

Technical Paper No. 421

**Harvest and Use of Wild Resources in Northway,
Alaska, 2014, with special attention to nonsalmon fish**

by

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and

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November 2016

Alaska Department of Fish and Game

Division of Subsistence



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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
mid-eye-to-fork	MEF
mid-eye-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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ALASKA, 2014, WITH SPECIAL ATTENTION TO NONSALMON FISH**

by

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ABSTRACT

As part of an effort to update subsistence harvest information for Wrangell-St. Elias National Park and Preserve (WRST) resident zone communities, Alaska Department of Fish and Game Division of Subsistence staff and local research assistants administered comprehensive subsistence harvest surveys and key respondent interviews in Northway Village, Northway, and Northway Junction, Alaska (“Northway”), with funding from the National Park Service. This report presents the results of this study, as well as qualitative and quantitative information from research conducted in the 2000s that was not fully published. Although direct use of WRST by Northway residents may have declined since the park’s establishment, sociocultural connections to resident zone communities in the Copper River Basin remain strong. Given the location of Northway in the Upper Tanana River basin, this report requires a distinct regional literature review from reports based on surveys in the Copper River Basin. However, presentation of results from the 2014 study year is consistent with the Copper Basin reports for comparability. The project was approved by the Northway Village Council in November 2014. During the fieldwork in February 2015, surveyors invited 73 eligible Northway households (identified as present for 6 months or more of the study year) to participate, and 55 households (75%) participated; additionally, 9 ethnographic interviews provided qualitative context for the quantitative data. Results indicate that 100% of Northway households used wild resources, and that Northway residents harvested an estimated 60,791 lb of wild food in 2014 (314 lb per capita), the majority of which was moose or humpback whitefish. Rapid social and ecological changes have prompted adaptation in Northway’s subsistence practices over the last century. Two particular events with lasting effects on subsistence include the construction of the Northway airfield and Alaska Highway in the early 1940s, and the incursion of silt-laden glacial rivers into previously clearwater habitats, which began in the 1970s.

Key words: Northway, Upper Tanana region, nonsalmon fish, humpback whitefish, traditional knowledge, contaminants, subsistence

1. INTRODUCTION

This report provides information about the harvests and uses of fish, wildlife, and wild plant resources by the community of Northway (*K'ehthiign*, Figure 1-1), Alaska¹, in 2014, including estimates of edible pounds, compiled maps of search and harvest areas for multiple resources, analysis of food security data, discussion of changes to the food system over time, and local comments and concerns voiced during surveys and ethnographic interviews. Harvest information was collected in February 2015 by research staff of the Alaska Department of Fish and Game (ADF&G) Division of Subsistence working with 5 local research assistants. The household harvest surveys indicate that during 2014, 95% of Northway households participated in fishing, hunting, and gathering wild resources, and 100% of households used wild resources (Table 1-1). Northway households harvested an average of 8 species in 2014, with a maximum of 42, and Northway residents used at least 109 specific resources during the study year. Table 1-2 presents a complete list of wild resources used during the study year. Additionally in February 2015, 9 ethnographic interviews with older men and women were conducted to provide context and give meaning to the quantitative data derived from the surveys. Interview and survey respondents emphasized that subsistence resources are the foundation of living in Northway, even while they identified multiple concerns and problems—especially land use and management, changing weather and habitats, and contamination.

Since 1978, the Division of Subsistence has been charged with quantifying wild resource harvests by Alaska residents throughout the state and has administered comprehensive resource harvest surveys in the majority of Alaska communities.² Data collected by the Division of Subsistence assist the Alaska Board of Fisheries and Board of Game in establishing the amount reasonably necessary for subsistence for each game population or fish stock with a positive customary and traditional use finding, as required by Alaska statute (AS 16.05.258(b)). The information collected by the Division of Subsistence is also used in land and resource planning to understand the harvest of wild resources by communities throughout Alaska. The locations and timing of hunting, fishing, and gathering activities are especially important for evaluating potential impacts of development on local harvesting patterns. Community-based harvest reporting has been shown to be a valuable means for collecting reliable harvest data in rural Alaska, in order to effectively manage fish and wildlife and to fully provide for the subsistence priority as required by Alaska state law and the federal Alaska National Interest Lands Conservation Act (ANILCA). Collecting harvest and use information through in-person household surveys provides a more comprehensive and accurate picture of a community-wide subsistence economy than simply relying upon reported harvests for individual species (Andersen and Alexander 1992).

PROJECT BACKGROUND

The ADF&G Division of Subsistence has conducted comprehensive harvest surveys in multiple communities³ in the Copper River basin and upper Tanana region over 5 of the last 6 years, many of which were funded by the Wrangell-St. Elias National Park and Preserve (WRST), and all of which contribute to updated information about subsistence harvests and uses for WRST resident zone communities (those 23 communities, including Northway, eligible to engage in subsistence uses in WRST in recognition of their customary and traditional uses of park lands⁴).

1. The community of Northway is made up of 3 census designated places (CDPs): Northway Village, Northway, and Northway Junction and a few households beyond those boundaries. In this report, “Northway” refers to all of those affiliated residences.

2. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. “Community Subsistence Information System: CSIS.” Accessed June 29, 2015. <https://www.adfg.alaska.gov/sb/CSIS>. Hereafter *ADF&G CSIS*.

3. Chistochina, Mentasta Pass, Mentasta Lake, Slana, Copper Center, Gakona, Willow Creek, Kenny Lake, Chitna, McCarthy, Paxson, Gulkana, Nelchina, Mendeltna, Lake Louise, Tolsona, Glenallen, Tazlina, and Tonsina (La Vine et al. 2014:2).

4. National Park Service. “Wrangell-St Elias National Park and Preserve, Alaska. Subsistence Eligibility.” Accessed October 31, 2016. <https://www.nps.gov/wrst/learn/management/subsistence-eligibility.htm>

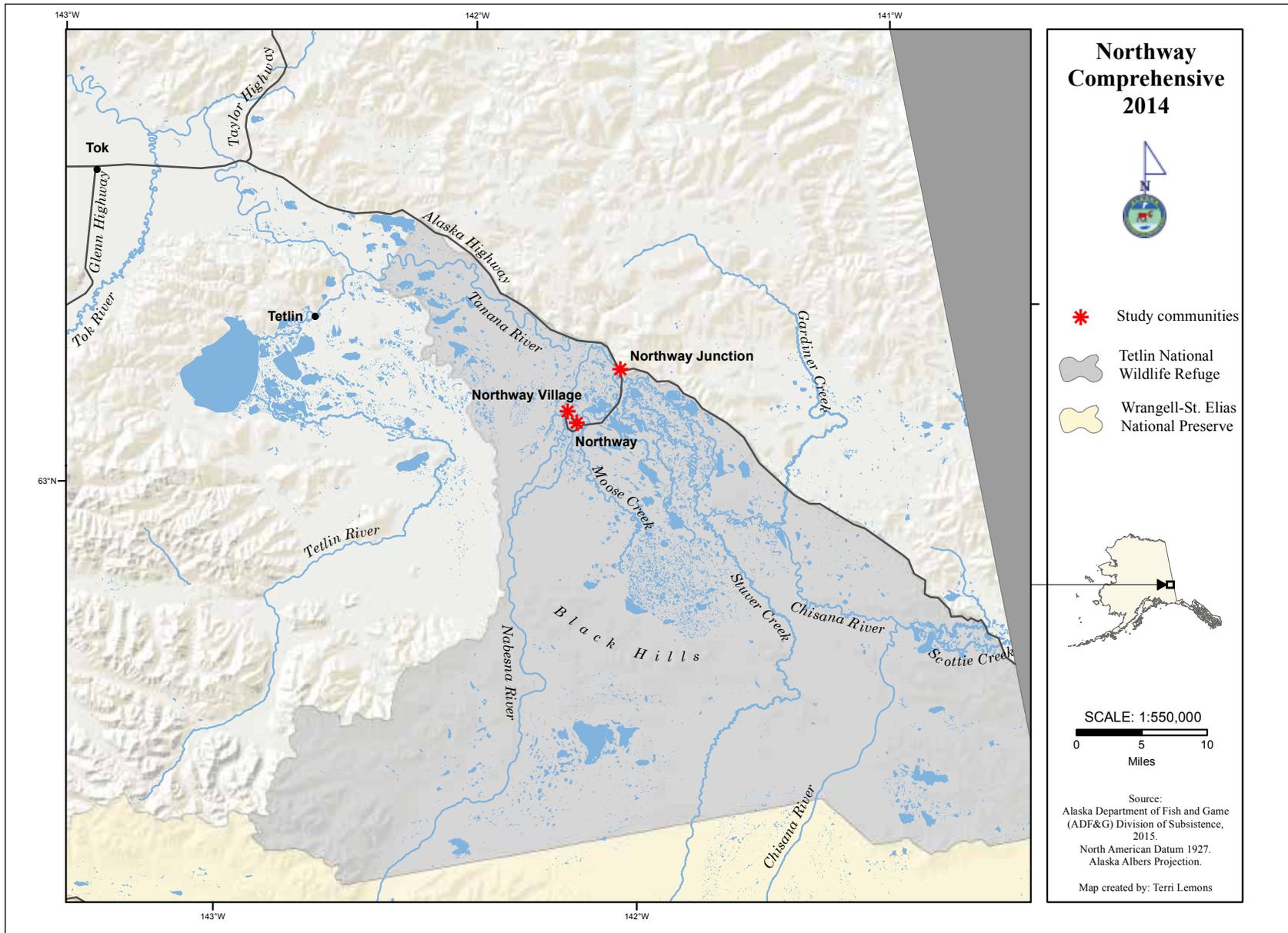


Figure 1-2.—Study area map, Northway, 2014.

Table 1-1.—Resource harvest and use characteristics, Northway, 2014.

Characteristic	
Mean number of resources used per household	14.4
Minimum	1
Maximum	43
95% confidence limit (\pm)	8.8%
Median	12.0
Mean number of resources attempted to harvest per household	11.5
Minimum	0
Maximum	43
95% confidence limit (\pm)	11.5%
Median	9.0
Mean number of resources harvested per household	10.4
Minimum	0
Maximum	42
95% confidence limit (\pm)	12.1%
Median	8.0
Mean number of resources received per household	4.5
Minimum	0
Maximum	17
95% confidence limit (\pm)	11.7%
Median	3.0
Mean number of resources given away per household	5.8
Minimum	0
Maximum	28
95% confidence limit (\pm)	14.3%
Median	4.0
Household harvest (lb)	
Minimum	0
Maximum	4,778
Mean	832.8
Median	268.5
Estimated total harvest weight (lb)	60,791.0
Estimated community per capita harvest (lb)	313.7
Percentage using any resource	100%
Percentage attempting to harvest any resource	95%
Percentage harvesting any resource	95%
Percentage receiving any resource	95%
Percentage giving away any resource	91%
Number of households in sample	55
Number of resources asked about and identified voluntarily by respondents	107

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

Table 1-2.–Resources used, Northway, 2014.

Resource	Scientific name
Unknown chum salmon	<i>Oncorhynchus keta</i>
Coho salmon	<i>Oncorhynchus kisutch</i>
Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Pink salmon	<i>Oncorhynchus gorbuscha</i>
Sockeye salmon	<i>Oncorhynchus nerka</i>
Unknown salmon	<i>Oncorhynchus spp.</i>
Flounders	
Pacific halibut	<i>Hippoglossus stenolepis</i>
Burbot	<i>Lota lota</i>
Dolly Varden	<i>Salvelinus malma</i>
Lake trout	<i>Salvelinus namaycush</i>
Arctic grayling	<i>Thymallus arcticus</i>
Northern pike (small, pickle)	<i>Esox lucius</i>
Northern pike	<i>Esox lucius</i>
Sheefish	<i>Stenodus leucichthys</i>
Rainbow trout	<i>Oncorhynchus mykiss</i>
Broad whitefish	<i>Coregonus nasus</i>
Least cisco	<i>Coregonus sardinella</i>
Humpback whitefish	<i>Coregonus pidschian</i>
Round whitefish	<i>Prosopium cylindraceum</i>
Unknown whitefishes	
Black bear	<i>Ursus americanus</i>
Brown bear	<i>Ursus arctos</i>
Caribou	<i>Rangifer tarandus</i>
Moose	<i>Alces alces</i>
Dall sheep	<i>Ovis dalli</i>
Beaver	<i>Castor canadensis</i>
Coyote	<i>Canis latrans</i>
Foxes	<i>Vulpes spp.</i>
Snowshoe hare	<i>Lepus americanus</i>
Gray wolf	<i>Canis lupus</i>
Wolverine	<i>Gulo gulo</i>
River (land) otter	<i>Lontra canadensis</i>
Lynx	<i>Lynx canadensis</i>
Marten	<i>Martes spp.</i>
Mink	<i>Neovison vison</i>
Muskrat	<i>Ondatra zibethicus</i>
Porcupine	<i>Erethizon dorsatum</i>
Weasels	<i>Mustela spp.</i>
Unknown seals	
Unknown whales	
Bufflehead	<i>Bucephala albeola</i>
Goldeneyes	<i>Bucephala spp.</i>
Mallard	<i>Anas platyrhynchos</i>
Northern pintail	<i>Anas acuta</i>
Unknown scaups	<i>Aythya spp.</i>
Black scoter	<i>Melanitta nigra</i>
Surf scoter	<i>Melanitta perspicillata</i>
White-winged scoter	<i>Melanitta fusca</i>
Unknown scoters	<i>Melanitta spp.</i>
Northern shoveler	<i>Anas clypeata</i>

-continued-

Table 1-2.–Continued.

Unknown teal	<i>Anas spp.</i>
American wigeon	<i>Anas americana</i>
Canada goose	<i>Branta canadensis parvipes</i>
Snow goose	<i>Chen caerulescens</i>
White-fronted goose	<i>Anser albifrons</i>
Unknown swans	<i>Cygnus spp.</i>
Sandhill crane	<i>Grus canadensis</i>
Spruce grouse	<i>Falcipennis canadensis</i>
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>
Ruffed grouse	<i>Bonasa umbellus</i>
Unknown ptarmigans	<i>Lagopus spp.</i>
Duck eggs	
Blueberry	<i>Vaccinium uliginosum alpinum</i>
Lowbush cranberry	<i>Vaccinium vitis-idaea minus</i>
Highbush cranberry	<i>Viburnum edule</i>
Crowberry	<i>Empetrum nigrum</i>
Cloudberry	<i>Rubus chamaemorus</i>
Raspberry	<i>Rubus idaeus</i>
Soapberry	<i>Shepherdia canadensis</i>
Wild rhubarb	<i>Polygonum alaskanum</i>
Indian potato ("roots")	<i>Hedysarum alpinum</i>
Hudson's Bay (Labrador) tea	<i>Ledum palustre</i>
Wild rose hips	<i>Rosa acicularis</i>
Mushrooms	
Punk	
Chaga	<i>Inonotus I. obliquus</i>
Muskrat candy	<i>Myriophyllum spp.</i>
Wood	
Bark	
Other wood	

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

Northway is outside the Copper River basin, but affiliations with residents of the Copper River region are strong and include networks of wild food distribution. This report documents the continued importance of subsistence in Northway. It may also be of use to local and regional advisory councils in making recommendations for regulatory changes. Finally, it will assist the State of Alaska Board of Fisheries and Board of Game and the Federal Subsistence Board in the informed management of fish and wildlife in the region.

Including this survey, ADF&G Division of Subsistence has conducted 5 harvest surveys in Northway. Two comprehensive subsistence harvest surveys occurred in the 1980s. In 1984, researchers surveyed active harvesters about their harvests from June 1983–May 1984 (Case 1986). Because the survey was limited to active harvesters, the data could not be expanded to provide community estimates. However, a portion of those results was included in a report about Copper River salmon use by upper Tanana residents (Haynes et al. 1984). In 1988, researchers surveyed a random sample of 45 Northway community households (50%) about their harvests from June 1987–May 1988 (Marcotte 1991). Quantitative harvest data are available in the CSIS.⁵ The sampling approach allowed for expansion to produce community-level estimates, and thus those results serve as the most useful comparison to the data contained in this report.

The Division of Subsistence implemented 2 limited harvest surveys more recently: a migratory bird survey of Northway Village residents (Andersen and Jennings 2001),⁶ and a nonsalmon fish and large land mammals survey in 2004.⁷ Results from those surveys are also available in the CSIS. Northway also participated in 3 ethnographic studies conducted by or in collaboration with the Division of Subsistence. Haynes and Simeone (2007) provide a rich ethnographic overview of the Upper Tanana region⁸; Friend et al. studied traditional ecological knowledge of nonsalmon fishes from 2003 to 2007⁹; and Andersen et al. (2013) documented observations of climate change in several Alaska communities, including Northway. These and other studies are referenced throughout this report.

CONTEMPORARY SETTING

Northway is a road-accessible Upper Tanana Dineh¹⁰ Athabascan community located near where the Nabesna River and Chisana River join to become the Tanana River, 50 miles southeast of the regional hub, Tok, and 42 miles from the Canadian border. There is a population cluster at Northway Village, 9 miles from the Alaska Highway, and the remainder of the population is spread along Northway Road and the highway, including smaller clusters near Northway Junction.

The upper Tanana River valley is underlain by discontinuous permafrost that has been reportedly thawing in recent years (Andersen et al. 2013). The valley floor is composed of wetlands with complex networks of creeks and lakes, and the surrounding hills are covered with boreal forest or alpine tundra as the elevation increases. One major change to local habitats has been the repeated incursion of silty glacial water into previously clear water that began in the 1970s, and that over time has destroyed the main traditional fishery,

5. ADF&G CSIS

6. Substantial differences in sampling approaches make these data not comparable to the present study, and they will not be used for comparisons in this report; these data are listed under Northway Village in the CSIS.

7. M. Koskey, *Subsistence resource use among ten Tanana River Valley communities, 2004–2005*, unpublished data. The manuscript of this work is on file with ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701. Hereafter *Koskey unpublished*.

8. “We define the Upper Tanana region as the area of eastern interior Alaska populated historically by speakers of the Upper Tanana and Tanacross Athabascan languages” (Haynes and Simeone 2007:5). McKennan (1959:16) did not include Tanacross within Upper Tanana territory.

9. Friend, C., G. Holton, C. Brown, N. Easton, and M. Koskey. *Upper Tanana subsistence fisheries traditional ecological knowledge study*. OSM Project 04-253. The manuscript of this work is on file with USFWS Office of Subsistence Management Fisheries Resource Monitoring Program. Hereafter *Friend et al. unpublished*.

10. Easton uses this form of Dene to “indicate the Aboriginal people of the North who speak or who are descendants of speakers of the Athapaskan language” (Easton 2008:36).

as described in detail in the Discussion and Conclusions chapter. The historical and ecological setting of Northway is more thoroughly described in the Community Background chapter.

Local infrastructure at Northway Junction includes an Alaska State Troopers post and a small store where Naabia Niign, Ltd., a subsidiary of the local Native corporation (Northway Natives Inc.),¹¹ sells limited groceries and local crafts. Other infrastructure includes the Walter Northway (K–12) School, a post office¹², and the Northway Airport, which has a 5,100-foot runway. The community hall, a washeteria and health clinic, and a water treatment plant are located in Northway Village. The Northway Village Council (NVC)¹³ provides pump-and-haul water and sewage services for about one-half of the total households; most of the remaining households have an individual well and full plumbing, though there are a few residences without plumbing.

“The upper Tanana region” is the phrase commonly used to reference the drainage basin surrounding the Alaska Highway between the community of Delta and the U.S.—Canada border, presumably bounded to the north and south by the ridges of the Tanana River watershed. Capitalized, however, “Upper Tanana” may refer to the cultural region that Haynes and Simeone define as “...the area of eastern interior Alaska populated historically by speakers of the Upper Tanana and Tanacross Athabascan languages” (2007:5), or to the Upper Tanana language, or to speakers of the Upper Tanana language (who occupied the eastern portion of the cultural region). The Upper Tanana cultural region extends into the White River watershed (Ladue River to the north, Snag River to the east [in Canada], and the headwaters of the White River to the south), as first described by McKennan (1959:17). The marshy pass crossed by the Alaska Highway on the Canadian side of the border has very gradual relief, and affiliations across both the pass and the border are strong. The Scottie Creek Band of Upper Tanana Dineh, whose territory included areas on both sides of the pass, was fractured by the establishment of the border.¹⁴ Many descendants of the Scottie Creek Band reside in Beaver Creek, YT, which is in the White River drainage. That history and those kin relations are an important part of the cultural geography of the Upper Tanana region. Northway residents maintain kinship connections to other Upper Tanana communities, from Beaver Creek in Canada to Dot Lake in Alaska, as well as beyond to Gakona and Copper Center in the Copper River basin. Many former residents live in Fairbanks or Anchorage and return for important events such as hunting and potlatches.

REGULATORY CONTEXT

ADF&G regulations in Game Management Unit (GMU) 12 include hunting and fishing opportunities for residents (subsistence, personal use, and sport) and nonresidents (sport) on state and federal lands (ADF&G 2013). Northway is within the Tetlin National Wildlife Refuge (TNWR) and near the WRST. As federally-qualified resident zone community members, Northway residents’ customary and traditional use of federal lands in GMU 12 is recognized in federal regulations. Most land north of the Alaska Highway is owned by the State of Alaska, where subsistence opportunities are available to all Alaska residents. Northway residents also obtain resources elsewhere, including nearby parts of GMU 20, especially in the Ladue River basin and along the Taylor Highway, and in the Copper River basin (GMU 11), especially near Slana. The mountainous portion of the WRST is not used by Northway residents as much as in the past, but this survey

11. Native corporations result from the 1971 Alaska Native Claims Settlement Act (ANCSA), which distributed funds and land through the a hierarchical structure of 13 regional corporations and more than 200 village-level corporations in order to compensate Alaska Native people for the lands they relinquished (Arnold 1976; Brown 2004). Both regional and village corporations manage land that was part of the original settlement as well as assets derived from investments for their members.

12. The Northway Post Office was originally established as the Moose Creek Post Office in February 1941 and has been open continuously since then. C. Marunde, Northway Postmaster, personal communication June 22, 2016.

13. In addition to the corporate structure, most rural communities in Alaska also maintain tribal status, a political recognition that reflects a government-to-government relationship with the federal government. Most take 1 of 2 forms: Indian Reorganization Act councils or traditional councils. Most manage the programs for which their members are eligible in addition to local government issues, especially those pertaining to their members (Case and Voluck 2012).

14. The profound effects from and lingering resentment over this fracturing are documented from a local perspective in Easton (2007).

documented some uses in 2014. The regulatory context for Northway residents is complicated by the dual federal and state management of fish and wildlife resources on federal lands, and the many boundaries that residents cross in pursuit of wild foods.

Hunting licenses are required for subsistence hunting, and because of road accessibility, subsistence fishing permits are required for all subsistence fishing in the upper Tanana area (5 AAC 01.230(b)(5)). Salmon do not run in abundance in this area, although spawning-condition salmon are occasionally caught incidentally in nonsalmon nets. There are regulated seasons for locally-available large land mammals and also for most small land mammals on state lands and in the TNWR and WRST (ADF&G 2013; U.S. Fish and Wildlife Service 2012). ADF&G and U.S. Fish and Wildlife Service allow hunting opportunities for moose, caribou¹⁵, black bears, brown bears, and Dall sheep, as well as wolves and wolverines. The harvest of other furbearers and small mammals is less restrictive or not restricted at all, except that trapping requires a license and adherence to seasons, bag limits, and statewide trapping regulations, and there is no open season for beavers under hunting regulations (ADF&G 2013).

Although subsistence fishing permits are required, there are no restrictions on subsistence fishers in the upper Tanana River basin, except that salmon may not be retained. Generally, salmon are not available in the upper Tanana River (except a few in spawning condition), and residents have long acquired salmon from the Copper, White, and Yukon river basins (Case 1986; Haynes and Simeone 2007; Haynes et al. 1984). As Alaska residents, Northway residents are entitled to the same salmon harvest opportunities and regulatory restrictions as other state residents; opportunities to catch Yukon River Chinook salmon have been limited or eliminated in recent years (Brown et al. 2015). Most Northway residents harvest salmon in the Copper River basin portion of the WRST under subsistence fishing permits for a fishery that occurs from the mouth of the Slana River to the downstream edge of the Chitina-McCarthy Bridge in the Glennallen subdistrict (ADF&G Division of Sport Fish 2008). Others fish under personal use permits below that point (ADF&G Division of Sport Fish [*n.d.*]).

STUDY OBJECTIVES

This study estimates Northway's 2014 subsistence harvests and describes the subsistence economy of the community. Specific objectives included:

- 1) Estimate annual harvests and uses of wild fish, game, and plant resources in a 12-month study period by Northway residents, including rates of individual participation in subsistence activities;
- 2) Map areas used for hunting, fishing, and gathering during the 12-month study period;
- 3) Collect demographic information, including community size and composition, ethnicity, birth-place, and length of residency in Northway;
- 4) Document involvement in the cash economy, including jobs and other sources of cash income;
- 5) Evaluate trends in wild resource harvests and current food security conditions;
- 6) Document traditional knowledge observations regarding wild resources;
- 7) Document local concerns about hunting and fishing.

15. Federal regulations provide caribou hunting opportunities for rural resident zone community members east of the Nabesna River; Alaska regulations provide for opportunities for state residents west of the Tok River (ADF&G 2013; U.S. Fish and Wildlife Service 2012).

Table 1-3.—Selected study findings, Northway, 2014.

Category	Community Northway ^b
Demography	
Population	193.8
Percentage of population that is Alaska Native	87.7%
Percentage of household heads born in Alaska	79.5%
Average length of residency of household heads (years)	45.2
Cash economy	
Average number of months employed	9.0
Percentage of employed adults working year-round	53.0%
Percentage of income from sources other than employment	30.2%
Average household income ^a	\$40,602
Per capita income ^a	\$15,295
Resource harvest and use	
Per capita harvest (lb)	313.7
Average household harvest (lb)	832.8
Number of resources used by 50% or more households	14.0
Average number of resources used per household	14.4
Average number of resources attempted to be harvested per household	11.5
Average number of resources harvested per household	10.4
Average number of resources received per household	4.5
Average number of resources given away per household	5.8
Percentage of total harvest taken by top 25% ranked households	72.3%
Percentage of households that harvested 70% of harvest	21.8%
Per capita harvest by lowest ranked 50% of households (lb)	17.2
Percentage of total harvest taken by lowest ranked 50% of harvesting households	5.5%
Average number of resources used by lowest ranked 50% of households	10.3
Average number of resources used by top 25% ranked households	23.2

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

a. Includes income from sources other than employment.

b. Includes 3 census designated places as defined by the U.S. Census: Northway, Northway Junction, and Northway Village.

FINAL REPORT ORGANIZATION

This report summarizes the data from the 2014 study year collected during systematic household surveys and key respondent interviews as well as additional feedback provided at community review meetings in 2015. Qualitative data from the 2015 surveys and interviews is referenced throughout the report. The Community Background chapter includes detailed descriptions of the environmental setting, the historical context, and the role of subsistence. The Results chapter includes tables and figures that show demographic and employment characteristics, individual participation in harvesting and processing of wild resources, characteristics of resource harvests and uses, food security information, and also harvest and use trends over time. Resource harvest maps are included in their respective sections. Table 1-3 shows selected study findings and will be referenced in later discussions of survey results. The Discussion and Conclusions chapter includes a comparison section that discusses harvest patterns as they have varied between study years 1987, 2004, and 2014. The final chapter also includes a discussion of comments given by survey and interview respondents.

2. METHODS

This is the first opportunity ADF&G has had to update comprehensive subsistence practices and levels in Northway (Northway Village, Northway, and Northway Junction) since the 1980s. As mentioned earlier, other data collection efforts have focused only on particular species or sets of species. This study relies on a standard survey instrument developed during a series of surveys conducted by the Division of Subsistence for similar studies in Alaska that have taken place since the 1980s. Many survey questions are the same as or similar to questions in prior harvest assessment tools, so results of these surveys are comparable with past results as well as results from other regions.

ETHICAL PRINCIPLES FOR THE CONDUCT OF RESEARCH

ADF&G Division of Subsistence research is guided by the research principles outlined in the *Alaska Federation of Natives Guidelines for Research*¹ and by the National Science Foundation, Office of Polar Programs in its *Principles for the Conduct of Research in the Arctic*², 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.

GENERAL RESEARCH DESIGN

ADF&G Division of Subsistence utilizes a number of quantitative and qualitative social science research methods to fulfill its mission. The household survey component of this study was quantitative in nature and involved documenting the amount of fish and wildlife resources harvested by a community of users, with the principal unit of analysis being the household. In communities of fewer than 100 households like Northway, researchers attempt to administer the survey using a census approach that includes all households. In the case that some households are unable to participate, survey results are expanded to the whole community based upon the patterns identified in the sample of surveyed households.

Qualitative data in this report come from multiple sources, primarily the 9 ethnographic interviews and the comments provided by survey respondents in February 2015, and also from prior ADF&G and U.S. Fish and Wildlife Service (USFWS) research described below. Although participant observation was not implemented for this project, the lead author had spent considerable time in Northway, including personal participation in harvest activities such as fishing, mushroom picking, and moose hunting with local residents prior to the study year. In 2015, she assisted USFWS biologist Angela Matz in the collection of fish and “root” (Indian potato) samples for contaminants analysis in the ongoing Northway Traditional Foods Survey being conducted by the USFWS for the U.S. Army Garrison at Ft. Wainwright, and she learned additional details about fish and fishing from local fishermen hired for the traditional foods study. Longstanding qualitative issues were discussed in personal and formal conversations with many community residents during the lead author’s doctoral research (2004–2011) as well as at Northway Village Council (NVC) meetings associated with this report and the traditional foods study. References to academic literature, prior ADF&G reports, and USFWS and ADF&G biologists also augment the local ethnography throughout the report.

1. 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>

2. 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>

Project Planning and Approvals

In April 2014, Wrangell-St. Elias National Park and Preserve (WRST) Cultural Anthropologist and Subsistence Specialist Barbara Cellarius approached ADF&G Division of Subsistence to propose a comprehensive harvest survey in Northway to be funded and overseen by WRST and conducted by ADF&G staff. Following confirmation of feasibility by the division's Northern Region Program Manager, James Simon, ADF&G Subsistence Resource Specialist (SRS) Anna Godduhn attended an NVC meeting on October 14, 2014 to describe the proposed project and seek approval. The general process of a comprehensive survey was described and a Northway-specific draft survey form was reviewed by the NVC. The council passed a resolution to support the project (Appendix A) and assisted with refining the list of species to be included on the survey instrument that had been approved by the U.S. Office of Management and Budget on April 20, 2012 for use in the Copper Basin studies.

Systematic Household Surveys

The primary method for collecting subsistence harvest and use information was a systematic household survey. The survey instrument (Appendix B) was structured to collect demographic, resource harvest and use, and economic data that are comparable to information collected in other subsistence harvest surveys and with data in the Community Subsistence Information System (CSIS)³. NVC Tribal Administrator Nicole Rallo provided a list of households in January 2015, and ADF&G finalized the survey instrument in the same month. As noted earlier, the study community of Northway included 3 census designated places: Northway, Northway Junction, and Northway Village.

ADF&G staff arrived in Northway on February 2, 2015 for a local research assistant (LRA) training session that evening. Seven LRAs were initially trained, and 5 participated in the survey effort, as shown in Table 2-1. A short description of the project was delivered to all local U.S. Postal Service addresses to introduce the study and ADF&G staff to the community. With input from the LRAs and the NVC Tribal Administrator, the eligible household list was corrected for minor changes; to be considered eligible for the survey, a household must have been present in the community for at least 6 months in 2014. In total, 73 households were identified as eligible and 55 households (75%) participated in the survey (Table 2-2). Fieldwork occurred February 3–10, 2015. LRAs were responsible for contacting household heads to query willingness to participate and, as appropriate, plan a time for the survey. Surveys were conducted in pairs (one LRA and one ADF&G staff) to share the primary tasks of collecting survey data and mapping resource search areas. During a survey, LRAs took the lead in either asking the survey questions or mapping search and harvest areas. Surveys took an average of 53 minutes to complete; most took about 30 minutes, and a few took much longer (Table 2-3). ADF&G staff coded the surveys and checked the maps, usually on the same day that the survey was conducted.

Confidentiality was maintained through the use of identification codes in place of residents' names or addresses. Households were assigned numerical codes before surveys began. The household code sheet was maintained by SRS Godduhn during survey administration and remained in her custody after the survey was complete. Surveyors had codes only for the households they were assigned to survey. Household code sheets did not accompany surveys when surveys were submitted for data entry and analysis. Following finalization of the data and this report, names were deleted from all retained copies of the household code sheet.

Mapping Locations of Subsistence Hunting, Fishing, and Gathering Activities

During household surveys, researchers asked respondents to indicate the locations of their fishing, hunting, and gathering activities during the study year. In addition, surveyors 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 used standard Division of Subsistence mapping methods. Points were used to mark harvest

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*.

Table 2-1.–Project staff, Northway, 2014.

Task	Name	Organization
Northern Regional Program Manager	James Simon	ADF&G Division of Subsistence
Principal Investigator	Caroline Brown	ADF&G Division of Subsistence
Community Research Lead	Anna Godduhn	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	Marylynn L. Kostick	ADF&G Division of Subsistence
Programmer	Marylynn L. Kostick	ADF&G Division of Subsistence
Data Entry	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	Marylynn 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	Anna Godduhn	ADF&G Division of Subsistence
	Erin Shew	ADF&G Division of Subsistence
	Chris McDevitt	ADF&G Division of Subsistence
	Glenn Helkenn	ADF&G Division of Subsistence
Local Research Assistants	Kelly Frank	Northway
	Shala Sam	Northway
	Michael Murphy	Northway
	Joe Spitler	Northway
	Howard Sam	Northway

Source ADF&G Division of Subsistence, 2016.

Table 2-2.–Sample achievement, Northway, 1987, 2004, and 2014.

Sample information	Study year		
	1987	2004	2014 (This study)
Number of dwelling units	90	80	73
Survey goal	90	80	73
Households surveyed	45	60	55
Households failed to be contacted	-	-	14
Households declined to be surveyed	-	-	4
Households moved or occupied by nonresident	-	-	3
Total households attempted to be surveyed	90	80	73
Refusal rate	-	-	6.8%
Number of eligible households	90	80	73
Percentage of total households surveyed	50.0%	75.0%	75.3%
Expansion weighting factor	2.00	1.33	1.33
Sampled population	162	197	146
Estimated population	324	263	193.8

Source ADF&G Division of Subsistence household surveys, 1988, 2005, and 2015.

Note "-" indicates that data are unavailable.

Table 2-3.—Survey length, Northway, 2014.

Community	Survey length (minutes)		
	Average	Minimum	Maximum
Northway	53	10	159

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

locations and polygons (circled areas) were used to indicate harvest effort areas, such as areas searched while hunting moose.⁴ Some lines were also drawn in order to depict harvesting activity that did not occur at a specific point, such as traplines.

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).⁵ The application was developed by HDR, Inc., an environmental research firm located in Anchorage. Points, polygons, or lines were electronically 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 an appropriate scale and allowed documentation of harvesting activities in any location in the state of Alaska. Once a feature was entered, the researcher filled out details of the effort, including species under pursuit, harvested amount (if any), method of access to the resource, and month(s) of harvest. Paper maps were also available for backup, but were not needed during the surveys.

Once a survey was complete, researchers matched the mapped data to the survey form to ensure all provided map data had been documented. This quality control exercise was completed in the field before the surveys were submitted to the lead researcher. The data were synchronized between iPads, and researchers verified that the household data had been uploaded to the HDR server via wireless network. Once data collection was complete, the data were downloaded into an ArcGIS file geodatabase. At the end of the field season, the geodatabase was delivered to the Information Management (IM) staff of the Division of Subsistence for analysis.

Key Respondent Interviews

Researchers consulted with NVC members and LRAs to identify key respondents. The purpose of the key respondent interviews was to provide additional context for the quantitative data and also to inform the community background chapter, as well as the seasonal round, comparison, and community comments and concerns sections. Davis and Ruddle (2010:891) stress the importance of a systematic methodology for gathering local knowledge primarily through peer recommendations. Semi-structured interview protocols provide a format for systematically documenting comparable information about the same or an overlapping set of topics in a community while providing flexibility for each key respondent's level of expertise, experience, and focus. Prior to fieldwork, the NVC and other community members assisted researchers in identifying individuals considered to be knowledgeable about aspects of subsistence. Researchers used a snowball method to learn about other local experts. Researchers conducted 9 interviews with 10 individuals; all invited key respondents participated in an interview. The interviews followed a semi-directed interview protocol designed by ADF&G researcher Robbin La Vine for the Copper Basin studies, which researchers modified slightly for use in the upper Tanana region (Appendix C). Key respondents were informed that in order to maintain anonymity, their names would not be included in this report. Interviews were all conducted by the lead author; 8 of 9 were recorded; the ninth interview was short and limited in scope. The recordings were transcribed by ADF&G staff in Fairbanks, and they were reviewed and analyzed by the lead author with reference to prior qualitative information and academic literature.

4. Large land mammal harvest sites were recorded, but are not included on the published maps.

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

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. Coded and checked surveys were reviewed by the project lead prior to sending the surveys to IM staff for data entry. IM 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 internal network. 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 edible weight using standard factors (conversion factors are listed in Appendix D).

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 “non-response” 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:

$$H_i = \bar{h}_i S_i \quad (1)$$

$$\bar{h}_i = \frac{h_i}{n_i} \quad (2)$$

where:

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

\bar{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 constant for 95% confidence limits is 1.96. Though there are numerous ways to express the formula below, it contains the components of a SD, V, and SE:

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

where:

s = sample standard deviation,

n = sample size,

\bar{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 CSIS. This publicly-accessible database includes community-level study findings.

Population Estimates and Other Demographic Information

As noted above, one objective of the research was to collect demographic information for all eligible households in Northway. For this study, eligibility was defined as being domiciled in the community for at least 6 months during the study year of 2014. Because not all eligible households were surveyed, population estimates were calculated by multiplying the average household size of surveyed households by the total number of year-round households, as identified by Division of Subsistence researchers in consultation with community officials and other knowledgeable respondents.

There may be several reasons for the differences among the population estimates 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.), including the complication of combining 3 census designated places (CDP) and including a few households near, but outside, these 3 CDPs. Sampling of households, depending on eligibility criteria or timing of surveys, may explain differences in the population estimates. As more fully described in the Demographics section of the Results chapter, the sample was not equally representative of the 3 CDPs.

Map Data Entry and Analysis

As discussed above, maps were generated based on data collected using an iPad. All data were entered on the iPad in the field during surveys and checked 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 10.3 using a standard template for reports. Maps show harvest locations for fish (salmon and nonsalmon), harvest areas for plants and berries and birds, and hunting areas for land mammals. To ensure confidentiality, harvest locations for large land mammals are not included in maps produced for the report. Community-level mapped data were somewhat dominated by a single household's large search and harvest area for all categories. Maps were reviewed at the November 2015 community review meeting to ensure accuracy as well as identify any data the NVC would like to keep confidential. The council did not identify any confidential information, and it did not recommend going back to that household to refine the maps.

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, modified to account for both subsistence sources and market sources. The protocol modified for this survey was the 12-month food security scale questionnaire developed by the U.S. Department of Agriculture (USDA). The standard 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.

For Division of Subsistence research, the food security protocol was modified by the addition of several questions designed to determine whether food insecurities, if any, were related to subsistence foods or store-bought foods. Additionally, the wording of some questions was changed slightly. As in Brazil (Pérez-Escamilla et al. 2004), the USDA term "balanced meals" was not necessarily interpreted consistently among Alaskans, and was replaced with the term "healthy meals" to reflect unique dietary and cultural circumstances in rural Alaska.

In 2015, Division of Subsistence added a filter question to reduce the number of questions asked to food secure households. Households agreeing with the statement "We had enough of the kinds of foods we wanted to eat" were considered food secure and were not asked about increasingly severe instances of food insecurity.

Community Review Meetings

Following a request from the Northway Village Council for expedited data, ADF&G staff presented preliminary survey findings at an NVC meeting on June 13, 2015; 15 community members attended the meeting, including all NVC members. At the meeting, the lead researcher reviewed the results, verified that conversion factors were locally applicable, described qualitative themes heard during interviews, and discussed details not fully described by survey and key respondents. Adjustment to conversion factors (primarily of moose) was needed, and the resulting adjusted harvest estimates were reviewed at another NVC meeting, on November 10, 2015; 12 people were in attendance, including 5 NVC members. Also at this second review meeting, qualitative issues such as changing habitats were discussed to clarify the lead author's understanding of certain details.

In July 2016, ADF&G provided a review draft of this report to the NVC, Northway Natives Inc., and other community members as well as the funding agency (WRST), and original authors of the unpublished traditional knowledge study described below. In October 2016, the revised draft was provided to the Tetlin National Wildlife Refuge (TNWR) manager and ADF&G's Tok-area biologists. After receipt of comments, the report was finalized. ADF&G mailed a short (6-page) summary of the study findings to each household in the study community.

UNPUBLISHED RESEARCH CONDUCTED IN NORTHWAY

In the early 2000s, ADF&G Division of Subsistence collaborated with TNWR on 2 projects in the upper Tanana region, the results of which were not fully published. A third ADF&G project was conducted in collaboration with Research North in 2010–2011. Data from these projects are included in this report. The following sections provide a description of each project and its methods.

Tanana River Valley Subsistence Harvest Baseline Project

Northway was included in a larger project that documented the subsistence harvest and use of nonsalmon fishes and land mammals in 10 Tanana River communities⁶. In 2005, ADF&G researchers surveyed 60 out of 80 eligible Northway households to collect subsistence harvest and use information including the areas used during the study year January 1 through December 31, 2004 (Appendix E).⁷ The nonsalmon component of the 2005 survey was funded by the USFWS Office of Subsistence Management (OSM), and the land mammal component was funded by the Alaska Department of Natural Resources and ADF&G.⁸ Additionally, surveyors asked each household to describe of the amount of time spent hunting moose and the availability of moose as compared to 5 years earlier and 10 years earlier. The study provided quantitative results that are available on the CSIS, but not yet available in print. Although the data collection in 2005 was limited in scope, standard Division of Subsistence analytical methods described above were used for the nonsalmon fish and land mammal survey analysis. Accordingly, results of the 2005 survey are comparable to the land mammal and nonsalmon fish data for 1987 and 2014. Existing salmon harvest data from postseason surveys for 2004 are also included in the Discussion and Conclusions chapter, corrected from the original publication by respective area offices (Fall et al. 2007).⁹

Upper Tanana Subsistence Fisheries Traditional Ecological Knowledge Study

This study also includes results from a 2003–2007 study on Upper Tanana traditional ecological knowledge of nonsalmon fishes.¹⁰ The research was conducted at the request of 5 village councils (Northway, Tetlin, Tanacross, Dot Lake, and Healy Lake), the USFWS Eastern Interior Regional Subsistence Advisory Council, and the TNWR. The project was funded by the USFWS Office of Subsistence Management. The communities each expressed concerns about the quantity, quality, and health of fish in their area compared to earlier times. The collaborative project, led by TNWR Tribal Liaison Constance Friend (USFWS, now retired), documents rich ethnographic details of local fisheries across the Upper Tanana region. Friend, ADF&G Division of Subsistence staff, and other collaborators conducted working group meetings and

6. Manley Hot Springs, Minto, Nenana, Healy Lake, Dot Lake, Tanacross, Tok, Tetlin, Northway, and Eagle (Eagle is on the Yukon River, but is connected to the upper Tanana region by road).

7. M. Koskey, *Subsistence resource use among ten Tanana River Valley communities, 2004–2005*, unpublished data. The manuscript of this work is on file with ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701. Hereafter *Koskey unpublished*.

8. M. Koskey, *Briefing paper (2/1/06): Tanana River Valley subsistence harvest baseline project*, unpublished document, 2006. Unpublished data are on file with ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701.

9. M. Somerville, ADF&G Fisheries Biologist, personal communication, June 10, 2016; and D. Jallen, ADF&G Fisheries Biologist personal communication, January 4, 2016.

10. Friend, C., G. Holton, C. Brown, N. Easton, and M. Koskey. *Upper Tanana subsistence fisheries traditional ecological knowledge study*. OSM Project 04-253. The manuscript of this work is on file with USFWS Office of Subsistence Management Fisheries Resource Monitoring Program. Hereafter *Friend et al. unpublished*.

in-depth interviews with elders and knowledgeable fishers. Additionally, the TNWR and the Alaska Fire Service sponsored an Upper Tanana Cultural Resources Summit “to dialog (*sic*) about Upper Tanana Native perspectives and priorities concerning cultural sites and resources and their preservation and protection.”¹¹ Qualitative discussion of fisheries was an important component of the meeting and contributed both information and further questions to the research.

A public report was drafted but not completed.¹² Some of the findings from that study are included in this report, primarily information that came from the interviews in Northway and Beaver Creek. In Northway, 9 semi-structured interviews were conducted by Melissa Robinson (University of Alaska Fairbanks) and Caroline Brown (ADF&G). In Beaver Creek, YT, interviews were conducted by Friend and Norman Easton (Yukon College). Gary Holton of the Alaska Native Language Center provided linguistics expertise. This report includes edited sections from that draft report with the permission and review of the original authors.

Climate Change and Impacts on Subsistence Fisheries in the Yukon River Drainage, Alaska

In 2011, Northway was included in a collaborative project between Research North and ADF&G Subsistence Division to explore and document local knowledge of ecological conditions and perceptions of change related to subsistence fishing (Andersen et al. 2013). The ethnographic project used cultural consensus analysis (Carothers et al. 2014) to analyze local knowledge regarding environmental change in 6 communities across Interior Alaska. This method involved developing a list of approximately 25 statements about observed environmental change gleaned from extensive ethnographic interviewing in all of the participating communities and testing those statements for agreement or disagreement with a much broader set of fishers in each community (Andersen et al. 2013). In Northway, ADF&G staff member Brittany Retherford and local research assistant Kelly Frank conducted these statement surveys with 31 households.

11. USFWS Alaska Region, 2005. “Refuge Co-Hosts Upper Tanana Cultural Resources Summit.” Accessed September 20, 2016. <http://www.fws.gov/fieldnotes/regmap.cfm?arskey=15350>.

12. Friend et al. unpublished



Plate 3-1.—The Black Hills, the Nutzotin Mountains, and, in the far background, the Wrangell Mountains make up the southern horizon.

3. COMMUNITY BACKGROUND

ENVIRONMENTAL SETTING

The upper Tanana River basin lies between the Yukon-Tanana Upland and the Nutzotin Mountains, the easternmost extension of the northern foothills of the Alaska Range (Plate 3-1). Immediately south of those foothills, the Chisana and Nabesna glaciers flow from the Wrangell and St. Elias mountain ranges, which rise to over 16,000 ft (4,267 m). The valley floor is characterized by meandering streams and muskeg (Brabets et al. 2000:37) and is underlain by discontinuous permafrost that has warmed or thawed in recent decades, affecting hydrology and ecological habitats across the state and locally (Osterkamp et al. 2009; Reger et al. 2012). Thick beds of loess (windblown silt) and lenses of volcanic ash deposits are found throughout the region (Brabets et al. 2000:43–45; Easton et al. 2011). Geologic activity in the area can be dramatic: in 2002, an earthquake that registered 7.9 on the Richter scale shook the region and caused extensive damage to the Northway Airport runway, which lies at an elevation of 1,720 ft (524 m). According to the U.S. Geologic Survey (USGS), the runway was rendered unusable because of liquefaction, a phenomenon in which prolonged shaking transforms sediments into a slurry (Fuis and Wald 2003). Northway respondents also described changes to hydrology that were exacerbated by the earthquake, leading to repercussions with fish and muskrats, as summarized in the Environmental Change section of the Discussion and Conclusions chapter.

