014). However, moose densities in GMU 20C on the western side of the Tanana River have been low for many years, likely from predation by wolves and bears (Hollis 2014). Infrequent surveying suggests a likely density fluctuating between 0.2–0.7 moose/mi^2 or approximately 3,800 moose in 2011 outside Denali National Park and Preserve.

As suggested earlier in this section, there are some prominent differences evident in the resource harvest patterns of the participating Interior communities. In 2014, Healy households harvested 29 lb of moose per person, and moose accounted for 57% of the total wild resource harvest (Table 5-4; Figure 5-9). In Tanana and Rampart, both of which are off the road system and situated along the Yukon River, moose provided

7. See Brown et al. (2015) for a more detailed description of moose management in GMU 21D.

8. Glenn Stout, Area Biologist, ADF&G, Galena, personal communication, June 10, 2012.

9. ADF&G Division of Subsistence. Juneau. "Community Subsistence Information System: CSIS." http://www.adfg.alaska.gov/sb/csis. Hereafter *ADF&G CSIS*.

10. ADF&G CSIS.

a much higher number of pounds harvested per person: 88 lb and 103 lb respectively (tables 2-4 and 3-4). However, because of the high harvests of other wild resources, primarily fish, moose accounted for a lesser percentage of the total wild resource harvests of these communities: 9% and 27% respectively, than was found in Healy (figures 2-8 and 3-8).

Salmon

ADF&G has collected annual harvest data on salmon species by Yukon River communities through permits and post-season household surveys since the 1960s. Figure 9-3 shows salmon harvests from 1990 to 2014 for District Y-5, which encompasses the 2014 Interior study communities except Healy[11]. In general, the harvest of salmon has declined in the study communities. Specifically, the harvest of Chinook salmon had been relatively stable until the crash in 2000, followed by a modest increase and then another precipitous decline beginning in 2009. Yukon River communities located upstream of the mouth of the Tanana River do not harvest large numbers of summer chum salmon, because this run does not distribute upstream of the Tanana River. Although communities upstream of the Tanana River mouth report harvesting them, it is unclear how many of those are misidentified early fall chum salmon or are stray summer chum salmon. Fall chum salmon, however, are a mainstay of salmon harvests for upper Tanana River communities. After experiencing severe declines after the 2000 salmon crash, fall chum salmon runs began rebuilding through the 2000s, but harvests increased only to approximately 60% of historical harvest levels through the 1980s and 1990s (Fall et al. 2013).

Restrictions on subsistence salmon fisheries in 1993, 1998, 2000–2002, and 2009 established because of low runs are evident in the lowered harvests seen in those years (Figure 9-3). The overall trend of declining Chinook salmon harvests can be attributed to continued poor runs, particularly since 2008. Fall chum salmon are heavily harvested for subsistence in the upper Yukon River region, and large fluctuations in harvest of this resource are apparent over the years. A large proportion of the fall chum salmon harvests for the region occurred in the community of Tanana, which, as previously mentioned, historically had a number of large dog teams. Summer chum salmon harvest levels have declined since the mid-1990s, partially due to the closure of the salmon roe commercial fishery in 1997 (Fall et al. 2009).

Figure 9-4 shows the composition of subsistence harvests of salmon by Y-5 communities in the years 1990, 2000, and 2010. This decadal comparison of salmon harvests by species illustrates some important differences in the composition of harvest between very different years in terms of species abundance and

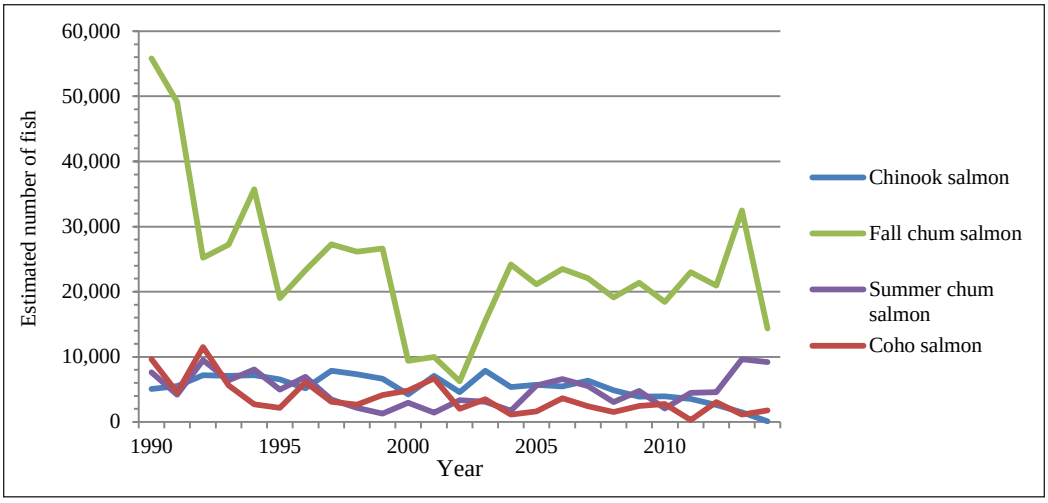


Figure 9-3.–Salmon harvests, District Y-5, 1990–2010.

11. Although Healy residents have previously reported gillnetting in the Tanana River, the 2014 survey documented harvests throughout southcentral Alaska but not from the Yukon River or its tributaries.

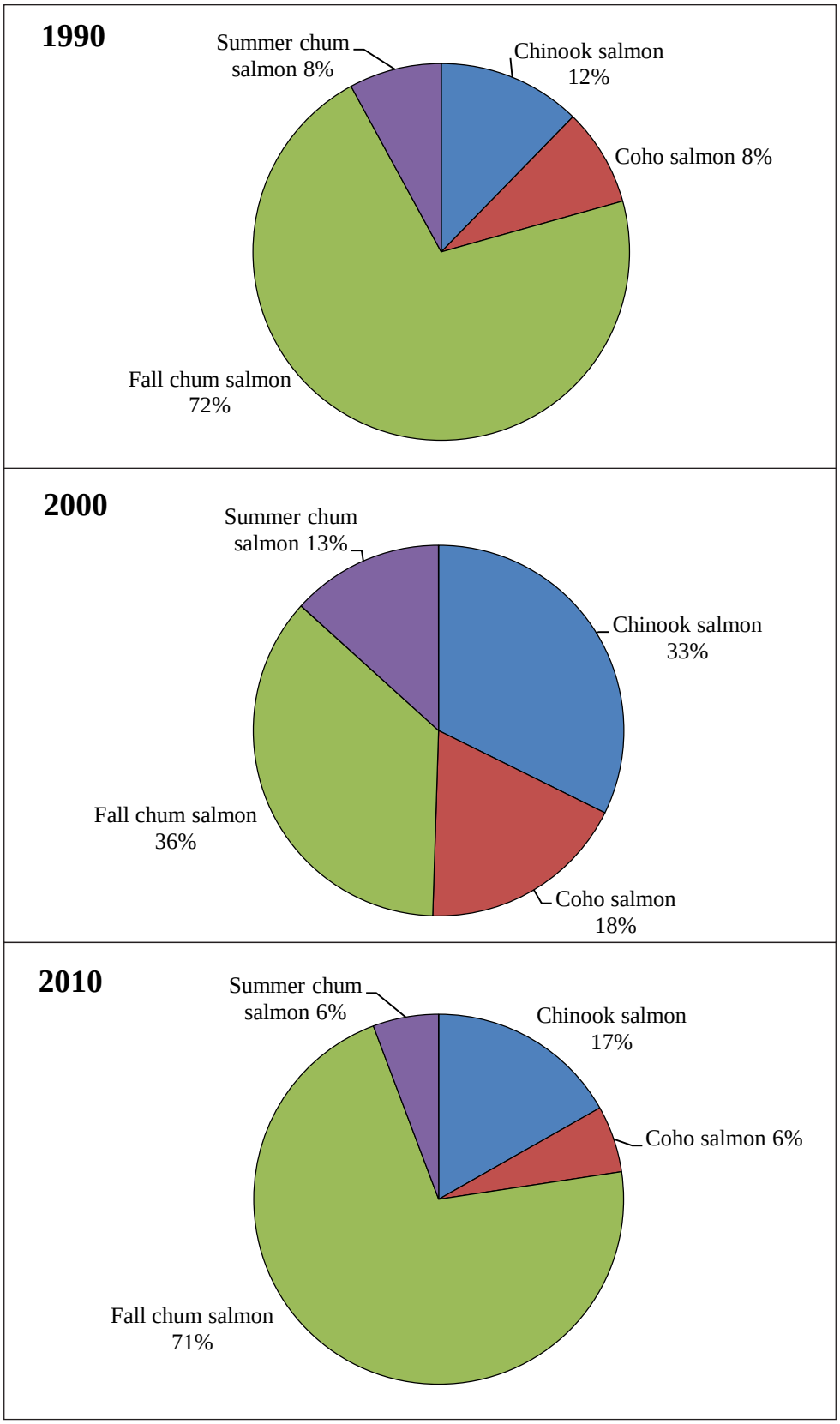


Figure 9-4.–Composition of salmon harvests, District Y-5, 1990, 2000, and 2010.

regulations. The first pie chart—1990—shows a year of typical, unrestricted harvests of all species in Y-5. The 2000 graph represents a disaster year where the runs of all 4 species were well below average and restrictions were in place for much of the summer. The third graph for 2010 represents largely rebuilt summer and fall chum runs but with continued low runs of Chinook salmon. Although restrictions in the subsistence fishery were not in place for the summer 2010 season, environmental conditions kept the harvest lower than typical and border passage requirements of the Yukon Salmon Agreement were not met (JTC 2011). In typical years (e.g., 1990), fall chum salmon harvests appear to compose nearly three-quarters of the salmon harvest, while in 2000, the overall contribution of fall chum salmon likely resulted from restrictions during the fall season. Finally, in 2010, it appears that the species composition resembles the pre-restriction years (the environmental conditions during the summer season did not affect the fall season to the same degree). Neither summer chum nor coho salmon compose large percentages of the total harvest in any year. Coho salmon run at low abundances more generally, and summer chum salmon do not distribute widely upstream of the Tanana River.

The 2 communities for which earlier comparable comprehensive survey data are available—Stevens Village and Tanana—show a similar pattern of decreasing salmon harvests over time, even when those harvests are adjusted for decreasing human populations. In 1984, residents of Stevens Village harvested an estimated 335 lb per capita of Chinook salmon, 298 lb of summer chum salmon, and 282 lb of fall chum salmon (Sumida 1988); in contrast, residents harvested 10 lb per capita of Chinook salmon, 0 lb of summer chum salmon, and 297 lb of fall chum salmon in 2014 (Table 4-4). Residents of Tanana harvested 234 lb of Chinook salmon per capita, 175 lb of summer chum salmon, and 983 lb of fall chum salmon in 1987 (Case and Halpin 1990); in contrast, they harvested 6 lb per capita of Chinook salmon, 112 lb per capita of summer chum salmon, and 511 lb per capita of fall chum salmon in 2014 (Table 2-4).

Arctic

The 3 Arctic study communities do not have identical subsistence patterns, and Anaktuvuk Pass has a very different resource base than Nuiqsut and Utqiaġvik. Subsistence harvest and use patterns in the North Slope region of Arctic Alaska have been documented frequently since the 1980s, largely because of information needs associated with the onset and advance of oil and gas development. Table 9-2 lists available harvest data by community, year, and scope for 2014 study communities. It should be noted that these are only studies that generated wild resource harvest estimates, and a large body of ethnographic work and spatial data also exists. As described earlier, 3 resource categories in particular define North Slope harvests: marine mammals (primarily bowhead whales and bearded seals), large land mammals, (overwhelmingly caribou), and nonsalmon fishes (various whitefish species, Arctic grayling, and char species). Little annual harvest monitoring has occurred recently on the North Slope, with the exception of bowhead whales; reported harvests of beluga whales and polar bears are documented annually at co-management meetings between the U.S. Fish and Wildlife Service, the Alaska Nanuuq Commission, and the Alaska Beluga Whale Committee.

Although 9 comprehensive harvest surveys had taken place in Utqiaġvik prior to this project, only 4 of them included estimated bowhead whale weights. Thus, a substantial portion of harvest by weight cannot be included in comparing total and per capita harvest weights. The same situation exists with regard to Nuiqsut: 6 prior studies documented total annual wild resource harvests, but bowhead whale weights were not estimated in 2 of these. Anaktuvuk Pass, which does not harvest any marine mammal species, has had 10 previous comprehensive harvest studies. Comparisons of total estimated harvests by weight, when sufficient information exists, are complicated by the fact that different studies have used different conversion factors for key resources such as seals, caribou, and nonsalmon fishes. The differences in estimated total harvests that result from using even slightly different conversion factors are considerable for species taken in large numbers or in a community of Utqiaġvik's size. In 2015 and 2016, Division of Subsistence staff undertook a review of conversion factors for marine mammals (other than bowhead whales) and nonsalmon fishes used in all Arctic studies since 1980 (presented in Appendix E). This resulted in changes to some factors used by Division of Subsistence in the Arctic area; these revised factors were used in the analysis of this study's 2014 data. In the discussion of long-term trends that follows, 2014 factors were applied to older datasets for the sake of comparison.

Table 9-2.–Summary of subsistence harvest surveys, excluding migratory bird surveys, Barrow, Nuiqsut, and Anaktuvuk Pass, 1985–2014.

Community	Study year	Source	Scope
Utqiaġvik	1987–1988	Braund and Associates 1993; CSIS[b]	All resources
(Barrow)	1988–1989	Braund and Associates. 1993; CSIS[b]	All resources
	1989–1990	Braund and Associates 1993; CSIS[b]	All resources
	1992	Fuller and George 1997	All resources
	1995–1996	Bacon et al. 2009, rev. 2011	All resources
	1996–1997	Bacon et al. 2009, rev. 2011	All resources
	2000	Bacon et al. 2009, rev. 2011	All resources
	2001	Bacon et al. 2009, rev. 2011	All resources
	2003	Bacon et al. 2009, rev. 2011	All resources
	2014	This study	All resources
Nuiqsut	1985–1986	ADF&G unpublished; CSIS[b]	All resources
	1992	Fuller and George 1997	All resources
	1993	Fall and Utermohle 1995; CSIS[b]	All resources
	1994–1995	Brower and Opie 1998	All resources
	1995–1996	Bacon et al. 2009, rev. 2011	All resources
	1999–2000	Pedersen 2000[c]; unpublished[a]	Caribou
	2000–2001	Bacon et al. 2009, rev. 2011	All resources
	2002–2003	Braem et al. 2011; CSIS[b]	Caribou
	2003–2004	Braem et al. 2011; CSIS[b]	Caribou
	2004–2005	Braem et al. 2011; CSIS[b]	Caribou
	2005–2006	Braem et al. 2011; CSIS[b]	Caribou
	2006–2007	Braem et al. 2011; CSIS[b]	Caribou
	2008	Braund and Associates 2010	Caribou
	2009	Braund and Associates 2011	Caribou
	2010	Braund and Associates 2012	Caribou
	2011	Braund and Associates 2013	Caribou
	2012	Braund and Associates 2014	Caribou
	2013	Braund and Associates 2015	Caribou
	2014	This study	All resources
Anaktuvuk Pass	1990–1991	Pedersen and Opie 1991, unpublished[d]; CSIS[b]	Caribou
	1991–1992	Pedersen and Opie 1992, unpublished[e]; CSIS[b]	Caribou
	1992	Fuller and George 1997	All resources
	1993–1994	Pedersen and Opie 1994, unpublished[f]; CSIS[b]	Caribou
	1994–1995	Brower and Opie 1996	All resources
	1996–1997	Bacon et al. 2009, rev. 2011	All resources
	1998–1999	Bacon et al. 2009, rev. 2011	All resources
	1999–2000	Bacon et al. 2009, rev. 2011	All resources
	2000–2001	Bacon et al. 2009, rev. 2011	All resources
	2001–2002	Bacon et al. 2009, rev. 2011	All resources
	2002–2003	Bacon et al. 2009, rev. 2011	All resources
	2006–2007	Pedersen and Nageak 2008, unpublished[a]; CSIS[b]	Caribou
	2011	Holen et al. 2012; CSIS[b]	All resources
	2014	This study	All resources

Source ADF&G Division of Subsistence, 2016.

a. Unpublished data are on file with ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701.

b. Data are available in the ADF&G Division of Subsistence Community Subsistence Information System (CSIS) http://www.adfg.alaska.gov/sb/csis

c. Pedersen, S. 2000. Documentation of large mammal harvest levels in Nuiqsut, June 1999 through May 2000. Unpublished report. ADF&G Division of Subsistence, Fairbanks.

d. Pedersen, S. and T. Opie, 1991, Documentation of caribou harvests in 1990–1991, file report. Unpublished report. ADF&G Division of Subsistence, Fairbanks.

e. Pedersen, S. and T. Opie, 1992, Documentation of caribou harvests in 1991–1992, file report. Unpublished report. ADF&G Division of Subsistence, Fairbanks.

f. Pedersen, S. and T. Opie, 1994, Documentation of caribou harvests in 1993–1994, file report. Unpublished report. ADF&G Division of Subsistence, Fairbanks.

Previous studies documenting customary and traditional uses of resources by North Slope residents have documented some of the highest pounds per capita harvest of subsistence foods in Alaska: in 1993, Nuiqsut residents harvested an estimated 742 edible pounds per person, 228 lb of which was caribou (Fall and Utermohle 1995). Total harvests have increased over time in all three communities since the 1980s; human populations have increased in particular in Utqiaġvik over three decades, while Nuiqsut and Anaktuvuk Pass have grown more slowly (figures 6-2, 7-3, 8-3, and 9-5). It should be noted that few comparable data points exist (and those are nearly 2 decades apart) between total harvest estimates that can be compared for Utqiaġvik and Nuiqsut (Figure 9-5). In Utqiaġvik, the increased harvest is particularly noticeable with regard to marine mammals between 1989 and 2014, largely because of increased bowhead harvest. Land mammals, particularly the 2014 estimates for caribou, also drive the overall trend. Anaktuvuk Pass shows a more modest increase over time, though with a great deal of interannual variation due to varying caribou harvests.

Nuiqsut residents achieved the highest per capita harvests of the 2014 study communities: 896 lb per person (Figure 9-6). The community harvested 5 bowhead whales in 2014, more than in any other survey year (Table 7-4; Brower and Opie 1998rev.; Fall and Utermohle 1995; Fuller and George 1997).[12] Anaktuvuk Pass followed with 391 lb per capita and Utqiaġvik with 362 lb per capita (tables 8-4 and 6-4). Typically, regional hubs harvest less wild food per person;[13] Utqiaġvik's per capita harvest is likely influenced by a particularly high caribou harvest estimate for 2014. Over all comparable study periods, the per capita harvests of Anaktuvuk Pass and Utqiaġvik have increased more modestly than total harvests due to concurrent increased human populations (figures 9-5 and 9-6). A trendline for Nuiqsut, however, shows a steeper incline. This is likely influenced by several factors—the community did not harvest a bowhead whale in 1985 due to environmental conditions; the 1994–1995 year was a particularly poor harvest year; and 2014 was a particularly successful harvest year. In addition, the community's population has not increased as total harvests have increased (figures 7-3 and 9-5).

Historical Harvest Comparisons by Resource

Bowhead Whales

Bowhead whales have been an important part of North Slope residents' subsistence uses for thousands of years, predating the commercial whaling period and continuing after it ended. In 1977, the International Whaling Commission banned subsistence take of bowhead based on inaccurate estimates of bowhead populations (Suydam and George 2012). Bowhead whale harvest quotas have increased since first implemented in 1978 as a result of more accurate population assessments, better documentation of subsistence needs, and the increase in the bowhead population (Suydam and George 2012). Unlike many species, a single conversion factor is not possible for bowhead whales given the vast difference in size (and weight) among harvested animals. Edible weights can be calculated based on information on weight, length, and girth; however, not all these dimensions are regularly collected for all harvested whales. Published data in most cases only give sex and length of harvested bowheads.

Utqiaġvik, the largest community on the North Slope, has more active whaling crews and strikes allocated each year than smaller communities (Suydam and George 2012). Since 1987, harvests have ranged from 7 to 30 whales each year; Nuiqsut bowhead harvests have ranged from 0 to 4 whales in that time period. Despite these smaller total harvests, Nuiqsut per capita harvests have been higher than those for Utqiaġvik. In 2014, Nuiqsut hunters harvested an estimated 357 lb per capita of bowhead whales, compared to 103 lb per capita by Utqiaġvik hunters (tables 6-4 and 7-4). Due to limited data, Nuiqsut's 2014 bowhead per capita harvest can be compared to previous studies in only 3 years:19 lb per capita in the 1985–1986 study period, 117 lb per capita in 1992, and 213 lb per capita in 1993 (Fall and Utermohle 1995; Fuller and George

12. ADF&G CSIS.

13. Ikuta, H., D.M. Runfola, A. Brenner, D.S. Koster, M.L. Kostick, and J. Park. *In prep.* Subsistence harvests and uses in Bethel, 2012. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 393.

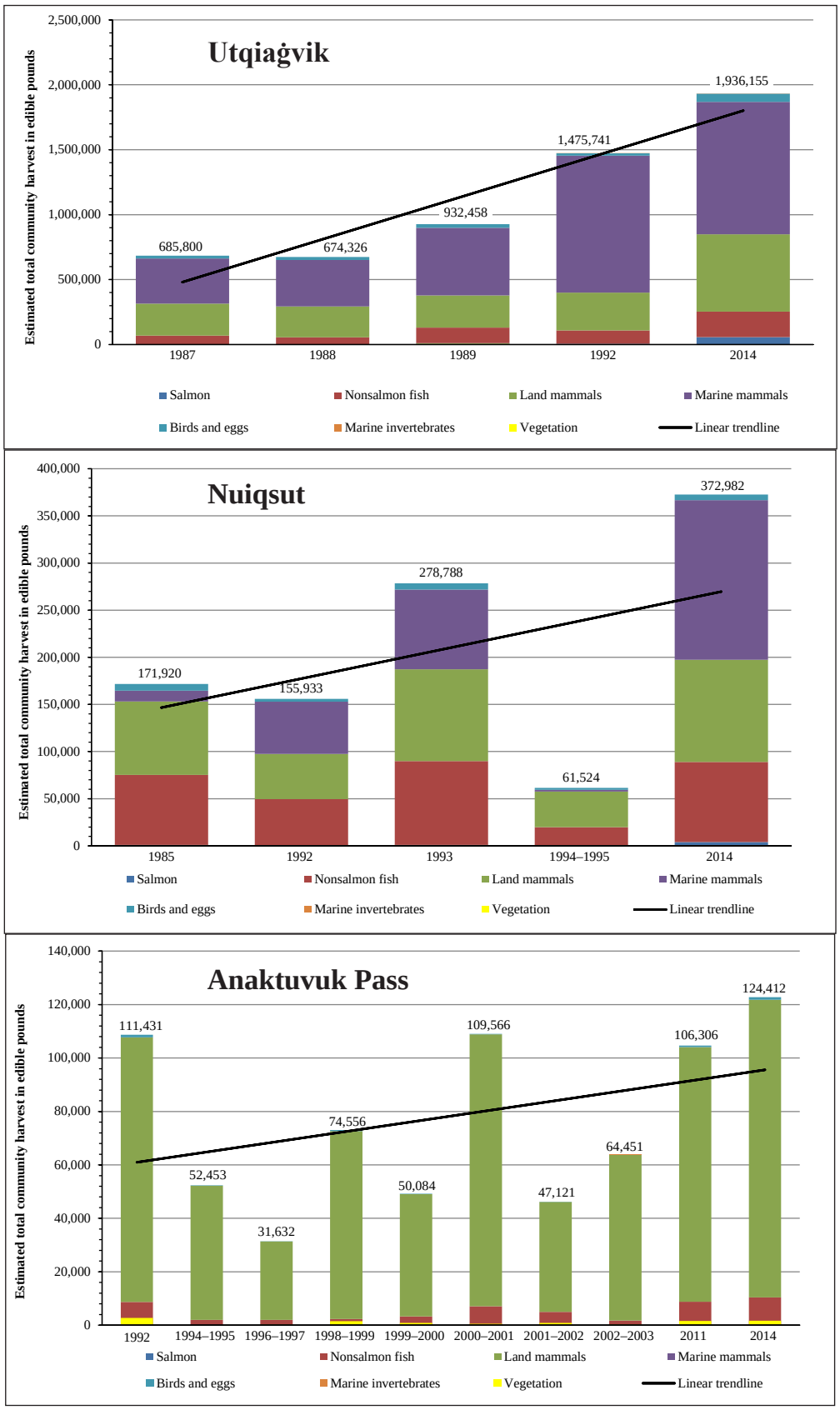


Figure 9-5.–Total community harvests in edible pounds, Utqiaġvik, Nuiqsut, and Anaktuvuk Pass, 1985–2014.

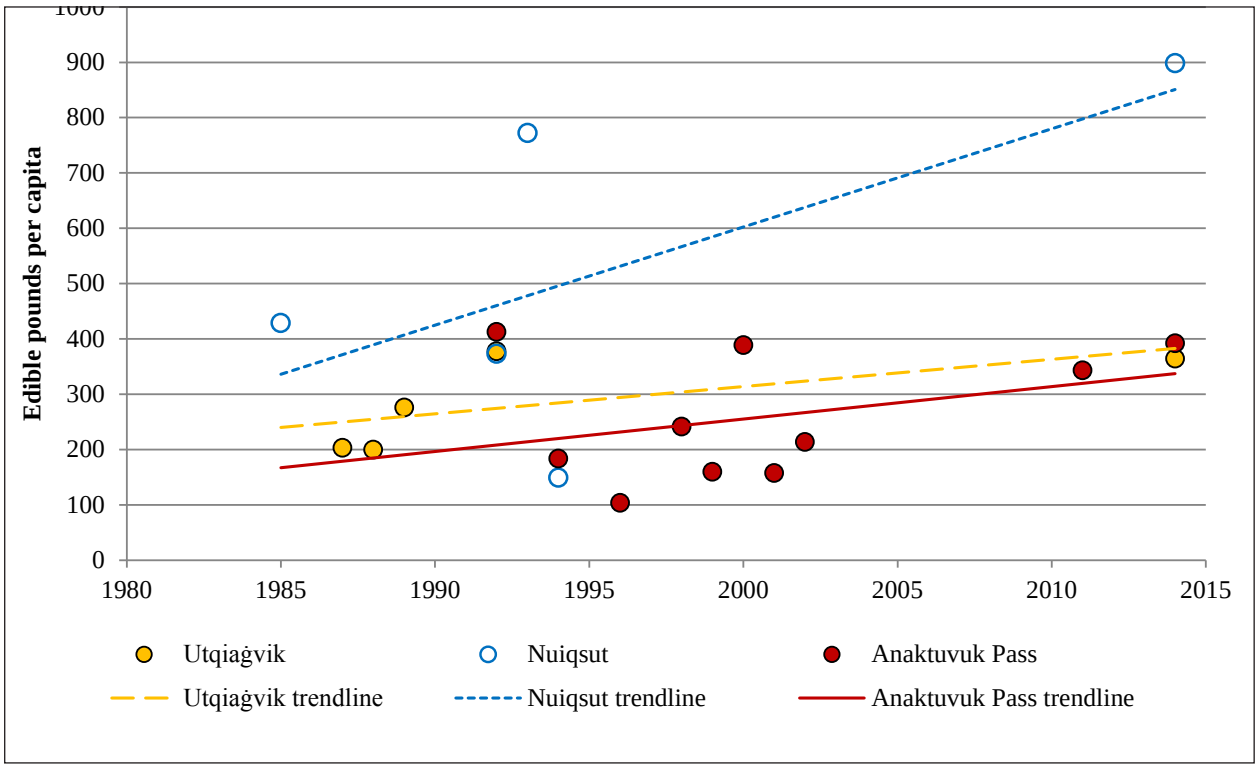


Figure 9-6.–Per capita harvests in edible pounds, Utqiaġvik, Nuiqsut, and Anaktuvuk Pass, 1985–2014.

1999rev.).[14] Utqiaġvik's harvest ranged from 55 lb per capita in 1987 to a high of 187 lb per capita in 1992 (Braund and Associates 1993; Fuller and George 1999rev.).

Bearded and Ringed Seals

Bearded seal (*ugruk*) and ringed seal (*natchiq*) are the most commonly harvested seals in North Slope subsistence hunts. Seals provide meat, and fat that can be rendered into oil, and bearded seal hides specifically are used in the construction of the traditional skinboats (*umiat*) used in spring bowhead whaling. In 2014, Utqiaġvik hunters harvested an estimated 1,070 bearded seals (58 lb per capita), and Nuiqsut residents harvested 48 (33 lb per capita; tables 6-4 and 7-4). Since the first harvest estimates in the mid-1980s, Utqiaġvik's bearded seal harvest ranged from 9 to 58 lb per person per year, with a mean value over all study years of 31 lb per capita (Table 6-4; Bacon et al. 2011rev.; Fuller and George 1997).[15] Nuiqsut has tended towards smaller harvests of bearded seals, ranging from no harvests in 1994–1995 to 33 lb per capita in 2014; over 7 studies, Nuiqsut's mean harvest was 10 lb per person (Table 7-4; Bacon et al. 2011rev.; Brower and Opie 1998rev.; Fuller and George 1997).[16] 2014 represented the highest total and per capita *ugruk* harvests for both communities (tables 6-4 and 7-4; Bacon et al. 2011rev.; Brower and Opie 1998rev.; Fuller and George 1997).

On a per capita basis, Nuiqsut's harvest of 108 ringed seals (15 lb per capita) exceeded Utqiaġvik's harvest of 428 animals (5 lb per capita) in 2014 (tables 6-4 and 7-4). Utqiaġvik's ringed seal harvests have remained relatively constant since the first surveys in 1987, despite an increase in human population (Figure 6-2; Table 6-4; Bacon et al. 2011rev.; Fuller and George 1997).[17] Nearly all studies estimated fewer *natchiq*

14. Comprehensive harvest survey data in 1985–1986 documented 7,458 lb of bowhead brought home as shares by Nuiqsut residents who had been on crews in another community (19 lb per capita); ADF&G CSIS.

15. ADF&G CSIS.

16. ADF&G CSIS.

17. ADF&G CSIS.

harvested than in 1987. Over 10 studies to date, Utqiaġvik had a mean per capita harvest of 5 lb. Nuiqsut's ringed seal harvests since 1985 have been more variable: harvests have ranged from 24 seals (1992) to 155 (1995–1996; Table 7-4; Bacon et al. 2011rev.; Brower and Opie 1998rev.; Fuller and George 1997).[18] Over 7 studies, Nuiqsut hunters harvested an average of 10 lb of *natchiq* per capita.

Caribou

Caribou are the species held most in common among the 3 Arctic study communities. In each, they are the most important terrestrial resource, as demonstrated in comprehensive studies since the mid-1980s (Table 9-2). In 2014, likely because of its sheer number of hunters, Utqiaġvik took the most caribou overall (4,323 animals; Table 6-4). However, in terms of edible pounds per capita, Anaktuvuk Pass hunters harvested more caribou per person (330 lb per capita) than Nuiqsut (253 lb) or Utqiaġvik (111 lb; tables 6-4, 7-4, and 8-4). Anaktuvuk Pass residents depend more heavily on caribou because of a more limited resource base than is available to coastal communities north of the Brooks Range. Over all studies, Anaktuvuk Pass reported higher per capita harvests of caribou than Nuiqsut or Utqiaġvik, ranging from a low of 93 lb per person in the 1996–1997 study period to 353 lb per person in 2000–2001 (Table 8-4; Bacon et al. 2011rev.; Brower and Opie 1998rev.; Fuller and George 1997; Holen et al. 2012).[19] Over 14 studies, Anaktuvuk Pass's average annual caribou harvest was 1.7 caribou per person, or 235 lb per capita. Nuiqsut's caribou take has ranged from 90 lb to 253 lb per capita through 15 studies, averaging 157 lb (1.2 animals) per person per year (Table 7-4; Bacon et al. 2011rev.; Braem et al. 2011; Braund and Associates 2010b, 2011, 2012, 2013b, 2014, 2015; Brower and Opie 1998rev.; Fall and Utermohle 1995; Fuller and George 1999rev.)[20]. Utqiaġvik's 2014 total and per capita harvest (4,323 caribou, 111 lb per capita) was the highest in any study (Table 6-4); the previous high—3,359 caribou—was an estimate for study year 2000 (Bacon et al. 2011rev.).[21] Even so, the questionably high estimate in 2014, discussed in the Utqiaġvik chapter, does not dramatically affect the long-term mean harvest of 72 lb (0.5 caribou) per person. Excluding the 2014 estimate results in a mean harvest of 66 lb per capita (0.48 caribou).

Fish

Salmon harvests have historically only played a minor role in North Slope subsistence harvests. In 2014, all salmon species combined were just 3% of total harvests by edible weight in Utqiaġvik, 1% in Nuiqsut, and less than 1% at Anaktuvuk Pass (figures 6-7, 7-7, and 8-7). Fish other than salmon, such as various whitefish species, Arctic grayling, and several char species are more significant. In 2014, nonsalmon fish accounted for 23% of the total wild resource harvest at Nuiqsut, 10% in Utqiaġvik, and 8% in Anaktuvuk Pass (tables 6-4, 7-4, and 8-4). At Utqiaġvik and Nuiqsut, broad whitefish, Arctic cisco, and least cisco make up the majority of whitefish harvest, although the composition of harvest varies in each community. Utqiaġvik fishers harvested an estimated 31 lb of whitefishes per capita: 27 lb were broad whitefish, 2 lb were Arctic cisco, and 2 lb were least cisco (Table 6-4). Nuiqsut harvests were much larger, with 189 lb per capita of whitefishes harvested in 2014 (Table 7-4). Nearly one-half of the per capita harvest, 88 lb, was broad whitefish, 78 lb was Arctic cisco, and 23 lb was least cisco. In Nuiqsut, long-term average per capita harvests were higher than the other Arctic study communities: 53 lb of Arctic cisco, 42 lb of broad whitefish, and 7 lb of least cisco per person annually (Table 7-4; Bacon et al. 2011rev.; Brower and Opie 1998rev.; Fall and Utermohle 1995; Fuller and George 1997).[22] Over all study periods, Utqiaġvik households harvested an

18. ADF&G CSIS.

19. ADF&G CSIS.

20. Braund and Associates, unpublished data for Nuiqsut, study years 2008–2013. Unpublished data are on file with ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701.

21. Previously, a different sampling approach in a joint Inupiat Community of the Arctic Slope/Division of Subsistence caribou harvest survey project produced overestimates in Utqiaġvik 2002–2007 (Braem et al. 2011) The challenges in drawing a simple random sample in Utqiaġvik suggest that a stratified sample based on North Slope Borough census data may indeed be the best approach in Utqiaġvik (see Bacon et al. 2011rev.; Braund et al. 1993).

22. ADF&G CSIS.

average of 13 lb of broad whitefish, 0.6 lb of Arctic cisco, and 1.5 lb of least cisco per person (Table 6-4; Bacon et al. 2011rev.; Fuller and George 1997).[23] Very little whitefish harvest occurred at Anaktuvuk Pass in 2014 or in previous study periods.

Arctic grayling, a fish that all study communities have in common, were most heavily harvested in Anaktuvuk Pass (on a per capita basis) in 2014, at 7 lb per person (Table 8-4). Nuiqsut (4 lb per capita) and Utqiaġvik (2 lb) harvested smaller amounts of this species (tables 6-4 and 7-4). Several species of char also play a part in Anaktuvuk Pass' subsistence patterns including Dolly Varden, Arctic char, and lake trout. Combined, these species contributed 24 lb per capita in 2014 (Table 8-4). Over 10 studies, Arctic grayling, Dolly Varden, Arctic char, and lake trout have been the most heavily harvested nonsalmon fish by Anaktuvuk Pass residents (Table 8-4; Bacon et al. 2011rev.; Fuller and George 1997; Holen et al. 2012).[24]

Conclusions

The results of this 2015 research further contribute to a diachronic understanding of subsistence patterns in Interior and Arctic Alaska. Analyses of harvest levels for specific species, demographics, harvest areas, and local economies help to characterize contemporary subsistence patterns and also contribute to knowledge of subsistence patterns statewide. This research also collected harvest assessment data for multiple subsistence resources and information on food security levels for all of the study communities; in all cases, this is the first time these types of data were collected.

Communities in Interior and Arctic Alaska have experienced a great deal of change in their subsistence patterns, especially over the last 30 years, despite continuing their historical and traditional hunting, fishing, trapping, and gathering practices. Given the unevenness of data availability across all of the study communities, in some cases it is difficult to track changes in harvest levels over time across all species. However, the historical harvest data available for several resources or resource categories are instructive for larger trends in each region. For example, annual salmon returns, especially Chinook salmon, have been poor in the Yukon River for the last several years, causing hardship for most users. Fishers have dealt with increasingly conservative management of subsistence fishing, in some cases including extended closures of the fisheries. For most communities on the Yukon River, salmon account for the majority of total wild resource harvests and Chinook salmon usually constitute a majority of the salmon harvest; a decline in fishing opportunities for Chinook salmon poses serious concerns for many communities with strong subsistence economies. Many households in this research discussed the need to replace Chinook salmon with other fish species or store-bought food, or to simply go without. It remains to be seen what the long-term effects of these declines will be or how communities will reorganize their subsistence harvests to accommodate lesser salmon harvests should the declines continue.

On Alaska's North Slope, a comparatively robust dataset exists for several species, caribou in particular. The data demonstrate the continuing importance of this species in maintaining diverse traditional diets and helps to explain the anxiety associated with ongoing declines in the Western Arctic and Teshekpuk herds. As yet, the harvestable surplus of the 2 herds exceeds amounts necessary for subsistence—only minor regulatory changes have occurred, and no annual bag limits have been imposed on either state- or federally-managed lands. Should the declines continue, it is likely that wildlife management agencies will impose more severe limitations on seasons and bag limits. It remains to be seen if recent federal actions[25] restricting eligibility to participate in caribou harvest on federally-managed lands in GMU 23 to federally-qualified users will be echoed in GMU 26. The importance of marine mammal species, bowhead whales in particular, is also evident. Environmental changes that could reduce the abundance of abundance or alter their distribution would have tremendous impacts to North Slope Iñupiat subsistence patterns. Whether or not declines in seal populations would result in harvest restrictions is yet unknown, although restrictions are already underway with regard to polar bears and Pacific walrus.

23. ADF&G CSIS.
24. ADF&G CSIS.
25. WSA 16-01.

All of these issues underscore the vulnerability of subsistence economies, but also the resilience of communities in the face of change. Although the availability of historical harvest data is variable, results indicate that for Interior communities in this study, harvest levels for certain wild resources have declined over the past few decades. Respondents in all of the study communities discussed changes in their harvesting practices, including decreases in resource availability as described above for Chinook salmon, regulatory restrictions, employment conflicts, increases in costs of fuel, development effects, and reported changes in weather patterns and landscape characteristics. In spite of apparent declines in subsistence harvests for some communities, results indicate that harvests in Interior and Arctic Alaska remain among the highest in the state (Fall 2014). Respondents emphasized the importance of subsistence hunting, fishing, and gathering, as well as cultural practices of sharing that linked many households in each community. Such cultural patterns provide a clear measure against the insecurity of fluctuating harvests and external pressures. In sum, subsistence uses in Interior and Arctic Alaska remain a vital part of cultural, economic, and social aspects of community life. However, these communities also regularly experience a great deal of pressure that can affect their subsistence practices, highlighting the need for sound management of resources and the continuing regulatory protection of subsistence uses of Alaska's fish and wildlife resources.

REFERENCES

Alaska Department of Fish and Game
1987. *Family fish camps on the Yukon River*, Wildlife Use Notebook Series, No. 3. Alaska Department of Fish and Game Division of Subsistence: Juneau.

2005. *2005–2006 Alaska hunting regulations governing general, subsistence, and commercial uses of Alaska's wildlife*.

2006. *2006–2007 Alaska hunting regulations governing general, subsistence, and commercial uses of Alaska's wildlife*.

2007. *Alaska Board of Game November 2007 Proposal Book*. Alaska Department of Fish and Game, Boards Support Section: Juneau.

Alaska Department of Fish and Game, Division of Wildlife Conservation
2014a. *ADF&G closes moose hunts in Unit 26A and 26B for fall 2014 [press release] May 12, 2014*.

Alaska Department of Fish and Game, Division of Wildlife Conservation
2014b. *Western Arctic caribou herd numbers 235,000 animals in recent survey [press release] May 12, 2014*.

Alaska Department of Fish and Game Division of Wildlife Conservation
2001. *Koyukuk River moose management plan 2000–2005: Unit 24 and the northern portion of Unit 21D*. Alaska Department of Fish and Game: Fairbanks.

Alaska Department of Labor and Workforce Development
n.d. *Population of Alaska by economic region, borough and census area, 2010–2013*. State of Alaska Department of Labor and Workforce Development, Research and Analysis Homepage: Population: Juneau.

2015. *Population of Alaska by economic region, borough and census area, 2010–2014*. State of Alaska Department of Labor and Workforce Development, Research and Analysis Homepage: Population: Juneau.

Alaska Department of Labor and Workforce Development Census and Geographic Information Network
2008. *Healy CDP, Denali Borough*.

Alexander, K.
2013. *The International Whaling Convention (IWC) and legal issues related to aboriginal rights*. Congressional Research Service, Report R40571: Washington D.C.

Andersen, D.B., C. Brown, R. Walker, and G. Jennings
2004. *The 2001–2002 harvest of moose, caribou, and bear in middle Yukon and Koyukuk river communities.* Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 278.

Andersen, D.B., C.J. Utermohle, and L. Brown
1998. *The 1997– 1998 harvest of moose, caribou, and bear in middle Yukon and Koyukuk river communities, Alaska.* Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 245.

2000. *The 1998–1999 harvest of moose, caribou, and bear in ten middle Yukon and Koyukuk river communities*. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 251.

Andersen, D.B., C.J. Utermohle, and G. Jennings
2001. *The 1999–2000 harvest of moose, caribou, and bear in ten middle Yukon and Koyukuk river communities*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 262: Juneau.

Anderson, D.D.
1970. *Microblade traditions in Northwestern Alaska*. Arctic Anthropology 7(2), pages 2–16.

Andrews, E.F.
1977. *Report on the cultural resources of the Doyon region, Central Alaska*. Cooperative Park Studies Unit, University of Alaska: Fairbanks.

Association of Canadian Universities for Northern Studies
2003. *Ethical principles for the conduct of research in the North*. The Association = L'Association: Ottawa.

Bacon, J.J., T.R. Hepa, H.K. Brower Jr., M. Pederson, T.P. Olemaun, J.C. George, and B.G. Corrigan
2011rev. *[2009] Estimates of subsistence harvest for villages on the North Slope of Alaska, 1994–2003*. North Slope Borough, Department of Wildlife Management: Barrow.

Berger, T.
1985. *Village journey: the report of the Alaska Native Review Commission*. Hill and Wang: New York.

Bersamin, A., B.R. Luick, E. Ruppert, J.S. Stern, and S. Zidenberg-Cherr
2006. *Diet quality among Yup'ik Eskimos living in rural communities is low: the Center for Alaska Native Health Research pilot study*. Journal of the American Dietetic Association 106(7), pages 1055–1063.

Bersamin, A., B.R. Luick, J.S. Stern, and S. Zidenberg-Cherr
2008. *Westernizing diets influence fat intake, red blood cell fatty acid composition, and health in remote Alaskan Native communities in the Center for Alaska Native Health study*. Journal of the American Dietetic Association 108(2), pages 266–27.

Betts, M.F.
1997. *Subsistence harvest and use patterns for Rampart, Tanana, Stevens Village, Manley Hot Springs, Eureka, and Minto, Alaska: Eureka-Rampart road study environmental assessment*. Northern Land Use Research, Inc.: Fairbanks.

Bickel, G., M. Nord, C. Price, W. Hamilton, and J. Cook
2000. *Guide to Measuring Household Food Security, Revised 2000*. U.S. Department of Agriculture, Food and Nutrition Service: Alexandria, VA.

Bird, K.J. and D.W. Houseknecht
2001. *Arctic National Wildlife Refuge, 1002 area, petroleum assessment, 1998, including economic analysis*. U.S. Geological Survey Fact Sheet 028-01.

Blackman, M.B.
1989. *Sadie Brower Neakok: an Inupiaq woman*. University of Washington Press: Seattle.

Bockstoce, J.R.
2009. *Furs and frontiers in the far north: the contest among Native and foreign nations for the Bering Strait fur trade*. Yale University Press: New Haven, CT.

1986. *Whales, ice, and men: the history of whaling in the western Arctic*. University of Washington Press: Seattle.

Bodenhorn, B.
1989. *The animals come to me, they know I share: Iñupiaq kinship, changing economic relations and enduring world views on Alaska's North Slope*. Cambridge University: Cambridge.

Borenstein, S.
2010. *Melting sea ice forces walruses onto Northwest Alaska beaches*. Anchorage Daily News.

Braem, N.M., S. Pedersen, J. Simon, D. Koster, T. Kaleak, P. Leavitt, J. Patkoak, and P. Neakok
2011. *Monitoring of Annual Caribou Harvests in the National Petroleum Reserve in Alaska: Ataqasuk, Barrow, and Nuiqsut, 2003–2007*. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 361: Fairbanks.

Braund and Associates
1993. *North Slope Subsistence Study: Barrow, 1987, 1988, 1989.* Technical Report No. 149, OCS Study, MMS 91-0086, submitted to U.S. Department of the Interior Minerals Management Service, for contract no. 14-12-0001-30284. Stephen R. Braund & Associates with University of Alaska Anchorage Institute of Social and Economic Research.: Anchorage.

2009. *Impacts and benefits of oil and gas development to Barrow, Nuiqsut, Wainwright, and Atqasuk harvesters*. North Slope Borough Department of Wildlife Management: Barrow.

2010a. *Subsistence mapping of Nuiqsut, Kaktovik and Barrow*. MMS OCS Study Number 2009-03, funded by the U.S. Department of the Interior Minerals Management Service. Stephen R. Braund & Associates: Anchorage.

2010b. *Nuiqsut caribou subsistence monitoring project: results of 2009 hunter interviews*. Prepared for ConocoPhillips Alaska, Inc., by Stephen R. Braund & Associates: Anchorage.

2011. *Nuiqsut caribou subsistence monitoring project: results of year two hunter interviews*. Prepared for ConocoPhillips Alaska, Inc., by Stephen R. Braund & Associates: Anchorage.

2012. *Nuiqsut caribou subsistence monitoring project: results of year three hunter interviews and household harvest surveys*. Prepared for ConocoPhillips Alaska, Inc., by Stephen R. Braund & Associates: Anchorage.

2013a. *Subsistence Use Area and Traditional Knowledge Studies: Anaktuvuk Pass, Barrow, and Nuiqsut*. Foothills West Transportation Access Environmental Studies. Prepared for Three Parameters Plus, Inc., and the Alaska Department of Transportation and Public Facilities: Anchorage.

2013b. *Nuiqsut caribou subsistence monitoring project: results of year 4 hunter interviews and household harvest surveys*. Prepared for ConocoPhillips Alaska, Inc., by Stephen R. Braund & Associates: Anchorage.

2014. *Nuiqsut caribou subsistence monitoring project: results of year 5 hunter interviews and household harvest surveys*. Prepared for ConocoPhillips Alaska, Inc., by Stephen R. Braund & Associates: Anchorage.

2015. *Nuiqsut caribou monitoring project: results of year 6 hunter interviews and household harvest surveys*. Prepared for ConocoPhillips Alaska, Inc., by Stephen R. Braund & Associates: Anchorage.

Braund, S.R. and J. Kruse editors.
2009. *Synthesis: three decades of research on socioeconomic effects related to offshore petroleum development in coastal Alaska*. U.S. Department of the Interior, Minerals Management Service, MMS OCS Study Number 2009-006: Anchorage.

Brower, R. and T. Opie
1998rev. *North Slope Borough subsistence harvest documentation project: data for Nuiqsut, Alaska for the period July 1, 1994 to June 30, 1995 [1997]*. North Slope Borough, Department of Wildlife Management: Barrow.

1996. *North Slope Borough subsistence harvest documentation project: data for Anaktuvuk Pass, Alaska for the period July 1, 1994 to June 30, 1995*. North Slope Borough, Department of Wildlife Management: Barrow.

Brown, C.L., A.R. Brenner, H. Ikuta, E. Mikow, B. Retherford, L.J. Slayton, A. Trainor, J. Park, D. Koster, and M.L. Kostick
2015. *The harvest and uses of wild resources in Mountain Village, Marshall, Nulato, Galena, and Ruby, Alaska, 2010*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 410: Fairbanks.

Brown, C.L., L.J. Slayton, A. Trainor, D.S. Koster, and M. Kostick
2014. *Wild resource harvests and uses, land use patterns, and subsistence economies in Manley Hot Springs and Minto, Alaska, 2012*. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 400: Fairbanks.

Brown, C., D. Koster, and P. Koontz
2010. *Traditional ecological knowledge and harvest survey of nonsalmon fish in the middle Yukon River region, Alaska 2005–2008*. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 358: Fairbanks.

Brown, C.L., J.S. Magdanz, D.S. Koster, and N.S. Braem
2012. *Subsistence harvests in 8 communities in the central Kuskokwim River drainage, 2009*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 365: Fairbanks.

2013. *Subsistence harvests in 6 communities in the Kuskokwim River drainage, 2010*. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 379: Fairbanks.

Brown, C.L., R.J. Walker, and S.B. Vanek
2004. *The 2002–2003 harvest of moose, caribou, and bear in middle Yukon and Koyukuk river communities*. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 280.

Brown, W.E.
1993. *Denali: symbol of the Alaskan wild. An illustrated history of the Denali-Mount McKinley region*. The Donning Company Publishers: Virgnia Beach.

Brown, W.E.
1979. *Nuiqsut heritage: a cultural plan*. Arctic Environmental Information and Data Center: Anchorage.