Seasonal variation in temperatures is extreme, with a summer mean temperature of 56°F and winter mean temperature of -13°F.¹ Historical weather data for Northway indicate that annual mean temperature has

1. Western Regional Climate Center. 2016. “Northway AP, Alaska (506586).” Accessed September 20, 2016. <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ak6586>; data collection and analysis methods may have changed between periods of record (Anthony Arguez, NOAA National Centers for Environmental Information Center for Weather and Climate, personal communication, April 12, 2016).

increased, with the most dramatic warming shown in winter: the estimated mean January temperature for 1981–2010 (-14.8°F) is 4.3°F higher than for 1961–1990 (-19.1°F). Most precipitation falls in summer as rain; the average annual 10.2 inches (1949–2012) includes an average of 37.2 inches of snow. Historically, freeze-up began in late September such that lakes and streams were frozen from October to mid-May (Hosley 1981). More recently, freeze-up is slowed or interrupted by warm weather in the late fall, finally freezing solid in late November; breakup usually begins in April (Plate 3-2).

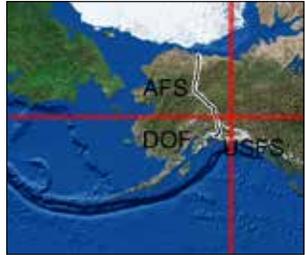
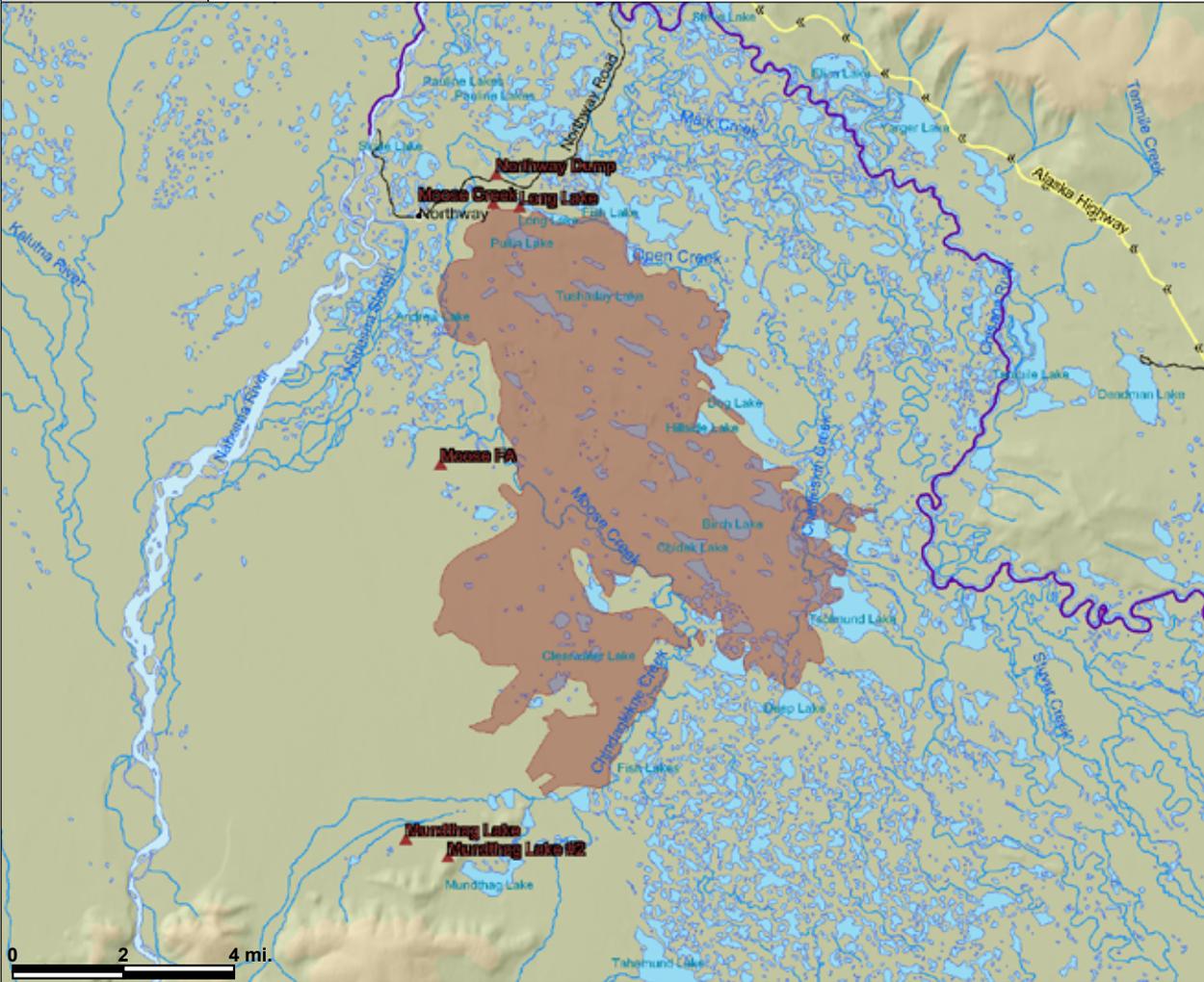
Land on the valley floor is covered with sphagnum and feather mosses, sedges, blueberry, bearberry, and Labrador tea. It is dotted with oxbow lakes and other small lakes ringed with willows. Thickets of black spruce and scattered growth of dwarf birch, alder, and willow crowd any rises in the valley landscape, shading ground patches of cranberry and wild rose. The surrounding hillsides support alternating and mixed patches of white and black spruce, birch, alder, and aspen trees, and a variety of shrubs. Due to the presence of near-surface permafrost, north-facing hillsides are predominantly black spruce, a pyrogenic species with shallow roots that grows well in permafrost soils. The landscape is increasingly prone to wildland fires, which affect subsistence opportunities (Chapin III et al. 2008). This vulnerability was profoundly exhibited in the summer of 2015, when several subsistence camps burned, and residents were busy with protective measures (Figure 3-1).

The basin supports multiple fish and mammal species and is an important component of the Pacific Flyway for migratory birds (Table 1-2). Large land mammals include moose, black and brown (grizzly) bears, Dall (mountain) sheep, and caribou of the Nelchina, Macomb, Fortymile, and Chisana caribou herds. Primary furbearers include wolves, lynx, wolverines, beavers, muskrats, river otters, and snowshoe hares.



Plate 3-2.—Freeze-up on the Chisana River begins in October, but in recent years has faltered in November. Chisana River in October 2014 (top) and November 2015 (bottom).

Fire footprint near Northway, 2015



Legend

- Elevation Meters**
- 0-250
- 251-500
- 501-750
- 751-1000
- 1001-1250
- 1251-1500
- 1501-1750
- 1751-2000
- 2001-2500
- 2501-3000
- > 3001
- Background
- Out of range
- Temporary Flight Restrictions**
- Towns**
- Municipality
- Home Rule City
- Other Towns
- All NHD Lakes**
- Lake/Pond
- Ice Mass
- Swamp/Marsh
- Reservoir
- NHD River Areas**
- Stream/River
- Area of Complex Channels
- Rapids
- Bay/Inlet
- NHD Rivers**
- Yukon Roads**
- Primary
- Secondary
- Road

0 2 4 mi.

This map is a user generated static output from an Internet mapping site and is for general reference. Data layers that appear on this map are obtained from many sources. This map is not to be used for navigation.

Notes: http://afsmaps.blm.gov/imf_firehistory/imf.jsp?site=firehistory

Scale: 1:176,049

Map Created:
May 26, 2016 11:59:51 AM
on the AICC Mapping Site

Figure 3-2.—The 2015 wildland fire season burned substantial acreage close to Northway (Alaska Interagency Coordination Center 2016).

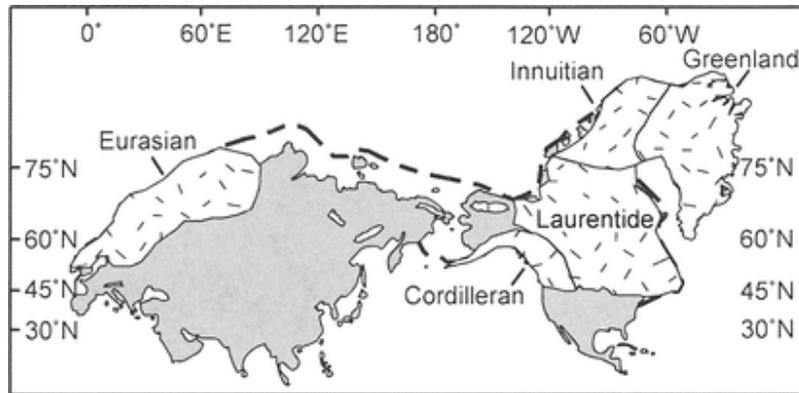


Figure 3-3.—The upper Tanana River basin is located in the unglaciated wedge between the Cordillera and Laurentide ice sheets (Walteri et al. 2004).

Preeminent among the fish species are humpback whitefish, Arctic grayling, northern pike, burbot (locally called lingcod, mudshark, or lush), and longnose suckers. Nearly all of these animals and plants were long used by the Upper Tanana Dineh for food, medicine, lodging, and other needs (Case 1986; Haynes and Simeone 2007); most still are, although nonfood uses have generally shifted from the construction of shelter and equipment to the production of crafts for gifts and sale.

HISTORICAL CONTEXT

Despite the proximity to contemporary ice fields, the Tanana River basin and the hills and small mountains to the north were not glaciated during the last glacial period (Waltari et al. 2004). Thus, the study area was once along the eastern edge of ice-free Beringia (Figure 3-2). Likewise, oral history extends occupation of the upper Tanana region to back to the last ice age (Easton 2001). For example, Bessie John, a Scottie Creek elder, said in 1996,

Oh yeah, special places like Scottie Creek. That's old, old land there. My old people say that when the glaciers, you know, ice everywhere, all around Yukon, that place was okay. Lots of old-time animal, like elephant, cat. Scottie Creek had no glacier and that's where Indian people lived that time. They hunted elephant for food, meat like moose. That place has got lots of elephant bones and other old animal bones. (John 1996)

Ongoing archeology in the Alaska/Canada borderlands region continually adds to physical evidence of ancient history that substantiates and illuminates oral history, including that “the earliest occupants of the Little John site...[approximately 14,000 years ago] appear to have predominantly hunted bison, wapiti, and caribou” (Easton et al. 2011).

Travel routes through the Upper Tanana region and to areas such as Ahtna Athabascan territory in the Copper River drainage and Han Athabascan territory along the Yukon River were maintained long before the first Euro-American expeditions in the late 1880s and the establishment of trading posts (Haynes and Simeone 2007:18–20). There was no international boundary, and life revolved around the local ecology. McKennan identifies the nuclear family as the basic unit of social organization (1969:116). People lived in small groups, generally extended family units; multiple groups in a particular area made up a band (McKennan 1969). The territory of each band overlapped with immediately adjacent bands, although the boundaries were flexible (Figure 3-3). The distinction between groups in the Upper Tanana cultural region is complicated by fluidity of the member populations and by flexibility in the cooperative efforts that sometimes included just part of a local band, but other times included members of multiple bands (McKennan 1959:17–18). Likewise, McKennan notes that culture in the Upper Tanana region consists “not of a series of discrete cultural blocks but rather something of a cultural continuum carried by a series of interlocking local bands whose micro-cultures differ in only minor details from those of their immediate

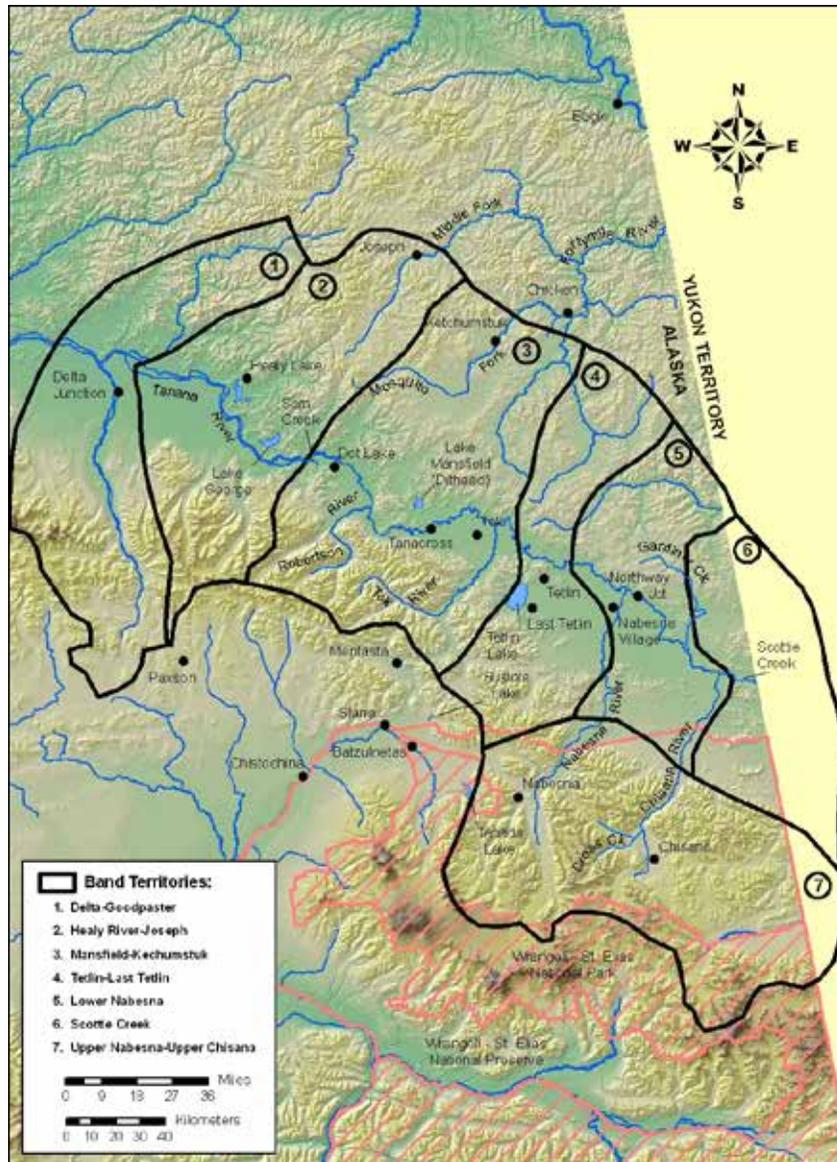


Figure 3-4.—Band territories and villages, Upper Tanana region (Cellarius et al. 2008).

neighbors” (1969:98). Indeed, most contemporary Northway residents maintain kinship ties throughout and beyond the Upper Tanana region (Haynes et al. 1984; 2015 surveys; 1506), as demonstrated in this report by the distribution of Copper River sockeye salmon to Northway households. The speed of social change has been especially dramatic in the eastern upper Tanana basin; the first local encounter with white miners was documented in 1898 (Madison and Yarber 1987) and the only road into Interior Alaska was constructed just over 40 years later (Coates 1985).

Western explorers had arrived in the Yukon River drainage from the east, over the Chilkoot Trail to the headwaters, and from the west, up the Yukon River. The Schwatka Expedition of 1891 traversed the fringe of Upper Tanana territory as it ascended the White River and descended the Copper River (Hayes 1898:133). However, no official expedition made it into the upper Tanana River drainage until 1885 (McKenna 1959:25–27). The Allen expedition came through the minimally-mapped Alaska Range to arrive at the Tanana River near what quickly became known as Tanana Crossing (Tanacross) before going downriver to the west (King 2004), missing the eastern upper Tanana basin. The Brooks expedition was the

first to document accessing the eastern upper Tanana region; the explorers ascended the White River and descended the Nabesna River in 1898 (Capps 1916:10–11), finding remnant populations of Upper Tanana Dineh—dramatically decreased by epidemics that preceded actual contact (Guédon 1974:10; McKennan 1959:19)—and prospectors followed. Essentially nothing was written of the Upper Tanana populations during the survey of the international boundary between the United States and Canada, but that history and the story of the first trader in the area (at Scottie Creek) have been told in retrospect by Norman Easton, based largely on local knowledge in the borderlands region (Easton 2007).

The Chisana Stampede in 1913 brought steamboats and prospectors as far upriver as they could go—not much farther than the confluence of the Nabesna and Chisana rivers, which become the Tanana River very close to Northway. Staging areas became the sites of the early trading stations, drawing members from the 4 regional bands² to settle in the forming village of [lower] Nabesna³ on the west bank of the Nabesna River (Guédon 1974). A key respondent in 2015 described stories he had heard as a child of how the stampede had also drawn much of the population from the valley floor to mining settlements in the mountains to the south, especially Chisana and also [upper] Nabesna, where there had long been winter settlements (1506). Natives there earned money or trade goods by washing clothes and procuring food for the miners, and some tried a hand at prospecting (1506). The heavy stampede was short, and local social and environmental effects were not well documented. However, hunting pressure on moose, caribou, and mountain sheep was substantial, especially in the mountains around the mines, where approximately 2,000 sheep were killed in a single winter (Capps 1916:21). Following the brief 1913 stampede, some miners lingered, but most of the visiting Native population returned north to lower elevations of the upper Tanana basin (Tetlin, [lower] Nabesna, Scottie Creek), or east into the Copper Basin (Mentasta, Slana, Copper Center), and continued their semi-nomadic lives, incorporating the use of dry goods, which remained available by fur trading (1506).

During the 1920s and 1930s, there was again little outside interest in the area. In 1940, [lower] Nabesna Village flooded and residents began to move across the river, calling the site Northway Village; the residence of Chief Walter Northway served as the first schoolroom, beginning in 1939 (Northway Village Council and Tanana Chiefs Conference, Inc. 2015:7), and the Bureau of Indian Affairs (BIA) established a school in 1941 (Barnhardt 1985).

World War II brought dramatic change to the relative quietude of the region when the Northway Staging Field was constructed along the Nabesna River just upstream from Northway Village as part of the Lend-Lease Program to supply aircraft to Russia (Hays 1996). Materials arrived by air from [upper] Nabesna, in the headwaters of the river about 50 miles south. In 1941, an initial landing strip was built, with local assistance, and about 1,100 tons of cargo—“everything needed to run a full scale war time airfield,” including 6 modern homes complete with silverware and curtains—was delivered by airplane except some extraordinarily heavy equipment that was hauled overland with the assistance of Native guides (Day 1957:219). The airfield is midway between Whitehorse and Fairbanks; it was a busy fueling station during the war, the fuel brought on barges by the barrel. The Alaska Highway was constructed in 1942 to support the flight path and open ground transportation into the Territory of Alaska⁴. “During the height of operations [in the early 1940s] at Northway, hundreds of buildings were built, including aircraft hangars, warehouses, movie theaters, garages, warehouses, a sawmill, powerhouse, machine shop, and dozens of barracks.”⁵

2. In the far eastern portion of the Tanana River drainage, indigenous bands included the Lower Nabesna, Scottie Creek, Upper Nabesna, and Upper Chisana bands. McKennan (1959:17–18) noted only 3 bands, but later research indicates that the Upper Chisana and Upper Nabesna bands had begun to combine their territories and efforts by the time McKennan arrived (Case 1986:23).

3. The settlement of Nabesna in the headwaters region of the Nabesna River (“[upper] Nabesna” in this report) is sometimes confused with Northway’s former location across the Nabesna River from the current location, which was called Nabesna in the 1920s and 1930s.

4. Alaska became a state in 1959 ([72 Stat. 339] Public Law 85-508, 85th Congress, H.R. 7999, July 7, 1958)

5. Alaska Department of Environmental Conservation, Spill Prevention and Response. 2011. “Northway Staging Field.” Accessed September 20, 2016. <https://dec.alaska.gov/spar/csp/sites/northway.htm>

It was an exciting if confusing time for local residents, who welcomed the plan to build a road connecting Upper Tanana communities to each other and the outside world.⁶ The developments provided additional incentive to live in the village or nearby: local residents earned money clearing brush, trapping furbearers, doing laundry, and tanning and sewing skins. The money earned from these activities enabled them to take advantage of new technology, for example traveling to Tetlin by airplane instead of by dogsled. However, the highway and the military site came with significant costs that were not recognized for decades. Medical treatment, wage labor, groceries, alcohol, tobacco, petroleum and petrochemicals, and traffic became increasingly standard features of community life. Access to medical treatment was particularly important with the influx of new epidemics during this time (Cruikshank 1985). For example, one key respondent remembered being taken to the “TB hospital” in Seward when she was a young girl in the 1940s. She said “I’m glad I had TB...If it wasn’t for TB, I wouldn’t, I don’t think I would have known the outside world” (1505). The Army left the area shortly after the war’s end but the airfield remained active through the Cold War.

The 1950s and 1960s were a busy time, with the continued practice of subsistence from fishing and hunting camps; use of several dog teams for hauling wood, running trap lines, and racing in carnivals; and continued integration of cash into the local economy (1503, 1506, 1507). There were 2 grocery stores, a movie theatre left by the Army, and several roadhouses along the highway where local residents danced on the weekends (1506). The village population continued to grow as more families settled permanently in Northway, though many elders continued to live in the camps. The homes built at the airfield in 1941 were occupied by Federal Aviation Administration families into the 1970s, when the operation was downsized and much of the airfield property was transferred to the State of Alaska.

Although change had already been dramatic, people in Northway have noted that events of the 1970s, including the fruition of concerns about leftover pollution, had more dramatic effects on subsistence than the wartime activity itself (Godduhn 2011:9). The 1971 Alaska Native Claims Settlement Act prompted Native allotment claims; commodities and wage labor became more available as traffic on the highway increased. The Tetlin National Wildlife Refuge and the Wrangell-St. Elias National Park and Preserve were created by the Alaska National Interest Lands Conservation Act in 1980. The TNWR surrounding Northway includes 682,604 acres of land: mostly wetlands that provide habitat for fish, resident and migratory birds, ungulates, and small mammals.⁷ There are many private inholdings, Native allotments, and local and regional Native corporation lands (Northway Natives Inc., and Doyon, Ltd.) scattered throughout the area, especially along Northway Road and the Alaska Highway.⁸ Major remediation of contaminated sites occurred in the 1980s and 1990s. The airfield was subject to substantial earthquake damage in 2002, and repaired to its full 5,100 ft length in 2008 (Homer 2013). The airfield now includes an active U.S. Customs and Border Protection station on site, although the lodge, hanger, and fuel service have been closed since the discovery of a petroleum plume in 2010.⁹

THE ROLE OF SUBSISTENCE

Contributions from Connie Friend, Norman Easton, Gary Holton, and Caroline Brown.

Multiple ethnographic accounts that describe the people and culture of the Upper Tanana region with particular attention to the role of subsistence predate the ADF&G subsistence research described in the Introduction chapter. The foundational ethnography of the region, *The Upper Tanana Indians*, by Robert

6. A. Gallen, Northway resident, personal communication, November 11, 2015.

7. USFWS Tetlin National Wildlife Refuge. 2016 “About the Refuge.” Accessed October 19, 2016.
<https://www.fws.gov/refuge/Tetlin/about.html>

8. Doyon, Limited. 2016. “Our Lands: Northway.” Accessed September 20, 2016.
<https://www.doyon.com/our-corporation/our-lands/northway/#dropdown-nav>

9. Fairbanks Daily News Miner. 2010. “Lodge, hangar, fuel service to close at Northway Airport.” Accessed September 29, 2016.
http://www.newsminer.com/news/local_news/lodge-hangar-fuel-service-to-close-at-northway-airport/article_06848ec0-a3b2-52d4-a8e0-24fc0df5d66e.html

McKenna, was the first comprehensive description of the people who were, at the time of his initial fieldwork in 1929–1930, “free from mission influence” and had very limited access to heavy trade items (McKenna 1959:26) despite the establishment of a mission at Tanana Crossing (Tanacross) in 1914 (Simeone 2007). McKenna’s early work was later augmented by fieldwork in the 1960s and 1970s (1981:576) and the recent publication of his detailed field journals (McKenna 2006), both of which add nuance and detail to the formal ethnography, especially with respect to social change in the mid-1900s. Guédon’s “People of Tetlin, Why are you singing?” focused on kinship and social structure, and the cooperative production of food and other material needs through subsistence (Guédon 1974). Twenty years later, Simeone (1995) described the regionally-significant potlatch ceremony and its role as a method of sharing wealth while promoting cooperation and other traditional values in *Rifles, Blankets, and Beads: Identity, History, and the Northern Athapaskan Potlatch*. This work is focused on Tanacross and discusses the influences of trade goods and attendant epidemics that arrived long before Euro-Americans and unsuccessful attempts by missionaries to eliminate the potlatch ceremony in the early 20th century. More recently, Haynes and Simeone (2007) synthesized these and other earlier ethnographic accounts to provide rich detail of many aspects of Upper Tanana culture, the evolution of the mixed subsistence-cash economy, and change in the 20th century. The work also includes a comprehensive annotated bibliography. Substantial work since 2007 includes a thesis that integrates local and scientific knowledge of area humpback whitefish (Robinson 2005), a dissertation regarding military waste sites (Godduhn 2011), and a study of environmental observations related to climate change (Andersen et al. 2013), all referenced in this report.

McKenna (1959:34) describes the seasonal round followed by Upper Tanana people in the late 1920s, noting that fishing efforts had intensified. Mining activities had led to a depletion of caribou, and the use of dogs to support an active fur trade had increased the need for dog food. According to Chief Sam, who was trapping “about the mouth of the Nabesna” in the winter of 1929–1930,

In the old days the people seldom stayed in the village. Always they were on the trail, hunting and camping. In July, whitefish were dried and cached at the Fish Camp. Then the people went moose hunting, caching the meat. In the winter they visited the caches and then when the caribou came they killed caribou. After the moose season [August] the people went up to the head of the Nabesna to secure sheepskins for winter. Then they would return to the village; make their cloths; and then take the winter hunting trails to Ladue [River drainage], the Chisana Basin, and the White River, in the spring when the leaves were coming out they returned to the village. They would take birch bark and sew it together to make new tents and the wait for the caribou to come back again. (McKenna 1959:46)

This semi-nomadic life was characterized by flexible associations of families linked by complex networks of kinship, marriage, sharing, and trade, briefly described above. Many aspects of annual cycles and associated relationships are described in *Ttheek’ädñ ut’iin yaaniidq’ oonign’*: *Old-time Stories of the Scottie Creek People* (Tyone and Kari 1996).

In the spring, just before snowmelt and the breakup of river ice, Upper Tanana Dineh would move their camps into the lowlands to favored fishing sites (Plate 3-3). At the fish camps they would erect bark-covered huts and prepare their dip nets and canoes, continuing to hunt for moose as well as muskrat and beaver. Following breakup, stone and willow weirs were repaired or constructed and intensive fishing began. Because few salmon reach the upper Tanana River system, the fisheries have always centered on humpback whitefish, the only abundant fish in the Nabesna and Chisana rivers or their tributaries. Some of this catch would be stored in ground caches for use later in the summer.

Greens were abundant in the summertime. One notable traditional food in the Upper Tanana was the root of an aquatic plant described as sweet and celery-like, locally called “muskrat candy.”¹⁰ This was a popular food for people, swans, muskrats, and other animals. The roots could be acquired fresh from creek bottoms

10. Haynes and Simeone (2007:24) identify “muskrat candy” as the watermilfoil *Myriophyllum spicatum*, which is native to Europe, Asia, and northern Africa, but invasive to North America. The more likely species is the northern watermilfoil *M. sibiricu*.



Plate 3-3.—End of the fishing season at Fish Camp, circa 1950.

in summer. One of this study's key respondents described women and children working together to collect muskrat candy at Fish Camp when he was a child. The kids would get into Fish Creek upstream from the women and kick and pull the plants up so that they would float down to the women, also in the water and ready to receive them (1506).

In late July, people in the fish camps would disperse. Most of the men traveled into the mountains to hunt sheep with snares or bows with copper-tipped arrows for their meat, skins, and horns, while most of the women, children, and elderly people would remain in the lowlands, continuing to fish and snaring marmots and Arctic ground squirrels to eat and make blankets from their skins (Easton 2007). As the cooler weather began to descend in late August, the Dineh moved into upland villages and smaller camps to hunt migrating caribou, often by constructing barriers or fences, which would either concentrate a group of animals for easy dispatch or direct them into snares.¹¹ Caribou skins were used for clothing and shelter, and their bones were crafted into tools such as skin scrapers, needles, awls, and hunting points. Some of the favored 19th century locations for hunting caribou included the upper Scottie Creek valley, the headwaters of Beaver Creek, and along extensive fences built for the purpose such as near Kechumstuck and in the lower White River. Much of the caribou meat was dried and stored to supply the major part of the winter food. The meat was supplemented by fish that had been harvested and dried in summer or caught through the winter lake ice, and moose, which were hunted opportunistically throughout the year. People could also take muskrat

11. Friend, C., G. Holton, C. Brown, N. Easton, and M. Koskey. *Upper Tanana subsistence fisheries traditional ecological knowledge study*. OSM Project 04-253. The manuscript of this work is on file with USFWS Office of Subsistence Management Fisheries Resource Monitoring Program. Hereafter *Friend et al. unpublished*.



Plate 3-4.—Northway hunters and fishers teach youth traditional knowledge and practical skills.

candy from muskrat caches in winter, in exchange for a piece of cracker or fish (1506). The constant need for firewood likely dominated outdoor activity in the winter; when not searching for firewood, people spent time repairing equipment and trapping furbearers for their thick winter coats.

Although some of the details have changed, many of these patterns still hold true, and hunting and fishing are still integral parts of growing up in Northway (Plate 3-4).

Terrestrial Animals and Hunting

Easton has described in detail how hunting reaches into the personal identity, social relations, and moral values of Upper Tanana culture; the experience of “hunting” extends far beyond the mere provision of calories and raw materials into seemingly unrelated daily activities through social mores and an obligation of reciprocity to the land (Easton 2008). The following narrative describing traditional hunting practices is largely drawn from McKennan’s work and augmented by key respondents who remember the transition to a more modern life during their youth. McKennan retained present tense for descriptions of 1929–1930, although that writing was published much later (1959).

Caribou was a predominant food early in the 20th century. McKennan wrote of 1929, “the economic life of the Upper Tanana centers around the caribou. Not only does the animal constitute the source of food for the Natives and their dogs, but also it supplies the material for their clothing, shelters, and boats as well as netting for their snowshoes and babiche and sinew for their snares, cords, and lashing” (McKennan 1959:47). However, since the mid-20th century, caribou population dynamics—including migratory patterns that change in response to development or wildland fires, variable hunting pressure, and hunting regulations—have generally led to its replacement as a cornerstone species by moose. Dietary variation was and is still provided by muskrats, beavers, snowshoe hares (locally known as “rabbits”), ducks, grouses, and porcupines. Although they were eaten historically, Dall sheep, bears, and lynx are rarely consumed today.

The eastern upper Tanana River basin is traversed by 3 distinct caribou herds: the Nelchina, Mentasta, and Chisana caribou herds.¹² Caribou were traditionally hunted during their migrations in early winter and early summer and during major aggregations in late November and mid-May. During his stay at [upper] Nabesna in November and December of 1929, McKennan observed the passage of some 60,000 to 70,000 caribou (McKennan 1959:47). Caribou hunting methods included individual tracking, capturing in surrounds, and snaring along fences. Surrounds and fences required considerable labor to erect and maintain and were a focal point for the cooperative effort of normally-separated residential groups on the upper White River and the Yukon-Tanana Uplands. This technology was largely abandoned sometime before the 1920s, following the widespread introduction of the high-powered rifle and a steep decline of the Chisana herd in the winter of 1913–1914 (Capps 1916:21). That winter, miners engaged in the short-lived Chisana Stampede depleted the herd.¹³

Moose were hunted with snares throughout the region and the year in the early 20th century. Hunts might be solo ventures, or might involve fences, dogs, and hunting partners positioned to assist in the chase. McKennan noted that prior to his time in the Upper Tanana region, moose were “run down on snowshoes and killed with bows and arrows... This arduous method of hunting is little used today and it is a common complaint of the older men that the younger generation lacks the endurance of its forefathers” (1959:48). Moose were essential during the intervals between the end of the whitefish fishery in late summer and the arrival of the caribou in fall. Moose also refilled food stores in late winter and early spring after the caribou meat ran out and before hunting for muskrats and waterfowl resumed. Similar to caribou, nonedible portions of the moose were used as raw material for a variety of secondary uses (McKennan 1959:48–49).

Mountain sheep were hunted in the fall in the Nutzotin and Wrangell-St. Elias mountains and on the Macomb Plateau, prior to the November rut and prior to snowfall, which hindered access to the higher elevations (McKennan 1959:49). Snares were the principal means of harvest prior to rifles.

Bears were highly prized as a major source of grease for consumption and other uses, such as lubrication and the protection of guns and other metals (McKennan 1959). Bears were generally hunted in or near their dens along south-facing hillsides in the winter. Prior to the arrival of the rifle, killing a bear brought considerable prestige to a man for his bravery, since they were usually confronted at close quarters by hunters armed only with a spear or club. Women did not eat bear flesh and participated in the pursuit of bears by following cultural restrictions that would encourage a bear to meet its hunter, or at least not dissuade it (McKennan 1959:163).

For much of the 20th century, muskrats were trapped in the early spring and hunted in the fall for both their meat and fur. This pattern extended from the pre-contact past, but was amplified by the fur trade in the early 1900s (McKennan 1959:47). The myriad lakes of the upper Tanana River basin provided an ideal environment for muskrats as well as beavers, which were also trapped and shot for meat and fur. Hundreds of muskrats could be trapped in a day during the times when they were more abundant. McKennan even noted that neighbors called the Upper Tanana people “*Tzuntatin*, or ‘rat people’” (1959:15), likely indicating this heavy use of muskrats. One key respondent in this study, describing his youth in the 1940 and 1950s, said that in some years, if they could not get a moose, they primarily ate muskrats until the birds came back in the spring (1504). According to McKennan (1959:92–93), muskrat hunters commonly used birch bark canoes to hunt muskrats. Some of the small, light canoes were covered with canvas by the time McKennan visited the Upper Tanana region in the late 1920s. Northway boat builders have substituted plywood in more recent times, but there are still a few “rat canoes” around Northway (Plate 3-5). Muskrats were one of the early hunting targets for growing children, who were taught simple rules for safety and efficiency, such as to wait for a muskrat to be easily retrievable:

12. ADF&G. 2016. “Caribou (*Rangifer tarandus granti*) Species Profile.” Accessed October 4, 2016. <http://www.adfg.alaska.gov/index.cfm?adfg=caribou.main>

13. Additional dramatic declines since the 1970s reduced the Chisana caribou herd to about 315 members by the year 2002 (Chisana Caribou Herd Working Group 2012:7). Since then, the herd has been protected; international efforts to understand the herd and maintain or increase its numbers are reviewed elsewhere (Chisana Caribou Herd Working Group 2012; McElheran 2006).



Plate 3-5.—Julius Sam with rat canoe.

You gotta shoot them, you know, you could peek down around the corner and you could see them swimming toward you, you know, and just wait, you know. Two shots, I guess, because, Mom and Dad, it's ah, "Here's two shots, two muskrats." You know, because they get mad at us because we just shoot around, bing bing, see who's the best shot and stuff like that. (1506)

Of the small land mammals, porcupines were most favored, with their thick layer of fat, although muskrats, snowshoe hares ("rabbits"), and grouses made up more of the average diet; all were hunted and snared throughout the region and throughout the year (McKenna 1959:34–35). The hoary marmot ("whistling marmot") was a highly prized food to be found in the foothills of the Nutzotin Mountains and along the Macomb plateau. Like Arctic ground squirrels, marmots were caught with snares; these (as well as the larger furbearers, wolf and lynx) could provide a meal if needed, but were generally targeted for their skins. Any of the smaller animals might also be killed or stunned for dispatch by throwing sticks or rocks.

Millions of migrating waterfowl pass through this section of the Pacific Flyway, and those that settle on the lakes for the summer to breed were hunted with blunted arrows, especially in summer when the molt made them more vulnerable (McKenna 1959:54).

Fishes and Fishing

Fish have long played a major role in the subsistence economies of the Upper Tanana region. Although residents enjoy salmon and seek them out elsewhere, humpback whitefish are far more abundant in the area. Prior to contact and for decades after, the bands of the eastern Upper Tanana region occupied large overlapping territories (Figure 3-3; McKenna 1969; Case 1986:19–25; Haynes and Simeone 2007:7–11), and people from the Mansfield-Ketchemstuk band would often join fisheries in the territories of the Tetlin-Last Tetlin, Lower Nabesna, and Scottie Creek bands (Guédon 1974). Although the use of dogs as pack animals and hunting partners declined in the early 1900s, their use in teams for transportation increased, boosting the need for dry fish and muskrats to feed them (McKenna 1959: 34). For example, although there was a post office, Ada Gallen picked up mail from the mail plane and delivered the arrival to recipients by dog team (Plate 3-6). When speaking of her childhood at Scottie Creek, elder Mary Tyone (now deceased) remembered common processing techniques of fermenting salmon. "When we fix salmon head we put it in bucket in ground and we take it out and eat it. We leave it in ten days only because it will spoil in summer... Stinkfish, oooh, I love that stinkfish. Smell funny, but it sure taste good" (Tyone and Tyone 2002). Fish are still shared with extended family and friends and preserved for winter food either by smoking and drying, jarring, or freezing.¹⁴

14. Friend et al. unpublished

Nonsalmon fish

Nonsalmon fish are abundant in the upper Tanana River and were used throughout the year by Upper Tanana Dineh. *Ba*, whitefish cut and dried for human consumption, was a major staple and was especially critical when mammals were scarce (Plate 3-7). As described earlier, Northway residents participated in a community-initiated study of traditional ecological knowledge regarding nonsalmon fishes in the Upper Tanana region from 2004 to 2007.¹⁵ With permission from the authors, edited portions of that manuscript are used in this section.

Whitefishes, Luugn

Locally-available whitefish species, almost exclusively humpback whitefish with some round whitefish, are a major component of the annual subsistence harvests of Upper Tanana residents (Case 1986; Haynes and Simeone 2007; Marcotte 1991). In all quantified studies, humpback whitefish constitute a great majority of the nonsalmon fish harvest and contribute substantial edible pounds.

A traditional creation story provides a backdrop for the important role of whitefish in Upper Tanana culture with the central role of Whitefish Woman. Variations of the following narrative are heard throughout the Upper Tanana region. This version was told by Joseph Tommy Johnny, *Taiy Chi*, from Beaver Creek, YT in 1999:

How did the world start up? Okay, the very beginning, okay. They say that this planet was just water, right?

There was no ground. And so...Fish-woman, you know, fish-girl, like fish, but here [above the waist] like woman, eh? Funny how Native people know that a long time ago, the very beginning. You don't see that in a book today.

There's that one, that Fish-woman...and a Crow, you see, that's the main Crow. Okay? Crow...Crow, tired, he's got no place to land, eh, he's Crow, like Raven, he's got no place to land. Tired, he can't float, he just drown. So he kept flying, out above the water. This earth was all covered with water.

So, he gets tired and pretty soon he sees just a little stick sticking out like that. He pull like this, he pull like that, Crow, you know? And then Fish-girl come up. "Let's see your baby," he said. The Fish-woman, she had a little baby, eh? There was no ground, just a stick sticking out like that.

So he tell that Fish-girl, "Let me see that kid for a while," you know, Crow. So, yeah, she give it to Crow and that's a mistake, eh? That's a mistake there, yeah, because that Crow he take off, eh? He hold that baby. That Fish-girl is got her hand out and Crow is holding the baby there. The Fish-girl say "Give me back my kid."

"No, I'm not giving it back. Give me a little mud, a little ground like this. Ground. You got to go down." Dive? Down below, she bring up ground like that and fold it like that [over the stick]. "Bring some more."



Reprinted with permission of James Gallen
Plate 3-6.—Ada Gallen delivered mail for the U.S. Postal Service in the 1940s and 1950s.

15. Friend et al. unpublished

Tired, she just going down there. Pretty soon it's a little bit big, eh? Ground. It gets bigger, and bigger, and bigger, eh? See now, this is the Crow now, pretty soon he think, "Bring mud too, mud, you know mud? Under the water, bring that up too, mud. Bring this one—bring willow, you know." He hold that baby. He got three feet, like that. He jump on it eh? The ground there? Jump on it.

The Crow there, he's holding the baby, eh? Pretty soon the ground is going out like that, right? Yup, spreading it out. "Bring some more, bring some more, you want your baby!" The Fish-woman just half crazy, eh? She was so tired, pretty soon she's just standing there. Crow, he keep flattening it out, going out, going out, like that, eh? "Bring me up the tree," he said, "tree. You see the tree there? You see the trees here? Bring me up little ones, you know? Bring me up the five of them."

Oh, what else? "Go down and get the spruce too. Get birch. Get poplar." He name it for them, eh? And she go down and take it off and bring it up like that, eh?...Crow, he dancing around, his three feet, the ground is growing out like that. Pretty soon that's how this world is made. Crow, Crow made that! (Johnny 1999)

Crow [Raven], a dictatorial and somewhat violent benefactor like nature itself, directs Whitefish Woman to provide the very landscape of the Upper Tanana region. Whitefish Woman's skill and beauty can be seen as metaphors of nutrition and abundance that attracted First Man and gave her high value.

Simeone and Kari (2002) argue that language is critical to the study of culture. Lexical specialization is often an index of the complexity of knowledge about and experience with a topic or thing. As described by Friend et al.¹⁶, the importance and depth of knowledge about whitefishes in the Upper Tanana area also is reflected in language. In an example of prototypical language, in most Interior Alaska communities the general word for fish indicates salmon; in the Upper Tanana region, whitefish are *the* fish (Table 3-1). Although Upper Tanana fish terms generally distinguish between what biologists differentiate as species,



Plate 3-7.—Humpback whitefish cut and hanging to dry as "Ba."

16. Friend et al. unpublished

Table 3-1.—Athabascan terms for “fish.”

Language	Term ^a	Specific Meaning
Ahtna	łuk'ae	salmon
Dena'ina	liq'a	salmon
Deg Xinag	łegg	salmon
Upper Kuskokwim	łuk'a	salmon
Koyukon	łook'e (łuk'E)	salmon
Gwich'in	łuk	salmon
Lower Tanana	łuk'a	salmon
Tanacross	łuug	whitefish
Upper Tanana	łuugn	whitefish

Source Friend et al. 2007: 80

a. Multiple forms may exist due to dialectical variation.

Upper Tanana linguistic inventories also attend to qualifiers that describe life stage, fish condition, and other characteristics—especially as related to where and when fish are best for human use.¹⁷

In biological terms, the humpback whitefish complex of species includes 3 forms in North America: lake whitefish *Coregonus clupeaformis*, Alaska whitefish *C. nelsonii*, and humpback whitefish *C. pidschian*. They are distinguishable only by population-level differences in modal gill raker counts on the first gill arch, making the identification of individuals in river systems where they occur together impossible (Brown 2006).¹⁸

During the 2004 and 2014 studies, respondents identified some variations in humpback whitefish: large, small, silvery to very dark, and flesh that tastes different by area or habitat. In addition, respondents noted general differences in condition by season. For example, in Northway, although every respondent noted firmer flesh in the summer and “mushy” flesh during the dormant winter months, some respondents talked about very large and dark whitefish with huge eggs, and others noted smaller, more silvery fish. Fish caught in lakes tasted differently than those harvested from the Nabesna River, which are substantially larger than those caught in lakes; some of the difference is related to the timing of harvest in the different habitats. Some respondents said they could also taste differences between fish from different lakes.

Melissa Robinson, a student and intern with USFWS during the 2004 ethnographic effort, documented many nuances in an integration of local and scientific knowledge of whitefish. Her thesis describes the gender specificity of knowledge, based on flexible gender roles in fishing and on observations such as parasitism, sedimentation, and water temperature (Robinson 2005). She found broad agreement between local knowledge and scientific knowledge, but noted benefits from the detailed observations of local residents about such things as particular locations of fish concentration and seasonality of parasitism. Fish sampling efforts have affirmed local observations of morphologic diversity in upper Tanana River humpback whitefish beyond the modal gill raker count (Brown 2006), as described by key respondents in the traditional knowledge study and documented by Robinson (2005) and Friend et al.¹⁹

In general, the timing and location of fishing indicate seasonal locations and movements of fish. The river systems of the eastern upper Tanana River (i.e., the Nabesna and Chisana river basins) include complex wetlands as well as myriad creeks and lakes that serve as important seasonal habitats and travel corridors for whitefishes. In addition to humpback whitefish, round whitefish are found in these waters, and landlocked least ciscoes inhabit at least several lakes in the central portion of the TNWR (Glesne et al. 2011). The

17. Friend et al. unpublished

18. The taxonomy of these fish has long been the subject of debate. Since 1979, humpback whitefish in Alaska have been referred to as *C. pidschian* (Brown et al. 2012) when genetic analyses indicated that the 3 forms are indeed the same species with high morphologic diversity. Brown et al. (2012) follows the recommendation of McDermid et al. (2007) and broadly identifies Alaska’s humpback whitefish as *C. clupeaformis*, but recommends the use of *C. pidschian* in this report because that is the dominant form in Alaska’s upper Tanana River (Randy Brown, USFWS fisheries biologist, personal communication, December 1, 2015).

19. Friend et al. unpublished

migration of least ciscoes has been identified in the upper Tanana River as ending at Moon Lake, which is approximately 60 straight-line miles west of Northway.²⁰

The annual cycle of whitefish fishing begins when fish move from rivers into small, clearwater lakes just after breakup. Some respondents described natural indicators that help identify good fishing times in the spring and summer. One elder couple noted that fish are present and in good condition in July when the blueberries turn color (0401; 0402). They also knew fish were moving back down creeks when foxtails turn color and then begin to die. Fishing continues throughout the summer, as whitefish move between lakes and creeks, according to residents. Not surprisingly, families gathered around these spots, such as at *K'ehthiign*, the main traditional fishery in the Northway area. Several elders provided textured understandings of whitefish movements during the summer that merit future investigation. For example, several fishers identified daily movements of whitefish based on air and water temperatures; most directed their harvesting efforts based on these observations.²¹

Most respondents agreed that time of day is an important factor for successful harvest in the lakes (see also Robinson 2005). One elder characterized this observation:

Oh, evening—I don't know why but when I was really young, Mom told me that the water get really hot at night, warm, too warm at night. So they're moving. In the evening is when we start fishing and all night they'll be running. In the day they'll kind of slow down...with a net, it doesn't matter where you set it, it can be at the mouth or in the river...like most creek, it'll really run in June, you know and then it'll slow down. But like old Fish Camp, it run during the night because there's lake on both sides and the creek is right between. (0402CB)

Another fisherman said “When it's hot it doesn't take more than a couple of hours for whitefish to get soft in the net...it sure seems like after a blistering hot day, that night, the fish are running good” (0403CB).

Beginning in late July and August, whitefishes move out of the lakes to the rivers, lingering until late August when they move away from the lake outlets into swift-flowing sections of the river to spawn. These runs are especially favored by residents; spawning females, plump with eggs, are preferred. Some fish remain in the lakes or return directly to wintering habitats; residents consider these to be nonspawning fish.