Burch Jr., E.S.
1975. *Eskimo kinsmen: changing family relationships in northwest Alaska*, 59th book in the Monograph, The American Ethnological Society. West Publishing Co.: St. Paul, MN.

1980. *Traditional Eskimo societies in northwest Alaska*. Senri Ethnological Studies 4, pages 253–304.

1998. *The Iñupiaq Eskimo nations of northwest Alaska*. University of Alaska Press: Fairbanks.

Buzzell, R.G.
1994. *Mining the burning hills: a history of Alaska's Suntrana coal mine and townsite*. Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation, Office of History and Archaeology Report No. 40: Anchorage.

Campbell, J.M.
1989rep. *[1968] Territoriality among ancient hunters: interpretations from ethnography and nature*. North Slope Borough Planning Department: Barrow, AK.

Case, M. and L. Halpin
1990. *Contemporary wild resource use patterns in Tanana, Alaska, 1987*. Alaska Department of Fish and Game, Division of Subsistence.

Catton, T.
1997. *Inhabited wilderness: Indians, Eskimos, and national parks in Alaska*. University of New Mexico Press: Albuquerque.

Coates, J.
2004. *Experience and expression of food security across cultures: practical implications for valid measurement*. Food and Nutrition Technical Assistance Project, FHI 360: Washington, DC.

Coates, J., E.A. Frongillo, B.L. Rogers, P. Webb, P.E. Wilde, and R. Houser
2006. *Commonalities in the experience of household food insecurity across cultures: what are measures missing?* Journal of Nutrition 136(5), page 1438S–1448S.

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

Cole, D.
1999. *Fairbanks: a gold rush town that beat the odds*. University of Alaska Press: Fairbanks.

Coleman-Jensen, A., M. Nord, M. Andrews, and S. Carlson
2012. *Household food security in the United States, 2011*. U.S. Department of Agriculture, Economic Research Service, Economic Research Report No. 141: Washington, DC.

ConocoPhillips
2005. *Fish and wildlife of Alaska's North Slope: fisheries*.

Couch, J.S.
1957. *Philately below zero: a postal history of Alaska*. American Philatelic Society.

Darbyshire and Associates
1990. *Rampart*. Alaska Department of Community and Regional Affairs, Division of Municipal Assistance.

DeMarban, A.
2015. *Blasted over oil project, Alaska governor seeks broad tribal policy*. Alaska Dispatch News.

Dumond, D.E.
1977. *The Eskimos and Aleuts*. Thames and Hudson: London.

Dumond, D.E.
1975. "*Coastal adaptation and cultural change in Alaskan Eskimo prehistory*" [in] W. Fitzhugh, editor *Prehistoric maritime adaptations of the circumpolar zone*. Mouton Publishers: The Hague.

Environmental News Network
2001. *Former military site in Alaska contaminated with toxic chemicals*.

Fall, J.A.
2014. *Subsistence in Alaska: a year 2012 update*. Alaska Department of Fish and Game Division of Subsistence: Anchorage.

2016. *Regional patterns of fish and wildlife harvests in contemporary Alaska*. Arctic 69(1), pages 47–64.

Fall, J.A., B.M. Balivet, A.R. Brenner, D. Holen, L. Hutchinson-Scarbrough, B. Jones, T.M. Krieg, T. Lemons, M.A. Marchioni, E. Mikow, L.A. Sill, and A. Trainor
2013. *Alaska subsistence and personal use salmon fisheries 2010 annual report*, Technical Paper No. 381. Alaska Department of Fish and Game, Division of Subsistence.

Fall, J.A., A.R. Brenner, S.S. Evans, L. Hutchinson-Scarbrough, B. Jones, R. La Vine, T. Lemons, M.A. Marchioni, E. Mikow, J.T. Ream, L.A. Sill, and A. Trainor
2013. *Alaska subsistence and personal use salmon fisheries 2011 annual report*, Technical Paper No. 387. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 387.

Fall, J.A., C. Brown, M.F. Turek, N. Braem, A. Russell, W.E. Simeone, D.L. Holen, L.C. Naves, L. Hutchinson-Scarborough, T. Lemons, V. Ciccone, T. Krieg, and D. Koster
2009. *Alaska subsistence salmon fisheries 2006 annual report*, Technical Paper No. 344. Alaska Department of Fish and Game, Division of Subsistence.

Fall, J.A. and C.J. Utermohle editors.
1995. *An Investigation of the Sociocultural Consequences of Outer Continental Shelf Development in Alaska*, 5: Alaska Peninsula and Arctic. U.S. Department of the Interior, Minerals Management Service, Alaska Outer Continental Shelf Region: Anchorage.

Fritz, S. editor.
2015. *Bureau of Land Management, National Petroleum Reserve in Alaska Subsistence Advisory Panel Meeting: summary of public presentations and panel recommendations*. U.S. Bureau of Land Management: Anchorage.

Frongillo, E.A. and S. Nanama
2006. *Development and validation of an experience-based measure of household food insecurity within and across seasons in northern Burkina Faso*. Journal of Nutrition 136(5), page 1409s–1419s.

Fuller, A., S. and J. George C.
1999rev. *[1997] Evaluation of subsistence harvest data from the North Slope Borough 1993 census for eight North Slope Villages: for the calendar year 1992*. North Slope Borough, Department of Wildlife Management: Barrow.

Galginaitis, M.
2012. *Annual assessment of subsistence bowhead whaling near Cross Island, 2011: annual report*. U.S. Department of the Interior, Bureau of Ocean Energy Management: Anchorage.

2014. *Monitoring Cross Island whaling activities, Beaufort Sea, Alaska: 2008–2012 final report, incorporating ANIMIDA and cANIMIDA (2001–2007)*. US Department of the Interior, Bureau of Ocean Energy Management, OCS Study BOEM 2013-218: Anchorage.

Galginaitis, M.C.
1990. *Subsistence Resource Harvest Patterns: Nuiqsut*. Submitted to the US Department of Interior, Minerals Management Service, Alaska OCS Region: Anchorage.

Galginaitis, M.C., C. Chang, K.M. MacQueen, A.A. Dekin Jr., and D. Zipkin
1984. *Ethnographic Study and Monitoring Methodology of Contemporary Economic Growth, Sociocultural Change and Community Development in Nuiqsut, Alaska*. Social and Economic Studies Program Technical Report No. 96. Submitted to the US Department of Interior, Minerals Management Service, Alaska OCS Region: Anchorage.

Geist, V.
2006. "*The North American model of wildlife conservation: a means of creating wealth and protecting public health while generating biodiversity*" [in] D.M. Lavigne, editor *Gaining ground: in pursuit of ecological sustainability*. International Fund for Animal Welfare and University of Limerick: Guelph, Canada and Limerick, Ireland.

Goldsmith, S.
2007. *The remote rural economy of Alaska*. University of Alaska Anchorage Institute of Social and Economic Research: Anchorage.

Hall, Jr., E.S.
1976. *Contributions to anthropology: the Interior peoples of northern Alaska*. National Museums of Canada, Archaeological Survey of Canada Paper No. 49: Ottawa.

Hladick, C.
2015. *Letter to Mayor Charlotte Brower in regards to 2014 Barrow population determination for tax cap purposes*. https://www.commerce.alaska.gov/web/Portals/4/pub/NSB_Determination_Letter_Commissioner_Approved.pdf

Hoffecker, J.F.
2001. *Late Pleistocene and early Holocene sites in the Nenana River valley, central Alaska*. Arctic Anthropology 38(2), pages 139–153.

Hoffecker, J.F. and S.A. Elias
2003. *Environment and archaeology in Beringia*. Evolutionary Anthropology 12, pages 34–49.

Hoffman, D., D. Libbey, and G. Spearman
1988. *Nuiqsut: land use values through time in the Nuiqsut area*. North Slope Borough and Anthropology and Historic Preservation Section of the Cooperative Park Studies Unit, University of Alaska Fairbanks: Barrow.

Holen, D., S.M. Hazell, and D.S. Koster
2012. *Subsistence harvests and uses of wild resources by communities in the eastern Interior of Alaska, 2011*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 372: Anchorage.

Holen, D., S.M. Hazell, J.M. Van Lanen, J.T. Ream, S.P.A. Desjardins, B. Jones, and G. Zimpelman
2014. *The harvest and use of wild resources in Cantwell, Chase, Talkeetna, Trapper Creek, Alexander/Susitna, and Skwentna, Alaska, 2012*. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 385: Anchorage.

Hollis, A.L.
2014. "*Units 20C, 20F, and 25C moose.*" [in] P. Harper and L.A. McCarthy, editors *Moose management report of survey and inventory activities 1 July 2011–30 June 2013*. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2014-6: Juneau.

Holmes, C.E.
2001. *Tanana River valle archaeology circa 14,000 to 9,000 B.P.* Arctic Anthropology 38(2), pages 154–170.

Houseknecht, D.W., K.J. Bird, J.H. Shuenemeyer, E.D. Attanasi, C.P. Garrity, C.J. Schenk, R.R. Charpentier, R.M. Pollastro, T.A. Cook, and T.R. Klett
2010. *2010 updated assessment of undiscovered oil and gas resources of the National Petroleum Reserve in Alaska (NPRA)*. U.S. Geological Survey Fact Sheet 2010-3102.

Huntington, S.
1993. *Shadows on the Koyukuk: an Alaska Native's life along the river*. Alaska Northwest Books: Anchorage.

International Whaling Commission
2012. *International Convention for the Regulation of Whaling, 1946 Schedule, as amended by the Commission at the 64th Annual Meeting, Panama City, Panama, July 2012*. International Whaling Commission: Panama City, Panama.

Joling, D.
2011. *Walrus herds gather on Alaska's northwest shore*. Anchorage Daily News.

2013. *10,000 walrus come ashore in NW Alaska*. Anchorage Daily News.

Jolles, C.Z.
2002. *Faith, food, and family in a Yupik whaling community*. University of Washington Press: Seattle.

JTC (Joint Technical Committee of the Yukon River US/Canada Panel)
2011. *Yukon River salmon 2010 season summary and 2011 season outlook*. Alaska Department of Fish and Game, Division of Commerical Fisheries, Regional Information Report No. 3A11-01: Anchorage.

De Laguna, F.
1936. *An archaeological reconnaissance of the Middle and Lower Yukon Valley, Alaska*. American Antiquity 2(1), pages 6–12.

1947. *Prehistory of northern North America as seen from the Yukon*. Society for American Archaeology: Menasha, WI.

L'Ecuyer, R.
1997. *Prospecting and mining activity in the Rampart, Manley Hot Springs, and Fort Gibbon mining districts of Alaska, 1894 to the present era*. U.S. Department of the Interior Bureau of Land Management, Open File Report No. 61: Fairbanks.

Lefevre, J.S.
2013. *A pioneering effort in the design of process and law supporting integrated Arctic Ocean management*. Environmental Law Reporter 43, pages 10893–10908.

Magdanz, J.S., J. Greenberg, J.M. Little, and D.S. Koster
2016. *The persistence of subsistence: wild food harvests in rural Alaska, 1983–2013*. Social Science Research Network.

Magdanz, J.S., E. Trigg, A. Ahmasuk, P. Nanouk, D.S. Koster, and K. Kamletz
2009. *Patterns and trends in subsistence salmon harvests, Norton Sound-Port Clarence Area, Alaska, 1994–2003*. American Fisheries Society Symposium 70, pages 395–431.

Matthew, M., D. Lacey, J. Kari, and R. Mayo editors.
1999. *Stevens Village land use plan, ethnography of ancestral lands, and integrated resourced management plan*. Stevens Village Council: Stevens Village, AK.

McDowell Group
2009. *Alaska geographic differential study 2008*. State of Alaska Department of Administration: Alaska.

McFayden Clark, A.
1981. "*Koyukon*" [in] W.C. Sturtevant and J. Helm, editors *Handbook of North American Indians*, 6: Subarctic. Smithsonian Institution Press: Washington, D.C.

McKennan, R.A.
1981. "*Tanana*" [in] W.C. Sturtevant and J. Helm, editors *Handbook of North American Indians*, 6: Subarctic. Smithsonian Institution Press: Washington, D.C.

Melgar-Quinonez, H.R., A.C. Zubieta, B. MkNelly, A. Nteziyaremye, M.F.D. Gerardo, and C. Dunford
2006. *Household Food Insecurity and Food Expenditure in Bolivia, Burkina Faso, and the Philippines*. Journal of Nutrition 136(5), page 1431S–1437S.

Moncrieff, C.F.
2007. *Traditional ecological knowledge of customary trade of subsistence harvested salmon on the Yukon River*, Final report to the Office of Subsistence Management, Fisheries Information Services, study 04-265. Yukon River Drainage Fisheries Association: Anchorage.

National Oceanic and Atmospheric Administration (NOAA)
2014. *Northern pinnepeds unusual mortality event: update 2014*.

Nelson, E.W.
1978. *E. W. Nelson's notes on the Indians of the Yukon and Innoko Rivers, Alaska.* Field Museum of Natural History: Chicago.

Nelson, R.K., K.H. Mautner, and G.R. Bane
1982. *Tracks in the wildland: a portrayal of Koyukon and Nunamiut subsistence*. University of Alaska Fairbanks, Cooperative Park Studies Unit, Anthropology and Historic Preservation: Fairbanks.

Nord, M., M. Andrews, and S. Carlson
2008. *Household food security in the United States, 2007*. Department of Agriculture, Economic Research Service, ERR-66: Washington, DC.

North Slope Borough, Department of Planning and Community Services, Community Planning and Real Estate Division
2015. *Draft Nuiqsut comprehensive development plan*. : Nuiqsut, AK.

North Slope Borough Department of Wildlife Management
2013. *Mold on Aanaakłiq in Nuiqsut*. The Towline 5(2), page 6.

Orth, D.J.
1971rep. *[1967] Dictionary of Alaska Place Names*. United States Government Printing Office.

Osgood, C.
1940. *Ingalik Material Culture*. Yale University Press: New Haven, Connecticut.

Oswalt, W.H.
1967. *Alaskan Eskimos*. Chandler Publishing Company: San Francisco, CA.

Pamperin, N.J.
2014. "*Unit 21C moose*" [in] L.A. McCarthy and P. Harper, editors *Moose management report of survey and inventory activities 1 July 2011–30 June 2013*. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2014-6: Juneau.

Parrett, L.
2015. *Memorandum: Summary of Teshekpuk Caribou Herd photocensus conducted July 6, 2015*.

Pedersen, S.
1979. *Regional subsistence land use North Slope Borough*. North Slope Borough and the Anthropology and Historic Preservation Section of the Cooperative Park Studies Unit, University of Alaska, Fairbanks: Fairbanks.

Pérez-Escamilla, R., A.M. Segall-Corrêa, L.K. Maranha, M. de F.A. Sampaio, L. Marín-León, and G. Panigassi
2004. *An adapted version of the U.S. Department of Agriculture food insecurity module is a valid tool for assessing household food insecurity in Campinas, Brazil*. Journal of Nutrition 134(8), pages 1923–1928.

Pilz, D.
2004. *Chaga and other fungal resources: assessment of sustainable commercial harvesting in Khabarovsk and Primorsky Krais, Russia*. Report prepared for Winrock Internations, Morrilton, Arkansas and the FOREST Project, Khabarovsk, Russia.

Pilz, D., S.J. Alexander, J. Smith, R. Shroeder, and J. Freed
2006. *Nontimber forest product opportunities in Alaska*. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-671: Portland, OR.

Potter, B.A.
2008. *Radiocarbon chronology of central Alaska: technological continuity and economic chage*. Radiocarbon 50(2), pages 181–204.

Rosen, Y.
2014. *Judge rules Beringia bearded seals improperly listed as threatened*. Alaska Dispatch News.

Schneider, W.S., S. Pedersen, and D. Libbey
1980. *Land use values through time in the Barrow–Atqasuk Area*. North Slope Borough and the Anthropology and Historic Preservation Section of the Cooperative Park Studies Unit, University of Alaska, Fairbanks: Fairbanks.

Shepro, C.E., D.C. Maas, D.G. Callaway, J. McAnich, and J. Bergerson
n.d. *North Slope Borough 2010 economic profile and census report, Volume X*. North Slope Borough Department of Adminstrationand Finance: Barrow, AK.

Shinkwin, A. and M. Case
1984. *Modern foragers: Wild resource use in Nenana Village, Alaska*. Alaska Department of Fish and Game, Division of Subsistence.

Simon, J.J.K.
1998. *Twentieth century Iñupiaq Eskimo reindeer herding on northern Seward Peninsula, Alaska*. Doctoral dissertation. University of Alaska Fairbanks, Department of Anthropology.

Simon, J.J., S.T. Howdeshell, R.A. Sattler, and K.D. Adamczak
2001. *Final report on military impacts to tribes in Interior Alaska. Department of Defense Native American Lands Environmental Mitigation Program Cooperative Agreement POA-98-5024; Administration for Native Americans Grant 90NM0040/01*. Tanana Chiefs Conference, Inc., Tribal Environmental Restoration Program: Fairbanks.

Spearman, G.R.
1979. Land use values through time in the Anaktuvuk Pass area. Anthropology and Historic Preseveration, Cooperative Park Studies Unit, University of Alaska: Fairbanks.

Speegle, J.
2012. *NOAA lists ringed and bearded ice seal populations under the Endangered Species Act [press release]*.

Stevens Village Council
1991. *A comprehensive land use plan for the traditional lands of Stevens Village*. Stevens Village Council: Stevens Village, AK.

Stout, G.W.
2010. "*Unit 21B moose*" [in] P. Harper, editor *Moose management report of survey and inventory activities 1 July 2007–30 June 2009*. Alaska Department of Fish and Game, Project 1.0: Juneau.

2014. "*Unit 21D moose*" [in] L.A. McCarthy and P. Harper, editors *Moose management report of survey and inventory activities 1 July 2011–30 June 2013*. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2014-6: Juneau.

Sumida, V.A.
1988. *Land and resource use patterns in Stevens Village, Alaska*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 129: Fairbanks.

Suydam, R.S. and J.C. George
2012. *Subsistence harvest of bowhead whales (Balaena mysticetus) by Alaskan Eskimos, 1974 to 2011. Paper SC/64/AWMP8 submitted to the Scientific Committee of the International Whaling Commission*. International Whaling Commission.

Swindale, A. and P. Bilinsky
2006. *Development of a universally applicable household food insecurity measurement tool: process, current status, and outstanding issues*. Journal of Nutrition 136(5), page 1449S–1452S.

Turck, T.J. and D.L.L. Turck
1992. *Trading posts along the Yukon River: Noochuloghoyet trading post in historical context*. ARCTIC 45(1), pages 51–61.

URS Corporation
2005. *North Slope Borough comprehensive plan: Nuiqsut village profile*. North Slope Borough.

U.S. Census Bureau
n.d. *2010 Decennial Census and American Community Survey data*. U.S. Census Bureau American FactFinder Homepage: Washington, D.C. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

U.S. Census Bureau
2003. *2000 census of population and housing: population and housing unit counts PHC-3-3, Alaska*. : Washington, D.C.

2011. *2010 census*. U.S. Census Bureau: Washington, D.C.

U.S. Department of Commerce
2010. *Commerce Secretary Gary Locke announces "fishery failure" determination for Alaska Chinook salmon [press release]*.

U.S. Department of the Interior
1965. *Rampart project, Alaska: market for power and effect of project on natural resources*. U.S. Department of the Interior: Juneau.

U.S. Fish and Wildlife Service
2014. *Pacific walrus: the Endangered Species Act and Alaska Native hunting*.

Valencia, K., C.A. Phillips, and L. Boltz editors.
2005. *The Alaska wilderness guide*, 9th edition. Morris Communications Company LLC: Anchorage.

Van Stone, J.W. and I. Goddard
1981. "*Territorial groups of West-Central Alaska before 1898*" [in] W.C. Sturtevant and J. Helm, editors *Handbook of North American Indians*, 6: Subarctic. Smithsonian Institution Press: Washington, D.C.

Walker, B.
2014. *Letter to Secretary of the Interior Sally Jewell supporting permit approval for the Greater Mooses Tooth-1 development project*.

Webb, P., J. Coates, E.A. Frongillo, B.L. Rogers, A. Swindale, and P. Bilinsky
2006. *Measuring household food insecurity: why it's so important and yet so difficult to do*. Journal of Nutrition 136(5), page 1404s–1408s.

WHPacific, Inc.
2015. *North Slope regional energy plan, final draft*. North Slope Borough: Barrow.

Wickersham, J.
1938. *Old Yukon: Tales,Trails, and Trials*. Wachington Law Book Co.: Washington D.C.

Wiehl, M. and Rampart Tribal Council
2014. *Rampart Community Plan 2014*. Tanana Chiefs Conference Village Planning and Development Program: Fairbanks.

Wolfe, R.J.
1987. *The super-household: specialization in subsistence economies*. Paper presented at the 14th annual meeting of the Alaska Anthropological Association, March 1987, Anchorage, Alaska. Alaska Department of Fish and Game Division of Subsistence: Juneau.

Wolfe, R.J. and C. Scott
2010. *Continuity and change in salmon harvest patterns, Yukon River drainage, Alaska*, U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program No. 07-253. Robert J. Wolfe and Associates: San Marcos, CA.

Wolfe, R.J., C.L. Scott, W.E. Simeone, C.J. Utermohle, and M.C. Pete
2010. *The "super-household" in Alaska Native subsistence economies*. Final Report to the National Science Foundation, Project ARC 0352611.

Wolfe, R.J. and C.J. Utermohle
2000. *Wild food consumption rate estimates for rural Alaska populations*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 261: Juneau.

Wolfe, R.J. and R.J. Walker
1986. *Impacts of roads and settlement entry on subsistence in Alaska*. Proceedings of the Annual Meeting of Alaska Anthropological Association: Fairbanks.

1987. *Subsistence economies in Alaska: productivity, geography, and development impacts*. Arctic Anthropology 24(2), pages 56–81.

Wunderlich, G.S. and J.L. Norwood
2006. *Food insecurity and hunger in the United States: an assessment of the measure. Panel to review the U.S. Department of Agriculture's measurement of food insecurity and hunger*. Committee on National Statistics, Division of Behavioral and Social Sciences and Education, the National Academies Press: Washington, D.C.

Young Jr., D.D., P. Harper, and L.A. McCarthy
2014. "*Unit 20A moose*" [in] *Moose management report of survey and inventory activities 1 July 2011–30 June 2013*. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2014-6: Juneau.

APPENDIX A–SURVEY INSTRUMENT

COMPREHENSIVE WILD FOOD HARVEST SURVEY

ALASKA LNG - TANANA

TANANA, ALASKA

From January 1, 2014 to December 31, 2014

printed: 2015-02-13

This survey is used to estimate wild food harvests and to describe rural community 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 wild food resources.

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: _____

INTERVIEWER 1: _____

INTERVIEWER 2: _____

INTERVIEW DATE: _____

START TIME: _____

STOP TIME: _____

DATA CODED BY:

DATA ENTERED BY:

SUPERVISOR:

ALASKA DEPARTMENT OF FISH AND GAME
1300 COLLEGE RD.
FAIRBANKS, AK 99701
907-459-7321

NATIVE VILLAGE OF TANANA
PO BOX 130
TANANA, AK 99777
907-366-7160

DIVISION OF HEALTH AND PUBLIC SERVICES
3601 C STREET, SUITE 540
ANCHORAGE, AK 99503
907-269-8000

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 January 1, 2014 and December 31, 2014 WHO were the head or heads of your 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?	Where were parents living when this person was born?	How many years has this person lived in Tanana?
ID #	*(circle)*	*(relation)*	*(circle)*	*(circle)*	*(years)*	*(AK city or state)*	*(number)*
HEAD 1	Y N		M F	Y N			
1							
NEXT enter spouse or partner. If a household has a SINGLE HEAD, leave HEAD 2 row BLANK and move to PERSON 3.							
HEAD 2	Y N		M F	Y N			
2							
BELOW, enter children (oldest to youngest), grandchildren, grandparents, or anyone else living full-time in this household.							
PERSON 03	Y N		M F	Y N			
3							
PERSON 04	Y N		M F	Y N			
4							
PERSON 05	Y N		M F	Y N			
5							
PERSON 06	Y N		M F	Y N			
6							
PERSON 07	Y N		M F	Y N			
7							
PERSON 08	Y N		M F	Y N			
8							
PERSON 09	Y N		M F	Y N			
9							
PERSON 10	Y N		M F	Y N			
10							
PERSON 11	Y N		M F	Y N			
11							
PERSON 12	Y N		M F	Y N			
12							
PERSON 13	Y N		M F	Y N			
13							

PERMANENT HH MEMBERS: 01 **TANANA: 336**

HOUSEHOLD PARTICIPATION

HOUSEHOLD ID

To continue our questions about people in your household, I would like to ask a few questions about participation in harvesting wild foods…

Between January 1, 2014 and December 31, 2014

Did this person ….

PERSON ID# FROM PAGE 2	FISH		LARGE LAND MAMMALS		SMALL LAND MAMMALS		MARINE MAMMALS		BIRDS AND EGGS		PLANTS / BERRIES / WOOD	
	FISH FOR	PROCESS	HUNT / TRAP	PROCESS	HUNT / TRAP	PROCESS	HUNT	PROCESS	HUNT / GATHER	PROCESS	GATHER	PROCESS
ID #	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*
HEAD 1	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
1												
HEAD 2	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
2												
PERSON 03	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
3												
PERSON 04	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
4												
PERSON 05	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
5												
PERSON 06	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
6												
PERSON 07	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
7												
PERSON 08	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
8												
PERSON 09	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
9												
PERSON 10	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
10												
PERSON 11	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
11												
PERSON 12	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
12												
PERSON 13	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
13												

PERMANENT HH MEMBERS: 01 **TANANA: 336**

RETAINED COMMERCIAL HARVESTS

HOUSEHOLD ID

1. Do you or members of your household USUALLY participate in any commercial fishery?..... Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household PARTICIPATE in any commercial fishery?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT PAGE*.

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 COMM 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*
SUMMER CHUM (DOG)	Y N	Y N	Y N				IND.	
111010001								
FALL CHUM (DOG)	Y N	Y N	Y N				IND.	
111020001								
CHINOOK (KING) SALMON	Y N	Y N	Y N				IND.	
113000001								
COHO (SILVER) SALMON	Y N	Y N	Y N				IND.	
112000001								
SOCKEYE (RED) SALMON	Y N	Y N	Y N				IND.	
115000001								
PINK (HUMPIES) SALMON	Y N	Y N	Y N				IND.	
114000001								
UNKNOWN SALMON	Y N	Y N	Y N				IND.	
119000001								
HERRING	Y N	Y N	Y N				GAL.	
120200001								
HERRING ROE	Y N	Y N	Y N				GAL.	
120300001								
KING CRAB	Y N	Y N	Y N				IND.	
501008001								

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*
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 fishery.*
5 *Double counting (captains' removals for crew members and crew members' removal for own uses) is fixed in analysis. Collect both.*

COMMERCIAL FISHING: 03 **TANANA: 336**

HARVESTS: SALMON

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for salmon for subsistence, personal use, or sport?..... Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household USE or TRY TO HARVEST salmon?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT 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 during the last year. How many were harvested 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.DO NOT INCLUDE catch and release fish or retained commercial harvests.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	FISH WHEEL	GILL NET OR SEINE	ROD & REEL3	DIP NET	OTHER GEAR (specify type)	Units[4]	# of those used just for dog food?
						(number harvested by each gear type)				*amount / type*	*specify*	*amt.*
SUMMER CHUM (DOG)	Y N	Y N	Y N	Y N	Y N					/	IND.	
111010000												
FALL CHUM (DOG)	Y N	Y N	Y N	Y N	Y N					/	IND.	
111020000												
CHINOOK (KING) SALMON	Y N	Y N	Y N	Y N	Y N					/	IND.	
113000000												
COHO (SILVER) SALMON	Y N	Y N	Y N	Y N	Y N					/	IND.	
112000000												
SOCKEYE (RED) SALMON	Y N	Y N	Y N	Y N	Y N					/	IND.	
115000000												
PINK (HUMPIES) SALMON	Y N	Y N	Y N	Y N	Y N					/	IND.	
114000000												
UNKNOWN SALMON	Y N	Y N	Y N	Y N	Y N					/	IND.	
119000000												
	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 January 1, 2014 and December 31, 2014.*

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 "ice fishing."*

4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

SALMON: 04 **TANANA: 336**

HARVEST 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…*

ASSESSMENTS: SALMON 110000000

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
IF LESS or MORE … X = do not use
WHY was your use different? _____ 1
_____ 2

During the last year,[1]
…did your household GET ENOUGH salmon?..... Y N
If NO…
What KIND of salmon did you need? _____

How would you describe the impact to your household of not getting enough salmon last year?	*… not noticable?*	*… minor ?*	*… major?*	*… Severe?*
	(0)	*(1)*	*(2)*	*(3)*

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

NETWORKS & ASSESSMENTS OF SALMON: 66, 67 **TANANA: 336**

HARVESTS: FRESH WATER FISH

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for fresh water fish for subsistence, personal use, or sport?..... Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household USE or TRY TO HARVEST fresh water fish?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT 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 fresh water fish ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested with ….

INCLUDE fresh water 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. DO NOT INCLUDE catch and release fish or retained commercial harvests.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	FISH WHEEL	GILL NET OR SEINE	ICE FISHING	ROD & REEL[3]	OTHER GEAR (specify type)	Units[4]	# of those used just for dog food?
						(number harvested by each gear type)				*amount / type*	*specify*	*amt.*
BURBOT (MUDSHARK)	Y N	Y N	Y N	Y N	Y N					/	IND.	
124800000												
PIKE	Y N	Y N	Y N	Y N	Y N					/	IND.	
125500000												
GRAYLING	Y N	Y N	Y N	Y N	Y N					/	IND.	
125200000												
RAINBOW TROUT	Y N	Y N	Y N	Y N	Y N					/	IND.	
126204000												
DOLLY VARDEN	Y N	Y N	Y N	Y N	Y N					/	IND.	
125006000												
BLACKFISH	Y N	Y N	Y N	Y N	Y N					/	IND.	
125600000												
LONG-NOSE SUCKER	Y N	Y N	Y N	Y N	Y N					/	IND.	
126000000												
OTHER TROUT (SPECIFY)	Y N	Y N	Y N	Y N	Y N					/	IND.	
126299000												
	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 fresh water fish?..... Y N

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*
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 " ice fishing."*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVESTS: WHITEFISH

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for whitefish for subsistence, personal use, or sport?..... Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household USE or TRY TO HARVEST whitefish?..... Y N

IF the answer to QUESTION 2 is NO, to to the NEXT 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 during the last year. How many were harvested with ….

INCLUDE fresh water 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.DO NOT INCLUDE catch and release fish or retained commercial harvests.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	FISH WHEEL	GILL NET OR SEINE	ICE FISHING	ROD & REEL[3]	OTHER GEAR (specify type)	Units[4]	# of those used just for dog food?
						(number harvested by each gear type)				*amount / type*	*specify*	*amt.*
ROUND WHITEFISH	Y N	Y N	Y N	Y N	Y N					/	IND.	
126412000												
HUMPBACK WHITEFISH	Y N	Y N	Y N	Y N	Y N					/	IND.	
126408000												
BROAD WHITEFISH	Y N	Y N	Y N	Y N	Y N					/	IND.	
126404000												
LEAST CISCO	Y N	Y N	Y N	Y N	Y N					/	IND.	
126406060												
SHEEFISH	Y N	Y N	Y N	Y N	Y N					/	IND.	
125600000												
UNKNOWN WHITEFISH	Y N	Y N	Y N	Y N	Y N					/	IND.	
126499000												
	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					/		

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 January 1, 2014 and December 31, 2014.*
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 " ice fishing."*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

WHITEFISH: 06 **TANANA: 336**

HARVESTS: MARINE FISH

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for marine fish for subsistence, personal use, or sport?..... Y N

2. During the last year (between December 1, 2013 and November 30, 2014), did you, or members of your household USE or TRY TO HARVEST marine fish?..... Y N

IF the answer to QUESTION 2 is NO, to to the NEXT 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 fish ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested with ….

INCLUDE fresh water 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. DO NOT INCLUDE catch and release fish or retained commercial harvests.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	FISH WHEEL	GILL NET OR SEINE	ICE FISHING	ROD & REEL[3]	OTHER GEAR (specify type)	Units[4]	# of those used just for dog food?
						(number harvested by each gear type)				amount / type	specify	amt.
HALIBUT	Y N	Y N	Y N	Y N	Y N					/	LB.	
121800000												
HERRING	Y N	Y N	Y N	Y N	Y N					/	GAL.	
120200000												
PACIFIC COD (GRAY)	Y N	Y N	Y N	Y N	Y N					/	IND.	
121004000												
PACIFIC TOM COD	Y N	Y N	Y N	Y N	Y N					/	IND.	
121008000												
STARRY FLOUNDER	Y N	Y N	Y N	Y N	Y N					/	IND.	
121406000												
SMELT	Y N	Y N	Y N	Y N	Y N					/	GAL.	
120400000												
ROCKFISH	Y N	Y N	Y N	Y N	Y N					/	IND.	
122600000												
EULACHON *(HOOLIGAN, CANDLEFISH)*	Y N	Y N	Y N	Y N	Y N					/	GAL.	
120404000												
LINGCOD	Y N	Y N	Y N	Y N	Y N					/	IND.	
121606000												
	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 marine 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 January 1, 2014 and December 31, 2014.*
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 "ice fishing."*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVEST SUMMARY: OTHER FISH

HOUSEHOLD ID

If this household did NOT USE or HARVEST other fish 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 other fish…*

ASSESSMENTS: OTHER FISH 120000000

To conclude our other fish section, I am going to ask a few general questions about other fish.

During the last year,[1]
… did your household use LESS, SAME, or MORE other fish than in recent years? …… X L S M

IF LESS or MORE … X = do not use

WHY was your use different? _____ 1

_____ 2

During the last year,[1]
…did your household GET ENOUGH other fish?..... Y N

If NO…

What KIND of other fish did you need? _____

How would you describe the impact to your household of not getting enough other fish last year?	*… not noticable?*	*… minor ?*	*… major?*	*… Severe?*
	(0)	*(1)*	*(2)*	*(3)*

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

NETWORKS & ASSESSMENTS OF OTHER FISH: 66, 67 **TANANA: 336**

HARVESTS: MARINE INVERTEBRATES

HOUSEHOLD ID

1. Do you or members of your household USUALLY harvest marine invertebrates for subsistence, personal use, or sport? Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household USE or TRY TO HARVEST marine invertebrates?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT 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 during the last year. How many were harvested with ….

INCLUDE marine invertebrates that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If harvesting with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest. DO NOT INCLUDE marine invertebrates caught commercially, or were not retained.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	AMOUNT (amt)	Units[4] specify	COMMENTS (text)
DUNGENESS CRAB	Y N	Y N	Y N	Y N	Y N		IND.	
501004000								
KING CRAB	Y N	Y N	Y N	Y N	Y N		IND.	
501008000								
TANNER CRAB	Y N	Y N	Y N	Y N	Y N		IND.	
501012000								
RAZOR CLAMS	Y N	Y N	Y N	Y N	Y N		GAL.	
500612000								
FRESHWATER CLAMS	Y N	Y N	Y N	Y N	Y N		GAL.	
500604000								
BUTTER CLAMS	Y N	Y N	Y N	Y N	Y N		GAL.	
500602000								
CLAMS	Y N	Y N	Y N	Y N	Y N		GAL.	
500699000								
	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 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 January 1, 2014 and December 31, 2014.*
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 " ice fishing."*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

MARINE INVERTEBRATES: 08 **TANANA: 336**

HARVEST 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…*

ASSESSMENTS: MARINE INVERTEBRATES 500000000

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

IF LESS or MORE … X = do not use

WHY was your use different? _____ 1

_____ 2

During the last year,[1]
…did your household GET ENOUGH marine invertebrates?..... Y N

If NO…

What KIND of marine invertebrates did you need? _____

How would you describe the impact to your household of not getting enough marine invertebrates last year?	*… not noticable?*	*… minor ?*	*… major?*	*… Severe?*
	(0)	*(1)*	*(2)*	*(3)*

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

NETWORKS & ASSESSMENTS OF MARINE INVERTEBRATES: 66, 67 **TANANA: 336**

HARVESTS: LARGE LAND MAMMALS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt for large land mammals? Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household USE or TRY TO HARVEST large land mammals?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT 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 mammals ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested in ….

INCLUDE large land 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	SEX M/F	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS[3] (specify)
							(specify amount harvested per month)													
MOOSE	Y N	Y N	Y N	Y N	Y N	M														IND
						F														IND
211800000						UNK														IND
211800001						1														
211800002						2														
211800009						-9														
CARIBOU	Y N	Y N	Y N	Y N	Y N	M														IND
						F														IND
211000000						UNK														IND
211000001						1														
211000002						2														
211000009						-9														
BLACK BEAR	Y N	Y N	Y N	Y N	Y N	M														IND
						F														IND
210600000						UNK														IND
BROWN BEAR	Y N	Y N	Y N	Y N	Y N															IND.
210800000																				
DALL SHEEP	Y N	Y N	Y N	Y N	Y N															IND.
212200000																				
GOAT	Y N	Y N	Y N	Y N	Y N															IND.
211600000																				
DEER	Y N	Y N	Y N	Y N	Y N															IND.
211200000																				
	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 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 January 1, 2014 and December 31, 2014.*

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.*

LARGE LAND MAMMALS: 10 **TANANA: 336**

HARVEST 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…*

ASSESSMENTS: LARGE LAND MAMMALS 210000000

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

IF LESS or MORE … X = do not use

WHY was your use different? _____ 1

_____ 2

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? _____

How would you describe the impact to your household of not getting enough large land mammals last year?	*… not noticable?*	*… minor ?*	*… major?*	*… Severe?*
	(0)	*(1)*	*(2)*	*(3)*

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

NETWORKS & ASSESSMENTS OF LARGE LAND MAMMALS: 66, 67 **TANANA: 336**

HARVESTS: SMALL LAND MAMMALS OR FURBEARERS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt or trap for small land mammals or furbearers?..... Y N

2. During the last year (between January 1, 2014 and December 31, 2014),
   did you, or members of your household USE or TRY TO HARVEST small land mammals or furbearers?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT 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 mammals or furbearers ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested in ….

INCLUDE small land mammals or furbearers 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	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	NUMBER USED FOR FOOD OR FOR FOOD & FUR	UNITS[3]
						(specify amount harvested per month)													*(amount)*	*specify*
BEAVER	Y N	Y N	Y N	Y N	Y N															IND.
220200000																				
PORCUPINE	Y N	Y N	Y N	Y N	Y N															IND.
222600000																				
SNOWSHOE HARE	Y N	Y N	Y N	Y N	Y N															IND.
221004000																				
RED FOX	Y N	Y N	Y N	Y N	Y N															IND.
220804000																				
CROSS FOX	Y N	Y N	Y N	Y N	Y N															IND.
220804020																				
WOLF	Y N	Y N	Y N	Y N	Y N															IND.
223200000																				
WOLVERINE	Y N	Y N	Y N	Y N	Y N															IND.
223400000																				
LAND OTTER	Y N	Y N	Y N	Y N	Y N															IND.
221200000																				
MUSKRAT	Y N	Y N	Y N	Y N	Y N															IND.
222400000																				
WEASEL	Y N	Y N	Y N	Y N	Y N															IND.
223000000																				

…Continue on next page

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*
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.*

SMALL LAND MAMMALS OR FURBEARERS: 14 **TANANA: 336**

HARVESTS: SMALL LAND MAMMALS OR FURBEARERS

HOUSEHOLD ID

…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?
- **D** …try[2] to harvest _____?
- **E** …actually harvest any _____?

if harvest is "yes"

Please estimate how many small land mammals or furbearers ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested in ….

INCLUDE small land mammals or furbearers 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	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	NUMBER USED FOR FOOD OR FOR FOOD & FUR	UNITS[3]
						(specify amount harvested per month)													(amount)	specify
LYNX	Y N	Y N	Y N	Y N	Y N															IND.
221600000																				
MARTEN	Y N	Y N	Y N	Y N	Y N															IND.
222000000																				
COYOTE	Y N	Y N	Y N	Y N	Y N															IND.
220400000																				
MINK	Y N	Y N	Y N	Y N	Y N															IND.
222200000																				
MARMOT	Y N	Y N	Y N	Y N	Y N															IND.
221800000																				
GROUND SQUIRREL	Y N	Y N	Y N	Y N	Y N															IND.
222802000																				
TREE SQUIRREL	Y N	Y N	Y N	Y N	Y N															IND.
222804000																				
	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 small land mammals or furbearers?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

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.*

SMALL LAND MAMMALS OR FURBEARERS: 14 **TANANA: 336**

HARVEST SUMMARY: SMALL LAND ANIMALS

HOUSEHOLD ID

If this household did NOT USE or HARVEST small land animals 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 small land mammals…*

ASSESSMENTS: SMALL LAND ANIMALS 220000000

To conclude our small land animals section, I am going to ask a few general questions about small land animals.

During the last year,[1]
… did your household use LESS, SAME, or MORE small land animals than in recent years? …… X L S M

IF LESS or MORE … X = do not use

WHY was your use different? _____ 1

_____ 2

During the last year,[1]
…did your household GET ENOUGH small land animals?..... Y N

If NO…

What KIND of small land animals did you need? _____

How would you describe the impact to your household of not getting enough small land animals last year?	*… not noticable?*	*… minor ?*	*… major?*	*… Severe?*
	(0)	*(1)*	*(2)*	*(3)*

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

NETWORKS & ASSESSMENTS OF SMALL LAND ANIMALS: 66, 67 **TANANA: 336**

HARVESTS: MARINE MAMMALS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt for marine mammals?..... Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household USE or TRY TO HARVEST marine mammals?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT 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 got during the last year. How many were harvested in ….

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	SEX	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS[3]
						M/F	(specify amount harvested per month)													(specify)
RINGED SEAL	Y N	Y N	Y N	Y N	Y N															IND.
300810000																				
SPOTTED SEAL	Y N	Y N	Y N	Y N	Y N															IND.
300812000																				
UNKNOWN SEAL *(OR SEAL OIL)*	Y N	Y N	Y N	Y N	Y N															IND.
300899000																				
WHALE *(SPECIFY)*	Y N	Y N	Y N	Y N	Y N															IND.
301600000																				
	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.
	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 January 1, 2014 and December 31, 2014.*
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 **TANANA: 336**

HARVEST 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…*

ASSESSMENTS: MARINE MAMMALS 300000000

To conclude our marine mammals section, I am going to ask a few general questions about marine mammals.

During the last year,[1]

… did your household use LESS, SAME, or MORE marine mammals than in recent years? …… X L S M

IF LESS or MORE … X = do not use

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

…did your household GET ENOUGH marine mammals?..... Y N

If NO…

What KIND of marine mammals did you need? _____

How would you describe the impact to your household of not getting enough marine mammals last year?	*… not noticable?*	*… minor ?*	*… major?*	*… Severe?*
	(0)	*(1)*	*(2)*	*(3)*

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

NETWORKS & ASSESSMENTS OF MARINE MAMMALS: 66, 67 **TANANA: 336**

HARVESTS: MIGRATORY WATERFOWL

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt for migratory waterfowl?..... Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household USE or TRY TO HARVEST migratory waterfowl?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT 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 migratory waterfowl ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested in ….

INCLUDE migratory waterfowl 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	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 (CACKLERS)	Y N	Y N	Y N	Y N	Y N						IND.
410404040											
CANADA GEESE (BIG LESSER)	Y N	Y N	Y N	Y N	Y N						IND.
410404080											
CANADA GEESE (UNKNOWN)	Y N	Y N	Y N	Y N	Y N						IND.
410404990											
WHITE-FRONTED GEESE *Specklebelly*	Y N	Y N	Y N	Y N	Y N						IND.
410410000											
SPECTACLED EIDER	Y N	Y N	Y N	Y N	Y N						IND.
410206060											
BRANT (SEA GEESE)	Y N	Y N	Y N	Y N	Y N						IND.
410402000											
SNOW GEESE	Y N	Y N	Y N	Y N	Y N						IND.
410408000											
GEESE (UNKNOWN)	Y N	Y N	Y N	Y N	Y N						IND.
410499000											
TUNDRA SWAN (WHISTLING)	Y N	Y N	Y N	Y N	Y N						IND.
410604000											
SANDHILL CRANE	Y N	Y N	Y N	Y N	Y N						IND.
410802000											

…Continue on the next page

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

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.*

MIGRATORY WATERFOWL: 15

HARVESTS: MIGRATORY WATERFOWL

HOUSEHOLD ID

…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?
- **D** …try[2] to harvest _____?
- **E** …actually harvest any _____?

if harvest is "yes"

Please estimate how many migratory waterfowl ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested in ….

INCLUDE migratory waterfowl 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	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)*
MALLARD	Y N	Y N	Y N	Y N	Y N						IND.
410214000											
NORTHERN PINTAIL	Y N	Y N	Y N	Y N	Y N						IND.
410220000											
GOLDENEYE	Y N	Y N	Y N	Y N	Y N						IND.
410210000											
GREEN WINGED TEAL	Y N	Y N	Y N	Y N	Y N						IND.
410232060											
CANVASBACK	Y N	Y N	Y N	Y N	Y N						IND.
410204000											
BLACK SCOTER	Y N	Y N	Y N	Y N	Y N						IND.
410228020											
UNKNOWN DUCKS	Y N	Y N	Y N	Y N	Y N						IND.
410299000											
	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 migratory waterfowl?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

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.*

MIGRATORY WATERFOWL: 15

HARVESTS: OTHER BIRDS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt for other birds?..... Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household USE or TRY TO HARVEST other birds?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT 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 during the last year. How many were harvested in ….

INCLUDE other birds 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	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)
PTARMIGAN	Y N	Y N	Y N	Y N	Y N						IND.
421804000											
SPRUCE GROUSE	Y N	Y N	Y N	Y N	Y N						IND.
421802020											
RUFFED GROUSE	Y N	Y N	Y N	Y N	Y N						IND.
421802060											
SHARP-TAILED GROUSE	Y N	Y N	Y N	Y N	Y N						IND.
421802040											
GROUSE (UNKNOWN)	Y N	Y N	Y N	Y N	Y N						IND.
421802990											
	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 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 January 1, 2014 and December 31, 2014.*

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.*

OTHER BIRDS: 15

HARVESTS: BIRD EGGS

HOUSEHOLD ID

1. Do you or members of your household USUALLY harvest bird eggs?..... Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household USE or TRY TO HARVEST bird eggs?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT 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 bird eggs ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested with ….

INCLUDE bird eggs that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If harvesting 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	AMOUNT (amt)	Units[4] specify	COMMENTS (text)
GULL EGGS	Y N	Y N	Y N	Y N	Y N		IND.	
431212000								
GEESE EGGS	Y N	Y N	Y N	Y N	Y N		IND.	
430400000								
DUCK EGGS	Y N	Y N	Y N	Y N	Y N		IND.	
430200000								
EGGS (UNKNOWN)	Y N	Y N	Y N	Y N	Y N		IND.	
439900000								
	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.	
	Y N	Y N	Y N	Y N	Y N		IND.	

During the last year, did your household use any other kind of bird 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 January 1, 2014 and December 31, 2014.*
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 gear."*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

BIRD EGGS: 15 **TANANA: 336**

HARVEST SUMMARY: BIRDS AND EGGS

HOUSEHOLD ID

If this household did NOT USE or HARVEST birds and 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 and eggs…*

ASSESSMENTS: BIRDS AND EGGS 400000000

To conclude our birds and eggs section, I am going to ask a few general questions about birds and eggs.

During the last year,[1]
… did your household use LESS, SAME, or MORE birds and eggs than in recent years? …… X L S M

IF LESS or MORE … X = do not use

WHY was your use different? _____ 1

_____ 2

During the last year,[1]
…did your household GET ENOUGH birds and eggs?..... Y N

If NO…

What KIND of birds and eggs did you need? _____

How would you describe the impact to your household of not getting enough birds and eggs last year?	*… not noticable?*	*… minor ?*	*… major?*	*… Severe?*
	(0)	*(1)*	*(2)*	*(3)*

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

NETWORKS & ASSESSMENTS OF BIRDS AND EGGS: 66, 67 **TANANA: 336**

HARVESTS: BERRIES

HOUSEHOLD ID

1. Do you or members of your household USUALLY harvest berries?..... Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household USE or TRY TO HARVEST berries?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT 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 during the last year.

INCLUDE berries that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If harvesting 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	AMOUNT (amt)	Units[4] specify	COMMENTS (text)
BLUEBERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601002000								
LOW BUSH CRANBERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601004000								
HIGH BUSH CRANBERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601006000								
CROWBERRY *(BLACKBERRY)*	Y N	Y N	Y N	Y N	Y N		GAL.	
601007000								
CLOUD BERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601016000								
RASPBERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601020000								
OTHER BERRIES	Y N	Y N	Y N	Y N	Y N		GAL.	
601099000								
	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 January 1, 2014 and December 31, 2014.*
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 gear."*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

BERRIES: 17 **TANANA: 336**

HARVESTS: PLANTS AND GREENS

HOUSEHOLD ID

1. Do you or members of your household USUALLY harvest plants and greens?..... Y N

2. During the last year (between January 1, 2014 and December 31, 2014), did you, or members of your household USE or TRY TO HARVEST plants and greens?..... Y N

IF the answer to QUESTION 2 is NO, to to the *NEXT 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 and greens ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.

INCLUDE plants and greens that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If harvesting 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	AMOUNT (amt)	Units[4] specify	COMMENTS (text)
WILD RHUBARB	Y N	Y N	Y N	Y N	Y N		GAL.	
602006000								
FIREWEED	Y N	Y N	Y N	Y N	Y N		GAL.	
602042000								
HUDSON BAY TEA *LABRADOR TEA*	Y N	Y N	Y N	Y N	Y N		GAL.	
602018000								
FIDDLEHEAD FERNS	Y N	Y N	Y N	Y N	Y N		GAL.	
602014000								
WILLOW LEAVES	Y N	Y N	Y N	Y N	Y N		GAL.	
602031000								
MUSHROOMS	Y N	Y N	Y N	Y N	Y N		GAL.	
602040000								
OTHER PLANTS	Y N	Y N	Y N	Y N	Y N		GAL.	
602038000								

During the last year, did your household use any other kind of plants and greens?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?
FIREWOOD	Y N	Y N	Y N	Y N	Y N
604000000					

Please estimate the percentage of your household's heating needs in 2014 that came from firewood.