Although some Northway fishers knew little of where or how often whitefishes spawned, others had clear ideas about the process. According to one elder who spent a great deal of time fishing in Northway's Moose Creek, “September, that's when we start catching them and they got eggs in them, so that's when they start to lay sometime in September, I think...in the river” (0601MR). An elder couple identified spawning grounds by the presence of other predatory animals, such as eagles (0404CF). Some respondents also noted that humpback whitefish are rougher to the touch once they have returned to the river in the fall than at other times of the year; these fall-time whitefish are known to be less slimy and easier to hold (Andersen et al. 2004; Georgette and Shiedt 2005:64, 65; Robinson 2005:102).

By mid-October, most fish return to deeper, slower, riverine habitats where they overwinter before returning to the lakes in the spring. One elder from Northway described the seasonal movements of whitefishes based on his experiences using under-ice nets in Moose Creek and the Nabesna River:

What we did, we cut hole, cut hole about every five foot and then we push our net to the next hole with stick and pull it out and then we set the whole net to catch fish in November. And I don't remember if there is eggs in there, seems like there is no eggs in there in November. So they could be laying their eggs in the river in August or September...they live a long time because they, in the deep rivers during wintertime that's where they stay, during wintertime. And then in the spring...they go into the lake and they get fat...and then they go into the river and then they quit. (0401MR)

20. R. Brown, USFWS fisheries biologist, personal communication, December 1, 2015.

21. Friend et al. unpublished

His wife added, “They don’t swim around much in [early] spring, not like burbot does. But not whitefish—they stay in one place” (0401MR).

Little is known about juvenile rearing habitats in the Upper Tanana region. Little fish are observed in different places, and species identification is not always possible. One resident recalls catching lots of small fish, which he thought might be whitefishes, in the spring around Memorial Day when they were out paddling around.

...Really narrow creek by Kenny’s Lake by the graveyard by Moose Creek—for about a week, that’s where they put the fish trap. [We] were looking in that lake fooling around just ‘cause we were in the boat and it was high water and we were running around, we seen thousands of little fish. I mean, they were all over, so we just got a white bucket and dipped it real fast and remember we caught like 50 of them in there? I mean, they were little guys, about like that [less than an inch]; they were just little guys swimming around. (0403CB)

Local knowledge about whitefish diets comes from cutting fish and cleaning out the stomachs to eat as a delicacy. Northway respondents have noticed that fish harvested out of the rivers have less food in their stomachs than fish caught in lakes. According to one elder:

You know those snail...they eat those little bugs [an unidentified-in-English insect called “*tuu lalil*,” literally, “water butterfly”], they eat mosquitoes...I don’t know what they eat too, those river fish. It’s more clean stomach when we get that stomach. Stomach out that lake, it’s got more stuff in there. Inside their stomach, that fish. And when we eat fish stomach from the river it’s just clean and white...but in fish camp and different place like Mark Creek, they have those little snail and little bugs in their stomach. (0601MR)

Fishers reasonably infer that whitefish stop eating when they move back out to the rivers: “...they don’t eat in the river. I know they don’t eat. There’s hardly anything in their stomach when you eat fish stomach. They quit eating in August...there’s a little bit in their stomach...I don’t know why they quit eating. They’re not like grayling or pike...I really don’t know why they quit eating” (0401MR). Some residents suspect the lack of food has something to do with the flesh being soft in the winter.

Information about seasonal movements of whitefish provided by the 2004 respondents has since been echoed in a biological study: in response to local concerns about possible declines in the humpback whitefish population, USFWS undertook a multi-year radiotelemetry project to identify important habitats for humpback whitefish and to gain a better understanding of their seasonal movements. The report summarized the general seasonal habitat use as follows:

1) lake habitats for feeding in the spring and early summer; 2) river habitats by mid to late summer for migration to spawning areas; 3) two swiftly-flowing, gravel substrate regions of rivers for spawning; and 4) flat-water, soft-substrate habitats of rivers or open lake systems for overwintering. (Brown 2006:1)

Two of Brown’s tagging sites were Fish Lake and Tenmile Lake, elucidating general seasonal movements for humpback whitefish targeted by Northway residents at these 2 locations. Most Fish Lake and Tenmile Lake whitefish overwintered in the Chisana and Nabesna rivers, migrating back to their respective lakes in the spring and early summer. Brown (2006) found that nearly 80% of the tagged fish from all tagging sites, including Fish Lake and Tenmile Lake, concentrated in 2 distinct areas of the Nabesna and Chisana rivers during the late fall, spawning locations. Brown’s (2006) study provides important data towards understanding the status of whitefish populations in the area, and the general findings about seasonal movements echo the observational knowledge provided by our respondents.

Burbot, Ts'aan

Burbot, generally called lingcod or mudshark in Northway, has long been valued by residents across Interior Alaska as a source of fresh meat, especially during winter and other times when whitefishes are not as available. According to key respondents in this study, burbot are harvested in the summer as well as through the ice in late fall and early spring (1501, 1503, 1506). Historically, burbot were so revered that newborn baby boys in Healy Lake were bathed in “burbot juice” to impart them with swiftness and fluidity (Callaway and Miller-Friend 2007rev.:37). Northway respondents described optimum times to harvest burbot as well as primary locations for harvest, reporting that burbot are most effectively caught in slower water, generally in eddies near clear water inflows, or other shallow areas. Similarly to residents of the lower-middle Yukon River and the Koyukuk River (Andersen 2007; Brown et al. 2005), residents of the upper Tanana River identify the nighttime hours as most productive for burbot harvest. Respondents described using a set line with 1 or more baited hooks to catch burbot:

...set your hooks up, even down there on Chisana, down by the bridge, you can catch them there...when I was young and lived with my mom, her and I used to do that all the time. And you know, they must go out to eat in the evening, I don't know why, it just seems like we always catch them in the night. I remember some of those things because sometimes we set hooks through ice and sometimes like right now [open water, October] we set hook but we put them on the bank, you know, they're sticking in the bank, and the hook go in the water and we always have to go out in the night, we check them, even through ice you know. (0401CB)

Another respondent said:

You can't catch them too well in the gillnet because their heads are too big and body too small—they get tangled up! If you get a really big one, it's got a big, ugly head; they're good eating, they don't have hardly any bones...you set your hooks but you just leave it there. And then later in the night, you go out and check them. And you would have fish. (0404CF)

According to most respondents, burbot were found in the Nabesna and Chisana rivers throughout the year, but seldom ventured up the clear creeks into lakes, or at least were not caught in whitefish nets there as they are sometimes in the main rivers.

Fishers sometimes use rod and reel to fish for burbot:

Springtime when the water goes out you can catch them on rod and reel by throwing out a hook and letting it bop down the side of the river and they'll catch them like that. They're best right now [October], but people fish them a lot in the spring. (0403CB)

Similar observations were documented in a radiotagging project in the 1980s, during which it was found that burbot move, sometimes long distances, in the Tanana, Chisana, and Nabensa rivers in all seasons, generally staying in the mainstem and resting in shallows (Breeser et al. 1988).

Northern Pike, Ch'uljuudn

Northern pike are found in freshwater throughout the circumpolar north and are considered quite desirable in the Upper Tanana region. Juvenile northern pike 8–12 inches long, locally referred to as “pickle-pike” or “pickles,” are also popular for human food and are sometimes used as bait to catch other fish, especially burbot, or furbearers, such as marten.

Salmonids tend to be the major food source of northern pike in Alaska (Mecklenburg et al. 2002:143), and whitefishes are the most abundant salmonid in the upper Tanana River, such that northern pike are often caught incidentally when fishing for whitefishes. However, northern pike also eat burbot, longnose suckers, and even smaller northern pike. They are also known to eat “waterfowl, frogs, small mammals, ...and insects” (Morrow 1980:167).

Northern pike are not migratory, but individual northern pike sometimes move considerable distances (Morrow 1980:168), and certain fishing holes in the Upper Tanana region are well known for their presence. Residents do observe some seasonal movements, though. As explained by one Northway resident, northern pike are sometimes caught incidentally as they move from one locality to another:

They go up into the lakes remember? And then they don't back down 'til June or July...I mean the Fish and Wildlife people, they're catching pike up there laying their eggs in the springtime. They tell you not to fish 'til after June, they give you a certain day where you can go. We don't go out of our way to catch these fish, we're after whitefish. If we catch this kind, we just eat them. (0401CB)

This comment implies that in spring, northern pike travel upstream and into lakes to spawn, linger to feed, and then return to the river in middle to late summer to overwinter there. In fact, this respondent further reported seeing northern pike eggs on the reeds in the lakes off of Moose Creek in the springtime when out trapping muskrats. A recent respondent explained that the time to fish for northern pike is shortly after the ice breaks up, in early to mid-May:

See the pike, you fish for pike about 2 weeks after ice go, the water has to get right temperature before they bite. The water, from winter, has to be the right temperature before they'll bite, otherwise, they don't. Biologists should know that! (1504)

The respondent stipulated that nets set under the ice also caught northern pike incidentally, and those fish were also eaten. When fishers are targeting pike, they usually use rod and reel gear in open water, especially at the confluence of clear and muddy waters and at deep points on many of the clearwater creeks. Northern pike were reportedly harvested by a number of methods historically, including hand jigs, dip nets, and rod and reel. Fish traps were most common for juvenile northern pike or pickle-pike.

Pickle-pike were caught in traps built along clearwater creeks. Sometimes pickle-pike would be harvested when setting hooks for burbot in the Chisana River, by snagging. A respondent explained:

You just chop through ice where they're going through. You just stand there and wait for them and you have a little hook on the stick and you leave that in water and when you see them coming by, you just snag them! This is the kind you use [shows hook]. You leave it in water like this and if you see a little pickle coming out from the ice, you just snag it out and then it'll fall on the ice. You gotta have a stick like this for a handle. This time of the year [October], only it's gotta be cold. Right now [10/14/04], it should be ice, but there's no ice. We always have ice this time of year. Right down here on Moose Creek at [the confluence with] Fish Camp [Creek]. And you go down to village [on the Nabesna River] and you should be able to catch grayling right now...alongside the bank or the mouth of the creek under the ice, with a fishing pole, with a little bitty hook with a little piece of bacon or something—it's gotta be small... You do this kind of snagging towards the evening, or early morning, same way with grayling. When the water's high the little pike move into Moose Creek. (0401CB)

Her husband described the pickle-pike fish trap (small fyke net), which was used in open water to avoid freezing over the top of the trap:

That little pike, they don't always catch 'em by that hook, they use fish-trap. About 50 years ago they used a lot of willow, maybe 5 feet long with willow all around and where the pike go in, it goes down like that [motions with his hands a signify larger opening that constricts down to a small opening into the middle of a surrounding trap], like a funnel and then they go in there and they can't get out.

We try to find where the water would be shallow and where it's swiftest, like under the bridge [at Moose Creek] would be a good place for it. And then there's some little creeks that goes into Moose Creek way up by Julius' camp...there's one lake there, there's a little creek you can step over it but there's a creek, but there you can catch the



Plate 3-8.—Modern trap for catching juvenile northern pike (“pickle-pike”).

little pike. Maybe 3 feet wide, but you can catch pike... there’s spring water coming out in the lakes, underground water and they stay open all winter. In wintertime, we could go over, and lots of little pike. (0401CB)

Traps are still used, but are often constructed with milled wood (Plate 3-8) or are purchased; pickles are also caught by snagging, and sometimes with a jigging-pole (hand-line through the ice or open water).

Though not nearly as important as whitefish for food, northern pike nevertheless remain a common part of the annual diet. They are a popular food for sharing and, once caught, may be distributed across the Upper Tanana region, sometimes in barter for other resources, but usually in the unspoken reciprocity of sharing networks. Northern pike were also valued as dog food when dog teams provided transportation.

Northway respondents often describe how changing river conditions affect the quality of the fish and wildlife resources. As more fully described in the Discussion and Conclusions chapter, silt-laden glacial river water began to flood clear waters, including at the traditional fish camp at *K’ehthhiign*, occasionally in the 1970s and 1980s, more

often in the 1990s, and annually in the 2000s. In 2004, a key respondent said:

And when the river started coming through, it just destroyed everything. So nobody gets to move to Fish Camp anymore because the water’s everywhere!...Farther up it’s still clear. Pike still come through, you can still get fish, but like my daughter say, some of those fish taste like mud...Pike are about 2 ft, 15-pounder. They used to be bigger—38, 45 pounds—that was 20 years ago! (0401CB)

That northern pike are smaller and less abundant than 2 or 3 generations ago was mentioned repeatedly throughout the Upper Tanana during research in the 2000s and during the 2015 surveys. One of the recent key respondents shared a photograph from the 1970s of himself and a friend with the northern pike they had caught, saying those fish were “average” at the time, but now northern pike that large are rare (Plate 3-9). Nevertheless, northern pike remain present throughout the region, and they are harvested, used, shared, and consumed in all communities of the Upper Tanana region.

Arctic Grayling, Seejel

Arctic grayling is the only kind of grayling found in Alaska. In appearance, the Arctic grayling is quite distinctive. Its large dorsal fin—particularly in adult males—usually contains more than 17 rays. The blue-gray Arctic grayling has a pink or lavender iridescence and small blue-black spots on its sides (Mecklenburg et al. 2002:191). Arctic grayling start migrating upstream in April through channels cut in the ice by surface run-off, traveling as far as 160 km by late May to spawn (Morrow 1980:146).

Arctic grayling can be found in many clearwater tributaries to the Chisana and Nabesna rivers. One elder described a clearwater stream several miles up the Chisana River where the old people used to set willow fish traps for Arctic grayling (0401MR). In 2004, people began fishing for Arctic grayling in May²²; the fresh fish provided a welcome change from dried or frozen foods. With roads making access to good fishing easier, many Northway families now fish for Arctic grayling where the Alaska Highway crosses Gardiner

22. Koskey unpublished

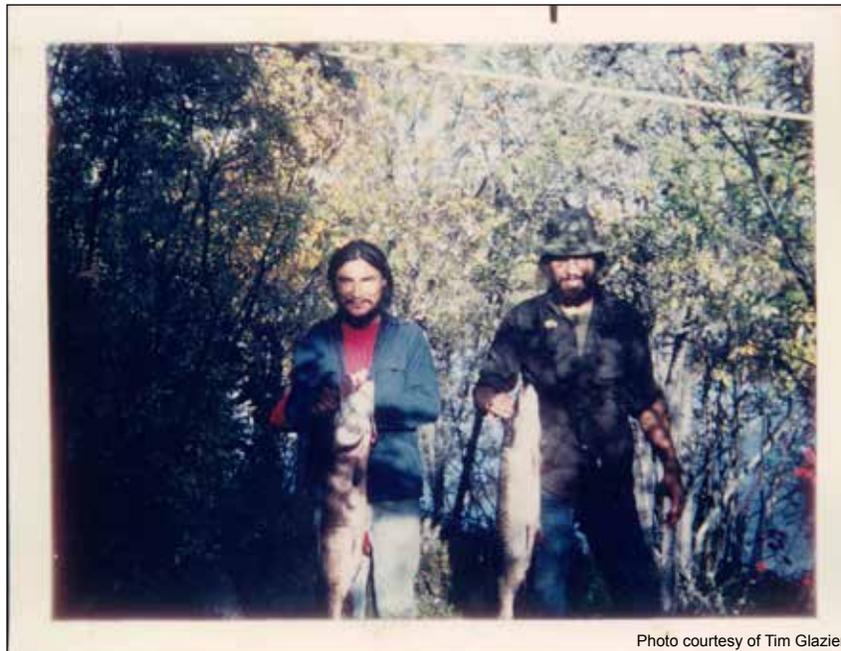


Photo courtesy of Tim Glazier

Plate 3-9.—“Average” northern pike in the 1970s are rare now.

Creek. Few respondents indicated that Arctic grayling were of critical importance to their diet, but many enjoy fishing for this traditional food to provide dietary variation.

Longnose Sucker, Taats’adn

The longnose sucker ranges across northern North America, including Arctic rivers in northeast Labrador, parts of Canada, and most of Alaska, and also in eastern Siberia (Morrow 1980:173–174). The longnose sucker is distinguished by an elongated cylindrical body and a mouth for bottom feeding, with thick ventral lips covered with papillae. These fish are abundant in the fisheries of the upper Tanana region, where they tend to be green-gray in color.

Some fishers will eat these fish, but they are the least favorite because of their many bones; they are most often used for bait. Most residents of the Upper Tanana region are concerned about the choking hazard caused by fish bones, and they are especially diligent to remove bones when preparing food for children and elders.

Mary Tyone, who grew up at Scottie Creek, told Friend that there was an abundance of longnose suckers there. “Fish very much important. Suckers—can take out thousands, millions if want to. Scottie Creek, Big Scottie Creek—good country. [We] stored a lot of fish at Scottie Creek” (0201CF).

In a prior interview, Tyone had said that Scottie Creek was a “survivor village” because they stored large quantities of longnose suckers in underground caches and people who had nothing to eat could come there. She described how people sometimes came there from as far away as Batzulnetas (Tyone and Tyone 2002).²³ In Friend’s 2002 interview, Tyone stated that she preferred the taste of longnose sucker to whitefishes (0201CF).

23. Several oral historical accounts maintain that Upper Tanana ancestors gathered together village sites in the Scottie Creek valley during the periods of White River Volcano eruptions in A.D. 100 and A.D. 800. It is said that people from the Nabesna, Chisana, and White river drainages worked together to survive the devastating effects of the ashfall. They say the fishery resource was crucial, because the eruption occurred during the late winter when the stream was frozen, and fish were not affected as dramatically as land mammals and birds. At one site in the Scottie Creek valley, artifacts have been recovered from within the volcanic ashfall itself, suggesting rapid abandonment at the time of the eruption (Easton et al. 2011).

In the fall when the Upper Tanana Dineh were preparing to go moose hunting, they would “build a bridge [weir] for fish” blocking the fish until their return. Upon returning, people took out the fish through the ice, let them freeze, and stacked them like firewood for winter use (1506). Longnose suckers were not specifically pursued, except by the people of Scottie Creek and possibly Tanacross. However, they were kept when netted with targeted fish such as whitefish.

Salmon

Salmon do not reach the upper Tanana River in substantial numbers; accordingly, Upper Tanana fishers are not nearly as familiar with salmon ecology or life history as they are with the nonsalmon fishes that swim in the waters surrounding them. Chum and coho salmon are the only species of salmon present in the area.²⁴ Salmon have long been pursued in other drainages and continue to be an important component of sharing and trade networks within and beyond the community. In one of the earliest written records of the region, Lt. Allen noted that Tetlin fishers were at Batzulnetas, an Ahtna settlement in the upper Copper River basin, when he passed through there in 1887 (Halpin 1987:52). At that time, Tetlin and Batzulnetas were linked by a summer trail through the mountains.

There are 2 runs of chum salmon in the Yukon and Tanana rivers: a summer run and a fall run. These fish were eaten by people, but were largely used to feed the many dog teams that provided ground transportation in winter until the advent of snowmachines, which came to Northway later than cars. Thousands of chum salmon (often called “dog fish” or simply “dogs”) were harvested and dried along the Yukon River each fall and distributed around the area through exchange practices of sharing, customary trade, or barter. Some elders remember an abundance of chum salmon in the Scottie Creek²⁵ fishery (Anderton and Tobler 2004:23). However, Upper Tanana communities lie near the terminus of this fishery, where the salmon are in near spawning condition.

Although chum salmon were popular for people and their dogs, the truly prized fish was *Ts’ernah* (Scottie Creek dialect for Chinook salmon, literally, “big fish”). These fish continue to be highly valued because of their large size and rich oil content. According to David Johnny, Chinook (king) salmon were present in large numbers at Scottie and Mirror creeks in earlier times.²⁶ However, reports of Chinook salmon and coho salmon in the upper Tanana and Chisana rivers are “isolated and not confirmed on a consistent basis” (Anderton and Tobler 2004:22). For decades, people traveled to Eagle on the Yukon River in June and July to fish for Chinook salmon, where they were abundant. Comments recorded during the surveys and interviews for this study echoed those heard recently along the Yukon River regarding hardship imposed by the current low abundance and resulting conservative management of Yukon River Chinook salmon (Brown et al. 2015).

Likewise, sockeye salmon do not run in the upper Tanana River (or even in the Yukon River in appreciable numbers), but they are an important feature of the diet for Northway residents. Fishers from the upper Tanana region utilize fish wheels and dip nets to harvest sockeye salmon from the Copper River, especially near Slana, as described in the Results chapter.

24. Chum salmon are present in the upper Tanana and Chisana rivers and a short way up the Nabesna River, with spawning grounds identified in the mainstem of the Tanana River and in the Chisana River. Coho salmon present in the upper Tanana and lower Nabesna rivers, with no identified spawning grounds. ADF&G. n.d. “Fish Resource Monitor: Anadromous Waters.” Accessed October 4, 2016. <http://extra.sf.adfg.state.ak.us/FishResourceMonitor/?mode=awc>

25. Scottie Creek is a transboundary tributary to the Chisana River in the Yukon River drainage.

26. D. Johnny, personal communication to C. Friend, 2006.

4. RESULTS

In February of 2015, ADF&G Division of Subsistence staff surveyed 55 of 73 households (75%) in Northway¹ (Table 2-2). Expanding for 18 unsurveyed households, Northway’s estimated total harvest of wild foods between January and December 2014 was 60,791 lb usable weight (lb; ±19%; Table 1-1). The average harvest per household was 833 lb; the average harvest per person was 314 lb.

Figure 4-1 shows the composition of the harvest by species. Humpback whitefish contributed more than any other single species to the estimated harvest, approximately 30% of harvested wild foods by weight. Moose accounted for 25% of the harvest. The remaining 45% of the harvest was made up of much smaller amounts of many resources, as described in detail below.

This chapter summarizes findings from the household surveys, including demographic characteristics, responses to harvest assessment questions, harvest estimates, employment and income, and responses to food security questions. Harvest amounts are expanded estimates.

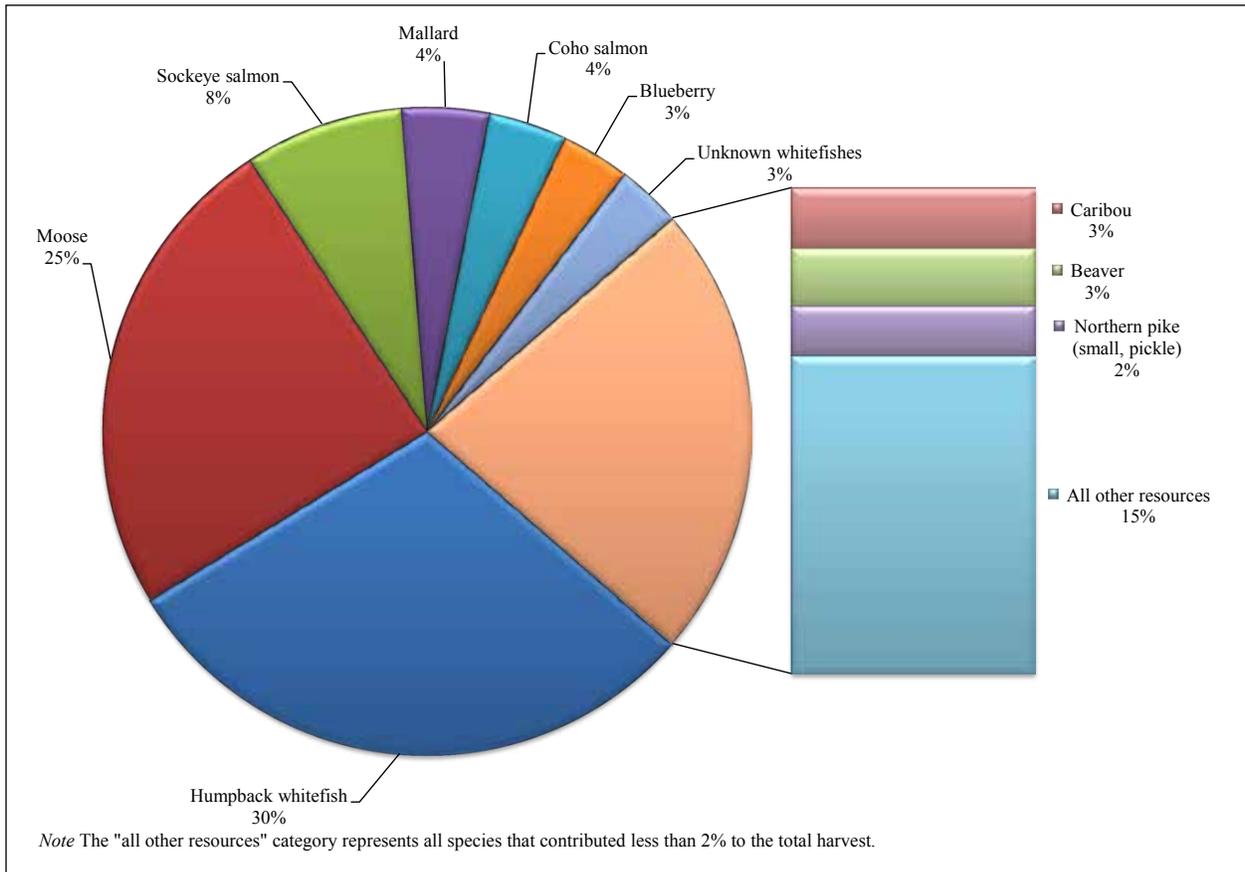


Figure 4-2.—Top resources harvested in edible pounds per capita, Northway, 2014.

1. The community of Northway is made up of 3 census designated places (CDPs): Northway Village, Northway, and Northway Junction and a few households beyond those boundaries. In this report, “Northway” refers to all of those affiliated residences.

POPULATION ESTIMATES AND DEMOGRAPHIC INFORMATION

Population estimates and other demographic information in Northway are complicated by the existence of 3 census designated places (CDPs). Some variation in population characteristics between the 3 CDPs can be gleaned from U.S. Census data. For example, in 2010, Northway Village had the highest percentage of Native residents and Northway the lowest. Additionally, Northway Village had the highest household size, the highest number of elders, and the lowest median age.² Northway Junction had the highest percentage of persons less than 20 years old and the lowest percentage of occupied housing units.

The Northway Village Council (NVC) considers the population of all 3 CDPs and a few outside those boundaries as members of the community of Northway. NVC members are frustrated by the fractionation of 3 CDP designations, and the NVC is working with the Alaska Department of Commerce, Community, and Economic Development (ADCCED), Division of Community and Regional Affairs to request that the U.S. Census Bureau consolidate the 3 into a single CDP for the 2020 census.³ The population estimate calculated for this study includes all residences affiliated with the community within all 3 CDPs and outside their boundaries.

Table 4-1 and Figure 4-2 show 2010 and 2014 data for comparison of the total combined 2010 U.S. census counts, total combined American Community Survey (ACS) 2009–2013 estimates, the total estimate from this study, and a census count conducted by NVC in 2015. Appendix Table D-2 shows 2010 U.S. Census data and ACS estimates for each CDP. The estimate generated by this study (194 people) shows the largest discrepancy from the NVC data and council members feel strongly that the 2014 population estimate generated by this study is low. It is very likely that the NVC census (229 people), although conducted in 2015, is the best estimate of actual permanent residents in 2014; this number is quite similar to the combined ACS estimates (235 people; Table 4-1). The discrepancy can probably be explained by this study's sampling results, which underrepresent larger households in Northway Village.

All households were invited to participate in the harvest survey, but not all households were available and interested in participating. The sample ultimately included a higher portion of Northway and Northway Junction households (96% and 87%, respectively) than Northway Village households (50%), such that Northway Village, which is also the most demographically distinct in terms of household size, is underrepresented in this study's data. The reasons for this are unclear, but the underrepresentation does appear to have produced low population and mean household size estimates for the combined Northway community.

Prior to 1980, U.S. Census boundaries are unclear and much of the population lived outside the 1980 Northway Village and Northway CDP boundaries. Prior to 1960, there had been many sporadic population counts in the upper Tanana region (Marcotte 1991:25–28), but these were confounded by the fluidity of Upper Tanana communities. Census data are available for the 3 population segments as each became a CDP.⁴

Figure 4-3 shows combined CDP data for historical population estimates and the total population trend since 1990, the first time all 3 CDPs were included in the census. The population of Northway has decreased over recent decades. Respondents say that families have moved elsewhere in the Upper Tanana region or to other places in Alaska, especially the cities (1502, 1506, 1508, HH14).

The 55 surveyed households reported 146 residents, which was expanded to an estimated community population of 194 (Table 4-2). The 73 eligible households had estimated average of 2.7 members each. The mean age of household members was 40.5 years and the median was 42 years. The oldest resident in

2. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed September 22, 2016. <http://commerce.alaska.gov/dcr/DCRAexternal>

3. Northway Village Council meeting, November 10, 2015.

4. The 3 census designated places (CDPs) were established in different years: Northway Village was established in 1980, Northway in 1960, and Northway Junction in 1990 (Borah 2016; U.S. Census Bureau 1961).

Table 4-1.—Population estimates, Northway, 2010 and 2014.

	Census (2010)	5-year American Community Survey (2009–2013)		Northway Village Council (2014) ^b	This study (2014)	
	Northway, Northway Junction, Northway Village Combined	Estimate	Range ^a	Estimate	Estimate	Range ^c
Total population						
Households	77	74.0	53–95		73.0	
Population	223	235.0	160–310	229.0	193.8	177–210
Alaska Native						
Population	198	188.0	121–255	210.0	169.9	153–186
Percentage	88.8%	80.0%	51.3%–108.7%	91.7%	87.7%	79.2%–96.2%

Sources U.S. Census Bureau (2011) for 2010 estimate; U.S. Census Bureau for American Community Survey (ACS) 2012 estimate (5-year average); and ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate.

Note Division of Subsistence household survey eligibility requirements differ from those used by (ACS).

a. ACS data range is the reported margin of error.

b. Northway Village Council meeting, November 10, 2015.

c. No range of households is estimated for division surveys.

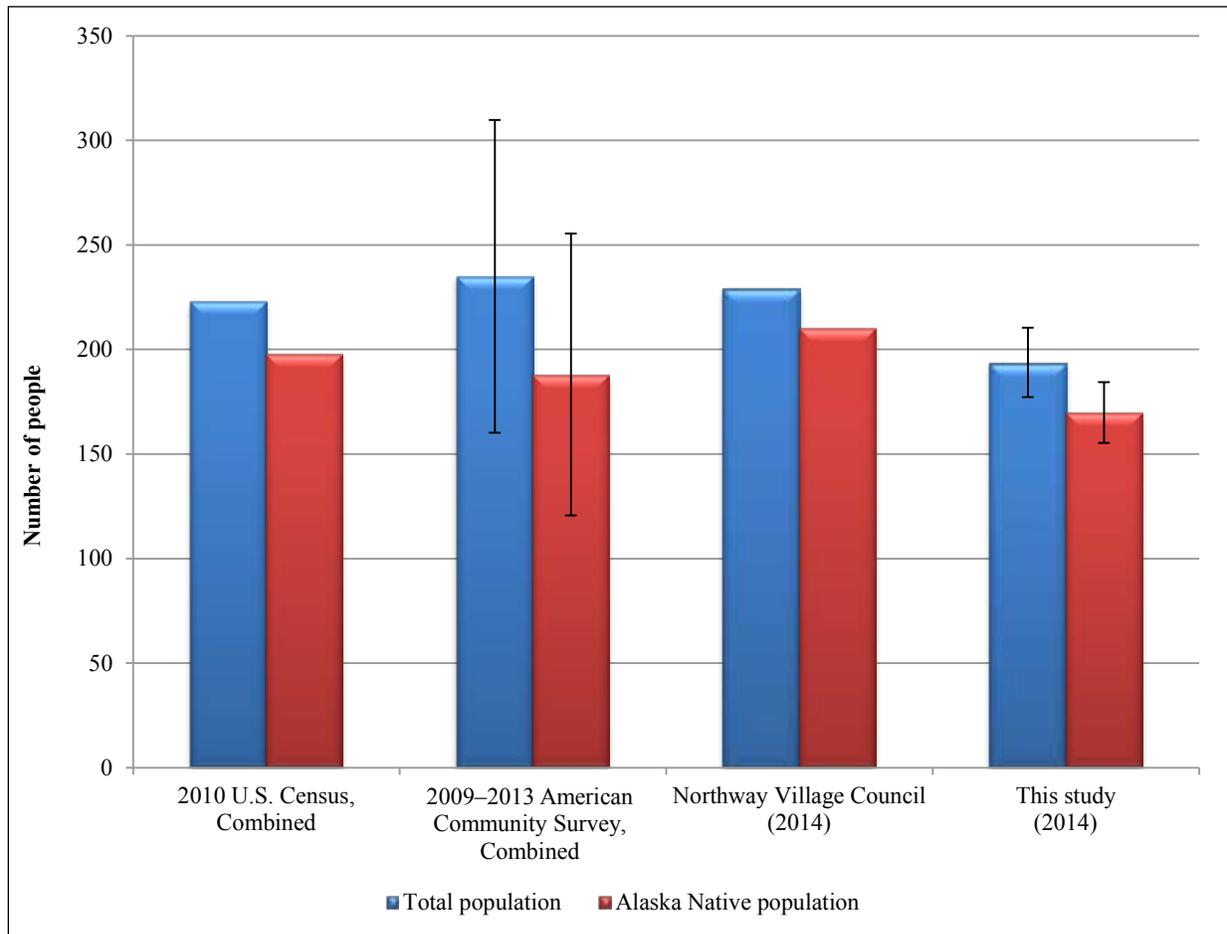


Figure 4-3.—Population estimates, Northway, 2010 and 2014.

Table 4-2.—Sample and demographic characteristics, Northway, 2014.

Characteristics	Community Northway
Sampled households	55
Eligible households	73
Percentage sampled	75.3%
Sampled population	146
Estimated community population	193.8
Household size	
Mean	2.7
Minimum	1
Maximum	8
Age	
Mean	40.5
Minimum ^a	0
Maximum	91
Median	42.0
Length of residency (in years)	
Total population	
Mean	32.6
Minimum	0
Maximum	91
Heads of household	
Mean	45.2
Minimum	3
Maximum	91
Alaska Native	
Estimated households ^b	
Number	65.0
Percentage	89.1%
Estimated population	
Number	169.9
Percentage	87.7%

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.

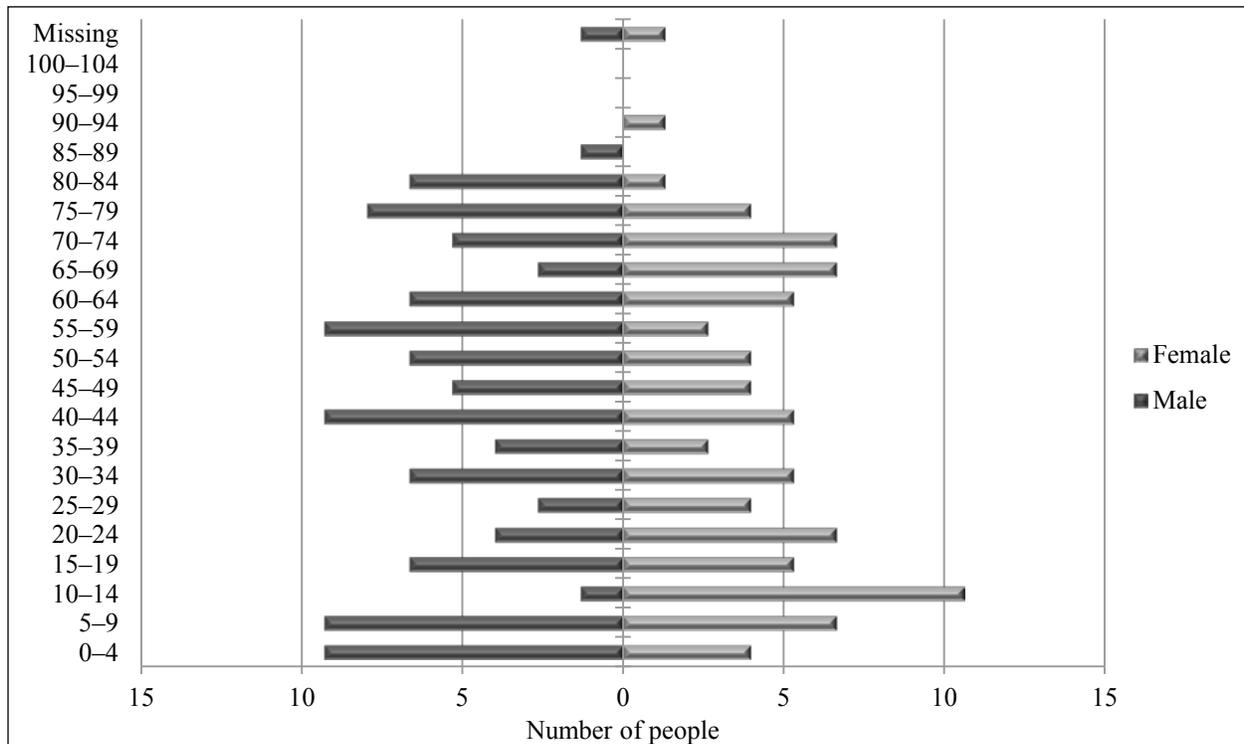


Figure 4-4.—Population profile, Northway, 2014.

2014 was 91 years old, and the youngest were newborn babies. The population profile in Figure 4-4 shows estimated numbers of males and females in each age group. About 88% of the individuals and 89% of the households identified as Alaska Native.

The average length of residency among the total population was about 33 years; 71% of people were born to residents of Northway and 12% were born outside of Alaska (tables 4-2 and 4-3). Approximately 60% of household heads were born to Northway households, and 19% were born outside of Alaska (Table 4-4). A few residents named historical settlements such as Scottie Creek and Batzulnetas as their birth places; those born at Fish Camp and Charlieskin were included under Northway.

INCOME AND CASH EMPLOYMENT

Cash is an integral and critical feature of Alaska’s rural communities, often shared in much the same manner as other resources (Wheeler 1998). Figure 4-5 shows the top income sources for Northway in 2014, including earned and other sources; more specific data are presented in Table 4-5. Northway is connected to Alaska’s road system, but in terms of employment, the community is clearly rural. There are few available jobs; many are seasonal, part-time, or temporary, such as highway construction and firefighting.

Despite the paucity of employment opportunities, about 70% of income was earned by employment (Table 4-5). Expanded household survey data indicate that an estimated 93 people (62% of adults) from 57 households (78%) held 123 jobs and earned over \$2,000,000 in 2014 (tables 4-5 and 4-6). As in many rural Alaska communities, government work is a substantial contributor to community income. Northway fits that model: more than one-half the wage earnings came from local, state, and federal employment (Table 4-7). Positions with the local government, primarily the NVC but also the school district, were most numerous, but also often part-time or seasonal.⁵ Positions with the State of Alaska, primarily road maintenance for the Alaska Department of Transportation and Public Facilities, were most lucrative, in part because they were generally full-time and year-round. Federal employment was mostly with the TNWR that surrounds

5. Northway community review meetings, June 13, 2015 and November 10, 2015.

Table 4-3.—Birthplaces of population, Northway, 2014.

Birthplace	Percentage
Copper Center	0.7%
Eagle	0.7%
Fairbanks	1.4%
Galena	0.7%
McGrath	1.4%
Minto	0.7%
North Pole	1.4%
Northway	71.2%
Nulato	0.7%
Stevens Village	0.7%
Tanacross	0.7%
Tanana	0.7%
Tetlin	0.7%
Tok	1.4%
Yukon	1.4%
Scottie Creek	0.7%
Bird Creek	0.7%
Batzulnetas	0.7%
Other U.S.	11.6%
Foreign	0.7%
Missing	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 4-4.—Birthplaces of household heads, Northway, 2014.

Birthplace	Percentage
Eagle	1.2%
Fairbanks	1.2%
Galena	1.2%
McGrath	2.4%
Minto	1.2%
Northway	60.0%
Nulato	1.2%
Stevens Village	1.2%
Tanana	1.2%
Tok	2.4%
Yukon River area	2.4%
Scottie Creek	1.2%
Batzulnetas	1.2%
Other U.S.	18.8%
Foreign	1.2%
Missing	2.4%

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.

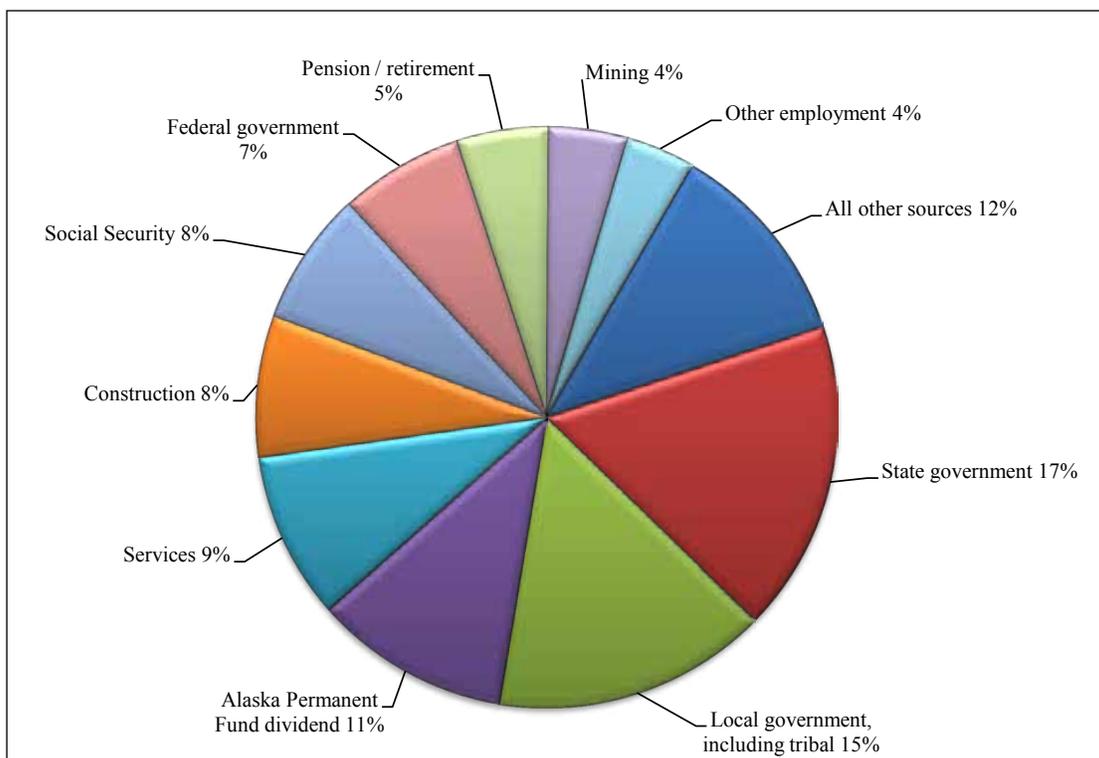


Figure 4-5.—Top income sources, Northway, 2014.

Table 4-5.—Estimated earned and other income, Northway, 2014.

Income source	Number of employed adults ^a	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
State government	8.3	8.3	\$514,731	\$152,368 – \$1,024,282	\$7,051	17.4%
Local government, including tribal	37.4	23.5	\$453,727	\$164,568 – \$811,441	\$6,215	15.3%
Services	19.4	18.0	\$275,211	\$117,771 – \$703,775	\$3,770	9.3%
Construction	8.3	8.3	\$233,560	\$33,028 – \$681,805	\$3,199	7.9%
Federal government	12.5	11.1	\$204,308	\$48,307 – \$495,850	\$2,799	6.9%
Mining	-	5.5	\$129,357	\$9,837 – \$424,636	\$1,772	4.4%
Other employment	-	4.2	\$114,784	\$7,442 – \$264,463	\$1,572	3.9%
Retail trade	8.3	8.3	\$87,835	\$16,318 – \$236,987	\$1,203	3.0%
Manufacturing	-	2.8	\$25,153	\$12,024 – \$55,187	\$345	0.8%
Agriculture, forestry, and fishing	6.9	6.9	\$15,571	\$0 – \$61,544	\$213	0.5%
Transportation, communication, and utilities	-	1.4	\$13,175	\$12,282 – \$26,985	\$180	0.4%
Earned income subtotal	92.7	56.8	\$2,067,412	\$1,312,691 – \$2,886,108	\$28,321	69.8%
Other income						
Alaska Permanent Fund dividend		67.7	\$322,575	\$265,062 – \$390,091	\$4,419	10.9%
Social Security		27.9	\$220,847	\$110,452 – \$362,807	\$3,025	7.5%
Pension / retirement		10.6	\$150,675	\$28,627 – \$345,344	\$2,064	5.1%
Native corporation dividend		62.4	\$66,289	\$53,222 – \$80,248	\$908	2.2%
Supplemental Nutrition Assistance Program (food		13.3	\$50,923	\$17,857 – \$104,247	\$698	1.7%
Heating assistance		14.6	\$25,446	\$6,037 – \$71,145	\$349	0.9%
Disability		5.3	\$21,487	\$761 – \$55,156	\$294	0.7%
Longevity bonus		6.6	\$13,911	\$2,787 – \$33,608	\$191	0.5%
Adult Public Assistance (OAA, APD)		2.7	\$9,490	\$0 – \$37,960	\$130	0.3%
Other		1.3	\$7,698	\$0 – \$15,396	\$105	0.3%
Unemployment		8.0	\$6,907	\$1,288 – \$19,068	\$95	0.2%
Supplemental security income		1.3	\$267	\$0 – \$1,398	\$4	0.0%
TANF (Temporary assistance for needy families)		0.0	\$0	\$0 – \$0	\$0	0.0%
Workers' compensation / insurance		0.0	\$0	\$0 – \$0	\$0	0.0%
Child support		0.0	\$0	\$0 – \$0	\$0	0.0%
Veteran disability		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%
Meeting honoraria		0.0	\$0	\$0 – \$0	\$0	0.0%
Other income subtotal		70.3	\$896,516	\$654,034 – \$1,245,568	\$12,281	30.2%
Community income total			\$2,963,928	\$2,169,152 – \$3,702,196	\$40,602	100.0%

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

a. Data omitted under conditions where number of employed adults was 6 or fewer.

Table 4-6.—Employment characteristics, Northway, 2014.

Characteristic	Community Northway
All adults	
Number	149.4
Mean weeks employed	24.2
Employed adults	
Number	92.7
Percentage	62.1%
Jobs	
Number	123.1
Mean	1.3
Minimum	1
Maximum	6
Months employed	
Mean	9.0
Minimum	1
Maximum	12
Percentage employed year-round	53.0%
Mean weeks employed	39.1
Households	
Number	73
Employed	
Number	56.8
Percentage	77.8%
Jobs per employed household	
Mean	2.2
Minimum	1
Maximum	6
Employed adults	
Mean	
Employed households	1.6
Total households	1.3
Minimum	1
Maximum	4
Mean person-weeks of employment	49.6

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

Table 4-7.—Employment by industry, Northway, 2014.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	123.1	56.8	92.7	
Federal government	10.1%	19.5%	13.4%	9.9%
Executive, administrative, and managerial	1.1%	2.4%	1.5%	3.6%
Technologists and technicians, except health	3.4%	7.3%	4.5%	4.3%
Administrative support occupations, including clerical	1.1%	2.4%	1.5%	0.0%
Service occupations	3.4%	4.9%	4.5%	1.8%
Transportation and material moving occupations	1.1%	2.4%	1.5%	0.2%
State government	6.7%	14.6%	9.0%	24.9%
Executive, administrative, and managerial	1.1%	2.4%	1.5%	5.2%
Service occupations	1.1%	2.4%	1.5%	6.7%
Agricultural, forestry, and fishing occupations	1.1%	2.4%	1.5%	1.1%
Transportation and material moving occupations	3.4%	7.3%	4.5%	11.9%
Local government, including tribal	33.7%	41.5%	40.3%	21.9%
Engineers, surveyors, and architects	1.1%	2.4%	1.5%	0.1%
Social scientists, social workers, religious workers, and lawyers	1.1%	2.4%	1.5%	0.6%
Teachers, librarians, and counselors	5.6%	12.2%	7.5%	4.9%
Health technologists and technicians	3.4%	7.3%	4.5%	7.4%
Technologists and technicians, except health	2.2%	4.9%	3.0%	0.6%
Administrative support occupations, including clerical	1.1%	2.4%	1.5%	1.9%
Service occupations	9.0%	17.1%	11.9%	4.7%
Construction and extractive occupations	1.1%	2.4%	1.5%	0.0%
Precision production occupations	3.4%	7.3%	4.5%	0.4%
Transportation and material moving occupations	1.1%	2.4%	1.5%	1.2%
Handlers, equipment cleaners, helpers, and laborers	4.5%	7.3%	4.5%	0.1%
Agriculture, forestry, and fishing	5.6%	12.2%	7.5%	0.8%
Agricultural, forestry, and fishing occupations	5.6%	12.2%	7.5%	0.8%
Mining	4.5%	9.8%	6.0%	6.3%
Service occupations	1.1%	2.4%	1.5%	1.2%
Construction and extractive occupations	3.4%	7.3%	4.5%	5.1%
Construction	6.7%	14.6%	9.0%	11.3%
Engineers, surveyors, and architects	1.1%	2.4%	1.5%	0.2%
Transportation and material moving occupations	3.4%	7.3%	4.5%	7.4%
Handlers, equipment cleaners, helpers, and laborers	2.2%	4.9%	3.0%	3.7%
Manufacturing	3.4%	4.9%	4.5%	1.2%
Writers, artists, entertainers, and athletes	3.4%	4.9%	4.5%	1.2%
Transportation, communication, and utilities	1.1%	2.4%	1.5%	0.6%
Technologists and technicians, except health	1.1%	2.4%	1.5%	0.6%
Retail trade	7.9%	14.6%	9.0%	4.2%
Technologists and technicians, except health	1.1%	2.4%	1.5%	0.5%
Marketing and sales occupations	4.5%	9.8%	6.0%	1.3%
Service occupations	2.2%	4.9%	3.0%	2.4%
Services	16.9%	31.7%	20.9%	13.3%
Engineers, surveyors, and architects	1.1%	2.4%	1.5%	0.5%
Technologists and technicians, except health	2.2%	4.9%	3.0%	0.7%
Marketing and sales occupations	1.1%	2.4%	1.5%	1.0%
Service occupations	7.9%	17.1%	10.4%	8.6%
Mechanics and repairers	1.1%	2.4%	1.5%	1.5%
Construction and extractive occupations	1.1%	2.4%	1.5%	0.1%
Transportation and material moving occupations	1.1%	2.4%	1.5%	0.9%
Handlers, equipment cleaners, helpers, and laborers	1.1%	2.4%	1.5%	0.1%
Industry not indicated	3.4%	7.3%	4.5%	5.6%
Executive, administrative, and managerial	1.1%	2.4%	1.5%	2.9%
Service occupations	1.1%	2.4%	1.5%	1.2%
Construction and extractive occupations	1.1%	2.4%	1.5%	1.4%

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

Northway, and these jobs, primarily Refuge Information Technician positions for the summer-only visitor center, were also seasonal.

Limited services are available in Northway, and some of the services jobs may have been outside the community, for example at Pogo Mine near Delta Junction. Local construction work is sporadically available in Northway, although there were no major construction projects in 2014.⁶ Mining, forestry (firefighting), and manufacturing (generally, crafting natural materials into products, such as birch bark baskets and beaded moose skin slippers) were relatively minor contributions to the total community income in 2014, but they were important for a few families. About 22% of households (an estimated 16 out of 73) were not employed (Table 4-6). About 53% of employed adults worked year-round, and employed adults averaged about 9 months of work. The percentages of employed persons and employed households add up to more than 100% because some individuals had more than 1 job, and some employed households included more than 1 employed person. Employed households had an average of 2.2 jobs and a combined total average of about 50 weeks of work.

Table 4-8 shows the jobs described in the surveys in terms that identify the type of employment schedule, not including the annual number of weeks or months worked for each job. About 33% of the reported jobs were described as full-time, and about 40% as part-time. Another 20% of jobs were described as on-call, which are part-time by definition. About 5% of jobs had a shift schedule. This term is used to identify jobs that require leaving Northway for a set period of work followed by a set period of time off such as the 2-weeks-on, 2-weeks-off schedule common for jobs at distant industrial projects.

With respect to other sources of income, the Alaska Permanent Fund dividend and U.S. Social Security were the highest contributors (Table 4-5). Pension/retirement income was also substantial, but inflated by the cashing out of retirement benefits by at least 1 survey respondent; the level shown should not be considered a normal contribution to the total annual income.⁷ This study found that average household income, including all sources, was about \$40,600, and that the median household income was about \$32,400 (tables 4-5 and 4-8).

Comparison of income estimates to American Community Survey (ACS) data is also confounded by the designation of 3 CDPs. Median income estimates for the 3 CDPs and this study are shown in Figure 4-6. The estimates are highly variable, and this study's estimated median 2014 household income was \$32,411—above the ACS estimate for Northway Village and below those for Northway and Northway Junction.

SUMMARY OF HARVEST AND USE PATTERNS

Seasonal Round

The rhythm of life in contemporary Northway is closely associated with the seasonal round of subsistence activity. As the days get longer in early spring, Northway trappers focus on muskrat and beaver trapping. Muskrat trapping shifts to hunting as lake ice melts, but ends when the animals begin fighting for territory in late May. Neither muskrats nor snowshoe hares are hunted in the summer when their coats are thin, their meat lacks fat, and they are raising young. As breakup continues, migratory birds begin to move through the area, and some remain to nest. Canada geese, mallards, buffleheads, and northern pintails are among the most abundant birds, welcomed as a fresh source of meat after a long winter. Eggs are also collected, but just a few, a traditional conservation measure (1504).

Once the river ice is gone, fishing for whitefish can begin and may continue through the summer, as described in the Community Background chapter. Arctic grayling and northern pike are popular targets of open-water rod and reel fishing. Some households set long lines for burbot in the summer, although this is done more frequently through the ice in the autumn and winter. Each summer, some Northway residents go to the Copper River basin to harvest salmon, which are widely shared with other community members. Birch bark, used to make baskets, can be easily peeled from trees at any time in the summer. The bark can

6. Nichol Rallo, NVC Tribal Administrator, personal communication, November 2015.

7. Godduhn, A. Field notes, February 2015; David Koster, ADF&G Research Analyst, personal communication, February 2015.

Table 4-8.—Reported job schedules, Northway, 2014.

Schedule	Jobs		Employed persons		Employed households	
	Number	Percentage	Number	Percentage	Number	Percentage
Full time	40.1	32.6%	40.1	43.3%	31.9	56.1%
Part time	49.8	40.4%	37.4	40.3%	31.9	56.1%
Shift	5.5	4.5%	5.5	6.0%	5.5	9.8%
On call (occasional)	24.9	20.2%	19.4	20.9%	16.6	29.3%
Part time shift	1.4	1.1%	1.4	1.5%	1.4	2.4%
Schedule not reported	1.4	1.1%	1.4	1.5%	1.4	2.4%

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

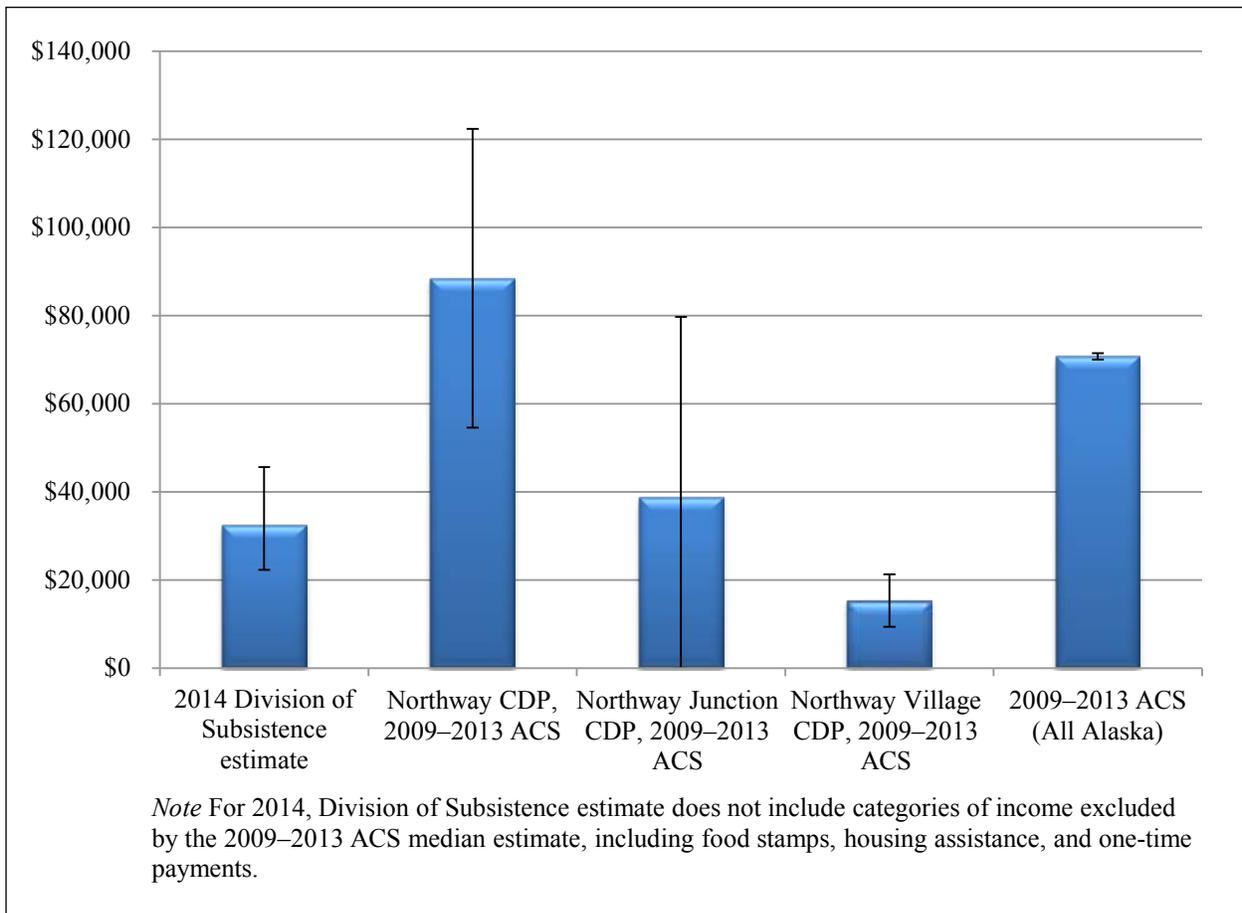


Figure 4-6.—Comparison of median income estimates, Northway combined and individual CDPs and all Alaska, 2014.

be stored and humidified for use later. In rainy summers, such as 2014, some households avidly gather the proliferating mushrooms. The main focus in July and August is berries. Blueberries and raspberries ripen in July, and lowbush cranberries are picked after the first frost in late August or September.

Residents shift their focus to moose hunting during fall time. Hunters often use rivers as travel corridors and may hunt migrating waterfowl opportunistically on hunting trips through the wetlands. Many residents spend extra time on the Alaska Highway during the hunting season in hopes of harvesting moose; some include the Taylor Highway to expand their area and to include caribou in the search. Snowshoe hares (locally known as rabbits) are hunted throughout the winter, but especially in September when they are fattest. Hunting for grouses and ptarmigans intensifies in the fall and continues through the winter. In general, winter is the slowest season for subsistence activities. Setting long lines for burbot and running trap lines for furbearers keep some households busy. Trappers take marten, a primary target, and other furbearers such as mink, weasel, lynx, and wolf throughout the winter. Additionally, some households make use of the Nelchina caribou herd that often winters in the hills north of Northway. Additionally, although the meat is generally not edible, salvaging parts (such as bone and skin used for crafts) from roadkills along the highway has become part of the seasonal round for some households (1509).

Individual Participation in the Harvesting and Processing of Wild Resources

Figure 4-7 and Appendix Table D-3 report the levels of individual participation in the harvest and processing of wild resources by Northway residents in 2014. About 84% of individuals of all ages participated in harvesting and 82% participated in processing subsistence resources. Gathering vegetation was the most widespread activity: about 75% of residents participated in 2014. More than one-half of the population went fishing and hunting, and about one-half helped process fish and large land mammals. A smaller percentage of the population, about one-third, hunted small land mammals; similarly, one-third of community members

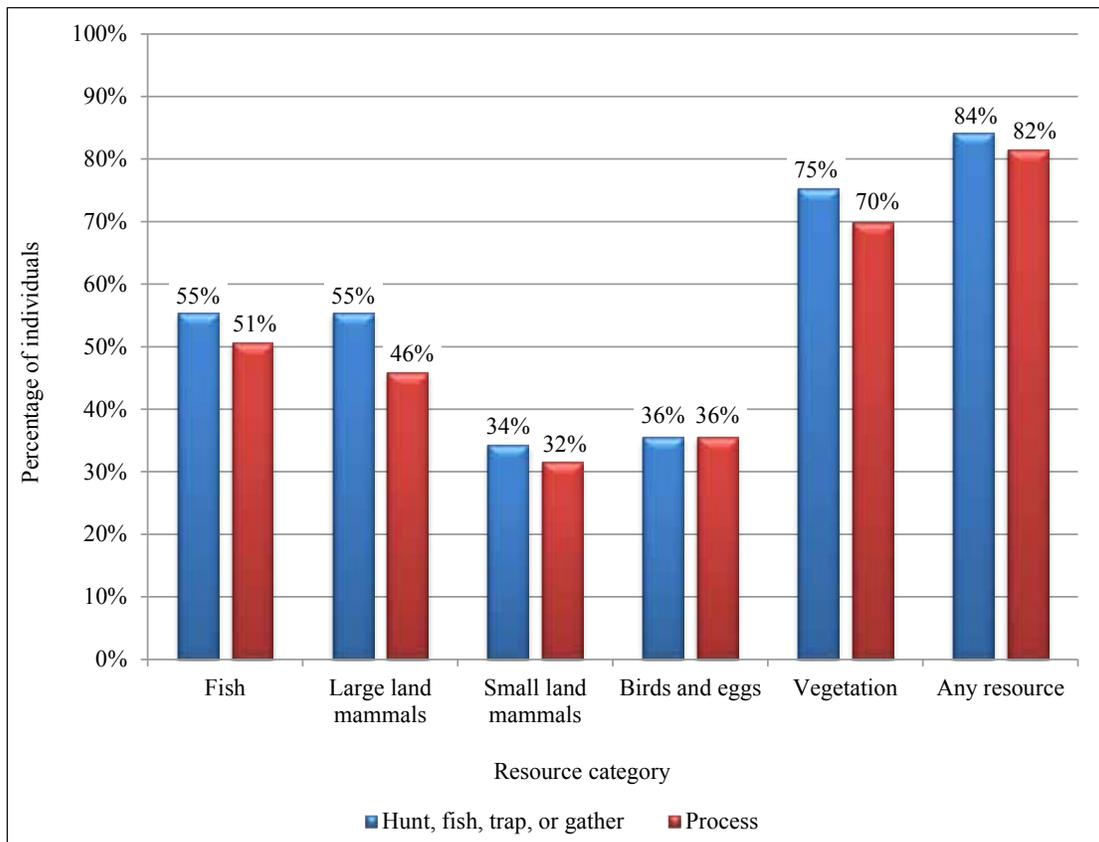


Figure 4-7.—Individual participation in subsistence harvesting and processing activities, Northway, 2014.

Table 4-9.—Individual participation in other subsistence-related activities, Northway, 2014.

Total number of people	194
Building fish wheels	
Number	4.0
Percentage	2.1%
Building fish traps	
Number	6.7
Percentage	3.4%
Building dog sleds	
Number	2.7
Percentage	1.4%
Sewing skins or cloth	
Number	51.9
Percentage	26.8%
Cooking wild foods	
Number	154.3
Percentage	79.6%

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

hunted birds, gathered eggs, or both. Similar percentages processed those harvests.

The survey also asked questions about individual participation in subsistence-related craft activities. About 80% of individuals (an estimated 154 people) cooked wild foods, mostly excluding small children (Table 4-9). Although only a few individuals participated in the construction of traditional equipment, there was a much higher level of participation in skin sewing.

Household Harvest and Use of Wild Resources

Table 1-1 summarizes resource harvest and use characteristics for Northway in 2014 at the household level. The average harvest was 314 lb edible weight per household. During the study year, community households harvested an average of 10 specific resources and used an average of 14 specific resources. The maximum number of resources used by any household was 43. In addition, households gave away an average of 6 specific resources. Overall, at least 78 different resources (Table 1-2), were used by Northway households in 2014. This included several resources that are not available in the upper Tanana River basin, as well as a few resources that were not asked about in the survey instrument but identified by survey respondents.

Figure 4-8 shows the percentages of households that used wild resources in blue, attempted to harvest in pink, and harvested wild foods in red. The difference between percentages of households harvesting and percentages of households using the resource can be explained by sharing practices; it is common in subsistence research to see higher levels of use among households than of harvest. All of the major subsistence resource categories were shared and used in Northway in 2014 except marine invertebrates. Salmon and large land mammals are the most striking examples of sharing—these were harvested by only about one-quarter of households but used by most households.

Generally, households that attempted to harvest did harvest, as indicated by close percentages of attempting and harvesting. The only exception is that 40% of households hunted but did not harvest large land mammals. However, some hunters recorded as “not harvesting” were part of a successful hunt: the actual harvest of a hunting group is attributed only to the shooter so that each harvested animal is counted only once.

Northway households often traveled to harvest wild resources on motorized equipment; boats, snowmachines, and all-terrain vehicles were all regular forms of transportation (Figure 4-9). Other motorized equipment was carried along, including generators, winches, and ice augers (Figure 4-10). Many natural materials were used in the production of handicrafts, especially from the land mammals and vegetation categories (Figure 4-11). Bark was used by at least 27% of households, primarily birch bark for making baskets. “Other raw materials” for handicrafts were used by 42% of households, especially moose skin and beaver fur but also including diamond willow, willow shoots, spruce roots, porcupine quills, and caribou fur.

Sharing of Wild Resources

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, household characteristics associated with higher food production include the presence of multiple working-age males, involvement with commercial fishing, and higher wage incomes. Characteristics common to lower producing

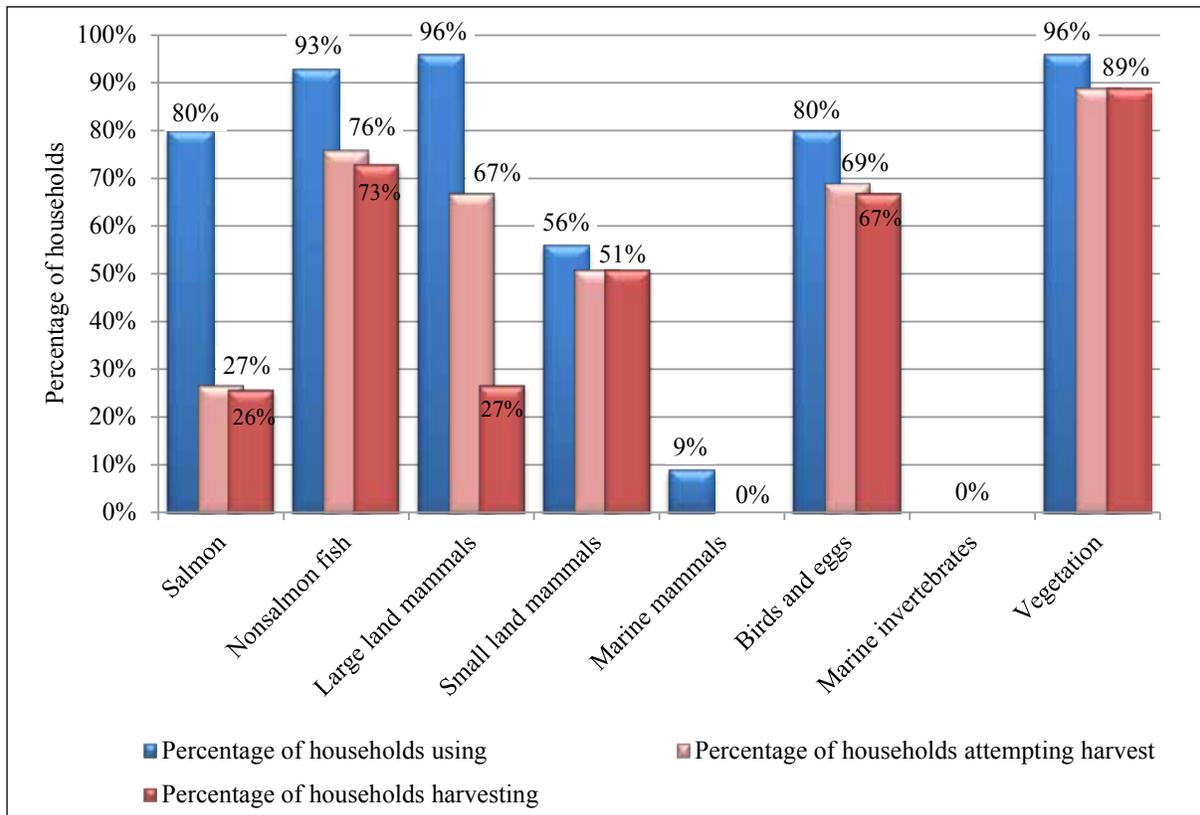


Figure 4-8.—Percentages of households using, attempting to harvest, or harvesting wild resources, by category, Northway, 2014.

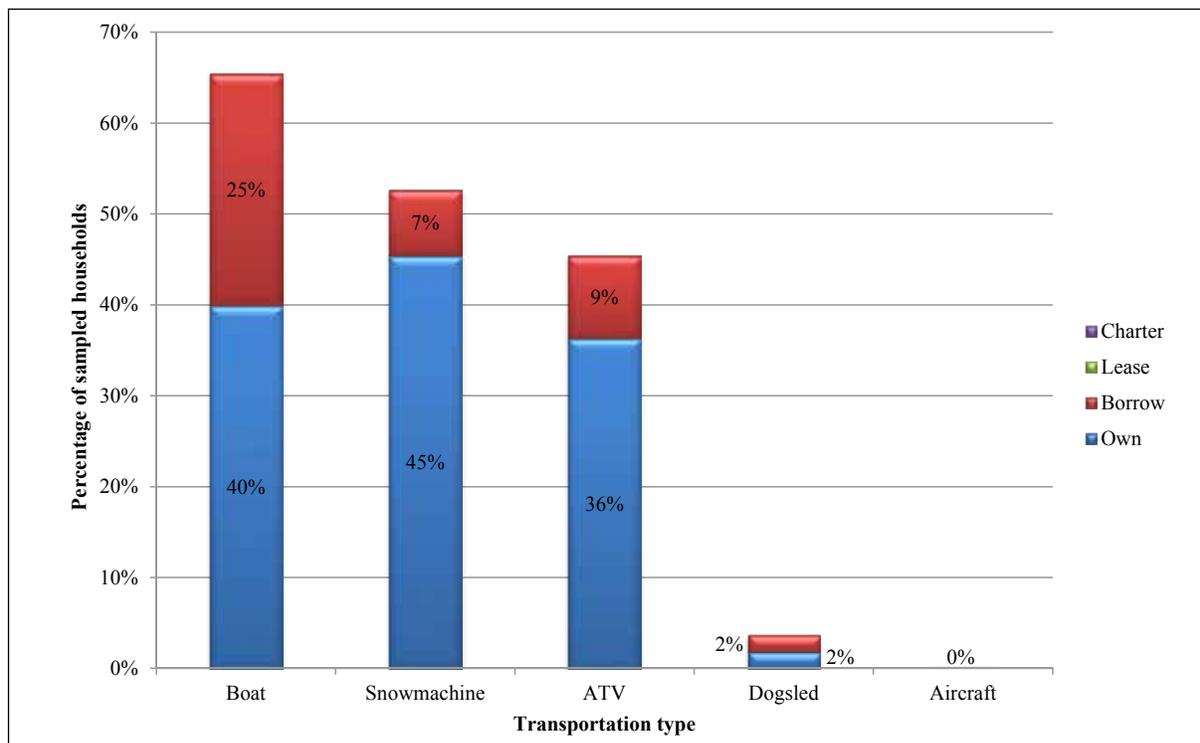


Figure 4-9.—Alternative modes of transportation used by sampled households to access wild resources, Northway, 2014.

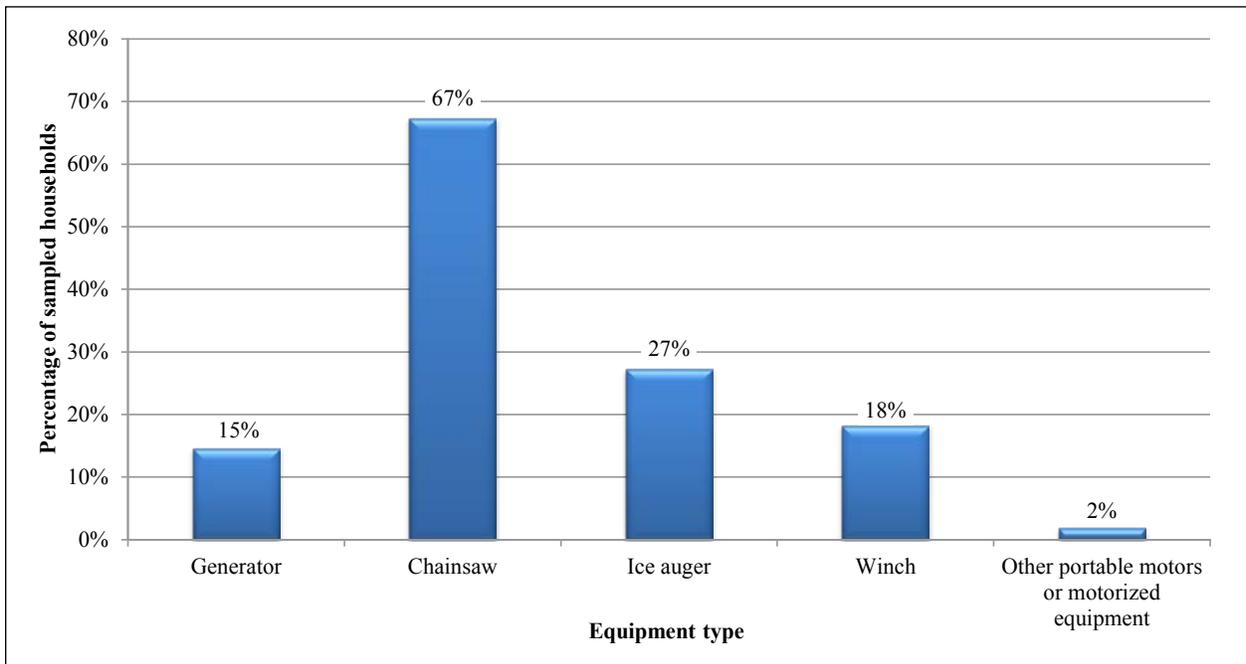


Figure 4-10.—Portable motorized equipment used by sampled households while searching for and harvesting wild resources, Northway, 2014.

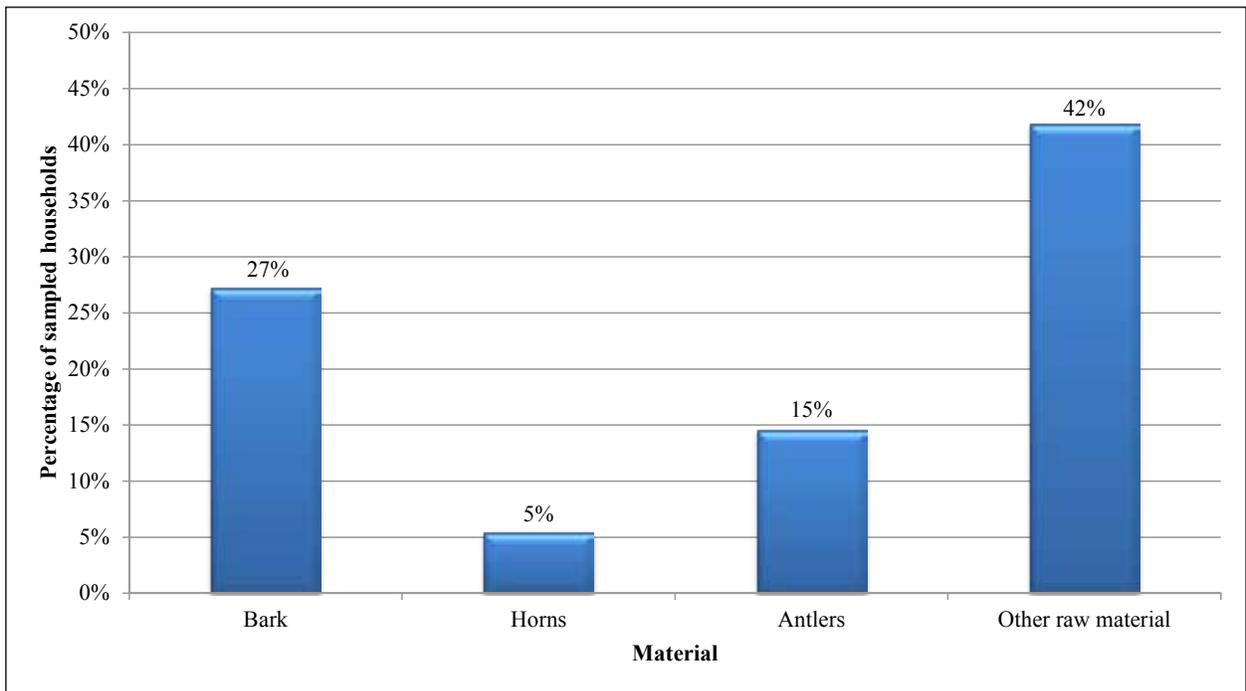


Figure 4-11.—Natural materials used by sampled households for making handicrafts, Northway, 2014.

households included female household heads, age of elders, non-Native household heads, and single-person households (Wolfe et al. 2010). Household “developmental cycles” (i.e., the relative age or “maturity” of household heads and number of productive household members) have also been associated with harvests. High harvesting households in Northway included all general demographics (Native, non-Native, and mixed race households). As shown in Figure 4-12, in the 2014 study year in Northway, the highest harvesting 22% of households brought in about 69% of the total harvest of wild resources as estimated in pounds edible weight.

Although subsistence harvest surveys collect information based on individual households, in reality, much of the production (harvesting and processing) of subsistence foods is achieved by households within a community that works cooperatively. This cooperation is often organized based on kinship in the manner of traditional Athabascan communities. Cooperation in the production of foods is just one component of subsistence economies. Subsistence foods are also widely distributed among households within a community through sharing, and also by barter and customary trade. The organization of the contemporary mixed market–subsistence economies that are predominant in rural Alaska communities has been documented ethnographically by numerous researchers. Of particular interest for the Upper Tanana region of Alaska are reports from McKennan (1959), Guédon (1974), Langdon and Worl (1981), Wolfe and Ellanna (1983), Wolfe and Walker (1987), Haynes et al. (1984), Case (1986), Halpin (1987), Fall (1990), Simeone (1995), and Haynes and Simeone (2007). Further analysis of the study findings, beyond the scope of this report, might identify characteristics of the highly productive households in Northway.

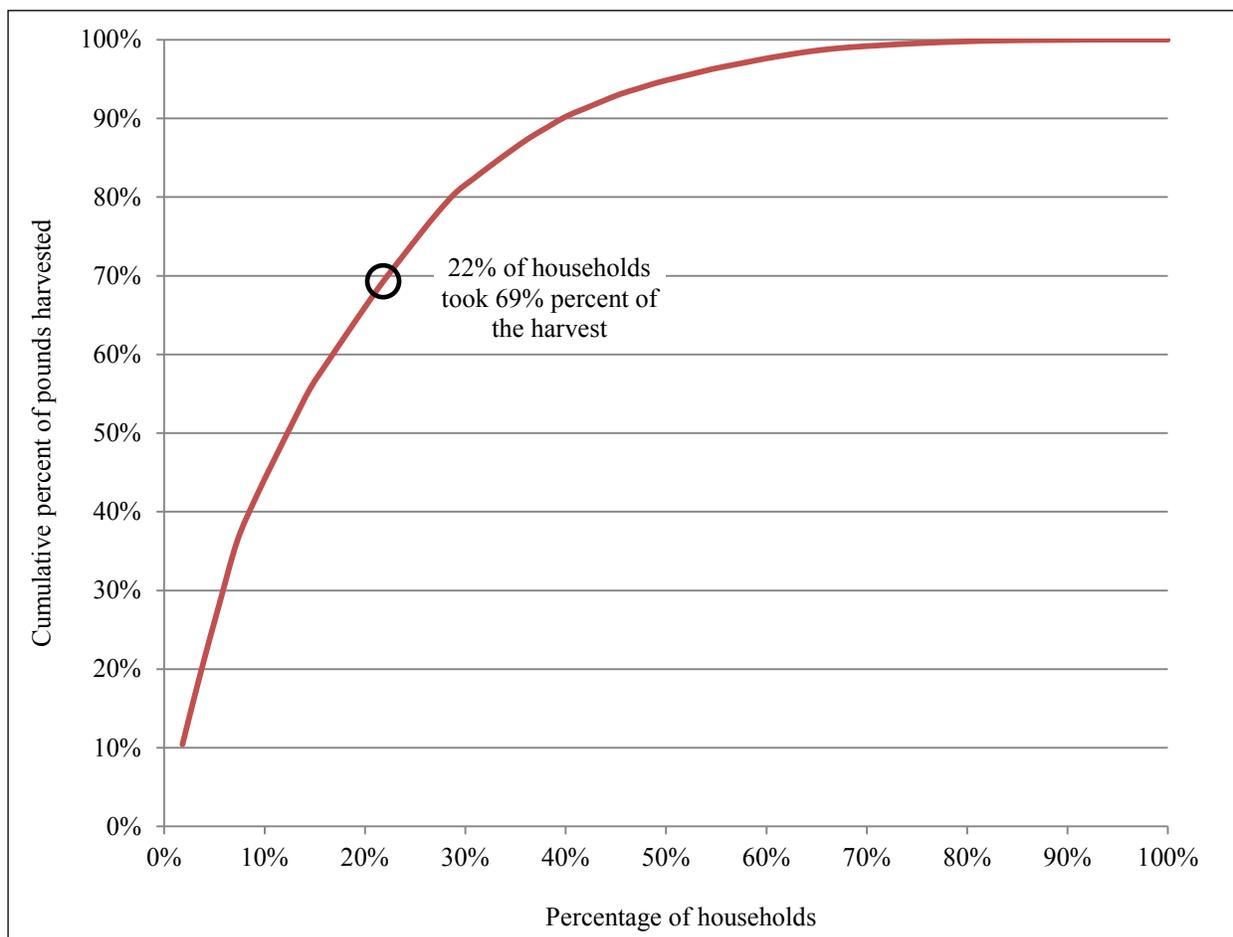


Figure 4-12.—Household specialization, Northway, 2014.

HARVEST QUANTITIES AND COMPOSITION

Table 4-10 reports estimated wild resource harvests and uses by Northway residents in 2014 and is organized first by general category and then by species. All edible resources are reported in pounds edible weight (lb; see Appendix C for conversion factors).⁸ A household was classified as “harvesting” if any member of the surveyed household had harvested the resource during the study year, and “receiving” if the household acquired resources from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Both harvesting and receiving indicate that a household “used” a resource, whether the resource was eaten, given away, fed to dogs, or used for craft. 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.

All responding Northway households used wild foods in 2014, and nearly all harvested, received, and gave away wild foods (Table 4-10). This study estimates that Northway residents harvested a total of 60,791 lb of wild foods in 2014, amounting to 833 lb per household and 314 lb per resident. The composition of the harvest by resource category is shown in Figure 4-13 and discussed in detail below. Northway residents covered extensive territories in their pursuit of wild food, as seen in Figure 4-14.

As described in the Demography section, this study’s estimated population (194) is likely low. Any sampling result that underestimated the population would also have underestimated the total harvest as well, but per capita averages derived from study data would not be affected and appear to be reasonable.

Harvest and Use Characteristics by Species

Table 4-11 lists the 10 most widely used individual resources in 2014 and shows differences from Figure 4-1, the 10 most harvested resources in terms of edible weight. Moose, the second most harvested species by weight (25% of the total harvest), is the most widely used resource, by 96% of households. The next most widely used resource, blueberry, was harvested in much lower quantities; blueberries made up only 4% of the total harvest weight, but was used by 87% of households. The most harvested species by weight, humpback whitefish, was used by 67% of households. During the survey effort, one of the researchers visited a classroom at the Walter Northway School to describe the project. The students made their own list of important wild foods reflecting what they eat in their homes (Plate 4-1). Although they had little familiarity with the word “subsistence,” they understood the importance of wild foods for their families. Table 4-11 and Plate 4-1 share 8 out of 10 of the resources, which suggests that the students maintain an accurate understanding of what their community uses. Differences in rank for any given resource on each list may reflect family-specific practices, cultural importance, or changes from year to year. For example, although muskrat occupies the lower one-third of the survey list, the students ranked it third on their list, likely reflecting the historical role and traditional value of muskrat in Northway more than its actual use by households today.

Harvest and Use Characteristics by Resource Category

Nonsalmon Fish

In contrast to most river systems in Alaska, the upper Tanana River does not support major runs of salmon. Although the harvest of nonsalmon fish is an important component of subsistence across rural Alaska, few communities rival Northway in the harvest and use of humpback whitefish—historically one of the most reliable and abundant resources in the basin. Some details regarding the traditional importance of nonsalmon fish are found in the Community Background and Discussion and Conclusion chapters. This section will focus on information about 2014 from the harvest surveys and key respondent interviews.

8. Edible weight includes plant and animal parts usable as food. Some bone weight is included in the conversion from whole weight to edible weight (lb). Resources that are not eaten, such as firewood and some furbearers, are included in the conversion factor table and assigned a value of zero.

Table 4-10.—Estimated harvest and use of fish, wildlife, and vegetation resources, Northway, 2014.

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
All resources	100.0	94.5	94.5	94.5	90.9	60,791.0	832.8	313.7	60,791.0 lb		832.8	18.7
Salmon	80.0	27.3	25.5	63.6	36.4	7,908.5	108.3	40.8	7,908.5 lb		108.3	33.2
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0
Unknown chum salmon	3.6	3.6	3.6	0.0	0.0	40.5	0.6	0.2	5.3 ind		0.1	69.7
Coho salmon	29.1	10.9	10.9	20.0	14.5	2,370.1	32.5	12.2	293.3 ind		4.0	56.2
Chinook salmon	20.0	7.3	7.3	10.9	7.3	352.2	4.8	1.8	19.9 ind		0.3	50.5
Pink salmon	7.3	3.6	3.6	3.6	1.8	313.1	4.3	1.6	92.9 ind		1.3	76.1
Sockeye salmon	45.5	18.2	16.4	30.9	23.6	4,832.6	66.2	24.9	814.9 ind		11.2	41.7
Spawnouts	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	14.5	0.0	0.0	14.5	5.5	0.0	0.0	0.0	0.0 ind		0.0	0.0
Nonsalmon fish	92.7	76.4	72.7	43.6	47.3	23,957.8	328.2	123.6	23,957.8 lb		328.2	29.9
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
Flounders	1.8	1.8	1.8	0.0	0.0	4.0	0.1	0.0	1.3 ind		0.0	99.6
Pacific halibut	3.6	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0
Burbot	50.9	41.8	36.4	18.2	21.8	1,204.1	16.5	6.2	501.7 ind		6.9	31.8
Dolly Varden	3.6	1.8	1.8	1.8	1.8	11.9	0.2	0.1	13.3 ind		0.2	99.6
Lake trout	3.6	1.8	1.8	1.8	1.8	21.2	0.3	0.1	10.6 ind		0.1	99.6
Arctic grayling	47.3	50.9	45.5	5.5	9.1	497.2	6.8	2.6	497.2 ind		6.8	23.0
Northern pike (small, pickle)	16.4	16.4	16.4	0.0	7.3	1,408.2	19.3	7.3	1,408.2 ind		19.3	53.2
Northern pike	18.2	14.5	12.7	5.5	5.5	328.5	4.5	1.7	73.0 ind		1.0	50.4
Sheefish	1.8	1.8	1.8	0.0	1.8	159.3	2.2	0.8	26.5 ind		0.4	99.6
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	3.6	3.6	3.6	0.0	1.8	27.9	0.4	0.1	19.9 ind		0.3	73.7
Unknown trouts	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	7.3	1.8	1.8	5.5	1.8	84.9	1.2	0.4	26.5 ind		0.4	99.6
Bering cisco	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 4-10.—Page 2 of 4.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount		95% confidence limit (\pm) harvest	
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit		Mean per household
Nonsalmon fish, continued												
Least cisco	1.8	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0
Humpback whitefish	67.3	43.6	43.6	30.9	32.7	18,181.1	249.1	93.8	6,060.4 ind		83.0	37.6
Round whitefish	7.3	7.3	7.3	0.0	5.5	81.0	1.1	0.4	161.9 ind		2.2	82.0
Unknown whitefishes	1.8	1.8	1.8	0.0	1.8	1,948.5	26.7	10.1	663.6 ind		9.1	99.6
Large land mammals	96.4	67.3	27.3	78.2	36.4	16,750.2	229.5	86.4	16,750.2 lb		229.5	25.2
Black bear	5.5	5.5	1.8	1.8	3.6	132.7	1.8	0.7	1.3 ind		0.0	99.6
Brown bear	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0
Caribou	34.5	23.6	12.7	12.7	12.7	1,725.5	23.6	8.9	13.3 ind		0.2	37.8
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	96.4	65.5	23.6	76.4	36.4	14,892.0	204.0	76.8	22.6 ind		0.3	26.3
Dall sheep	3.6	1.8	0.0	1.8	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0
Small land mammals	56.4	50.9	50.9	16.4	29.1	3,119.1	42.7	16.1	3,119.1 lb		42.7	31.4
Beaver	25.5	21.8	20.0	7.3	14.5	1,651.0	22.6	8.5	115.5 ind		1.6	47.7
Coyote	10.9	10.9	10.9	0.0	1.8	0.0	0.0	0.0	13.5 ind		0.2	44.7
Foxes	12.7	12.7	12.7	0.0	3.6	0.0	0.0	0.0	41.1 ind		0.6	45.8
Snowshoe hare	29.1	29.1	25.5	3.6	9.1	355.5	4.9	1.8	184.5 ind		2.5	30.6
River (land) otter	1.8	1.8	1.8	0.0	0.0	0.0	0.0	0.0	2.7 ind		0.0	99.6
Lynx	12.7	12.7	12.7	0.0	0.0	26.5	0.4	0.1	55.7 ind		0.8	99.6
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	20.0	20.0	20.0	0.0	0.0	8.6	0.1	0.0	244.2 ind		3.3	99.6
Mink	7.3	7.3	7.3	0.0	0.0	2.7	0.0	0.0	11.9 ind		0.2	99.6
Muskrat	45.5	36.4	36.4	9.1	21.8	1,015.1	13.9	5.2	1,364.4 ind		18.7	29.7
Porcupine	12.7	14.5	10.9	1.8	7.3	59.7	0.8	0.3	11.9 ind		0.2	41.1
Squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0
Weasels	1.8	1.8	1.8	0.0	1.8	0.0	0.0	0.0	53.1 ind		0.7	99.6
Gray wolf	7.3	7.3	7.3	0.0	0.0	0.0	0.0	0.0	17.3 ind		0.2	53.5
Wolverine	5.5	5.5	5.5	0.0	0.0	0.0	0.0	0.0	10.6 ind		0.1	57.3
Marine mammals	9.1	0.0	0.0	9.1	1.8	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	1.8	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0
Unknown seal	1.8	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0

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Table 4-10.–Page 3 of 4.