0%	1% - 25%	26% - 50%	51% - 75%	76% - 99%	100%
(0)	(1)	(2)	(3)	(4)	(5)

(circle one)

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*
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 gear."*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVEST SUMMARY: PLANTS AND BERRIES

HOUSEHOLD ID

If this household did NOT USE or HARVEST plants and berries 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 plants and berries…*

ASSESSMENTS: PLANTS AND BERRIES 600000000

To conclude our plants and berries section, I am going to ask a few general questions about plants and berries.

During the last year,[1]

… did your household use LESS, SAME, or MORE plants and berries than in recent years? …… X L S M

IF LESS or MORE … X = do not use

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

…did your household GET ENOUGH plants and berries?..... Y N

If NO…

What KIND of plants and berries did you need? _____

How would you describe the impact to your household of not getting enough plants and berries last year?	*… not noticable?*	*… minor ?*	*… major?*	*… Severe?*
	(0)	*(1)*	*(2)*	*(3)*

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

NETWORKS & ASSESSMENTS OF PLANTS AND BERRIES: 66, 67 **TANANA: 336**

HARVEST SUMMARY: ALL RESOURCES

HOUSEHOLD ID

ASSESSMENTS: ALL RESOURCES 0

To conclude our harvests section, I am going to ask a few general questions about wild resources.

During the last year,[1]

… did your household use LESS, SAME, or MORE wild resources than in recent years? …… X L S M

IF LESS or MORE … X = do not use

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

…did your household GET ENOUGH wild resources?..... Y N

If NO…

What KIND of wild resources did you need? _____

How would you describe the impact to your household of not getting enough wild resources last year? ……	*… not noticable?* *(0)*	*… minor ?* *(1)*	*… major?* *(2)*	*… Severe?* *(3)*

HEALTH IMPACT ASSESSMENTS

(circle ONE response)

In a normal week, how often are wild foods such as salmon, non-salmon fish, moose, caribou, birds, etc. served in your household?	None, don't use (0)	Less than once per week (1)	1 - 3 times per week (2)	4 - 6 times per week (3)	Once per day (4)	2 times per day (5)	3 Times per day (6)

If this household does NOT USE wild foods, go to the next page

Otherwise, continue below…

Please list the TOP FIVE MOST IMPORTANT WILD FOODS that are used in your household. Include wild foods that may not be available now, but are important at other times of the year. Please list most important foods first.

(Not necessary to fill out every line)

	Wild Food 1	Wild Food 2	Wild Food 3	Wild Food 4	Wild Food 5
TOP FIVE WILD FOODS					

If your household CANNOT GET WILD FOODS, what foods do members of your household eat instead? These can be general categories or more specific items you purchase or grow. Please list most important alternative foods first. These can be general categories or more specific items you purchase, grow, or are grown locally.

(Not necessary to fill out every line)

	Other Food	Other Food	Other Food	Other Food	Other Food
OTHER FOODS[2] (1 TO 5)					
OTHER FOODS[2] (6 TO 10)					

1 *"LAST YEAR" means between January 1, 2014 and December 31, 2014.*

2 *For "OTHER FOODS", we are not interested in condiments or staples, such as sugar, flour, coffee, or butter etc... We are interested in foods used in place of traditional foods for meals or snacks. This includes foods substituted by personal preference or out of necessity (traditional food not available).*

ASSESSMENTS OF ALL RESOURCES: 66 **TANANA: 336**

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'd like you to think about all your household's food, both wild food and store-bought...

Which of these three statements best describes the food eaten in your household in the last 12 months…

(Circle one)

STATEMENT 1. We had enough of the kinds of food we wanted to eat……
❷ **STATEMENT 2**. We had enough food, but not always the KIND of food we wanted to eat……
❸ **STATEMENT 3**. Sometimes, or often, we did **NOT HAVE ENOUGH** food to eat…….

1 2 3

HH1 C

If 2 or 3

If STATEMENT 2 or STATEMENT 3 was TRUE, continue with food security questions on this page. Otherwise, go to next section…

Now I am going to read you several statements about different food situations.
Please tell me whether EACH statement was true for your household (HH) in the last 12 months.

❹ **STATEMENT 4. We WORRIED that our household would run out of food before we could get more.** HH2

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

…did this happen because your household couldn't get WILD FOOD,
your HH couldn't get STORE-BOUGHT food, or your HH couldn't get BOTH KINDS of food?..... WILD STOR BOTH

❺ **STATEMENT 5. 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 did NOT have what you needed to hunt, fish, gather, OR did not have enough money to buy food.

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

…did this happen because your household couldn't get WILD FOOD,
your HH couldn't get STORE-BOUGHT food, or your HH couldn't get BOTH KINDS of food?..... WILD STOR BOTH

❻ **STATEMENT 6. 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 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 WILD FOOD…

STATEMENT 7. The WILD 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 8. 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 any ONE of the STATEMENTS 4, 5, OR 6 was "YES," continue with food security questions on next page. Otherwise, go to next section…

FOOD SECURITY

HOUSEHOLD ID

If any ONE of the STATEMENTS 4, 5, or 6 on previous page was "YES," continue with food security questions below. Otherwise, go to next section…

AD1

In the past 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 ?

If YES…

…in which months did this happen?..... J F M A M J J A S O N D

AD2

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 ?

AD3

In the last 12 months, were adults in the HH ever HUNGRY BUT DID NOT EAT because there was not enough food?..... N Y ?

AD4

In the last 12 months, did adults in the HH LOSE WEIGHT because there was not enough food?..... N Y ?

AD5

In the last 12 months, were adults in the HH ever NOT EAT FOR A WHOLE DAY because there was not enough food?..... N Y ?

If YES…

…in which months did this happen?..... J F M A M J J A S O N D

EMPLOYMENT

HOUSEHOLD ID

The next few pages ask about jobs and income. 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 hunting, fishing, and gathering activities.

Between January 1, 2014 and December 31, 2014 ...

…Did any members of your household earn money from a JOB or from SELF EMPLOYMENT?..... Y N

Starting with the first head of your household, what job or jobs did he or she have last year?

For each member of this household born before 1999, list EACH JOB held last year. For household members who did not have a job, write: RETIRED, UNEMPLOYED, STUDENT, HOMEMAKER, DISABLED, etc..

			INCLUDE EACH PERSON 16 YEARS AND OLDER EVEN IF THEY DID NOT HAVE A JOB				WORK SCHEDULE[2]					
			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?	FULL TIME	PART TIME	SHIFT - FULL TIME	ON-CALL, VARIES	SHIFT - PART TIME	In the past year how much did hee or she earn in this job?
			(ID #)	*(job title [1])*	*(employer)*	*(circle each month worked)*	*(circle one)*					*gross income[3]*
	1ST JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
1	6	910100000		*SOC:*	*SIC:*		*schedule:*					
	2ND JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
2	6	910100000		*SOC:*	*SIC:*		*schedule:*					
	3RD JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
3	6	910100000		*SOC:*	*SIC:*		*schedule:*					
	4TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
4	6	910100000		*SOC:*	*SIC:*		*schedule:*					
	5TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
5	6	910100000		*SOC:*	*SIC:*		*schedule:*					
	6TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
6	6	910100000		*SOC:*	*SIC:*		*schedule:*					
	7TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
7	6	910100000		*SOC:*	*SIC:*		*schedule:*					
	8TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
8	6	910100000		*SOC:*	*SIC:*		*schedule:*					
	9TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
9	6	910100000		*SOC:*	*SIC:*		*schedule:*					
	10TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
10	6	910100000		*SOC:*	*SIC:*		*schedule:*					

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+ hr/wk)*
PT *- Parttime (<35 hr/wk)*
SF *- Shift (2wks on/2wks off, etc.)*
SP *- Shift - part time*
OC *- Irregular, on call*
-- -Unemployed

GROSS INCOME is the same as TAXABLE INCOME on a W-2 form. Self-employment, enter revenue - expense

EMPLOYMENT: 23 **TANANA: 336**

OTHER INCOME

HOUSEHOLD ID

Between January 1, 2014 and December 31, 2014 ...

…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 2014 (circle one)	TOTAL amount all members of your household received from _____ in 2014 (dollars)	
DIVIDENDS	ALASKA PERMANENT FUND DIVIDEND	Y N	$	/ YR
	32			
	NATIVE CORPORATION DIVIDENDS	Y N	$	/ YR
	13			

Alaska PFD IN 2014
1 PFD = $1,884
2 PFDs = $3,768
3 PFDs = $5,652
4 PFDs = $7,536
5 PFDs = $9,420
6 PFDs = $11,304
7 PFDs = $13,188
8 PFDs = $15,072
9 PFDs = $16,956
10 PFDs = $18,840
11 PFDs = $20,724

Regional corporations	***Dividend***
Doyon	*$4.95*

Village Corporation(s)	***Dividend***
NVT (Nuchalawoyya)	

Between January 1, 2014 and December 31, 2014 ...

…Did any members of your household receive OTHER income such as SENIOR BENEFITS or UNEMPLOYMENT?..... Y N

IF NO, go to the next section on this 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 (QUEST CARD)	Y N	$	/ YR
	11			
	ADULT PUBLIC ASSISTANCE	Y N	$	/ YR
	3			
	SUPPLIMENTAL SECURITY INCOME (SSI)	Y N	$	/ YR
	10			
STATE BENEFIT	ENERGY 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	Y N	$	/ YR
	49			
	MEETING HONORARIA *(not per diem*)*	Y N	$	/ YR
	50			
	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 _____ weeks =

for _____ weeks =
for _____ weeks =

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 **TANANA: 336**

COMMENTS

HOUSEHOLD ID

DO YOU HAVE ANY QUESTIONS, COMMENTS OR CONCERNS?

INTERVIEW SUMMARY: **DON'T FORGET TO FILL IN THE STOP TIME** _____

COMMENTS: 300 **TANANA: 336**

APPENDIX B–ETHNOGRAPHIC INTERVIEW PROTOCOLS

2015 LNG North Slope TEK Interview Protocol

Introduction

Indicate the following basic information that needs to be on record:

- Interviewer(s) name
- Date and place of interview
- Name of project this interview is conducted for

Describe the LNG project and goal of the interview:

- WHO we are,
- WHY is this project conducted,
- WHAT kind of information we are hoping to gather,
- WHICH AREAS we are interested in learning about,
- HOW the interview will be conducted/the kinds of questions we will be asking to try and get the information we are looking for.

Demographic Information: Ask the respondent about his/her background:

- Name
- Year/location born
- Parents names and where from?
- How long has respondent been hunting/fishing?

GENERAL QUESTIONS

Local history/ general questions about subsistence: It is up to you to ask these questions in the beginning or end of the interviews:

- Have there been any major events that have changed subsistence practices overall?
- How are gas prices affecting how, where, or when people harvest wild foods?
- Are young people interested in hunting and fishing? Are food preferences the same or different as they were in the past?
- What roles can the knowledge of people who have spent their life living off the land play in resource management?
- What information would you use to manage whale/caribou populations if you were in charge?
- Do you know of any efforts at traditional wildlife management in the past?
- What does subsistence mean for you?

Subsistence activities:

- Timing – are there months of intense effort, or whenever present
- Means (this might include gear type for fish, but for other resources, this can include transportation method/means of access

- Patterns of use: salvage practices, processing, what used for
- Observations on species abundance, migration patterns – are there changes in either? How do they feel the population is doing right now
- Are environmental factors contributing to changes in what they do, and how they do it
- Any specific about 2014 harvest that was remarkable or different

Environmental change:

Break-up/freeze-up
- Change in magnitude or timing of break-up events? Freeze-up?
- How does this impact the river?
- How does it affect whale/animal/fish behavior?

Precipitations (snowfall/rainfall)
- Any changes in the amount of snow/rainfall over time?
- Low/high snowfall/rainfall years: When? Any effects observed on the land and ocean condition?

Temperatures
- Any years with exceptional warm/cold temperatures? Any effects observed on the land and ocean condition?
- Effects on animal/fish behavior?

Sea ice/ Wind directions
- Has sea ice thickness changed over time?
- Have wind directions changed in the past 5-10 years? Did they affect sea ice conditions?

Land changes
- Any major erosion/permafrost melt in the Barrow area?
- Any changes in the vegetation type, size, or density *(shrubs, tree species, berry crops, lichen condition)*?
- Any changes in the moisture levels in the soil *(berry crops, lichen condition)*?

Effects on whaling/hunting/fishing in response to climate change
- Have you observed any change on animal conditions (whale, seal, walrus, caribou , fish, etc.)?
- Do you have to travel further for whaling/hunting/fishing?
- Does it take more/less time for whaling/hunting/fishing (CPUE-catch per unit effort)?
- How are changes affecting your ability to travel or to do subsistence activities? (this includes both harvesting and processing)
- What were travel conditions like in 2014? How did these affect your subsistence?

DEVELOPMENT

LNG:

- Do you think that pipeline project will impact subsistence activities positively and negatively?
- Do you think that it may change caribou migration patterns?
- [By showing map], where does pipeline need to be buried or on the ground?

Other concerns

- Any development project (mining, construction work, etc.) in the Barrow area that you worry affects subsistence resources?
- What kind of development?
- How has it affected the ocean or surrounding land (noise, pollution, sedimentation, wake of boats, etc.)?
- What do you think of off shore drilling?

Population size

- Has the population of "community X" changed over time (grown/shrunk)?
- Effects of population change on the river and surrounding environment?

Hunting pressure

- Have the hunting pressure changed over time in your community?
- Do people from other villages whale/hunt/fish in the same areas you do?

Traffic (There are large 24 vessels in Prudhoe Bay, supported by many ships/boats in the sea and vehicles on the land)

- Have the traffic been increasing or decreasing on the land and river? Any changes in animals' behavior that may be related to these traffics?
- How does this affect the hunting/whaling/fishing?

If you want, ask about traditional land trails from Barrow – there are 4-5 trails used as "highways" connected with small trails to go to camps, hunting grounds, etc.

SPECIES SPECIFIC QUESTIONS

Bowhead Whaling: Please describe your whaling practices

- What are roles of whaling captain, his wife, and his crew (harpooner, etc.)?
- Can you describe how spring/fall whaling are operated?
- How much do whaling captains spend for spring/fall whaling?
- Who do you hunt with year to year? How is this determined?
- What months do you whaling? Has anything changed about the time of year you hunt?
- If whaling is successful, how does the captain distribute/share it?
- Which parts of the marine mammals do you use? How do you preserve/process these parts?
- How do you feel the whale population is doing right now? Why do you think the population is declining/increasing (e.g. predation concerns, hard winters, good habitat, etc?)?
- Have you noticed anything different about whale health? Such as amount of fat, condition of skin, types or number of sores or growths? Are the whales healthy? (If sick seals have been seen, be sure to get specific information on when, where, how, and how it was acting).
- Are there environmental factors that contribute to changes in whaling? (weather, ocean or sea ice conditions, etc.)
- Are younger people learning to whale? If so, how do they do that? How did you learn?
- Can you show us where your whaling camp is? Where do you search whales in the spring and fall?
- In the past 5-20 years, have your campsite and search area changed? Why?
- Do you see whales hauled out on land? If so, what time of year?
- 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)?
- Should successful fall whaling captains host *Nalukataq* in the following June?

Other Marine Mammal hunting (non-bowhead whales, polar bear, seals, walrus)

- Please describe your current marine mammal hunting
- Who do you hunt with year to year? How is this determined?
- What months do you hunt for marine mammals? Has anything changed about the time of year you hunt?
- If you are successful, what do you do with the marine mammals – how do you distribute/share it?
- Which parts of the marine mammals do you use? How do you preserve/process these parts?
- How do you feel the marine mammal population is doing right now? Why do you think the population is declining/increasing (e.g. predation concerns, hard winters, good habitat, etc.)?
- Have you noticed anything different about marine mammals health? Such as amount of fat, condition of skin, types or number of sores or growths? Are the marine mammals healthy? (If sick seals have been seen, be sure to get specific information on when, where, how, and how it was acting).

- Are there environmental factors that contribute to changes in marine mammals hunting? (weather, ocean or sea ice conditions, etc)
- Are younger people learning to hunt? If so, how do they do that? How did you learn?
- 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?
- Do you see marine mammals (seals, walrus) hauled out on land? If so, what time of year?
- Are there any rules about hunting or the treatment of marine mammals or other animals during marine mammal hunting/harvest?
- Native names for marine mammals or other aspects of marine mammal hunting? Do you remember any traditional stories about marine mammal or marine mammal hunting in your village?
- Are there any marine mammal species that are more or less commonly now than in the past?
- 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)?

Large game hunting

Caribou:

- How many trips do you usually make to hunt caribou; in 2014 specifically; what is the typical duration (a day trip, going out to fixed camps etc
- Are there particular locations that you usually go to look for caribou (camps, placenames). Does this vary seasonally?
- How was caribou hunting in 2014? What was the body condition of the animals you harvested?
- Do you harvest caribou just for your own households, or do you harvest to provide for others?
- If respondent is associated with skin boats as a captain/crew member/skin sewer, how much caribou sinew is needed to skin a boat? If a boat captain, do they obtain all their sinew through their own and crew's caribou hunting? Or do they trade for it, what do they trade, with who, what other communities? How is sinew salvaged/processed for use in skinning boats? Are there any substitutes for caribou sinew in sewing boat skins?
- Bulls/cows: preference for one or the other? Is preference related to the time of year? Are there specific uses related to whether a bull or cow (I am thinking about sinew, here.)
- What management approaches do you think are appropriate –
    - Reporting requirements – by individual hunters or by communities, or should agencies continue to rely upon harvest surveys?
    - If harvest limits begin, should they be for individuals or for entire communities?
    - Would you prefer a short season with few limitations or a longer season with limitations such as daily bag limits, or individual limits
    - Should there be changes to current seasons or bag limits?

Other Large mammals:

- Who do you hunt with year to year? How is this determined?
- If you are successful, what do you do with the moose/bear/caribou – how do you distribute/share it?
- Which parts of the bear/caribou do you use? How do you preserve/process these parts?

- How do you feel the bear/caribou population is doing right now? Why do you think the population is declining/increasing? Are they healthy?
- 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?
- Are there environmental factors that contribute to changes in bear/caribou hunting? (weather, river conditions, winter conditions, migratory routes (caribou), etc)
- Are younger people learning to hunt? If so, how do they do that? How did you learn?
- Are there any rules about hunting or the treatment of bear/caribou or other animals during moose hunting/harvest?
- 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?
- Are there any species that are more or less commonly now than in the past?
- 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)?

Trapping: Please describe your current trapping practices:

- Do you trap with anyone else? How is this determined?
- How do you 'hold' your trapline? From whom (if anyone) did you get it/take it over?
- Are younger people learning to trap? If so, how do they do that? How did you learn?
- What species do you trap? Why?
- 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?
- 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?
- Are there environmental factors that contribute to changes in trapping? (changing weather, snow pack, river conditions, etc)
- Are there any furbearer species that are more or less commonly now than in the past?
- 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)?

Migratory Bird hunting and other Bird hunting:

- What are the primary species you try to get every year? Do you collect eggs (which kinds?)
- Who do you hunt with year to year? How is this determined?
- If you are successful, what do you do with the birds – how do you distribute/share it?
- How do you preserve/process your harvest?
- 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?
- Are there environmental factors that contribute to changes in bird migrations and hunting? (changing weather patterns, changing habitat, etc.)
- Are younger people learning to hunt birds? If so, how do they do that? How did you learn?
- 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?

- Are there any rules about hunting or the treatment of birds during hunting/harvest?
- Native names for birds or other aspects of bird hunting? Do you remember any traditional stories about birds or bird hunting in your village?
- Are there any natural seasonal indicators that you use to know when the birds will come?
- Are there any bird species that are more or less commonly now than in the past?
- 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)?

Fishing – ask questions for each species, both salmon and non-salmon

- Which species do you harvest? Timing of that harvest (for each species)?
- Do you fish with other people? How is this determined?
- What are the primary means you use to harvest different species of fish? (gear type by species?)
- What do you do with the fish you harvest – how do you distribute/share it?
- Are younger people learning to fish? If so, how do they do that? How did you learn?
- 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?
- Have your fishing areas changed at all? (map changes in area – currently and 10-20 years ago)
- 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)
- Are there environmental factors that contribute to changes in fishing? (weather, river conditions, etc)
- Which parts of the fish do you use? How do you preserve/process these parts?
- Are there any rules about fishing or the treatment of fish/nets during fishing?
- Native names for fish species or other aspects of fishing? Do you remember any traditional stories about fish species or fishing in your village?
- Are there any fish species that are more or less commonly now than in the past?
- 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)?
- Have you observed any water mold? According to NSB DWM, It was first observed in Nuiqsut in 2013, then again in 2014. But there is no report in the Barrow area.

Vegetation:

- Do you go berry picking (etc.) with anyone else? How is this determined?
- are younger people interested in participating in berry picking (etc.)? If so, how do they do that? How did you learn?
- What species of plants do you gather? Why?
- 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?
- 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?

- Are there environmental factors that contribute to changes in gathering plants? (changing weather, snow pack, river conditions, etc)
- Are there any plant species that are more or less commonly now than in the past?
- 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)?

Wrap-up.
Is there anything else that we are missing that is important about subsistence hunting, fishing, or gathering activities?

For elders, is there anything specific that you would like to share with younger generations?

Alaska LNG Project - Healy

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?

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.]**

Beginning in the spring with bird hunting…

Part 2. Migratory Bird hunting

1. Please describe your current migratory 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?

Part 3. Non-salmon fishing – ask questions for each species (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], sheefish, and pike. If a household heavily harvests another species, document that as much as possible.**)**

1. 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 non-salmon? (gear type by species?)

d. what do you do with the non-salmon 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 non-salmon population is doing right now? Why do you think the population is declining/increasing? Are the non- salmon healthy?

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 non-salmon 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 non- salmon species or other aspects of fishing? Do you remember any traditional stories about non-salmon species or fishing in your village?

Part 4. Salmon fishing

1. Please describe your current salmon fishing practices:

a. do you fish with other people? How is this determined?

b. which species do you harvest? Timing of that harvest?

c. what are the primary means you use to harvest salmon? (gear type by species?)

d. what do you do with the salmon you harvest – how do you distribute/share it?

e. which parts of the salmon do you use? How do you preserve/process these parts?

f. how do you feel the salmon population is doing right now? Why do you think the population is declining/increasing? Are the salmon healthy?

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 salmon fishing? (weather, river conditions, etc)

j. many people say that the elders used observations of the environment (changes in the land or water, weather, other animals' behavior) to know when salmon were coming and how many might come. Do you remember any of these 'natural indicators'?

k. are younger people learning to fish? If so, how do they do that? How did you learn?

l. are there any rules about fishing or the treatment of fish/nets during fishing?

m. native names for salmon species or other aspects of fishing? Do you remember any traditional stories about salmon or fishing in your village?

Part 5. Moose hunting

1. Please describe your current moose hunting practices

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 – how do you distribute/share it?

c. which parts of the moose do you use? How do you preserve/process these parts?

d. how do you feel the moose population is doing right now? Why do you think the population is declining/increasing (e.g. predation concerns, hard winters, good habitat, etc?)? Are the moose healthy?

e. Are there environmental factors that contribute to changes in moose hunting? (weather, river conditions, etc)

f. are younger people learning to hunt? If so, how do they do that? How did you learn?

g. 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?

h. are there any rules about hunting or the treatment of moose or other animals during moose hunting/harvest?

i. native names for moose or other aspects of moose hunting? Do you remember any traditional stories about moose or moose hunting in your village?

Part 6. Other large game hunting (brown bear, black bear, caribou)

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 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 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?

Part 7. 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)

APPENDIX C–CONVERSION FACTORS

Table C-1.–Conversion factors, Tanana, 2014.

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 qt 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
Summer chum salmon	individual	5.0320
Summer chum salmon [CF retention]	individual	5.0320
Fall chum salmon	individual	5.0320
Fall chum salmon [CF retention]	individual	5.0320
Coho salmon	individual	5.1680
Coho salmon [CF retention]	individual	5.1680
Chinook salmon	individual	8.6830
Chinook salmon [CF retention]	individual	8.6830
Pink salmon	individual	2.5770
Pink salmon [CF retention]	individual	2.5770
Sockeye salmon	individual	4.0320
Sockeye salmon [CF retention]	individual	4.0320
Salmon roe	gallons	1.0000
Unknown salmon	individual	5.0320
Unknown salmon	pounds	1.0000
Unknown salmon [CF retention]	individual	5.0320
Unknown salmon [CF retention]	pounds	1.0000
Pacific herring	gallons	6.0000
Pacific herring [CF retention]	gallons	6.0000
Pacific herring roe	gallons	5.5000
Pacific herring roe [CF retention]	gallons	5.5000
Pacific herring roe/unspecified	gallons	5.5000
Pacific herring spawn on kelp	gallons	5.5000
Smelt	gallons	6.0000
Eulachon (hooligan, candlefish)	gallons	3.2500
Unknown smelt	gallons	6.0000
Pacific (gray) cod	individual	0.5000
Pacific tomcod	individual	0.5000
Starry flounder	individual	1.1000
Lingcod	individual	4.0000
Pacific halibut	pounds	1.0000
Unknown rockfish	individual	1.5000
Alaska blackfish	individual	0.7500
Burbot	individual	2.4000
Dolly Varden	individual	0.9000
Arctic grayling	individual	0.9000
Northern pike	individual	1.4000
Sheefish	individual	6.0000
Longnose sucker	individual	2.0000
Rainbow trout	individual	1.4000
Unknown trout	individual	1.4000
Broad whitefish	individual	1.4000
Bering cisco	individual	0.7000

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Table C-1.–Page 2 of 4.

Resource name	Reported units	Conversion factor
Least cisco	individual	1.0000
Unknown cisco	individual	1.0870
Humpback whitefish	individual	3.0000
Round whitefish	individual	0.5000
Unknown whitefishes	individual	2.3734
Black bear	individual	100.0000
Brown bear	individual	141.0000
Caribou	individual	136.0000
Deer	individual	42.5000
Mountain goat	individual	72.5000
Moose	individual	540.0000
Dall sheep	individual	104.0000
Beaver	individual	15.0000
Coyote	individual	0.0000
Red fox–cross phase	individual	0.0000
Red fox–red phase	individual	0.0000
Snowshoe hare	individual	2.0000
River (land) otter	individual	3.0000
Lynx	individual	4.0000
Marmot	individual	5.0000
Marten	individual	0.0000
Mink	individual	2.0000
Muskrat	individual	0.7500
Porcupine	individual	5.0000
Arctic ground (parka) squirrel	individual	0.5000
Red (tree) squirrel	individual	0.5000
Weasel	individual	0.5000
Gray wolf	individual	0.0000
Wolverine	individual	0.0000
Bearded seal	individual	286.0000
Ringed seal	individual	57.0000
Spotted seal	individual	98.0000
Unknown seals	individual	56.0000
Walrus	individual	770.0000
Whale	individual	0.0000
Beluga whale	individual	995.0000
Bowhead whale	individual	28,677.0000
Bowhead whale, male	individual	28,677.0000
Bowhead whale, female	individual	28,677.0000
Canvasback	individual	1.9000
Spectacled eider	individual	2.4300
Goldeneye	individual	1.5400
Mallard	individual	1.9500
Northern pintail	individual	1.5000
Black scoter	individual	0.9000
Northern shoveler	individual	1.0900
Green-winged teal	individual	0.5200
Unknown ducks	individual	1.5219
Brant	individual	6.0000

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Table C-1.–Page 3 of 4.

Resource name	Reported units	Conversion factor
Cackling goose	individual	1.2000
Canada goose	individual	1.2000
Unknown Canada/cackling goose	individual	1.2000
Snow goose	individual	4.0000
White-fronted goose	individual	4.2400
Unknown geese	individual	2.2986
Tundra (whistling) swan	individual	11.2100
Sandhill crane	individual	8.4000
Golden/black-bellied plover	individual	0.1300
Unknown shorebirds	individual	0.1000
Spruce grouse	individual	0.7000
Sharp-tailed grouse	individual	0.7000
Ruffed grouse	individual	0.7000
Unknown grouses	individual	0.7000
Willow ptarmigans	individual	0.7000
Unknown ptarmigans	individual	0.7000
Snowy owl	individual	3.0000
Unknown duck eggs	individual	0.1500
Unknown goose eggs	individual	0.3000
Unknown swan eggs	individual	0.6300
Unknown crane eggs	individual	0.6300
Unknown small shorebird eggs	individual	0.0400
Unknown gull eggs	individual	0.3000
Unknown loon eggs	individual	0.1800
Murre eggs	individual	0.2200
Tern eggs	individual	0.0500
Unknown eggs	individual	0.3000
Butter clams	gallons	3.0000
Freshwater clams	gallons	3.0000
Razor clams	gallons	3.0000
Razor clams	quarts	0.7500
Unknown clams	gallons	3.0000
Dungeness crab	individual	0.7000
King crab	individual	2.1000
King crab [CF retention]	individual	2.1000
Tanner crab	individual	1.6000
Shrimp	gallons	2.0000
Blueberry	gallons	4.0000
Blueberry	quarts	1.0000
Blueberry	half-pints	0.2500
Lowbush cranberry	gallons	4.0000
Lowbush cranberry	quarts	1.0000
Highbush cranberry	gallons	4.0000
Highbush cranberry	quarts	1.0000
Crowberry	gallons	4.0000
Cloudberry	gallons	4.0000
Cloudberry	quarts	1.0000

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Table C-1.–Page 4 of 4.

Resource name	Reported units	Conversion factor
Cloudberry	pints	0.5000
Raspberry	gallons	4.0000
Raspberry	quarts	1.0000
Raspberry	half-pints	0.2500
Strawberry	pounds	1.0000
Other wild berry	gallons	4.0000
Wild rhubarb	pounds	1.0000
Wild rhubarb	gallons	4.0000
Fiddlehead ferns	gallons	1.0000
Hudson's Bay (Labrador) tea	pounds	1.0000
Hudson's Bay (Labrador) tea	gallons	1.0000
Hudson's Bay (Labrador) tea	quarts	0.2500
Hudson's Bay (Labrador) tea	half-pints	0.0630
Willow leaves	gallons	1.0000
Wild rose hips	half-pints	0.2500
Other wild greens	pounds	1.0000
Other wild greens	gallons	1.0000
Unknown mushrooms	gallons	1.0000
Unknown mushrooms	quarts	0.2500
Fireweed	gallons	1.0000
Plantain	gallons	1.0000
Stinkweed	gallons	1.0000
Unknown fungi	gallons	1.0000
Punk	gallons	0.0000
Chaga	gallons	1.0000
Wild chives	gallons	1.0000
Wood	–	0.0000
Bark	gallons	0.0000
Spruce	gallons	0.0000
Willow	individual	0.0000

Source ADF&G Division of Subsistence household surveys, 2015.

Table C-2.–Conversion factors, Rampart, 2014.

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 qt 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
Summer chum salmon	individual	5.0320
Summer chum salmon [CF retention]	individual	5.0320
Fall chum salmon	individual	5.0320
Fall chum salmon [CF retention]	individual	5.0320
Coho salmon	individual	5.1680
Coho salmon [CF retention]	individual	5.1680
Chinook salmon	individual	8.6830
Chinook salmon [CF retention]	individual	8.6830
Pink salmon	individual	2.5770
Pink salmon [CF retention]	individual	2.5770
Sockeye salmon	individual	4.0320
Sockeye salmon [CF retention]	individual	4.0320
Unknown salmon	individual	5.0964
Unknown salmon [CF retention]	individual	5.0964
Pacific herring	gallons	6.0000
Pacific herring [CF retention]	gallons	6.0000
Pacific herring roe [CF retention]	gallons	5.5000
Smelt	gallons	6.0000
Eulachon (hooligan, candlefish)	gallons	3.2500
Unknown smelt	gallons	6.0000
Pacific (gray) cod	individual	0.5000
Pacific tomcod	individual	0.5000
Starry flounder	individual	1.1000
Lingcod	individual	4.0000
Pacific halibut	Pounds	1.0000
Unknown rockfish	individual	1.5000
Alaska blackfish	individual	0.7500
Burbot	individual	2.4000
Dolly Varden	individual	0.9000
Arctic grayling	individual	0.9000
Northern pike	individual	1.4000
Sheefish	individual	6.0000
Longnose sucker	individual	2.0000
Rainbow trout	individual	1.4000
Unknown trout	individual	1.4000
Broad whitefish	individual	1.4000
Least cisco	individual	1.0000
Humpback whitefish	individual	3.0000
Round whitefish	individual	0.5000
Unknown whitefishes	individual	2.5137
Black bear	individual	100.0000
Brown bear	individual	141.0000

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Table C-2.–Page 2 of 3.

Resource name	Reported units	Conversion factor
Caribou	individual	136.0000
Deer	individual	42.5000
Mountain goat	individual	72.5000
Moose	individual	540.0000
Dall sheep	individual	104.0000
Beaver	individual	15.0000
Coyote	individual	0.0000
Red fox–cross phase	individual	0.0000
Red fox–red phase	individual	0.0000
Snowshoe hare	individual	2.0000
River (land) otter	individual	3.0000
Lynx	individual	4.0000
Marmot	individual	5.0000
Marten	individual	0.0000
Mink	individual	2.0000
Muskrat	individual	0.7500
Porcupine	individual	5.0000
Arctic ground (parka) squirrel	individual	0.5000
Red (tree) squirrel	individual	0.5000
Weasel	individual	0.5000
Gray wolf	individual	0.0000
Wolverine	individual	0.0000
Ringed seal	individual	57.0000
Spotted seal	individual	98.0000
Unknown seals	individual	56.0000
Whale	individual	0.0000
Canvasback	individual	1.9000
Spectacled eider	individual	2.4300
Goldeneye	individual	1.5400
Mallard	individual	1.9500
Northern pintail	individual	1.5000
Black scoter	individual	0.9000
Green-winged teal	individual	0.5200
Unknown ducks	individual	1.1833
Brant	individual	6.0000
Canada/cackling goose	individual	1.2000
Canada goose	individual	1.2000
Unknown Canada/cackling goose	individual	1.2000
Snow goose	individual	4.0000
White-fronted goose	individual	4.2400
Unknown geese	individual	2.7553
Tundra (whistling) swan	individual	11.2100
Sandhill crane	individual	8.4000
Golden/black-bellied plover	individual	0.1300
Unknown shorebirds	individual	0.1000
Spruce grouse	individual	0.7000
Sharp-tailed grouse	individual	0.7000
Ruffed grouse	individual	0.7000
Unknown grouses	individual	0.7000

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Table C-2.–Page 3 of 3.

Resource name	Reported units	Conversion factor
Unknown ptarmiganss	individual	0.7000
Snowy owl	individual	3.0000
Unknown duck eggs	individual	0.1500
Unknown goose eggs	individual	0.3000
Unknown swan eggs	individual	0.6300
Unknown crane eggs	individual	0.6300
Unknown small shorebird eggs	individual	0.0400
Unknown gull eggs	individual	0.3000
Unknown loon eggs	individual	0.1800
Murre eggs	individual	0.2200
Unknown murre eggs	individual	0.2200
Tern eggs	individual	0.0500
Unknown tern eggs	individual	0.0500
Unknown eggs	individual	0.0000
Butter clams	gallons	3.0000
Freshwater clams	gallons	3.0000
Razor clams	gallons	3.0000
Unknown clams	gallons	3.0000
Dungeness crab	individual	0.7000
King crab	individual	2.1000
King crab [CF retention]	individual	2.1000
Tanner crab	individual	1.6000
Blueberry	gallons	4.0000
Lowbush cranberry	gallons	4.0000
Highbush cranberry	gallons	4.0000
Crowberry	gallons	4.0000
Cloudberry	gallons	4.0000
Raspberry	gallons	4.0000
Other wild berry	gallons	4.0000
Wild rhubarb	gallons	4.0000
Fiddlehead ferns	gallons	1.0000
Hudson's Bay (Labrador) tea	gallons	1.0000
Willow leaves	gallons	1.0000
Other wild greens	gallons	1.0000
Unknown mushrooms	gallons	1.0000
Fireweed	gallons	1.0000
Wood	–	0.0000

Source ADF&G Division of Subsistence household surveys, 2015.

Table C-3.–Conversion factors, Stevens Village, 2014.

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 qt 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
Summer chum salmon	individual	5.0320
Summer chum salmon [CF retention]	individual	5.0320
Fall chum salmon	individual	5.0320
Fall chum salmon [CF retention]	individual	5.0320
Coho salmon	individual	5.1680
Coho salmon [CF retention]	individual	5.1680
Chinook salmon	individual	8.6830
Chinook salmon [CF retention]	individual	8.6830
Pink salmon	individual	2.5770
Pink salmon [CF retention]	individual	2.5770
Sockeye salmon	individual	4.0320
Sockeye salmon [CF retention]	individual	4.0320
Unknown salmon	individual	5.1048
Unknown salmon [CF retention]	individual	5.1048
Pacific herring	gallons	6.0000
Pacific herring [CF retention]	gallons	6.0000
Pacific herring roe [CF retention]	gallons	5.5000
Smelt	gallons	6.0000
Eulachon (hooligan, candlefish)	gallons	3.2500
Unknown smelt	gallons	6.0000
Pacific (gray) cod	individual	0.5000
Pacific tomcod	individual	0.5000
Starry flounder	individual	1.1000
Lingcod	individual	4.0000
Pacific halibut	pounds	1.0000
Unknown rockfish	individual	1.5000
Alaska blackfish	individual	0.7500
Burbot	individual	2.4000
Dolly Varden	individual	0.9000
Arctic grayling	individual	0.9000
Northern pike	individual	1.4000
Sheefish	individual	6.0000
Longnose sucker	individual	2.0000
Rainbow trout	individual	1.4000
Unknown trout	individual	1.4000
Broad whitefish	individual	1.4000
Least cisco	individual	1.0000
Humpback whitefish	individual	3.0000
Round whitefish	individual	0.5000
Unknown whitefishes	individual	3.4921
Black bear	individual	100.0000
Brown bear	individual	141.0000
Caribou	individual	136.0000

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Table C-3.–Page 2 of 3.

Resource name	Reported units	Conversion factor
Deer	individual	42.5000
Mountain goat	individual	72.5000
Moose	individual	540.0000
Dall sheep	individual	104.0000
Beaver	individual	15.0000
Coyote	individual	0.0000
Red fox–cross phase	individual	0.0000
Red fox–red phase	individual	0.0000
Snowshoe hare	individual	2.0000
North American river (land) otter	individual	3.0000
Lynx	individual	4.0000
Marmot	individual	5.0000
Marten	individual	0.0000
Mink	individual	2.0000
Muskrat	individual	0.7500
Porcupine	individual	5.0000
Arctic ground (parka) squirrel	individual	0.5000
Red (tree) squirrel	individual	0.5000
Weasel	individual	0.5000
Gray wolf	individual	0.0000
Wolverine	individual	0.0000
Ringed seal	individual	57.0000
Spotted seal	individual	98.0000
Unknown seal	individual	56.0000
Whale	individual	0.0000
Canvasback	individual	1.9000
Spectacled eider	individual	2.4300
Goldeneye	individual	1.5400
Mallard	individual	1.9500
Northern pintail	individual	1.5000
Black scoter	individual	0.9000
Green-winged teal	individual	0.5200
Unknown ducks	individual	0.9500
Brant	individual	6.0000
Cackling goose	individual	1.2000
Canada goose	individual	1.2000
Unknown Canada/cackling goose	individual	1.2000
Snow goose	individual	4.0000
White-fronted goose	individual	4.2400
Unknown geese	individual	1.2000
Tundra (whistling) swan	individual	11.2100
Sandhill crane	individual	8.4000
Golden/black-bellied plover	individual	0.1300
Unknown shorebirds	individual	0.1000
Spruce grouse	individual	0.7000
Sharp-tailed grouse	individual	0.7000
Ruffed grouse	individual	0.7000
Unknown grouse	individual	0.7000
Unknown ptarmigan	individual	0.7000

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Table C-3.–Page 3 of 3.

Resource name	Reported units	Conversion factor
Snowy owl	individual	3.0000
Unknown duck eggs	individual	0.1500
Unknown goose eggs	individual	0.2700
Unknown swan eggs	individual	0.6300
Unknown crane eggs	individual	0.6300
Unknown small shorebird eggs	individual	0.0400
Unknown gull eggs	individual	0.3000
Unknown loon eggs	individual	0.1800
Murre eggs	individual	0.2200
Unknown murre eggs	individual	0.2200
Tern eggs	individual	0.0500
Unknown tern eggs	individual	0.0500
Unknown eggs	individual	0.0000
Butter clams	gallons	3.0000
Freshwater clams	gallons	3.0000
Razor clams	gallons	3.0000
Unknown clams	gallons	3.0000
Dungeness crab	individual	0.7000
King crab	individual	2.1000
King crab [CF retention]	individual	2.1000
Tanner crab	individual	1.6000
Blueberry	gallons	4.0000
Lowbush cranberry	gallons	4.0000
Highbush cranberry	gallons	4.0000
Crowberry	gallons	4.0000
Cloudberry	gallons	4.0000
Raspberry	gallons	4.0000
Other wild berry	gallons	4.0000
Wild rhubarb	gallons	4.0000
Fiddlehead ferns	gallons	1.0000
Hudson's Bay (Labrador) tea	gallons	1.0000
Willow leaves	gallons	1.0000
Other wild greens	gallons	1.0000
Unknown mushrooms	gallons	1.0000
Fireweed	gallons	1.0000
Chaga	pounds	1.0000
Wood	–	0.0000

Source ADF&G Division of Subsistence household surveys, 2015.

Table C-4.–Conversion factors, Healy, 2014.

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 qt 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	individual	5.0320
Chum salmon [CF retention]	individual	5.0320
Coho salmon	individual	5.1680
Coho salmon [CF retention]	individual	5.1680
Chinook salmon	individual	8.6830
Chinook salmon [CF retention]	individual	8.6830
Pink salmon	individual	2.5770
Pink salmon [CF retention]	individual	2.5770
Sockeye salmon	individual	4.0320
Sockeye salmon [CF retention]	individual	4.0320
Landlocked salmon	individual	1.5000
Unknown salmon	individual	4.1232
Unknown salmon [CF retention]	individual	4.1232
Pacific herring	gallons	6.0000
Pacific herring [CF retention]	gallons	6.0000
Pacific herring roe [CF retention]	gallons	5.5000
Smelt	gallons	6.0000
Eulachon (hooligan, candlefish)	gallons	3.2500
Unknown smelt	gallons	6.0000
Pacific (gray) cod	individual	0.5000
Pacific tomcod	individual	0.5000
Unknown cod	individual	0.5000
Flounder	individual	1.1000
Starry flounder	individual	1.1000
Lingcod	individual	4.0000
Lingcod	pounds	1.0000
Pacific halibut	individual	21.2000
Pacific halibut	pounds	1.0000
Pacific halibut [CF retention]	pounds	1.0000
Black rockfish	individual	1.5000
Yelloweye rockfish	individual	1.5000
Unknown rockfish	individual	1.5000
Burbot	individual	2.4000
Dolly Varden	individual	0.9000
Lake trout	individual	1.4000
Arctic grayling	individual	0.9000
Northern pike	individual	1.4000
Sheefish	individual	6.0000
Longnose sucker	individual	2.0000
Cutthroat trout	individual	1.4000
Rainbow trout	individual	1.4000
Unknown trout	individual	1.4000
Broad whitefish	individual	1.4000

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Table C-4.–Page 2 of 4.

Resource name	Reported units	Conversion factor
Least cisco	individual	0.7000
Humpback whitefish	individual	3.0000
Round whitefish	individual	0.5000
Unknown whitefishes	individual	0.0000
Unknown nonsalmon fish	individual	1.1203
Black bear	individual	100.0000
Brown bear	individual	141.0000
Caribou	individual	136.0000
Mule deer	individual	42.5000
Mountain goat	individual	72.5000
Moose	individual	540.0000
Dall sheep	individual	104.0000
Beaver	individual	15.0000
Coyote	individual	0.0000
Red fox–cross phase	individual	0.0000
Red fox–red phase	individual	0.0000
Snowshoe hare	individual	2.0000
River (land) otter	individual	3.0000
Lynx	individual	4.0000
Marmot	individual	5.0000
Marten	individual	0.0000
Mink	individual	2.0000
Muskrat	individual	0.7500
Porcupine	individual	5.0000
Arctic ground (parka) squirrel	individual	0.5000
Red (tree) squirrel	individual	0.5000
Weasel	individual	0.5000
Gray wolf	individual	0.0000
Wolverine	individual	0.0000
Fur seal	individual	15.0000
Harbor seal	individual	56.0000
Unknown seals	individual	56.0000
Sea otter	individual	19.5000
Steller sea lion	individual	200.0000
Unknown whale	individual	0.0000
Canvasback	individual	1.9000
Spectacled eider	individual	2.4300
Goldeneye	individual	1.5400
Mallard	individual	1.9500
Northern pintail	individual	1.5000
Black scoter	individual	0.9000
Green-winged teal	individual	0.5200
American wigeon	individual	1.3100
Unknown ducks	individual	1.7168
Brant	individual	6.0000
Cackling goose	individual	1.2000
Canada goose	individual	1.2000
Unknown Canada/cackling goose	individual	1.2000
Snow goose	individual	4.0000

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Table C-4.–Page 3 of 4.

Resource name	Reported units	Conversion factor
White-fronted goose	individual	4.2400
Unknown geese	individual	0.0000
Tundra (whistling) swan	individual	11.2100
Sandhill crane	individual	8.4000
Spruce grouse	individual	0.7000
Sharp-tailed grouse	individual	0.7000
Ruffed grouse	individual	0.7000
Unknown grouses	individual	0.7000
Unknown ptarmigans	individual	0.7000
Unknown duck eggs	individual	0.1500
Unknown goose eggs	individual	0.3000
Unknown gull eggs	individual	0.3000
Unknown eggs	individual	0.0000
Butter clams	gallons	3.0000
Freshwater clams	gallons	3.0000
Pinkneck clams	quarts	0.7500
Razor clams	pounds	1.0000
Razor clams	gallons	3.0000
Unknown clams	gallons	3.0000
Dungeness crab	individual	0.7000
King crab	individual	2.1000
King crab [CF retention]	individual	2.1000
Tanner crab	individual	1.6000
Octopus	individual	4.0000
Oyster	gallons	3.0000
Scallops	gallons	1.6500
Shrimp	pounds	1.0000
Shrimp	gallons	2.0000
Blueberry	pounds	1.0000
Blueberry	gallons	4.0000
Blueberry	quarts	1.0000
Blueberry	pints	0.5000
Blueberry	half-pints	0.2500
Lowbush cranberry	gallons	4.0000
Lowbush cranberry	quarts	1.0000
Lowbush cranberry	pints	0.5000
Lowbush cranberry	half-pints	0.2500
Highbush cranberry	gallons	4.0000
Highbush cranberry	quarts	1.0000
Highbush cranberry	pints	0.5000
Crowberry	pounds	1.0000
Crowberry	quarts	1.0000
Crowberry	pints	0.5000
Crowberry	half-pints	0.2500
Currants	gallons	4.0000
Currants	quarts	1.0000
Cloudberry	gallons	4.0000

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Table C-4.–Page 4 of 4.

Resource name	Reported units	Conversion factor
Cloudberry	pints	0.5000
Cloudberry	half-pints	0.2500
Raspberry	pounds	1.0000
Raspberry	gallons	4.0000
Raspberry	quarts	1.0000
Salmonberry	gallons	4.0000
Other wild berry	gallons	4.0000
Beach asparagus	pints	0.5000
Wild rhubarb	pounds	1.0000
Devils club	quarts	0.2500
Devils club	half-pints	0.6250
Fiddlehead ferns	quarts	0.2500
Nettle	gallons	1.0000
Hudson's Bay (Labrador) tea	pounds	1.0000
Hudson's Bay (Labrador) tea	gallons	1.0000
Hudson's Bay (Labrador) tea	half-pints	0.0630
Wild rose hips	gallons	4.0000
Wild rose hips	quarts	1.0000
Yarrow	pounds	1.0000
Other wild greens	pounds	1.0000
Other wild greens	gallons	1.0000
Other wild greens	half-pints	0.0630
Unknown mushrooms	pounds	1.0000
Unknown mushrooms	gallons	1.0000
Unknown mushrooms	quarts	0.2500
Fireweed	gallons	1.0000
Fireweed	quarts	0.2500
Fireweed	half-pints	0.0630
Chaga	pounds	1.0000
Wood	–	0.0000
Roots	pounds	0.0000
Birch sap	gallons	0.0000

Source ADF&G Division of Subsistence household surveys, 2015.

Table C-5.–Conversion factors, Utqiaġvik, 2014.

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 qt 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	individual	6.0190
Chum salmon [CF retention]	individual	6.0190
Coho salmon	individual	5.1410
Coho salmon [CF retention]	individual	5.1410
Chinook salmon	individual	8.6830
Chinook salmon	pounds	1.0000
Chinook salmon [CF retention]	individual	8.6830
Pink salmon	individual	2.4840
Pink salmon [CF retention]	individual	2.4840
Sockeye salmon	individual	4.0320
Sockeye salmon [CF retention]	individual	4.0320
Unknown salmon	individual	4.8475
Pacific herring [CF retention]	gallons	6.0000
Pacific herring roe	gallons	5.5000
Pacific herring roe [CF retention]	gallons	5.5000
Smelt	individual	0.1400
Capelin (grunion)	individual	3.2500
Eulachon (hooligan, candlefish)	individual	0.2500
Eulachon (hooligan, candlefish)	5-gallon buckets	16.2500
Eulachon (hooligan, candlefish)	gallons	3.2500
Rainbow smelt	individual	0.2000
Rainbow smelt	gallons	6.0000
Unknown smelt	individual	0.1400
Bass	individual	1.0000
Arctic cod	individual	0.1100
Saffron cod	individual	0.2100
Arctic flounder	individual	1.1000
Lingcod	individual	4.0000
Pacific halibut	individual	21.2000
Pacific halibut	pounds	1.0000
Pacific halibut [CF retention]	individual	21.2000
Pacific halibut [CF retention]	pounds	1.0000
Rockfish	individual	1.5000
Unknown rockfish	individual	1.5000
Unknown sculpin	individual	1.5000
Burbot	individual	4.2000
Arctic char	individual	3.3000
Dolly Varden	individual	3.3000
Lake trout	individual	4.0000
Arctic grayling	individual	0.9000
Northern pike	individual	3.3000
Sheefish	individual	5.5000
Whitefishes	individual	1.1946

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Table C-5.–Page 2 of 4.