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
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 whales	9.1	0.0	0.0	9.1	1.8	0.0	0.0	0.0	0.0	ind	0.0	0.0
Birds and eggs	80.0	69.1	67.3	25.5	36.4	5,343.0	73.2	27.6	5,343.0 lb		73.2	53.1
Bufflehead	14.5	9.1	9.1	5.5	7.3	140.3	1.9	0.7	350.7	ind	4.8	94.2
Goldeneyes	9.1	9.1	9.1	0.0	3.6	116.5	1.6	0.6	75.7	ind	1.0	87.5
Mallard	54.5	40.0	40.0	14.5	23.6	2,641.4	36.2	13.6	1,354.6	ind	18.6	58.9
Long-tailed duck	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pintail	12.7	10.9	9.1	3.6	7.3	215.6	3.0	1.1	143.7	ind	2.0	91.9
Unknown scaups	5.5	5.5	5.5	0.0	5.5	131.6	1.8	0.7	146.2	ind	2.0	90.6
Black scoter	10.9	9.1	7.3	3.6	3.6	96.8	1.3	0.5	107.5	ind	1.5	58.7
Surf scoter	1.8	1.8	1.8	0.0	1.8	17.9	0.2	0.1	19.9	ind	0.3	99.6
White-winged scoter	7.3	7.3	7.3	0.0	7.3	250.6	3.4	1.3	109.4	ind	1.5	85.5
Unknown scoters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern shoveler	7.3	5.5	5.5	1.8	3.6	4.5	0.1	0.0	4.1	ind	0.1	95.9
Unknown teals	9.1	9.1	9.1	0.0	3.6	13.5	0.2	0.1	25.9	ind	0.4	60.7
American wigeon	5.5	5.5	5.5	0.0	5.5	19.2	0.3	0.1	14.6	ind	0.2	90.6
Canada goose	25.5	21.8	18.2	7.3	9.1	562.8	7.7	2.9	140.7	ind	1.9	47.3
Snow goose	5.5	3.6	3.6	1.8	3.6	68.8	0.9	0.4	17.3	ind	0.2	71.6
White-fronted goose	7.3	7.3	7.3	0.0	5.5	253.2	3.5	1.3	59.7	ind	0.8	69.9
Unknown swans	1.8	1.8	1.8	0.0	1.8	21.2	0.3	0.1	2.7	ind	0.0	99.6
Sandhill crane	1.8	1.8	1.8	0.0	1.8	22.3	0.3	0.1	2.7	ind	0.0	99.6
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
Spruce grouse	49.1	41.8	40.0	10.9	16.4	382.8	5.2	2.0	546.8	ind	7.5	31.0
Sharp-tailed grouse	20.0	20.0	18.2	3.6	7.3	140.3	1.9	0.7	200.4	ind	2.7	41.4
Ruffed grouse	21.8	20.0	20.0	3.6	5.5	137.5	1.9	0.7	196.4	ind	2.7	44.2
Ptarmigans	23.6	23.6	21.8	1.8	7.3	95.7	1.3	0.5	136.7	ind	1.9	33.8
Duck eggs	9.1	9.1	7.3	1.8	1.8	10.6	0.1	0.1	70.3	ind	1.0	55.8
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
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

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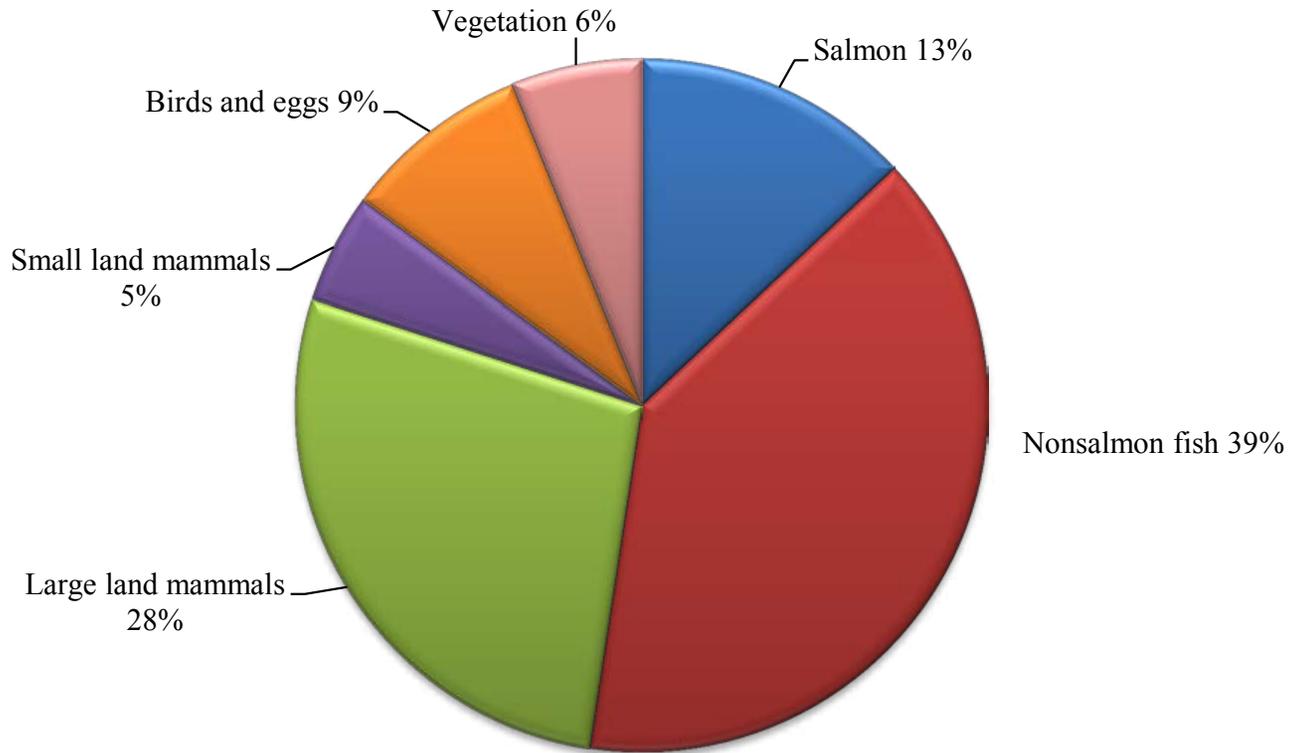
Table 4-10.–Page 4 of 4.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount		95% confidence limit (\pm) harvest	
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit		Mean per household
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
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	96.4	89.1	89.1	49.1	60.0	3,712.4	50.9	19.2	3,712.4 lb		50.9	15.6
Blueberry	87.3	74.5	74.5	25.5	47.3	2,083.8	28.5	10.8	521.0 gal		7.1	18.0
Lowbush cranberry	63.6	61.8	60.0	9.1	32.7	715.4	9.8	3.7	178.9 gal		2.5	18.6
Highbush cranberry	7.3	7.3	7.3	0.0	5.5	53.1	0.7	0.3	13.3 gal		0.2	53.3
Crowberry	10.9	10.9	10.9	1.8	5.5	54.4	0.7	0.3	13.6 gal		0.2	48.2
Cloudberry	5.5	7.3	5.5	0.0	1.8	8.6	0.1	0.0	2.2 gal		0.0	68.2
Raspberry	45.5	43.6	43.6	1.8	21.8	396.5	5.4	2.0	99.1 gal		1.4	19.7
Soapberry	1.8	1.8	1.8	0.0	0.0	10.6	0.1	0.1	2.7 gal		0.0	99.6
Wild rhubarb	7.3	7.3	7.3	0.0	3.6	22.6	0.3	0.1	22.6 gal		0.3	55.4
Indian potato (roots)	10.9	9.1	9.1	1.8	5.5	38.5	0.5	0.2	9.6 gal		0.1	48.2
Hudson's Bay (Labrador)	3.6	3.6	3.6	1.8	1.8	5.3	0.1	0.0	5.3 gal		0.1	78.3
tea												
Spruce tips	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 gal		0.0	0.0
Wild rose hips	16.4	14.5	14.5	1.8	5.5	95.6	1.3	0.5	23.9 gal		0.3	38.7
Mushrooms	45.5	40.0	38.2	9.1	18.2	210.7	2.9	1.1	210.7 gal		2.9	56.6
Punk	5.5	3.6	3.6	0.0	3.6	0.0	0.0	0.0	30.5 gal		0.4	87.3
Chaga	16.4	9.1	7.3	9.1	9.1	13.3	0.2	0.1	13.3 gal		0.2	58.7
Muskrat candy	7.3	3.6	3.6	3.6	1.8	4.0	0.1	0.0	4.0 gal		0.1	73.7
Wood	80.0	56.4	56.4	34.5	18.2	0.0	0.0	0.0	0.0 lb		0.0	0.0
Bark	1.8	1.8	1.8	0.0	1.8	0.0	0.0	0.0	0.0 lb		0.0	0.0
Other wood	16.4	12.7	12.7	3.6	3.6	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 4-13.—Composition of harvest by resource category in edible pounds, Northway, 2014.

Table 4-11.—Top 10 most widely used edible resources, Northway, 2014.

Rank ^a	Resource ^b	Percentage of households using
1.	Moose	96.4%
2.	Blueberry	87.3%
3.	Humpback whitefish	67.3%
4.	Lowbush cranberry	63.6%
5.	Mallard	54.5%
6.	Burbot	50.9%
7.	Spruce grouse	49.1%
8.	Arctic grayling	47.3%
9.	Sockeye salmon	45.5%
9.	Muskrat	45.5%
9.	Raspberry	45.5%
9.	Mushrooms	45.5%

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.

b. Firewood was used by 80% of households.

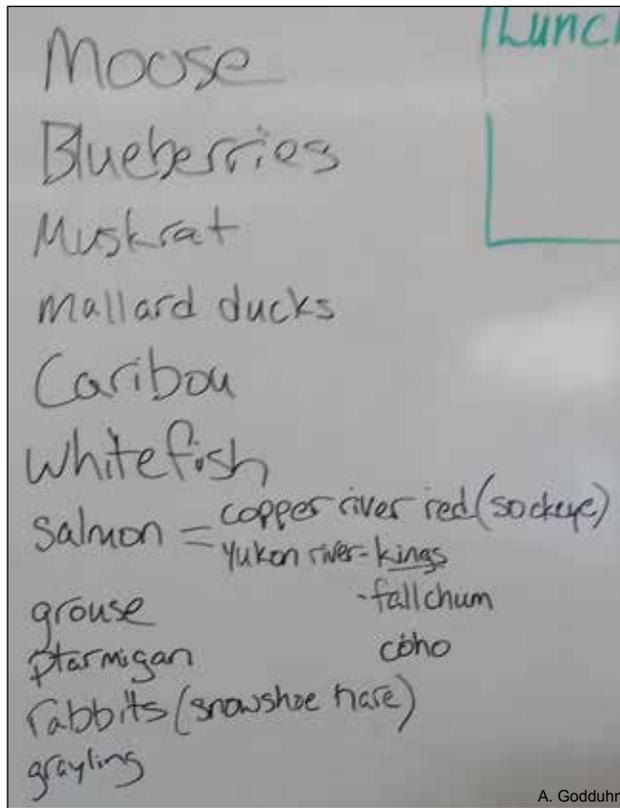


Plate 4-1.—Wild foods identified as important by Northway high school students in February 2015.

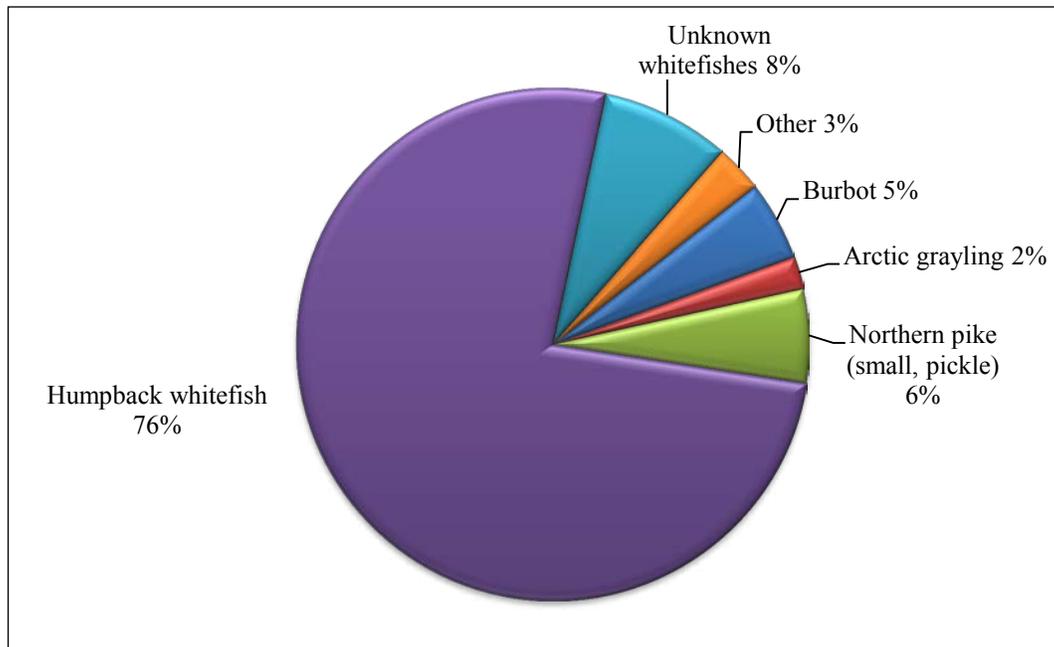


Figure 4-15.—Composition of nonsalmon fish harvest by edible pounds, Northway, 2014.

The survey data indicate that the harvest of nearly 9,500 nonsalmon fish amounted to 23,958 lb, which provided 39% of the wild food supply in Northway (Table 4-10; Figure 4-13). More than three-quarters (76%) of that weight was humpback whitefish (Figure 4-15). Because the much smaller round whitefish is the only other whitefish species caught in the Nabesna and Chisana river systems (Brown 2006)⁹ (approximately 3% of the identified local whitefishes catch in the survey data), it is likely that the vast majority of the unknown whitefishes were humpback whitefish, such that humpbacks probably accounted for over 80% of the nonsalmon harvest by weight.

The next most harvested nonsalmon fish by weight was northern pike. The vast majority of northern pike were caught as juveniles.¹⁰ Pickle-pike are popular: they provided an estimated 1,408 lb to Northway’s 2014 harvest, approximately 6% of the nonsalmon harvest (Table 4-10; Figure 4-15). About 73 adult northern pike added 329 lb to the total wild food supply (Table 4-10).

Pickle-pike are sometimes used as bait to catch another popular wild food: burbot (locally called lingcod or lush), which was the next most harvested nonsalmon fish by weight, making up another 5% of the nonsalmon harvest (Figure 4-15). Arctic grayling was another popular target, and nearly 500 were caught in 2014 (Table 4-10). Some of the nonsalmon fish reported by Northway households were not caught locally. Sheefish (inconnu), broad whitefish, and flounders are not found in the upper Tanana River system, but were caught elsewhere by Northway residents, mostly while they were fishing for salmon.

The primary gear for catching nonsalmon fish was setnet (set gillnet). About 6,951 nonsalmon fish (20,509 lb) were taken using setnets, 1,712 nonsalmon fish (2,091 lb) were caught using other subsistence methods (longlining through the ice or in open water, jigging through the ice, and hooking or snagging), and 728 nonsalmon fish (1,257 lb) were harvested using rod and reel gear (Table 4-12). Figure 4-16 is a visual representation of the edible pounds of nonsalmon fish harvested by gear type. Fishing equipment is often shared. One especially productive net in the Chisana River near Moose Creek in August of 2014 caught over 2,000 humpback whitefish. Those fish were harvested by at least 7 different households, some of whom worked together, and used by even more (HH61).

9. Landlocked least cisco occurs in some lakes of the central WRST (Brown 2006), but none was reported as harvested in 2014.

10. Mature northern pike fall within the “other” category on Figure 4-15.

Table 4-12.—Nonsalmon fish harvests by gear type and resource, Northway, 2014.

Resource	Subsistence methods															
	Removed from commercial catch		Fish wheel		Gillnet or seine		Ice fishing		Other method		Subsistence gear, any method		Rod and reel		Any method	
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Nonsalmon fish	0.0	0.0	0.0	0.0	6,951.0	20,508.5	73.0	100.9	1,712.2	2,091.3	8,736.1	22,700.6	728.2	1,257.2	9,464.3	23,957.8
Pacific herring	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flounders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	4.0	1.3	4.0
Pacific halibut	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	19.9	47.8	270.8	649.8	290.7	697.6	211.0	506.5	501.7	1,204.1
Dolly Varden	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	11.9	13.3	11.9
Lake trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	21.2	10.6	21.2
Arctic grayling	0.0	0.0	0.0	0.0	0.0	0.0	53.1	53.1	33.2	33.2	86.3	86.3	411.0	411.0	497.2	497.2
Northern pike (small, pickle)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,408.2	1,408.2	1,408.2	1,408.2	0.0	0.0	1,408.2	1,408.2
Northern pike	0.0	0.0	0.0	0.0	11.9	53.8	0.0	0.0	0.0	0.0	11.9	53.8	61.1	274.7	73.0	328.5
Sheefish	0.0	0.0	0.0	0.0	26.5	159.3	0.0	0.0	0.0	0.0	26.5	159.3	0.0	0.0	26.5	159.3
Longnose sucker	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.9	27.9	19.9	27.9
Unknown trouts	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	26.5	84.9	0.0	0.0	0.0	0.0	26.5	84.9	0.0	0.0	26.5	84.9
Bering cisco	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	6,060.4	18,181.1	0.0	0.0	0.0	0.0	6,060.4	18,181.1	0.0	0.0	6,060.4	18,181.1
Round whitefish	0.0	0.0	0.0	0.0	161.9	81.0	0.0	0.0	0.0	0.0	161.9	81.0	0.0	0.0	161.9	81.0
Unknown whitefishes	0.0	0.0	0.0	0.0	663.6	1,948.5	0.0	0.0	0.0	0.0	663.6	1,948.5	0.0	0.0	663.6	1,948.5

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

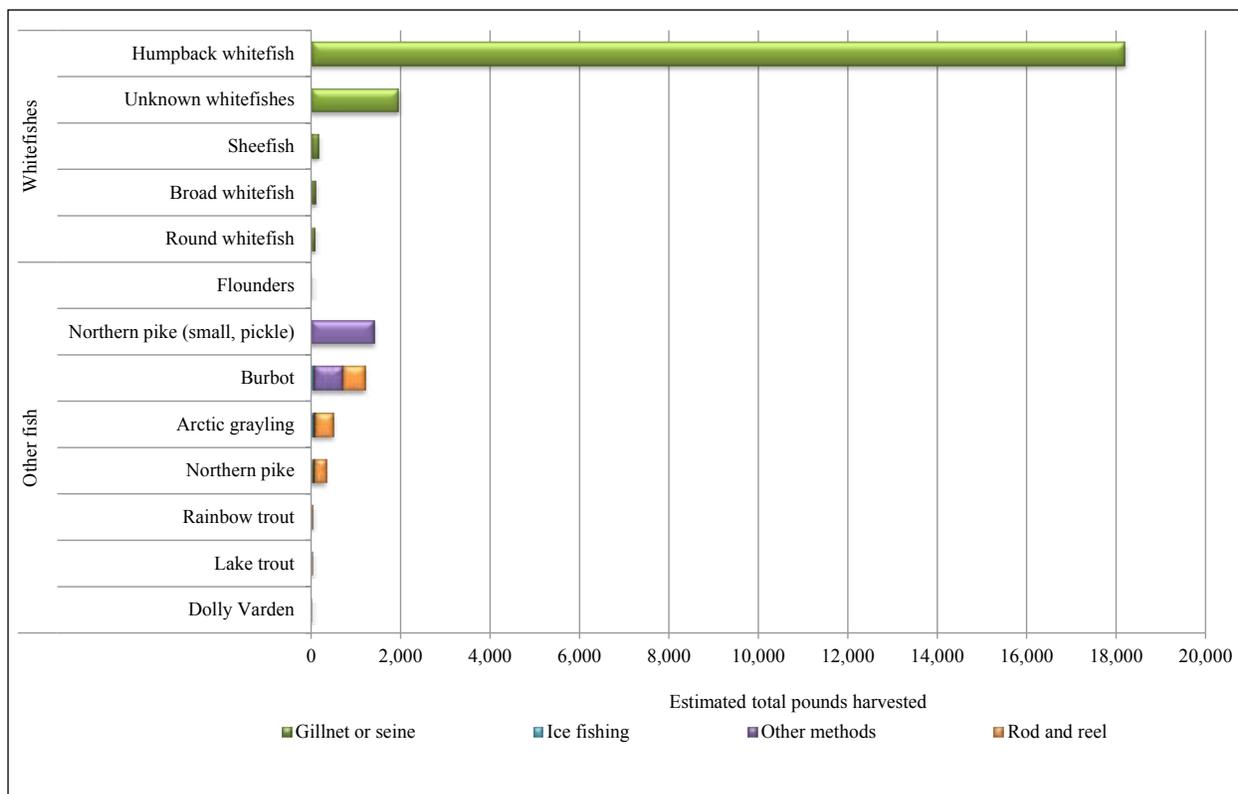


Figure 4-16.—Nonsalmon fish harvests by gear type, Northway, 2014.

Northway residents caught nonsalmon fish in the major rivers of the upper Tanana River system (the Nabesna, Chisana, Tanana, and Tetlin rivers) and many smaller tributaries (Moose, Mark, Ten Mile, Stuver, Gardiner, and Scottie creeks; Figure 4-17). The bulk of the 2014 harvest reportedly came directly from the Nabesna or Chisana rivers. The owner of the highly productive net mentioned above said that “whitefish don’t run normally anymore” (HH61). She described less predictable runs than in decades past, and how her family had tried several upriver locations over the summer and “finally found them” near the mouth of Moose Creek in August. She also said that they had more success than in 2013, and that she had not seen abnormal fish for several years.

Burbot are known for lingering in eddies where clear creeks come into the main rivers and there are many ‘holes’ used for setting long lines, in open water or through ice (1501, 1503, 1506). Pickle-pike are taken mostly from small creeks along Northway Road, while adult pike are found mostly in clearwater streams and lakes, such as Moose Creek and Mark Lake. A picnic area along the Alaska Highway, at the bridge that crosses Gardiner Creek, is a popular spot to cast for Arctic grayling.

Salmon

Although not locally available, salmon is also important in Northway. The harvest surveys indicate the incidental capture of 5 chum salmon in whitefish nets near Northway (Table 4-10; probably fall chum salmon), but these were in spawning condition and not necessarily considered suitable for human food. However, an estimated 7,909 lb of salmon were harvested by Northway households, primarily sockeye salmon (Table 4-10; Figure 4-18). Salmon is such a widely shared food in the Upper Tanana region that more Northway households gave salmon away than actually caught salmon. Households participating in the cooperative use of fish wheels, especially near Slana, to harvest sockeye salmon reported significant harvests of “Copper River reds” (Table 4-10; Figure 4-19). Some of the fish wheels were owned by Northway residents, and some were owned by relatives in the Copper River basin (1509). Sockeye salmon have long

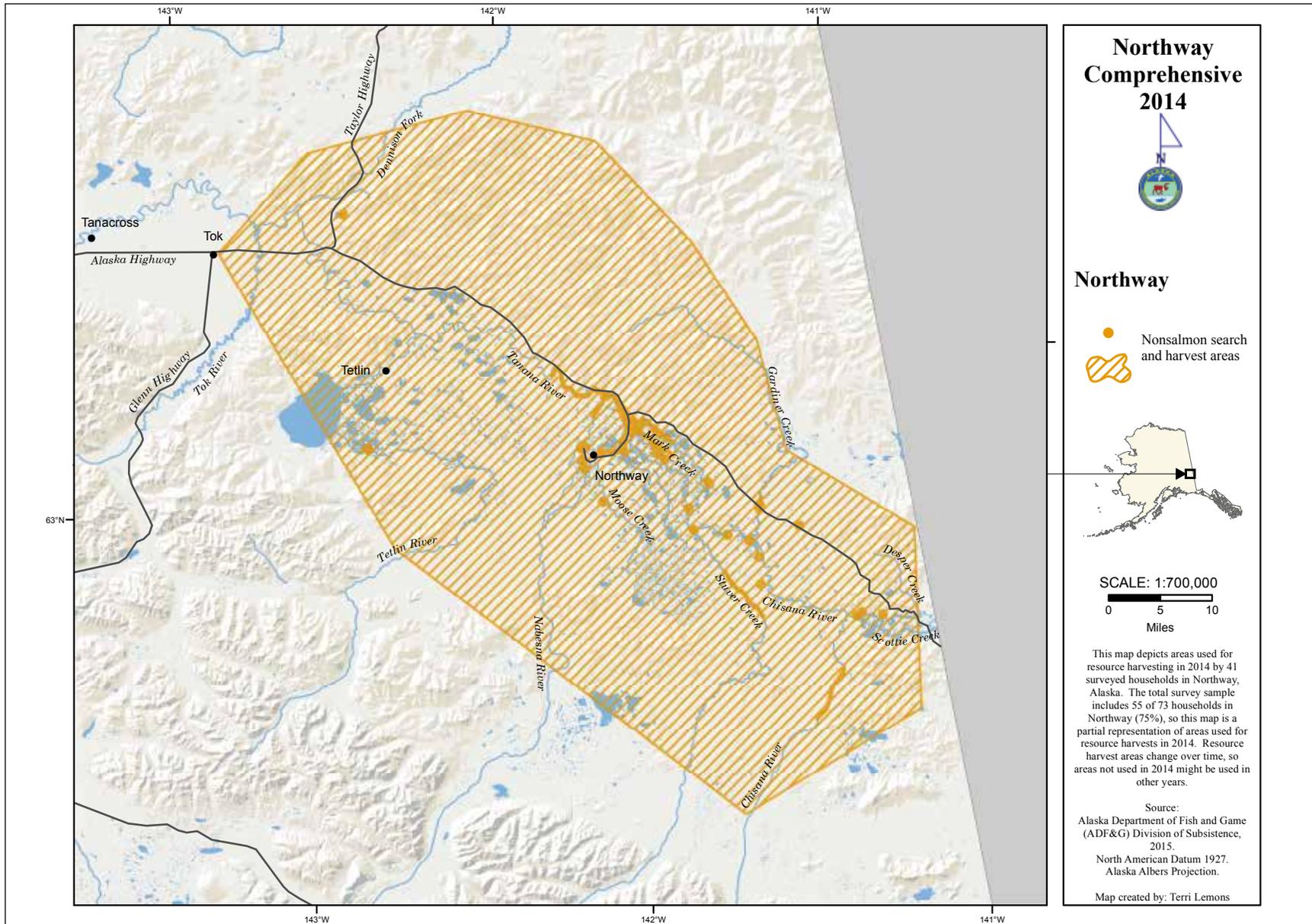


Figure 4-17.—Nonsalmon fishing areas, Northway, 2014.

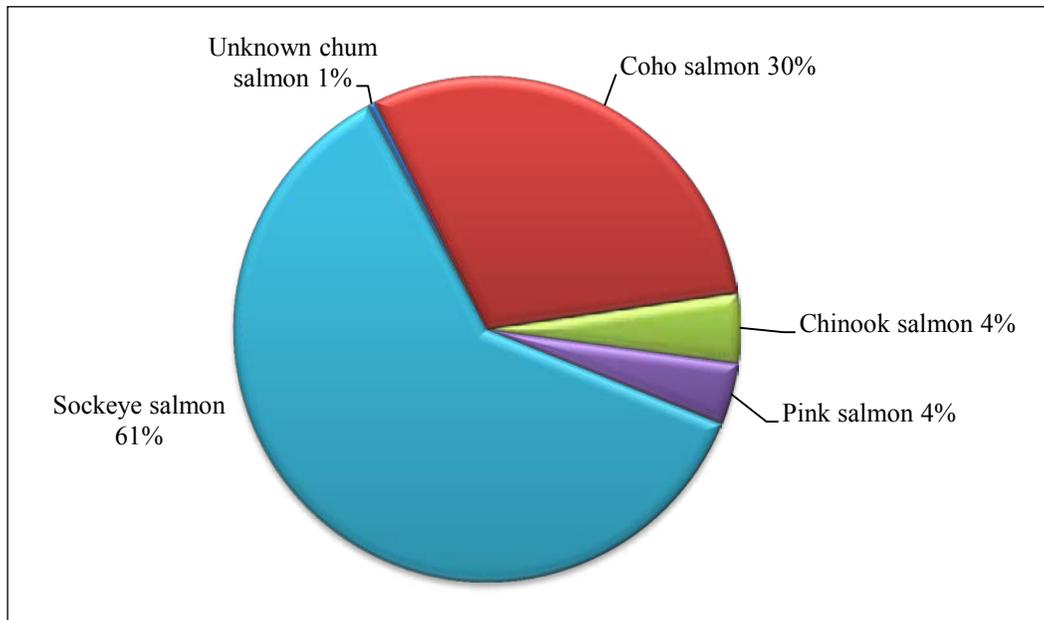


Figure 4-18.—Composition of salmon harvest by edible pounds, Northway, 2014.

been used by Northway households (Haynes et al. 1987), and have become even more important since declines in Yukon River Chinook salmon resulted in significant subsistence restrictions on that harvest. Northway residents also caught salmon from the Kenai River and the Yukon River (Yukon River locations not mapped).

The overwhelming majority of salmon (91% of individual fish) were caught in fish wheels, although one quarter of the coho salmon were caught in set gillnets (Table 4-13). A far smaller number of salmon were caught by rod and reel (27 pink and 7 coho salmon). Table 4-13 lists the numbers of fish and edible pounds caught by each gear type; Figure 4-20 is a graphical representation of harvests by gear type.

Large Land Mammals

An estimated 37 large land mammals (16,750 lb; Table 4-10) accounted for 28% of Northway’s wild food supply in 2014 (Figure 4-13). The weight was primarily contributed by moose, which is the most available source of wild red meat in the eastern upper Tanana valley (Figure 4-21).

Survey data indicate that 23 moose were harvested for subsistence use in 2014 (Table 4-10). Most moose (20 individuals including 1 cow) were taken in September (Table 4-14). Two other bulls were harvested (in August and December). Although only 26% of households were counted as harvesting moose, other households were often involved with those hunts (Table 4-10). Moose meat was widely shared, such that 96% of Northway households used moose in 2014.

Key respondents described some competition with hunters from outside the area, and especially with other predators. Easy access via the Alaska Highway brings other Alaska residents (some of whom have heritage in the area or were formerly residents themselves), other U.S. residents, and foreigners to GMU 12. One hunter described working with 8 or 9 other households to harvest moose (1502). He considers a harvest of 4 moose for the hunting group to be a good year; in 2014, they only got 2 moose. He went on to say that sometimes family members who moved away come home to participate:

They can’t take it away from folks who move and come back. You know, it’s still their land. No matter what, you know, so to me it’s no competition, you know. I got to respect that, you know. I got to respect them if, you know, if they live in the city and you know, they want, need, they’ll come and get it because it’s more difficult for them living in the city to go out on the streets and get a moose. (1502)

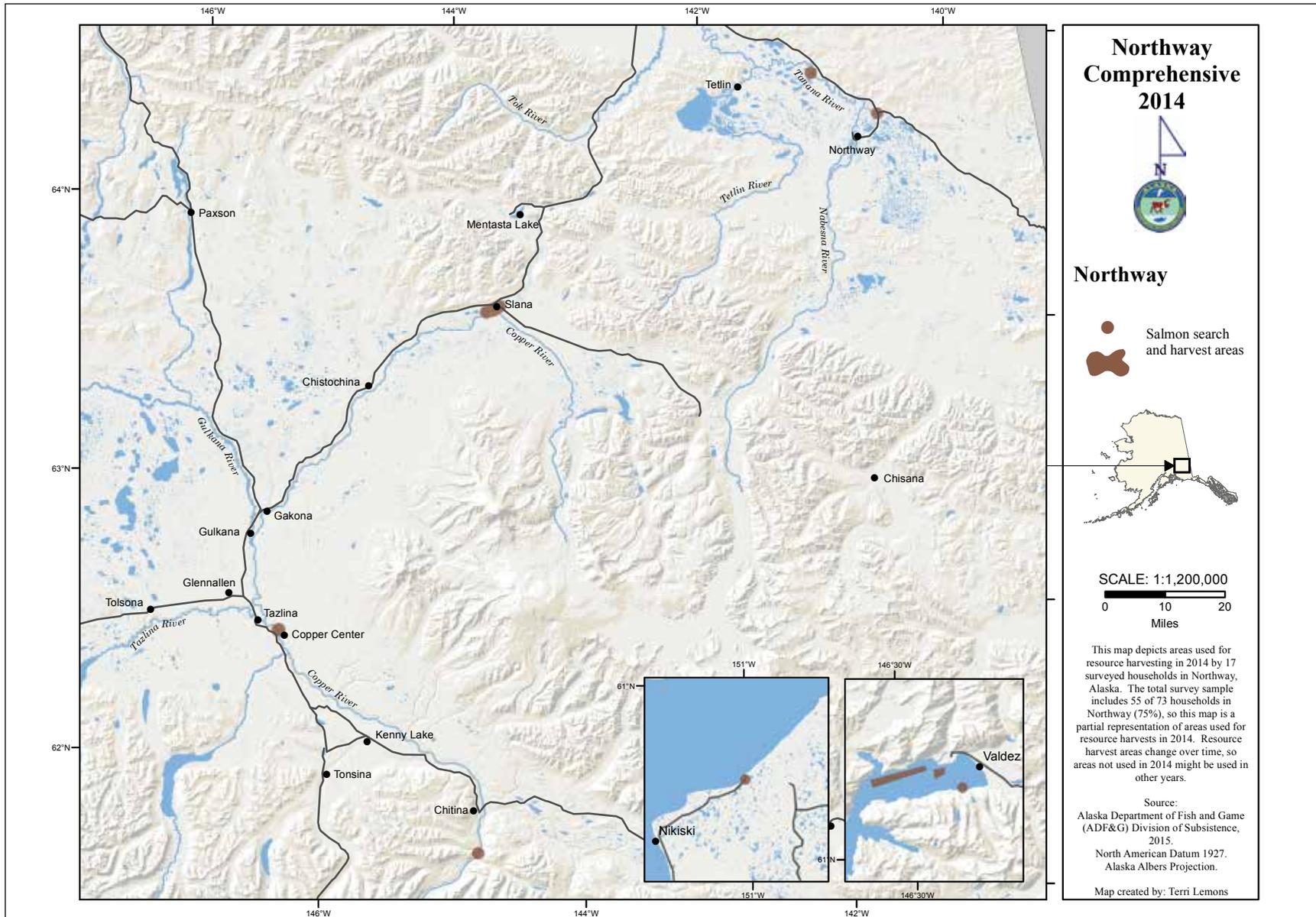


Figure 4-19.—Salmon fishing areas, Northway, 2014.

Table 4-13.—Salmon harvests by gear type and resource, Northway, 2014.

Resource	Subsistence methods															
	Removed from commercial catch		Dip net		Gillnet or seine		Fish wheel		Other method		Subsistence gear, any method		Rod and reel		Any method	
	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	79.6	641.0	1,113.6	7,124.4	0.0	0.0	1,193.2	7,765.4	33.2	143.1	1,226.4	7,908.5
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	0.0	0.0	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 chum salmon	0.0	0.0	0.0	0.0	5.3	40.5	0.0	0.0	0.0	0.0	5.3	40.5	0.0	0.0	5.3	40.5
Coho salmon	0.0	0.0	0.0	0.0	74.3	600.6	212.4	1,715.9	0.0	0.0	286.7	2,316.5	6.6	53.6	293.3	2,370.1
Chinook salmon	0.0	0.0	0.0	0.0	0.0	0.0	19.9	352.2	0.0	0.0	19.9	352.2	0.0	0.0	19.9	352.2
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	66.4	223.6	0.0	0.0	66.4	223.6	26.5	89.5	92.9	313.1
Sockeye salmon	0.0	0.0	0.0	0.0	0.0	0.0	814.9	4,832.6	0.0	0.0	814.9	4,832.6	0.0	0.0	814.9	4,832.6
Spawnouts	0.0	0.0	0.0	0.0	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.

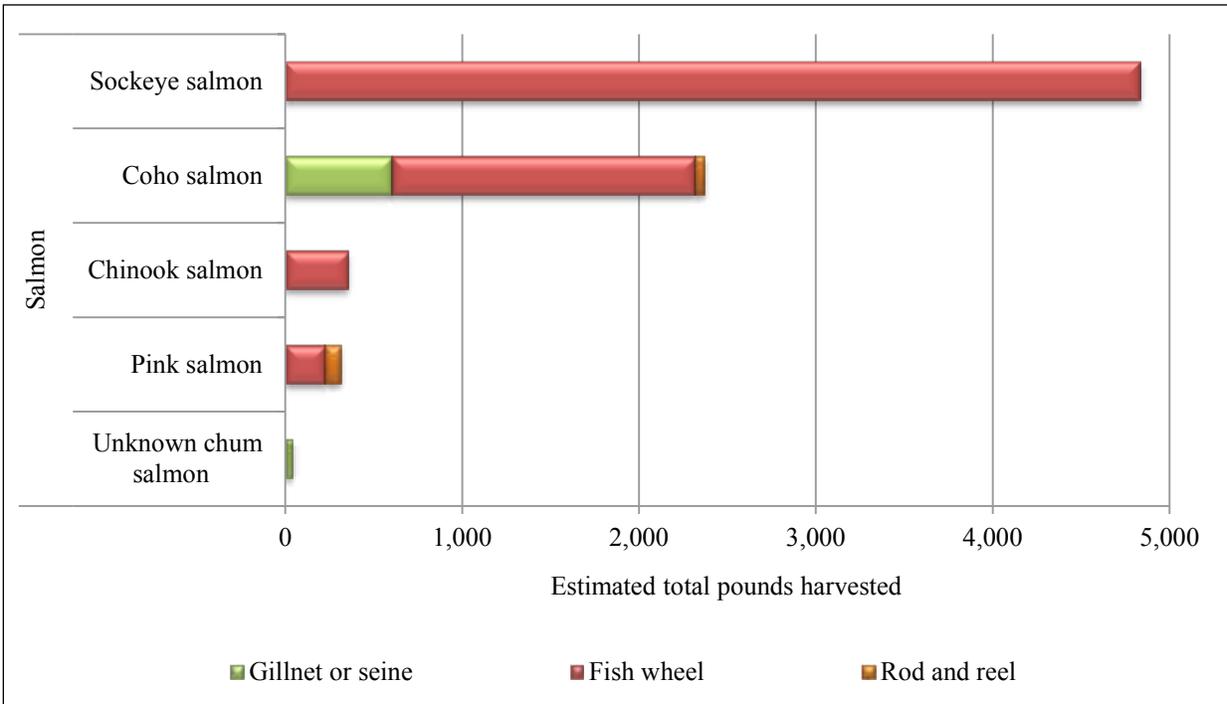


Figure 4-20.—Salmon harvests by gear type, Northway, 2014.

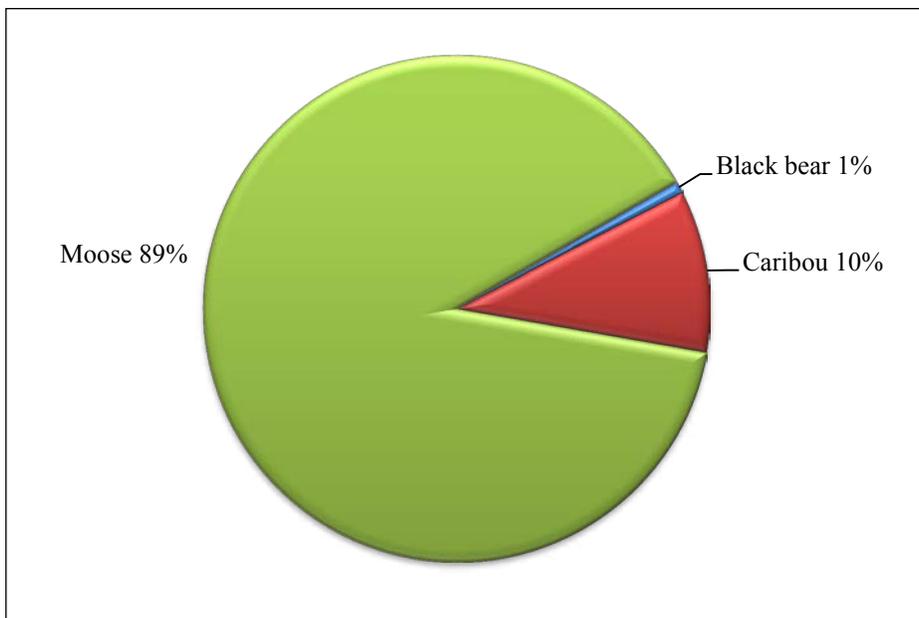


Figure 4-21.—Composition of large land mammal harvest by edible pounds, Northway, 2014.

Table 4-14.—Estimated large land mammal harvests by month and sex, Northway, 2014.

Resource	Estimated harvest by month													Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	
All large land mammals	2.7	1.3	2.7	0.0	2.7	0.0	0.0	2.7	19.9	1.3	2.7	1.3	0.0	37.2
Black bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	1.3
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
Caribou	2.7	1.3	2.7	0.0	2.7	0.0	0.0	0.0	0.0	1.3	2.7	0.0	0.0	13.3
Caribou, male	2.7	1.3	2.7	0.0	2.7	0.0	0.0	0.0	0.0	1.3	2.7	0.0	0.0	13.3
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
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
Moose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	19.9	0.0	0.0	1.3	0.0	22.6
Moose, bull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	18.6	0.0	0.0	1.3	0.0	21.2
Moose, cow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	1.3
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

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

Wolf and bear populations reportedly increased after local predator control programs ended in the 1950s and in adjacent units in the 1980s (Wells 2014; 1501, 1502, 1504); intensive management of wolves has been ongoing in portions of Unit 12 and Unit 20 north of the Alaska Highway (ADF&G Division of Wildlife Conservation 2016) and ADF&G biologists currently assess predator populations in the Northway area as stable.¹¹ Nonetheless, residents report that competition with predators is sometimes problematic with respect to moose hunting, as described in the Discussion and Conclusions chapter.

Northway residents harvested up to 10 additional moose for use and distribution at potlatches in 2014. At the June 9, 2015 community review meeting, the estimated number of moose (23 animals) seemed low to NVC members. In reviewing the numbers, they suggested that potlatch moose had not been reported to these surveys, likely because they are not considered part of the subsistence harvest of an individual household. The ADF&G office in Tok issues permits and tracks the harvest of ceremonial moose, which are regulated under different statutes than subsistence resources¹². ADF&G documented 10 ceremonial moose taken by Northway residents in 2014,¹³ 1 or more of which may have also been reported during the subsistence harvest surveys. Moose is an important part of potlatch, which can be seen as a method of sharing wealth while promoting cooperation and other traditional values (Simeone 1995). Depending on the expected attendance (generally 100–300 people that often include visitors from across the state), multiple moose may be harvested in preparation for potlatch. The events occur several times a year, with breakfast, lunch, and dinner served at the community hall for at least 3 days. During both funeral and memorial potlatches, generous servings of moose meat (with rice, in soup, and on meaty, boiled bones) are heaped onto plates for immediate consumption, and leftovers are distributed, primarily to elders who no longer hunt for themselves. For some, that meat is an important supply of food, although the weight (approximately 6,600 lb) is not included in the estimates described in this report.

An estimated 13 caribou were taken by Northway residents in 2014 (Table 4-10). Two resident herds are found in the upper Tanana River basin: the Macomb caribou herd that ranges around Dot Lake, and the Chisana caribou herd of the Chisana and White river basins. Three other herds (Nelchina, Mentasta, and Fortymile caribou herds) traverse portions of the upper Tanana River basin seasonally. All of these herds are sometimes hunted by residents of Northway, depending on multiple factors, primarily the proximity of their passage. The Nelchina caribou herd, when migrating past the Taylor Highway, is probably the most frequent target of Northway hunters in recent years. All hunting on the Chisana caribou herd was closed in Alaska from 1994 to 2011. In 2012, a limited harvest by federally-qualified subsistence users¹⁴ was approved by the Federal Subsistence Board, providing opportunities consistent with the cooperative management plan for the herd (Chisana Caribou Herd Working Group 2012). Black bear was the only other

11. J. Wells, ADF&G Wildlife Biologist, personal communication, October 25, 2016.

12. 5 AAC 99.025

13. T. Faulise, ADF&G Program Technician, personal communication, June 14, 2016

14. Residents of communities with positive customary and traditional use determinations, such as Northway.

large land mammal reported as harvested by Northway residents in 2014, by only 2% of households (Table 4-10). A few households hunted Dall sheep, but none reported a harvest.

Large land mammals were mostly harvested on the valley floor, and in the hills north of the Alaska Highway (Figure 4-22). Moose search areas essentially covered the low elevation portions of the upper Tanana basin, with rivers and the road serving as high-intensity corridors. Some hunters acknowledge avoiding Tetlin tribal lands; others likely have relations there that make accessing these lands for hunting acceptable. Local residents on the road during the hunting season watch for moose. Hunting from the road is often described more as a shot at luck than serious hunting, but some households would otherwise not have an opportunity because they lack the equipment or time to hunt away from the road. Some hunters used extensive areas, mostly accessed by boat from the main rivers. Drainage basins of Scottie Creek (U.S. portions), Gardiner Creek, the Ladue River, and the Dennison Fork of the Fortymile River were also used for hunting moose. To the south, moose were hunted inside the WRST in the upper Chisana River drainage. Caribou hunting encompassed a slightly smaller total area, not extending as far in to the Ladue River or Scottie Creek drainages, and also included the Taylor Highway toward Eagle, where competition with hunters from Alaska's larger cities can be intense. Black bear were hunted in the Gardiner Creek drainage as well as in the Mentasta Mountains west of the upper Nabesna River within the WRST. Dall sheep were hunted but not harvested in the Nutzotin Mountains on the east side of the Nabesna, also in the WRST.

Small Land Mammals/Furbearers

The bulk of edible pounds from small land mammals came from beaver and muskrat (Figure 4-23). Northway residents harvested the vast majority of muskrat (99%), beaver (95%), snowshoe hare (96%), and porcupine (100%) for food or for food and fur (Table 4-10; Figure 4-24; Appendix Table D-1). Other furbearers are less popular as meals, although some were reportedly used for food (12% of lynx and 7% of marten). The estimated harvest by weight does not include those resources that were not eaten. For example, the edible pounds of beaver included 110 out of 116 animals harvested because 6 were harvested for their fur and not eaten. Small land mammals were not as widely shared, although 22% of households reported giving away muskrat. Hunters and trappers took small mammals in every month of the year except July (Table 4-15). Muskrat season stands out in the table: March, April, and May were the most active months. Snowshoe hare was harvested in most months except summer.

At least 1 small land mammal hunter went outside the Tanana River drainage to Snag Creek (which drains northeast to the White River, a direct tributary of the Yukon) in the WRST to look for fur (Figure 4-25).

Marine Mammals

No Northway residents reported hunting for marine mammals, but a few Northway households received and used harbor seal, seal oil, and muktuk (whale blubber, noted on Table 4-10 as "unknown whale").

Birds and Eggs

Migratory waterfowl in addition to resident game birds contributed about 5,343 lb to the total wild food supply (Table 4-10). The most available and eagerly pursued bird is the mallard duck, and these were the likely source of duck eggs as well. Mallards accounted for nearly one-half the edible pounds of birds and eggs (2,641 lb; Table 4-10; Figure 4-26). The remainder (2,702 lb) comprised smaller amounts of other species, especially Canada geese (10%). Canada geese in the upper Tanana River basin primarily belong to 2 subspecies: *Branta canadensis parvipes* (some of which breed locally) and *B. c. taverneri* (which generally breed on the coast). These are among the smaller Canada geese, but larger than cackling geese.¹⁵

Several Northway hunters described seeing fewer migratory birds moving through the area in recent years (1502, 1503, 1504, 1506). Hunting waterfowl in the easily-accessible lakes along Northway Road is no longer possible at all, they say, because the mud has buried the grasses and other bird foods; the migrating birds do not land nearby. However, waterfowl are hunted opportunistically across the valley (Figure 4-27).

15. Lilliana Naves, ADF&G Research Analyst, personal communication, November 9, 2015.

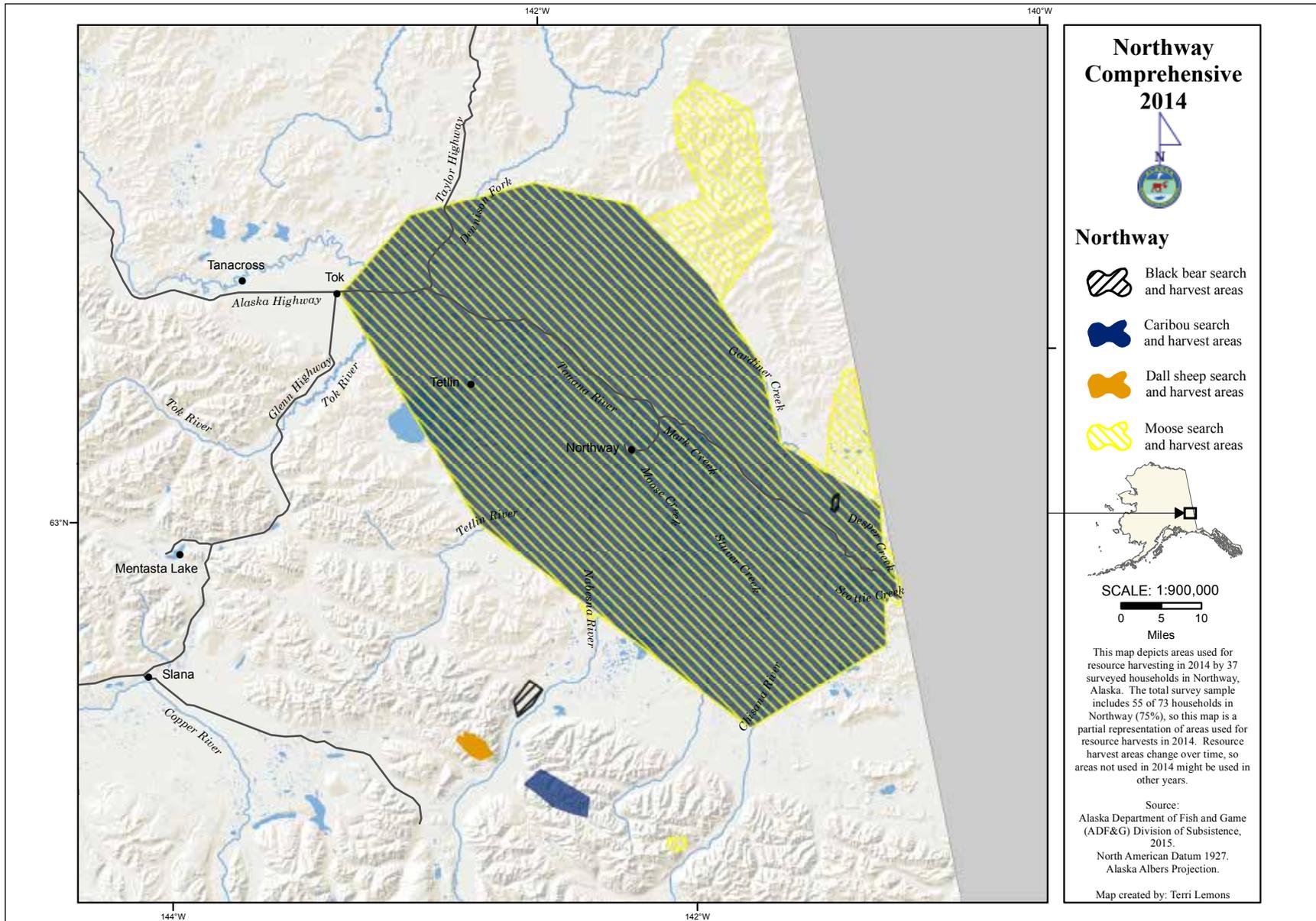


Figure 4-22.—Large land mammal hunting areas, Northway, 2014.