Resource name	Reported units	Conversion factor
Broad whitefish	individual	3.2000
Broad whitefish	pounds	1.0000
Arctic cisco	individual	0.7000
Bering cisco	individual	0.7000
Least cisco	individual	0.7000
Humpback whitefish	individual	2.1000
Round whitefish	individual	0.7000
Unknown whitefishes	individual	1.1946
Unknown nonsalmon fish	individual	2.1722
Black bear	individual	88.0000
Brown bear	individual	86.0000
Caribou	individual	136.0000
Mule deer	individual	42.5000
Moose	individual	538.0000
Muskox	individual	295.0000
Dall sheep	individual	104.0000
Beaver	individual	20.0000
Coyote	individual	0.0000
Arctic fox	individual	0.0000
Red fox	individual	0.0000
Snowshoe hare	individual	2.5000
River (land) otter	individual	3.0000
Lynx	individual	4.0000
Marmot	individual	5.0000
Marten	individual	0.0000
Porcupine	individual	5.0000
Arctic ground (parka) squirrel	individual	0.5000
Gray wolf	individual	0.0000
Wolverine	individual	0.0000
Reindeer–feral	individual	125.0000
Polar bear	individual	372.0000
Bearded seal	individual	286.0000
Ribbon seal	individual	101.0000
Ringed seal	individual	57.0000
Spotted seal	individual	98.0000
Unknown seals	individual	56.0000
Walrus	individual	770.0000
Beluga whale	individual	995.0000
Bowhead whale	individual	28,677.0000
Bowhead whale, female	individual	28,677.0000
Common eider	individual	2.2100
King eider	individual	1.4300
Spectacled eider	individual	2.4300
Steller's eider	individual	1.0000
Unknown eiders	individual	1.6443
Mallard	individual	1.9500
Merganser	individual	1.7600

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Table C-5.–Page 3 of 4.

Resource name	Reported units	Conversion factor
Long-tailed duck	individual	1.5000
Northern pintail	individual	1.5000
Black scoter	individual	0.9000
Green-winged teal	individual	0.5200
Wigeon	individual	1.3100
Unknown ducks	individual	1.6403
Brant	individual	1.6000
Canada/cackling goose	individual	3.3000
Snow goose	individual	3.6000
White-fronted goose	individual	3.1000
Unknown geese	individual	3.9913
Swans	individual	3.9913
Unknown swans	individual	11.2100
Unknown cranes	individual	8.4000
Golden/black-bellied plover	individual	0.1300
Whimbrel	individual	0.1000
Godwit	individual	0.1000
Unknown shorebirds	individual	0.1000
Guillemot	individual	0.4000
Glaucous gull	individual	2.8100
Sabine's gull	individual	0.0000
Unknown loons	individual	5.4400
Unknown murres	individual	1.6500
Tern	individual	0.0000
Unknown terns	individual	0.0000
Ruffed grouse	individual	0.7000
Unknown ptarmigans	individual	0.7000
Snowy owl	individual	3.0000
Northern pintail eggs	individual	0.1500
Unknown duck eggs	individual	0.1500
White-fronted goose eggs	individual	0.2500
Unknown goose eggs	individual	0.3000
Unknown swan eggs	individual	0.6300
Unknown crane eggs	individual	0.6300
Golden plover eggs	individual	0.0700
Godwit eggs	individual	0.5000
Unknown small shorebird eggs	individual	0.0400
Unknown gull eggs	individual	0.3000
Unknown loon eggs	individual	0.1800
Murre eggs	individual	0.2200
Unknown murre eggs	individual	0.2200
Tern eggs	individual	0.0500
Unknown tern eggs	individual	0.0500
Unknown seabird eggs	individual	0.1600
Snowy owl eggs	individual	0.1300
Unknown eggs	individual	0.2950
Razor clams	quarts	0.7500

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Table C-5.–Page 4 of 4.

Resource name	Reported units	Conversion factor
Unknown clams	individual	0.2500
Unknown clams	gallons	3.0000
King crab	individual	2.1000
King crab [CF retention]	individual	2.1000
Unknown crabs	individual	2.1000
Unknown mussels	gallons	1.5000
Shrimp	pounds	1.0000
Shrimp	gallons	2.0000
Blueberry	gallons	4.0000
Blueberry	quarts	1.0000
Lowbush cranberry	gallons	4.0000
Lowbush cranberry	quarts	1.0000
Highbush cranberry	gallons	4.0000
Crowberry	gallons	4.0000
Crowberry	quarts	1.0000
Elderberry	gallons	4.0000
Huckleberry	gallons	4.0000
Raspberry	gallons	4.0000
Raspberry	quarts	1.0000
Salmonberry	gallons	4.0000
Salmonberry	quarts	1.0000
Salmonberry	half-pints	0.2500
Strawberry	gallons	4.0000
Wild rhubarb	pints	0.5000
Eskimo potato	gallons	4.0000
Eskimo potato	pints	0.5000
Hudson's Bay (Labrador) tea	gallons	1.0000
Hudson's Bay (Labrador) tea	quarts	0.2500
Sourdock	gallons	1.0000
Sourdock	quarts	0.0500
Willow leaves	gallons	1.0000
Other wild greens	gallons	1.0000
Other wild greens	quarts	0.2500
Other wild greens	half-pints	0.0630
Unknown mushrooms	pounds	1.0000
Unknown mushrooms	gallons	1.0000
Sorrel	pounds	1.0000
Sorrel	gallons	1.0000
Fireweed	gallons	1.0000
Stinkweed	gallons	1.0000
Stinkweed	quarts	0.0630

Source ADF&G Division of Subsistence household surveys, 2015.

Table C-6.–Conversion factors, Nuiqsut, 2014.

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 qt 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	individual	6.0190
Chum salmon [CF retention]	individual	6.0190
Coho salmon	individual	5.1410
Coho salmon [CF retention]	individual	5.1410
Chinook salmon	individual	8.6830
Chinook salmon [CF retention]	individual	8.6830
Pink salmon	individual	2.4840
Pink salmon [CF retention]	individual	2.4840
Sockeye salmon	individual	4.0320
Sockeye salmon [CF retention]	individual	4.0320
Unknown salmon	individual	5.9295
Pacific herring [CF retention]	gallons	6.0000
Pacific herring roe/unspecified	gallons	5.5000
Rainbow smelt	individual	0.2000
Rainbow smelt	pounds	1.0000
Rainbow smelt	gallons	6.0000
Arctic cod	individual	0.1100
Saffron cod	individual	0.2100
Unknown cod	individual	0.7500
Arctic flounder	individual	1.1000
Pacific halibut	pounds	1.0000
Pacific halibut [CF retention]	pounds	1.0000
Unknown rockfish	individual	1.5000
Unknown sculpin	individual	1.5000
Burbot	individual	4.2000
Arctic char	individual	3.3000
Dolly varden	individual	3.3000
Lake trout	individual	4.0000
Arctic grayling	individual	0.9000
Arctic grayling	pounds	1.0000
Northern pike	individual	3.3000
Sheefish	individual	5.5000
Whitefishes	individual	0.7785
Broad whitefish	individual	3.2000
Broad whitefish	pounds	1.0000
Broad whitefish [CF retention]	individual	3.2000
Arctic cisco	individual	0.7000
Arctic cisco	pounds	1.0000
Bering cisco	individual	0.7000
Bering cisco [CF retention]	individual	0.7000
Least cisco	individual	0.7000
Least cisco	pounds	0.7000

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Table C-6.–Page 2 of 4.

Resource name	Reported units	Conversion factor
Humpback whitefish	individual	2.1000
Round whitefish	individual	0.7000
Unknown whitefishes	individual	0.7785
Unknown nonsalmon fish	individual	0.8064
Brown bear	individual	86.0000
Caribou	individual	136.0000
Moose	individual	538.0000
Muskox	individual	295.0000
Dall sheep	individual	104.0000
Beaver	individual	20.0000
Coyote	individual	0.0000
Arctic fox	individual	0.0000
Red fox	individual	0.0000
Snowshoe hare	individual	2.5000
River (land) otter	individual	3.0000
Lynx	individual	4.0000
Marmot	individual	5.0000
Marten	individual	0.0000
Porcupine	individual	5.0000
Arctic ground (parka) squirrel	individual	0.5000
Gray wolf	individual	0.0000
Wolverine	individual	0.0000
Polar bear	individual	372.0000
Bearded seal	individual	286.0000
Ribbon seal	individual	101.0000
Ringed seal	individual	57.0000
Spotted seal	individual	98.0000
Unknown seal	individual	56.0000
Walrus	individual	770.0000
Beluga whale	individual	995.0000
Bowhead whale	individual	28677.0000
Bowhead whale, male	individual	28677.0000
Bowhead whale, female	individual	28677.0000
Common eider	individual	2.2100
King eider	individual	1.4300
Spectacled eider	individual	2.4300
Steller's eider	individual	1.0000
Mallard	individual	1.9500
Red-breasted merganser	individual	1.7600
Long-tailed duck	individual	1.5000
Northern pintail	individual	1.5000
Black scoter	individual	0.9000
Green-winged teal	individual	0.5200
Wigeon	individual	1.3100
Unknown ducks	individual	0.6642
Brant	individual	1.6000
Unknown Canada/cackling goose	individual	3.3000
Snow goose	individual	3.6000
White-fronted goose	individual	3.1000

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Table C-6.–Page 3 of 4.

Resource name	Reported units	Conversion factor
Unknown geese	individual	3.7986
Tundra (whistling) swan	individual	11.2100
Sandhill crane	individual	8.4000
Golden/black-bellied plover	individual	0.1300
Whimbrel	individual	0.1000
Godwit	individual	0.1000
Unknown small shorebirds	individual	0.1000
Black guillemot	individual	0.4000
Glaucous gull	individual	2.8100
Sabine's gull	individual	0.0000
Unknown loons	individual	5.4400
Unknown murres	individual	1.6500
Arctic tern	individual	0.0000
Unknown ptarmigans	individual	0.7000
Snowy owl	individual	3.0000
Unknown duck eggs	individual	0.1500
Brant eggs	individual	0.2500
Unknown goose eggs	individual	0.3000
Tundra swan eggs	individual	0.6300
Unknown swan eggs	individual	0.6300
Sandhill crane eggs	individual	0.6300
Unknown crane eggs	individual	0.6300
Unknown small shorebird eggs	individual	0.0400
Unknown gull eggs	individual	0.3000
Unknown loon eggs	individual	0.1800
Murre eggs	individual	0.2200
Unknown murre eggs	individual	0.2200
Tern eggs	individual	0.0500
Arctic tern eggs	individual	0.0500
Unknown tern eggs	individual	0.0500
Unknown clams	gallons	3.0000
Unknown king crab [CF retention]	individual	2.1000
Unknown crab	individual	2.1000
Unknown mussels	gallons	1.5000
Blueberry	pounds	1.0000
Blueberry	gallons	4.0000
Blueberry	quarts	1.0000
Blueberry	pints	0.5000
Blueberry	half-pints	0.2500
Lowbush cranberry	gallons	4.0000
Lowbush cranberry	quarts	1.0000
Lowbush cranberry	pints	0.5000
Lowbush cranberry	half-pints	0.2500
Highbush cranberry	gallons	4.0000
Crowberry	gallons	4.0000
Crowberry	pints	0.5000
Crowberry	half-pints	0.2500

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Table C-6.–Page 4 of 4.

Resource name	Reported units	Conversion factor
Cloudberry	pounds	1.0000
Cloudberry	gallons	4.0000
Cloudberry	quarts	1.0000
Other wild berry	gallons	4.0000
Hudson's Bay (Labrador) tea	gallons	1.0000
Sourdock	gallons	1.0000
Willow leaves	gallons	1.0000
Other wild greens	gallons	1.0000
Unknown mushrooms	gallons	1.0000
Stinkweed	gallons	1.0000

Source ADF&G Division of Subsistence household surveys, 2015.

Table C-7.–Conversion factors, Anaktuvuk Pass, 2014.

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 qt 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	individual	6.0190
Chum salmon [CF retention]	individual	6.0190
Coho salmon	individual	5.1410
Coho salmon [CF retention]	individual	5.1410
Chinook salmon	individual	8.6830
Chinook salmon [CF retention]	individual	8.6830
Pink salmon	individual	2.4840
Pink salmon [CF retention]	individual	2.4840
Sockeye salmon	individual	4.0320
Sockeye salmon [CF retention]	individual	4.0320
Unknown salmon	individual	4.0320
Pacific herring [CF retention]	gallons	6.0000
Pacific herring roe [CF retention]	gallons	5.5000
Rainbow smelt	gallons	6.0000
Pacific halibut	individual	21.2000
Pacific halibut	pounds	1.0000
Pacific halibut [CF retention]	pounds	1.0000
Burbot	individual	4.2000
Arctic char	individual	3.3000
Dolly Varden	individual	3.3000
Lake trout	individual	4.0000
Arctic grayling	individual	0.9000
Arctic grayling	plastic shopping bag	12.0000
Northern pike	individual	3.3000
Sheefish	individual	5.5000
Trout	individual	1.4000
Rainbow trout	individual	1.4000
Unknown trout	individual	1.4000
Unknown trout	pounds	1.0000
Broad whitefish	individual	3.2000
Arctic cisco	individual	0.7000
Least cisco	individual	0.7000
Humpback whitefish	individual	2.1000
Round whitefish	individual	0.7000
Brown bear	individual	86.0000
Caribou	individual	136.0000
Moose	individual	538.0000
Muskox	individual	295.0000
Dall sheep	individual	104.0000
Beaver	individual	20.0000
Coyote	individual	0.0000
Arctic fox	individual	0.0000
Red fox	individual	0.0000

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Table C-7.–Page 2 of 3.

Resource name	Reported units	Conversion factor
Snowshoe hare	individual	2.5000
River (land) otter	individual	3.0000
Lynx	individual	4.0000
Marmot	individual	5.0000
Marten	individual	0.0000
Muskrat	individual	0.7500
Porcupine	individual	5.0000
Arctic ground (parka) squirrel	individual	0.5000
Gray wolf	individual	0.0000
Wolverine	individual	0.0000
Polar bear	individual	372.0000
Bearded seal	individual	286.0000
Ribbon seal	individual	101.0000
Ringed seal	individual	57.0000
Spotted seal	individual	98.0000
Unknown seal	individual	56.0000
Walrus	individual	770.0000
Beluga whale	individual	995.0000
Bowhead whale	individual	28677.0000
Bowhead whale, male	individual	28677.0000
Bowhead whale, female	individual	28677.0000
Common eider	individual	2.2100
King eider	individual	1.4300
Spectacled eider	individual	2.4300
Steller's eider	individual	1.0000
Mallard	individual	1.9500
Merganser	individual	1.7600
Long-tailed duck	individual	1.5000
Northern pintail	individual	1.5000
Scaup	individual	1.6800
Black scoter	individual	0.9000
White-winged scoter	individual	2.2900
Green-winged teal	individual	0.5200
Wigeon	individual	1.3100
Unknown ducks	individual	1.5700
Brant	individual	1.6000
Canada/cackling goose	individual	3.3000
Snow goose	individual	3.6000
White-fronted goose	individual	3.1000
Unknown geese	individual	3.9400
Swans	individual	3.9400
Unknown swans	individual	11.2100
Unknown cranes	individual	8.4000
Golden/black-bellied plover	individual	0.1300
Whimbrel/curlew	individual	0.1000
Godwit	individual	0.1000
Unknown shorebirds	individual	0.1000
Unknown small shorebirds	individual	0.1000
Guillemot	individual	0.4000

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Table C-7.–Page 3 of 3.

Resource name	Reported units	Conversion factor
Unknown loons	individual	5.4400
Tern	individual	0.0000
Unknown terns	individual	0.0000
Unknown ptarmigans	individual	0.7000
Snowy owl	individual	3.0000
Unknown duck eggs	individual	0.1500
Unknown goose eggs	individual	0.3000
Unknown swan eggs	individual	0.6300
Sandhill crane eggs	individual	0.6300
Unknown crane eggs	individual	0.6300
Unknown small shorebird eggs	individual	0.0400
Unknown gull eggs	individual	0.3000
Unknown loon eggs	individual	0.1800
Murre eggs	individual	0.2200
Unknown murre eggs	individual	0.2200
Tern eggs	individual	0.0500
Unknown tern eggs	individual	0.0500
Unknown clams	gallons	3.0000
Unknown king crabs [CF retention]	individual	2.1000
Unknown crabs	individual	2.1000
Unknown mussels	gallons	1.5000
Blueberry	gallons	4.0000
Blueberry	quarts	1.0000
Blueberry	pints	0.5000
Blueberry	half-pints	0.2500
Lowbush cranberry	gallons	4.0000
Lowbush cranberry	quarts	1.0000
Lowbush cranberry	pints	0.5000
Lowbush cranberry	half-pints	0.2500
Highbush cranberry	gallons	4.0000
Crowberry	pounds	1.0000
Crowberry	gallons	4.0000
Crowberry	half-pints	0.2500
Cloudberry	gallons	4.0000
Cloudberry	quarts	1.0000
Cloudberry	half-pints	0.2500
Other wild berry	gallons	4.0000
Eskimo potato	individual	0.1000
Eskimo potato	gallons	4.0000
Eskimo potato	quarts	1.0000
Eskimo potato	pints	0.5000
Hudson's Bay (Labrador) tea	gallons	1.0000
Sourdock	gallons	1.0000
Spruce tips	gallons	1.0000
Willow leaves	gallons	1.0000
Other wild greens	gallons	1.0000
Unknown mushrooms	gallons	1.0000
Stinkweed	gallons	1.0000

Source ADF&G Division of Subsistence household surveys, 2015.

APPENDIX D–ADDITIONAL TABLES

Table D1-1.–Resources used by study communities, 2014.

Resource	Scientific name
Chum salmon	*Oncorhynchus keta*
Summer chum salmon	*Oncorhynchus keta*
Fall chum salmon	*Oncorhynchus keta*
Coho salmon	*Oncorhynchus kisutch*
Chinook salmon	*Oncorhynchus tshawytscha*
Pink salmon	*Oncorhynchus gorbuscha*
Sockeye salmon	*Oncorhynchus nerka*
Landlocked salmon	*Oncorhynchus spp.*
Unknown salmon	*Oncorhynchus spp.*
Pacific herring	*Clupea pallasi*
Pacific herring roe	*Clupea pallasi*
Pacific herring spawn on kelp	*Clupea pallasi*
Capelin (grunion)	*Mallotus villosus*
Eulachon (hooligan, candlefish)	*Thaleichthys pacificus*
Rainbow smelt	*Osmerus mordax*
Unknown smelt	
Bass	
Arctic cod	*Boreogadus saida*
Pacific (gray) cod	*Gadus macrocephalus*
Pacific tomcod	*Microgadus proximus*
Saffron cod	*Eleginus gracilis*
Unknown cod	
Flounder	
Arctic flounder	*Liopsetta glacialis*
Starry flounder	*Platichthys stellatus*
Lingcod	*Ophiodon elongatus*
Pacific halibut	*Hippoglossus stenolepis*
Black rockfish	*Sebastes melanops*
Yelloweye rockfish	*Sebastes ruberrimus*
Unknown rockfish	
Unknown sculpin	
Alaska blackfish	*Dallia pectoralis*
Burbot	*Lota lota*
Arctic char	*Salvelinus alpinus*
Dolly Varden	*Salvelinus malma*
Dolly Varden–unknown	*Salvelinus malma*
Lake trout	*Salvelinus namaycush*
Arctic grayling	*Thymallus arcticus*
Northern pike	*Esox lucius*
Northern pike	*Esox lucius*
Sheefish	*Stenodus leucichthys*
Longnose sucker	*Catostomus catostomus*
Cutthroat trout	*Oncorhynchus clarkii*
Rainbow trout	*Oncorhynchus mykiss*
Unknown trout	
Broad whitefish	*Coregonus nasus*
Arctic cisco	*Coregonus autumnalis*
Bering cisco	*Coregonus laurettae*
Least cisco	*Coregonus sardinella*
Unknown cisco	*Coregonus spp.*
Humpback whitefish	*Coregonus pidschian*
Round whitefish	*Prosopium cylindraceum*
Unknown whitefishes	
Unknown nonsalmon fish	

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Table D1-1.–Page 2 of 4

Resource	Scientific name
Black bear	*Ursus americanus*
Brown bear	*Ursus arctos*
Caribou	*Rangifer tarandus*
Mule deer	*Odocoileus hemionus*
Mountain goat	*Oreamnos americanus*
Moose	*Alces alces*
Muskox	*Ovibos moschatus*
Dall sheep	*Ovis dalli*
Beaver	*Castor canadensis*
Coyote	*Canis latrans*
Arctic fox	*Vulpes lagopus*
Red fox	*Vulpes vulpes*
Red fox–cross phase	*Vulpes vulpes*
Red fox–red phase	*Vulpes vulpes*
Snowshoe hare	*Lepus americanus*
River (land) otter	*Lontra canadensis*
Lynx	*Lynx canadensis*
Marmot	*Marmota spp.*
Marten	*Martes spp.*
Mink	*Neovison vison*
Muskrat	*Ondatra zibethicus*
Porcupine	*Erethizon dorsatum*
Arctic ground (parka) squirrel	*Spermophilus parryii*
Red (tree) squirrel	*Tamiasciurus hudsonicus*
Weasel	*Mustela*
Gray wolf	*Canis lupus*
Wolverine	*Gulo gulo*
Polar bear	*Ursus maritimus*
Bearded seal	*Erignathus barbatus*
Fur seal	*Callorhinus ursinus*
Harbor seal	*Phoca vitulina*
Ribbon seal	*Histriophoca fasciata*
Ringed seal	*Histriophoca fasciata*
Spotted seal	*Phoca largha*
Unknown seals	
Sea otter	*Enhydra lutris*
Steller sea lion	*Eumetopias jubatus*
Walrus	*Odobenus rosmarus*
Beluga whale	*Delphinapterus leucas*
Bowhead whale	*Balaena mysticetus*
Unknown whales	
Canvasback	*Aythya valisineria*
Common eider	*Somateria mollissima*
King eider	*Somateria spectabilis*
Spectacled eider	*Somateria fischeri*
Steller's eider	*Polysticta stelleri*
Unknown eiders	
Goldeneye	*Bucephala spp.*
Mallard	*Anas platyrhynchos*
Merganser	*Mergus spp.*
Red-breasted merganser	*Mergus serrator*
Long-tailed duck	*Clangula hyemalis*
Northern pintail	*Anas acuta*
Scaup	*Aythya spp.*

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Table D1-1.–Page 3 of 4.

Resource	Scientific name
Black scoter	*Melanitta nigra*
White-winged scoter	*Melanitta fusca*
Northern shoveler	*Anas clypeata*
Green-winged teal	*Anas crecca*
Wigeon	*Anas spp.*
American wigeon	*Anas americana*
Unknown ducks	
Brant	*Branta bernicla*
Canada/cackling goose	*Branta spp.*
Cackling goose	*Branta hutchinsii minima*
Canada goose	*Branta canadensis parvipes*
Snow goose	*Chen caerulescens*
White-fronted goose	*Anser albifrons*
Unknown geese	
Tundra (whistling) swan	*Cygnus columbianus*
Unknown swans	*Cygnus spp.*
Sandhill crane	*Grus canadensis*
Unknown cranes	*Grus spp.*
Golden/black-bellied plover	*Pluvialis spp.*
Whimbrel/curlew	*Numenius spp.*
Whimbrel	*Numenius phaeopus*
Godwit	*Limosa spp.*
Unknown shorebirds	
Unknown small shorebirds	
Guillemot	*Cepphus spp.*
Black guillemot	*Cepphus grylle*
Glaucous gull	*Larus hyperboreus*
Sabine's gull	*Xema sabini*
Unknown loons	*Gavia spp.*
Unknown murres	*Uria spp.*
Arctic tern	*Sterna paradisaea*
Unknown terns	
Spruce grouse	*Falcipennis canadensis*
Sharp-tailed grouse	*Tympanuchus phasianellus*
Ruffed grouse	*Bonasa umbellus*
Unknown grouses	
Willow ptarmigan	*Lagopus lagopus*
Unknown ptarmigans	*Lagopus spp.*
Snowy owl	*Bubo scandiacus*
Northern pintail eggs	*Anas acuta*
Unknown duck eggs	
Brant eggs	*Branta bernicla*
White-fronted goose eggs	*Anser spp.*
Unknown goose eggs	
Tundra swan eggs	*Cygnus columbianus*
Unknown swan eggs	*Cygnus spp.*
Sandhill crane eggs	*Grus canadensis*
Unknown crane eggs	*Grus spp.*
Golden plover eggs	*Pluvialis dominica*
Godwit eggs	*Limosa spp.*
Unknown small shorebird eggs	
Unknown gull eggs	
Unknown loon eggs	*Gavia spp.*
Unknown murre eggs	*Uria spp.*
Arctic tern eggs	*Sterna paradisaea*
Unknown tern eggs	
Unknown seabird eggs	

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Table D1-1.–Page 4 of 4.

Resource	Scientific name
Snowy owl eggs	*Bubo scandiacus*
Unknown eggs	
Butter clams	*Saxidomus gigantea*
Freshwater clams	
Pinkneck clams	*Mactromeris polynyma*
Razor clams	*Siliqua spp.*
Unknown clams	
Dungeness crab	*Cancer magister*
King crab	
Unknown king crabs	
Tanner crab	*Chionoecetes spp.*
Unknown crabs	
Unknown mussels	*Mytilus spp.*
Octopus	*Octopus vulgaris*
Oyster	
Scallops	
Shrimp	
Blueberry	*Vaccinium uliginosum alpinum*
Lowbush cranberry	*Vaccinum vitis-idaea minus*
Highbush cranberry	*Viburnum edule*
Crowberry	*Empetrum nigrum*
Elderberry	*Sambucus racemosa*
Currants	*Ribes spp.*
Huckleberry	*Vaccinium parvifolium*
Cloudberry	*Rubus chamaemorus*
Raspberry	*Rubus idaeus*
Strawberry	*Fragaria virginiana*
Other wild berry	
Beach asparagus	*Salicornia virginica*
Wild rhubarb	*Polygonum alaskanum*
Eskimo potato	*Hedysarum alpinum*
Devils club	*Echinopanax horridum*
Fiddlehead ferns	
Nettle	*Urtica spp.*
Hudson's Bay (Labrador) tea	*Ledum palustre*
Sourdock	*Rumex fenestratus*
Spruce tips	*Picea spp.*
Willow leaves	*Salix spp.*
Wild rose hips	*Rosa acicularis*
Yarrow	*Achillea spp.*
Other wild greens	
Unknown mushrooms	
Sorrel	*Rumex spp.*
Fireweed	*Epilobium angustifolium*
Plantain	*Plantago major*
Stinkweed	*Artemisia tilesii*
Punk	
Chaga	*Inonotus I. obliquus*
Wild chives	*Allium schoenoprasum*
Wood	
Bark	
Roots	
Spruce	*Picea spp.*
Willow	*Salix spp.*
Birch sap	*Betula spp.*

Source ADF&G Division of Subsistence household surveys, 2015.

Table D2-1.–Population estimates, Tanana, 2010 and 2014.

	Census (2010)	5-year American Community Survey (2010-2014) Estimate	Range[a]	This study (2014) Estimate	Range[b]
Total population					
Households	100	94.0	76–112	91.0	
Population	246	248.0	198–298	204.1	188–220
Alaska Native					
Population	220	208.0	161–255	180.6	164–197
Percentage	89.4%	83.9%	64.9%–102.8%	88.5%	80.3%–96.8%

Sources U.S. Census Bureau (2011) for 2010 estimate; U.S. Census Bureau for American Community Survey (ACS) 2014 estimate (5-year average); and ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate.
Note Division of Subsistence household survey elegiblity requirements differ from those used by ACS.
a. ACS data range is the reported margin of error.
b. No range of households is estimated for division surveys.

Table D2-2.–Population profile, Tanana, 2014.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	5.5	5.1%	5.1%	5.5	5.7%	5.7%	11.0	5.4%	5.4%
5–9	5.5	5.1%	10.3%	5.5	5.7%	11.4%	11.0	5.4%	10.8%
10–14	2.8	2.6%	12.8%	4.1	4.3%	15.7%	6.9	3.4%	14.2%
15–19	11.0	10.3%	23.1%	6.9	7.1%	22.9%	17.9	8.8%	23.0%
20–24	5.5	5.1%	28.2%	6.9	7.1%	30.0%	12.4	6.1%	29.1%
25–29	6.9	6.4%	34.6%	5.5	5.7%	35.7%	12.4	6.1%	35.1%
30–34	2.8	2.6%	37.2%	5.5	5.7%	41.4%	8.3	4.1%	39.2%
35–39	5.5	5.1%	42.3%	1.4	1.4%	42.9%	6.9	3.4%	42.6%
40–44	1.4	1.3%	43.6%	4.1	4.3%	47.1%	5.5	2.7%	45.3%
45–49	9.7	9.0%	52.6%	2.8	2.9%	50.0%	12.4	6.1%	51.4%
50–54	8.3	7.7%	60.3%	9.7	10.0%	60.0%	17.9	8.8%	60.1%
55–59	13.8	12.8%	73.1%	11.0	11.4%	71.4%	24.8	12.2%	72.3%
60–64	12.4	11.5%	84.6%	15.2	15.7%	87.1%	27.6	13.5%	85.8%
65–69	4.1	3.8%	88.5%	1.4	1.4%	88.6%	5.5	2.7%	88.5%
70–74	2.8	2.6%	91.0%	2.8	2.9%	91.4%	5.5	2.7%	91.2%
75–79	0.0	0.0%	91.0%	0.0	0.0%	91.4%	0.0	0.0%	91.2%
80–84	2.8	2.6%	93.6%	4.1	4.3%	95.7%	6.9	3.4%	94.6%
85–89	0.0	0.0%	93.6%	0.0	0.0%	95.7%	0.0	0.0%	94.6%
90–94	0.0	0.0%	93.6%	1.4	1.4%	97.1%	1.4	0.7%	95.3%
95–99	0.0	0.0%	93.6%	0.0	0.0%	97.1%	0.0	0.0%	95.3%
100–104	0.0	0.0%	93.6%	0.0	0.0%	97.1%	0.0	0.0%	95.3%
Missing	6.9	6.4%	100.0%	2.8	2.9%	100.0%	9.7	4.7%	100.0%
Total	**107.5**	**100.0%**	**100.0%**	**96.5**	**100.0%**	**100.0%**	**204.1**	**100.0%**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.

Table D2-3.–Birthplaces of population, Tanana, 2014.

Birthplace	Percentage
Alatna	0.7%
Anchorage	0.7%
Beaver	1.4%
Chuathbaluk	0.7%
Fairbanks	7.4%
Fort Yukon	0.7%
Galena	2.7%
Grayling	2.7%
Huslia	2.0%
Kaltag	0.7%
Kokrines	0.7%
Kotzebue	1.4%
Nome	1.4%
Nulato	3.4%
Rampart	1.4%
Ruby	2.0%
Shageluk	0.7%
Stony River	0.7%
Tanana	53.4%
Kallands	0.7%
Missing	3.4%
Other Alaska	0.7%
Other U.S.	9.5%
Other country	1.4%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

Table D2-4.–Individual participation in subsistence harvest and processing activities, Tanana, 2014.

Total number of people	**204.1**
Fish	
Fish	
Number	81.3
Percentage	39.9%
Process	
Number	104.2
Percentage	51.0%
Large land mammals	
Hunt	
Number	105.6
Percentage	51.7%
Process	
Number	117.0
Percentage	57.3%
Small land mammals	
Hunt or trap	
Number	28.5
Percentage	14.0%
Process	
Number	31.4
Percentage	15.4%
Marine mammals	
Hunt	
Number	0.0
Percentage	0.0%
Process	
Number	0.0
Percentage	0.0%
Birds and eggs	
Hunt/gather	
Number	85.6
Percentage	42.0%
Process	
Number	99.9
Percentage	49.0%
Vegetation	
Gather	
Number	154.1
Percentage	75.5%
Process	
Number	155.5
Percentage	76.2%
Any resource	
Attempt harvest	
Number	164.1
Percentage	80.4%
Process	
Number	162.7
Percentage	79.7%

Source ADF&G Division of Subsistence household surveys, 2015.

Table D2-5.–Estimated harvests of salmon by gear type and resource, Tanana, 2014.

	Removed from commercial catch		Subsistence methods													
			Fish wheel		Gillnet or seine		Dip net		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**275.8**	**1,387.6**	**24,382.3**	**123,008.4**	**3,256.4**	**16,559.6**	**37.2**	**150.1**	**0.0**	**0.0**	**27,676.0**	**139,718.0**	**6.9**	**34.6**	**27,958.6**	**141,140.2**
Summer chum salmon	0.0	0.0	3,153.3	15,867.3	1,374.7	6,917.2	0.0	0.0	0.0	0.0	4,527.9	22,784.6	4.1	20.8	4,532.1	22,805.4
Fall chum salmon	275.8	1,387.6	19,009.2	95,654.3	1,437.8	7,235.0	0.0	0.0	0.0	0.0	20,447.0	102,889.3	0.0	0.0	20,722.8	104,276.9
Coho salmon	0.0	0.0	2,215.7	11,450.8	172.3	890.7	0.0	0.0	0.0	0.0	2,388.1	12,341.5	0.0	0.0	2,388.1	12,341.5
Chinook salmon	0.0	0.0	4.1	35.9	133.7	1,161.3	0.0	0.0	0.0	0.0	137.9	1,197.2	0.0	0.0	137.9	1,197.2
Pink salmon	0.0	0.0	0.0	0.0	137.9	355.3	0.0	0.0	0.0	0.0	137.9	355.3	0.0	0.0	137.9	355.3
Sockeye salmon	0.0	0.0	0.0	0.0	0.0	0.0	37.2	150.1	0.0	0.0	37.2	150.1	0.0	0.0	37.2	150.1
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	13.8	2.7	13.8

Source ADF&G Division of Subsistence household surveys, 2015.
Note The harvested number of salmon is represented as individual fish harvested.

Table D2-6.–Estimated harvests of nonsalmon fish by gear type and resource, Tanana, 2014.

		Removed from commercial catch		Subsistence methods													
				Fish wheel		Gillnet or seine		Ice fishing		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Units[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**0.0**		**25,639.6**		**7,032.6**		**3.3**		**488.4**		**33,163.9**		**1,147.8**		**34,311.8**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe/unspecified	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring spawn on kelp	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eulachon (hooligan, candlefish)	gal	0.0	0.0	0.0	0.0	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 smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific (gray) cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.7	1.4	0.7
Pacific tomcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Starry flounder	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lingcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.9	68.9	68.9	68.9
Unknown rockfish	ind	0.0	0.0	0.0	0.0	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 blackfish	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	ind	0.0	0.0	44.1	105.9	20.7	49.6	1.4	3.3	40.0	96.0	106.2	254.8	2.8	6.6	108.9	261.4
Dolly Varden	ind	0.0	0.0	0.0	0.0	6.9	6.2	0.0	0.0	0.0	0.0	6.9	6.2	0.0	0.0	6.9	6.2
Arctic grayling	ind	0.0	0.0	20.7	18.6	2.8	2.5	0.0	0.0	0.0	0.0	23.4	21.1	46.9	42.2	70.3	63.3
Northern pike	ind	0.0	0.0	34.5	48.3	595.6	833.9	0.0	0.0	0.0	0.0	630.1	882.1	89.6	125.5	719.7	1,007.6
Sheefish	ind	0.0	0.0	1,272.6	7,635.6	155.8	934.8	0.0	0.0	0.0	0.0	1,428.4	8,570.4	148.9	893.5	1,577.3	9,463.9
Longnose sucker	ind	0.0	0.0	82.7	165.5	29.0	57.9	0.0	0.0	0.0	0.0	111.7	223.4	0.0	0.0	111.7	223.4
Rainbow trout	ind	0.0	0.0	0.0	0.0	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 trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	0.0	0.0	1,843.8	2,581.3	896.2	1,254.7	0.0	0.0	19.3	27.0	2,759.3	3,863.0	5.5	7.7	2,764.8	3,870.8
Bering cisco	ind	0.0	0.0	206.8	144.8	344.7	241.3	0.0	0.0	0.0	0.0	551.5	386.1	0.0	0.0	551.5	386.1
Least cisco	ind	0.0	0.0	1,020.3	1,020.3	827.3	827.3	0.0	0.0	137.9	137.9	1,985.5	1,985.5	0.0	0.0	1,985.5	1,985.5
Unknown cisco	ind	0.0	0.0	193.0	209.8	0.0	0.0	0.0	0.0	0.0	0.0	193.0	209.8	0.0	0.0	193.0	209.8
Humpback whitefish	ind	0.0	0.0	1,768.2	5,304.6	693.0	2,079.0	0.0	0.0	75.8	227.5	2,537.0	7,611.1	0.0	0.0	2,537.0	7,611.1
Round whitefish	ind	0.0	0.0	448.1	224.1	103.4	51.7	0.0	0.0	0.0	0.0	551.5	275.8	5.5	2.8	557.0	278.5
Unknown whitefishes	ind	0.0	0.0	3,447.0	8,180.9	292.3	693.7	0.0	0.0	0.0	0.0	3,739.3	8,874.7	0.0	0.0	3,739.3	8,874.7

Source ADF&G Division of Subsistence household surveys, 2015.

Note The summary row that includes incompatible units of measure for harvest number has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

Table D2-7.–Comparison of median income estimates, Tanana, 2014.

Data source	Median[a]	Range[b,c]
2014 Division of Subsistence estimate	$37,419	$29,958 – $48,759
2010-2014 ACS (Tanana City)	$45,938	$38,221 – $53,655
2010-2014 ACS (All Alaska)	$71,829	$71,094 – $72,564

Sources ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate; U.S. Census Bureau for American Community Survey (ACS) 5-year survey estimate.

a. Division of Subsistence 2014 estimate does not include categories of income excluded by the 2010-2014 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 D3-1.–Population estimates, Rampart, 2010 and 2014.

	Census (2010)	5-year American Community Survey (2010-2014) Estimate	Range[a]	This study (2014) Estimate	Range[b]
Total population					
Households	10	7.0	1–13	13.0	
Population	24	15.0	3–27	39.0	39–39
Alaska Native					
Population	23	7.0	1–13	39.0	39–39
Percentage	95.8%	46.7%	6.7%–86.7%	100.0%	100.0%–100.0%

Sources U.S. Census Bureau (2011) for 2010 estimate; U.S. Census Bureau for American Community Survey (ACS) 2014 estimate (5-year average); and ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate.
Note Division of Subsistence household survey elegiblity requirements differ from those used by ACS.
a. ACS data range is the reported margin of error.
b. No range of households is estimated for division surveys.

Table D3-2.–Population profile, Rampart, 2014.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	1.9	16.7%	16.7%	3.7	13.3%	13.3%	5.6	14.3%	14.3%
5–9	0.0	0.0%	16.7%	3.7	13.3%	26.7%	3.7	9.5%	23.8%
10–14	0.0	0.0%	16.7%	1.9	6.7%	33.3%	1.9	4.8%	28.6%
15–19	0.0	0.0%	16.7%	3.7	13.3%	46.7%	3.7	9.5%	38.1%
20–24	3.7	33.3%	50.0%	1.9	6.7%	53.3%	5.6	14.3%	52.4%
25–29	0.0	0.0%	50.0%	1.9	6.7%	60.0%	1.9	4.8%	57.1%
30–34	0.0	0.0%	50.0%	1.9	6.7%	66.7%	1.9	4.8%	61.9%
35–39	1.9	16.7%	66.7%	0.0	0.0%	66.7%	1.9	4.8%	66.7%
40–44	0.0	0.0%	66.7%	3.7	13.3%	80.0%	3.7	9.5%	76.2%
45–49	1.9	16.7%	83.3%	0.0	0.0%	80.0%	1.9	4.8%	81.0%
50–54	0.0	0.0%	83.3%	5.6	20.0%	100.0%	5.6	14.3%	95.2%
55–59	0.0	0.0%	83.3%	0.0	0.0%	100.0%	0.0	0.0%	95.2%
60–64	1.9	16.7%	100.0%	0.0	0.0%	100.0%	1.9	4.8%	100.0%
65–69	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
70–74	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
75–79	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
80–84	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
85–89	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
90–94	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
95–99	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
100–104	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Missing	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Total	**11.1**	**100.0%**	**100.0%**	**27.9**	**100.0%**	**100.0%**	**39.0**	**100.0%**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.

Table D3-3.–Birthplaces of population, Rampart, 2014.

Birthplace	Percentage
Anchorage	4.8%
Arctic Village	4.8%
Eagle	4.8%
Fairbanks	4.8%
Fort Yukon	19.0%
Rampart	33.3%
Stevens Village	9.5%
Tanana	14.3%
Tatitlek	4.8%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

Table D3-4.–Individual participation in subsistence harvesting and processing, Rampart, 2014.

Total number of people	**39.0**
Fish	
Fish	
Number	27.9
Percentage	71.4%
Process	
Number	31.6
Percentage	81.0%
Large land mammals	
Hunt	
Number	22.3
Percentage	57.1%
Process	
Number	26.0
Percentage	66.7%
Small land mammals	
Hunt or trap	
Number	22.3
Percentage	57.1%
Process	
Number	18.6
Percentage	47.6%
Marine mammals	
Hunt	
Number	0.0
Percentage	0.0%
Process	
Number	0.0
Percentage	0.0%
Birds and eggs	
Hunt/gather	
Number	24.1
Percentage	61.9%
Process	
Number	20.4
Percentage	52.4%
Vegetation	
Gather	
Number	29.7
Percentage	76.2%
Process	
Number	33.4
Percentage	85.7%
Any resource	
Attempt harvest	
Number	37.1
Percentage	95.2%
Process	
Number	35.3
Percentage	90.5%

Source ADF&G Division of Subsistence household surveys, 2015.

Table D3-5.–Estimated harvests of salmon by gear type and resource, Rampart, 2014.

	Removed from commercial catch		Subsistence methods													
			Fish wheel		Gillnet or seine		Dip net		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**0.0**	**0.0**	**297.1**	**1,512.9**	**1,467.1**	**7,478.6**	**0.0**	**0.0**	**0.0**	**0.0**	**1,764.3**	**8,991.5**	**0.0**	**0.0**	**1,764.3**	**8,991.5**
Summer chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fall chum salmon	0.0	0.0	167.1	841.1	761.4	3,831.5	0.0	0.0	0.0	0.0	928.6	4,672.6	0.0	0.0	928.6	4,672.6
Coho salmon	0.0	0.0	130.0	671.8	705.7	3,647.1	0.0	0.0	0.0	0.0	835.7	4,319.0	0.0	0.0	835.7	4,319.0
Chinook salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sockeye salmon	0.0	0.0	0.0	0.0	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 salmon	0.0	0.0	0.0	0.0	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, 2015.

Note The harvested number of salmon is represented as individual fish harvested.

Table D3-6.–Estimated harvests of nonsalmon fish by gear type and resource, Rampart, 2014.

		Removed from commercial catch		Subsistence methods													
				Fish wheel		Gillnet or seine		Ice fishing		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**0.0**		**490.3**		**317.2**		**50.1**		**278.6**		**1,136.2**		**84.3**		**1,220.5**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eulachon (hooligan, candlefish)	gal	0.0	0.0	0.0	0.0	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 smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific (gray) cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific tomcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Starry flounder	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lingcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	lb	0.0	0.0	0.0	0.0	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 rockfish	ind	0.0	0.0	0.0	0.0	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 blackfish	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.6	200.6	83.6	200.6	14.9	35.7	98.4	236.2
Dolly Varden	ind	0.0	0.0	0.0	0.0	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 grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	55.7	50.1	55.7	50.1	111.4	100.3	18.6	16.7	130.0	117.0
Northern pike	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	13.0	9.3	13.0
Sheefish	ind	0.0	0.0	0.0	0.0	24.1	144.9	0.0	0.0	0.0	0.0	24.1	144.9	0.0	0.0	24.1	144.9
Longnose sucker	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow trout	ind	0.0	0.0	0.0	0.0	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 trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	0.0	0.0	111.4	156.0	31.6	44.2	0.0	0.0	0.0	0.0	143.0	200.2	5.6	7.8	148.6	208.0
Least cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback whitefish	ind	0.0	0.0	111.4	334.3	42.7	128.1	0.0	0.0	9.3	27.9	163.4	490.3	3.7	11.1	167.1	501.4
Round whitefish	ind	0.0	0.0	0.0	0.0	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 whitefishes	ind	0.0	0.0	0.0	0.0	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, 2015.

Note The summary row that includes incompatible units of measure for harvest number has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

Table D4-1.–Population estimates, Stevens Village, 2010 and 2014.

	Census (2010)	5-year American Community Survey (2010-2014) Estimate	Range[a]	This study (2014) Estimate	Range[b]
Total population					
Households	26	12.0	6–18	4.0	
Population	78	69.0	30–108	10.0	10–10
Alaska Native					
Population	71	64.0	29–99	10.0	10–10
Percentage	91.0%	92.8%	42.0%–143.5%	100.0%	100.0%–100.0%

Sources U.S. Census Bureau (2011) for 2010 estimate; U.S. Census Bureau for American Community Survey (ACS) 2014 estimate (5-year average); and ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate.
Note Division of Subsistence household survey elegiblity requirements differ from those used by ACS.
a. ACS data range is the reported margin of error.
b. No range of households is estimated for division surveys.

Table D4-2.–Population profile, Stevens Village, 2014.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	0.0	0.0%	0.0%	0.0	0.0%	0.0%	0.0	0.0%	0.0%
5–9	0.0	0.0%	0.0%	0.0	0.0%	0.0%	0.0	0.0%	0.0%
10–14	0.0	0.0%	0.0%	0.0	0.0%	0.0%	0.0	0.0%	0.0%
15–19	0.0	0.0%	0.0%	1.0	20.0%	20.0%	1.0	10.0%	10.0%
20–24	1.0	20.0%	20.0%	2.0	40.0%	60.0%	3.0	30.0%	40.0%
25–29	1.0	20.0%	40.0%	1.0	20.0%	80.0%	2.0	20.0%	60.0%
30–34	1.0	20.0%	60.0%	0.0	0.0%	80.0%	1.0	10.0%	70.0%
35–39	0.0	0.0%	60.0%	0.0	0.0%	80.0%	0.0	0.0%	70.0%
40–44	0.0	0.0%	60.0%	0.0	0.0%	80.0%	0.0	0.0%	70.0%
45–49	0.0	0.0%	60.0%	0.0	0.0%	80.0%	0.0	0.0%	70.0%
50–54	0.0	0.0%	60.0%	1.0	20.0%	100.0%	1.0	10.0%	80.0%
55–59	0.0	0.0%	60.0%	0.0	0.0%	100.0%	0.0	0.0%	80.0%
60–64	1.0	20.0%	80.0%	0.0	0.0%	100.0%	1.0	10.0%	90.0%
65–69	0.0	0.0%	80.0%	0.0	0.0%	100.0%	0.0	0.0%	90.0%
70–74	0.0	0.0%	80.0%	0.0	0.0%	100.0%	0.0	0.0%	90.0%
75–79	1.0	20.0%	100.0%	0.0	0.0%	100.0%	1.0	10.0%	100.0%
80–84	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
85–89	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
90–94	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
95–99	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
100–104	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Missing	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Total	**5.0**	**100.0%**	**100.0%**	**5.0**	**100.0%**	**100.0%**	**10.0**	**100.0%**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.

Table D4-3.–Birthplaces of population, Stevens Village, 2014.

Birthplace	Percentage
Arctic Village	10.0%
Fairbanks	10.0%
Stevens Village	50.0%
Tanana	10.0%
Missing	20.0%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

Table D4-4.–Individual participation in subsistence harvesting and processing activities, Stevens Village, 2014.

Total number of people	**10.0**
Fish	
Fish	
Number	5.7
Percentage	57.1%
Process	
Number	5.7
Percentage	57.1%
Large land mammals	
Hunt	
Number	4.3
Percentage	42.9%
Process	
Number	0.0
Percentage	0.0%
Small land mammals	
Hunt or trap	
Number	4.3
Percentage	42.9%
Process	
Number	4.3
Percentage	42.9%
Marine mammals	
Hunt	
Number	0.0
Percentage	0.0%
Process	
Number	0.0
Percentage	0.0%
Birds and eggs	
Hunt/gather	
Number	4.3
Percentage	42.9%
Process	
Number	7.1
Percentage	71.4%
Vegetation	
Gather	
Number	5.7
Percentage	57.1%
Process	
Number	5.7
Percentage	57.1%
Any resource	
Attempt harvest	
Number	5.0
Percentage	50.0%
Process	
Number	5.0
Percentage	50.0%

Source ADF&G Division of Subsistence household surveys, 2014.

Table D4-5.–Reported harvests of salmon by gear type and resource, Stevens Village, 2014.

	Removed from commercial catch		Subsistence methods													
			Fish wheel		Gillnet or seine		Dip net		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**0.0**	**0.0**	**500.0**	**2,516.0**	**102.0**	**557.1**	**0.0**	**0.0**	**0.0**	**0.0**	**602.0**	**3,073.1**	**0.0**	**0.0**	**602.0**	**3,073.1**
Summer chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fall chum salmon	0.0	0.0	500.0	2,516.0	90.0	452.9	0.0	0.0	0.0	0.0	590.0	2,968.9	0.0	0.0	590.0	2,968.9
Coho salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chinook salmon	0.0	0.0	0.0	0.0	12.0	104.2	0.0	0.0	0.0	0.0	12.0	104.2	0.0	0.0	12.0	104.2
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sockeye salmon	0.0	0.0	0.0	0.0	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 salmon	0.0	0.0	0.0	0.0	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, 2015.

Note The harvested number of salmon is represented as individual fish harvested.

Table D4-6.–Reported harvests of nonsalmon fish by gear type and resource, Stevens Village, 2014.

		Removed from commercial catch		Subsistence methods													
				Fish wheel		Gillnet or seine		Ice fishing		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**0.0**		**0.0**		**459.6**		**0.0**		**0.0**		**459.6**		**0.0**		**459.6**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eulachon (hooligan, candlefish)	gal	0.0	0.0	0.0	0.0	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 smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific (gray) cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific tomcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Starry flounder	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lingcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	lb	0.0	0.0	0.0	0.0	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 rockfish	ind	0.0	0.0	0.0	0.0	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 blackfish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	ind	0.0	0.0	0.0	0.0	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 grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern pike	ind	0.0	0.0	0.0	0.0	14.0	19.6	0.0	0.0	0.0	0.0	14.0	19.6	0.0	0.0	14.0	19.6
Sheefish	ind	0.0	0.0	0.0	0.0	22.0	132.0	0.0	0.0	0.0	0.0	22.0	132.0	0.0	0.0	22.0	132.0
Longnose sucker	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow trout	ind	0.0	0.0	0.0	0.0	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 trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least cisco	ind	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Humpback whitefish	ind	0.0	0.0	0.0	0.0	102.0	306.0	0.0	0.0	0.0	0.0	102.0	306.0	0.0	0.0	102.0	306.0
Round whitefish	ind	0.0	0.0	0.0	0.0	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 whitefishes	ind	0.0	0.0	0.0	0.0	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, 2015.

Note The summary row that includes incompatible units of measure for harvest number has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

Table D5-1.–Population estimates, Healy, 2010 and 2014.

	Census (2010)	5-year American Community Survey (2010–2014) Estimate	Range[a]	This study (2014) Estimate	Range[b]
Total population					
Households	434	447.0	389–505	366.0	
Population	1,021	1,146.0	958–1,334	1,005.8	924–1,088
Alaska Native					
Population	43	22.0	1–43	25.9	1–51
Percentage	4.2%	1.9%	0.1%–3.8%	2.6%	0.1%–5.1%

Sources U.S. Census Bureau (2011) for 2010 estimate; U.S. Census Bureau for American Community Survey (ACS) 2014 estimate (5-year average); and ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate.
Note Division of Subsistence household survey elegiblity requirements differ from those used by ACS.
a. ACS data range is the reported margin of error.
b. No range of households is estimated for division surveys.

Table D5-2.–Population profile, Healy, 2014.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	28.8	5.6%	5.6%	23.1	4.7%	4.7%	51.9	5.2%	5.2%
5–9	57.6	11.2%	16.9%	34.6	7.0%	11.7%	92.2	9.2%	14.3%
10–14	34.6	6.7%	23.6%	57.6	11.7%	23.4%	92.2	9.2%	23.5%
15–19	34.6	6.7%	30.3%	54.8	11.1%	34.5%	89.3	8.9%	32.4%
20–24	28.8	5.6%	36.0%	28.8	5.8%	40.4%	57.6	5.7%	38.1%
25–29	20.2	3.9%	39.9%	17.3	3.5%	43.9%	37.5	3.7%	41.8%
30–34	40.3	7.9%	47.8%	43.2	8.8%	52.6%	83.6	8.3%	50.1%
35–39	46.1	9.0%	56.7%	37.5	7.6%	60.2%	83.6	8.3%	58.5%
40–44	37.5	7.3%	64.0%	34.6	7.0%	67.3%	72.0	7.2%	65.6%
45–49	34.6	6.7%	70.8%	31.7	6.4%	73.7%	66.3	6.6%	72.2%
50–54	43.2	8.4%	79.2%	31.7	6.4%	80.1%	74.9	7.4%	79.7%
55–59	40.3	7.9%	87.1%	43.2	8.8%	88.9%	83.6	8.3%	88.0%
60–64	31.7	6.2%	93.3%	23.1	4.7%	93.6%	54.8	5.4%	93.4%
65–69	14.4	2.8%	96.1%	11.5	2.3%	95.9%	25.9	2.6%	96.0%
70–74	5.8	1.1%	97.2%	5.8	1.2%	97.1%	11.5	1.1%	97.1%
75–79	5.8	1.1%	98.3%	2.9	0.6%	97.7%	8.6	0.9%	98.0%
80–84	2.9	0.6%	98.9%	2.9	0.6%	98.2%	5.8	0.6%	98.6%
85–89	0.0	0.0%	98.9%	0.0	0.0%	98.2%	0.0	0.0%	98.6%
90–94	0.0	0.0%	98.9%	0.0	0.0%	98.2%	0.0	0.0%	98.6%
95–99	0.0	0.0%	98.9%	0.0	0.0%	98.2%	0.0	0.0%	98.6%
100–104	0.0	0.0%	98.9%	0.0	0.0%	98.2%	0.0	0.0%	98.6%
Missing	5.8	1.1%	100.0%	8.6	1.8%	100.0%	14.4	1.4%	100.0%
Total	**513.0**	**100.0%**	**100.0%**	**492.8**	**100.0%**	**100.0%**	**1,005.8**	**100.0%**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.

Table D5-3.–Birthplaces of population, Healy, 2014.

Birthplace	Percentage
Anchorage	2.0%
Anderson	0.3%
Cantwell	0.9%
Clear	0.3%
Delta Junction	0.3%
Fairbanks	2.9%
Harding Lake Census Designated Place	0.3%
Healy	28.7%
Nenana	0.6%
Nome	0.3%
Palmer	0.3%
Seward	0.6%
Skagway	0.3%
Sutton	0.6%
Wasilla	0.6%
Denali Park	0.3%
Missing	0.3%
Other U.S.	57.9%
Foreign	2.9%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

Table D5-4.–Individual participation in subsistence harvesting and processing activities, Healy, 2014.

Total number of people	**1,005.8**
Fish	
Fish	
Number	484.0
Percentage	48.1%
Process	
Number	365.2
Percentage	36.3%
Large land mammals	
Hunt	
Number	385.5
Percentage	38.3%
Process	
Number	331.4
Percentage	32.9%
Small land mammals	
Hunt or trap	
Number	107.2
Percentage	10.7%
Process	
Number	89.9
Percentage	8.9%
Marine mammals	
Hunt	
Number	0.0
Percentage	0.0%
Process	
Number	0.0
Percentage	0.0%
Birds and eggs	
Hunt/gather	
Number	248.5
Percentage	24.7%
Process	
Number	182.3
Percentage	18.1%
Vegetation	
Gather	
Number	660.9
Percentage	65.7%
Process	
Number	597.1
Percentage	59.4%
Any resource	
Attempt harvest	
Number	809.8
Percentage	80.5%
Process	
Number	720.5
Percentage	71.6%

Source ADF&G Division of Subsistence household surveys, 2015.

Table D5-5.–Estimated harvests of salmon by gear type and resource, Healy, 2014.

	Removed from commercial catch		Subsistence methods													
			Dip net		Gillnet or seine		Fish wheel		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**0.0**	**0.0**	**1,706.1**	**6,818.9**	**0.0**	**0.0**	**0.0**	**0.0**	**8.6**	**41.3**	**1,714.7**	**6,860.2**	**580.7**	**2,502.2**	**2,295.5**	**9,362.4**
Chum salmon	0.0	0.0	2.9	14.5	0.0	0.0	0.0	0.0	2.9	14.5	5.8	29.0	5.8	29.2	11.6	58.2
Coho salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	14.9	2.9	14.9	183.0	945.7	185.9	960.6
Chinook salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.1	200.2	23.1	200.2
Pink salmon	0.0	0.0	43.2	111.4	0.0	0.0	0.0	0.0	0.0	0.0	43.2	111.4	95.1	245.1	138.3	356.5
Sockeye salmon	0.0	0.0	1,660.0	6,693.0	0.0	0.0	0.0	0.0	0.0	0.0	1,660.0	6,693.0	265.1	1,069.0	1,925.1	7,762.0
Landlocked salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	13.0	8.6	13.0
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	11.9	2.9	11.9	0.0	0.0	2.9	11.9

Source ADF&G Division of Subsistence household surveys, 2015.

Note The harvested number of salmon is represented as individual fish harvested.

Table D5-6.–Estimated harvests of nonsalmon fish by gear type and resource, Healy, 2014.

		Removed from commercial catch		Subsistence methods													
				Fish wheel		Gillnet or seine		Ice fishing		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**0.0**		**0.0**		**0.0**		**63.1**		**20.2**		**83.3**		**5,258.4**		**5,341.7**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eulachon (hooligan, candlefish)	gal	0.0	0.0	0.0	0.0	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 smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific (gray) cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific tomcod	ind	0.0	0.0	0.0	0.0	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 cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Starry flounder	ind	0.0	0.0	0.0	0.0	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 flounder	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	6.3	5.8	6.3	0.0	0.0	5.8	6.3
Lingcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.0	196.0	49.0	196.0
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,882.3	3,882.3	3,882.3	3,882.3
Black rockfish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	8.6	5.8	8.6
Yelloweye rockfish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	8.6	5.8	8.6
Unknown rockfish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.3	99.4	66.3	99.4
Burbot	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.3	41.5	17.3	41.5
Dolly Varden	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.1	41.5	46.1	41.5
Lake trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	11.5	16.1	5.8	8.1	17.3	24.2	196.0	274.4	213.3	298.6
Arctic grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	2.9	2.6	2.9	2.6	5.8	5.2	524.5	472.1	530.3	477.2
Northern pike	ind	0.0	0.0	0.0	0.0	0.0	0.0	5.8	8.1	0.0	0.0	5.8	8.1	40.3	56.5	46.1	64.6
Sheefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Longnose sucker	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cutthroat trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	25.9	36.3	0.0	0.0	25.9	36.3	126.8	177.5	152.7	213.8
Unknown trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round whitefish	ind	0.0	0.0	0.0	0.0	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 whitefishes	ind	0.0	0.0	0.0	0.0	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 nonsalmon fish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	3.2	2.9	3.2	0.0	0.0	2.9	3.2

Source ADF&G Division of Subsistence household surveys, 2015.

Note The summary row that includes incompatible units of measure for harvest number has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

Table D5-7.–Comparison of median income estimates, Healy, 2014.

Data source	Median[a]	Range[b,c]
2014 Division of Subsistence estimate	$89,536	$77,536–$101,304
2010–2014 ACS (Healy CDP)	$97,708	$77,454–$117,962
2010–2014 ACS (All Alaska)	$71,829	$71,094–$72,564

Sources ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate; U.S. Census Bureau for American Community Survey (ACS) 5-year survey estimate.

a. Division of Subsistence 2014 estimate does not include categories of income excluded by the 2010–2014 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 D6-1.–Population estimates, Utqiaġvik, 2010 and 2014.

	Census (2010)	5-year American Community Survey (2010-2014) Estimate	Range[a]	This study (2014) Estimate	Range[b]
Total population					
Households	1,280	1,312.0	1,205–1,419	1,584.0	
Population	4,212	4,296.0	4,174–4,418	5,314.7	4,959–5,670
Alaska Native					
Population	2,889	3,041.0	2,690–3,392	3,559.5	3,191–3,928
Percentage	68.6%	70.8%	62.6%–79.0%	67.0%	60.0%–73.9%

Sources U.S. Census Bureau (2011) for 2010 estimate; U.S. Census Bureau for American Community Survey (ACS) 2014 estimate (5-year average); and ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate.
Note Division of Subsistence household survey elegiblity requirements differ from those used by ACS.
a. ACS data range is the reported margin of error.
b. No range of households is estimated for division surveys.

Table D6-2.–Birthplaces of population, Utqiáġvik, 2014.

Birthplace	Percentage
Akiak	0.1%
Anaktuvuk Pass	0.1%
Anchorage	1.4%
Atqasuk	0.3%
Bethel	0.2%
Fairbanks	1.3%
Fort Richardson	0.1%
Juneau	0.5%
Kaktovik	0.2%
Kasilof	0.1%
Kenai	0.1%
Kiana	0.1%
Kodiak City	0.1%
Nome	0.1%
Nuiqsut	0.2%
Palmer	0.1%
Point Hope	0.6%
Point Lay	0.3%
Ruby	0.1%
Selawik	0.1%
Stebbins	0.1%
Unalakleet	0.1%
Wainwright	1.4%

-continued-

Table D6-2–Continued.

Birthplace	Percentage
Wrangell	0.1%
Yakutat	0.3%
Allakaket	0.1%
Colville Village	0.1%
Umiat	0.1%
Utqiaġvik	61.4%
Missing	2.0%
Other Alaska	0.2%
Other U.S.	17.7%
Foreign	9.8%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

Table D6-3.–Population profile, Utqiaġvik, 2014.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	221.2	7.9%	7.9%	270.3	10.7%	10.7%	491.5	9.3%	9.3%
5–9	319.5	11.5%	19.4%	233.5	9.2%	20.0%	553.0	10.4%	19.7%
10–14	264.2	9.5%	28.9%	215.0	8.5%	28.5%	479.2	9.0%	28.7%
15–19	251.9	9.1%	38.0%	178.2	7.1%	35.5%	430.1	8.1%	36.8%
20–24	135.2	4.9%	42.8%	178.2	7.1%	42.6%	313.3	5.9%	42.7%
25–29	202.8	7.3%	50.1%	165.9	6.6%	49.1%	368.6	6.9%	49.7%
30–34	202.8	7.3%	57.4%	208.9	8.3%	57.4%	411.7	7.8%	57.4%
35–39	184.3	6.6%	64.0%	178.2	7.1%	64.5%	362.5	6.8%	64.2%
40–44	178.2	6.4%	70.4%	141.3	5.6%	70.1%	319.5	6.0%	70.3%
45–49	135.2	4.9%	75.3%	116.7	4.6%	74.7%	251.9	4.7%	75.0%
50–54	178.2	6.4%	81.7%	184.3	7.3%	82.0%	362.5	6.8%	81.8%
55–59	190.5	6.8%	88.5%	190.5	7.5%	89.5%	380.9	7.2%	89.0%
60–64	129.0	4.6%	93.2%	79.9	3.2%	92.7%	208.9	3.9%	92.9%
65–69	79.9	2.9%	96.0%	73.7	2.9%	95.6%	153.6	2.9%	95.8%
70–74	24.6	0.9%	96.9%	12.3	0.5%	96.1%	36.9	0.7%	96.5%
75–79	24.6	0.9%	97.8%	30.7	1.2%	97.3%	55.3	1.0%	97.6%
80–84	0.0	0.0%	97.8%	0.0	0.0%	97.3%	0.0	0.0%	97.6%
85–89	0.0	0.0%	97.8%	18.4	0.7%	98.1%	18.4	0.3%	97.9%
90–94	0.0	0.0%	97.8%	0.0	0.0%	98.1%	0.0	0.0%	97.9%
95–99	0.0	0.0%	97.8%	0.0	0.0%	98.1%	0.0	0.0%	97.9%
100–104	0.0	0.0%	97.8%	0.0	0.0%	98.1%	0.0	0.0%	97.9%
Missing	61.4	2.2%	100.0%	49.2	1.9%	100.0%	110.6	2.1%	100.0%
Total	**2,783.3**	**100.0%**	**100.0%**	**2,525.2**	**100.0%**	**100.0%**	**5,308.5**	**100.0%**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.

Table D6-4.–Individual participation in subsistence harvesting and processing activities, Utqiaġvik, 2014.

Total number of people	**5,314.7**
Fish	
Fish	
Number	1,433.1
Percentage	27.0%
Process	
Number	1,670.9
Percentage	31.4%
Large land mammals	
Hunt	
Number	1,188.9
Percentage	22.4%
Process	
Number	1,741.6
Percentage	32.8%
Small land mammals	
Hunt or trap	
Number	135.0
Percentage	2.5%
Process	
Number	147.8
Percentage	2.8%
Marine mammals	
Hunt	
Number	886.8
Percentage	16.7%
Process	
Number	1,793.0
Percentage	33.7%
Birds and eggs	
Hunt/gather	
Number	1,098.9
Percentage	20.7%
Process	
Number	1,278.9
Percentage	24.1%
Vegetation	
Gather	
Number	559.1
Percentage	10.5%
Process	
Number	642.6
Percentage	12.1%
Any resource	
Attempt harvest	
Number	2,051.2
Percentage	38.6%
Process	
Number	2,553.2
Percentage	48.0%

Source ADF&G Division of Subsistence household surveys, 2015.

Table D6-5.–Estimated harvests of salmon by gear type and resource, Utqiaġvik, 2014.

	Removed from commercial catch		Subsistence methods													
			Set gillnet		Seine net		Fish wheel		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**519.8**	**2,657.7**	**7,299.7**	**36,153.7**	**6.1**	**29.6**	**48.9**	**271.4**	**3,606.9**	**15,359.2**	**10,961.6**	**51,813.9**	**605.5**	**2,790.7**	**12,086.9**	**57,262.3**
Chum salmon	152.9	920.3	3,886.3	23,391.8	0.0	0.0	0.0	0.0	0.0	0.0	3,886.3	23,391.8	0.0	0.0	4,039.2	24,312.1
Coho salmon	275.2	1,414.9	577.1	2,967.0	0.0	0.0	36.7	188.6	519.8	2,672.5	1,133.7	5,828.1	250.7	1,289.1	1,659.6	8,532.1
Chinook salmon	0.0	0.0	73.4	637.2	0.0	0.0	6.1	53.1	71.9	624.4	151.4	1,314.8	18.3	159.3	169.8	1,474.1
Pink salmon	30.6	76.0	1,344.6	3,339.9	0.0	0.0	0.0	0.0	61.2	151.9	1,405.7	3,491.8	12.2	30.4	1,448.5	3,598.1
Sockeye salmon	61.2	246.6	1,296.6	5,227.7	0.0	0.0	0.0	0.0	2,953.9	11,910.3	4,250.5	17,138.0	318.0	1,282.3	4,629.7	18,666.9
Unknown salmon	0.0	0.0	121.7	590.1	6.1	29.6	6.1	29.6	0.0	0.0	134.0	649.4	6.1	29.6	140.1	679.0

Source ADF&G Division of Subsistence household surveys, 2015.
Note The harvested number of salmon is represented as individual fish harvested

Table D6-8.–Estimated harvests of fish for consumption by dogs, Utqiaġvik, 2014.

Resource	Amount	Pounds
Salmon		
Pink salmon	12.2 ind	30.4 lb
Nonsalmon fish		
Saffron cod	61.2 ind	12.8 lb
Least cisco	611.6 ind	428.1 lb
Total	**685.0 ind**	**471.3 lb**

Source ADF&G Division of Subsistence household surveys, 2015.

Table D6-6.–Estimated harvests of nonsalmon fish by gear type and resource, Utqiaġvik, 2014.

		Removed from commercial catch		Subsistence methods													
				Set gillnet		Seine net		Fish wheel		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Units[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**259.3**		**136,530.3**		**0.0**		**0.0**		**50,584.4**		**187,114.7**		**8,675.4**		**196,049.4**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capelin (grunion)	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,406.6	4,571.6	1,406.6	4,571.6	366.9	1,192.6	1,773.6	5,764.2
Eulachon (hooligan, candlefish)	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	32.5	10.0	32.5	0.0	0.0	10.0	32.5
Rainbow smelt	gal	0.0	0.0	0.2	1.2	0.0	0.0	0.0	0.0	225.1	1,350.4	225.3	1,351.6	0.0	0.0	225.3	1,351.6
Unknown smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bass	ind	0.0	0.0	0.0	0.0	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 cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	122.3	13.5	122.3	13.5	61.2	6.7	183.5	20.2
Saffron cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	226.3	47.5	226.3	47.5	0.0	0.0	226.3	47.5
Arctic flounder	ind	0.0	0.0	6.1	6.7	0.0	0.0	0.0	0.0	0.0	0.0	6.1	6.7	0.0	0.0	6.1	6.7
Lingcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.3	73.4	18.3	73.4
Pacific halibut	lb	259.3	259.3	0.0	0.0	0.0	0.0	0.0	0.0	3,522.7	3,522.7	3,522.7	3,522.7	3,502.7	3,502.7	7,284.7	7,284.7
Unknown rockfish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.8	64.2	42.8	64.2
Unknown sculpin	ind	0.0	0.0	244.6	366.9	0.0	0.0	0.0	0.0	0.0	0.0	244.6	366.9	24.5	36.7	269.1	403.6
Burbot	ind	0.0	0.0	373.1	1,566.9	0.0	0.0	0.0	0.0	336.4	1,412.8	709.4	2,979.6	18.3	77.1	727.8	3,056.7
Arctic char	ind	0.0	0.0	214.1	706.4	0.0	0.0	0.0	0.0	0.0	0.0	214.1	706.4	0.0	0.0	214.1	706.4
Dolly Varden	ind	0.0	0.0	122.3	403.6	0.0	0.0	0.0	0.0	61.2	201.8	183.5	605.5	0.0	0.0	183.5	605.5
Lake trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	122.3	489.3	122.3	489.3
Arctic grayling	ind	0.0	0.0	4,024.2	3,621.8	0.0	0.0	0.0	0.0	4,574.0	4,116.6	8,598.2	7,738.4	2,574.8	2,317.3	11,172.9	10,055.6
Northern pike	ind	0.0	0.0	24.5	80.7	0.0	0.0	0.0	0.0	30.6	100.9	55.0	181.6	0.0	0.0	55.0	181.6
Sheefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	0.0	0.0	33,754.8	108,015.2	0.0	0.0	0.0	0.0	10,176.7	32,565.6	43,931.5	140,580.8	30.6	97.9	43,962.1	140,678.7
Arctic cisco	ind	0.0	0.0	15,002.1	10,501.5	0.0	0.0	0.0	0.0	2,507.5	1,755.2	17,509.6	12,256.7	0.0	0.0	17,509.6	12,256.7
Bering cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least cisco	ind	0.0	0.0	12,213.3	8,549.3	0.0	0.0	0.0	0.0	195.7	137.0	12,409.0	8,686.3	966.3	676.4	13,375.3	9,362.7
Humpback whitefish	ind	0.0	0.0	1,082.5	2,273.3	0.0	0.0	0.0	0.0	350.0	734.9	1,432.5	3,008.2	67.3	141.3	1,499.7	3,149.4
Round whitefish	ind	0.0	0.0	623.8	436.7	0.0	0.0	0.0	0.0	30.6	21.4	654.4	458.1	0.0	0.0	654.4	458.1
Unknown whitefishes	ind	0.0	0.0	0.0	0.0	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 nonsalmon fish	ind	0.0	0.0	0.0	0.0	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, 2015.

Note The summary row that includes incompatible units of measure for harvest number has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

Table D6-7.–Comparison of median income estimates, Utqiaġvik, 2014.

Data source	Median[a]	Range[b,c]
2014 Division of Subsistence estimate	$106,884	$93,187–$117,152
2010-2014 ACS (Barrow City)	$82,976	$65,714–$100,238
2010–2014 ACS (All Alaska)	$71,829	$71,094–$72,564

Sources ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate; U.S. Census Bureau for American Community Survey (ACS) 5-year survey estimate.

a. Division of Subsistence 2014 estimate does not include categories of income excluded by the 2010–2014 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 D7-1.–Population estimates, Nuiqsut, 2010 and 2014.

	Census (2010)	5-year American Community Survey (2010-2014) Estimate	Range[a]	This study (2014) Estimate	Range[b]
Total population					
Households	114	100.0	75–125	108.0	
Population	402	371.0	271–471	415.2	374–457
Alaska Native					
Population	360	348.0	271–425	398.5	358–439
Percentage	89.6%	93.8%	73.0%–114.6%	96.0%	86.3%–105.7%

Sources U.S. Census Bureau (2011) for 2010 estimate; U.S. Census Bureau for American Community Survey (ACS) 2014 estimate (5-year average); and ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate.
Note Division of Subsistence household survey elegiblity requirements differ from those used by ACS.
a. ACS data range is the reported margin of error.
b. No range of households is estimated for division surveys.

Table D7-2.–Population profile, Nuiqsut, 2014.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	29.8	15.0%	15.0%	39.1	18.3%	18.3%	68.9	16.7%	16.7%
5–9	26.1	13.1%	28.0%	22.3	10.4%	28.7%	48.4	11.7%	28.4%
10–14	11.2	5.6%	33.6%	18.6	8.7%	37.4%	29.8	7.2%	35.6%
15–19	7.4	3.7%	37.4%	7.4	3.5%	40.9%	14.9	3.6%	39.2%
20–24	16.8	8.4%	45.8%	11.2	5.2%	46.1%	27.9	6.8%	45.9%
25–29	20.5	10.3%	56.1%	29.8	13.9%	60.0%	50.3	12.2%	58.1%
30–34	22.3	11.2%	67.3%	13.0	6.1%	66.1%	35.4	8.6%	66.7%
35–39	13.0	6.5%	73.8%	5.6	2.6%	68.7%	18.6	4.5%	71.2%
40–44	1.9	0.9%	74.8%	5.6	2.6%	71.3%	7.4	1.8%	73.0%
45–49	5.6	2.8%	77.6%	9.3	4.3%	75.7%	14.9	3.6%	76.6%
50–54	16.8	8.4%	86.0%	7.4	3.5%	79.1%	24.2	5.9%	82.4%
55–59	9.3	4.7%	90.7%	7.4	3.5%	82.6%	16.8	4.1%	86.5%
60–64	7.4	3.7%	94.4%	11.2	5.2%	87.8%	18.6	4.5%	91.0%
65–69	5.6	2.8%	97.2%	1.9	0.9%	88.7%	7.4	1.8%	92.8%
70–74	3.7	1.9%	99.1%	1.9	0.9%	89.6%	5.6	1.4%	94.1%
75–79	0.0	0.0%	99.1%	1.9	0.9%	90.4%	1.9	0.5%	94.6%
80–84	0.0	0.0%	99.1%	1.9	0.9%	91.3%	1.9	0.5%	95.0%
85–89	0.0	0.0%	99.1%	1.9	0.9%	92.2%	1.9	0.5%	95.5%
90–94	0.0	0.0%	99.1%	0.0	0.0%	92.2%	0.0	0.0%	95.5%
95–99	0.0	0.0%	99.1%	0.0	0.0%	92.2%	0.0	0.0%	95.5%
100–104	0.0	0.0%	99.1%	0.0	0.0%	92.2%	0.0	0.0%	95.5%
Missing	1.9	0.9%	100.0%	16.8	7.8%	100.0%	18.6	4.5%	100.0%
Total	**199.2**	**100.0%**	**100.0%**	**214.1**	**100.0%**	**100.0%**	**413.4**	**100.0%**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.

Table D7-3.–Birthplaces of population, Nuiqsut, 2014.

Birthplace	Percentage
Alakanuk	0.9%
Anaktuvuk Pass	1.3%
Anchorage	2.2%
Atqasuk	0.4%
Emmonak	0.4%
Fairbanks	0.9%
Kaktovik	0.4%
Kotzebue	0.4%
Kwigillingok	0.4%
Nuiqsut	58.7%
Point Hope	0.4%
Balance of North Slope Borough	0.9%
Colville Village	0.4%
Utqiaġvik	23.3%
Missing	2.2%
Other Alaska	1.3%
Other U.S.	4.5%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

Table D7-4.–Individual participation in subsistence harvesting and processing activities, Nuiqsut, 2014.

Total number of people	**415.2**
Fish	
Fish	
Number	197.1
Percentage	47.5%
Process	
Number	168.4
Percentage	40.6%
Large land mammals	
Hunt	
Number	137.8
Percentage	33.2%
Process	
Number	181.8
Percentage	43.8%
Small land mammals	
Hunt or trap	
Number	17.2
Percentage	4.1%
Process	
Number	15.3
Percentage	3.7%
Marine mammals	
Hunt	
Number	88.0
Percentage	21.2%
Process	
Number	151.2
Percentage	36.4%
Birds and eggs	
Hunt/gather	
Number	112.9
Percentage	27.2%
Process	
Number	149.3
Percentage	35.9%
Vegetation	
Gather	
Number	185.6
Percentage	44.7%
Process	
Number	149.3
Percentage	35.9%
Any resource	
Attempt harvest	
Number	275.0
Percentage	66.2%
Process	
Number	263.7
Percentage	63.5%

Source ADF&G Division of Subsistence household surveys, 2015.

Table D7-5.–Estimated harvests of salmon by gear type and resource, Nuiqsut, 2014.

	Removed from commercial catch		Subsistence methods													
			Set gillnet		Seine net		Fish wheel		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**186.2**	**1,120.8**	**474.8**	**2,475.5**	**0.0**	**0.0**	**0.0**	**0.0**	**37.2**	**224.2**	**512.1**	**2,699.6**	**14.9**	**68.3**	**713.2**	**3,888.7**
Chum salmon	186.2	1,120.8	359.4	2,163.1	0.0	0.0	0.0	0.0	37.2	224.2	396.6	2,387.3	0.0	0.0	582.8	3,508.0
Coho salmon	0.0	0.0	3.7	19.1	0.0	0.0	0.0	0.0	0.0	0.0	3.7	19.1	7.4	38.3	11.2	57.4
Chinook salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink salmon	0.0	0.0	106.1	263.6	0.0	0.0	0.0	0.0	0.0	0.0	106.1	263.6	0.0	0.0	106.1	263.6
Sockeye salmon	0.0	0.0	1.9	7.5	0.0	0.0	0.0	0.0	0.0	0.0	1.9	7.5	7.4	30.0	9.3	37.5
Unknown salmon	0.0	0.0	3.7	22.1	0.0	0.0	0.0	0.0	0.0	0.0	3.7	22.1	0.0	0.0	3.7	22.1

Source ADF&G Division of Subsistence household surveys, 2015.
Note The harvested number of salmon is represented as individual fish harvested.

Table D7-6.–Estimated harvests of fish for consumption by dogs, Nuiqsut, 2014.

Resource	Amount	Pounds
Salmon		
Chum salmon	1.9 ind	11.2 lb
Nonsalmon fish		
Rainbow smelt	1.9 gal	11.2 lb
Saffron cod	26.1 ind	5.5 lb
Arctic flounder	18.6 ind	20.5 lb
Unknown sculpin	1.9 ind	2.8 lb
Burbot	3.7 ind	15.6 lb
Dolly Varden–unknown	378.9 ind	1,250.5 lb
Lake trout	27.9 ind	111.7 lb
Arctic grayling	1.9 ind	1.7 lb
Northern pike	9.3 ind	30.7 lb
Broad whitefish	284.2 ind	909.5 lb
Arctic cisco	96.4 ind	67.5 lb
Least cisco	7,815.8 ind	5,471.1 lb
Humpback whitefish	44.7 ind	93.8 lb
Round whitefish	1.9 ind	1.3 lb
Total		**8,004.6 lb**

Source ADF&G Division of Subsistence household surveys, 2015.

Table D7-7.–Estimated harvests of nonsalmon fish by gear type and resource, Nuiqsut, 2014.

				Subsistence methods													
		Removed from commercial catch		Set gillnet		Seine net		Fish wheel		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**72.6**		**42,534.2**		**0.0**		**0.0**		**41,039.5**		**83,573.7**		**1,460.0**		**85,106.3**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe/unspecified	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow smelt	gal	0.0	0.0	36.6	219.7	0.0	0.0	0.0	0.0	115.6	693.4	152.2	913.2	0.0	0.0	152.2	913.2
Arctic cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saffron cod	ind	0.0	0.0	1.9	0.4	0.0	0.0	0.0	0.0	130.3	27.4	132.2	27.8	0.0	0.0	132.2	27.8
Unknown cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.4	1.9	1.4
Arctic flounder	ind	0.0	0.0	22.3	24.6	0.0	0.0	0.0	0.0	0.0	0.0	22.3	24.6	0.0	0.0	22.3	24.6
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	134.1	134.1	134.1	134.1
Unknown rockfish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	2.8	1.9	2.8
Unknown sculpin	ind	0.0	0.0	9.3	14.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	14.0	0.0	0.0	9.3	14.0
Burbot	ind	0.0	0.0	24.2	101.7	0.0	0.0	0.0	0.0	363.8	1,527.9	388.0	1,629.6	0.0	0.0	388.0	1,629.6
Arctic char	ind	0.0	0.0	193.7	639.1	0.0	0.0	0.0	0.0	0.0	0.0	193.7	639.1	46.6	153.6	240.2	792.7
Dolly Varden	ind	0.0	0.0	33.5	110.6	0.0	0.0	0.0	0.0	372.4	1,229.0	405.9	1,339.6	1.9	6.1	407.8	1,345.7
Lake trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.9	111.7	27.9	111.7	0.0	0.0	27.9	111.7
Arctic grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	335.2	301.7	335.2	301.7	1,291.0	1,161.9	1,626.2	1,463.6
Northern pike	ind	0.0	0.0	9.3	30.7	0.0	0.0	0.0	0.0	1.9	6.1	11.2	36.9	0.0	0.0	11.2	36.9
Sheefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	18.6	59.6	10,800.9	34,563.0	0.0	0.0	0.0	0.0	619.6	1,982.7	11,420.5	36,545.7	0.0	0.0	11,439.1	36,605.3
Arctic cisco	ind	0.0	0.0	7,484.2	5,238.9	0.0	0.0	0.0	0.0	38,793.1	27,155.2	44,681.3	32,394.1	0.0	0.0	46,277.3	32,394.1
Bering cisco	ind	18.6	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.6	13.0
Least cisco	ind	0.0	0.0	2,029.7	1,420.8	0.0	0.0	0.0	0.0	11,302.8	7,911.9	13,332.4	9,332.7	0.0	0.0	13,332.4	9,332.7
Humpback whitefish	ind	0.0	0.0	78.2	164.2	0.0	0.0	0.0	0.0	41.0	86.0	119.2	250.3	0.0	0.0	119.2	250.3
Round whitefish	ind	0.0	0.0	9.3	6.5	0.0	0.0	0.0	0.0	9.3	6.5	18.6	13.0	0.0	0.0	18.6	13.0
Unknown whitefishes	ind	0.0	0.0	0.0	0.0	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, 2015.

Note The summary row that includes incompatible units of measure for harvest number has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

Table D7-8.–Comparison of median income estimates, Nuiqsut, 2014.

Data source	Median[a]	Range[b,c]
2014 Division of Subsistence estimate	$81,622	$65,027 – $109,791
2010-2014 ACS (Nuiqsut City)	$85,833	$67,481 – $104,185
2010-2014 ACS (All Alaska)	$71,829	$71,094 – $72,564

Sources ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate; U.S. Census Bureau for American Community Survey (ACS) 5-year survey estimate.

a. Division of Subsistence 2014 estimate does not include categories of income excluded by the 2010-2014 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 D8-1.–Population estimates, Anaktuvuk Pass, 2010 and 2014.

	Census (2010)	5-year American Community Survey (2010–2014) Estimate	Range[a]	This study (2014) Estimate	Range[b]
Total population					
Households	99	61.0	39–83	99.0	
Population	324	233.0	174–292	317.5	274–361
Alaska Native					
Population	298	226.0	175–277	267.2	219–315
Percentage	92.0%	97.0%	75.1%–118.9%	84.1%	69.0%–99.3%

Sources U.S. Census Bureau (2011) for 2010 estimate; U.S. Census Bureau for American Community Survey (ACS) 2014 estimate (5-year average); and ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate.
Note Division of Subsistence household survey elegiblity requirements differ from those used by ACS.
a. ACS data range is the reported margin of error.
b. No range of households is estimated for division surveys.

Table D8-2.–Population profile, Anaktuvuk Pass, 2014.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	15.0	9.3%	9.3%	16.9	10.8%	10.8%	31.9	10.1%	10.1%
5–9	15.0	9.3%	18.6%	16.9	10.8%	21.7%	31.9	10.1%	20.1%
10–14	11.3	7.0%	25.6%	9.4	6.0%	27.7%	20.7	6.5%	26.6%
15–19	13.2	8.1%	33.7%	13.2	8.4%	36.1%	26.3	8.3%	34.9%
20–24	5.6	3.5%	37.2%	13.2	8.4%	44.6%	18.8	5.9%	40.8%
25–29	9.4	5.8%	43.0%	7.5	4.8%	49.4%	16.9	5.3%	46.2%
30–34	16.9	10.5%	53.5%	9.4	6.0%	55.4%	26.3	8.3%	54.4%
35–39	15.0	9.3%	62.8%	7.5	4.8%	60.2%	22.5	7.1%	61.5%
40–44	9.4	5.8%	68.6%	13.2	8.4%	68.7%	22.5	7.1%	68.6%
45–49	7.5	4.7%	73.3%	5.6	3.6%	72.3%	13.2	4.1%	72.8%
50–54	20.7	12.8%	86.0%	15.0	9.6%	81.9%	35.7	11.2%	84.0%
55–59	5.6	3.5%	89.5%	9.4	6.0%	88.0%	15.0	4.7%	88.8%
60–64	5.6	3.5%	93.0%	3.8	2.4%	90.4%	9.4	3.0%	91.7%
65–69	3.8	2.3%	95.3%	3.8	2.4%	92.8%	7.5	2.4%	94.1%
70–74	5.6	3.5%	98.8%	3.8	2.4%	95.2%	9.4	3.0%	97.0%
75–79	1.9	1.2%	100.0%	3.8	2.4%	97.6%	5.6	1.8%	98.8%
80–84	0.0	0.0%	100.0%	0.0	0.0%	97.6%	0.0	0.0%	98.8%
85–89	0.0	0.0%	100.0%	0.0	0.0%	97.6%	0.0	0.0%	98.8%
90–94	0.0	0.0%	100.0%	0.0	0.0%	97.6%	0.0	0.0%	98.8%
95–99	0.0	0.0%	100.0%	0.0	0.0%	97.6%	0.0	0.0%	98.8%
100–104	0.0	0.0%	100.0%	0.0	0.0%	97.6%	0.0	0.0%	98.8%
Missing	0.0	0.0%	100.0%	3.8	2.4%	100.0%	3.8	1.2%	100.0%
Total	**161.6**	**100.0%**	**100.0%**	**156.0**	**100.0%**	**100.0%**	**317.5**	**100.0%**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2015.

Table D8-3.–Birthplaces of population, Anaktuvuk Pass, 2014.

Birthplace	Percentage
Anaktuvuk Pass	69.4%
Anchorage	0.6%
Fairbanks	2.9%
Hooper Bay	0.6%
Huslia	0.6%
Kaktovik	0.6%
Kaltag	1.8%
Kobuk	0.6%
Nuiqsut	2.4%
Point Hope	0.6%
Shungnak	1.2%
Killik River Area	1.8%
Utqiaġvik	2.4%
Other Alaska	1.2%
Other U.S.	13.5%

Source ADF&G Division of Subsistence household surveys, 2015.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

Table D8-4.–Individual participation in subsistence harvesting and processing activities, Anaktuvuk Pass, 2014.

Total number of people	**317.5**
Fish	
Fish	
Number	162.8
Percentage	51.3%
Process	
Number	150.6
Percentage	47.4%
Large land mammals	
Hunt	
Number	87.5
Percentage	27.6%
Process	
Number	122.1
Percentage	38.5%
Small land mammals	
Hunt or trap	
Number	39.2
Percentage	12.3%
Process	
Number	26.8
Percentage	8.4%
Marine mammals	
Hunt	
Number	0.0
Percentage	0.0%
Process	
Number	16.3
Percentage	5.1%
Birds and eggs	
Hunt/gather	
Number	45.4
Percentage	14.3%
Process	
Number	51.5
Percentage	16.2%
Vegetation	
Gather	
Number	142.5
Percentage	44.9%
Process	
Number	142.5
Percentage	44.9%
Any resource	
Attempt harvest	
Number	196.1
Percentage	61.8%
Process	
Number	192.4
Percentage	60.6%

Source ADF&G Division of Subsistence household surveys, 2015.

Table D8-5.–Estimated harvests of salmon by gear type and resource, Anaktuvuk Pass, 2014.

	Removed from commercial catch		Subsistence methods													
			Set gillnet		Seine net		Fish wheel		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**56.0**	**225.9**	**56.0**	**225.9**	**0.0**	**0.0**	**56.0**	**225.9**
Chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coho salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chinook salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sockeye salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.0	225.9	56.0	225.9	0.0	0.0	56.0	225.9
Unknown salmon	0.0	0.0	0.0	0.0	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, 2015.
Note The harvested number of salmon is represented as individual fish harvested.

Table D8-6.–Estimated harvests of fish for consumption by dogs, Anaktuvuk Pass, 2014.

Resource	Amount	Pounds
Nonsalmon fish		
Arctic char	1.9 ind	6.2 lb
Lake trout	1.9 ind	7.5 lb
Arctic grayling	28.6 ind	25.7 lb
Total	**32.3 ind**	**39.3 lb**

Source ADF&G Division of Subsistence household surveys, 2015.

Table D8-7.–Estimated harvests of nonsalmon fish by gear type and resource, Anaktuvuk Pass, 2014.

		Removed from commercial catch		Subsistence methods													
				Set gillnet		Seine net		Fish wheel		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**0.0**		**133.4**		**0.0**		**1.7**		**4,933.2**		**5,068.3**		**5,154.0**		**10,222.3**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	118.8	118.8	118.8	118.8
Burbot	ind	0.0	0.0	0.0	0.0	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 char	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	712.0	2,349.7	712.0	2,349.7	459.5	1,516.4	1,171.5	3,866.1
Dolly Varden	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.0	92.5	28.0	92.5
Lake trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	535.8	2,143.1	535.8	2,143.1	379.2	1,516.8	915.0	3,659.8
Arctic grayling	ind	0.0	0.0	39.2	35.3	0.0	0.0	1.9	1.7	428.4	385.5	469.5	422.5	2,049.1	1,844.2	2,518.6	2,266.7
Northern pike	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sheefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.4	52.3	37.4	52.3
Unknown trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.4	52.3	37.4	52.3	0.0	0.0	37.4	52.3
Broad whitefish	ind	0.0	0.0	0.0	0.0	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 cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.7	13.1	18.7	13.1
Humpback whitefish	ind	0.0	0.0	46.7	98.1	0.0	0.0	0.0	0.0	0.0	0.0	46.7	98.1	0.0	0.0	46.7	98.1
Round whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	2.6	3.7	2.6	0.0	0.0	3.7	2.6

Source ADF&G Division of Subsistence household surveys, 2015.

Note The summary row that includes incompatible units of measure has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

Table D8-8.–Comparison of median income estimates, Anaktuvuk Pass, 2014.

Data source	Median[a]	Range[b,c]
2014 Division of Subsistence estimate	$67,075	$44,543–$81,525
2010–2014 ACS (Anaktuvuk Pass City)	$49,375	$24,918–$73,832
2010–2014 ACS (All Alaska)	$71,829	$71,094–$72,564

Sources ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate; U.S. Census Bureau for American Community Survey (ACS) 5-year survey estimate.

a. Division of Subsistence 2014 estimate does not include categories of income excluded by the 2010–2014 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.

APPENDIX E–EVALUATION OF ARCTIC ALASKA MARINE MAMMAL AND NONSALMON FISHES CONVERSION FACTORS TO ESTIMATE EDIBLE POUNDS

Nicole M. Braem and James J. Simon, November 2016

Introduction

In 2015 and 2016, lead Arctic Subsistence Resource Specialist Nicole Braem conducted a review of the origins of the varying sets of conversion factors for Arctic Area marine mammals and nonsalmon fishes used to estimate usable (edible) pounds of harvested animals for subsistence uses. The Arctic Area is a Division of Subsistence research area comprising the Bering Strait region, Northwest Arctic Borough, and North Slope Borough (NSB). In the course of 30 years of research, Alaska Department of Fish and Game (ADF&G) Division of Subsistence staff, contractors, and the NSB Department of Wildlife Management (DWM) incorporated different factors; the bases for the factors were not always well-documented. In order to compare long-term datasets, a review of the sources, biological information, and justification for factors used was undertaken. In some cases, no changes were recommended to existing factors.

This appendix is organized into sections by category and by species. Each species section includes a review of studies, past and current sources for mean live weights (which, in turn, drive conversion factors to edible pounds), a summary of conversion factor approaches, and a recommendation. The recommended factor was used in this study.

Not all studies included tables of conversions factors, and not all tables included detailed sourcing information. Where possible, in this review, if the factor used for a species was not described in a report, it was calculated by dividing total estimated pounds by the total estimated number harvested. Although all published Arctic area reports with harvest estimates were reviewed, not all studies included every species under consideration here. All materials reviewed are listed in the "References Cited" section.[1,2]

Marine Mammals

Older source material drives most of the edible weight conversions. Two sources in particular form the basis of many factors used by the Division of Subsistence, which are in some cases based upon earlier biological research conducted by others.

At ADF&G, Stoker (1983) was the basis for determining the North Slope marine mammal conversion factors to be used to convert numbers of individual animals into edible pounds, while information compiled in Burch (1985) served as the foundation for Bering Strait and Kotzebue area conversion factors. In review, Braem found that both Stoker and Burch had a few missteps with their source materials. For example, Stoker (1983) entirely omitted marine mammal blubber and oil from his recommended conversion factors; this omission is a large part of the difference in conversion factors between those used on the North Slope and elsewhere in the Arctic Area. In a few instances, Division of Subsistence staff misquoted Stoker's recommendations. Furthermore, Burch (1985) made some interpretations with regard to live weights that are problematic when compared to the original biological source materials. For most species, the recommendations for conversion factors used in prior studies and those recommended within this review do not make recommendations for salvaged edible portions other than meat and blubber. Further work should be done to refine conversion factors to account for organs and other parts commonly salvaged.

Walrus

The conversion factors used for this species have varied widely. Historically, harvests of walrus have been heaviest in several Bering Strait region communities, although smaller harvests occur elsewhere in the Arctic Area.

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1. These include the Community Subsistence Information System (CSIS), an online repository for Alaska community harvest information gathered by the Alaska Department of Fish and Game Division of Subsistence and others. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." https://www.adfg.alaska.gov/sb/CSIS. Hereafter *ADF&G CSIS*.

2. They additionally include S. Pedersen, Kaktovik project folder, Alaska Department of Fish and Game Division of Subsistence, unpublished data, 1985–1987. This data is on file at the Division of Subsistence, 1300 College Road, Fairbanks, AK 99701. Hereafter *Pedersen unpublished data*.

Review of Studies

Table E-1 shows previous studies documenting walrus harvest, conversion factors published within a report, and a validation of the factor applied. As noted above, not all reports published a table of factors used.

Biological References on Mean Live Weights

Measurements and estimates of mean live weights have been reported by Burns (1978) and Fay (1981, 1982); these published live weights were referenced by Stoker (1983) and Burch (1985) in their subsistence harvest reports.

Burns (1978) stated that by 2 years of age, young walrus weigh approximately 750 lb. Females reach their maximum weight of approximately 2,000 lb by 8 to 9 years of age, and males continue growing until at least 14 or 15 years of age. No weights are given for adult males.

Fay (1981:3) gives weights for newborn walrus calves: newborn male calves weigh 64 kg and newborn female calves weigh 63 kg (the report rounded the value to 140 lb for calves generally). Adult female walrus weigh 812 kg (1,790 lb), somewhat greater than the estimate in Burns (1978). The report also gives a weight for adult male walrus of 1,215 kg (2,679 lb).

Fay (1982:33, 34) presents weights for newborn and 2-month-old walrus calves, adult females, and adult males (Table E-2). Newborn calves weigh 45–75 kg through their first month, and at 2 months they weigh approximately 95 kg (209 lb). The report also suggests a rate of growth for walrus calves:

> If change in weight of captive calves is a valid guide (Fig. 20), the free-living calves probably require about 5 months to double their weight. Their weight at the end of the first year may be about three times their birth weight. (Fay 1982:33)

Adult weights and ages of maximum weight in Fay (1982) differ slightly from Burns (1978) and from Fay (1981):

> Females appear to reach their maximum weight (average 830 kg) at about 12 to 14 years; males undergo a secondary acceleration in weight increase from about the 10th to the 16th year and reach their maximum weight (average, 1,200 kg) sometime thereafter. (Fay 1982:34)

Stoker (1983) and Burch (1985) present mean live weights from Burns (1978) and Fay (1981, 1982). Stoker (1983) cites Fay (1982) to report that walrus calves weigh 95 kg (209 lb), adult females weigh 832 kg (1,834 lb), and adult males weigh 1,210 kg (2,668 lb). Burch (1985) cites Fay (1981, 1982) for mean live weights. Burch (1985) rounds adult female walrus weights to 1,800 lb and males to 2,600 lb. The report does not give a weight for walrus calves of any age, but it does present a weight for adult walrus of unknown sex (2,200 lb), which may have been calculated by averaging male and female mean weights.

Methods of Conversion

Because walrus, like many marine mammals, are so large, the question of what hunters salvage is relevant. A 1982 study conducted by the Alaska Eskimo Walrus Commission documented harvests in Mekoryuk, Gambell, Savoonga, Nome/King Island, Wales, and Diomede (Lourie 1982). Salvage varied daily with the number of animals killed, ice conditions, and individual preferences, and it varied over the course of the season. In addition, over the study period, the overall percentage of edible weight salvaged varied between communities from 27.6% at Mekoryuk to 15.7% at Nome/King Island and 7.2% at Diomede. In general, it appears that communities that harvested more walrus showed a lower salvage percentage.