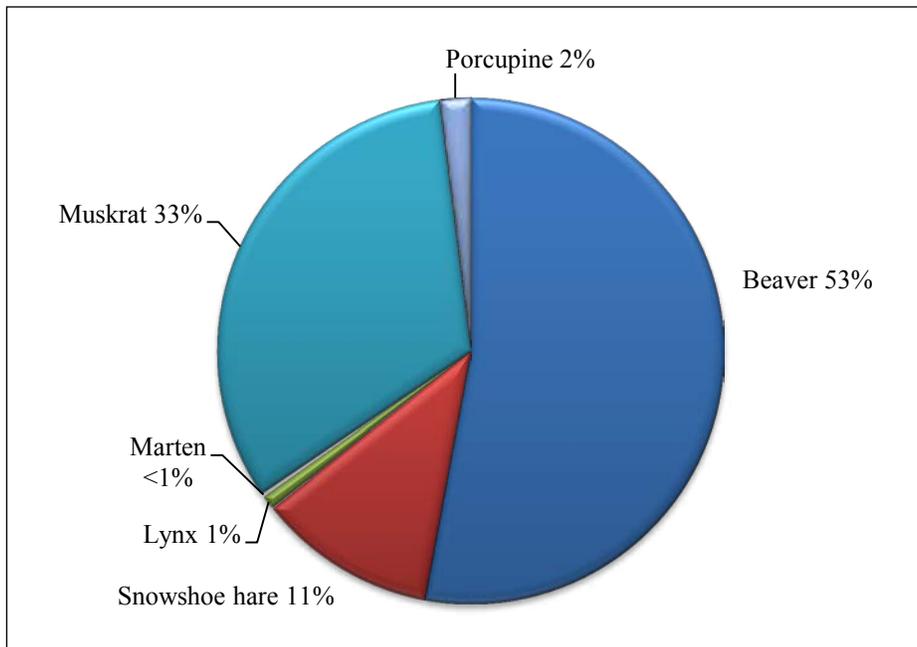


Figure 4-23.—Composition of small land mammal/furbearer harvest by edible pounds, Northway, 2014.

Table 4-15.—Estimated small land mammal/furbearer harvests by month, Northway, 2014.

Resource	Estimated harvest by month													Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	
All small land mammals	164.6	164.6	426.1	436.7	467.2	62.4	0.0	1.3	61.1	38.5	167.3	116.9	19.9	2,126.5
Beaver	0.0	0.0	35.8	54.4	19.9	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	115.5
Coyote	0.0	1.4	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	4.1	5.4	0.0	13.5
Foxes	18.6	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	5.3	5.3	0.0	41.1
Snowshoe hare	18.6	19.9	15.9	10.6	0.0	0.0	0.0	0.0	50.4	17.3	35.8	13.3	2.7	184.5
River (land) otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.0	2.7
Lynx	15.9	10.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	9.3	17.3	0.0	55.7
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	42.5	51.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	79.6	46.5	17.3	244.2
Mink	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	5.3	2.7	0.0	11.9
Muskrat	54.4	66.4	374.3	359.7	447.3	62.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,364.4
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	10.6	0.0	0.0	0.0	0.0	11.9
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	13.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.5	13.3	0.0	53.1
Gray wolf	0.0	4.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	17.3
Wolverine	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	5.3	0.0	10.6

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

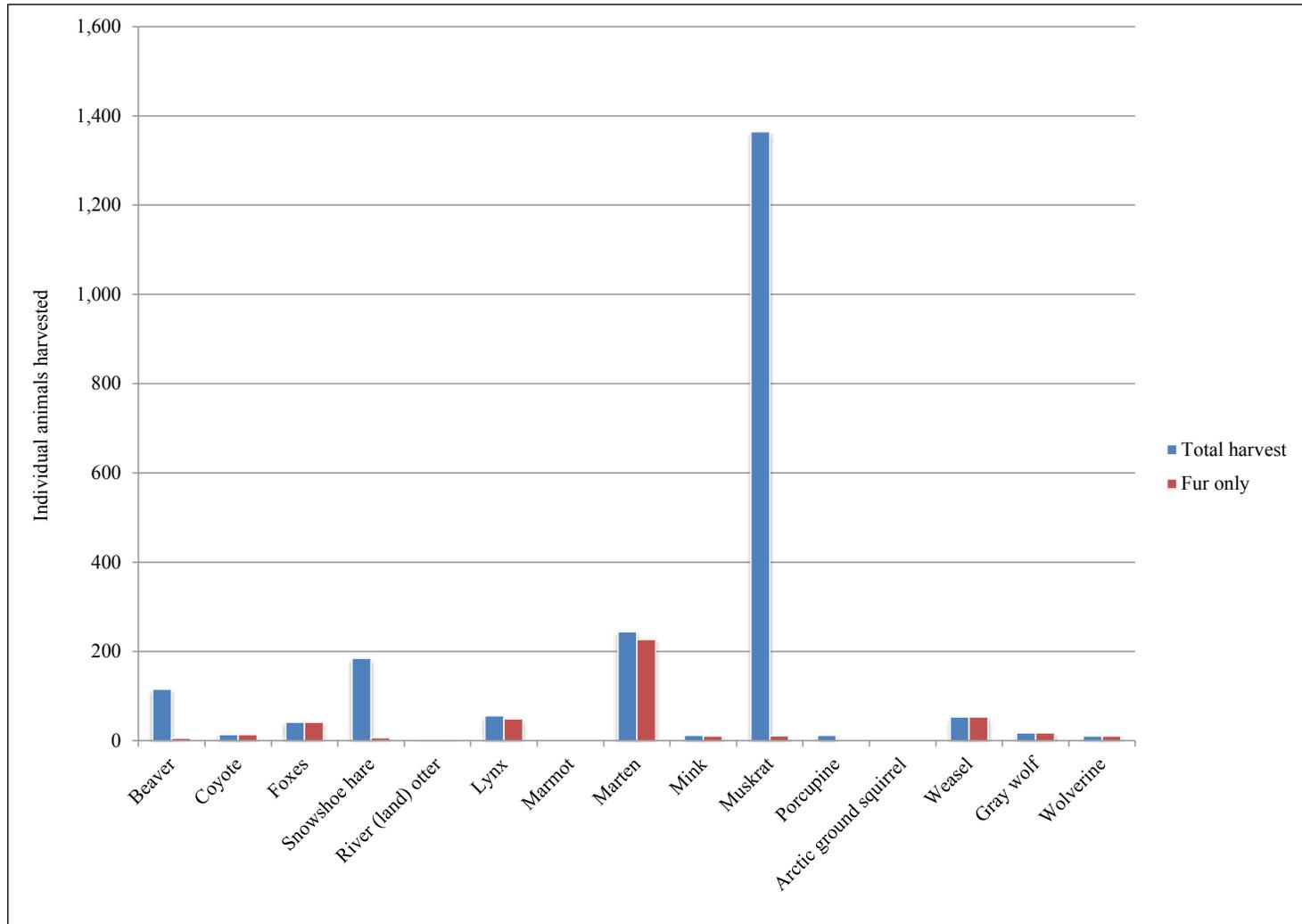


Figure 4-24.—Estimated small land mammal/furbearer harvests for food or fur, Northway, 2014.

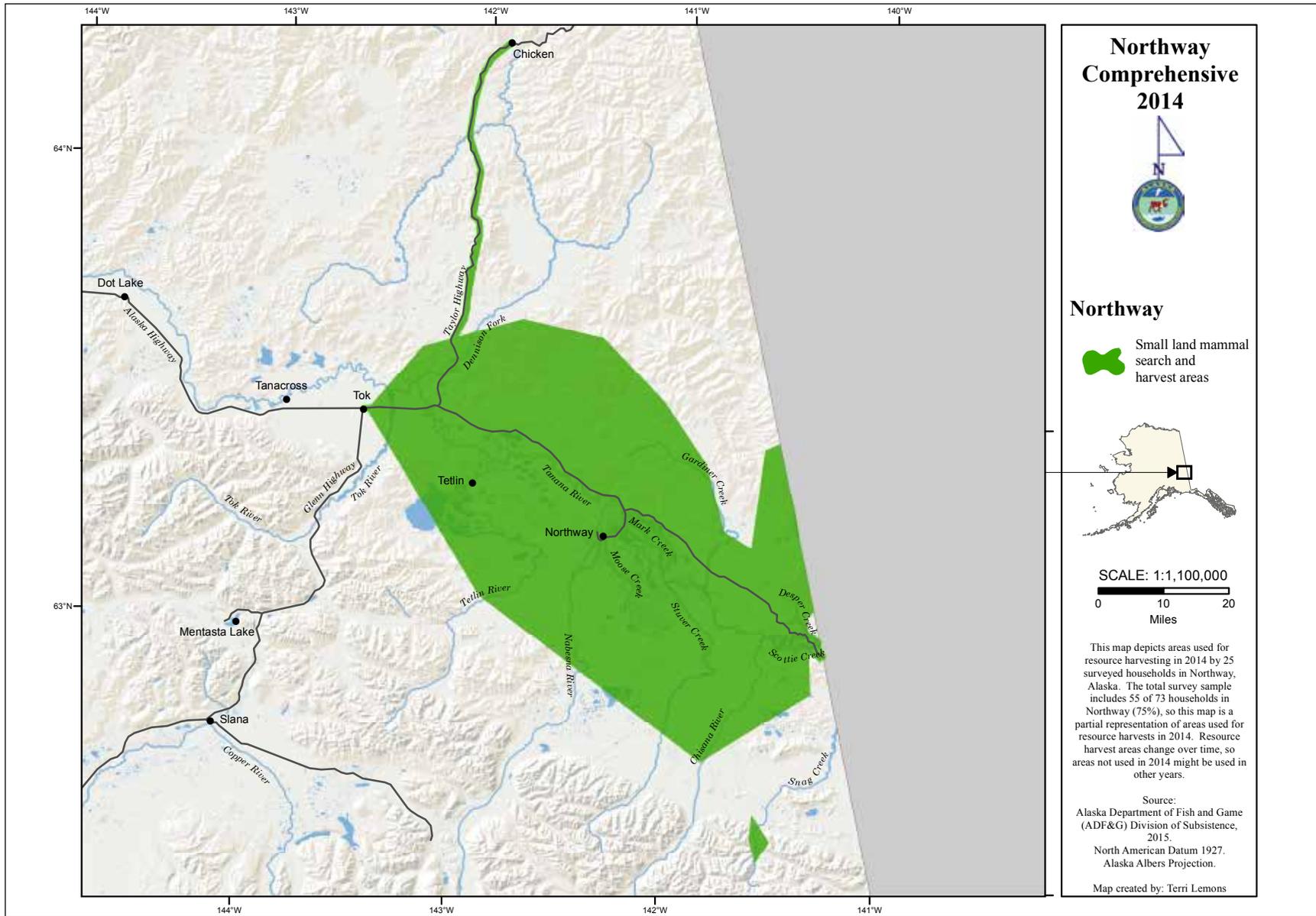


Figure 4-25.—Small land mammal/furbearer hunting areas, Northway, 2014.

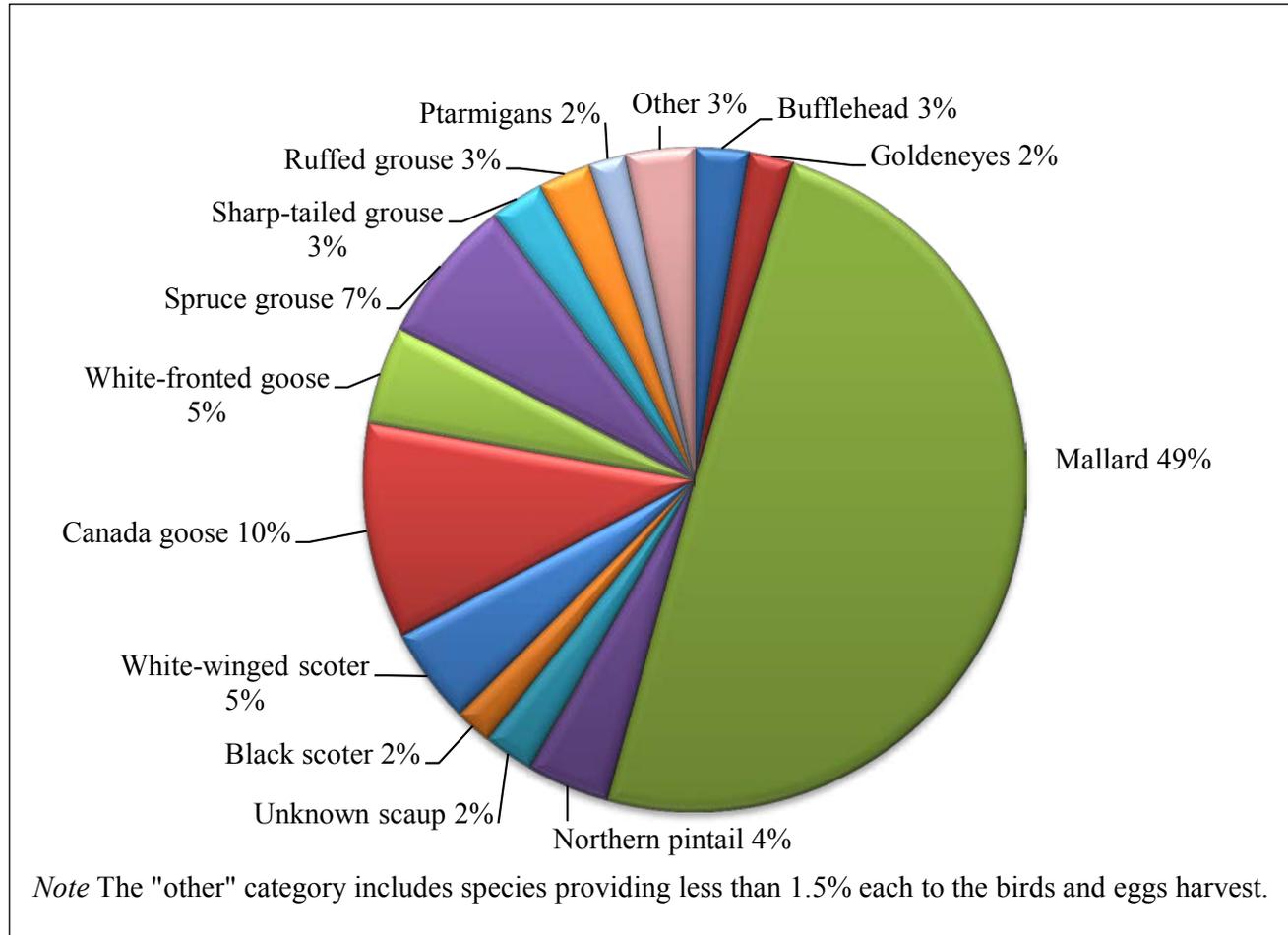


Figure 4-26.—Composition of bird and bird egg harvest by edible pounds, Northway, 2014.

Table 4-16.—Estimated bird harvests by season, Northway, 2014.

Resource	Estimated harvest by season					Total
	Spring	Summer	Fall	Winter	Season unknown	
All birds	1,587.4	329.2	1,517.5	221.7	0.0	3,655.8
Bufflehead	337.1	5.3	8.3	0.0	0.0	350.7
Goldeneyes	67.7	5.3	2.7	0.0	0.0	75.7
Mallard	553.5	106.2	694.9	0.0	0.0	1,354.6
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0
Northern pintail	132.7	0.0	11.0	0.0	0.0	143.7
Unknown scaups	132.7	0.0	13.5	0.0	0.0	146.2
Black scoter	33.2	39.8	34.5	0.0	0.0	107.5
Surf scoter	19.9	0.0	0.0	0.0	0.0	19.9
White-winged scoter	92.9	0.0	16.5	0.0	0.0	109.4
Unknown scoters	0.0	0.0	0.0	0.0	0.0	0.0
Northern shoveler	0.0	0.0	4.1	0.0	0.0	4.1
Unknown teals	0.0	8.0	17.9	0.0	0.0	25.9
American wigeon	0.0	13.3	1.4	0.0	0.0	14.6
Canada goose	124.8	0.0	2.7	13.3	0.0	140.7
Snow goose	14.6	0.0	0.0	2.7	0.0	17.3
White-fronted goose	59.7	0.0	0.0	0.0	0.0	59.7
Unknown swans	2.7	0.0	0.0	0.0	0.0	2.7
Sandhill crane	2.7	0.0	0.0	0.0	0.0	2.7
Unknown loons	0.0	0.0	0.0	0.0	0.0	0.0
Spruce grouse	6.6	73.0	378.3	88.9	0.0	546.8
Sharp-tailed grouse	0.0	33.2	134.1	33.2	0.0	200.4
Ruffed grouse	0.0	33.2	150.0	13.3	0.0	196.4
Ptarmigans	6.6	11.9	47.8	70.3	0.0	136.7

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

Grouses and ptarmigans are also appreciated by local hunters, especially in the fall (Table 4-16). The survey form mistakenly included April as “winter;” some of the migratory waterfowl were harvested during that month.

Marine Invertebrates

No marine invertebrates were reported as harvested or received during 2014 by Northway households (Table 4-10).

Vegetation

As in most rural Alaskan communities, vegetation makes up a small but vital component of the wild food supply in Northway. About 1,151 gallons of plants and fungi were harvested by Northway households amounting to 2,084 lb of blueberries, and about 1,628 lb of other foods, including lowbush cranberries, raspberries, mushrooms, and roots (Indian potato and “muskrat candy;” Table 4-10). The summer of 2014 was especially rainy, and mushrooms were abundant. Mushrooms accounted for 6% of the vegetation harvest in 2014 (Figure 4-28); *Boletus* mushrooms are especially popular in Northway (Plate 4-2). “Muskrat candy” is a sweet aquatic-plant root, the use of which is described in the Role of Subsistence section of the Community Background chapter. Vegetation was the most widely harvested and shared resource category; 89% of households picked berries, greens, roots, or mushrooms, and 60% of households gave them away (Table 4-10). Blueberries were the most widely shared single species; almost one-half of households (47%) gave away blueberries and one-quarter (26%) of households received them. One reason for that large

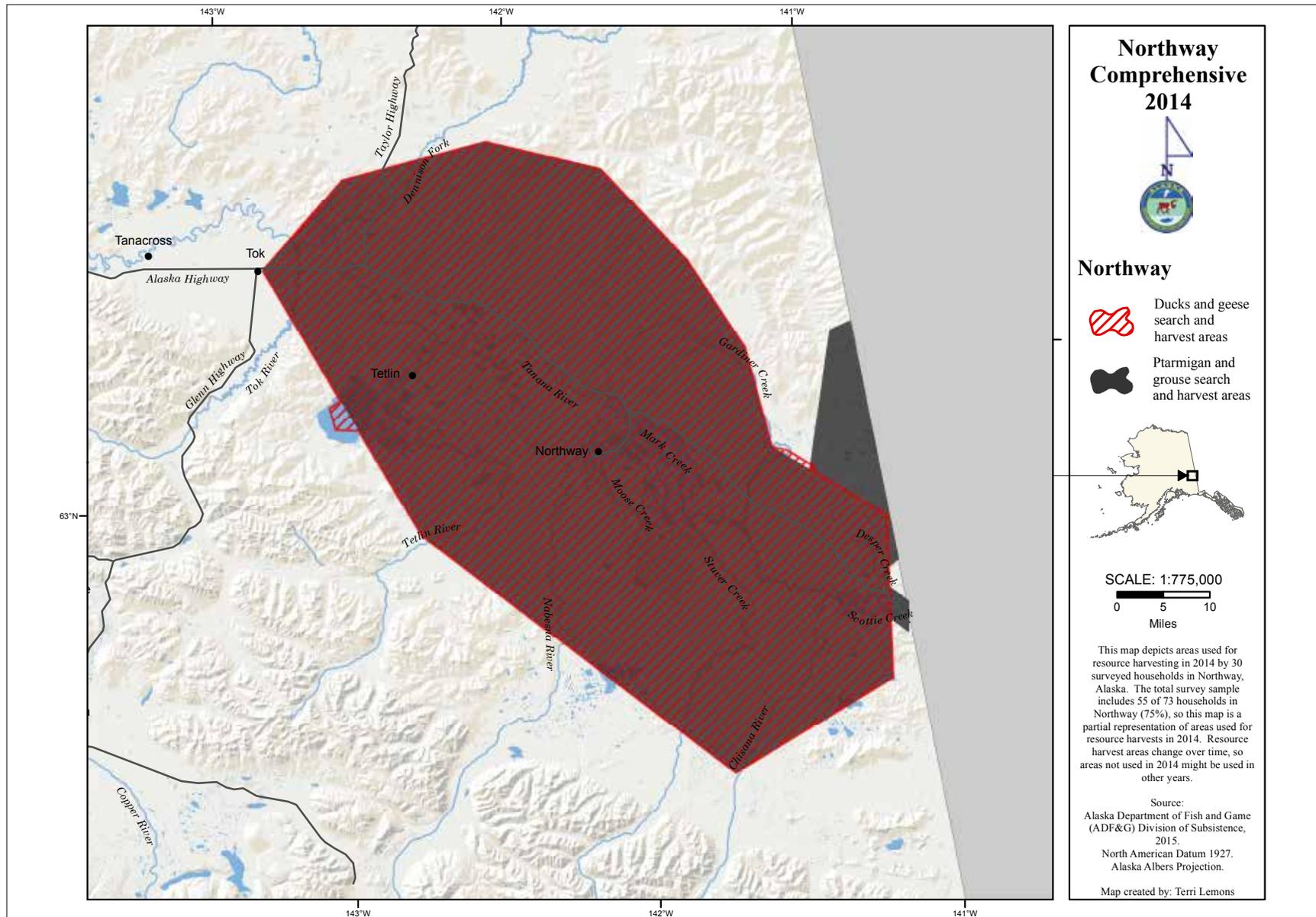


Figure 4-27.—Bird hunting areas, Northway, 2014.

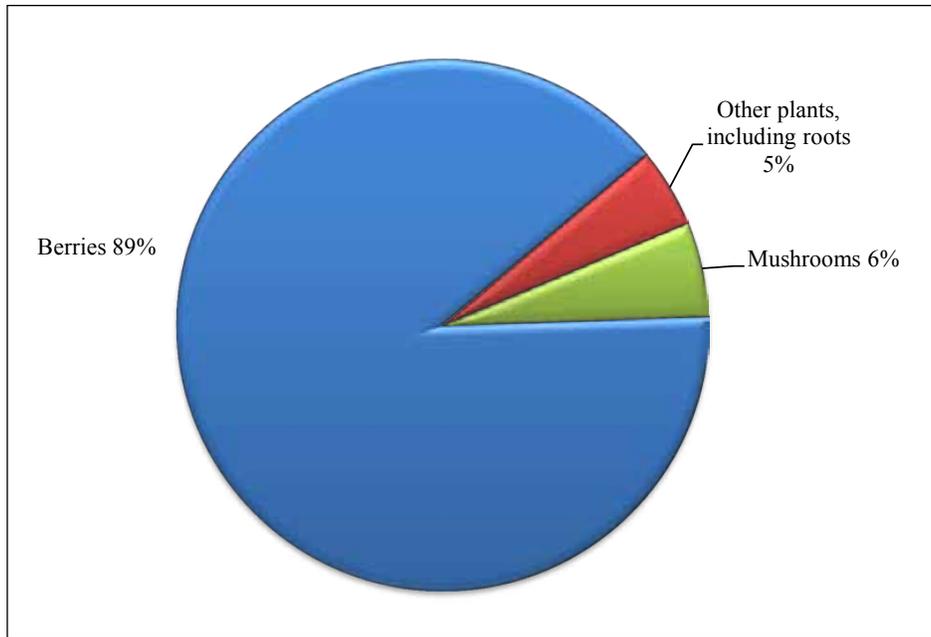


Figure 4-28.—Composition of vegetation harvest by type, Northway, 2014.



Plate 4-2.—Bolete mushrooms (*ch'inay'*) are popular in Northway.



C. Marunde

Plate 4-3.—Winter weather along the Taylor Highway in June 2014.

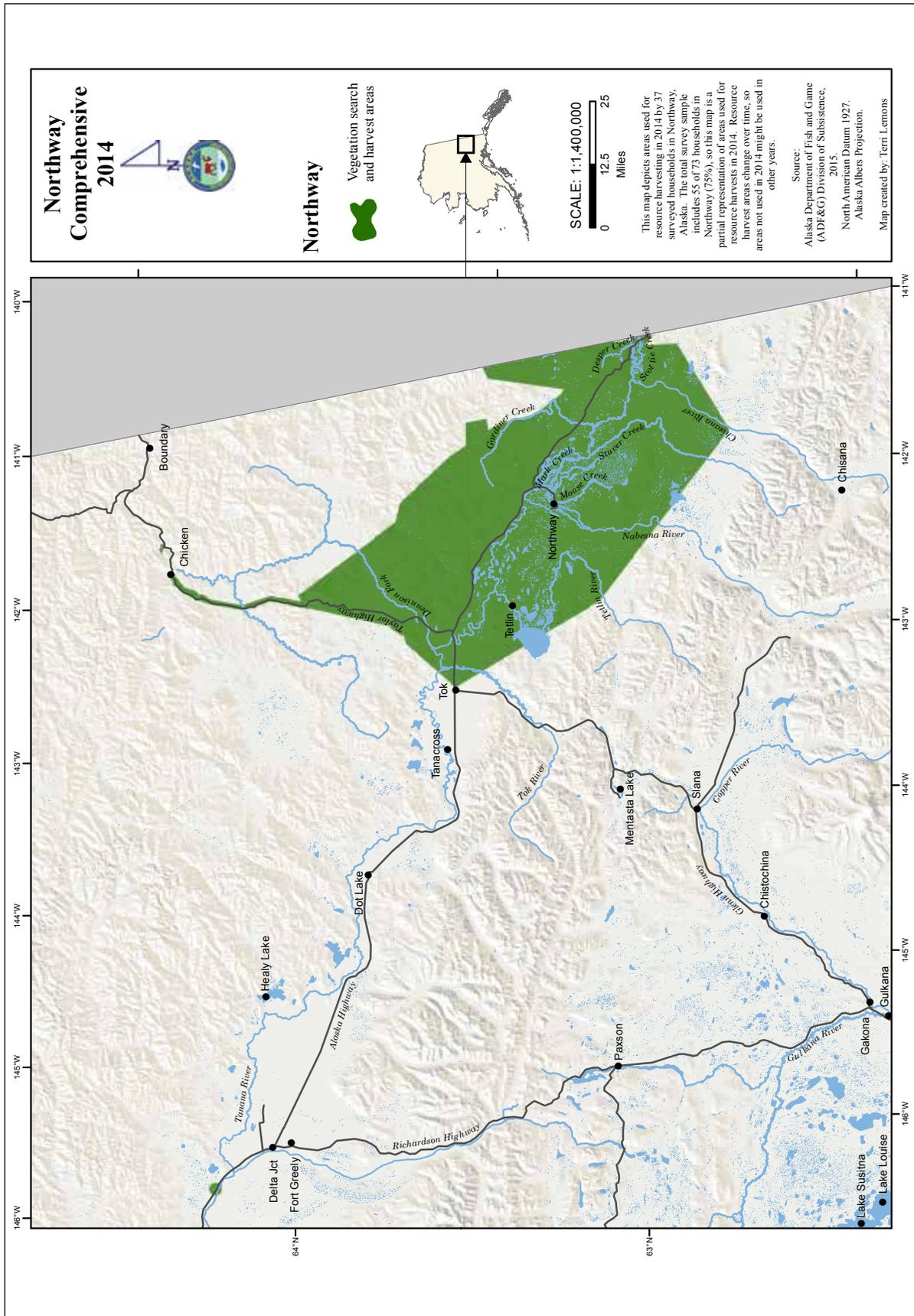
discrepancy may be that berries are a critical ingredient for the potlatch: many households both stock and diminish their personal berry supply partially for that unpredictable need. It is likely that lowbush cranberries would have been more heavily used if they had been more available, but some respondents noted that lowbush cranberries were hard to find in 2014. Freezing temperatures in June 2014 may partially explain the lack of cranberries (Plate 4-3)

Another critical use of vegetation in Northway is for firewood. All surveyed households responded to a question about their use of wood for home heating. Sixteen percent of households reported no use in 2014, and slightly more (20%) described exclusive use of firewood for heat. Overall, 73% of households said that firewood provided more than one-half of their household’s heat (Table 4-17). The “other wood” in Table 4-10 includes willow shoots and spruce roots for use in birch bark baskets, and diamond willow. Vegetation was collected across the upper Tanana valley (Figure 4-29).

Table 4-17.—Use of firewood for home heating, Northway, 2014.

Average annual cost of home heating	Household use of wood for home heating as a percentage of total fuel for heating											
	0%		1%–25%		26%–50%		51%–75%		76%–99%		100%	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
\$1,308.56	9	16.4%	2	3.6%	4	7.3%	13	23.6%	16	29.1%	11	20.0%

Source ADF&G Division of Subsistence household surveys, 2015



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; respondents sometimes provided more than one reason. If they did not get enough of a resource, they were asked to evaluate the severity of the problem to their household. This section discusses responses to those questions.

Together, Figure 4-30, Table 4-18, Figure 4-31, and Table 4-19 provide a broad overview of households’ assessments of their harvests in 2014. Because the assessment questions are not relevant for households that do not typically use a resource, not all households were asked to respond to all questions. Additionally, some households that do typically use a resource simply did not answer questions.

According to the assessments, the large land mammal harvest was the most insufficient relative to demand. About 44% of households said they used less and 33% said they did not get enough large land mammals in 2014 (Table 4-18; figures 4-30 and 4-31). At least one key respondent noted that he made up for the shortfall with other wild foods: “Well, we got salmon, we got whitefish, we got muskrat, we got—I didn’t get any ducks last fall...I’ve got roots. We’ve got berries. We’re fine” (1502). The most cited reason for using less large mammals was that households had been unsuccessful; other households reported personal reasons, a lack of effort or time, and other reasons (Table 4-20). The reported impact of the large land mammals shortfall was felt most substantially: one-half of those reporting that they did not get enough said that the impact was major, and an additional 22% said the impact was severe (Table 4-19). This deficit is also reflected in Table 4-21, where the largest percentage of households identified moose as a needed resource.

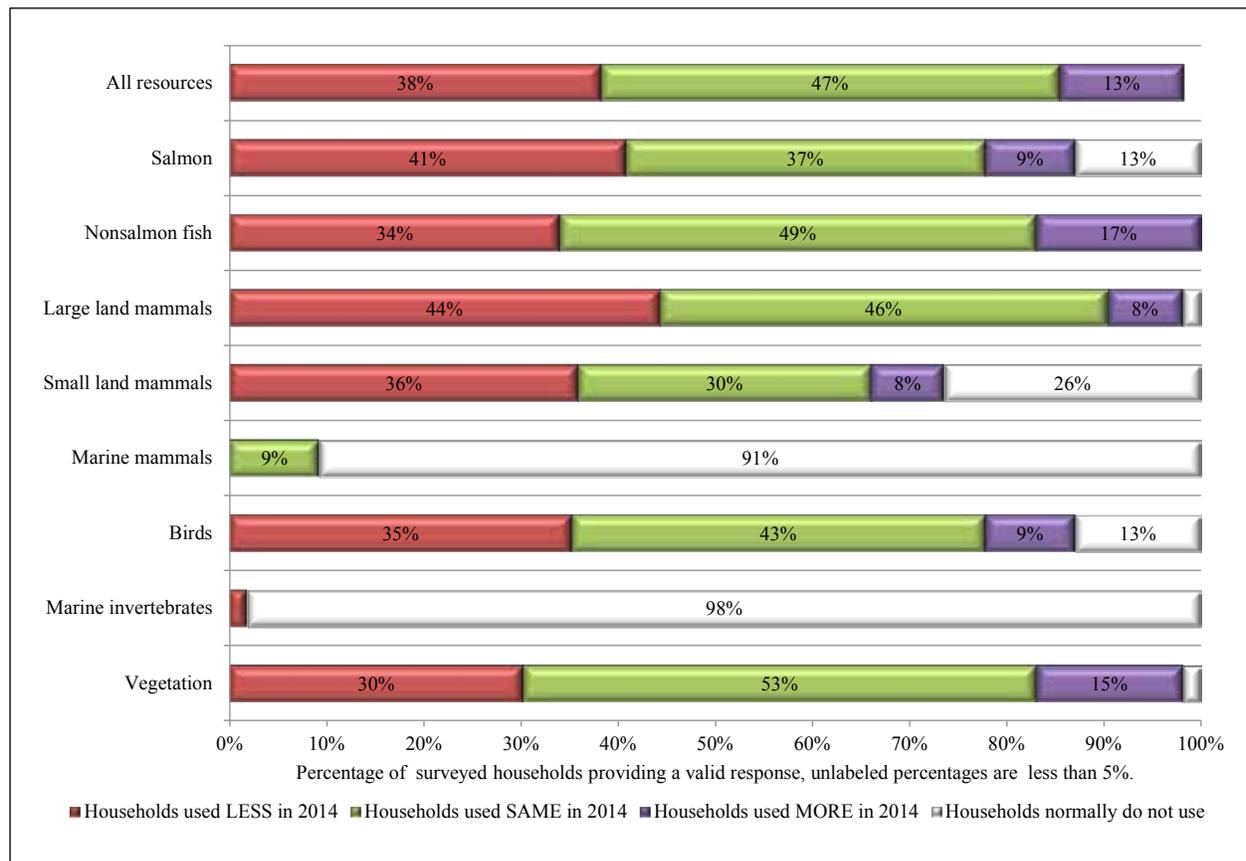


Figure 4-30.—Changes in household uses of resources compared to recent years, Northway, 2014.

Table 4-18.—Changes in household uses of resources compared to recent years, Northway, 2014.

Resource category	Sampled households	Valid responses ^a	Households reporting use									Households not using	
			Total households		Less		Same		More		Number	Percentage	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage			
All resources	55	54	54	100.0%	21	38.9%	26	48.1%	7	13.0%	0	0.0%	
Salmon	55	54	47	87.0%	22	40.7%	20	37.0%	5	9.3%	7	13.0%	
Nonsalmon fish	55	53	53	100.0%	18	34.0%	26	49.1%	9	17.0%	0	0.0%	
Large land mammals	55	52	51	98.1%	23	44.2%	24	46.2%	4	7.7%	1	1.9%	
Small land mammals	55	53	39	73.6%	19	35.8%	16	30.2%	4	7.5%	14	26.4%	
Marine mammals	55	54	5	9.3%	0	0.0%	5	9.3%	0	0.0%	49	90.7%	
Birds	55	54	47	87.0%	19	35.2%	23	42.6%	5	9.3%	7	13.0%	
Marine invertebrates	55	54	1	1.9%	1	1.9%	0	0.0%	0	0.0%	53	98.1%	
Vegetation	55	53	52	98.1%	16	30.2%	28	52.8%	8	15.1%	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.

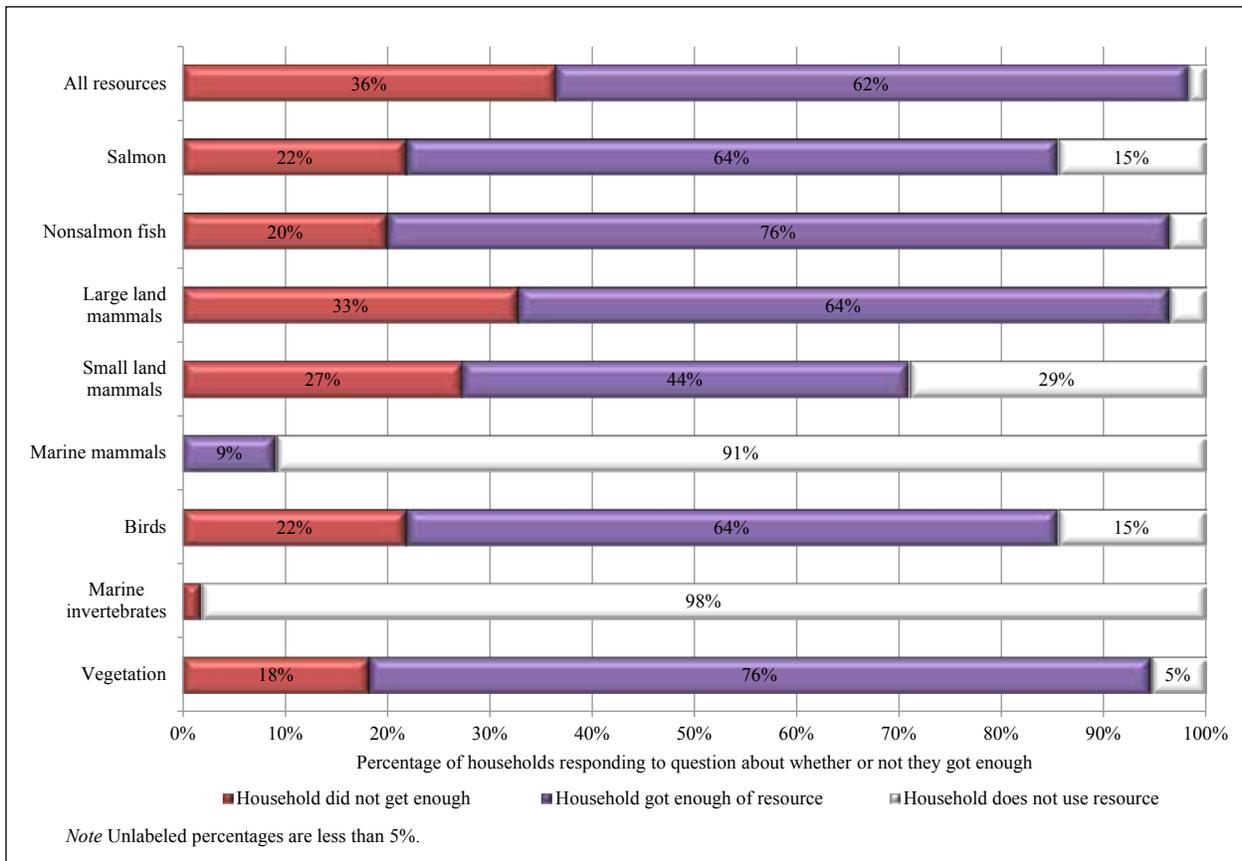


Figure 4-31.—Percentages of households reporting whether or not they got enough resources, Northway, 2014.

A few households reported using more large game, either because they had been more successful or had received more (Table 4-22).

Nonsalmon fish is another critical resource in many Northway households, and used in almost all. Of 55 surveyed households, 53 reported that they usually use nonsalmon fish (although not all did in 2014; tables 4-10 and 4-18). Essentially one-half (49%) of those households said that they used about the same amount of nonsalmon fish in 2014 as they did in previous years, 34% reported that they used less, and 17% said they used more (Table 4-18; Figure 4-30). When asked why they used less, 44% of the respondents who did so reported personal reasons; for example, an illness in the family (Table 4-20). Others reported that they did not have enough time, that they did not put in enough effort, or that nonsalmon fish were less available. Some households that attempted nonsalmon fishing were unsuccessful, and even successful fishers noted that the fish were hard to find and that efforts in 2014 required persistence (HH62). For those households that reported using more nonsalmon fish in 2014, increasing their effort was the most cited reason (Table 4-22). Others said they needed more or had received more.

Most households that normally use nonsalmon fish reported that they got enough of the resource (76%; Figure 4-31), and 20% of these households said that they did not get enough in 2014. When asked to evaluate the impact of not getting enough nonsalmon fish, 3 households (27%) described it as not noticeable, 2 (18%) described the impact as minor, 5 (45%) said that not getting enough nonsalmon had a major effect on their household, and 1 (9%) stated that the impact was severe (Table 4-19).

Small land mammals and salmon share some characteristics in Figure 4-30, in that more households reported using less than reported using about the same amount. Shortfalls of salmon were identified as problematic by more respondents than shortfalls of small mammals (tables 4-19 and 4-21). These resources

Table 4-19.—Reported impact to households reporting that they did not get enough of a type of resource, Northway, 2014.

Resource category	Sample households	Households not getting enough						Impact to those not getting enough							
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	55	54	98.2%	20	37.0%	1	5.0%	1	5.0%	4	20.0%	9	45.0%	5	25.0%
Salmon	55	47	85.5%	12	25.5%	0	0.0%	0	0.0%	6	50.0%	4	33.3%	2	16.7%
Nonsalmon fish	55	53	96.4%	11	20.8%	0	0.0%	3	27.3%	2	18.2%	5	45.5%	1	9.1%
Large land mammals	55	53	96.4%	18	34.0%	2	11.1%	1	5.6%	2	11.1%	9	50.0%	4	22.2%
Small land mammals	55	39	70.9%	15	38.5%	0	0.0%	1	6.7%	8	53.3%	4	26.7%	2	13.3%
Marine mammals	55	5	9.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	55	47	85.5%	12	25.5%	0	0.0%	3	25.0%	3	25.0%	5	41.7%	1	8.3%
Marine invertebrates	55	1	1.8%	1	100.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	55	52	94.5%	10	19.2%	0	0.0%	0	0.0%	6	60.0%	3	30.0%	1	10.0%

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 4-20.—Reasons for less household uses of resources compared to recent years, Northway, 2014.

Resource category	Valid responses ^a	Households reporting reasons for less use	Resources less available						Weather/environment											
			Family/personal		Regulations		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	54	19	4	21.1%	4	21%	0	0.0%	0	0.0%	0	0%	2	11%	1	5%	4	21.1%	3	15.8%
Salmon	54	22	5	22.7%	1	5%	0	0.0%	2	9%	7	32%	5	23%	0	0.0%	0	0.0%	2	9.1%
Nonsalmon fish	53	18	8	44.4%	3	17%	0	0.0%	0	0%	0	0%	3	17%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	52	23	4	17.4%	1	4%	0	0.0%	0	0%	0	0%	3	13%	12	52.2%	0	0.0%	0	0.0%
Small land mammals	53	19	6	31.6%	4	21%	0	0.0%	2	11%	1	5%	4	21%	0	0.0%	0	0.0%	1	5.3%
Marine mammals	54	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	54	19	5	26.3%	3	16%	0	0.0%	1	5%	1	5%	3	16%	1	5.3%	5	26.3%	0	0.0%
Marine invertebrates	54	1	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	15	3	20.0%	5	33%	0	0.0%	0	0%	2	13%	1	7%	0	0.0%	5	33.3%	0	0.0%

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Table 4-20.—Continued.

Resource category	Valid responses ^a	Households reporting reasons for less use	Working/no time						Equipment/fuel expense						Used other resources					
			Other reasons		Regulations		Small/diseased animals		Did not get enough		Did not need		Equipment/fuel expense		Used other resources		Too much competition			
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage		
All resources	54	19	0	0%	5	26.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	10.5%
Salmon	54	22	1	5%	4	18.2%	4	18.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	53	18	2	11%	6	33.3%	0	0.0%	0	0.0%	1	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	52	23	1	4%	2	8.7%	1	4.3%	0	0.0%	1	4.3%	0	0.0%	0	0.0%	0	0.0%	1	4.3%
Small land mammals	53	19	2	11%	2	10.5%	0	0.0%	1	5.3%	1	5.3%	1	5.3%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	54	0	0	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	54	19	1	5%	5	26.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	54	1	0	0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	53	15	0	0%	2	13.3%	0	0.0%	0	0.0%	2	13.3%	0	0.0%	0	0.0%	0	0.0%	1	6.7%

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 4-21.—Resources of which households reported needing more, Northway, 2014.

Resource	Households needing	Percentage of households
All resources	4	7.3%
Fish	6	10.9%
Salmon	3	5.5%
Coho salmon	1	1.8%
Chinook salmon	5	9.1%
Pink salmon	1	1.8%
Sockeye salmon	4	7.3%
Nonsalmon fish	3	5.5%
Cod	1	1.8%
Pacific halibut	1	1.8%
Burbot	1	1.8%
Whitefishes	2	3.6%
Humpback whitefish	1	1.8%
Black bear	1	1.8%
Caribou	3	5.5%
Moose	21	38.2%
Small land mammals	3	5.5%
Beaver	1	1.8%
Hare	1	1.8%
Snowshoe hare	2	3.6%
Lynx	2	3.6%
Marten	3	5.5%
Muskrat	7	12.7%
Gray wolf	1	1.8%
Birds and eggs	3	5.5%
Ducks	5	9.1%
Mallard	1	1.8%
Black scoter	1	1.8%
Geese	2	3.6%
Grouse	1	1.8%
Ptarmigan	2	3.6%
Duck eggs	1	1.8%
Crabs	1	1.8%
Berries	10	18.2%
Blueberry	5	9.1%
Lowbush cranberry	1	1.8%
Plants, greens, and	1	1.8%
Wood	2	3.6%
Unknown resource	4	7.3%

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

Table 4-22.—Reasons for more household uses of resources compared to recent years, Northway, 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	54	7	1	14.3%	0	0.0%	0	0.0%	2	28.6%	1	14.3%	3	42.9%	0	0.0%
Salmon	54	5	1	20.0%	0	0.0%	0	0.0%	1	20.0%	2	40.0%	0	0.0%	0	0.0%
Nonsalmon fish	53	9	0	0.0%	0	0.0%	0	0.0%	1	11.1%	2	22.2%	3	33.3%	0	0.0%
Large land mammals	52	4	0	0.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	53	4	3	75.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	54	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds	54	5	1	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	60.0%	0	0.0%
Marine invertebrates	54	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	53	8	3	37.5%	0	0.0%	1	12.5%	0	0.0%	0	0.0%	3	37.5%	1	12.5%

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Table 4-21.—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		Got/ fixed equipment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	54	7	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	14.3%	0	0.0%	0	0.0%
Salmon	54	5	0	0.0%	0	0.0%	1	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	53	9	0	0.0%	0	0.0%	1	11.1%	2	22.2%	0	0.0%	1	11.1%	0	0.0%	1	11.1%
Large land mammals	52	4	1	25.0%	0	0.0%	0	0.0%	2	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	53	4	0	0.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	54	0	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	54	5	0	0.0%	0	0.0%	0	0.0%	1	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	54	0	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	8	1	12.5%	0	0.0%	0	0.0%	1	12.5%	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.

are generally not as critical as nonsalmon fish and large land mammals for Northway residents, but their declining use implies declining wild-food dietary variation and decreased availability of preferred foods such as Chinook salmon and muskrat. The reasons for using less of the resources were variable. About one-third of households that gave a reason for using less salmon said that they received less (Table 4-20). Personal and family reasons were cited most often for using less small mammals, by 6 households (32%).