Patterson (1974:5) described “dressed weights” for walrus citing a “series of studies by John Burns of the Department of Fish and Game: bull walrus, 1,000 pounds; female, 600 pounds; pup, 65 pounds.” A review of tables for the “Arctic Slope,”, “NANA,” and “Bering Straits” regions shows that different values were used in calculating the total dressed weights in each one. A 945 lb conversion factor was used for North Slope communities, a 1,000 lb factor in Northwest Arctic communities, and 968 lb factor in Bering Strait.

Table E-1.–Conversion factors, walrus, 1982–2007.

Study period	Factor in report (lb)[a]	Study community	Factor check[b] (lb)	Source
1982	-	Kivalina	75[b]	Burch 1985
1983	-	Kivalina	900[b]	Burch 1985
1985	-	Nuiqsut	734[b]	CSIS
1986	770	Kotzebue	787[b]	Georgette and Loon 1993
1987	772	Point Lay	767[b]	Impact Assessment, Inc. 1989
1987	772	Utqiaġvik	770[b]	Braund and Associates 1989a
1988	772	Utqiaġvik	774[b]	Braund and Associates 1993a
1989	772	Utqiaġvik	772[b]	Braund and Associates 1993a
1988	772	Wainwright	777[b]	Braund and Associates 1989b
1989	772	Wainwright	774[b]	Braund and Associates 1989b
1989	770; first animal harvested by household/crew	Brevig Mission, Shishmaref, Golovin	unable to check	Conger and Magdanz 1990
1989	385; second animal harvested by household/crew	Brevig Mission, Shishmaref, Golovin	unable to check	Conger and Magdanz 1990
1989	192.5; all subsequent harvests by household/crew	Brevig Mission, Shishmaref, Golovin	unable to check	Conger and Magdanz 1991
1991	-	Kotzebue	779[b]	Fall and Utermohle 1995
1992	-	Kaktovik	737[c]	Fall and Utermohle 1995
1992	-	Kivalina	757	Fall and Utermohle 1995
1992	772	Utqiaġvik	774[c]	Fuller and George 1997
1992	772	Kaktovik	747[c]	Fuller and George 1998
1992	772	Point Hope	775[c]	Fuller and George 1999
1992	772	Wainwright	776[c]	Fuller and George 2000
	772	Anaktuvuk Pass, Nuiqsut	no walrus harvested[c]	Fuller and George 2001
1992	772	Atqasuk, Point Lay	no harvest data[c]	Fuller and George 2002
1994	-	Deering	916[b]	Magdanz et al. 2002
1994	-	Wales	401[b]	Magdanz et al. 2002
1994	-	Noatak	951[b]	CSIS
1995	772	Kaktovik	no species-specific weight estimates[c]	Brower et al. 2000
2002–2004	-	Kotzebue	770[c]	Whiting 2006
2003	-	Buckland	816[c]	Magdanz et al 2011
2007	700	Noatak	617[b]	Magdanz et al 2010
2007	700	Kivalina	675[b]	Magdanz et al 2010

Source ADF&G Division of Subsistence, 2016.
a. "-" indicates that a conversion factor was not published in the report.
b. Conversion factors were checked by dividing estimated total pounds by estimated number of animals harvested as published in ADF&G CSIS.
c. Conversion factor was checked by dividing estimated total pounds by estimated number of animals harvested as published in the report.

Table E-2.–Comparative weights of male and female Pacific walruses (Fay 1982:34, Table 4).

Table 4. *Comparative whole body weights of male and female Pacific walruses.*[a]

	Whole body weight (kg)					
	Males			Females		
Age class	No.	Range	Mean	No.	Range	Mean
Calves, <1 month	7	45.4–77.1	65.1	11	46.7–73.5	61.9
Calves, about 2 months	3	86.2–104.3	95.3	1	95.3	–
Adults: males >14 years, females >9 years	54	880.0–1,656.0	1,210.0	34	400.0–1,250.0	832.0

[a]Sources: IU. Bukhtiarov, J. J. Burns, F. H. Fay, and K. W. Kenyon (unpublished data).

Stoker (1983) did not describe what portions of the animals were salvaged.

> Pedersen (1971), estimated that approximately 40 percent of the total weight of the adult male walrus was utilizable, and 60 percent of adult females. Applying these figures to those of Fay's (1982) for average weights (1,210 kilograms adult males, 832 kilograms adult females, 95 kilograms calves) a mean utilizable figure of 445 kilograms per animal is obtained, which agrees fairly well with the estimate of Patterson (1974) of 390 kilograms per walrus in the north Bering Sea, 430 kilograms in the northern Chukchi Sea. Within this report, a conservative estimate of 35 percent utilization, which translates to 350 kilograms (770 pounds[3]) per walrus will be employed. (Stoker 1983:A-64)

There were several challenges in checking this factor. Pedersen (1971) contains no percentages for utilizable weight on any of the species described in the document; these may originate from a personal communication. The values attributed to Patterson (1974) do not match the values in that report. It is unclear how the author arrived at a mean live weight of 445 kg or chose 35% of it to arrive at a 350 kg utilizable weight.

Conger and Magdanz (1990a:7–9) noted in field observations that not all walrus and all parts of a walrus were considered equally edible. Not all hunters salvaged the same amount, and salvage varied depending on whether the walrus was harvested on ice or in water and ice conditions at the time. "Hunters preferred flippers, blubber with meat, shoulder meat, heart, liver, intestines, kidney, and ribs for drying (Iya 1989)." In Brevig Mission, researchers noted that salvage appeared greater at the beginning of season than at the end. Citing a 1982 Eskimo Walrus Commission (EWC) report (Lourie 1982), authors noted that salvage from individual animals ranged from 100% to less than 2% of total edible weight.

> There are considerable differences between these study communities themselves, and between them and the communities in this study. But these data do support a general assumption that a portion of the edible weight of walrus was being salvaged. The data also suggest that quantity (*sic*) of edible portions salvaged declined as the harvest increased.
>
> Researchers discussed this assumption with two key respondents in Brevig Mission and one in Nome, and proposed a model of declining utility. The model assumed that—for a given household—the first walrus was fully utilized (770 pounds), the second walrus was 50 percent utilized (385 pounds), and all subsequent walrus were 25 percent utilized (192.5 pounds). This model returned a somewhat higher percentage harvested that (*sic*) Lourie's observations showed. An earlier model returned a lower harvest, but one of the key informants said that model's estimate was too low. Researchers recognized that this was a crude model at best, but believed it returned a more realistic estimate of the walrus harvest than straight expansion. (Conger and Magdanz 1990a:8–9)

3. Stoker likely rounded the actual value of 772 lb.

Citing Burns (1978), Fay (1981:3), and Fay (1982:34) as reported in Burch 1985, Georgette and Loon (1993:204) gave a general live weight of 2,200 lb (the mean weight for males and females). For conversion, they sourced a value of 770 lb from Stoker (1983:A-54).

Discussion

The Division has not done a great deal of work in historically heavy walrus harvesting communities in Bering Strait (e.g., Gambell, Savoonga, Nome/King Island, Wales, Diomede) since studies completed in the 1990s.

In the 2014 survey and key respondent interviews in Diomede and in recent reports from St. Lawrence Island, there are indications that walrus harvests have declined recently due to very poor ice conditions. Salvage practices may have changed from the 1980s (and even 1990), and hunters may be salvaging much more of the animal than documented in the EWC report because of uncertain opportunity to harvest more.

Walrus Recommendations

Use 770 lb usable weight conversion factor per walrus, using Conger and Magdanz's (1990a) declining model of utility where appropriate. When surveying particular Bering Strait communities, document current salvage practices to determine if the graduated conversion factor approach is still appropriate. Consider asking about harvest of calves and subadults, and develop factors for those age classes**.**

Bearded Seal

The conversion factors used for bearded seals in Bering Strait and Northwest Alaska have consistently been higher than those used in North Slope studies.

Review of Studies

Table E-3 shows previous studies documenting bearded seal harvest, the conversion factor if published within a report, and a check of the factor applied. As noted above, not all reports published a table of factors used.

Biological References on Mean Live Weights

Johnson et al. (1966) described harvests of bearded seals in an eight-month period (November 1960 through June 1961). During this time, Point Hope harvested 91 adult animals and 82 "immature" ones (Johnson et al. 1966:884). The report clarifies the seasonal age distribution of the seal harvest: "Immature seals make up the larger portion in the winter months; the entire catch of this species is, however, spotty until June. At this time there is an almost two for one preponderance of adults over immature specimens" (Johnson et al. 1966: 909). The sizes of adults harvested were almost equal. "It was not possible to secure weights on the larger animals; one female (M1374) weighed 793 lb, with no allowance for blood and body fluids spilled" (Johnson et al. 1966:909).[4]

Burns (1967) discussed maximum and mean live weights, noting considerable seasonal variation in weight: "Some adult Pacific bearded seals attain a weight during the winter in excess of 350 kg, and many weigh more than 270 kg even during the summer months when they are in lean condition" (Burns 1967:60). In June, July, and August, 14 females averaged 229 kg and 11 males averaged 244 kg (Burns 1967:23). The report also compares its data to weights recorded by other biologists:

> They are by far the largest of our northern seals, often weighing in excess of 350 kg (770 lbs) during the winter months. The comments included in Allen's (op. cit.) account—that the weight of males in "full flesh" varies from 13 to 15 cwt—appear to be gross over-estimations. Johnson, et al (op. cit.) recorded the weight of an adult female supporting a term foetus as 793 lb (about 361 kg). No allowance was made for blood or body (*sic*)

4. 793 lb = 360 kg.

Table E-3.–Conversion factors, bearded seal, 1982–2011.

Study period	Factor in report (lb)[a]	Study community	Factor check (lb)	Source
1982	-	Kivalina	341[b]	Burch 1985
1983	-	Kivalina	331[b]	Burch 1985
1985	176	Kaktovik	180[b]	CSIS, Pedersen unpublished[d]
1985	-	Nuiqsut	178[b]	CSIS
1986	176	Kaktovik	173[b]	CSIS, Pedersen unpublished[d]
1986	420	Kotzebue	420[b]	Georgette and Loon 1993
1987	-	Point Lay	180[b]	Impact Assessment, Inc. 1989
1987–1989	176	Utqiaġvik	176[b]	Braund 1989a, 1993a
1988	176	Wainwright	175[b]	Braund 1989b, 1993b
1989	176	Wainwright	176[b]	Braund 1989b, 1993b
1989	420	Brevig Mission	417[b]	Conger and Magdanz 1990
1989	420	Shishmaref	420[b]	Conger and Magdanz 1990
1989	420	Golovin	412[b]	Conger and Magdanz 1990
1991	-	Kotzebue	Adult 420[b]	Fall and Utermohle 1995
1992	-	Kaktovik	177[b]	Fall and Utermohle 1995
1992	-	Kivalina	Adult 387[b]	Fall and Utermohle 1995
1993	-	Kivalina	Young 102[b]	Fall and Utermohle 1996
1992	176	Utqiaġvik, Kaktovik, Wainwright	176[c]	Fuller and George 1997
1992	176	Nuiqsut	173[c]	Fuller and George 1997
1992	176	Point Hope	177[c]	Fuller and George 1997
1992	176	Anaktuvuk Pass	no bearded seal harvest[c]	Fuller and George 1997
1992	176	Atqasuk, Point Lay	no harvest data[c]	Fuller and George 2001
1993	-	Nuiqsut	172[b]	Fall and Utermohle 1995
1994	-	Deering, Wales	Adult 419[b]	Magdanz et al. 2002
1995	-	Deering, Wales	Young 177[b]	Magdanz et al. 2002
1994	-	Noatak	Adult 417[b]	CSIS
1994	-	Noatak	Young 175[b]	CSIS
1995	176	Kaktovik	no species-specific weight estimates	Brower et al. 2000
2002–2004	-	Kotzebue	420[c]	Whiting 2006
2003	-	Buckland	Adult 420[c],	Magdanz et al. 2011
2004	-	Buckland	Young 177c	Magdanz et al. 2012
2006	-	Kiana	Adult 432[c]	Magdanz et al. 2011
2007	420	Noatak	Male 417[b]	Magdanz et al. 2010
2007	420	Noatak	Female 444[b]	Magdanz et al. 2011
2007	420	Noatak	Unknown sex 427[b]	Magdanz et al. 2012
2007	420	Kivalina	Male 421[b]	Magdanz et al. 2010
2007	420	Kivalina	Unknown sex 421[b]	Magdanz et al. 2011
2011	-	Selawik	425[b]	Braem et al. 2013

Source ADF&G Division of Subsistence, 2016.
a. "-" indicates that a conversion factor was not published in the report.
b. Conversion factors were checked by dividing estimated total pounds by estimated number of animals harvested as published in ADF&G CSIS.
c. Conversion factor was checked by dividing estimated total pounds by estimated number of animals harvested as published in the report.

d. S. Pedersen, Kaktovik project folder, Alaska Department of Fish and Game Division of Subsistence, unpublished data, 1985–1987. This data is on file with the ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701.

Table E-4.–Average weights, percentages of hide and blubber, and percentages of usable meat of ringed, bearded, and spotted seals (Burns 1979).

Species	Average Weight (all age classes)	Average % of Hide and Blubber	Average % of Usable Meat
Ringed Seal	35 kg	46%	38%
Bearded Seal	157 kg	29%	50%
Spotted Seal	70 kg	38%	36%

> spilled. During the summer months large seals will weigh as much as 600 lbs (273 kg). (Burns 1967:12)

Burns (1977) also described seasonal variation in weights.

> Oogruks are heaviest during winter and early spring when they frequently attain a weight of more than 750 pounds. From June through September adult oogruks usually weigh from 475 to 525 pounds. (Burns 1977)

This paper also reported weights of newborn bearded seals:

> The average weight of pups at birth is around 75 pounds and average length is about 52 inches. By the end of a brief nursing period lasting from 12 to 18 days, pups increase their weight almost three times, to around 190 pounds. (Burns 1977)

The Burns (1979) memo provides mean live weights for 3 species of seals for all age classes; for bearded seal the memo gives a value of 157 kg (Table E-4).

Burns and Frost (1979)[5] estimated the yield of meat, hides, and oil from reported harvests of seals in Game Management Units 18, 22, 23, and 26 from January 1, 1977 to June 30, 1978. This exercise was based on estimated harvests published in Matthews (1978), assumptions of an age structure of harvest based on sampled harvests, and mean weights of seals in various age groups. This model of harvest resulted in a mean harvest weight of 156.9 kg per seal. Table E-5 shows mean weights of 37 harvested seals as printed in Burns and Frost (1979:365).

Burns (1981a) describes maximum weights

> Although differences in length between the sexes were slight, the differences in maximum weights were marked. Maximum reported weights in the Bering-Chukchi Sea were 262 kg for a male (Burns 1967) and 360.5 kg for a female (Johnson et al. 1966). In our recent studies the heaviest seal examined was a 316 kg, pregnant female taken on 29 March 1977. She was supporting a 32.3 kg foetus. Differences in average weights of males and females (disregarding females supporting large foetuses) are similar to differences in length. The length: weight relationship in 106 seals is illustrated in Fig. 5. (Burns 1981a:151)

The illustration is reprinted here as Figure E-1. The report also describes the age composition of harvests.

> In our samples, collected between 1975 and 1977 (N=448), the oldest age animal was 25. Our data was obtained primarily from animals killed by coastal-based Eskimo hunters. At some locations these samples are significantly biased toward younger seals, which may occur in larger numbers close to shore. Thus, as an example, at one location in the south-eastern Bering Sea 65% of the bearded seal taken in the spring harvest were pups. In all samples combined, pups accounted for 30% of the catch. Only 2% of our combined

5. This report appears in a 1983 environmental assessment of the Alaskan Continental Shelf. To reduce confusion, the report will be cited as Burns and Frost (1979), but it has been cited by others as Burns and Frost (1983).

Table E-5.–Age, standard length and weight of bearded seals harvested from the Bering and Chukchi seas (Burns and Frost 1979:365, Table 9)

Age (yrs)	Standard Length (cm) N	Mean	Range	Std. Dev.	Weight N	Mean	Range	Std. Dev.
0	52	146.4	120.0-179.0	13.4	13	68.2	27.2- 91.6	20.5
1	1.7	159.0	127.5-188.0	17.0	5	112.5	64.0-152.2	31.6
2	10	182.8	164.7-199.0	10.0	4	155.7	86.2-204.5	50.6
3	7	193.8	158.8-215.7	20.3	4	197.0	160.9-243.1	35.6
4	7	207.2	180.0-233.0	17.1	0	--	--	--
5	4	210.1	200.0-226.0	12.1	0	--	--	--
6	5	208.3	197.0-221.0	9.1	2	242.3	222.7-261.8	27.6
7	3	211.9	204.5-222.3	9.3	1	215.7	--	--
8	3	213.0	200.0-220.0	11.2	1	244.5	--	--
9	8	219.7	205.8-235.1	8.2	2	242.0	222.7-261.3	27.3
10	2	229.5	227.0-232.0	3.5	0	--	--	--
11	6	224.4	215.0-240.0	10.5	1	240.9	--	--
12	9	214.5	204.0-222.0	6.3	2	261.4	206.8-315.9	77.2
13	4	219.9	215.0-231.0	7.5	0	--	--	--
14	1	227.0	--	--	0	--	--	--
15	2	218.2	217.2-219.1	1.3	1	220.2	--	--
16	1	233.0	--	--	0	--	--	--
17	0	0	--	--	0	--	--	--
18	0	0	--	--	0	--	--	--
19	0	0	--	--	0	--	--	--
20	1	224.3	--	--	1	268.2	--	--
20+	7	214.1	202.0-232.0	9.7	0	--	--	--
Total	1.49				37			

> samples were seals older than age 20. Our samples also consistently show more females than males in all age groups entering the harvest. Of 426 seals taken in 1975–77, for which sex was determined, 56% were females. A preponderance of females was also reported by Johnson et al. (1966). (Burns 1981a:156–157)

Stoker (1983:A-66) cited Burns and Frost (1979), giving the mean weight of bearded seals harvested at 157 kg and 345 lb (*sic*).

Burch (1985:153) published a table of monthly mean live weights for male, female, and unknown sex bearded seals, citing Burns (1977) and Burns (1981a:151) as the basis the mean live weights. It is not clear how Burch arrived at these live weights by month from Burns (1977) and Burns (1981a:151). Based on a review of the data, these values seem more like maximum weights than mean weights. Also, Burns (1967) reported that 14 females averaged 229 kg in the months of June, July, and August. Taking the average of Burch's derived weights for that period gives a value of 250 kg: adding 21 kg, or 45 lb to the Burns (1967) estimate.

Kelly (1988a) described seasonal variation in weight for male and female seals. Females lose about 9% of their body weight between late winter and summer, and males lose about 37% (Kelly 1988a:82).

> The contention of Burns and Frost (1983) that females average heavier than males during fall through spring is contradicted by their data. The average weight of two males taken in that period was 390.0 kg, while the average of five females was 250.3 kg. In summer, females (N=14) averaged 228.6 kg, and males (N=11) averaged 244.4 kg (Burns 1967; Burns and Frost 1983). (Kelly 1988a:82)

Nelson (2008a), an update of the ADF&G Wildlife Notebook Series description of bearded seals, did not describe mean live weights.

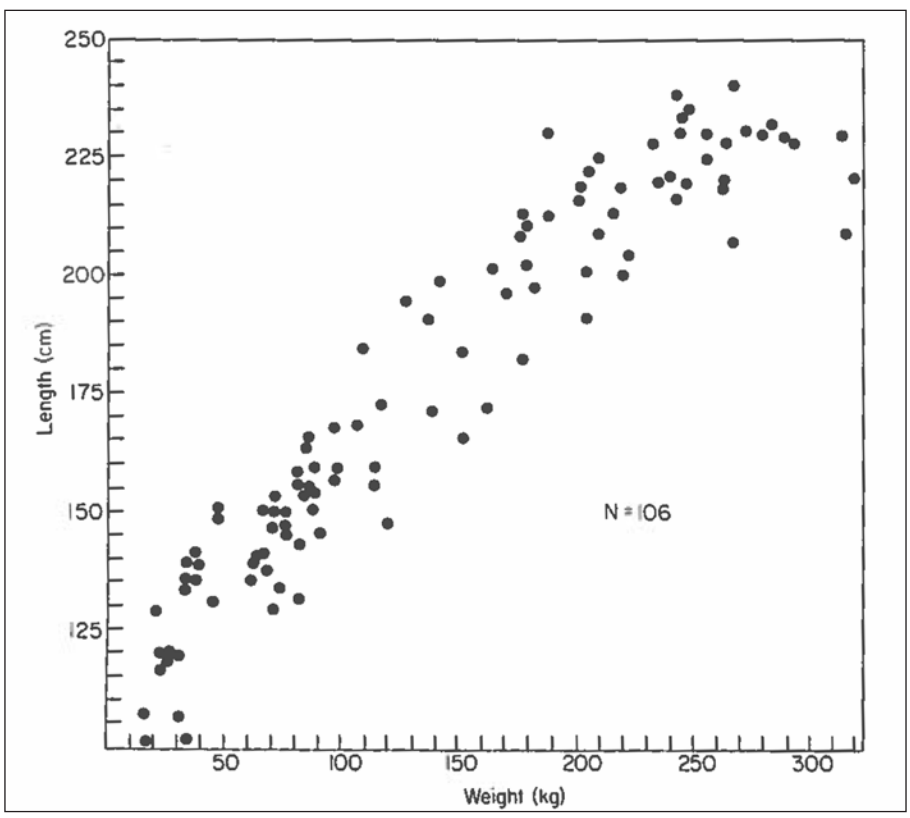

Figure E-1.–Length:weight relationship in 106 Pacific bearded seals from the Bering and Chukchi Seas (Burns 1981a:151, Figure 5).

> They weigh up to 800 pounds (360 kg), in late winter and spring when they are heaviest. Pups are usually 4 feet (132 cm) long and weight (*sic*) about 74 pounds (33.6 kg)…Pups rapidly increase their weight to around 190 pounds (86 kg) in a nursing period that may last a month.

Cameron et al. (2010) summarized existing research, noting that few whole animal weights were available.

> Bearded seals tend to be leanest in the summer after the molt (Burns and Frost 1983).[6] The maximum recorded weights are 432 kg and 375 kg (pregnant females collected in the Bering Sea in April, 1985 and 1991 respectively), and 360.5 kg (female collected in mid-June (Johnson et al. 1966) (K. Frost, Alaska Department of Fish and Game (*ret.*), June 29, 2010, pers. comm.) Judging from weights of small numbers of seals taken in late winter–spring and in summer in the Bering and Chukchi Seas (Burns 1967, Burns and Frost 1983), females lose about 9% and males about 37% of their body weight between late winter and summer. According to Burns (1981a), blubber thickness decreases from an average of 7.2 cm to 4.4 cm over the same period. Females also lose weight in the springtime through parturition. An apparently near-term fetus measured by Burns and Frost (1983) accounted for 10.2% of the female's total weight. (Cameron et al. 2010:6–7)

Quakenbush et al. (2011) discussed the mean age within reported harvests since 1960. The report defined pups as seals less than 1 year of age, subadults as aged 1–6, and adults as those aged 7 and older. Most of a seal's growth occurs in its first 2 or 3 years after birth. Authors noted that with the exception of the 1960s, the proportion of pups in the harvest has remained fairly constant, averaging approximately 40%. Some communities, like Point Hope, prefer larger seals.

> Overall, the mean age within the harvest declined from 6.8 years (95% CL = 5.8–8.1) in the 1960s, to 4.4 years (95% CL = 4.2–4.7; P<0.01) in the 1970s, and then increased to 5.2 years (95% CL = 4.7–5.8; P = 0.03) in the 2000s. The older mean age in the 1960s was largely due to fewer pups in the harvest during that time period. Excluding pups from the calculation of mean age resulted in mean ages that were more similar. Mean ages without pups, declined from 8.3 (95% CL = 7.4–9.3) in the late 1960s to 7.1 (95% CL = 6.9–7.5) in the 1970s, but increased to 8.1 (95% CL = 7.4–8.8) in the 2000s. (Quakenbush et al. 2011:47)

The report also noted that the sex ratio of the harvest skews toward females.

Methods of Conversion

Burns and Frost (1979) describe percentages of total carcass weight that is hide and blubber (29%) and edible meat (70%). They further state that 80% of the hide and blubber is oil. Using these percentages and their mean weight of 157 kg, hide and blubber accounts for 46 kg, 36 kg of which is edible oil; edible meat accounts for 78 kg. Therefore on average, for all sexes and age classes, total edible weight is 114 kg (252 lb).

Stoker (1983:A-66) cited a mean live weight from Burns and Frost (1979) of 157 kg, "about 50 percent of which is considered utilizable for human consumption." Stoker did not include a value for blubber or oil. The resulting conversion factor is 78[7] kg (172 lb) of meat.

Georgette and Loon (1993:203) used live weights provided in Burch (1985). This report averaged values for both sexes for the months between April and June for a value of 612 lb (278 kg). The report based the edible portion that is meat on Burns (1979): "Burns estimated that 50% of a bearded body seal weight is usable meat (306 lb)" (Georgette and Loon 1993:203). Based on fieldwork, researchers estimated that a bearded seal, on average, yields 15 gallons of oil. Researchers weighed 5-gallon buckets of oil, which weighed 38 pounds. Therefore, a single bearded seal yields 114 lb of oil. Using Burch's live weights, Burns' methods

6. In this paper referred to as Burns and Frost (1979).

7. Likely rounded down: 50% of 157 kg is 78.5 kg, which equals 173 lb.

for meat, and Georgette's field research on oil, total edible weight is 420 lb. This was probably intended as a factor for an adult bearded seal, although it has been used for bearded seals in general in later studies.

Discussion

It must be recognized that biologists' concepts of pup and immature seals do not necessarily match those of local people. Age class factors will be discussed in more detail in the following section. This study presents 2 options for a general bearded seal factor and recommends the latter. Georgette's measurements of oil are preferable to a general estimate of blubber.

The first option for a general bearded seal factor would use the average live weight from Burns and Frost (1979:315) and proportions of hide and blubber and meat from Burns (1979) for a conversion factor of 252 lb.

The second option would calculate meat using the average live weight from Burns and Frost (1979:315) and the average percentage of usable meat from Burns (1979), resulting in 172 lb of meat. Oil would be calculated using Georgette's fieldwork estimate (114 lb). In 2015, Braem consulted with a knowledgeable local expert (who in turn, contacted others); she confirmed that Georgette's weights for oil "sound good."[8] The conversion factor resulting from this option would be 286 lb.

Bearded Seal Recommendation, without Age Class Distinction

Use a 286 lb conversion factor when surveys do not ask about different age classes of animals harvested.

Continued Discussion of Juvenile Bearded Seals

Few harvest studies have distinguished between adult and juvenile bearded seals. A conversion factor for juvenile seals first was used in the Arctic region by Georgette and Loon (1993). The authors based the conversion factor on live weights published by Burch (1985; Table E-6), which Burch sources to Burns (1977, 1981a:151). The sourcing of Burch's (1985) information for the live weights of "young of the year" is challenging. Burns (1977) gives a weight for newborn pups and suggests a fast growth rate, but it does not report weights by month. The later Burns (1981a:151) reference does not give information about average weights or seasonal weight loss.

Burns (1977) gives an average weight of pups at birth of 75 lb, with an average length of about 52 inches. "By the end of a brief nursing period lasting from 12 to 18 days, pups increase their weight almost three times, to around 190 pounds" (Burns 1977).

As noted in Burns and Frost (1979), the dramatic weight increase during the nursing period is a reserve. After weaning, pups lose weight as they learn to feed themselves. Bearded seals are generally born in April or May and would be approximately 5 months old in October.

Burns (1981a) does not mention average live weights for young of the year, but it does include a figure showing length-weight relationships (figures E-1 and E-2). Burns (1981a:150) presents an age-length chart based on 143 male and female animals. The mean length of adult seals (age 10 and older) is 233 cm. Blue lines are added to the figure to indicate 3 age classes: newborn pups average 131 cm (56% of adult length), 1-year-old animals average 165 cm (71% of adult length), and 2-year-old animals average 214 cm (79% of adult length; Figure E-2). The mean length for a 5-month-old animal, indicated by a green line, lies somewhere between the mean newborn length of 131 cm and the mean 1-year length of 165 cm. Animals with a length around 148 cm range in weight from greater than 40 kg to nearly 120 kg (>80 lb to 265 lb). The October, November, December (5-, 6-, and 7-month) mean live weights that appear in Burch (1985) are higher than the range based on Burns (1981a).

Georgette and Loon (1993) based the 'juvenile bearded seal" conversion factor on the October–December "young of the year" weights reported in Burch (1985). However, the young of the year values are probably

8. S. Tahbone, active subsistence user and maker of seal oil, personal communication, May 2015.

Table E-6.–Mean live weights of bearded seals by month (Burch Jr. 1985:153).

	Mean live weight (lb)			Mean live weight (kg)		
Month	Male	Female	Unknown sex	Male	Female	Unknown sex
January	725	750	737	329	340	334
February	725	750	737	329	340	334
March	700	725	712	318	329	323
April	650	675	662	295	306	300
May	600	625	612	272	283	278
June	550	575	562	249	261	255
July	525	550	537	238	249	244
August	500	525	513	227	238	233
October*			250			113
November*			300			136
December*			350			159

Source Burch (1985:151)

Note * indicates assumed to be young of the year only.

too high, and it is not clear whether or not hunters are harvesting young of the year (less than 1-year-old). Additionally, biologists' definitions of age classes (pup, juvenile, adult) likely do not conform to local concepts of age groups.

ADF&G marine mammal biologist Mark Nelson[9] noted that local hunters who use local names for young seals (e.g., *ugrukchiaq(t)*) usually mean a seal between 1 and 3 years, and possibly 4-year-old animals, and that it is virtually impossible to distinguish between 1- and 2-year-old seals by size.

Harvest surveys (Coffing et al. 1998, 1999) conducted in the Yukon-Kuskokwim Delta asked about 3 age classes: pup, juvenile, and adult. However, no documentation of how those age classes or conversion factors were established has been found, nor has a 'pup' conversion factor been found.

Methods of Conversion, Juvenile Bearded Seals

Georgette and Loon (1993:203) based their conversion factor on the problematic live weights table in Burch (1985), Burns (1979) salvage percentages, and their own field notes. According to key respondents, a juvenile bearded seal yields 5 gallons of oil (38 lb). With a mean live weight of 275 lb, 50% of which is usable meat, added to 38 lb of oil, Georgette and Loon (1993) developed a conversion factor of 176 lb for "juvenile bearded seal."

Discussion

Researchers might explore the following alternatives for age-class conversion factors, based on mean live weights by age modelled in Burns and Frost (1979:360, Table 6) and approaches to conversion discussed in Burns (1979) and Burns and Frost (1979:358).

The first option would develop 3 separate conversion factors for pups, young or juvenile, and adults. For pups (all seals under 1 year of age), use a mean live weight of 68 kg (150 lb) based on Burns and Frost (1979), and percentages of usable meat and oil from Burns (1979) for a conversion factor of 109 lb. Converting the mean weight of these animals (156 kg, 344 lb) from Burns and Frost (1979) with percentages from Burns (1979) results in a conversion factor of 250 lb for juvenile bearded seals. Finally, for an adult bearded seal conversion factor, use the mean weight animals over 5 years old (242 kg, 526 lb) as published in Burns and Frost (1979); applying percentages from Burns (1979) leads to a conversion factor of 386 lb.

A second alternative would be to develop only 2 age-class factors, by the method described above. Personal communication from ADF&G marine mammal biologist Mark Nelson would seem to support the development of a young or "juvenile" conversion factor based on length-weight data on animals aged 0–4

9. M. Nelson, ADF&G marine mammal biologist, personal communication, September 2015.

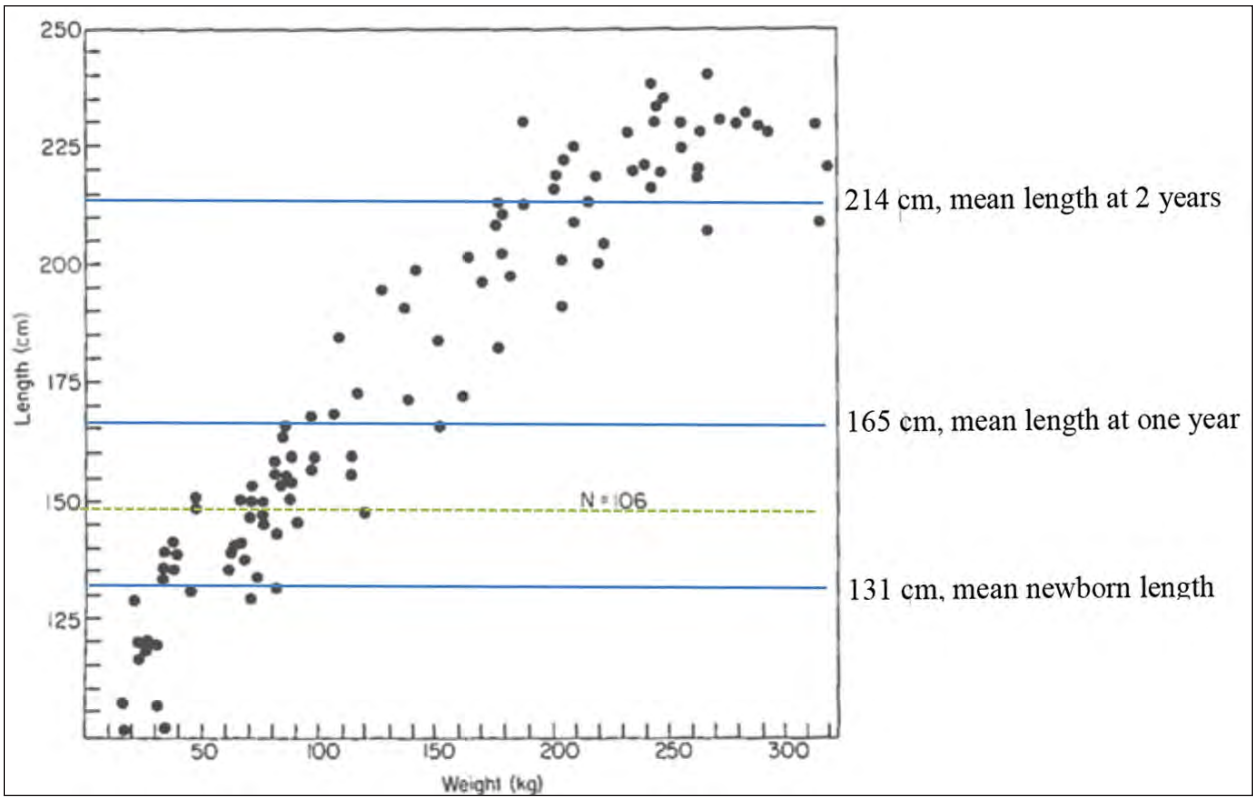

Figure E-2.–Length:weight relationship in 106 Pacific bearded seals from the Bering and Chukchi seas, mean lengths of newborn and juvenile seals indicated (Burns 1981a:150, Figure 5).

(Burns and Frost 1979). A factor for "young" seals could be based on mean weights from under 1 year to 4 years of age, and an "adult" factor would apply to all seals aged 5 and older. Thus, mean live weights of young seals (102 kg, 224 lb) would result in a conversion factor of 163 lb; mean live weights of adult seals (240 kg, 528 lb) would result in a factor of 385 lb.

A third alternative would simply change the ages considered "young" to seals 0–3 years old and "adults" to those 4+years. The resulting factors would convert "young" seals at 150 lb and "adult seals" at 381 lb.

Regardless of the specific age definitions of "young" and "adult" bearded seals, using the mean live weights from Burns and Frost (1979) results in lower age-class conversion factors than those published in Georgette and Loon (1993).

Bearded Seal Recommendations, with Age Class Distinction

Division of Subsistence recommends 2 age-class factors in studies that distinguish age classes. For young or juvenile bearded seals, us a conversion factor of 163 lb. For adult bearded seals, use a conversion factor of 385 lb.

A former Division of Subsistence researcher noted that the seasonality of the harvest may help determine the age class of harvested seals.[10] In his experience in the Kotzebue region, juvenile seals were harvested in the fall when they swam into river deltas to catch fish. We note that timing of harvests may be different in other regions.

In the future, it may be possible to design and fund a project to refine age-class-based conversion factors for bearded seals. Such an approach might include weighing harvested animals, estimations from hunters, and a review of more recently collected datasets from marine mammal biologists that would allow the division

10. J. Magdanz, ADF&G Division of Subsistence, Kotzebue Region, personal communication 2015.

to arrive at mean live weights based upon lengths and ages as was done for the general conversion factor recommended for bearded seal.

Ringed Seal

As with bearded seals, there is a significant difference between ringed seal conversion factors used for the North Slope and elsewhere within the Arctic region. These differences again originate in basing conversion factors on either Stoker (1983) or Burch (1985). In his conversion factor, Stoker (1983) omits blubber and oil. The basis for Stoker's conversion factors is live weight information from Frost and Lowry (1984) and an unattributed percentage meat value likely from Burns and Frost (1979). Burch (1985) published monthly average weights citing Johnson et al. (1966) for live weights from 892 adult seals harvested by Point Hope hunters in 1961.

Table E-7 shows previous studies documenting ringed seal harvest, the conversion factor if published within a report, and a check of the factor applied. As noted above, not all reports published a table of factors used.

Biological References on Mean Live Weights

In Johnson et al. (1966:884–885, 890), the authors note a shift in the composition of ringed seal harvest at Point Hope seasonally, with more immature seals harvested in spring than in winter. Table E-8 shows that in 1961, 926 adult ringed seals and 994 immature seals were harvested. Table E-9 gives the mean live weights for 892 of the adult seals.

However, as calculated from Table E-8, 74% of the spring (March–June) ringed seal harvest was immature ringed seals. Because Table E-9 only shows weights for adult seals harvested, a conversion factor derived from data in the table likely overestimates edible weight.

Authors noted that blubber thickness changes seasonally following the pattern of body-weight change:

> Blubber constitutes about one-half of the body weight of a ringed seal in good condition. The weight of the blubber of 2 adults harvested in March averaged 48% of the body weight. Muscle and bone constituted 37%; viscera, 10%; and the fresh skin, 5%. The blubber of an adult ringed seal harvested in June was 34% of the body weight. (Johnson et al. 1966:890)

For ringed seals in general, Burns (1979) gives a mean live weight for harvested animals of all age classes of 35 kg (Table E-4).

Frost and Lowry (1984:388) describe mean weights of harvested seals. "The average weight of 929 ringed seals taken in the Bering, Chukchi, and Beaufort Seas was 34.3 kg (Burns, Frost, and Lowry, unpubl.)."

Stoker (1983:A-67) cites Frost and Lowry (1983 [*sic*])[11] for a mean live weight of 75 lb (34.3 kg), and a range of 70 to 200 lb.

Burch (1985) cites data published in Johnson et al. (1966) for mean weights. It is not clear how the values for the months of July and October were calculated, because those values do not occur in the source material (tables E-7, E-8, and E-9). The female mean live weights appear to be the average of the pregnant and nonpregnant female mean weights. The unknown sex value is the mean of that average female weight and the average male weight.

Georgette and Loon (1993:204) averaged the average October through July values from the Burch (1985) table, arriving at a mean live weight value of 116 lb (53 kg).

Frost et al. (2002:1) cited their earlier work (Frost and Lowry 1981), stating that adult ringed seals in Alaska average 115 cm in length and 49 kg (108 lb) in weight.

11. Stoker refers to Frost and Lowry 1983 as "in press." The article was published in 1984.

Table E-7.–Conversion factors, ringed seal, 1982–2007.

Study period	Factor in report (lb)[a]	Study community	Factor check (lb)	Source
1982	-	Kivalina	76[b]	Burch 1985
1983	-	Kivalina	65[b]	Burch 1985
1985	-	Nuiqsut	42[b]	CSIS
1985–1986	42	Kaktovik	42[b]	CSIS, Pedersen unpublished[d]
1986	74	Kotzebue	74[b]	Georgette and Loon 1993
1987	-	Point Lay	42[b]	Impact Assessment, Inc. 1989
1987–1989	42	Utqiaġvik	42[b]	Braund 1989a, 1993a
1988–1989	42	Wainwright	42[b]	Braund 1989b, 1993b
1989	74	Brevig Mission, Shishmaref, Golovin	74[b]	Conger and Magdanz 1990
1991	-	Kotzebue	74[b]	Fall and Utermohle 1995
1992	-	Kaktovik	40[b]	Fall and Utermohle 1995
1992	-	Kivalina	69[b]	Fall and Utermohle 1995
1992	42	Utqiaġvik, Kaktovik, Point Hope, Wainwright	42[c]	Fuller and George 1997
1992	42	Nuiqsut	43[c]	Fuller and George 1997
1992	42	Anaktuvuk Pass	no ringed seal harvest[c]	Fuller and George 1997
1992	42	Atqasuk, Point Lay	no harvest data[c]	Fuller and George 1997
1993	-	Nuiqsut	74[b]	Fall and Utermohle 1995
1994	-	Deering	77[b]	Magdanz et al. 2002
1994	-	Wales	74[b]	Magdanz et al. 2002
1995	42	Kaktovik	no species-specific weight estimates	Brower et al. 2000
2002–2004	-	Kotzebue	74[c]	Whiting 2006
2003	-	Buckland	74[c]	Magdanz et al. 2011
2007	-	Noatak, Kivalina	69[b]	Magdanz et al. 2010

Source ADF&G Division of Subsistence, 2016.

a. "-" indicates that a conversion factor was not published in the report.

b. Conversion factors were checked by dividing estimated total pounds by estimated number of animals harvested as published in ADF&G CSIS.

c. Conversion factor was checked by dividing estimated total pounds by estimated number of animals harvested as published in the report.

d. S. Pedersen, Kaktovik project folder, Alaska Department of Fish and Game Division of Subsistence, unpublished data, 1985–1987. This data is on file with the ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701.

Table E-8.–Distribution by sex and maturity of seals taken at Point Hope November 1960 through June 1961 (Johnson et al. 1966:884, Table 2).

Table 2—DISTRIBUTION BY SEX AND MATURITY OF SEALS TAKEN AT POINT HOPE NOVEMBER 1960 THROUGH JUNE 1961

	Ringed Seal				Bearded Seal			
	Adult		Immature		Adult		Immature	
Month	Male	Female	Male	Female	Male	Female	Male	Female
November	19	21	18	8			2	1
December	61	34	21	15			1	
January	177	89	24	12		1	1	1
February	179	112	129	102		1	2	1
March	59	21	78	71	1	1	1	4
April	36	10	51	41		3	4	4
May	37	13	64	53	3	1	3	1
June	28	30	163	144	30	50	26	30
Total	596	330	548	446	34	57	40	42

Table E-9.–Comparison of weights of adult ringed seals, November 1960 to June 1961 (Johnson et al. 1966:890, Table 5).

Table 5—COMPARISON OF WEIGHTS* OF ADULT RINGED SEALS, NOVEMBER 1960 to JUNE 1961

	Males			Pregnant females			Nonpregnant females		
	Mean	Number	Range	Mean	Number	Range	Mean	Number	Range
November	114.4 ± 13.7	16	90–150	112.7 ± 13.7	13	95–135	92.5 ± 2.5	2	90–95
December	123.3 ± 19.0	60	75–175	123.1 ± 16.8	24	95–170	110.0 ± 14.6	8	90–135
January	152.9 ± 20.6	174	110–220	139.9 ± 18.4	79	100–190	113.9 ± 21.2	14	85–170
February	143.2 ± 26.0	187	90–210	147.6 ± 21.6	94	100–200	122.7 ± 18.0	11	95–155
March	122.8 ± 21.1	61	85–180	148.5 ± 19.1	17	110–190	108.0 ± 16.3	5	85–135
April	116.1 ± 19.3	35	90–180	147.5 ± 22.5	2	125–170	107.5 ± 12.5	6	95–130
May	114.8 ± 19.9	41	90–160				108.1 ± 25.8	13	70–165
June	92.4 ± 12.0	19	75–120				101.0 ± 16.0	11	75–130

*Means with standard deviation in pounds.

Table E-10.–Mean live weights, ringed seals (Burch Jr. 1985:154)

(4) Seal, Ringed (Phoca hispida); natsiq

Month	Males	Females	Sex Not Reported
October	108 lbs.	101 lbs.	105 lbs.
November	114 lbs.	103 lbs.	108 lbs.
December	123 lbs.	117 lbs.	120 lbs.
January	153 lbs.	127 lbs.	140 lbs.
February	143 lbs.	135 lbs.	139 lbs.
March	123 lbs.	128 lbs.	125 lbs.
April	116 lbs.	128 lbs.	122 lbs.
May	115 lbs.	108 lbs.	111 lbs.
June	92 lbs.	101 lbs.	96 lbs.
July	88 lbs.	95 lbs.	91 lbs.

Sources: Johnson, et al. (1966:890)

Methods of Conversion

Burns (1979) does not provide specific conversion factors for seal species, but it does provide direction on percentages of meat and blubber and hide, and gives a mean live weight (Table E-4). According to Burns (1979), the mean weight of all age classes of harvested ringed seals is 35 kg (77 lb). Usable meat is on average 38% of the live weight (13.3 kg, 29 lb), and hide and blubber is on average 46% of the live weight (16.1 kg, 35 lb).

Stoker (1983:A-67) states: "Using an estimate of 50 percent, the meat utilizable for human consumption averages 17 kilograms (38 pounds) per seal." Blubber and oil is omitted from this factor.

Various North Slope studies used a conversion factor of 42 lb that presumably originates in Stoker, like other factors for the region. Impact Assessment, Inc. (1989) cites Stoker, but a footnote to the citation states, "personal communication to Sverre Pedersen or unpublished documents available in the Fairbanks ADF&G office." Pedersen's data for 1985–1986[12] have a table of conversion factors that appears to incorrectly identify 42 lb as a value for ringed seals derived from Stoker (1983). As a result, North Slope studies have typically used 42 lb as a factor.

Georgette and Loon (1993:204) used the 116 lb mean live weight derived from Burch (1985), with Burns' (1979) estimation of 38% of live weight for meat of ringed seals, which leads to an estimate of 44 lb of meat (tables E-4 and E-9). Key respondents for the project estimated that a ringed seal yields 4 gallons (30 lb) of seal oil. Using these weights, Georgette and Loon (1993:204) developed a conversion factor of 74 lb for ringed seals.

12. Pedersen unpublished data.

Discussion

Clearly, the value presented in Stoker (1983) is too low, because it does not account for blubber and oil. The question remains whether to use the average live weight from Frost and Lowry (1984; based on 929 seals of various age classes harvested in the Bering, Chukchi, and Beaufort Seas) or from Johnson et al. (1966; based on 892 adult seals harvested at Point Hope in 1961). If using a single conversion factor for all age classes, we suggest basing it on the Frost and Lowry (1984) live weight. The oil value from Georgette and Loon's respondents is remarkably close to that calculated using Burns' (1979) percentages.

Using a 34.3kg (76 lb) average live weight (Frost and Lowry 1984), estimated percentages of meat (38%) and blubber and hide (46%) from Burns (1979), and percentage of hide and blubber that is oil (80%) from Burns and Frost (1979) results in a conversion factor of 57 lb.

Ringed Seal Recommendation

Use a single conversion factor of 57 lb for ringed seal.

Spotted Seal

The disparity in conversion factors for spotted seal used in the North Slope and in other areas originates in different average live weight values used and the omission or inclusion of blubber and oil. Table E-11 shows previous studies documenting spotted seal harvests, the conversion factor if published within a report, and a check of the factor applied. As noted above, not all reports published a table of factors used.

Biological References on Mean Live Weights

Data from Bigg (1981:3, Table 1) were cited in other studies to develop conversion factors for spotted seal (Table E-12). The table assembles biological information on a variety of harbor seal populations, and included *P. largha*, which is the spotted seal. Harbor seals and spotted seals are similar in appearance and size, and it is difficult even for biologists to distinguish between them. In the Bering Sea, the average weight of 22 male harbor seals was 85 kg (187 lb), and the average for 16 female harbor seals was 66 kg (146 lb).

Burns (1979) gives a mean weight for spotted seals of 70 kg (154 lb; Table E-4).

The mean live weight in Stoker (1983) is attributed to Josephson (1974), which was unavailable for review. "The average spotted seal weighs around 91 kilograms (200 pounds)" (Stoker 1983:A-68).

With respect to spotted seal, Burch (1985:154) cites weight and length values for the Bering Sea population of harbor seals described in Bigg et al. (1981). Based upon the information provided in Bigg et al. (1981), Burch provides an average weight for adult male spotted seal of 185 lb and for adult females of 145 lb. He averages the 2 values for an estimate of 165 lb for spotted seals of unknown sex.

Georgette and Loon (1993) use a mean live weight of 165 lb, citing Burch (1985).

Methods of Conversion

Burns (1979) provides direction on percentages of meat (36% of carcass), hide and blubber (38% of carcass), and edible oil (80% of hide and blubber). Use of the mean live weight in the document (70 kg, 154 lb) results in a conversion factor of 47 kg (104 lb).

Stoker (1983) notes that salvage is lower for spotted seal than for other species.

> An estimated 36 kilograms (80 pounds) is utilizable for human consumption (Josephson 1974). A somewhat lower utilization figure of 25 kilograms per seal is used for this report, however, since spotted seals are not, by and large, considered as desirable as are bearded seals and ringed seals, and so are not always used for human consumption (personal observation). (Stoker 1983:A-68)

As for other species, Stoker's conversion factor of 25 kg (55 lb) for spotted seal omits blubber and oil.

Table E-11.–Conversion factors, spotted seal, 1982–2011.

Study period	Factor in report (lb)[a]	Study community	Factor check (lb)	Source
1982	-	Kivalina	111[b]	Burch 1985
1983	-	Kivalina	87[b]	Burch 1985
1985	-	Nuiqsut	40[b]	CSIS
1985–1986	-	Kaktovik	50[b]	CSIS, Pedersen unpublished[d]
1986	98	Kotzebue	98[b]	Georgette and Loon 1993
1987	42	Point Lay	42[b]	Impact Assessment, Inc. 1989
1987	42	Utqiaġvik	51[b]	Braund 1989a, 1993a
1988–1989	42	Utqiaġvik	38[b]	Braund 1993a
1988–1989	-	Wainwright	42[b]	Braund 1989b, 1993b
1989	-	Brevig Mission, Shishmaref, Golovin	98[b]	Conger and Magdanz 1990
1991	-	Kotzebue	98[b]	Fall and Utermohle 1995
1992	-	Kaktovik	42[b]	Fall and Utermohle 1995
1992	-	Kivalina	70[b]	Fall and Utermohle 1995
1992	42	Utqiaġvik, Point Hope	42[c]	Fuller and George 1997
1992	42	Kaktovik, Nuiqsut, Wainwright	41[c]	Fuller and George 1997
1992	42	Anaktuvuk Pass	No spotted seal harvest[c]	Fuller and George 1997
1992	42	Atqasuk, Point Lay	No harvest data[c]	Fuller and George 1997
1993	-	Nuiqsut	Not converted to edible weight[b]	Fall and Utermohle 1995
1994	-	Deering	96[b]	Magdanz et al. 2002
1994	-	Wales	90[b]	Magdanz et al. 2002
1995	42	Kaktovik	no species-specific weight estimates[c]	Brower et al. 2000
2002–2004	-	Kotzebue	98[c]	Whiting 2006
2003	-	Buckland	98[c]	Magdanz et al. 2011
2007	-	Noatak	97[c]	Magdanz et al. 2010
2007	-	Kivalina	95[c]	Magdanz et al. 2010
2011	-	Selawik	99[c]	Braem et al. 2013

Source ADF&G Division of Subsistence, 2016.

a. "-" indicates that a conversion factor was not published in the report.

b. Conversion factors were checked by dividing estimated total pounds by estimated number of animals harvested as published in ADF&G CSIS.

c. Conversion factor was checked by dividing estimated total pounds by estimated number of animals harvested as published in the report.

d. S. Pedersen, Kaktovik project folder, Alaska Department of Fish and Game Division of Subsistence, unpublished data, 1985–1987. This data is on file with the ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701.

Table E-12.–Average standard length and body weight of harbor seals from different populations (Bigg 1981:3, Table 1).

TABLE 1 Average standard length (cm) and body weight (kg) of harbour seals from different populations. Sample size is in parentheses.

Population		New-born Length	New-born Weight	Adult Length M	Adult Length F	F/M	Adult Weight M	Adult Weight F	M wt / F length	Source
P. largha	Bering Sea			160(6)	143(9)	0.89				Chapskii (1967)
	Okhotsk Sea (?)			150(14)	146(7)	0.97				Belkin *et. al.* (1969)
	Tatar Strait			158(16)	158(35)	1.00	100(17)	89(34)	0.63	
	Peter the Great Bay			159(3)	157(10)	0.99	113(3)	114(10)	0.71	
	Bering Sea			149(12)	141(13)	0.95	85(22)	66(16)	0.57	Kosygin and Golisev (1971)
	Kuril Islands			150(14)	146(6)	0.97	90(13)	75(7)	0.60	
	Okhotsk Sea			153(19)	142(16)	0.93				
	Hokkaido	85		170(8)	159(28)	0.94				Naito and Nishiwaki (1972)
	Bering Sea (?)	84	9-12							Burns (1970)
P. v. stejnegeri	Hokkaido	98(20)		186(3)	169(8)	0.91				Naito and Nishiwaki (1972)
	Kuril Islands		19				87-170	60-142		Belkin (1964)
	Kuril Islands			174(8)	160(17)	0.92				Belkin *et al.* (1969)
P. v. richardsi	British Columbia-Tugidak Island	82(9)	10(9)	161(11)	148(50)	0.92	87(10)	65(42)	0.54	Bigg (1969b)
P. v. concolor	Sable Island (M)	81(13)	11(8)							Boulva (1971)
	(F)	79(18)	11(6)							

Various North Slope studies used a conversion factor of 42 lb that presumably originates from Stoker (1983), like other factors for the region. Impact Assessment, Inc. (1989:C-17) cites Stoker, but a footnote to the citation states, "personal communication to Sverre Pedersen or unpublished documents available in the Fairbanks ADF&G office." Unpublished data from Pedersen's work in Kaktovik have a table of conversion factors that appears to incorrectly identify 42 lb as a value from Stoker (1983).[13]

Georgette and Loon (1993:204) cite Burch (1985) for an average live weight of 165 lb. They calculate 36% (60 lb)[14] of the live weight is meat, citing Burns (1979). Key respondents in this project estimated that a spotted seal yields 5 gallons of oil (38 lb). The researchers arrive at a conversion factor of 98 lb.

Discussion

Although the Burns (1979) method and Georgette and Loon (1993) method assume different mean live weights, they arrive at similar conversion factors (104 lb versus 98 lb). Given the relatively few small numbers of spotted seals harvested, a 6 lb difference will not greatly affect harvest results.

Spotted Seal Recommendation

Retain the 98 lb conversion factor developed in Georgette and Loon (1993).

Ribbon Seal

Ribbon seals are much less commonly harvested than other species of seals. Of the few studies that do document ribbon seal harvests, conversion factors vary between 39 and 98 lb.

Georgette and Loon (1993) did not publish a conversion factor for ribbon seals, likely because none were harvested. Senior ADF&G staff, in review, recalled seeing a few ribbon seals harvested, but noted that they were used as dog food.[15] People much prefer bearded seal and ringed seal as human food. In some cases, ribbon seal meat is probably not utilized at all, but the hide is highly valued for clothing and craft work. That might explain a lower conversion factor in some communities.

13. Pedersen unpublished data.

14. This actual value is 59 lb, but the difference is negligible.

15. J. Magdanz, ADF&G Division of Subsistence, personal communication, September 2015.

Table E-13 shows previous studies documenting ribbon seal harvest, the conversion factor if published within a report, and a check of the factor applied. As noted above, not all reports published a table of factors used.

Biological References on Mean Live Weights

Burns (1981b) describes growth, weights, and lengths of ribbon seals. The maximum observed weight was that of a pregnant female weighing 148.2 kg, including a 7.3 kg fetus.

> At birth ribbon seal pups weigh approximately 10.5 kg and are about 86 cm long. The average weight of weaned pups during late May and early June was about 22 kg (15–30.9 kg, N=83) and average standard length was approximately 92 cm (74.0–127.8 cm, N=81). Normal increases in weight and standard length through the first six years of life are as follows: age 1, 33 kg and 106 cm; age 2, 50 kg and 130 cm; age 3, 59 kg and 139 cm; age 4, 61 kg and 144 cm; age 5, 65 kg and 148 cm; age 6, 67 kg and 148 cm. (Burns 1981b:92)

Burns (1984) states that in relation to other ice-associated seals in Alaskan waters, the ribbon seal is of intermediate size. It is smaller than the bearded seal and larger than the ringed seal. Average length (nose to tail, not including hind-flippers) is about 58 inches (145 cm) and 154 lb (70 kg), somewhat comparable to harbor and spotted seals.

Burch (1985) published an average live weight of ribbons seals of 154 lb, citing Burns (1984). Kelly (1988b:97) notes that weight of ribbon seals declines substantially in spring when blubber thickness decreases by 50–60%. Mature seals average 1.50–1.75 m in length and weigh up to 148 kg.

Nelson (2008b), the update to the original ADF&G Wildlife Notebook Series description of ribbon seals, gives an average size of 5.5 feet long and 175 lb for this species.

Methods of Conversion

Conger and Magdanz (1990a) and Magdanz et al. (2010) are the only Arctic Area studies that publish a ribbon seal factor in the report. However, neither describes a method of conversion. Conger and Magdanz (1990a) sources a factor of 75 lb to a Kotzebue survey.

Table E-13.–Conversion factors, ribbon seal, 1982–2007.

Study period	Factor in report (lb)[a]	Study community	Factor check (lb)	Source
1982–1983	-	Kivalina	92[b]	Burch 1985
1989	75	Shishmaref	76[b]	Conger and Magdanz 1990
1989	75	Brevig Mission, Golovin	No harvest	Conger and Magdanz 1991
1992	-	Kivalina	39[b]	Fall and Utermohle 1995
2002–2004	-	Kotzebue	Not converted to edible weight	Whiting 2006
2003	-	Buckland	98[c]	Magdanz et al. 2011
2007	-	Kivalina	86[b]	Magdanz et al. 2010

Source ADF&G Division of Subsistence, 2016.
a. "-" indicates that a conversion factor was not published in the report.
b. Conversion factors were checked by dividing estimated total pounds by estimated number of animals harvested as published in ADF&G CSIS.
c. Conversion factor was checked by dividing estimated total pounds by estimated number of animals harvested as published in the report.

Discussion

Starting with an average live weight of 154 lb from Burns (1984), we can calculate an edible meat value based on Burns (1979), on which Georgette and Loon (1993) based their bearded seal conversion factor (Table E-4). The memo gives edible weight percentages for ringed, spotted, and bearded seals, but unfortunately, it does not include ribbon seals. Because ribbon seals are larger than ringed seals, we suggest an edible weight similar to Burns' recommendation for spotted seals. The percentage of meat (36%) of a seal of 154 lb would be 55 lb. Key respondents of Georgette and Loon (1993) estimated that a spotted seal yields 5 gallons (38 lb) of oil. Combining these weights results in a conversion factor of 93 lb.

Ribbon Seal Recommendations

Use a conversion factor of 93 lb. In the future, additional research might be conducted to better understand the various uses of ribbon seal and the proportion of meat and oil that is used for human food and dog food relative to the importance of ribbon seal harvests for use of the hides in clothing manufacture and handicrafts. If such research identified that ribbon seals are exploited principally for use of the hide, then the conversion factor may be approached similarly to furbearers, in which harvested animals are not typically converted to edible weight.

Beluga Whale, or "Belukha Whale"

There is a large difference in beluga whale conversion factors between the North Slope and other parts of the Arctic region. Conversion factors range from 882 to 1,855 lb. The large range arises from researchers beginning with different average live weights (due in large part to the variability in average sizes of adult beluga from different populations across the circumpolar north and different salvage percentages.

Table E-14 shows previous studies documenting beluga whale harvests, the conversion factor if published within a report, and a check of the factor applied. As noted above, not all reports published a table of factors used.

Biological References on Mean Live Weights

Fay (1971) states that "belukha are a relatively small though conspicuous whale. Adult males tend to be somewhat larger than females, averaging 15 feet long and 330 pounds (*sic*), whereas the females average 12 feet and 3000 pounds." (Fay 1971:23–24) We assume that Fay meant "3,300 pounds" for adult male beluga.

Stoker (1983) gives a mean live weight of harvested beluga as approximately 800 kg (1,760 lb) citing Josephson (1974), which was not available for review.

Lowry (1984) says that at birth,

> belukha measure approximately 5 feet (1.5 m) long and weigh 90 to 130 pounds (40–60 kg)…Adult males are 11–15 feet (3.4–4.6 m) long and weigh 1,000–2,000 pounds (450–900 kg). Adult females are smaller, seldom exceeding 12 feet (3.7 m) in length…The size to which belukhas grow varies in different parts of their range. Individuals of more than 20 feet (6.1 m) have occasionally been recorded, though not in Alaska.

Frost and Lowry (1984) use a derived estimate for Beaufort Sea beluga whales based on length-weight data gathered elsewhere.

> Reported mean lengths of whales taken in the Mackenzie region are 4.1 and 4.3 m for males and 3.6 and 3.9 m for females (Sergeant and Brodie 1969; Fraker et al. 1978). Since most of the animals taken are adults (Fraker et al. 1978), these measurements are greater than the length of an average individual in the population. We use 4.0 m and 3.5 m as the average length of male and female white whales, respectively. Based on the Sergeant-Brodie length-weight relationship, the average weight for males and females is 940 and 660 kg. Assuming a 50:50 sex ratio, an average white whale then weighs about 800 kg. (Frost and Lowry 1984:386–387)

Table E-14.–Conversion factors, beluga whale, 1982–2011.

Study period	Factor in report (lb)[a]	Study community	Factor check (lb)	Source
1982	-	Kivalina	1594[b]	Burch 1985
1983	-	Kivalina	1603[b]	Burch 1985
1986	995	Kotzebue	1008[b]	Georgette and Loon 1993
1987	1855	Point Lay	1855[c]	Impact Assessment, Inc. 1989
1988	1400	Wainwright	1400[b]	Braund 1989b
1989	995	Golovin	971[b]	Conger and Magdanz 1990
1989	995	Brevig Mission, Shishmaref	No harvest	Conger and Magdanz 1991
1991	-	Kotzebue	995[b]	Fall and Utermohle 1995
1992	-	Kivalina	1001[b]	Fall and Utermohle 1995
1992	1400	Utqiaġvik	1679[b]	Fall and Utermohle 1995
1992	1400	Kaktovik	1381[b]	Fall and Utermohle 1995
1992	1400	Point Hope	1400[b]	Fall and Utermohle 1995
1992	1400	Wainwright	1405[b]	Fall and Utermohle 1995
1992	1400	Anaktuvuk Pass, Nuiqsut	No beluga harvest	Fall and Utermohle 1995
1992	1400	Atqasuk, Point Lay	No harvest data	Fall and Utermohle 1995
1994	-	Deering, Wales	995[b]	Magdanz et al. 2002
1994	-	Noatak	995[b]	CSIS
1995	1400	Kaktovik	No species-specific weight estimates	Brower et al. 2000
2002–2004	-	Kotzebue	995[c]	Whiting 2006
2007	-	Noatak	954[b]	Magdanz et al. 2010
2007	-	Kivalina	673[b]	Magdanz et al. 2010
2011	830	Selawik	No beluga harvest	Braem et al. 2013

Source ADF&G Division of Subsistence, 2016.
a. "-" indicates that a conversion factor was not published in the report.
b. Conversion factors were checked by dividing estimated total pounds by estimated number of animals harvested as published in ADF&G CSIS.
c. Conversion factor was checked by dividing estimated total pounds by estimated number of animals harvested as published in the report.

Burns and Seaman (1985) considered belukhas in the Bering, Chukchi, Beaufort, and eastern East Siberians seas and Amundsen Gulf to be part of a single population that winters mainly in the Bering Sea, referring to it as the Bering Sea population. Based on samples from northwest Alaska, they state that physical maturity of females is obtained between age 8 and 11 and in males between 10 and 14. “Mean standard length of females 11 years and older was 355 cm. Mean length of males 14 years and older was 413 cm…Length and weight of newborn calves averaged 155 cm and 72 kg” (Burns and Seaman 1985:1).

Burch (1985:153) cites Fay (1971:29) and Klinkhart (1978). Burch (1985:153) gives a mean live weight of 3,300 lb for adult males, 2,000 lb for adult females, 800 lb for young (midsummer) and 2,650 lb for unknown sex adults. This review could not find mean weights for young whales in either source. Considering all sources after Fay (1971), the mean live weight values reported by Burch (1985) seem inflated.

Impact Assessment (1989) also cites Fay (1971) and Klinkhart (1978). In a footnote to the conversion factor table, it states “Fay and Klinkhart estimated the live weight of beluga to be 2650.” The 2,650 lb value may originate in Burch (1985).

Georgette and Loon (1993:204) also cites Burch (1985) values, using the unknown sex adult live weight (2,650 lb).

Methods of Conversion

Burns (1979) does not give a usable proportion of live weight recommendation as for seals, instead including a photocopied report of Soviet research results on the percentage weights of various parts of beluga. Burns wrote that Division of Subsistence staff would be better off making their own recommendation on edible weight. The author of the attachment notes:

> According to Govorko (1934), the average weight of eight males was 1397 kg (from 875 to 1956 kg), and of seven females 1200 kg (from 946 to 1496 kg). More accurate data have been obtained by Aresen'ev (1936) who weighed 316 animals (170 males and 146 females) on Sakhalin. The males average 947 kg, the females 661 kg. (Burns 1979)

Stoker (1983) gives an average weight and rationale for a conversion factor of 400 kg (880 lb).

> The live weight of the average beluga taken is estimated at around 800 kg (1,760 pounds), 60% of which (420 kilograms [*sic*]) is considered utilizable for human consumption (Josephson, 1974). A utilization estimate of 450 kilograms is given by Pedersen (1971) for Point Hope. For purposes of this report, a utilizable weight of 400 kilograms per beluga is employed. Harvest records (Alaska Department of Fish and Game file data) indicate that the average size of landed belugas is slightly smaller than the population average. (Stoker 1983:A-63)

A review of Pedersen (1971) reveals no percentages utilizable weight on any of the species described in the document. These percentages may originate from a personal communication instead.

Braund and Associates (1989:A-21) cite a "Study team estimate based upon Burch (1985) and knowledge of the age and sex of whales harvested." This report employs a conversion factor of 1400 lb (635 kg)

Impact Assessment (1989) cites Fay (1971) and Klinkhart (1978) and presents a mean live weight of 2,650 lb, which may originate in Burch 1985:

> The percentage of that which was edible was low in the researchers opinion. 1855 pounds was calculated assuming the 70% of the 2650 lb whale would be edible. This 1855 is a researcher estimate, although the original figure he based it on came from Fay and Klinkhart. It is used to compute total lbs harvested by the community, but no household harvests are computed. (Impact Assessment, Inc. 1989:C-17)

This report reaches a conversion factor of 1855 lb (841 kg).

Georgette and Loon (1993) cite Fay (1971:29) and Klinkhart (1978) as cited in Burch (1985) for their live weight of 2,650 lb.

> Live weight is the average for adult males and females. Soviet research in 1935 revealed that blubber accounts for 30 percent of an adult beluga's body weight (795 pounds). Kotzebue hunters used the blubber and varied in the amount of meat, viscera, and other parts used. (Georgette and Loon 1993:204)

The Soviet research used to establish a salvage percentage is that of Drukker and Gaikichko (1935) as provided in Burns (1979). Georgette and Loon (1993) developed a beluga whale conversion factor of 995 lb. In review, it is assumed that the 200 lb balance is meant to represent salvage of meat, viscera, and other parts.

Discussion

Georgette and Loon (1993) raise a salient point regarding beluga harvest conversion factors. What is theoretically edible (for example, Stoker's assertion that 70% of a beluga whale is usable), does not necessarily correspond with what hunters salvage. Skin with blubber (maktak) is the prized part of a beluga whale. The percentage of edible weight salvaged may vary across regions.

It is not possible at this time to evaluate the significant differences reported for live weights of adult beluga whales. There is about a 1,000 lb difference between the estimates of Fay (1971) and Klinkhart (1978) in comparison to Frost and Lowry (1984). Sergeant and Brodie (1969) described the wide variability in adult beluga sizes among different circumpolar populations, "Size can be positively correlated with marine productivity, being lowest in the arctic and in estuaries and highest in subarctic seas."

In the absence of more specific research results on Alaska populations, one alternative might be to take the mean weight value of 800 kg (1,764 lb) from Frost and Lowry (1984), calculate the weight of skin and blubber from the percentage given in the Burns (1979) memo attachment (38%), and include an estimated meat salvage of 200 lb from Georgette and Loon (1993). This method would result in an 870 lb conversion factor for beluga whale.

Georgette and Loon (1993) used a 30% value for blubber, but did not include 8% of live weight that includes the hide, itself. Including the skin would result in a factor based on 38% of the total live weight for maktak.

Beluga Recommendations

Retain the Georgette and Loon (1993) conversion factor of 995 lb, which is the value with the best documentation for Arctic Alaska beluga populations and customary and traditional salvage practices. In the future, additional research might be conducted to better understand salvage practices related to beluga harvests throughout Arctic Alaska to explore the efficacy of development of an age-class and/or sex-based set of conversion factors.

Polar Bear

There are 2 stocks of polar bears in Alaska: the Bering/Chukchi Sea stock and the Southern Beaufort Sea stock. In 1988, the North Slope Borough signed an agreement with the Inuvialiuit Game Council in Canada that established harvest quotas and sought to protect denning bears and females accompanied by cubs.

Table E-15 shows previous studies documenting polar bear harvests, the conversion factor if published within a report, and a check of the factor applied. As noted above, not all reports published a table of factors used.

Biological References on Mean Live Weights

Lentfer (1978) gave weight ranges for mature males of 600 to 1200 lb and for mature females of 400 to 700 lb. Cubs weigh between 1 and 2 lb at birth. An extremely large adult male may weigh 1,400 lb.

The Burns (1979) memo on conversion factors noted that coastal harvest of bear included mainly sows and cubs. It gave a "guesttimated" (*sic*) average whole body weight of around 160 kg.

Burch (1985:149) citing Lentfer (1978) gave mean live weights of 1,000 lb for adult males, 550 lb for adult females, and 775 lb for animals of unknown sex.

Later source materials include Schliebe et al. (2006), which gives higher recorded maximum weights for males, 1,440 lb. Some individual bears too large to be weighed on the available equipment were estimated to weigh 800 kg (1,760 lb). Schliebe et al. (2006) confirmed a weight range for females of 400 to 700 lb.

Lentfer and Small (2008), a revision of Lentfer (1978), gave the same weight ranges for individuals and added that extremely large males may weight over 1,700 lb.

The U.S. Fish and Wildlife Service 2010 stock assessment for the Chukchi/Bering Sea stock of polar bears stated that harvest levels by Alaska Natives of this stock have declined recently. The sex-ratio of harvest since 1980 has remained consistent at 66% male and 34% female (2010a–b). "More recently, the 2003–2007 average Alaska harvest for the Southern Beaufort Sea in Alaska was 33 and the sex ratio was 67M:33F" (U.S. Fish and Wildlife Service 2010b:3). Because of the differences in size between male and female whales, the sex ratios of harvest are relevant to conversion factors when studies do not ask the sex of whales harvested.

Table E-15.–Conversion factors, polar bears, 1982–2007.

Study period	Factor in report (lb)[a]	Study community	Factor check (lb)	Source
1982–1983	-	Kivalina	398[b]	Burch 1985
1985	496	Kaktovik	626[b]	CSIS, Pedersen unpublished[d]
1986	496	Kaktovik	591[b]	CSIS, Pedersen unpublished[d]
1986	372	Kotzebue	376[b]	Georgette and Loon 1993
1987	496	Point Lay	661[b]	Impact Assessment, Inc. 1989
1987	496	Utqiaġvik	479[b]	Braund 1989a, 1993a
1988	496	Utqiaġvik	514[b]	Braund 1993a
1989	496	Utqiaġvik	499[b]	Braund 1993a
1988–1989	496	Wainwright	496[b]	Braund 1989b, 1993b
1989	372	Shishmaref	380[b]	Conger and Magdanz 1990
1989	372	Brevig Mission, Golovin	No polar bear harvest	Conger and Magdanz 1991
1992	-	Kaktovik	443[b]	Fall and Utermohle 1995
1992	-	Kivalina	109[b]	Fall and Utermohle 1995
1992	100	Barrow	99[c]	Fuller and George 1997
1992	100	Kaktovik	101[c]	Fuller and George 1997
1992	100	Nuiqsut	116[c]	Fuller and George 1997
1992	100	Point Hope	102[c]	Fuller and George 1997
1992	100	Wainwright	98[c]	Fuller and George 1997
1992	100	Anaktuvuk Pass	No polar bear harvest	Fuller and George 1997
1992	100	Atkasuk, Point Lay	No harvest data	
1993	-	Nuiqsut	Not converted to edible weight	Fall and Utermohle 1995
1994	-	Deering, Wales	443[b]	Magdanz et al. 2002
1995	496	Kaktovik	No species-specific weight estimates	Brower et al. 2000
2002–2004	-	Kotzebue	Not converted to edible weight	Whiting 2006
2003	-	Buckland	395[c]	Magdanz et al. 2011
2007	-	Noatak, Kivalina	No polar bear harvest	Magdanz 2010

Source ADF&G Division of Subsistence, 2016.
a. "-" indicates that a conversion factor was not published in the report.
b. Conversion factors were checked by dividing estimated total pounds by estimated number of animals harvested as published in ADF&G CSIS.
c. Conversion factor was checked by dividing estimated total pounds by estimated number of animals harvested as published in the report.

Methods of Conversion

Burns (1979) “guesstimated” a live weight of 160 kg (353 lb) as a basis for polar bear conversion.

> We have no specific information about polar bears. However, as a general rule for this quadruped, it is safe to base your calculations of lean usable meat on a figure of 33 percent of body weight…Bear fat, which is also usable, is perhaps 15 percent of whole body weight. (Burns 1979)

Using the method described above with an average weight of 353 lb would result in a conversion factor of 169 lb.

Stoker (1983) also acknowledges a lack of biological data on polar bears: "Though data are sparse, a utilization figure of 225 kilograms (500 pounds)[16] of meat per animal usable for human consumption is employed in this report (Patterson, 1974; Pedersen, 1971)" (Stoker 1983:A-69). Georgette and Loon (1993) cited Lentfer (1978) via Burch (1985:149) for live weight; the report averages male and female weights for an average weight of 775 lb. "The one sampled Kotzebue household that harvested a polar bear retrieved the meat and fat as well as the hide" (Georgette and Loon 1993:204). The report cites Burns (1979) for conversion percentages of meat (33%) and fat (15%) to reach a conversion factor of 372 lb.

Discussion

The live weights used by Georgette and Loon (1993) seem reasonable, because over the time, the composition of harvest has apparently changed. Burns (1979) asserted that harvest consisted primarily of females and cubs, and USFWS (2010a–b) reported harvests of over 60% males. Future harvest studies could develop sex-specific conversion factors based on means of published weight ranges for each sex.

Polar Bear Recommendation

Continue with Georgette and Loon (1993) factor of 372 lb of edible weight for polar bear.

Bowhead Whale

Due to the specialized nature of the research and monitoring of bowhead whale subsistence harvests and management activities by the Alaska Eskimo Whaling Commission (AEWC), the North Slope Borough Department of Wildlife Management (NSB DWM), and AEWC's contractors, references consulted for this assessment are a combination of subsistence and biological studies.

References on Mean Live Weights and Methods of Conversion

Because of the extremely large range in weights of individual whales, a discussion of mean live weights for whales in general is not helpful in determining conversion factors. Published studies have relied on weight per foot estimations derived from measured whales of different lengths to estimate the weights of individual harvested whales. It is also possible to estimate individual whale weights based on length/girth measurements.

George et al. (1988) discussed the methods of estimating bowhead weights based on length and girth measurements, and weights of various tissues from one 11 m long male whale (Table E-16).

Braund (1988:A-29–A-33) discussed at length the approach to weighing of crew shares, then using mean value of crew shares to calculate edible weight based on the number of shares. The report refers to *nininat*, *uati*, and *tavsi* portions. *Nininat* (shares to all crews participating in the butchering) shares varied from 266 to 2000 lb, and averaged over 1000 lb (Braund and Associates 1988:A-32). The *uati* share is served at community feats such as Nalukataq, Christmas, and Thanksgiving. One-half of the *tavsi* goes to the successful crew, and the other half is cooked and served to the public at the successful captain's house.[17] The *uati* and *tavsi* combined was about 40% of edible weight (Braund and Associates 1988:A-33) *Uati* and *tavsi* contained about twice as much meat as the *nininat* share.

In Braund (1989), the methods described the use of a formula to calculate weight per foot length for "short" (24–34 foot) and "long" (46–56 foot) whales based on understanding that shorter whales have a smaller body circumference and thus weight is less per foot on average than longer whales. Calculations were based on whales harvested and measured in Utqiaġvik in 1987 and 1988.

> Thus, the study team examined the existing data on Barrow whales and calculated weight per foot length for "short" (24 to 34 feet long) and long whales (46 to 56 feet) for which

16. 229 kg = 496 lb.

17. See "Traditional Distribution of Bowhead Whale at Barrow, Alaska." Accessed November 22, 2016. http://www.north-slope.org/assets/images/uploads/bm-butcher-diag.pdf

Table E-16.–Comparative tissue weights for one bowhead whale (George et al. 1988: 391, Table 3).

Table 3

Comparative tissue weights for bowhead whale 87B3[1]

	Weight (Kg)	% of total weight		Weight (Kg)	% of total weight
Tongue	893.0	6.0	Heart	95.2	0.6
Blubber/skin	6,601.9	44.6	Spleen	5.4	0.04
Muscle	2,428.0	16.4	Small intestine[2]	223.8	1.5
Baleen	595.5	4.0	Skull	1,177.3	8.0
Flukes	217.7	1.5	Vertebrae & ribs	863.9	5.8
Flippers	349.2	2.4	Lost blood[3]	888	6.0
Kidney (both)	97.9	0.7	Liver[4]	102	0.7
Stomach	48.1	0.3	Other[5]	90.7	0.6
Lungs (both)	119.7	0.8	Total[5]	14,797.3	100.04

[1] 11.0 m, male.
[2] Estimated by: weight of sub-sample × total length.
[3] Estimated weight.
[4] Includes penis and unidentified tissues associated with it.
[5] Total does not include large intestine and small amounts of intra-abdominal fat.

> we had data and then extrapolated from those length-to-weight ratios to arrive at edible weights per foot for mid-sized whales (35 to 45 feet). (Stephen R. Braund and Associates 1989:A-24)

Averaging the lengths and estimated edible weights of 11 "short" whales harvested in Utqiaġvik, researchers arrived at a 490 lb per linear foot average value (Table E-17).The study used different edible pounds per foot length for larger whales (795 lb/ft and 932 lb/ft).

The final report on harvest and use in Utqiaġvik includes a detailed discussion of methods for estimating bowhead whale weights over the 3-year study period (Braund and Associates 1993a:D-36–D-52). In the first 2 years, the study team weighed numerous portions of landed bowhead whales to calculate the usable weight from individual whales. In the third year, the researchers estimated this value without weighing any individual parts of whales, calculating the edible weight using a percentage of estimated live weights of individual whales. The NSB Wildlife Department provided estimates of live whale weights.

> We divided our estimates of usable weight for Year One and Year Two bowheads by the live weights for those whales and found that the estimated usable weight averages 57 percent of the live weights. For Year Three, we used the Wainwright method (multiplying the appropriate pounds per foot by the length of each whale) to estimate usable weight. We then calculated the percentage of live weight that these usable represented and averaged the percentages for the 10 whales. The estimated usable weight averaged 45 percent of the live weight when using the Wainwright pounds-per-foot method of calculating usable weight. The Year Three usable weights used in this report are the result of taking 45 percent of the live weights for Year Three whales. (Braund and Associates 1993a:D-51).

In the final report of the 2-year Wainwright study, authors described methods estimates of usable weight per foot for different size whales (e.g. short, middle, and long whales) based on existing data from whales harvested at Utqiaġvik (Braund and Associates 1993b:C-29–C-39). They noted that "…the weight per foot length of a bowhead whale increases with the length of the whale (i.e., shorter whales have a smaller body circumference and thus weigh less per foot on the average than longer whales whose body mass is proportionately larger per foot)" (Braund and Associates 1993b:C-34). Based on the calculated mean weight/length values, researchers estimated the usable weights for each whale harvested by Wainwright in the 2 study years.

Table E-17.–Summary statistics for 24 to 31 foot whales (Braund and Associates 1989:A-24)

NSB Whale ID Number	Date Harvested	Length (in feet)	Estimated Edible Weight
87-B1	5/1/87	30.5	17,290
87-B2	5/2/87	29.3	13,750
87-B7	10/29/87	27.8	22,620
88-B1	4/24/88	29.0	13,975
88-B2	4/25/88	29.7	14,150
88-B3	4/25/88	29.7	13,450
88-B4	4/25/88	25.5	9,162
88-B5	4/25/88	29.2	11,267
88-B6	5/2/88	27.3	14,820
88-B7	5/4/88	,26.8	14,187
88-B8	5/6/88	24.6	7,030
Average length:		28.13	
Average edible weight:			13,791

Average edible weight per foot length: 490 pounds of edible product per foot length for bowhead whales between 24.6 and 30.5 feet in length.

Fuller and George (1999rev.) provided a general estimate of the percentage of a whale's weight is salvaged.

> It is estimated that about 40% of the whale's total "mass" is used as food (NSB unpublished data, 1995; Romans 1984). Estimated weight was derived from a length/girth relationship (George et al. 1990). Where girth measurements were not available, a simple length/weight regression was used. For large whales it was necessary to extrapolate the regression beyond the largest whale actually weighed (12.8 m, 42 ft). Thus the estimates for large whales should be viewed cautiously. (Fuller and George 1999rev.:16)

The conversion factor table in the appendix does not include a factor for bowhead whale.

Brower et al. (2000) gave a 35,091 lb conversion factor for bowhead whales taken in the study period at Kaktovik. The authors clarified that "whale conversion weight was computed by the study team from the mean total usable weight per whale of the six whales harvested in Years One and Two" (Brower Jr. et al. 2000:49). After the third year of data collection, the study team determined a bowhead whale conversion factor of 29,466.2 lb: "whale conversion weight was computed by the study team from the mean total usable weight per whale of the 28 whales harvested in Years One, Two and Three" (Brower Jr. et al. 2000:51).

The report includes a table, "Conversion factors for bowhead whale from actual weights," which cites J.C., George, 1998 (Brower Jr. et al. 2000:53). A review of the table, reprinted here as Table E-18, shows that the researchers employed a 40% conversion to reach edible weights for all lengths of whales.

Donovan et al. ([*n.d.*]:27) includes a table describing measurements of 5 bowhead whales from the Bering, Chukchi, and Beaufort seas (Table E-19). The table appears to be referring to those in Brower (2000; Table E-18). The report uses these live weights to estimate edible weight.

> Using BCB [Bering-Chukchi-Beaufort seas] bowhead whale data, total body mass estimates lead to the food production estimates given in Table 10. In Greenland, the tongue is not eaten and is probably about 7% of the body mass. During processing, the blubber is trimmed into *mattak*, where about 20% of the blubber mass is consumed; blubber is pure fat and the quantity of blubber on a bowhead whale is considerably larger

Table E-18.–Conversion factors for bowhead whale from actual weights (Brower Jr. et al. 2000:53)

Conversion Factors for Bowhead Whale from Actual Weights**

Length (meters)	Length (ft.)	Weight (kg)	Weight (lbs.)	Edible Weight (lbs.)
4	13.2	1000	2200	880
7.5	24.75	4800	10560	4224
9	29.7	11550	25410	10164
11	36.3	14800	32560	13024
12.9	42.57	27346	60161.2	24064.48

*ADF&G, 1995

**J.C., George, 1998

> than for rorquals. The remaining blubber is used for heating and for dog food. (Donovan et al. [*n.d.*]:38)

The results in Table 10 (reprinted here as Table E-20) show edible weight as a narrow range of 27.3–27.5% of total body mass.

On request from SRS Braem, J.C. George and Q. Harcharek of the North Slope Borough Department of Wildlife Management gave recommendations for estimated usable weights of bowheads harvested at Utqiaġvik in 2014:

> The edible parts at Barrow include: maktak, muscle, tongue, heart, small intestine, and kidney. For some whales, the brain is eaten which is about 5 pounds. It was not included in these estimates.
>
> We note there are several matters to consider regarding our estimates for the useable or edible weights of the whales taken at Barrow in 2014. The bowhead whale weights we calculated are estimates based on a regression equation (from George et al. 2009) and are not the actual weight of the whale. We do not include confidence intervals for the whale weights but we estimate the mean error of the method at ~11% (N=5) by comparing the actual weights of weighed whales vs. estimates from the regression (George et al. 2009).
>
> The issue of useable weights of large whales is complex and somewhat controversial hence we use the average estimated "usable weight" of 57% for Barrow from SRBA (1993). In their report, SBRA weighed actual crew shares and compared these with estimated weights of the whales using the regressions in George et al. (2009).[18]

Discussion

The percentage edible weight has varied over time in different studies; the 2015 information provided by the North Slope Borough Department of Wildlife Management is based upon actual measurements by researchers with long-term experience in North Slope bowhead whaling communities.

18. J.C. George and Q. Harcharek, NSB Department of Wildlife Management, personal communication, November 23, 2015.

Table E-19.–Relative proportional mass of edible tissues as a function of total body mass for Bering-Chukchi-Beaufort seas bowhead whales (Donovan et al. [n.d.]:27, Table 7).

Table 7

Relative proportional mass of edible tissues as a function of total body mass for BCB bowhead whales *Note that *mattak* is trimmed blubber which includes the skin with about 1/5 of the blubber column.

Statistic	% Blubber	% Bone	% Muscle
Mean	44.1	12.0	18.6
SD	4.1	3.6	4.6
N	5	5	5
min	39.1	8.0	13.0
max	50.5	16.6	24.2

Table E-20.–Estimated food production from Greenland bowhead whales per strike based on data from Bearing-Chukchi-Beaufort seas bowheads (Donovan et al. [n.d.]:38, Table 10).

Table 10.

Estimated food production from Greenland bowhead whales per strike based on data for BCB bowheads (note that the largest bowhead whale measured directly was 12.87m (standard length) and some extrapolation using the derived length-weight relationship was needed. Edible weight = muscle+*mattak*. The *mattak* is estimated as the blubber mass * 0.20 to account for trimming. Note that animals over 45 tonnes are more difficult to handle and flense and thus the amount of edible products obtained is likely to be below the values indicated in the table.

Body mass (t)	Muscle	*Mattak*	Total edible
40	7.4	3.5	11.0
45	8.4	4.0	12.3
50	9.3	4.4	13.7
55	10.2	4.9	15.1
60	11.1	5.3	16.4

Bowhead whale recommendation

Use a general conversion factor of 57% of total weight for each whale harvested in a year, as recommended by the NSB DWM. The NSB DWM (and AEWC) keeps detailed records on individual whales harvested (including length, girth, and sex) that allow department researchers to estimate total weights for individual whales. Although the department does not measure girth for all whales harvested in all North Slope communities, the NSB DWM can still typically provide a weight estimate for each whale harvested.

Nonsalmon Fishes

As with other conversion factors in the Arctic area, different factors have been used for nonsalmon fishes by Division of Subsistence and other researchers in the North Slope, Bering Strait, and NANA regions. Based on Crapo et al. (1993), a general method of 0.7 multiplied by mean live weight is used by Division of Subsistence to determine conversion factors for fish, thus the mean live weight is the real determinant of factors. We acknowledge that gear type may determine the sizes of fish caught, but recognize that there is insufficient information to develop separate conversion factors for fish taken by rod and reel and nets of different mesh size. This review is limited to reports published up to 2011 and excludes data published in Magdanz et al. (2005), which did not include a conversion factor table and is not available through the CSIS. It is also limited to the most commonly harvested species of fish in the Arctic area. Information from Mecklenburg et al. (2002) has only been included when it proved helpful in terms of mean live weights.

Not all studies included tables of conversion factors, and not all tables included detailed sourcing information. Where possible, in this review, if the factor used was not described in a report, it was calculated by dividing total estimated pounds of a species by the total estimated number harvested. Although all published Arctic reports with harvest estimates were reviewed, not all studies included every species under consideration here. All materials reviewed are listed in the "References Cited" section.

Many early studies combined whitefishes (other than sheefish) into a general category rather than ask about them at the species level. Later studies have attempted to quantify whitefish harvests by species, but this effort is complicated by the differences between western and local taxonomies; additionally, for these and other species identification to the species level may require examining gill rakers. A similar confusion exists in distinguishing between Dolly Varden and Arctic char. Two species, saffron cod and burbot, are often locally called "tomcod" and "lingcod," respectively, leading to species misidentification by researchers, local research assistants, and respondents. The incorporation of locally-specific Iñupiaq names and high-quality photographs during harvest surveys has improved species-level estimates, but species identification remains an area in need of improvement.

Dolly Varden (*Salvelinus malma*) and Arctic Char (*Salvelinus alpinus*), trout

Species identification challenges complicate the discussion of weights and conversion factors. Dolly Varden *Salvelinus malma* and Arctic char *Salvelinus alpinus* are both present in the Arctic area. They cannot be accurately identified based on physical appearance or size. DeCicco (1985) determined that the majority of fish caught in the Arctic Area are Dolly Varden. Arctic char tend to be lake fish. Many Bering Strait and Northwest Alaska area residents simply call them "trout," however on the North Slope people refer mostly to "Arctic char." Some studies only asked about Arctic char, others only about Dolly Varden, and some simply queried "trout."

Biological References on Mean Live Weights

Morrow (1980:60) states that "Alaskan Dolly Varden do not, as a rule, reach great size. Adult fish rarely exceed 3 kg, although around Kotzebue they are sometimes twice that weight."[19]

Burch (1985:147) gave 6 mean live weights for Arctic char based on interviews with Kivalina residents:

19. 3 kg= 6.6 lb; 6 kg= 13.2 lb.

- “Little” = 0.5 lb
- “Small” = 2.0 lb
- “Medium” = 5.0 lb
- “Big” = 10.0 lb
- “Giant” = 14.0 lb
- Size not reported = 2.0 lb

DeCicco (1985) documented Arctic char weights ranging from approximately 1.9 to 2.5 kg. The report states that Arctic char in Kotzebue region grow more rapidly than do those on the Sagavanirktok River on North Slope, and that the weight of individual fish will vary over the course of the reproductive cycle and time of year. The report documents mean live weights from prespawning Arctic char tagged in the Kelly, Kugururok, Nimiuktuk, and Wulik rivers in 1983 (DeCicco 1985:89).[20]

Georgette and Loon (1993) gave a mean live weight of 4.7 lb for Dolly Varden based on DeCicco 1985: “The live weight represents an average of prespawning Dolly Varden in 1983 in the Kelly, Kugururok, Nimiuktuk, and Wulik rivers in northwest Alaska” (Georgette and Loon 1993:207).

Mecklenburg et al. (2002:199–200) discusses both species of char, describing the challenges in the scientific understanding of the fish. For Arctic char, authors noted:

> Various lengths have been reported as maximum sizes for *S. alpinus*, but because of taxonomic confusion with other *Salvelinus* species it is difficult to determine which reports actually pertain to any given species. Morrow (1980) reported that the largest Arctic char known is one from the Northwest Territories weighing 13.5 kg. Alaskan records he mentioned were 5 kg or less. (Mecklenburg et al. 2002:199)

With regard to Dolly Varden, the author noted similar issues:

> Various sizes have been reported as maximal for *S. malma*, but *S. malma, S. alpinus*, and *S. confluentus* were confused for so long it is difficult to determine which reports actually pertain to *S. malma*. A.L. DeCicco (pers. comm., 26 May 2000) reported *S. malma* reaches 100 cm or more and 8.6 kg in Wulik River, northwestern Alaska. Elsewhere in Alaska, adults rarely exceed 3 kg (Morrow 1980). (Mecklenburg et al. 2002:200)

Jones (2006:103) also described challenges in identification.

> Trout are extremely variable in looks (as well as life style), depending on the following factors: their age, if they are breeding, their latitude, which species, and whether they are the smaller, land-locked lake populations (possibly Arctic char), the stream dwellers, or the larger sea run trout. Trout harvested around Kotzebue Sound are predominately the anadromous, stream-dwelling, northern form of Dolly Varden. (Jones 2006:103)

Jones described maximum and mean weights based on her research. “In the study area, trout can weigh up to 20 pounds (9 kg) and up to 100 cm long. Trout of all smaller sizes are caught and used, averaging more like 6 to 12 pounds” (Jones 2006:104).

George et al. (2009:27, 29) includes descriptions of both species.

> An average weight for an Alaskan Dolly Varden is 2.2–4.4 lbs (1–2 kg), but on the North Slope they can grow to 10 lbs (5 kg). The largest Dolly Varden are found in Northwestern Alaska. The state record sport-caught fish was over 19 lbs., from the Noatak River. (George et al. 2009:27)

20. The rivers described above are in the vicinity of the villages of Noatak and Kivalina. State record-sized fish have been caught in the Wulik River.

Very large Arctic char are present on the North Slope. "Warren Matumeak of Barrow caught Arctic char that were quite large at more than 10 lbs (over 4 kg) in lakes along the lower Chipp River. In Arctic Canada, they can grow to 30 lb (13.6 kg)" (George et al. 2009:29).

Conversion Factors

Factors have varied between 1.0 lb (Burch Jr. 1985) and 2.8 lb on the North Slope (Braund and Associates 1993a–b; Fall and Utermohle 1995; Fuller and George 1997) and 3.3 lb elsewhere in Arctic Area (Conger and Magdanz 1990a; Georgette and Loon 1993). Arctic studies have published results naming one or both species, or simply "trout" or "char."

Pedersen[21] gives a "researcher's estimate" of 2.8 lb. Impact Assessment (1989:C-17) gives a conversion factor of 3.3 lbs, citing DeCicco (1985). Conger and Magdanz (1990a:60) gives a conversion factor of 3.3 lb, citing a 1986 Kotzebue study (published as Georgette and Loon [1993]). Georgette and Loon (1993:208) based their conversion factor on a mean live weight of 4.7 lb, multiplying by 0.7 for a 3.3 lb factor. In studies that followed, researchers in Bering Strait and Northwest Alaska used a 3.3 lb factor, while North Slope studies used a 2.8 lb factor.

Discussion

Georgette and Loon (1993) give a mean live weight based on weighed fish, which is preferable to researcher estimates. The difference between the 2 most common factors (2.8 and 3.3) for Dolly Varden or Arctic char is not large. Division of Subsistence staff members who have fished in Bering Strait and the NANA regions discussed the variability in size of Dolly Varden or Arctic char; each had examples of fish ranging from "pan size" to silver salmon size or larger, up to 15 lb.[22] For those studies documenting harvests at Kivalina, noted for its large fish, additional work on weights of fish would be helpful.

Dolly Varden / Arctic Char Recommendation

Due to regional naming conventions and the challenges in identifying Arctic char and Dolly Varden by species, we recommend using 3.3 lb from Georgette and Loon (1993) for both species and including both species on harvest surveys. Where appropriate, include the local name (trout) in surveys.

Inconnu (Sheefish) (*Stenodus leucichthys*), *Sii*

Sheefish are not common on the North Slope, but they have been documented in the Meade River. For the Arctic area, sheefish are primarily taken in the Kotzebue region. Alt (1988) identified the Kobuk-Selawik population, 1 of 3 major estuarine anadromous stocks in Alaska, each of which has 2 spawning populations. A small spawning population has also been documented on the Koyuk River.

Biological References on Mean Live Weights

Morrow (1980) does not describe mean live weights of subsistence-caught fish, but offers maximum documented weights in Alaska and other countries. Sheefish are "up to 27 kg in the Kobuk River, Alaska (Alt, 1969), to 28.6 kg in the Mackenzie River (Dymond, 1943) and to 40 kg in Siberia (Wynne-Edwards, 1952)" (Morrow 1980:25).

Alt (1987) states that "Sheefish in Alaska seldom exceed 10 kg although fish over 26.5 kg have been captured in the Kobuk River" (Alt 1987:2). The report describes use of various gear types, which can select for the size of fish caught.

> Sheefish grow at a fairly rapid rate with fish of the faster growing Minto Flats and Kuskokwim River stocks reaching 6.4 kg by age 10. The largest sheefish in Alaska (up

21. Pedersen unpublished data.

22. N. Braem, ADF&G Division of Subsistence, 2015, and J. Magdanz, ADF&G Division of Subsistence, personal communication, December 2015.

> to 23 kg) are found in the Kobuk River. Fish of nonanadromous stocks seldom reach 10 kg. (Alt 1987:6)

The report also describes the various gear types used by residents of Northwest Alaska during the year.

> The largest portion of the subsistence fishermen use hook and line gear through the ice at Selawik Lake and Hotham Inlet (Kobuk Lake). A small amount of under-ice gill netting occurs in the lower Selawik River and Hotham Inlet in October and November, but the majority of the harvest occurs during the jigging fishery in the lakes during April and May. Residents of Kotzebue, Noorvik, Kiana, Selawik, and Buckland participate in this fishery, generally making day trips by snow machine, dog sled or airplane to the lakes. Because schools of sheefish are migratory in the lakes, fishermen spend a good deal of time locating them. When schools are located, hundreds of fish can be caught in a few hours. Fish are usually frozen on the ice and are used for dog and human consumption. In the winter of 1987, sheefish ranging in age from 4 to 18 were sampled from this fishery (Table 8). These fish averaged 684 mm and 3.5 kg. The size and age composition of this sample is similar to that obtained in 1978 (Alt 1979). (Alt 1987:55)

In addition to ice fisheries, sheefish are harvested by rod and reel, set gillnets, and beach seines during times of open water.

> Open water subsistence fisheries also occur in Selawik Lake, Selawik River, and Tuklomarak Lake beginning immediately after ice out, generally by late May or early June. These fish are harvested by gill nets and jigging (hook and line). In the upper Kobuk River, some spawning sheefish are harvested by subsistence fishermen using beach seines. Sheefish are also harvest (*sic*) by subsistence fishermen using gillnets, especially at Noorvik and Kiana during the post spawning downstream migration. (Alt 1987:55–57)

Alt (1987:57) reported average sheefish weights in the Kotzebue Sound commercial fishery in 1965 (3.0 kg), 1967 (3.2 kg), and 1986 (3.7 kg).[23]

The report also included average weights of sport-caught fish on Kobuk River.

Table E-21.–Mean live weights of sheefish, Magdanz unpublished data.

Taube's catches of sheefish in the Upper Kobuk River					
	1997	1996	1995	Total	Proportion
Females	886	558	451	1895	43%
Males	1492	490	535	2517	57%
Totals				**4412**	

Alt's weights of sheefish from Alt 1988				
	kg	lb	Proportion	Contribution
Females	10.2	22.4	43%	9.64
Males	5	11	57%	6.28
Mean combined weights				**15.91**

Source J. Magdanz, ADF&G Division of Subsistence, unpublished data, 2007. This data is on file with the ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701.

23. 3.0 kg = 6.6 lb; 3.2 kg = 7.1 lb; 3.7 kg = 8.1 lb.

> A sample of sport caught sheefish from the upper Kobuk River in 1982 weighed an average of 9.1 kg for females and 4.89 kg for males. Fish as large as 15.9 kg are caught each summer, and in 1986, a 24.1 kg sheefish was caught on the Kobuk River.[24] (Alt 1987:58)

Alt (1988) reports on Kobuk River spawning sheefish. The paper gives mean weights for both females (10.2 kg) and males (5 kg).