Finally, respondents were asked the assessment questions regarding their overall use of wild resources in 2014 compared to other recent years. Almost one-half (26, 48%) felt they had used about the same amount of wild food overall, 7 households (13%) reported that they had used more, and 21 households (38%) felt as if they had used less (Table 4-18). The portion of total households that reported they had not gotten enough was essentially the same as the portion that used less: 20 households (36%) had felt a shortfall (Table 4-19). About one-half (45%) of those households said the impact to their household was major, and 4 (22%) felt it was severe. The overall assessments are most closely aligned with large land mammal assessments, implying that they were largely driven by moose, which was named as needed by 21 households (36%; Table 4-21). These concerns are also reflected in the food security data, described in the following section.

FOOD SECURITY

Following the harvest and assessment questions, survey respondents were asked to classify their access to the foods they wanted in order to assess their 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. This section of the survey was added at the behest of the USDA in their efforts to evaluate food security across the country. 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). A filter question identified households that reported having enough of the kinds of foods they wanted (58%; Table 4-23); those households were classified as high food security and not asked the full set of food security questions.

Respondents who stated they had not always had enough of the foods they wanted were asked a set of follow-up questions to determine their level of food security. Households reporting 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 little or no indication of changes in diet or food intake were classified as having marginal food security. Households reporting reduced quality, variety, or desirability of their diet, but little indication of reduced food intake were classified as having low food security. Households that reported multiple instances of disrupted eating patterns and reduced food intake were classified as having very low food security (Coleman-Jensen et al. 2012).

Core questions and the resulting responses from Northway respondents reporting less than high food security (40%) are summarized in Figure 4-32. These percentages are assumed to apply across the community. When asked if they had worried about having enough food, 16% said that they had. More than one-quarter of households (27%) reported that they lacked resources to get food at least 1 time in the study year. Thirteen percent of households indicated that the food they had run out 1 or more times. When asked if particular

Table 4-23.—Household descriptions of food eaten in the study year, Northway, 2014.

Statement	Percentage of households
Had enough of the kinds of food desired	58.2%
Had enough food, but not the desired kind	34.5%
Sometimes, or often, did not have enough food	5.5%
Missing/No response	1.8%

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

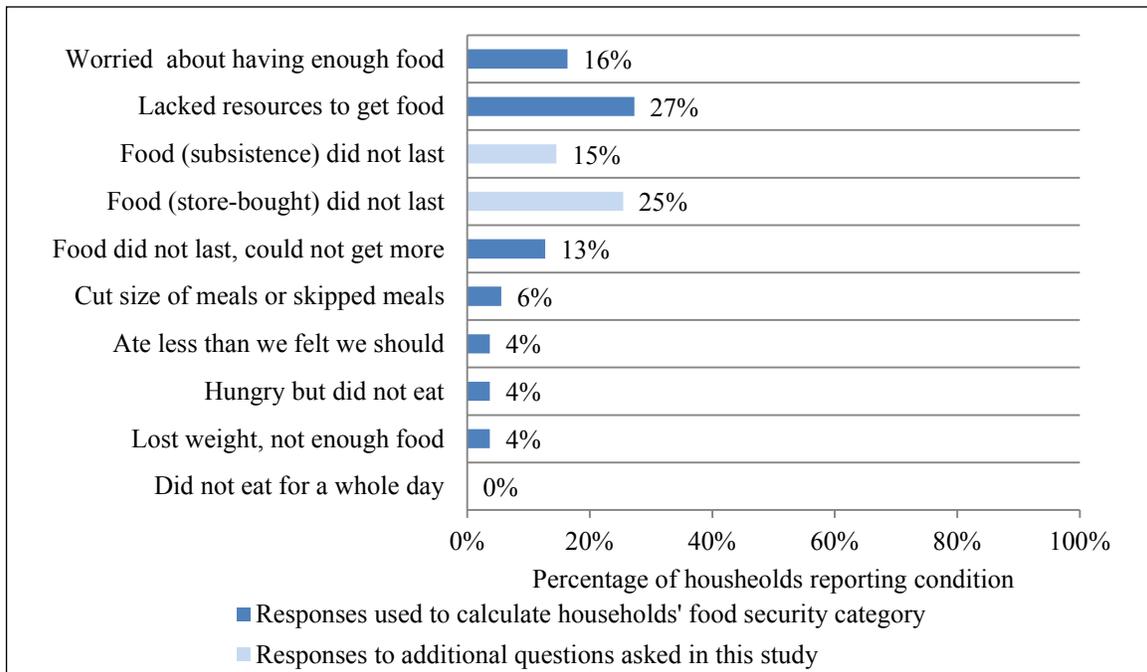


Figure 4-32.—Responses to questions about food-insecure conditions, Northway, 2014.

food types had run out (store bought vs. subsistence), more respondents reported that store-bought foods had run out (25%). Fewer households (6%) reported cutting the size or number of meals, and 4% reported losing weight because of a lack of food. No households reported that adults in the households had not eaten for a whole day.

Respondents who answered yes to these core questions were asked in what months the shortages had occurred. Figure 4-33 portrays the mean number of food insecure conditions per household by food security category by month. Figure 4-34 shows in which months households reported foods not lasting. Generally speaking, high and marginal food security households described few insecure events, although some anxiety was experienced in winter months. No households reported food security problems in April, May, June, September, and October (Figure 4-33), which corresponds with months that no households reported a shortage of subsistence foods (Figure 4-34). Low food security households described no insecure conditions in the spring, summer, or fall, and they reported the most food insecure conditions in the winter. Respondents identified a rise in food insecure events for very low food security households in July and August (Figure 4-33), when acquiring store-bought food was more of a problem than acquiring subsistence food (Figure 4-34). In the winter, more households reported running out of subsistence foods than store-bought foods, and the opposite was true in summer (Figure 4-34).

Food security results for surveys for Northway, the state of Alaska, and the United States are summarized in Figure 4-35. Despite numerous challenges, this study’s data indicate that a lower portion of Northway residents were classified as food insecure than in Alaska generally or the U.S. overall—as compared to estimates determined by the USDA. As in many rural Alaskan communities, food security seems closely related to the ability to work together with other households in the production of food, and also on sharing the costs and benefits of those efforts.

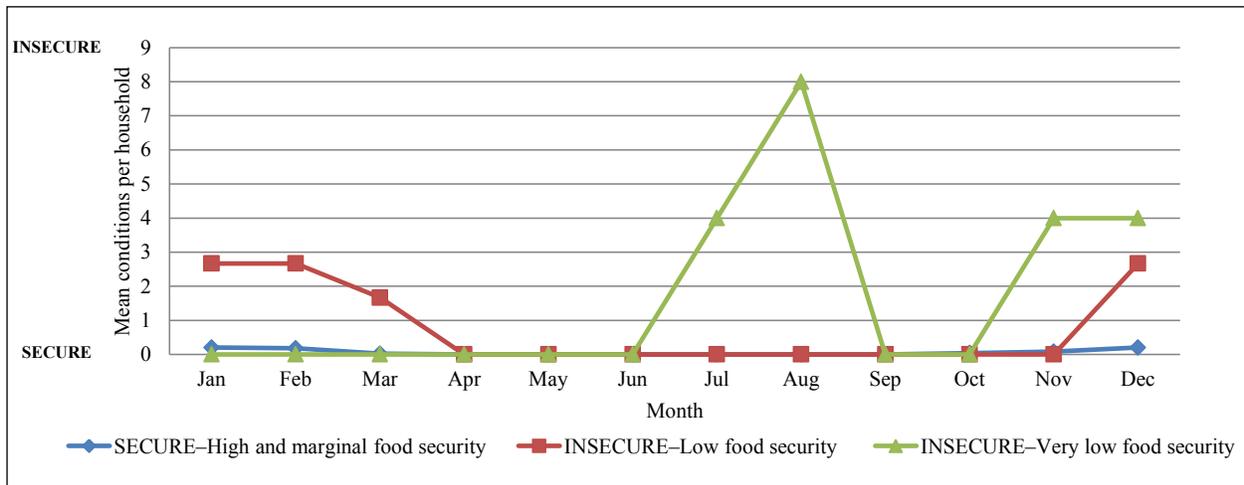


Figure 4-33.—Mean number of food-insecure conditions by month and by household security category, Northway, 2014.

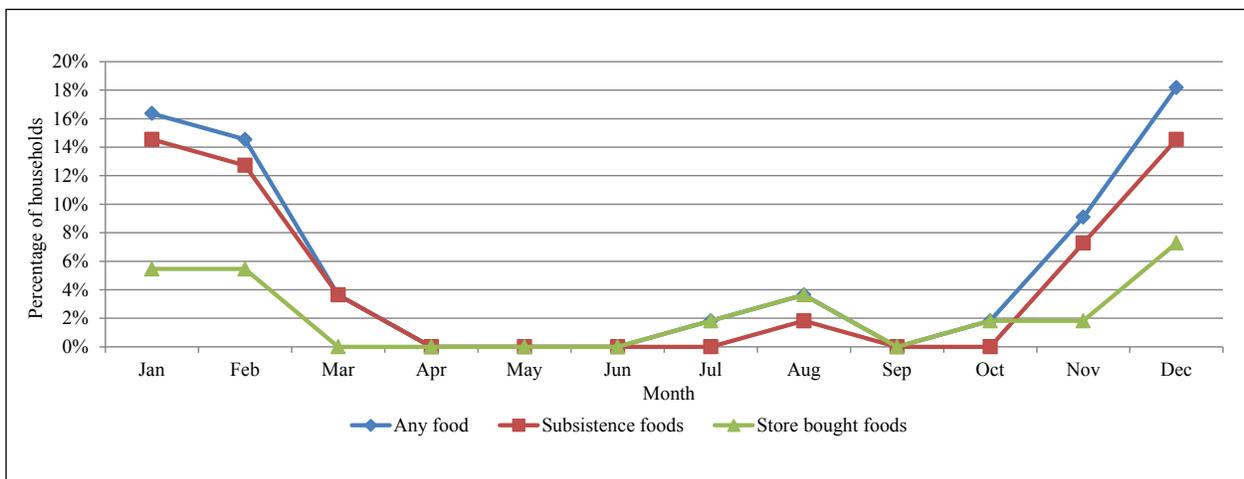


Table 4-24.—Comparison of months when foods did not last, Northway, 2014.

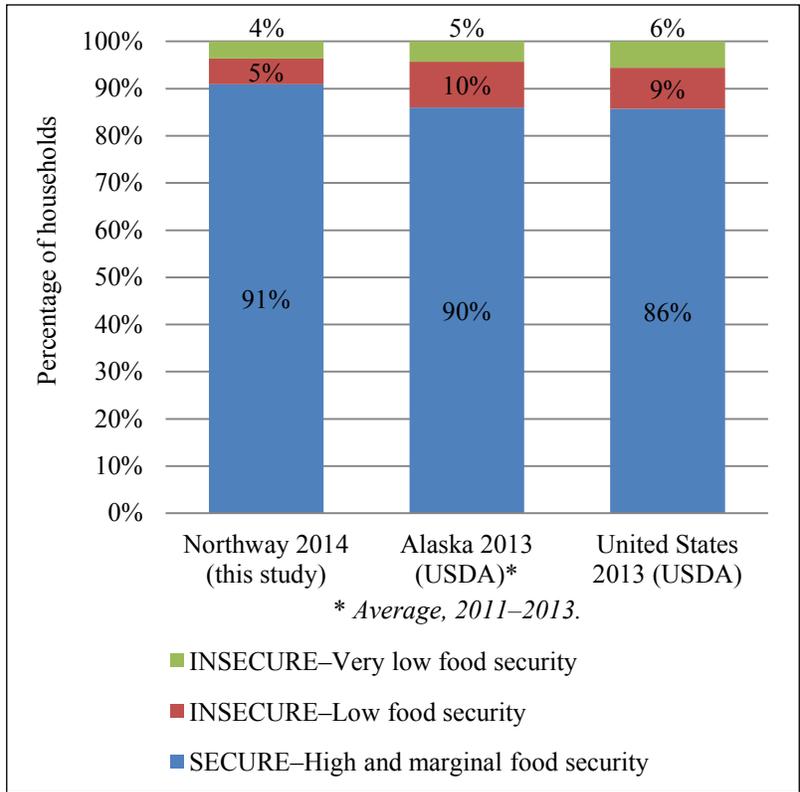


Figure 4-34.—Comparison of food security categories, Northway, 2014

5. DISCUSSION AND CONCLUSIONS

This final chapter begins with a comparison of recent findings with prior study years and ends with a broad view of local subsistence practices and patterns. It also reviews the major themes expressed and explored by Northway residents about the history and future of subsistence in their area.

COMPARISON OF CURRENT AND HISTORICAL HARVEST DATA

There have been 2 prior harvest surveys conducted in Northway with comparable methods of sampling and analysis, as described in the Introduction.¹ The first survey (Marcotte 1991) estimated the total harvest as well as each category in the context of all other categories for the total community. The second survey² estimated harvests and uses for the whole community, but only surveyed land mammals and nonsalmon fish. Together, land mammals and nonalmon fish provide the foundation of the food supply in Northway, as demonstrated for recent history in Figure 5-1 and Table 5-1. Perhaps the most striking feature of the

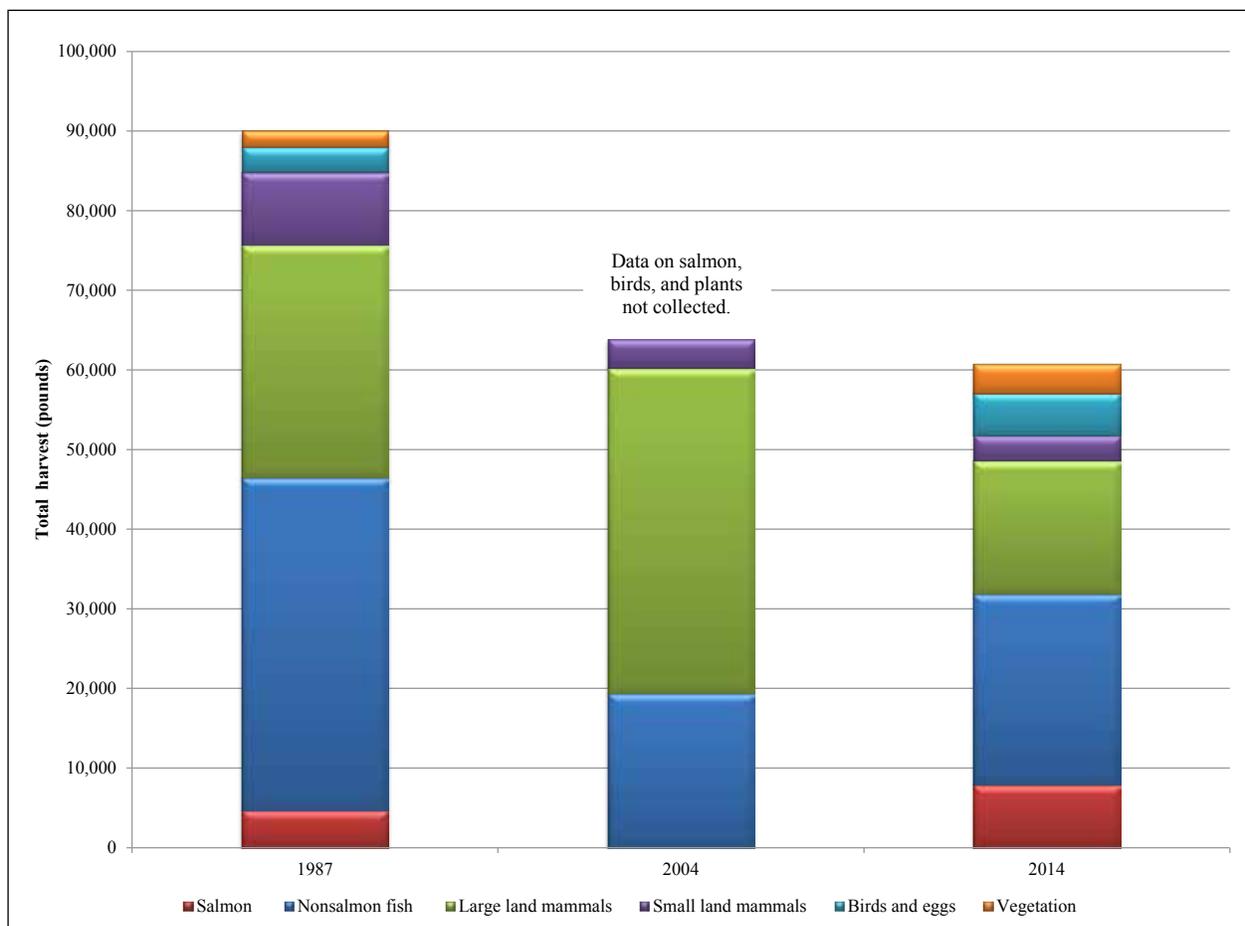


Figure 5-1.—Harvests by category in edible pounds, Northway, 1987, 2004, and 2014.

1. Case (1986) documents similar aspects of subsistence for the 1983–1984 study year, but the study focused on heavy harvesters, so it cannot be directly compared in this discussion. However, the research generated findings referenced in this report, and provided data for a review of the use of Copper River salmon by Upper Tanana residents (Haynes and Simeone 2007).

2. M. Koskey, *Subsistence resource use among ten Tanana River Valley communities, 2004–2005*, unpublished data. The manuscript of this work is on file with ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701. Hereafter *Koskey unpublished*.

Table 5-1.—Comparison of estimated total and per capita harvests by category in edible pounds, Northway, 1987, 2004, and 2014.

	1987			2004			2014		
	Total harvest (lb)	Per capita harvest (lb)	Percentage of total harvest	Total harvest (lb)	Per capita harvest (lb)	Percentage of total harvest	Total harvest (lb)	Per capita harvest (lb)	Percentage of total harvest
All Resources	90,090.0	278.1	100.0%	68,153.6	259.5	100.0%	60,791.0	313.7	100.0%
Salmon	4,684.0	14.5	5.2%	4,246.6 ^a	16.2	6.2%	7,908.5	40.8	13.0%
Nonsalmon fish	41,873.0	129.2	46.5%	19,484.0	74.2	28.6%	23,957.8	123.6	39.4%
Large land mammals	29,146.0	90.0	32.4%	40,793.0	155.3	59.9%	16,750.2	86.4	27.6%
Small land mammals	9,164.0	28.3	10.2%	3,630.0	13.8	5.3%	3,119.1	16.1	5.1%
Marine mammals	-	-	-	-	-	-	0.0	0.0	0.0%
Birds and eggs	3,136.0	9.7	3.5%	-	-	-	5,343.0	27.6	8.8%
Marine invertebrates	-	-	-	-	-	-	0.0	0.0	0.0%
Vegetation	2,088.0	6.4	2.3%	-	-	-	3,712.4	19.2	6.1%

Source ADF&G Division of Subsistence household surveys, 1988 (1987 study year), 2004 salmon harvest data derived from post-season permits, Division of Subsistence household surveys, 2005 (2004 study year, whitefish data), 2015 (2014 study year).

Note "-" indicates no data available.

a. Estimated edible pounds of salmon harvested for 2004 are derived from postseason permits (Fall et al. 2007).

data is the reversal of relative proportions in 2004 from the other study years (1987 and 2014, which show nonsalmon fish as the larger component of the overall harvest.

Sampling results and basic demographics for the 3 study years are found in Table 5-2; the table shows a decrease in the human population between 1987 (324 people) and 2014 (194 people). The use of per person and per household averages for discussion, although actual personal and household harvest levels are highly variable, allows for comparisons adjusted for population changes. Figure 5-2 shows the per capita harvest data for the 3 study years. Although the total harvests of the nonsalmon fish and large land

Table 5-2.—Sample and demographic characteristics, Northway, 1987, 2004, and 2014.

Characteristics	Northway		
	1987	2004	2014
Sampled households	45	60	55
Eligible households	90	80	73
Percentage sampled	50.0%	75.0%	75.3%
Sampled population	162	197	146
Estimated community population	324	262.7	193.8
Household size			
Mean	3.6	3.3	2.7
Minimum	-	-	1
Maximum	-	-	8
Age			
Mean	-	-	40.5
Minimum ^a	-	-	0
Maximum	-	-	91
Median	-	-	42.0
Length of residency (in years)			
Total population	-	-	
Mean	-	-	32.6
Minimum	-	-	0
Maximum	-	-	91
Heads of household	-	-	
Mean	-	-	45.2
Minimum	-	-	3
Maximum	-	-	91
Alaska Native			
Estimated households ^b			
Number	70	72	65.0
Percentage	77.8%	90.0%	89.1%
Estimated population			
Number	248	-	169.9
Percentage	76.50%	-	87.7%

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

Note "-" indicates that the information was not available.

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

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

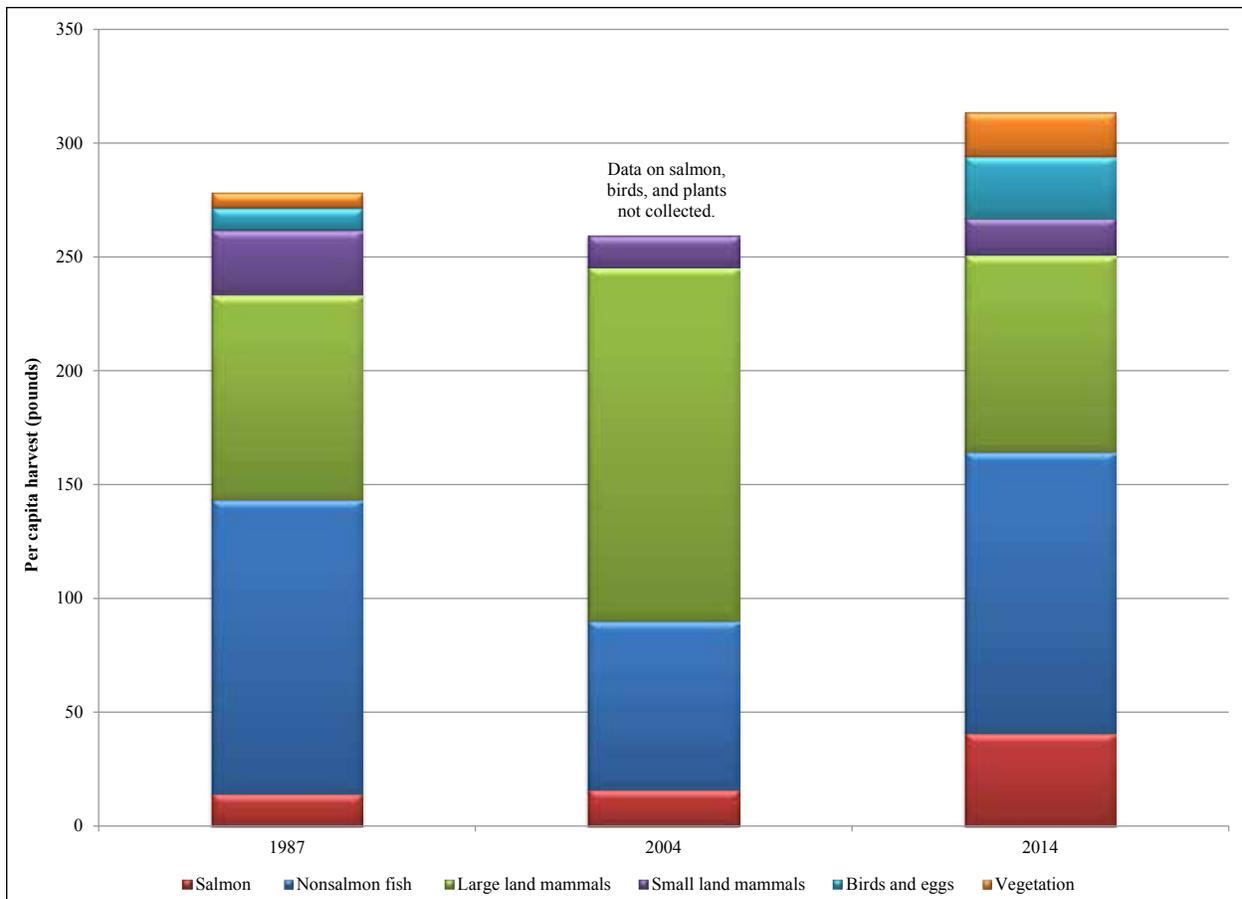


Figure 5-2.—Harvests by category in edible pounds per capita, Northway, 1987, 2004, and 2014.

mammals were overall much smaller in 2014 than in 1987, the data indicate that per capita harvests of these resource categories were similar. Northway residents harvested 129 lb per capita of nonsalmon fish in 1987 and 124 lb per capita in 2014. The per capita large land mammal harvest was 90 lb in 1987 and 86 lb in 2014. In contrast, higher harvests of salmon, birds and eggs, and vegetation in 2014, divided among a smaller number of people, result in dramatically greater proportions of the per capita food supply in 2014. For example, the harvest of birds and eggs in 1987 (3,136 lb) was 3.5% of the total, providing about 10 lb per capita; in 2014, birds and eggs (5,343 lb) made up almost 9% of the total and accounted for 28 lb per capita. These general trends are augmented by ethnographic data collected over the same time period, as referenced for each category, below. The following sections detail these trends for each resource category with data from harvest surveys and ethnographic interviews.

Fish

As stated, 1987 provides the best comparison to the 2014 harvest amounts and composition, but additional data regarding the harvest and use of nonsalmon fish are available for 2004; that survey did not query salmon, but postseason permit data are available for the discussion (Fall et al. 2007).³

3. Salmon data from Yukon River permits have been adjusted from the original publication (D. Jallen, ADF&G Fisheries Biologist personal communication, January 4, 2016). Adjusted data show that 22 households in Northway were issued permits. Only 48 Chinook salmon from the Upper Yukon Area were harvested under these permits. No adjustments were necessary for salmon harvests from the Copper River in 2004. Six Northway households obtained and returned permits, with total harvests of 8 Chinook and 549 sockeye salmon (Fall et al. 2007:145).

Table 5-3.—Estimated harvests of salmon and whitefishes in edible pounds, Northway, 1987, 2004, 2014.

	1987	2004	2014
Population estimate	324.0	263.0	193.0
Household estimate	90.0	80.0	73.0
Salmon	4,684.0	4,246.6	7,908.5
Chum salmon	85.0	-	40.5
Coho salmon	1,285.0	-	2,370.1
Chinook salmon	832.0	-	352.2
Pink salmon	0.0	-	313.1
Sockeye salmon	2,481.0	-	4,832.6
Landlocked salmon	0.0	-	0.0
Spawnouts	0.0	-	0.0
Unknown salmon	0.0	-	0.0
Whitefishes	32,466.0	16,356.0	20,295.4
Broad whitefish	0.0	0.0	84.9
Cisco	0.0	0.0	0.0
Bering cisco	0.0	0.0	0.0
Least cisco	0.0	0.0	0.0
Humpback whitefish	0.0	16,156.0	18,181.1
Round whitefish	0.0	200.0	81.0
Unknown whitefishes	0.0	0.0	1,948.5

Source ADF&G Division of Subsistence household surveys, 1988 (1987 study year), 2004 salmon harvest data derived from post-season permit returns (Fall et al., 2007), Division of Subsistence household surveys, 2005 (2004 study year, whitefish data), 2015 (2014 study year).

The use of fish has demonstrably changed since 1987, with a general increase in the harvest of salmon, and a decline and then some rebound in the harvest of nonsalmon fish, primarily humpback whitefish. Table 5-3 and Figure 5-3 illustrate these changes, which are discussed in more detail the following sections.

Nonsalmon Fish

Oral history indicates that traditional use of nonsalmon fish, especially humpback whitefish, exceeded the amounts documented in the harvest surveys⁴; however, quantified comparisons are limited to recent decades. Nonsalmon fishes composed nearly one-half of the estimated wild food supply in 1987, and 40% in 2014 (Table 5-1). In all 3 study years with comparable data on the harvest and use of nonsalmon fishes, whitefishes accounted for the bulk of the nonsalmon harvest by weight. In 1987, unspecified whitefishes made up about 75% of the edible nonsalmon fish harvest; in 2004 and 2014, combined whitefish species made up about 85% of the nonsalmon harvest. Although whitefish species were not differentiated in 1987, biological data and ethnographic information suggest they were nearly all humpback whitefish (Brown 2006; Case 1986)⁵ caught in the upper Tanana drainage, which was also true in 2004 and 2014. Results from the 2 more recent study years also included whitefish species from outside the watershed: broad whitefish (2004 and 2014) and sheefish (2014).⁶ Various combinations of burbot, northern pike, and Arctic grayling

4. Friend, C., G. Holton, C. Brown, N. Easton, and M. Koskey. *Upper Tanana subsistence fisheries traditional ecological knowledge study*. OSM Project 04-253. The manuscript of this work is on file with USFWS Office of Subsistence Management Fisheries Resource Monitoring Program. Hereafter *Friend et al. unpublished*.

5. Also see Community Background chapter and ADF&G CSIS.

6. ADF&G CSIS. In 2004, round whitefish accounted for about 1% of the estimated whitefishes harvest in pounds, and in 2014 they composed less than 1% of the whitefishes harvest.

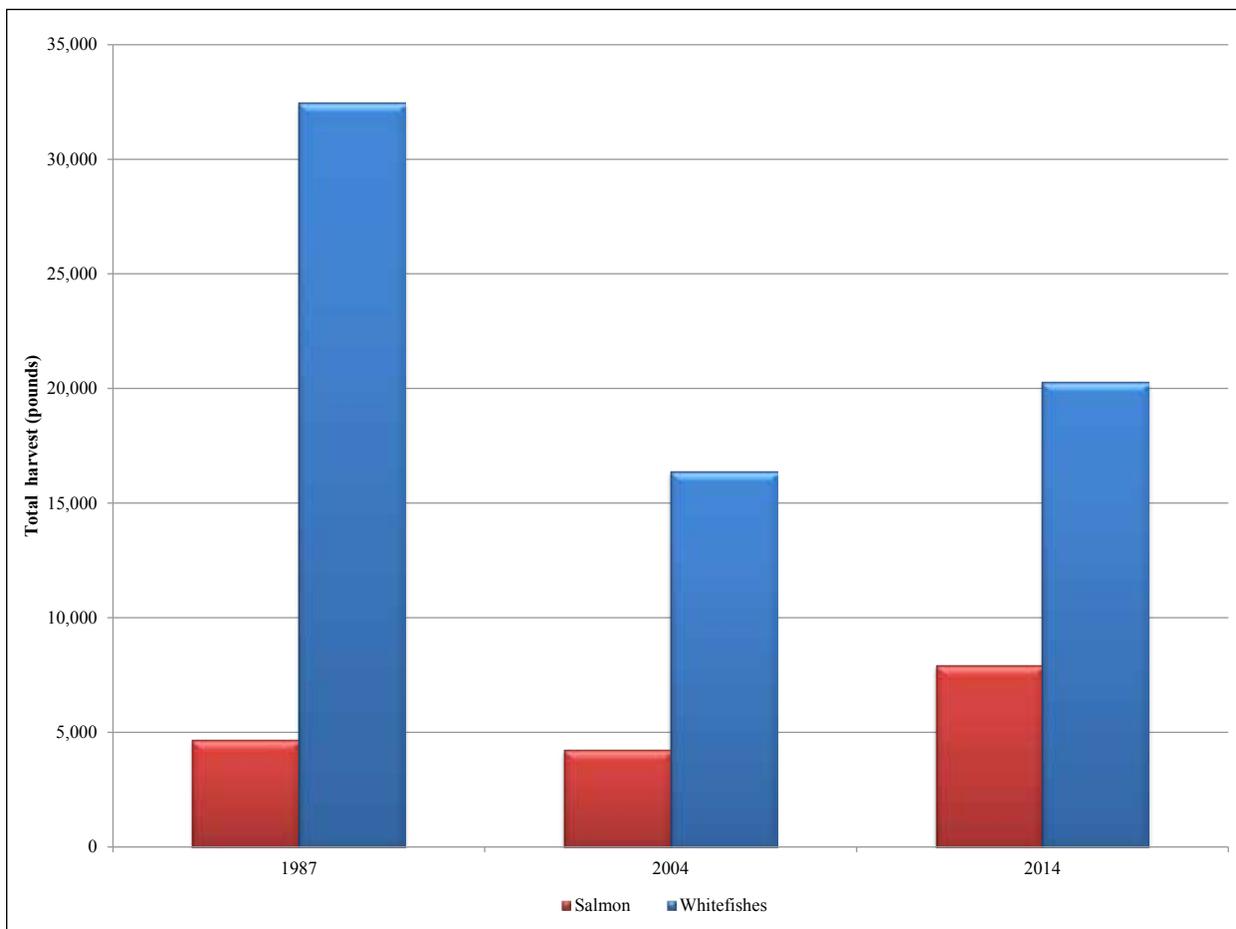


Figure 5-3.—Estimated harvests of salmon and whitefishes in edible pounds, Northway, 1987, 2004, and 2014.

made up the bulk of the remainder in all 3 years, along with longnose suckers in 1987 and 2004, as shown in Table 5-4. Of the 3 study years, the proportion of nonsalmon fish in the composition of the harvest was lowest in 2004—as was the percentage of households that used them (Table 5-1).

The estimated per capita harvest of whitefishes was about 100 lb in 1987. Results of the 2004 survey indicate that residents harvested an average of 62 lb of whitefishes that year. This study found about 105 lb of whitefishes were harvested per person in 2014. The percentage of households using nonsalmon fish also changed. In 1987 and 2014, 93% of households reported using nonsalmon fish species. However, in 2004, only 68% reported use. Although whitefishes are the key traditional fish of the region and the only fish that run in abundance in the upper Tanana River, only 55% of households used the resource in 2004. Table 5-5 shows those estimated harvests, with per household use averages calculated for households that actually used the harvests. Although the total harvest of whitefishes varies dramatically, households that used whitefish show relatively consistent average use levels over time.

Two general factors control fish harvests: availability and desirability. Trouble acquiring fish may be related to population abundance, habitat and distribution changes, or high fuel prices; wanting fish may be related to many things, such as the availability of other resources or concerns regarding resource health. As described in the Local Comments and Concerns section below, both availability and desirability of local nonsalmon fish were said to be low in the 1990s; the timing of decline in use is unclear, in part because it had begun prior to 1987 and also because it varied between households. Ethnographic information supports the 3 data points: the incursion of mud and increasing suspicions surrounding toxic waste began in the 1970s, and both continued to expand in the 1980s and 1990s (Godduhn 2011:8–10). The resurgence in use is also supported by ethnographic information from the 2014 study year that documents persistent fishers finding fish and always adapting to changes, also detailed below.

With respect to the timing of fishing activity, McKennan wrote of 1929–1930, “For a few days in July great numbers of whitefish are taken from the streams draining the lakes” (1959:35), adding that a few were also taken in the autumn. However, in the 1980s, whitefishes were primarily harvested in late spring and fall, during their migrations, and also in the summer (Marcotte 1991). Marcotte wrote that the “concentrated movement along area streams and rivers allows for greater efficiency of their harvest at these times” (1991:59). Some respondents in 2004 reported checking the fish for readiness by gauging the firmness of the flesh as early as May 10.⁷ According to the 2004 harvest survey, Northway residents caught a few humpback whitefish in May and October, but harvested 97% of their total annual harvest between June and September. Timing was not well tracked for fishing in the 2014 survey, but success was reportedly best in August, as described in the Results chapter.

Salmon

Traditional knowledge holds that historically salmon were somewhat more abundant in upper Tanana River tributaries, but that fish from adjacent basins, caught earlier in the run and not as close to spawning, were more desirable. Salmon from adjacent rivers were likely distributed across the Upper Tanana region along sharing and trade networks, as implied by encounters with the Chinook Jargon trade language by the Schwatka expedition in the upper Copper River basin in 1891 (Easton et al. 2013:80). When the Scottie Creek Band territory was disrupted by the establishment of the international border in 1903, it included portions of the White River drainage. Although regulation took time, the border immediately hampered and ultimately eliminated the availability of White River salmon for American-side Upper Tanana Dineh (Easton 2007). However, access to salmon from the Copper and Yukon rivers greatly increased in the mid-1900s (1945–1980) as roads improved and vehicles proliferated.

By the 1980s, long-distance travel to fish for salmon had been adopted as a standard component of the seasonal round for some Northway households. All studies that inquired (Case 1986; Marcotte 1991; and this study) have found that a small but substantial portion of Northway households go outside the upper Tanana basin to catch salmon and then share it with households who, in turn, also share it, such that most of

7. Friend et al. unpublished

Table 5-4.—Estimated harvests of nonsalmon fish, Northway, 1987, 2004, and 2014.

Resource	1987			2004			2014		
	Total harvest (lb)	Per capita harvest (lb)	Percentage of households	Total harvest (lb)	Per capita harvest (lb)	Percentage of households	Total harvest (lb)	Per capita harvest (lb)	Percentage of households
Nonsalmon fish	41,873	129.2	93.3	19,484	74.1	68.3	23,958	124.1	92.7
Humpback whitefish	32,466 ^a	100.2 ^a	84.4	16,156	61.5	55.0	18,181	93.8	67.3
Burbot	2,419	7.5	68.9	893	3.4	28.3	1,204	6.2	50.9
Northern pike	3,943	6.7	-	456 ^b	1.7 ^b	15.0	1,737	9.0	-
Arctic grayling	1,768	5.5	71.1	837	3.2	53.3	497	2.6	47.3
Longnose sucker	832	2.6	15.6	210	0.8	8.3	0	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 1988 (1987 study year), 2005 (2004 study year), 2015 (2014 study year).

Note Certain species harvested (e.g., trout) are included in the category harvest but not included as an individual resource, thus the total and per capita harvests of nonsalmon fish will be greater than the sum of individual species.

a. 1987 survey did not specify whitefishes; a small portion of the whitefish harvest was likely round whitefish.

b. 2004 survey did not query pickle-pike; results may only include adult fish.

Table 5-5.—Use of whitefishes and salmon, Northway, 1987, 2004, and 2014.

Resource	1987		2004		2014	
	Whitefishes	Salmon	Whitefishes	Salmon ^a	Whitefishes	Salmon
Total harvest (pounds)	32,466	4,684	16,356	4,247	20,295	7,908
Harvest per household (pounds)	360.7	52.0	204.5	53.1	278.0	108.3
Percentage of households using	84.0%	60.0%	55.0%	-	67.0%	80.0%
Use per using household (pounds)	429.4	86.7	371.7	-	415.0	135.4

Source ADF&G Division of Subsistence household surveys, 1988 (1987 study year), 2005 (2004 study year, whitefishes), 2015 (2014 study year).

Note "-" indicates data not available.

a. 2004 salmon harvest data derived from post-season permit returns.

the community gets to have some; this pattern is most thoroughly documented with respect to Copper River salmon and sociocultural ties between Upper Tanana and Ahtna peoples (Haynes et al. 1984).

Findings for the 1987 study year indicate that 20% of households harvested about 4,684 lb of salmon that was used by 60% of households (Marcotte 1991). A slightly lower salmon harvest weight (4,247 lb) was derived from postharvest survey tickets in 2004, which results in similar estimation of pounds per household for the smaller population (Table 5-5). This study finds that, in 2014, 26% of households harvested about 7,908 lb of salmon that were used by 80% of households. With only 2 fully-comparable data points (1987 and 2014; permit returns [2004] may not provide as complete a picture as in-person harvest surveys,⁸ and do not collect information about sharing), conclusions cannot be certain, but the present study implies a continuing increase in its use at both the community and household levels. A comparison of the edible pounds averaged among households that reported using salmon shows that households that do use salmon used more of it in 2014. The estimate of per capita pounds of salmon was highest in 2014, in part because the total harvest was higher, but also because the community population was lower. Salmon are still acquired from friends or family in the adjacent basins by simple receipt or in exchange for muskrat or other resources (1506).

Land Mammals

Large Land Mammals

Moose are the preferred and primary source of red meat protein in many Northway households. Historically, Upper Tanana Dineh took these animals at nearly any opportunity, and targeted them during particular seasons.

Moose hunting is most important at two periods of the year, in the late summer and fall after the disappearance of whitefish and in the late winter and early spring when the winter store of caribou has been consumed and before it is possible to hunt muskrat and ducks. (McKenna 1959:34)

Acquiring moose with firearms is far easier than with traditional technologies; the use of rifles almost certainly began before the end of the 19th century and had “largely supplanted the bow and arrow” by the late 1920s (McKenna 1959:58). Prior to large freezers, however, harvest of moose was constrained by the need to either use the animal quickly (generally by sharing), or to dry and cache the meat (McKenna 1959:33–34). As noted in the Community Background chapter, McKenna also described the importance of caribou in the late 1920s, and the hardship imposed by their depletion during the Chisana Stampede of 1913.

In the interim between McKenna’s fieldwork in the late 1920s and the 1987 survey, the ratio of harvest of caribou to moose meat is unknown, but caribou were essentially absent from the immediate area for decades beginning in the late 1930s, severely limiting access until the Alaska Highway improved and local residents acquired vehicles, and the Nelchina caribou herd ranged near the community for an unclear number of years (Northway and Pitka 2011). A key respondent for this study said that there were no caribou in the immediate area until “...maybe ’75, we started seeing them again” (1509). His family would travel north on the Taylor Highway toward Eagle to hunt for caribou in the 1950s and 1960s. He explained that their use of caribou declined in the 1970s, even though migrations again brought the animals to the eastern upper Tanana River valley:

Well, in the ’60s, the limit was 3 caribou, so you could get 3, and then they changed that to only 1...1 per person. So, we had, we were using less caribou then because they had cut the quota down. (1509)

Data collected by subsistence harvest surveys affirm that the harvest of large land mammals has been fundamental to residents’ subsistence way of life during recent history, with more moose harvested than caribou in each of the study years (tables 5-1 and 5-6). Further, the contribution of edible pounds to the

8. See Andersen and Alexander (1992) and Schmidt and Chapin (2014) for discussions of harvest reporting.

Table 5-6.—Estimated harvests of caribou and moose in total numbers and per capita pounds, Northway, 1987, 2004, and 2014.

	1987	2004	2014
Caribou			
Total number (individuals)	32.0	41.0	13.3
Per capita (pounds)	12.8	15.7	8.9
Moose			
Total number (individuals)	38.0	50.0	22.6
Per capita (pounds)	74.7	135.0	76.8

Source ADF&G Division of Subsistence household surveys, 1988 (1987 study year), 2005 (2004 study year), 2015 (2014 study year).

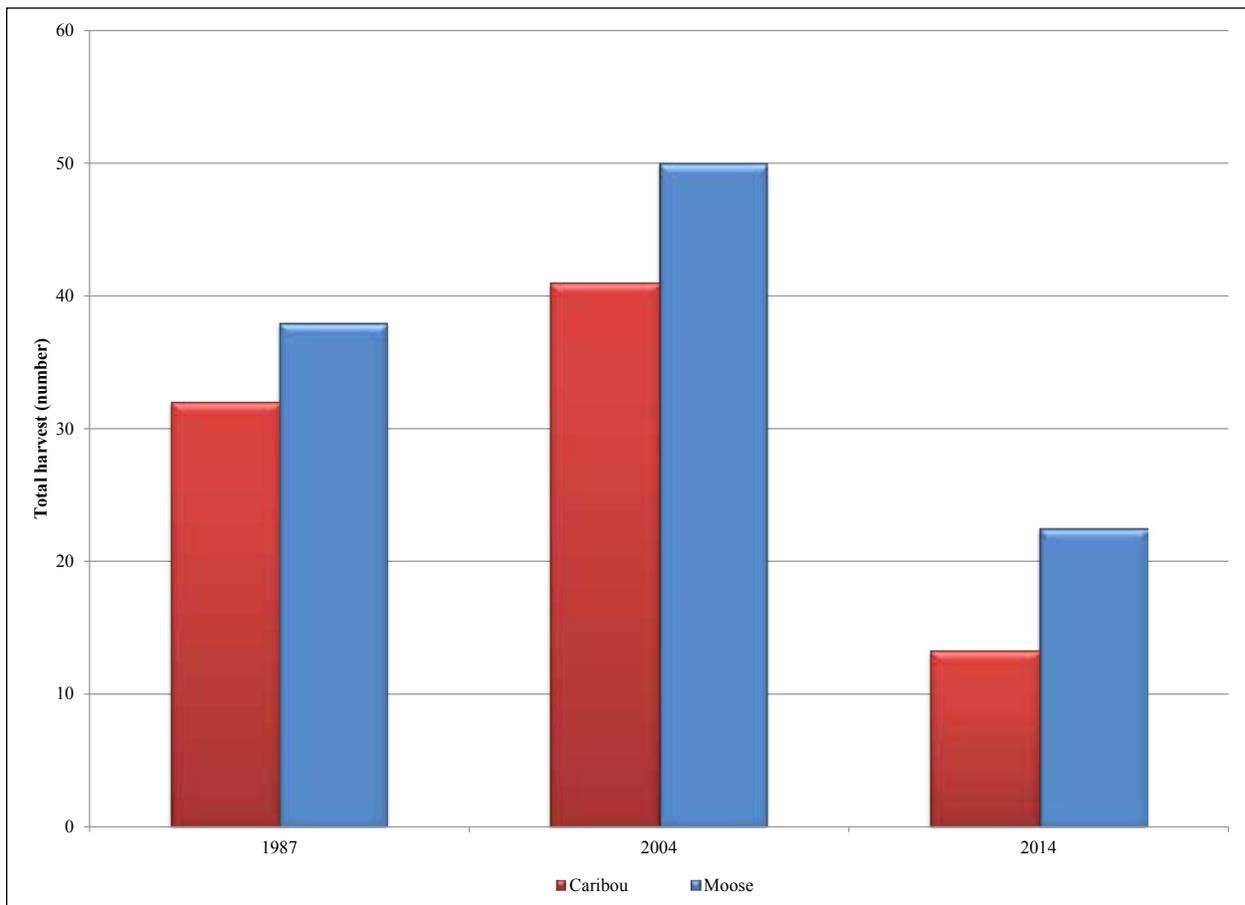


Figure 5-4.—Estimated numbers of caribou and moose harvested, Northway, 1987, 2004, and 2014.

subsistence harvest is much greater for each moose, because it is a much larger animal than caribou (Figure 5-4; Table 5-6). The 2004 study year stands out with the largest harvest of large mammals, which constituted a majority of the locally-procured foods included on that survey (Figure 5-1; Table 5-1). Northway respondents harvested a few black bears in all study years and Dall (mountain) sheep in 1987 and in 2004 (Table 4-10).⁹ In 2014, Dall sheep were reported as hunted and received but not harvested, likely because the harvesting household was not surveyed, or the gift came from another community (Table 4-10).

During the 2004 survey, respondents were asked to assess the availability of caribou and moose 10 years earlier, 5 years earlier, and at that time (Appendix E).¹⁰ The proportion of moose hunters describing availability as “good” diminished over the queried time periods, from 56% for the late 1990s, to 24% for the early 2000s, and 20% in the 2004 study year. Responses related to caribou were less indicative of a trend: 44% considered availability as “good” in the late 1990s, 22% in the early 2000s, and 33% in 2004. Use levels of these animals were described as stable: a majority of respondents stated that their use had not changed, but that they had worked harder to get moose. Although Figure 5-2 shows 2004 as the highest harvest of land mammals, these responses suggest that hunters were working harder to acquire sufficient meat for the smaller population.