Georgette and Loon (1993) based their mean live weight (7.8 lb) on the average weights of fish caught in a setnet commercial fishery (Alaska Department of Fish and Game Division of Commercial Fisheries, Nome Area Office 1986:75) and by subsistence fishers using hook and line[25].

> The average weight of sheefish in the preliminary results of the 1986–87 commercial sheefish fishery in Kotzebue Sound was 8.1 pounds. In spring 1987, Loon and Ken Alt of Division of Sport Fish weighed 148 sheefish caught with hook and line by subsistence fishermen on Kobuk Lake and found the average weight to be 7.5 pounds. Because Kotzebue residents harvested sheefish both with nets (represented by the commercial fishery average weight) and with hook and line, the live weight used was the average of these two numbers. (Georgette and Loon 1993)

Annual ADF&G Fishery Manuscript publications describe length, sex, and age results from sampling sheefish caught by rod and reel and subsistence gillnet fisheries on Hotham Inlet and the Kobuk River (Taube and Wuttig 1998; Taube 1996, 1997). They do not include mean live weights, but they do describe composition of harvests by sex, which is useful because of the differences in average weight between males and females.

Jones (2006) does not give any mean live weights. “In the study area, sheefish weigh up to 60 pounds (27 kg), with the longest one at 46 in (119 cm) and the oldest 20 years” (Jones 2006:130).

Although no description of live weights or methods exists in the published technical paper (Magdanz et al. 2010), Magdanz provided a set of conversion factors in a spreadsheet[26] that sourced his live weights to Alt (1988) and Taube (1976–1978; Table E-21). The Taube reference appears to be a typographical error, because the data match values for 1995–1997 in published Fishery Manuscript reports (Taube and Wuttig 1998; Taube 1996, 1997).

Alt (1988) weights in Magdanz’s table represent upper Kobuk river spawning fish, which are the largest on record in Alaska. Mean weights based solely on these values will be higher than for sheefish in general.

U.S. Fish and Wildlife Service (USFWS) biologist Brown created length-weight tables for whitefishes based on biological research conducted on the Selawik and Kobuk Rivers from 2011–2014.[27,28] The mean live weight value for sheefish on the Selawik River was 6,011 g (13.25 lb) and on the Kobuk River was 7064 g (15.6 lb). The average weight for both rivers together was 6,541g (14.4 lb).

Conversion Factors

Factors used for sheefish have varied from 5.5 lb to 11.14 lb. The primary consideration in applying factors is that the very large mean live weights that are appropriate for Kobuk River sheefish may be too large for a general, area-wide factor.

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24. 9.1 kg = 20 lb; 4.89kg = 10.7 lb. The Average of these weights is 15.4 lb.

25. Loon, 1987 field notes.

26. J. Magdanz, Alaska Department of Fish and Game Division of Subsistence, unpublished data. This data is on file with the ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701. Hereafter referred to as Magdanz unpublished data.

27. R. Brown, U.S. Fish and Wildlife Service, unpublished data, 2015. This data is on file with the ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701. Hereafter referred to as Brown unpublished data, 2015.

28. R. Brown, U.S. Fish and Wildlife Service fisheries biologist, confirmed that the study was targeting spawning fish in each river.

Georgette and Loon (1993) based their factor on a mean live weight of 7.8 pounds, multiplying by 0.7 for a conversion factor of 5.5 lb. Magdanz[29] used a mean live weight of 15.91 lb, multiplying by 0.7 for a factor of 11.14 lb.

Discussion

Sheefish caught with different gear and in different locations show a wide range of specific mean live weights. The smallest fish are caught by jigging through the ice on Hotham Inlet, known as Kobuk Lake (7.7 lb), and in the commercial fishery in Kotzebue Sound (8.1 lb). The largest fish are caught by sport anglers targeting big fish on the upper Kobuk River (females, 20 lb; males, 10.7 lb). Fish taken in this location would include spawning fish, which are larger than fish in other locations and at other times of year. Additional data suggest a mean weight for upper Kobuk River spawning fish of 15.91 lb.[30] During internal discussions of factors, Division of Subsistence staff agreed that in general, the upper Kobuk River values are too high for a general sheefish conversion factor across the region. We suggest using a higher value when converting to edible pounds in the upper Kobuk River communities. The main fishery for sheefish overall is jigging through the ice on Hotham Inlet, known as Kobuk Lake, and around Kotzebue.

Sheefish Recommendation

We recommend using a conversion factor of 5.5 lb sheefish generally and 11.14 lb for sheefish along the Kobuk River.

Broad Whitefish (*Coregonus nasus*)

Biological References on Mean Live Weights

Morrow (1980:34) states that "This species is the largest of Alaskan whitefishes. It is reported to reach weights up to 16 kg in the Kolyma River of Siberia (Berg, 1948), but most mature fish run around 2 to 5 kg." The average of the reported range would be 3.5 kg (7.7 lb).

Johnson (1986) measured fish caught in subsistence and commercial catch at a limited (test) commercial fishery at Selawik. The author noted most fishers using 2-inch mesh nets (Johnson 1986:13). These are smaller mesh size nets than those later documented in Georgette and Shiedt (2005), and they would result in catches of smaller-sized fish. Of 284 broad whitefish caught by subsistence fishers in June 1985, 45 were weighed (Johnson 1986:25). Weights ranged from 550–1500 g (1.2–3.3 lb) with a mean of 984 g (2.17 lb).

Jones (2006:198) states that "Broadnose whitefish average around 4 lb (2 kg) with the larger *siiguliaq* more like 11 lb (5 kg)."

George et al. (2009) reports "Fish caught in the Ikpikpuk and Colville rivers typically reach 5 to 8 lbs (2.3–3.6 kg)" (George et al. 2009:14). The text mentions instances of 20 lb and 32 lb fish caught as well. The average of the reported "typical" range is 6.5 lb.

Magdanz[31] cites a whitefish identification handout that appears as an appendix in Marcotte (1995), a study of subsistence fisheries in Minto, that states that broad whitefish average 4 to 5 lb with a maximum size of 15 lb. No source is given for these weights. Magdanz appears to have averaged the 2 values to arrive at an average live weight of 4.5 pounds.

According to ADF&G:

29. Magdanz unpublished data.
30. Magdanz unpublished data.
31. Magdanz unpublished data.

> Mature broad whitefish average from two to five kilograms (~4.4 to 11 pounds) in North Slope waters, mature fish are largest in the Colville and Chipp river areas and smallest on the eastern edge of their Alaska distribution.[32]

The average of the reported range is 7.75 lb.

Unpublished data from Brown[33] include live weights from 116 broad whitefish measured in the Selawik River delta in 2003. The mean live weight of these samples was 1,283 g (2.83 lb).

Conversion Factors

The factors used in the Arctic area for broad whitefish have ranged from 1.75 lb (Fall and Utermohle 1995) to 3.4 lb (Braund and Associates 1993a–b; Impact Assessment, Inc. 1989) and include some uncertainty in data sourcing.

Conversion factors used to date have been a series of researcher-estimated edible weights. Impact Assessment (1989) uses a 3.4 lb factor, based on "Personal communication to Sverre Pedersen or unpublished documents available in the Fairbanks ADF&G office." Braund et al. (1988) employs 2.5 lb for lake-caught fish, based on a "study team estimate" for lake-caught fish. For river-caught fish, Braund et al. (1988) uses 3.4 lb and cites the Subsistence Division's former Community Profile Database (CPDB), which is now maintained as the Community Subsistence Information System (CSIS)[34]. Magdanz[35] converts a 4.5 lb mean live weight based on Marcotte (1995) for a factor of 3.2 lb.

There is also the option of calculating a new factor based on George et al. 2009: (6.5 lb)(0.7) = 4.6 lb

Discussion

The middle value (3.2 lb) may represent a compromise and account for differences between river-caught and lake-caught fish. The Division of Subsistence has not typically distinguished between broad whitefish caught in rivers and those caught in lakes. This species is a strong candidate for a project involving weighing subsistence-harvested fish.

Broad Whitefish Recommendation

Retain Magdanz's 3.2 lb conversion factor.

Humpback Whitefishes (*Coregonus nelsoni, C. clupeaformis, and C. pidschian*)

Humpback whitefishes comprise 3 species (*Coregonus nelson, Coregonus clupeaformis, and Coregonus pidschian*) that can only be distinguished by comparing the modal number of gill rakers in large samples (Morrow 1980:35). The author further notes:

> Fisheries biologists in Alaska have applied one or another of these names to humpback whitefish throughout the state, all too often without adequate samples for proper identification. Hence distributional records are often of little value.
>
> There appear to be some differences in ecological relationships among the three species. *C. clupeaformis* is primarily a lake-dwelling form. *C. nelsoni* is mostly a stream dweller, only rarely being encountered in lakes. It seems to be intolerant of salt water. *C. pidschian* apparently is truly anadromous, at least in some areas, and may winter in the sea near river mouths. (Morrow 1980:35)

32. Alaska Department of Fish and Game, Juneau, 2016. "Broad whitefish *(Coregonus nasus)* species profile." Accessed August 30, 2016. http://www.adfg.alaska.gov/index.cfm?adfg=broadwhitefish.main
33. Brown unpublished data, 2015.
34. ADF&G CSIS.
35. Magdanz unpublished data.

Biological References on Mean Live Weights

Burch (1985) noted that the Kivalina people did not often differentiate between whitefish species; "when they do it is between the Bering cisco (*Coregonus laurettae*), or *tipuk*, and the humpback whitefish (*Coregonus pidschian*) or *qaalriq*" (Burch Jr. 1985:149). The author cites DeCicco 1985 (a personal communication March 4, 1985), that fish of those species average 1.25 lb.

Johnson (1986:25) measured fish caught in subsistence and commercial catches at a limited (test) commercial fishery at Selawik. Of 132 humpback whitefishes harvested, 38 were weighed. Weights ranged from 500–1600 g (1.1 lb–3.5 lb) with a mean weight of 864 g (1.9 lb). The author noted that most fishers used 2-inch mesh nets. These net sizes are smaller than those later documented in Georgette and Shiedt (2005). Using smaller mesh size setnets would minimize catches of larger sized whitefishes, thus biasing mean weights low.

Jones (2006:153) states that "Humpback whitefish average 1 to 2 ½ pounds (0.45 to 1.12 kg) with 9.5 pounds (4.28 kg) being a record from the Selawik area."[36] The average of the range is 1.75 lb.

According to George et al. (2009:17) "Humpback whitefish attain 22 in (57 cm) in length and reach over 2.2 lbs (1 kg) in weight."

Magdanz[37] cites a whitefish identification handout that appears as an appendix in Marcotte (1995), a study of subsistence fisheries in Minto, that states that humpback whitefishes average 2.5 to 3.5 lb. No source is given for these weights. Magdanz appears to have averaged the 2 values to arrive at an average live weight of 3 lb.

Unpublished data from USFWS biologist Brown includes 65 Selawik River humpback whitefishes with a mean weight of 647 g (1.43 lb).[38]

Conversion Factors

Conversion factors have ranged from 0.8[39] to 2.5 lb (Braund and Associates 1993a–b; Brower Jr. et al. 2000). A factor of 2.5 lb has been used in North Slope studies, which appears to originate in the Division of Subsistence CPDB for Nuiqsut and Kaktovik. Braund (1993b) cites the Division of Subsistence CPDB for Nuiqsut; Fuller and George (1997) cites Braund (1993a). Studies in Bering Strait and Northwest Alaska have used values of 1.75 (Fall and Utermohle 1995) and 2.1[40].

Based on mean live weights described above, several options are possible for humpback whitefishes. Multiplying these weights by 0.7, a conversion factor from Burch (1985) would be 0.9 lb; Johnson (1986), 1.3 lb; Jones (2006), 1.2 lb; Magdanz[41], 2.1 lb; and Brown[42], 1.0 lb.

Without mean live weights from the North Slope, it is difficult to evaluate the 2.5 lb factor that has been used there for humpback whitefishes.

Humpback Whitefishes Recommendation

Retain the 2.1 lb conversion factor for humpback whitefishes. Efforts should be made to obtain live weights of subsistence-caught fish to further inform this conversion factor.

36. 2.5 lb = 1.13 kg; 9.5 lb = 4.31 kg.
37. Magdanz unpublished data.
38. Brown unpublished data, 2015.
39. ADF&G CSIS, Nuiqsut 1985.
40. ADF&G CSIS.
41. Magdanz unpublished data.
42. Brown unpublished data, 2015.

Least Cisco (*Coregonus sardinella*)

Biological References on Mean Live Weights

Neither of the primary references for fishes in Alaska (Mecklenburg et al. 2002; Morrow 1980) include mean live weights of least cisco in Alaska.

Johnson et al. (1986:25) weighed 11 of 13 fish caught in June 1985 and calculated a mean weight of 453 g (1.0 lb). Weights ranged from 300–800 g (0.7 lb–1.8 lb).

According to Jones (2006:187), "Least ciscoes weigh up to 1.5 pounds (.5 kg) (*sic*) in Siberia and reach a length of 16" (41 cm) in Interior Alaska, but in the study area they weight (*sic*) less and are smaller."[43]

Magdanz[44] unpublished data from 2007 gives a mean live weight of 0.8 lb for this species but no source for the value.

Data from USFWS biologist Randy Brown shows weights for 108 Selawik River least cisco in 2003; these fish had a mean live weight of 0.7 lb.[45]

George et al. (2009) notes large variability in the size of least cisco.

> Growth, maturity and size vary greatly among different populations and habitats. In interior Alaska, least cisco can reach 16 in (41.3 cm) and about 1 lb (0.5 kg). Interior fish mature at age three to four, and maximum age is reported at 8–11 years. By contrast, fish in some North Slope populations mature at six to seven years, sometimes as late as 10 years depending on habitat, and often live over 20 years. Three growth forms have been described on the North Slope. The anadromous migratory form reaches lengths of 12–14 in (300–350 mm) by ages 10 to 12 years. The non-migratory lake resident (lacustrine) form can apparently grow faster in some cases and reach lengths of 16–18 inches (400–450 mm). In *Tasiqpak* Lake and several other coastal plain lakes, researchers have identified a "dwarf" race with a maximum size of about 8 in (18 cm), even when 15 years old! (George et al. 2009:19)

Conversion Factors

The earliest source for a least cisco conversion factor comes from a North Slope study in Wainwright (Braund and Associates 1993b), which used a study team estimate of 1.0 lb. Later North Slope reports used the same value, either citing study team estimates or Braund (1993b).

Conversion factors have ranged from 0.5 lb (Fall and Utermohle 1995) to 1.8 lb (Fall and Utermohle 1995; Magdanz et al. 2010). Most North Slope studies have used a value of 1.0 lb (Braund and Associates 1993a–b; Brower Jr. et al. 2000; Fuller and George 1997); factors have varied elsewhere.

Fall and Utermohle (1995) use a different conversion factor for study year 1991 than for study years 1992 and 1993 (for different communities).[46] Data for Kotzebue are converted with a 1.8 lb conversion factor; data for Kaktovik and Nuiqsut are converted with a factor of 0.5 lb.

Magdanz (2002) used a conversion factor of 1.6 lb for least cisco.[47]

Discussion

Two sources exist for mean live weights of fish in the Arctic Area: Johnson (1986) and unpublished data from Randy Brown. Conversions factors calculated from these 2 sources would result in a 0.7 lb or a 0.5 lb

43. 0.5 kg = 1.1 lb, not 1.5 lb.
44. Magdanz unpublished data.
45. Brown unpublished data, 2015.
46. ADF&G CSIS.
47. ADF&G CSIS.

factor respectively. Using the 0.7 lb factor would represent a compromise between the 0.5 lb factor and the 1.0 lb factor (researcher estimates) that has been in use.

Least Cisco Recommendation

We recommend a conversion factor of 0.7 lb, based on mean weight of 1.0 lb (Johnson 1986).

Arctic Cisco (*Coregonus autumnalis*)

Arctic cisco is understood to be distributed from Point Barrow eastward (Mecklenburg et al. 2002:183), so this species has not been included in surveys in Bering Strait or Northwest Alaska.

Biological References on Mean Live Weights

Morrow (1980) includes a maximum weight and an approximate average weight.

> Specimens up to 64 cm in total length and up to 2.68 kg in weight have been reported from the Lena River in Siberia (Berg, 1948). However, North American specimens are much smaller, averaging somewhere in the neighborhood of 35 to 40 cm long (Roguski and Komarek, 1971) and perhaps 1 kg in weight. (Morrow 1980:30)

Entrix, a Nuiqsut fishery monitoring contractor, published a 1986 report that was cited as a basis for conversion factors by Pedersen. ADF&G researchers were unable to obtain a copy of this report.

George et al. (2009:9) states, "In the North American Arctic, *Qaaktaq* will grow to about 20 in (50 cm), but in most areas are 14–16 in (35–40 cm) and weigh about 1 lb (0.5 kg)."

John Seigle of ABR, Inc., an environmental research firm, has been documenting the fall fishery at Nuiqsut for several years. Based on preliminary results, Seigle gave a mean live weight of 1 lb.[48]

Conversion Factors

Conversion factors used have varied from 0.6[49] to 1.0 lb (Braund and Associates 1993a–b; Brower Jr. et al. 2000; Fuller and George 1997). Given the distribution of the species, this factor has only been used in North Slope studies. Most commonly, a factor of 1.0 lb has been used.

Pedersen[50] sourced a 1986 Entrix report for a 0.7 lb conversion factor. No copy of the report could be located for review.

Braund (1993a–b) used a 1.0 factor, which was a "researcher estimate." Most North Slope studies that followed used this value.

Fall and Utermohle (1995) used a factor of 0.8 lb for Arctic cisco in Kaktovik and a value of 0.7 lb for Arctic cisco in Nuiqsut.[51]

Discussion

Pedersen used a factor of 0.7 lb, citing the 1986 Entrix report. A factor based on the mean live weight of 1.0 lb from ABR biologist Siegle[52] would result in a factor of 0.7 lb, as well.

Arctic Cisco Recommendation

Use a conversion factor of 0.7 lb.

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48. J. Seigle, Senior Scientist, fisheries and aquatic ecology, ABR Inc., personal communication, December 2015.
49. ADF&G CSIS, Nuiqsut 1985.
50. Pedersen unpublished data.
51. ADF&G CSIS.
52. J. Seigle, Senior Scientist, fisheries and aquatic ecology, ABR Inc., personal communication, December 2015.

Bering Cisco (*Coregonus laurettae*)

Evaluating this factor is challenging given the lack of data on mean live weights of this species in the Arctic area and a lack of documentation of sources for the conversion factors used.

Biological References on Mean Live Weights

Morrow (1980) does not does not give mean live weights. "The largest known Bering cisco, recorded by Alt (1973), was a female of 48 cm fork length from the lower 500 m of Hess Creek, Alaska. The average size of adults is about 30 cm" (Morrow 1980:29).

George et al. (2009) also does not give mean live weights, but says that Bering cisco are similar in size to Arctic cisco: "Size is comparable to the Arctic cisco at about 12 in (30 cm) for mature fish. Maximum length reported is 19.6 in (50 cm)" (George et al. 2009:12).

Conversion Factors

Bering cisco was not included in harvest surveys in Northwest Alaska studies until 1991; data for Kotzebue were calculated with a conversion factor of 1.75 lb[53]. Beginning with Magdanz et al. (2002),[54] a factor of 1.4 was used in studies in Bering Strait and Northwest Alaska, with the exception of Fall and Utermohle (1995), which used a factor of 1.75 lb for Kivalina in 1992. North Slope studies (Steven R. Braund and Associates 1989; Braund and Associates 1988; Brower Jr. et al. 2000; Fuller and George 1997) all used a conversion factor of 1.0 lb that originates in a study team estimate. The exception occurs in Fall and Utermohle (1995) in which the Kaktovik factor was 0.7 lb.

Discussion

There is no documentation on how factors for this species were developed for Bering Strait and Kotzebue area. In reviewing the various North Slope Borough and Braund reports for North Slope for whitefish species, all ciscos were attributed a 1.0 lb conversion factor derived from a study team estimate. An argument can be made that conversion factors for all ciscos should be equal, whatever value is used.

Bering Cisco Recommendation

This study recommends a 0.7 lb conversion factor for the other species of ciscoes based on documented mean live fish weights. Based on the assertion in George et al. (2009) that Bering cisco are approximately the same size as Arctic cisco, use a 0.7 value for this species of cisco as well.

Round Whitefish (*Prosopium cylindraceum*)

Evaluating this factor is challenging given the lack of data on mean live weights of this species in the Arctic area and a lack of documentation of sources for the conversion factors used.

Biological References on Mean Live Weights

George et al. (2009:22) describe mean live weights: "On the North Slope round whitefish typically reach weights of about 1 lb (0.5 kg) and 16–18 in (32–45 cm), although some fish have been reported to weigh about 5 lbs (2 kg)."

Marcotte (1995), a study of subsistence fisheries at Minto, included a species identification sheet used in the project that included round whitefish. It gives a mean live weight of 2 lb, but does not source this value.

Unpublished data from Magdanz[55] attributes a mean live weight of 1.0 lb to Marcotte (1995).

53. ADF&G CSIS, Kotzebue 1991.
54. ADF&G CSIS, Deering 1994.
55. Magdanz unpublished data.

Conversion Factors

Surveys in Northwest Alaska did not ask about round whitefish until studies documenting harvest in 1994 at Wales and Deering; these studies used conversion factors of 0.7 and 1.0.[56] In later studies, a factor of 0.7 was used for round whitefish in Bering Strait and Northwest Alaska.[57] Converting the mean live weight of 1.0 lb from Magdanz[58] gives a 0.7 lb conversion factor.

North Slope studies (Braund and Associates 1993a–b; Brower Jr. et al. 2000; Fuller and George 1997) all used a conversion factor of 1.0 lb that originates in a study team estimate.

Discussion

As with the case of Bering cisco, a review of the various North Slope Borough and Braund reports gave a conversion factor of 1 lb for all ciscos and round whitefish, which suggests that the researchers estimated an equal size for those species on the North Slope.

Round Whitefish Recommendation

We recommend using a 0.7 value for this species as well. As with other whitefishes, this species is a candidate for projects that weigh subsistence-caught fish.

Lake trout (*Salvelinus namaycush*)

Biological References on Mean Live Weights

There are no sources on mean live weight based on measurements of lake trout taken in the Arctic area. Morrow (1980), Mecklenberg et al. (2002) and George et al. (2009) cite maximum weights measured Canada and the continental U.S. Jones (2006:126) also gives a maximum weight, but observes that in Northwest Alaska "usually they are smaller, more like the Dolly Varden size."

Conversion Factors

The most common conversion factor used in Arctic Area is 4.0 lb. One study (Magdanz et al. 2010) used a 6.0 lb factor, but did not give a source for the origin of that value.

The 4.0 lb factor appears to originate in unpublished data from research in Kaktovik by ADF&G researcher Pedersen.[59] The binder includes a table of conversion factors that states that the 4.0 lb conversion factor is a "researcher's estimate." Later reports on the North Slope used this factor, which was also incorporated into the Division of Subsistence CPDB.

Lake Trout Recommendation

Continue with 4.0 lb conversion factor. As possible, incorporate weighing of subsistence-caught lake trout into future fisheries projects.

Flounders (*Platichythys stellatus, Liopsetta glacialis*)

Two species of flounder are likely caught by fishers in the Arctic Area: starry flounder *(Platichthys stellatus)* and Arctic flounder *(Liopsetta glacialis)*. Many studies did not ask about harvest at a species level, and simply asked about "flounder." Factors used at a species and categorical level have varied from 0.3 (Kaktovik in

56. ADF&G CSIS.

57. ADF&G CSIS.

58. Magdanz unpublished data.

59. S. Pedersen, Kaktovik project folder, Alaska Department of Fish and Game Division of Subsistence, unpublished data, 1985–1987. This data is on file with the ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701. Hereafter referred to as Pedersen unpublished data.

Fall and Utermohle [1995]) to 1.1 lb per fish (Kotzebue in Fall and Utermohle [1995]). Factors used for the Bering Strait and NANA region have been about double those used on the North Slope.

Biological References on Mean Live Weights

Starry flounder in other regions can achieve a maximum weight of 20 lbs (Morrow 1980:213). No source for mean live weights of either species caught in the Arctic area has been found.

Georgette and Loon (1993:208)gives a "researchers' estimate" of 1.5 lb.

ADF&G Division of Commercial Fisheries biologist Jim Menard[60] said a 1.0 lb mean live weight "seemed as good as any."

Conversion Factors

Pedersen[61] and Impact Assessment (1989:C-17) both give a "researcher's estimate" of 0.5 lb. Conger and Magdanz (1990a:60) gives a 1.0 lb conversion factor based on a Division of Subsistence "1987 Nushagak project." Georgette and Loon (1993:208) used a 1.1 lb factor based on a mean live weight of 1.5 lb. Fall and Utermohle (1995) used conversion factors of 1.1 lb in Kotzebue and Kivalina and 0.33 lb in Kaktovik.

Flounders Recommendation

Lacking any data on average live weights from which to calculate a new conversion factor, all options are "researcher estimates." We suggest retaining the factor of 1.1 lb from Georgette and Loon 1993 to be used for the category "flounder" and the 2 species individually.

Burbot (*Lota lota*), mudshark, *titaaliq/tiktaaliq*, lingcod

Factors have varied little between published Arctic studies (4.0–4.2 lb). In one exception (Burch Jr. 1985), a value of 1 lb was used. Burbot are taken by several methods in the Arctic area, including jigging through the ice, baited set lines under ice, and fish traps.

Biological References on Mean Live Weights

Morrow (1980:182) stated, "Reported up to 34 kg in weight and 152.4 cm long in Alaska (Turner, 1886; Dall, 1898) but the angling record for the state is only 10.2 kg. The average fish caught by an angler probably weighs in the neighborhood of .5 to 1 kg."[62]

Burch (1985:147) appears to have averaged the 2 values (0.5 kg and 1 kg) from Morrow (1980) to arrive at a mean live weight of 1.65 lb.

Johnson (1986) describes an ADF&G monitoring project of an exploratory commercial fishery and subsistence fisheries at Selawik, Alaska in 1985. It gave mean live weights of whitefishes harvested, northern pike, sheefish and burbot. Most fishers used 2-inch mesh setnets. The mean live weight of burbot caught in the commercial fishery was 7.5 lb (Johnson 1986: 15).

Georgette and Loon (1993:208) gives a mean live weight of 6 lb, citing Johnson (1986:15) and ADF&G (1986:146).

> Burbot harvested in the 1985 Selawik commercial fishery had a mean weight of 7.5 pounds. Burbot harvested in the 1986 Noatak River freshwater fishery had an average weight of 4.5 pounds. Live weight represents the average of these two numbers. (Georgette and Loon 1993:208)

60. J. Menard, Area Biologist, ADF&G Division of Commercial Fisheries, personal communication, 2016.

61. Pedersen unpublished data.

62. 0.5 kg = 1.1 lb; 1 kg=2.2 lb.

Mecklenburg et al. (2002:289) does not give a source for average weights of angler-caught burbot: "Length to 152 cm TL, weight to 34 kg, historically; today usually much smaller, with angler-caught burbot averaging 0.5–1.0 kg."

Jones (2006:222) gives maximum weights, but does not give a mean live weight.

> Mudshark can weigh up to 22 pounds (10 kg), with the record being 75 pounds (34 kg) set in 1886, Alaska. The average length caught is around 24" to 30" (30.5 cm to 76 cm) and that record (1886) fish was 59" (152.4 cm). (Jones 2006:222)

George et al. (2009:48) also give maximum weights, but does not give a mean live weight. "Burbot can grow large, with the largest specimens growing to 75 lb (34 kg) and 5 ft (152 cm) in length. In Alaska they have been seen in the Colville River to 38 in (96 cm), but a typical ten-year-old fish reaches 23 in (60 cm)."

Conversion Factors

Braund et al. (1993a) gave a 4.0 lb conversion factor, citing the Division of Subsistence CPDB for Nuiqsut and Kaktovik.

Georgette and Loon (1993:208) used a 4.2 lb conversion factor based on a mean live weight of 6.0 lb.

Discussion

After Georgette and Loon (1993), researchers in Bering Strait and Northwest Alaska continued using the 4.2 lb value, and researchers on the North Slope continued using the 4.0 lb value. The only mean live weight based on measured weights of fish in the Arctic Area comes from Georgette and Loon (1993).

Burbot Recommendation

We recommend retaining the 4.2 conversion factor described in Georgette and Loon (1993).

Arctic (Blue) Cod (*Boreogadus saida*)

Biological References on Mean Live Weights

Morrow (1980) does not describes a mean weight for Arctic cod: "one of the smallest of the cods. Most adults about 13 to 16 cm long, the largest specimen said to have been on 32.1 cm (Svetovidov, 1948). Weight to about 75 g"[63] (Morrow 1980:184).

Burch (1985:148) cites Morrow 1980 as source for live weight of 2.5 oz. The difference in this miscalculation is small (0.15 oz).

Jones (2006:40) gives an unsourced mean live weight that may be a typographical error. "The Arctic cod is the smallest cod in this area, measuring 6" (14cm) and averaging 1.5 lb (0.75kg)."

George et al. (2009:62) reports: "Arctic cod are one of the smallest cods and grow only to about 6 in (13–16 cm) and about 3 oz (75 gm)."

Conversion Factors

Conversion factors have either been based on mean live weight values from Burch (1985) or Morrow (1980). Multiplying the Burch (1985) live weight of 2.5 oz by 0.7 gives a conversion factor of 0.12 lb. Multiplying the live weight of 2.65 oz presented in Morrow (1980) by 0.7 also results in a conversion factor of 0.12 lb.

63. 75 g is equal to 0.17 lb, or 2.65 oz.

Arctic Cod Recommendation

We recommend retaining 0.11 lb factor that has been used for Arctic cod in the Arctic region from 1992–2007, because a 0.01 lb difference is negligible.

Saffron Cod (*Eleginus gracilis*), tomcod

Saffron cod is also known locally as "tomcod" and is frequently misidentified as "Pacific tomcod."

Biological References on Mean Live Weights

Morrow (1980) describes no mean weight for saffron cod. "Length usually around 25 to 35 cm but can reach about 50 cm and a weight of 1 kg" (Morrow 1980:187). Saffron cod grow slowly. "Three-year-old fish average about 30 cm in length and weigh about 200g; at 5+, 37.5 cm and 375 g; and at 7+, 46 cm and 800 to 900g" (Morrow 1980:188). It is unclear where in Alaska these lengths and weights were measured; location could affect mean lengths and weights. An approach to mean live weight could be to average the "usual lengths" (25 to 35 cm) and proportionally calculate a weight versus the maximum. This would result in a 0.6 kg (1.32 lb) mean live weight at 30 cm.

Burch (1985:148) gives a mean live weight of 1.0 lb, referencing Morrow (1980:187). It is not clear how this value was calculated.

Georgette and Loon (1993) provide a mean live weight of 0.3 lb, sourced from Mark Willette, Marine Advisory Program, Kotzebue, pers. comm. June 26, 1987. "Willette estimated the average weight of saffron cod in the Kotzebue area at 120 to 150 g" (Georgette and Loon 1993:207). The average of this range is 135 g (0.30 lb).

Jones (2006) does not give a mean live weight for saffron cod. "Tomcod reach 20" (51cm) in length, although they are much smaller in our area, like 12 [inches]" (Jones 2006:25).

George et al. (2009) reports a maximum weight. "While the saffron cod is one of the smaller members of the cod family, it is noticeably larger than the Arctic cod. Saffron cod are reported to reach 19 in (50 cm) and 2.2 lbs (1 kg). We have seen specimens as large as 7 in (18 cm) in Elson Lagoon and Dease Inlet" (George et al. 2009:64).

Conversion Factors

Factors have varied from 0.21 lb in Bering Strait (Conger and Magdanz 1990a) to 1.0 lb on the North Slope. The conversion factor of 0.21 lb was used in most studies in Bering Strait and Northwest Alaska communities. The North Slope factor is based on the use of an unsourced live weight given in Burch (1985), which was used as an edible weight in Braund et al. (1989). Later studies on the North Slope retained 1.0 lb as a conversion factor. Other conversion factors used for saffron cod include 0.7 lb (Fall and Utermohle 1995), and 0.75 lb (Wolfe 1981).

Discussion

There are several options for conversion factors based on mean live weights. A conversion factor based on an average and proportion from Morrow (1980) would be 0.9 lb. Drawing from Burch (1985) would give a conversion factor of 0.7 lb. Finally, using a live weight from Georgette and Loon (1993) would result in a conversion factor of 0.21 lb. This species is caught in great numbers, and mean live weights of subsistence-caught fish could be likely be obtained in Nome or other places where they are harvested in the fall.

Saffron Cod Recommendation

We recommend retaining the 0.21 lb conversion factor for saffron cod. This species is a good candidate for further work in refining the factor by weighing subsistence-caught fish.

Pacific Herring (*Clupea harengus pallasi*)

Pacific herring are often reported in gallons, not individual fish. However, factors for individual fish have been published.

Biological References for Mean Live Weights

According to Morrow (1980:18), Pacific herring are "said to reach 38 cm in Alaskan waters, but the average adult is probably around 25 cm." Morrow does not give mean live weights for Pacific herring.

Georgette and Loon (1993:208) give a mean live weight of individual herring of 120 g[64], based on actual weights of herring taken in Kotzebue Sound. They source a personal communication from Mark Willette, Marine Advisory Program, Kotzebue, June 26, 1987.

Jones (2006:18) provides an average length, but does not give an average weight: "Herring average 10" (25 cm) in length, but some reach 17" (43 cm)."

George et al. (2009:74) states "Average size is about 12 in (25 cm) in length and about 0.5 lb (0.25 kg) in weight, but slightly larger specimens occur." The source for the mean live weight is not given.

Conversion Factors

This species is commonly asked about and reported in gallons. The factor per gallon has varied from 5 lb (Fuller and George 1997) to 6 lb (Fall and Utermohle 1995) and later studies in Bering Strait and Northwest Alaska. There are 2 options for developing a conversion factor for individual Pacific herring.

A factor of 0.18 lb per fish has been used (Conger and Magdanz 1990b; Georgette and Loon 1993; Impact Assessment, Inc. 1989). A factor based on mean live weight of Kotzebue Sound herring as reported by Georgette and Loon (1993) would also be 0.18 lb. Using George (2009), a mean live weight of 0.5 lb would result in a conversion factor of 0.35 lb.

Pacific Herring Recommendation

We recommend retaining a 0.18 lb conversion factor for an individual herring.

64. 120 g = 0.26 lb.

REFERENCES

Alaska Department of Fish and Game Division of Commercial Fisheries, Nome Area Office

1986. *Annual management report 1986: Norton Sound, Port Clarence, Kotzebue*. Alaska Department of Fish and Game Division of Commercial Fisheries: Nome, Alaska.

Alt, K.T.

1987. *Review of sheefish (Stenodus leucichthys) studies in Alaska*. Alaska Department of Fish and Game Division of Sport Fish, Fishery Manuscript No. 3: Juneau.

1988. *Biology and management of inconnu (Stenodus leucichthys) in Alaska*. Finnish Fisheries Research 9, pages 127–132.

Bigg, M.A.

1981. "*Harbour seal: Phoca vitulina and P. largha*" [in] S.H. Ridgway and S.R. Harrison, editors *Handbook of marine mammals, Volume 2 Seals*. Academic Press: London.

Braund and Associates

1988. *North Slope Subsistence Study: Barrow, 1987.* US Department of the Interior, Minerals Management Service, OCS Study MMS 88-0080, Technical Report 133.: Anchorage.

1989a. *North Slope Subsistence Study, Barrow, 1988*. Technical Report No. 135, OCS Study, MMS 89-0077, submitted to U.S. Department of Interior, Minerals Management Service for contract no. 14-12-0001-30284. Prepared by Stephen R. Braund & Associates, Anchorage, with University of Alaska Anchorage Institute of Social and Economic Research.: Anchorage.

1989b. *North Slope Subsistence Study: Wainwright 1988.* US Department of the Interior, Minerals Management Service. OCS Study MMS 89-0078. Technical Report No. 136: Anchorage.

1993a. *North Slope Subsistence Study: Barrow, 1987, 1988, 1989.* Technical Report No. 149, OCS Study, MMS 91-0086, submitted to U.S. Department of the Interior Minerals Management Service, for contract no. 14-12-0001-30284. Stephen R. Braund & Associates with University of Alaska Anchorage Institute of Social and Economic Research.: Anchorage.

1993b. *The North Slope Subsistence Study: Wainwright, 1988, 1989. Submitted to the US Department of Interior, Minerals Management Service, Alaska OCS Region, Anchorage, Alaska*. Stephen R. Braund & Associates with Institute of Social and Economic Research, University of Alaska Anchorage: Anchorage.

Brower Jr., H.K., T.P. Olemaun, and T.R. Hepa

2000. *North Slope Borough subsistence harvest documentation project: data for Kaktovik, Alaska, for the period December 1, 1994 to November 30, 1994*. North Slope Borough Department of Wildlife Management: Barrow.

Burch Jr., E.S.

1985. *Subsistence production in Kivalina, Alaska: A twenty-year perspective*. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 128: Juneau.

Burns, J.J.

1967. *The Pacific bearded seal*. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration Project Report covering investigations completed by December 31, 1966. Volume 8: Projects W-6-R and W-14-R: Juneau.

1977. *The bearded seal in Alaska*, Wildlife Notebook Series. Alaska Department of Fish and Game.

1978. *The walrus in Alaska*, Wildlife Notebook Series. Alaska Department of Fish and Game.

1979. *Memorandum to Greg Moore regarding weights of ringed, bearded, and spotted seals and beluga whales*.

1981a. "*Bearded Seal Erignathus barbatus Erxleben*" [in] S.H. Ridgway and S.R. Harrison, editors *Handbook of marine mammals, Volume 2 Seals*. Academic Press: London.

1981b. "*Ribbon seal Phoca fasciata Zimmermann, 1783*" [in] S.H. Ridgway and S.R. Harrison, editors *Handbook of marine mammals, Volume 2 Seals*. Academic Press: London.

1984. *The ribbon seal in Alaska*, Alaska Wildlife Notebook Series. Alaska Department of Fish and Game.

Burns, J.J. and K.J. Frost
1979. *Natural history and ecology of the bearded seal, Erignathus barbatus. Final report to the Outer Continental Shelf Environmental Assessment Program, Research Unit 230*. Alaska Department of Fish and Game.

Burns, J.J. and G.A. Seaman
1985. "*II. Biology and ecology*" [in] *Investigation of belukha whales in coastal waters of western and northern Alaska*. Alaska Department of Fish and Game: Fairbanks.

Cameron, M.F., J.L. Bengtson, P.L. Boveng, J.K. Jansen, B.P. Kelly, S.P. Dahle, E.A. Logerwell, J.E. Overland, C.L. Sabine, G.T. Waring, and J.M. Wilder
2010. *Status review of the bearded seal (Erignathus barbatus)*. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-211.

Coffing, M., C.L. Scott, and C.J. Utermohle
1998. *The subsistence harvest of seals and sea lions by Alaska Natives in three communities of the Yukon-Kuskokwim Delta, Alaska, 1997-98*. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 255: Juneau.

1999. *The subsistence harvest of seals and sea lions by Alaska Natives in three communities of the Yukon-Kuskokwim Delta, Alaska, 1998-99*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 257.

Conger, A.O. and J. Magdanz
1990a. *The harvest of fish and wildlife in three Alaska communities: Brevig Mission, Golovin, and Shishmaref*. Alaska Department of Fish and Game, Division of Subsistence, and the U.S. Fish and Wildlife Service.

1990b. *The harvest of fish and wildlife in three Alaska communities: Brevig Mission, Golovin, and Shishmaref*. Alaska Department of Fish and Game, Division of Subsistence and the U.S. Fish and Wildlife Service, Technical Paper No. 188.

Crapo, C., B. Paust, and J. Babbitt
1993. *Recoveries and yields from Pacific fish and shellfish*. Marine advisory bulletin #37. University of Alaska Fairbanks Alaska Sea Grant College Program: Fairbanks.

DeCicco, A.L.
1985. *Annual performance report for inventory and cataloging of sport fish and sport fish waters of western Alaska with emphasis on Arctic char life history studies, Volume 26, Study G-I*. Alaska Department of Fish and Game Division of Sport Fish.

Donovan, G., D. Palka, C. George, N. Levermann, P. Hammond, and L. Witting
[*n.d.*]. *Report of the small working gropu on conversion factors (from whales to edible products) for the Greenlandic large whale hunt*. International Whaling Commission.

Fall, J.A. and C.J. Utermohle editors.
1995. *An investigation of the sociocultural consequences of outer continental shelf development in Alaska*, Volume V. Alaska Peninsula and Arctic. U.S. Department of the Interior Minerals Management Service, Alaska OCS Region, Social and Economic Studies Unit, OCS Study MMS 95-014, Technical Report No. 160: Anchorage.

Fay, F.H.
1971. "*Belukha, Arctic white wales*" [in] A. Seed, editor *Toothed whales in eastern North Pacific and Arctic waters*. Pacific Search Books: Seattle.

1981. "*Walrus Odobenus rosmarus Linnaeus*" [in] S.H. Ridgway and S.R. Harrison, editors *Handbook of marine mammals, Volume 1: the walrus, sea lions, fur seals and sea otter*. Academic Press: London.

1982. *Ecology and biology of the Pacific Walrus, Odobenus rosmarus divergens Illiger*. North American Fauna 74, pages 1–279.

Fraker, M.A., D.E. Sergeant, and W. Hoek
1978. *Bowhead and white whales in the southern Beaufort Sea*. Beaufort Sea Project Techincal Report No. 4.

Frost, K.J. and L.F. Lowry
1981. "*Ringed, Baikal, and Caspian seals*" [in] S.H. Ridgway and S.R. Harrison *Handbook of marine mammals, Volume 2 Seals*. Academic Press: London.

1984. "*Trophic relationships of vertebrate consumers in the Alaskan Beaufort Sea*" [in] P.W. Barnes, D.M. Schell, and E. Reimnitz, editors *The Alaskan Beaufort Sea: Ecosystems and Environments*. Academic Press: Orlando, FL.

Frost, K.J., L.F. Lowry, G. Pendleton, and H.R. Nute
2002. *Monitoring distribution and abundance of ringed seals in northern Alaska. OCS Study MMS 2002-043.* Final Report from the Alaska Department of Fish and Game for U.S. Minerals Management Service: Anchorage.

Fuller, A., S. and J. George C.
1999rev. *[1997] Evaluation of subsistence harvest data from the North Slope Borough 1993 census for eight North Slope Villages: for the calendar year 1992*. North Slope Borough, Department of Wildlife Management: Barrow.

Fuller, A., S. and J.C. George
1997. *Evaluation of subsistence harvest data from the North Slope Borough 1993 census for eight North Slope Villages for the calendar year 1993*. North Slope Borough Department of Wildlife Management: Barrow.

George, C., L. Moulton, and M. Johnson
2009. *A Field Guide to the Common Fishes of the North Slope of Alaska*. North Slope Borough Department of Wildlife Management: Barrow.

George, J.C., L.M. Philo, G.M. Carroll, and T.F. Albert
1988. "*1987 subsistence harvest of bowhead whales, Blaena mysticetus, by Alaskan Eskimos*" [in] *Thirty-eighth report of the International Whaling Commission*. International Whaling Commission: Cambridge.

Georgette, S. and H. Loon
1993. *Subsistence use of fish and wildlife in Kotzebue, a Northwest Alaska regional center*. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 167: Juneau.

Georgette, S. and A. Shiedt
2005. *Whitefish: traditional ecological knowledge and subsistence fishing in the Kotzebue Sound region, Alaska*. Alaska Department of Fish and Game Division of Subsistence and Maniilaq Association, Technical Paper No. 290: Kotzebue.

Hepa, T., H.K. Brower Jr., and D. Bates
1997. *North Slope Borough Subsistence Harvest Documentation Project : data for Atqasuk, Alaska for the period July 1, 1994, to June 30, 1995*. Department of Wildlife Management North Slope Borough: Barrow.

Impact Assessment, Inc.
1989. *Point Lay case study*. Minerals Management Service, Alaska Outer Continental Shelf Region, Technical Report No. 139: Anchorage.

Johnson, M.L., C.H. Fiscus, B.T. Ostenson, and M.L. Barbour
1966. "*Marine mammals*" [in] N. Wilimovsky and J.N. Wolfe, editors *Environment of the Cape Thompson region, Alaska*. U.S. Atomic Energy Commission Division of Technical Information: Oak Ridge, TN.

Johnson, R.
1986. *Progress report: Reconnisance [sic] survey of the subsistence/commercial whitefish, northern pike, and burbot fishery in the village of Selawik with emphasis on developing methods to monitor its effect on the exploited stocks*. U.S. Fish and Wildlife Services, Fairbanks Fishery Resources Project Report Number FY-86/8: Fairbanks.

Jones, A.
2006. *Iqaluich Niġiñaqtuat, Fish That We Eat*. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Final Report No. FIS02-023: Anchorage.

Josephson, K.
1974. *Use of the sea by Alaska Natives: a historical perspective*. University of Alaska, Arctic Environmental Information and Data Center: Fairbanks.

Kelly, B.P.
1988a. "*Bearded seal Erignathus barbatus*" [in] J.W. Lentfer *Selected marine mammals of Alaska: species accounts with research and management recommendations*, 33. Marine Mammal Commission: Washington D.C.

1988b. "*Ribbon seal, Phoca fasciata*" [in] *Selected marine mammals of Alaska: species accounts with research and management recommendations*. Marine Mammal Commission: Washington DC.

Klinkhart, E.
1978. *The Belukha in Alaska*. Alaska Wildlife Notebook Series. Alaska Department of Fish and Game.

Lentfer, J.W.
1978. *The polar bear in Alaska*, Alaska Wildlife Notebook Series. Alaska Department of Fish and Game.

Lentfer, J.W. and B. Small
2008. *Polar bear*, Alaska Wildlife Notebook Series. Alaska Department of Fish and Game.

Lourie, K.S.
1982. *The Eskimo Walrus Commission 1981–82 Walrus Data Collection Program*. Eskimo Walrus Commission: Nome, Alaska.

Lowry, L.F.
1984. *The beluga whale in Alaska*, Alaska Wildlife Notebook Series. Alaska Department of Fish and Game.

Magdanz, J.S., N.S. Braem, B.C. Robbins, and D.S. Koster
2010. *Subsistence harvests in Northwest Alaska, Kivalina and Noatak, 2007*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 354: Kotzebue.

Magdanz, J.S., C.J. Utermohle, and R.J. Wolfe
2002. *The production and distribution of wild food in Wales and Deering, Alaska*. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 259: Kotzebue.

Marcotte, J.R.
1995. *Minto subsistence pike and whitefish harvest assessment 1995 [draft]*. Alaska Department of Fish and Game Division of Subsistence, Special Publication No. SP1995-002: Juneau.

Matthews, J.
1978. *Seals: survey-inventory progress report*. Alaska Department of Fish and Game: Juneau.

Mecklenburg, C.W., T.A. Mecklenburg, and L.K. Thorsteinson
2002. *Fishes of Alaska*. American Fisheries Society: Bethesda, MD.

Morrow, J.E.
1980. *Freshwater fishes of Alaska*. Alaska Northwest Publishing Company: Anchorage.

Nelson, M.
2008a. *Bearded seal*, Alaska Wildlife Notebook Series. Alaska Department of Fish and Game.

2008b. *Ribbon Seal*, Alaska Wildlife Notebook Series. Alaska Department of Fish and Game.

Patterson, A.
1974. *Subsistence harvests in five native regions: for the Joint Federal-State Land Use Planning Commission for Alaska*. Resource Planning Team: Anchorage.

Pedersen, S.
1971. "*Status and trends of subsistence resource use at Point Hope*." [in] B. MacLean (Director) *Point Hope project report*. University of Alaska and National Science Foundation Division of Student Originated Studies: Fairbanks.

Quakenbush, L., J. Citta, and J. Crawford
2011. *Biology of the bearded seal (Erignathus barbatus) in Alaska, 1961–2009*. Alaska Department of Fish and Game, Arctic Marine Mammal Program: Fairbanks.

Schliebe, S., T.J. Evans, C. Hamilton, S.E. Jahrsdoerfer, K. Jhonson, R. Meehan, S. Miller, and Roy Michael
2006. *Range-wide status review of the polar bear (Ursus maritimus)*. U.S. Fish and Wildlife Service: Anchorage.

Sergeant, D.E. and P.F. Brodie
1969. *Body size in white whales Delphinapterus leucas*. Journal of the Fisheries Research Board of Canada 26(10), pages 2561–2580.

Stoker, S.
1983. "*Subsistence harvest estimates and faunal resource potential at whaling villages in northwestern Alaska*" [in] *Subsistence Study of Alaska Eskimo Whaling Villages, prepared for the U.S. Department of the Interior*. Alaska Consultants, Inc.: Anchorage.

Taube, T.T.
1996. *Abundance and composition of sheefish on the Kobuk River, 1994–1995*. Alaska Department of Fish and Game Division of Sport Fish, Fishery Manuscript No. 96-2: Anchorage.

1997. *Abundance and composition of sheefish in the Kobuk River, 1996*. Alaska Department of Fish and Game Division of Sport Fish, Fishery Manuscript No. 97-1: Anchorage.

Taube, T.T. and K. Wuttig
1998. *Abundance and composition of sheefish in the Kobuk River, 1997*. Alaska Department of Fish and Game Division of Sport Fish, Fishery Manuscript Report No. 98-3: Anchorage.

U.S. Fish and Wildlife Service
2010a. *Polar bear (Ursus maritimus): Chukchi/Bering seas stock*, Stock Assessment Reports. U.S. Fish and Wildlife Service, Marine Mammals Management, Alaska Region: Anchorage.

2010b. *Polar bear (Ursus maritimus: southern Beaufort Sea stock*, Stock Assessment Reports. U.S. Fish and Wildlife Service, Marine Mammals Management, Alaska Region: Anchorage.

Wolfe, R.J.
1981. *Norton Sound/Yukon Delta sociocultural systems baseline analysis*. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 59: n.p.