Neither hunter effort nor animal abundance was queried for 2014, but respondents were asked to assess their 2014 harvest relative to the last 5 years. Results of those questions indicate that 44% of households described less use of large land mammals in 2014 relative to other recent years, and 33% reported not having enough large land mammals (figures 4-28 and 4-29). Further, moose was the resource most often named as needed (by 21 of 55 households; Table 4-21).

Small Land Mammals/Furbearers

Although the consumption of small land mammals is now more of a treat than a staple in most households, small land mammals continue to provide fresh food and warm fur. Muskrat was harvested in high numbers historically. One respondent described the tally of a spring’s work: “Like ah, 1947, my dad, all of us, we got house, me and my dad had a tent outside to put dry muskrat in. It was—I think it was about 1,400 muskrat dried skin” (1504). He and another key respondent each identified processing muskrats as a family activity.

It has, nobody hunts, barely, I mean they hunt or we trap just so we have those things to eat you know, but when I was young Dad would go out and come back late at night or early morning over 100 muskrat...So here we are, Mom would skin, Mom and Dad would skin, us young kids would gut it and cut it up you know, I mean it’s a family work, we getting hundreds of muskrat we got to dry. [That was] the only way because there’s no freezer or nothing, and we would live on that. And that goes with ducks, I mean I would go in this fish smokehouse and could see just rows and rows of dried ducks, whitefish and you know, all those things, only thing they don’t dry is I think rabbit. (1507)

She went on to explain that rabbit does not dry well, and is a “right now food,” although in winter, heads were saved for emergencies:

Yeah in winter, too, I remember that every time they catch rabbit they would throw the head up on the roof so dogs don’t get it, and if for bad weather or cold weather Dad can’t run in to store you know, they would bring in those heads and skin them and make a meal out of it. (1507)

Survey data indicate that muskrats and snowshoe hares were the most harvested small mammals (by number of animals) for all 3 study years (Table 4-10).¹¹ More than 95% of the harvested animals were used as food. The edible pounds of small mammals contributed about 10% of the overall harvest in 1987, 6% of the land mammals and nonsalmon fishes harvest in 2004, and about 5% of the total harvest in 2014 (Table

9. ADF&G CSIS

10. Koskey unpublished

11. ADF&G CSIS

5-1). Small land mammals are also the foundation of trapping activity, which had begun a decline before 1987 that has continued. For example, martens are consistently the most popular nonfood target; Northway residents harvested about 676 in 1987, 486 in 2004, and 244 in 2014 (Table 4-10).¹² An evaluation of this decline, as related to availability vs. desirability, would require research beyond the scope of this project.

Birds and Eggs

Expansive wetlands in the upper Tanana serve as habitat for migratory waterfowl, especially in the spring and fall. Additionally, vast forests support what are now often referred to as “wild chickens” collectively: spruce grouse can be found throughout the area, while ruffed grouse and ptarmigans are found in the hills surrounding the valley floor. Like small land mammals, birds provide relatively few pounds of food, but are important to the households that use them. Although comparable data for Northway’s bird harvest is only available for 2 study years,¹³ the harvest of birds and eggs seems to have increased. Birds and eggs composed about 3.5% of the wild food harvest in 1987, and almost 9% in 2014 (Table 5-1). Easy access to birds and eggs declined as Charlieskin and Fish lakes were flooded repeatedly with muddy water; the 1987 harvest may have been negatively affected, but it seems that hunters had adapted by 2014.

Vegetation

Data regarding the use of vegetation has only been collected twice: the 1987 and 2014 study years. Vegetation was not specified in 1987, but rather categorized as either berries or greens. As was true in 2014, berries dominated the harvest in 1987, and smaller amounts of greens were used by lower percentages of households (Table 4-10).¹⁴ Estimates indicate that Northway harvesters collected about as much weight in blueberries in 2014 (2,084 lb; Table 4-10), as they gathered of total vegetation in 1987 (2,088 lb; Table 5-1). An additional 1,629 lb of vegetation was harvested in 2014, including 200 lb of mushrooms (Table 4-10). Altogether, berries, mushrooms, and greens composed 6% of the estimated wild food supply in 2014: about 19 lb per person as compared to 2% (6 lb per person) in 1987 (Table 5-1). The use of firewood has also increased, with 55% of households reporting use in 1987¹⁵ and 80% in 2014 (Table 4-17).

COMPARISON OF CURRENT AND HISTORICAL HARVEST AREAS

In the mid-1980s, ADF&G Division of Subsistence research documented Northway’s use areas for the first time (Case 1986). The report includes a set of search and harvest maps that delineate areas used for fishing, hunting, and trapping. The areas are generally wide corridors along rivers, creeks, and roads with considerable overlap of areas used to search and harvest different resources, especially fish, waterfowl, and moose. Case (1986) noted that much of the subsistence activity happened within 5–10 miles of the community. Trappers generally covered the most ground: traplines were run north of the Alaska Highway in the Ladue River drainage and along the Taylor Highway, around the Black Hills, and through the Nutzotin Mountains along the Nabesna River. The highest intensity area for trapping included the lower Chisana and Nabesna river corridors and the flats between them. The report describes competition with outside harvesters as an increasing problem: respondents had seen “greater numbers of vehicles parked along the Northway Road for hunting moose and waterfowl” (Case 1986:71). Some respondents felt that establishment of the TNWR had increased the number of nonlocal hunters and trappers. “One trapper, for example, reported discontinuing his trapping around the Takomahto Lake region because of the establishment in 1980 of a guiding camp there” (Case 1986:71).

The 2004 and 2014 surveys also asked respondents to identify the areas they used during the study years (Figure 4-14).¹⁶ However, although Northway residents recognize the importance of documentation, many

12. ADF&G CSIS

13. As mentioned earlier, there are bird harvest data for 2000; however, because of differences in sampling, the results cannot be usefully compared to the 1987 or 2014 data.

14. ADF&G CSIS

15. ADF&G CSIS

16. Koskey unpublished

are also extremely reluctant to identify prime areas for harvest activities. As described in the next section, Northway residents have grown somewhat accustomed to the flow of nonlocal hunters, but remain guarded with respect to myriad demands of land use in a road-accessible place with complex ownership boundaries. In particular, hunting and trapping pressure have continued to increase since 1984, and residents are wary of providing advantages to nonlocal hunters. Thus, maps produced for the 2004 and 2014 study years are less explicit; the maps for both study years essentially identify the valley floor from the Canadian border to Tetlin Junction, the Taylor Highway corridor north from Tetlin Junction to Eagle, and portions of the TNWR and the WRST, with a very similar pattern for all resources.

LOCAL COMMENTS AND CONCERNS

The survey concluded by inviting respondents to express any comments or concerns, and key respondents described their concerns in depth. Following is a summary of local observations that were given during surveys and interviews in February 2015, for the 2014 study year, occasionally augmented by other sources. Some households did not offer any additional information during the surveys, so not all households are represented in the summary. Local concerns have been broadly categorized into sections (Jurisdiction, Contaminants, Environmental Change, Human Ecology), all of which are relevant to the subsistence way of life in Northway. Comments and concerns provided by survey respondents are included in Table 5-7.

Jurisdiction

Land ownership and use are complex issues in Northway, where lands selected by Northway Natives, Inc. and Doyon under the Alaska Native Claims Settlement Act are surrounded by public lands over which residents have little control. Many Native allotments and other private lands lie along Northway Road and the Alaska Highway. Additional Native allotments are scattered across the valley, many as inholdings within the federal lands that cover much of the eastern upper Tanana River basin south of the Alaska Highway. The lower stretches of the Chisana and Nabesna rivers are within the Tetlin National Wildlife Refuge (TNWR), while their head water regions are in the Wrangell-St. Elias National Park (WRST). Most land north of the Alaska Highway, which runs essentially parallel to the Chisana and Tanana rivers, is owned by the State of Alaska. In Canada, the Scottie Creek basin is a Habitat Protection Area (Yukon Energy, Mines and Resources, Minerals Development Branch 2005). All of these areas are traditional hunting and fishing grounds for Upper Tanana Natives (McKenna 1959:17). Beyond legally-recognized land ownership, there are traditional familial use areas that are generally respected locally, but are unknown to nonlocal hunters and fishers.

One of the most frequently mentioned issues was the Alaska Department of Natural Resources' draft "Eastern Tanana Area Plan" (ETAP)¹⁷, which included a proposal to sell recreational lots along the Alaska Highway southeast of Northway. The public comment period (August 8–November 14, 2014) had ended prior to the survey effort; local and former residents had submitted over 100 comments in opposition to the lot sales. Many respondents in this study expressed their concerns related to the potential loss of the traditional hunting grounds. One of the key respondents said:

[I]f that sale goes through...we'll get people in here that don't understand the area, and they'll be, you know, trampling on Native allotments and you know, cutting firewood on Native lands and running through trails, that's where we're hunting and disrupting everything, I think, because they don't understand the way of life around here. (1509)

News that the parcels about which they were most concerned were removed from the final ETAP was well received in Northway. Finalization of the plan for print has been delayed by requests for reconsideration, but removal of those parcels for sale is not being reconsidered.¹⁸

17. Alaska Department of Natural Resources (DNR), Mining, Land & Water. 2016. "Eastern Tanana Area Plan." Accessed September 27, 2016. <http://dnr.alaska.gov/mlw/planning/areaplans/etap/>

18. Brandon McCutcheon, Alaska DNR Land Use Planner, personal communication, September 17, 2016.

Table 5-7.—Survey comments, Northway, 2014.

Blueberries and blackberries are not here. Seen lots of bears. Used to be able to pick lots of berries, now just a little. Have to look around and you can pick berries, not sure how come. Love moose!! Used to be big creek but beaver closed it up and now no more creek down there by Frypan Lake, where we fish grayling. Beaver closed it up with dam. Need to kill off the beaver, filling up creeks - especially Open Creek.

Chisana floods over due to Nabesna breakup. Fan boats (private owners) breaking barriers, clear lakes get dirty. Restricted access. Global warming - depressions, washouts, changes in topography. Main concerns regarding introduced flow of silty water into clear water lakes. Silt kills fish food; fish, muskrats leave, etc. Silty water getting in via damage caused by fan boats (busting through barriers) and breakup of the Nabesna River; jams and backs other waterways up, flooding results. Respondent also noted how land has changed due to climate change. Land is "sinking," new depressions every summer, creates washouts, etc.

Community garden would be a good idea for Northway - away from airfield pollution areas.

Concerned about ETAP^a. Any sort of land sale would interfere with hunting grounds.

Created Tetlin WR^b, no easy access. Can't use snowmachines unless there's sufficient snow or ATVs to harvest meat. Gas prices too high in 2014, burdened ability to harvest subsistence foods. Questions Border City's septic system. Concerned about seepage into adjacent waterways (Desper Creek into Scottie Creek, into Chisana River).

"Don't ignore regulations unless I have to, but you got to do what you got to do." Respondent described how he is building a hovercraft because lakes and rivers were filling up with silt and getting shallower. Soon they will be impassable by boat.

Extend moose season into September. Northway moose season is oftentimes not accommodating to hunters. Moose season should extend into September. More moose are seen in the area around Northway in the first 2 weeks of September.

Fish Lake - why not put a dam at Mark Creek? Resources to Fish Lake - whitefish [and others] have left Fish Lake - Fish Lake all silt now. Went to meeting, USFWS, ADF&G, raised hell regarding Fish Camp, Fish Lake, dam at Mark Creek.

Food security - respondent described high food insecurity in August due to slow processing of her food stamp renewal application.

Grizzlies - too many killing too many calves. Predator control? Map of proposed ETAP^a land? Respondent shared many concerns to include need for less regulation and more predator control (wolves and grizzlies killing too many moose calves). Much concern regarding silting of nearby lakes, loss of habitat. No more whitefish, no more muskrat because of it. Respondent believes fanboats in the 1980s are responsible. Respondent claimed that many waterfowl species flight patterns have changed in recent years, wonders if due to climate change.

Hunting should be open all year. It's not random, shoot for fun. They shoot it when they need it. 30 years ago we had 450 people, now just more than 100. Low rabbits, long time (3 or 4 years). Starting to come back.

Keep guided hunts away from Native communities (limit or ban them) because they take all the resources.

Less moose. Season split up, August (locals only) and September. Respondent would like to see the locals-only hunt extended into September.

-continued-

Longer moose season at least to September 20. It's too early - soon as they start to move, it closes.

Lots of outsiders hunting. There is a difference between Northway decedents coming home to hunt and Fairbanks or Anchorage residents coming into traditional hunting grounds - especially a problem on the northside near Seatons [state land]. Even former trooper is kind of ok - at least he shares - but most outsiders are a big problem. If DNR^c wants people to engage in scoping [ETAP^a], they should use Facebook! Net restrictions [for Yukon River king salmon] cause major hardship. Lots of gas for drifting and hotspots are crowded.

Mentioned contaminants and cancer talk among elders. Respondents is concerned about contaminated land near airport and asked whether pipes and other debris in the lakes there will be completely cleaned up.

Need to keep subsistence going because without it people will die. Why \$90 on the fuel gift certificate? \$90 seems like an odd number.

Nobody can fish king salmon on the upper [Yukon] river because people on lower Yukon catching them all. Need to lift restrictions on upper river because people depend on king salmon for food up here. Hunting guides/commercial guides should be giving meat to communities in the area where they hunt. Shut [anonymous] down. He never does anything for Northway people, never gives any meat to the community or elders. He just uses the community and doesn't give back.

Once in a while we get some roots.

Respondent concerned about silt entering lakes via erosion caused by fanboats, climate change, misuse of land. Also about Upper Tanana Athabaskan culture and tradition being passed along to younger generations. Children are learning less and less about "Indian ways." Respondent concerned about contaminated areas near the airport. Not many people use those areas anymore. Those that get muskrat in these areas keep the skins but toss the meat (inedible due to contaminants).

Respondent is concerned about the conditions of many surrounding lakes. Respondent explained that many of the surrounding lakes have gone from being clear to containing high amounts of silt from adjacent waterways. As the silt moves in, it kills vegetation - fish either move or die and other game, such as muskrat, move out as well. Respondent claimed that fan boat users are mostly to blame, explained that private boat owners oftentimes disturb vegetation/natural barriers between bodies of water - erosion takes over and silty water invades clear water source. Says that this began in the 1980s.

Respondent pleased to have caught 2 moose in 2014 season; he and his girlfriend each got one.

Respondent worries that the refuge might end up with a wilderness status, which would shut down hunting and fishing on the refuge - doesn't want to see that happen. Environmental change is also a concern, she's seen a lot of land sinking. 'Other change I've seen is uncontrollable growth of willows, shrubs, and trees, It's definitely warmer. Water isn't freezing like it used to. I was out a few weeks ago (beginning of January) and 2 creeks had opened that I've never seen open in winter before. Global warming is a concern because it will affect harvest of everything. Global warming is why the river came into Fish Lake - things are sinking.' Worried about contamination on the old pipeline along the highway, and also where a smaller pipeline ran along Northway Road because people pick roots and berries there.

-continued-

Stop commercial fishing at the mouth of the Yukon River. Keep the commercial guides and sports hunters off our traditional lands. Don't like guided moose hunts coming into Tetlin Refuge. They're going to wipe out all the moose, when state opens the season, the guided hunts on TNWR^b land.

That DNR^c land sale is our hunting grounds. Fish and Wildlife [USFWS]- no process before they built the campground at Seaton's - good hunting grounds. Activity on Yarger Lake [staging for USFWS boats and equipment near Lakeview Campground] chases off nesting birds.

The biggest issue I have is with the 5 day opening of the moose season in August (24-28) by ADF&G. During that time period very few if any moose are harvested because the animals are not moving. That takes away critical days allowed in September, when moose move and are much easier to find and harvest.

There are too many black bears and grizzlies in the area.

Too many people around here, up and down the road. Outside hunters don't know or respect the land. River water getting into all the lakes. Even Yarger Lake; the creek that used to drain it is all blocked with mud, backing it up. Lots of customary trade with Copper - they love muskrat. Surface waters drying up, even with all that rain. They done walked all over us. All that Indian property - used to just set up camp and get what we needed. Now along come #*0%ing game warden. Punk is for the taste, not just the buzz.

We walked back and forth with packsacks seasonally. Made our own entertainment - we're not bored, make it fun. \$35/ gallon of berries; most charge \$50.

Whitefish don't run normally anymore. Mark Lake in June - none. 10 Mile in July - none. July should be in the river; hard to find. Great 2 week run in August; the year before hardly got any. At least 5 families using their net, but thinks more like 8 or 9. When their smoke house was full, they would call another family and let them run the net. Those folks also let other people check it sometimes. Head 2 took a few people to the net, if they didn't have a boat. They harvested and 1/2 dried about 1,500 fish themselves and guess another 1000+ fish came from around the mouth of Moose Creek, many from their net.

With an influx of outsiders into our hunting area, seems like the wildlife population is in decline. The outsiders have superior equipment for hunting and seem to have no regard for where we hunt. I've had them camp 300 yards from me. They've got no respect or common courtesy for others. Twice I was willing to bear arms for hunting grounds, if that has to be done, it will be. Hunting grounds were ones traditionally used by elders. Respondent asked their permission before starting to hunt in that area and it was granted.

Wolves follow the caribou and every time caribou come through there's wolves. Would like to see ADF&G let predator control program know about the problem and do something about it. Lots of grizzlies too, last 5 years. In the late 90s there was a meeting with ADF&G, NVC^d, Northway community, Tetlin Wildlife Refuge - made a plan to record moose harvesting for potlatches and do away with poachers. It's been pretty successful. From late 90s to now, see more moose out there. But now see older moose, no younger moose due to predators. In the next few years we'll be suffering with moose if something isn't done about predators.

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

- a. Eastern Tanana Area Plan
- b. Tetlin National Wildlife Refuge
- c. Alaska Department of Natural Resources
- d. Northway Village Council

Management of the landscape to optimize the harvest of moose is not a new concept in the Upper Tanana region. For example, McKennan (1959:49) noted that “since moose prefer to browse on young willow shoots, hillsides were periodically burned to provide feeding places for the animals.” However, the intersection of local practice and contemporary management philosophy has often been characterized by conflict in Northway. When speaking of hunting regulations, one key respondent shared this story: a Northway hunter had been sent to jail for taking a moose out of season in the 1950s; his wife had demanded assistance, so “they didn’t gain by putting him in jail, you know, because they had to take care of the family while he was not there to do the trapping and stuff” (1509). This was prior to Alaska statehood, but it seems to have contributed to a negative impression of contemporary fish and wildlife management strategies.

Perceptions of an ongoing disconnect between local perspectives and contemporary management of the landscape were reflected in survey respondent comments (Table 5-7) as well as the ethnographic interviews. The establishment of the TNWR and the WRST in 1980 is still contentious. One of our key respondents said: “You know we lived, we lived off the land and I don’t think they had a right to control that because, you know, and then people go on welfare, and to me they just ruined people” (1505). For example, one survey respondent (HH 62) felt as if local involvement with the 2013 construction of a campground and recreational site at Seaton Roadhouse, about 18 miles southeast of Northway on the highway, had been insufficient, and lamented the conflicting use of those hunting grounds. In another example, a key respondent expressed grief for regulations that forbid killing an animal mortally wounded by traffic, so as to end its suffering—and also regretted the waste of meat (1509).

Regulations that hinder subsistence activities represent the most practical concerns. An elder key respondent described her feelings on the prohibition of using all-terrain vehicles (ATVs) in the TNWR, and of snowmachines until sufficient snow cover allows their use:

One thing I don’t like is that whole, how they call, those people owning, uh, Tetlin Refuge, I just, I try stay away from that side of the road as much I could because they say you can’t use 4-wheeler, you can’t use snowmachine unless there’s certain amount of snow, you know. You see moose over there you wonder how you get it out you know. Heck I could use my Indian way and just go down there and camp and kinda dry them a little bit and pack them out but you know...I think we should—this was ours first before any of it. It should remain that. I mean, I mention that lotta time, I wish we could get somebody real smart where they could get lawyers so we can fight them you know. (1507)

Another key respondent described his frustration even as he acknowledged the damage that ATVs can cause:

But if they had, if they had a regulation to where you can use 4-wheelers but you can’t drive in the same track that you come in there on, you use a different track, that way you’d never, you’d never do any damage. You know, if you come, left the road and went out and got your moose, when you go back to the road with your moose stay, go some other way, don’t go the way you come in. You’d never do any damage. You’d never have any environmental damage. I saw some places down there um, in the Caribou Creek area, sides of the mountains just tore, just wallowed down from thousands of 4-wheelers every, back and forth. They just, they can really, really wreck a place. (1509)

Another key respondent expressed appreciation for the subsistence priority and wildlife research, but lamented: “I mean, we used to get a lot of reports from the refuge and the state. Now we don’t get nothing” (1502).

Hunting pressure in Unit 12 and Unit 20 has increased.¹⁹ In particular, moose hunters in Unit 12 have increased approximately threefold over the last 40 years, and Northway hunters have felt that pressure. Some respondents said that most of the “outside” hunters either are not usually successful or go to different places; respondents distinguished between nonlocal hunters with no local connections and former residents who come home to hunt with family (1501, 1502, 1504, 1509). Most key respondents seemed more concerned over competition with predators such as bears and wolves. Competition with other hunters, including bears and wolves, is described in the Human Ecology section below.

Comments from survey respondents were more diverse than those from key respondents. Concerns related to the structure of the moose population, the timing of moose hunting opportunities, and other issues can be found in Table 5-7. For example, observations of fewer young moose, desires for an extension of the August resident hunt into September, and resentment over commercially guided hunts in the TNWR and WRST.

Contaminants

During the 1970s and 1980s, Northway residents became concerned about cancer, the leading cause of death for all Alaska Natives from 1989 through at least 2013 (Day and Lanier 2003; Espey et al. 2014; Holck et al. 2013). Local residents suspected that the old military waste sites had contaminated the foods and waters that local people depended upon (Godduhn 2011:10, 124). The concerns were spoken more loudly in the 1980s, and NVC and Northway Natives Inc. worked together to push for inclusion on the National Priorities List²⁰ for cleanup of the sites.

Perceived connections between health problems and the waste sites were vague, but highly disconcerting for local residents, who suspected historical and ongoing ecological exposure to contaminants. The federally-sponsored “Superfund” cleanup of military waste sites at the Northway Staging Field in the 1990s and other smaller remedial operations by other entities (e.g., ADOT, FAA, Alaska Communications System) were welcomed by local residents, but did not address concerns that waste sites had been uncontained for decades (Godduhn 2011).²¹ Sewage, along with household and industrial chemicals, had drained directly from airfield housing and other buildings into the Nabesna River until it was redirected into “Sewer Lake” sometime in the 1960s (1503). Northway Village lies less than 1 mile down the Nabesna River, which was a major drinking water source in winter (when it carries less sediment) until the 1970s, and it is still used by some households. The eastern end of the airfield drains into Moose Creek, where an asphalt plant, tar pits, and leaky barrels of DDT sat along the bank; the creek was a drinking water source for many families until the 1980s (Godduhn 2011:21). These waters also provided habitat for wild resources used as food: fish, muskrats, beavers, and waterfowl. Roadsides, where pesticides were regularly sprayed, had become popular for picking berries and Indian potatoes (locally called “roots”).

As in many Alaska communities, the idea that pollution contributed to cancer and other health problems has been part of local distress in Northway for decades (Cassady 2007; Godduhn 2011:5; Hunt and King 2006; Tanana Chiefs Conference, Inc. 2001). However, there have been relatively few studies on either the effects of the contamination on local wildlife populations or on how these local perceptions have changed subsistence practices (but see Godduhn 2011:36).

In 2012, the Northway Village Council, with EPA Indian General Assistance Program funding, initiated a backhaul project to remove solid waste remaining in and around the community. By August 2014, 1.57

19. ADF&G data retrieved from WinfoNet in 2015. WinfoNet is the ADF&G Division of Wildlife Conservation’s intranet website. The site provides a wide variety of tools to allow users to access, update, and download different kinds of data, including moose harvest data.

20. The U.S. Environmental Protection Agency (EPA) “Superfund” program defines the National Priorities List as “the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories.” U.S. EPA. 2016. “Superfund: National Priorities List.” Accessed September 27, 2016. <https://www.epa.gov/superfund/superfund-national-priorities-list-npl>

21. Alaska Department of Environmental Conservation, Spill Prevention and Response Contaminated Sites Program. 2011. “Northway Staging Field.” Accessed October 6, 2016. <http://dec.alaska.gov/spar/csp/sites/northway.htm>

million pounds of debris (light scrap metal, vehicle batteries, copper wire, electronics, and 647 abandoned vehicles) of various origins (including households, the military, and other sources) were removed from the community (Albert and Teasdale [n.d.]).

Most recently, in 2013, the U.S. Army Garrison Ft. Wainwright (USAG FWA) contracted with the U.S. Fish and Wildlife Service to test contaminant levels in key traditional foods. The ongoing effort to improve relationships and address community concerns will analyze samples of fish (humpback whitefish, burbot, and northern pike), edible roots, and muskrats. Even after opportunities to voice concerns at focus-group meetings related to the traditional food study earlier in the winter of 2014–2015, some respondents voiced those concerns about contaminants during the fieldwork for this study (February 2015). One key respondent said very simply “I’m scared to get any kind of food anymore because I’m always worried about that” (1507). Another key respondent described anxiety and adaptation following perceptions of contamination:

And like for instance, you know, I get my roots and stuff from around here but like I said, you know, with berries and all that, you know, I had to move farther out...[Y]ou know, there ain’t nobody going to take that away from me, you know. I keep saying that. It’s, it’s what I’ve got to have. But you know I try. To me it’s, the contaminants is all along this high-, this road. So we got to move farther out. (1502)

He went on to describe his concerns for youth:

There’s a few times that I hear the young people say, you know, they’re not going to eat anything from around here because they’re worried about the contaminants. And I don’t blame them, you know? They probably haven’t seen it but it’s what they heard...I think most of them know there’s contaminants and you know, it is a concern for them...And hearing these young people saying that you know, they’re not going to use this, they’re not going to use that...it is a problem. You know, my worries are what are they going to do? What are they going to eat here? (1502)

A few relevant comments from survey respondents were collected with a question about whether any areas are avoided for harvest activities because of concerns about health; responses to that question are compiled in Table 5-8, some of which reflect general assessments about wildlife populations rather than concerns about contamination. One survey respondent (HH 61) who has continued fishing over the decades despite safety concerns said that she had not seen any abnormal fish for several years. Nonetheless, she and other residents are eager for results from the USAG FWA study; the study is important enough to the community that it is acknowledged in the 2015 Northway Community Plan (Northway Village Council and Tanana Chiefs Conference, Inc. 2015:28).

Environmental Change

The State of Alaska recognizes that “[g]lobal warming is currently impacting Alaska and will continue to impact it in a number of ways. These impacts include melting polar ice, the retreat of glaciers, increasing storm intensity, wildfires, coastal flooding, droughts, crop failures, loss of habitat and threatened plant and animal species.”²² With variation across the state, ponds have been drying (Riordan et al. 2006), permafrost has been warming and thawing (Osterkamp 2007), and glacial rivers have been rising, particularly in the Yukon River drainage, including the Chisana and Nabesna rivers (Brabets and Walvoord 2009). This section describes landscape changes identified by Northway respondents in multiple studies (Andersen et al. 2013).²³ In particular, residents have noted that spring and fall have lengthened and winters have warmed and shortened, with rain sometimes lasting into October. In 2015, respondents described the new phenomena of occasional mid-winter rains. One of the key respondents spoke with sadness of these events, which result in ice covering everything:

22. State of Alaska. 2011. “Climate change in Alaska: what will climate change mean to Alaska?” Accessed September 27, 2016. <http://climatechange.alaska.gov/cc-ak.htm>

23. Friend unpublished; Koskey unpublished; this study.

Table 5-8.—Resources households avoided harvesting due to poor resource health, Northway, 2014.

Resource	Reason
Fish	At Moose Creek bridge stopped catching fish 7 years ago because they were deformed. Lot of parasites in fish, when weather is hot avoid harvest during that time.
Lingcod	Some lingcod had big sores on them.
Moose	Not many moose
Snowshoe hare	Letting the rabbits come back. Low cycle Low cycle Rabbits were low Rabbits due to low population cycle.
Porcupine	Trucks getting them.
Willow roots	Haven't seen many out there.
Not identified	Any resource near airport, all contaminated. Didn't ask (too difficult to convey) Doesn't fish at Moose Creek anymore, worried about whitefish being contaminated. Doesn't hunt or trap near contaminated area by airport. Doesn't trap near airport, contaminated. Not aware of Not last year They say there is contamination. No, never let it stop me. Used to fish in Fish Lake for whitefish and pike but don't anymore, because the river changed course into the lake and it's silty now. Impacted duck and muskrat hunting, too, and waterfowl nesting areas.

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

And then, just before that it rain and cover all the willows and stuff too. And you find rabbits, dead ones out there because some place where they just sit and try to eat, but they can't. They eat by smell, and they couldn't smell their food. (1504)

The effect of rain events on various mammals and other resources in the upper Tanana basin has not been studied. However, environmental change, especially as related to the warming climate, has become standard context of subsistence research in Alaska.

As described in the Methods chapter, Northway was included in a cultural consensus analysis of observations related to ecological change and subsistence fishing in 2010 and 2011 (Andersen et al. 2013). Broad agreement was found across study communities on several aspects of environmental change over recent decades, including changes to permafrost and hydrology that affect fish and the ability to go fishing, such as the drying of surface waters and less reliable ice conditions. Two propositions drew unanimous agreement among Northway respondents (“The permafrost is thawing more” and “Thawing permafrost affects the land, river banks, and lake edges”), and many others resulted in near consensus (Table 5-9). These problems are clearly apparent along the river (Plate 5-1). Many of the observations identified in the table were reiterated during this study, especially those related to hydrology and weather. Despite the challenges, wide agreement with the statement “I am not worried about environmental change” likely reflects a longstanding need to adapt as ecological conditions change.

The most frequently mentioned disruption to subsistence practices over decades in 2015 was the incursion of muddy glacial water into previously clearwater lakes and streams (Plate 5-2). The Nabesna and Chisana rivers are glacial in origin and “muddy” with fine glacial silt. The Black Hills, about 20 miles south of Northway, feed clear (nonglacial) water to the plethora of lakes and creeks on the flats between the lower Nabesna and Chisana rivers. However, beginning in the 1960s and 1970s, the Chisana River has flooded fish, muskrat, waterfowl, and moose habitat with silty water, turning the creeks into sloughs of the river in a decades-long process. Three respondents mentioned that when the Nabesna River is high, it holds the Chisana River back, causing it to flood (1501, 1503, Table 5-7). Key respondents described one of

Table 5-9.–Propositions of wide agreement among respondents, Northway, 2011.

Propositions of wide agreement among respondents in Northway	
The permafrost is thawing more.	100%
Thawing permafrost affects the land, river banks and lake edges.	100%
Changing water levels make it more difficult to access fishing spots.	97%
There is more erosion of the river banks.	94%
Water ways are more silty than in the past.	93%
Winters are warmer.	92%
High gas prices effect where we choose to fish.	92%
Silt in our waterways effects how we fish.	92%
I am not worried about environmental changes.	92%
During the summer, it tends to rain more.	90%
Lakes and sloughs are drying.	90%
Climate change is affecting the way we live.	85%
Water levels in this area are preventing fish from moving where they need to go.	85%
Big break-ups don't happen as much now; the ice just melts out.	82%
Overall, the ice is thinner on the lakes and rivers.	82%
Fall freeze-up tends to happen later.	82%
It is harder to predict the weather.	82%
The presence of beavers does not affect water quality.	18%

Source Andersen et al. 2013



Plate 5-1.–Degrading permafrost has caused many formerly solid banks to collapse, flooding sections of forest and killing the trees.



Plate 5-2.—The incursion of muddy glacial water into clearwater habitats has turned many grassy marshlands (left) into mudflats (right).

the earliest incursions as entering Mark Creek from its confluence with the Chisana during periods of especially high water. As repeated flooding filled that outlet with mud, the river broke into Mark Creek farther upstream, just below Mark Lake, and carved a new channel through to Charlieskin Creek (1506). As Charlieskin Lake filled with mud, the river carved another new channel and moved into Fish Creek. The quality of fish in these areas and the presence of waterfowl and muskrats have changed, as described by survey and key respondents in all Northway projects. For example:

There's two places where you go fishing over there. That's where we used to go fish with dip nets and one is called Charlieskin and the one on this side is called Fish Camp. And when the river started coming through, it just destroyed everything...So nobody gets to move to Fish Camp anymore because the water's everywhere!...It really change anyways, it's not the same, water all around, the trail is gone...Sandbars and water everywhere. Most of the trees are dying [too much water and too much silt] and most of the grounds are way lower. It used to be higher...Mark Creek, I mean where it go in from that river [Chisana]? That's Mark Creek coming into the river, but the river went into it and then comes out at Fish Camp—ruined everything. With air boat going up like that. The duck hunter, he go into Mark Creek over land and then the high water just run on the airboat trail. It's really old country there. Ducks, where they nest, it just ruin everything. There's no more grass, where they nest. Their food, it's all ruined. It's silt. Can't go anywhere on that [Charlieskin] lake without getting stuck. (0401CB)

This flooding, which has since expanded to other low barriers between clear and muddy waters, turns productive clearwater wetlands to mudflats, as shown in Plate 5-2.

People have different interpretations of the cause,²⁴ but all lament the loss of “Fish Camp,” the traditional fishery at *K'ehthtiign* (‘lake outlet;’ Tyone and Kari 1996). Most USGS maps label *K'ehthtiign* as “Kathakne,” and the site has been locally referred to as “Fish Camp” for decades. This was a major settlement at the outlet of Fish Lake. In 1929, McKennan’s informants called *K'ehthtiign* “the old village,” although he stipulated that compared to the very old village at Last Tetlin[g], the site seemed recently settled (1959:47). People from all 4 local bands and sometimes from farther away gathered at *K'ehthtiign* to fish. Although few families continued to relocate to remote winter camps, they still moved to Fish Camp during the summer months. “Like back in the ‘70s, you know, I still remember when I was a kid, you know, we had hundreds of

24. Some residents point to air boats that would drive over low banks between rivers and lakes; others blame the Alaska DOT, which attempted to redirect the new channel with a detonation in the 1990s that worsened the incursion, as acknowledged by the U.S. Army Corps of Engineers (U.S. Army Corps of Engineers 2009).

people over there fishing” (1502). A walking trail connected Fish Camp to more tents and cabins at nearby Charlieskin Creek, seen at the right of Plate 5-3. A key respondent in this study remembered some flooding before 1980, when the TNWR was established, and explained that it happened

...real slowly seems like. It just, I remember, man that Fish Camp over there used to have high land on both side of the creek...But pretty soon that mud start coming in, like Charlieskin they used to have that creek right there where they fish, that creek is no more. It's just mud. And Fish Camp, that creek is still coming through but you can't get fish from this side or that side but, because it's just all mud...Man, it was a beautiful place in that area, that Fish Lake—just clear water, nothing but grass around it where you can find duck's eggs and you look down in the water you could see big pike just at the bottom, you know, whitefish. No more. (1507)

The timing is difficult to clarify because the sedimentation started in different places at different times and has been happening over decades. Another key respondent summarized the timing and scope of the flooding (although there is some contradiction in his statement), and goes on to describe the role of the 2002 earthquake in lowering the water table, and spreading glacial water into lakes miles from the Chisana River:

This was like in the summer of 1964 was the first time that they had high water there. And I wasn't here yet. And then in, then it never got high no more for quite a few years. And then it, uh, probably in the '70s, '72 or '3, flooded again. And then the next time it got real bad was probably uh, probably '90. And then that [2002] earthquake, and then after that it was, it flooded every time. Since the earthquake, it's flooded every year.

[We used to go] all the way to Stuver Creek and all the way around [the Black Hills] and back down the other way. But going up through the lakes up to Stuver Creek, there was no problem with any flooding. No nothing. You know, I trapped it all the way up until you know, 1990. Uh, and all, you know, the whole year. And there was never any problems with any flooded areas. And now, since 1990, we go up through there beaver trapping and the whole country's washed out. And that's like miles from the river. All the way over in them lakes. And it never was like that until, until after the earthquake. So that earthquake is what really changed a lot of that. It, the earthquake done a lot of damage to the area. But there's other areas that is melting that wasn't affected by the earthquake. I saw lakes that com-, was completely drained. It's, it's no water at all in them. Beaver houses sitting there high and dry. And there was water there before. And it's just thawed out and drained. (1509)

Respondents in all recent Northway projects have made connections between sedimentation and decreased whitefish runs, changes in fishing patterns, and changes to the distribution of nonfish species (especially muskrats and ducks) in the area. The mud buries grasses and existing vegetation such that ducks and muskrats go elsewhere for their food. One key respondent said “Man it was a beautiful place in that area. That Fish Lake, just clear water—nothing but grass around it where you can find ducks' eggs and you look down in the water you could see *big* pike just at the bottom, you know, whitefish. No more” (1507). Later she said, “And all our trapping, you know that Fish Lake? We used to trap muskrat all over around there... No more. It's terrible. I mean when I picture how it used to been it just breaks my heart, you know?” (1507). Residents also spoke negatively about changes in the taste of fish. Although some fishermen noted in 2004 that the water farther up Mark Creek remained clear, the fish in those areas tasted different from what they were used to. “Farther up...it's still clear. Pike still come through, you can still get fish, but like my daughter say, some of those fish taste like mud” (0401CB).

Furthermore, the siltation has contributed to changes in fishing practices, primarily a shift from lake fishing to river fishing that may also have been related to land status and social changes of the 1970s (Case 1986:52–53).

Now days the water level is like a 20-foot change down in the lake now. It's either way up in the trees or there ain't any water in the creek...I believe the ground is, the



Plate 5-3.—K'ehthhiign was the primary fishery in the Northway area until the beginning of annual flooding. One structure can still be seen in the lower right of the photograph, taken in August 2011.

permafrost is melting and the ground is sinking. Of course as the ground sinks, the water is going to run to that area. So the river, that's why the river is there...because the ground and the permafrost is melting. (0403MR)

This comment, like many others from multiple Northway respondents in all projects, is related to the simple reality that as permafrost thaws, the volume of the soil decreases and the land sinks (Osterkamp et al. 2009). In 2015, a key respondent said it this way: “Lot of ground is disappearing. And it seems like the water's getting higher but it's not, it's, it's, we're losing ground—the permafrost thawing out” (1502). This respondent explained that any new structures are built in the hills along the highway instead of on the valley floor because of this problem.

The flooding of formerly clear waters with silt-rich river water was the landscape feature most often raised in respondent comments (Table 5-7). At least 2 of the recent key respondents expect the mud to continue to expand, essentially crossing Moose Creek, into lakes on the northwest side of Northway Road. One said:

Yeah, you can, you can see that, ah, Moose Creek, and here's the bridge. The road, you know, the water coming through [Fish Creek coming under the bridge and into Moose Creek] and it just kinda like that [circular motion]...and now you could see how much it's tearing out. And it's just right there. Pretty soon it's going to go that way. And then there it goes again, you know...Because it's coming out of the culverts [above and below the bridge]—like, like a fire hose, it just shooting out. (1502)

Another key respondent echoed this statement, but seemed to suggest that residents will be able to adapt to the whatever course the river takes:

It just broke through, and it just got bigger and bigger. I think it's going to break through at, ah, Fish Camp [Creek] bridge. See where it's eating up that bank on the other side? It gets bigger every year; pretty soon it's going to go. But I think it's changing all the time. It's always changed. (1503)

Human Ecology

Relationships between people, the land, and the animals of the Upper Tanana region have changed in many ways during recent history, with many environmental and sociopolitical influences beyond the scope of this report. Nonetheless, information collected in 2015 sheds additional light on complicated dynamics and local perceptions of changing conditions over decades, especially with respect to prior research into traditional ecological knowledge of nonsalmon fisheries and climate change. This section considers the future of human ecology in the upper Tanana valley, where variable resource availability continually reinforces the need for preparation, flexibility, and opportunism.

In 2015, access to large land mammals was a consistently voiced concern, particularly as related to competition with nonlocal hunters and predators. Other sociopolitical issues were also described as problematic. For example, caribou hunting opportunities are limited, and at least one key respondent seemed to identify the plethora of hunters coming from other areas, or perhaps their lack of success, as the reason Northway residents no longer generally go up the Taylor Highway (GMU 20E) in pursuit of caribou:

August 10 is when they open. I think it was car and pickup with trailer and motorhome with trailer with just bunch of 4-wheelers coming from all the way from, probably from Tok all the way from Fairbanks. Just nothing but pickup with trailers with 4-wheeler and motorhome with 4-wheeler. And I heard hardly, they hardly got anything. (1504)

Respondents tended to agree that the moose population was strong, although calf predation, especially by bears, is a concern. "I would say mainly bears. Bears would be taking [calves] more than wolves, yeah" (1501). He added, "Yeah, there's good moose count around Northway," and implied that people using the road to hunt deny themselves opportunity because "they have to be up in the woods to notice" (1501). Another key respondent said that there are no longer very many people who hunt bears or trap wolves, and he hopes for some kind of intensive management program:

I think the best deal would be that the refuge, the state, the Village of Northway, and the surrounding communities, you know, we get together and discuss this problem. 'Cause I'm, I'm pretty sure, you know, it's not only us having the problem... You know, reason people, reason why, you know, I don't trap and all that, is that I was taught from my father that, you know, if I'm not going to eat it, leave it alone. You know, I know there's money into it, but you know, I just, I just don't have the money to trap. I would like to see, you know, if possible that they would come down and do a predator control, you know, do something about trapping, you know, extend the trapping season or something... not only wolves but the grizzly bears. Because they—just another short story about last fall, me and my partner, we're out stalking a bull moose going after a bull moose and we ran into bears, 2 of them. And me and my partner there, we shot at them but you know, we didn't, didn't think we hit anything but, you know, after we shot, after we shot, we heard, we heard uh, something running beside of us and both of us, the bears and us, we were going after the same moose. Would've been bad. (1502)

Another key respondent doubted a need for intensive management: "The way they, the wolf, they just weed out the sick ones. And if the wolves don't do that, the whole herd would get sick and die off. That's how it was explained to me, by my dad" (1504).

Some respondents expressed concern that migratory bird populations have dwindled, others suspected the birds were avoiding the mud in formerly clear lakes that used to provide very local opportunities to hunt migratory birds:

Well, you know, ducks, they need good place for their food, for nesting. I think that plays a big part. And you know I think they just go on somewhere else, bypassing us...I think the waterfowl are bypassing us now. You know, taking a different route. You know, this was a big route. They come right through here. It was so, so black. You know, them flying over. We rarely see it now. Only thing I really see flying over is swan and crane. (1502)

Another key respondent, when asked if he had noticed changes to bird populations, said

Yeah, where's all the birds? I'm talking songbirds and stuff, they're just not like they used to be...Seems like there's way less. But the grouse, they go up and down. Year before last, nothing, and then, this last year, it was quite a bit, yeah. And...there's a lot more sharptail than, they came in, oh, 20, 30 years ago, I'd never seen a sharptail before that. Yeah, so now there, there's a lot of sharptails. And they're the best eating ones. (1503)

In reference to migratory waterfowl, the same respondent said “[I]t seems like there's a lot less [migratory waterfowl] compared to when I used to hunt a lot...all the lakes, [had a] lot more ducks” (1503). He said the change had started “20 years ago maybe,” including on clearwater lakes: “Yeah, I used to go across, just across the river with canoe and get all the ducks I'd want. Not anymore” (1503), although those lakes are still clear.

CONCLUSIONS

Although dramatic social and environmental changes have dramatically altered subsistence activities over the last century, culture among Upper Tanana Dineh and newer residents of Northway has evolved accordingly. Heritage and kinship are still celebrated in contemporary Northway through wild food, while new technologies and systems are readily adopted. The combined effects of contaminants concerns and the concurrent incursion of mud on local subsistence activities were severe and made the 1980s and 1990s a difficult period for residents.

Lingering concerns over contamination, increased uncertainty about environmental conditions, and limited power over public lands surrounding the community demonstrate the vulnerability of subsistence economies, perhaps especially those along Alaska's few connecting roads. Northway residents, like those of other subsistence-based communities, also struggle with high fuel costs for both transportation and heating homes, the requirements of more regular employment, the expense of rural infrastructures (e.g., the cost of freight), and many other day-to-day challenges. Despite these difficulties, the resilient population is adapting and experiencing a resurgence of confidence with respect to traditional foods and practices. Hunting and fishing remain central features of cultural, economic, and social aspects of community life in Northway, despite a great deal of pressure that can affect their subsistence practices. These findings highlight the need for continued improvement of communication and cooperation in the management of resources and the regulatory protection of opportunities for subsistence patterns to evolve as conditions change.

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**APPENDIX A–NORTHWAY VILLAGE COUNCIL
RESOLUTION**

NORTHWAY VILLAGE COUNCIL RESOLUTION 2015-21

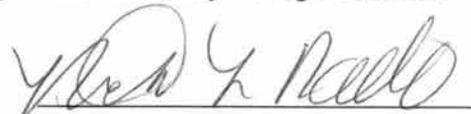
- WHEREAS, the Northway Village Council (hereinafter NVC) is a Federally Recognized Tribe; and
- WHEREAS, the NVC is the governing body of the people; and
- WHEREAS, the NVC wishes the Alaska Dept. of Fish and Game Division of Subsistence (hereinafter ADF&G) to do interviews and surveys within Northway, which will focus on updating existing subsistence harvest and use information for the community
- AND the NVC recognizes the importance of this work which will focus on the subsistence way of life in all its complexity including harvests, use, sharing, participation, history, and issues of concern
- AND the NVC recognizes the value of the information that will be used for a variety of resource planning and management efforts. Most importantly, this project will help fulfill the Division of Subsistence mandate to provide customary and traditional subsistence harvest and use data which will be available to the NVC, the community at large, agencies, or other interested parties
- AND the participation of individual households is voluntary and household information will be kept confidential.

NOW THEREFORE BE IT RESOLVED, that we authorize ADF&G to come to Northway to do interviews and surveys related to subsistence harvests and use of wild resources in 2014.

Passed this 14th day of October, 2014 at a meeting of the Northway Village Council.



President 10-14-14



Administrator

APPENDIX B—SURVEY INSTRUMENT

COMPREHENSIVE WILD FOOD HARVEST SURVEY

NORTHWAY, ALASKA

NORTHWAY
COMPREHENSIVE

From January 1, 2014 to December 31, 2014

OMB# 1024-0262

Expiration date: 04/30/2015

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 skip questions or 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: _____



PAPERWORK REDUCTION ACT STATEMENT:

A federal agency may not conduct or sponsor, and a person is not required to respond to, a collection of information, unless a currently valid OMB control number is displayed. 16 U.S.C.1a-7 authorizes collection of this information. This information will be used by the National Park Service, the Federal Subsistence Management Program, and the Alaska Department of Fish and Game, Division of Subsistence to understand more about the communities eligible to engage in subsistence in Wrangell-St. Elias National Park and Preserve. Response to this request is voluntary. Your name will not appear anywhere on the completed survey and your responses will be completely anonymous. The public reporting burden for completing individual interviews is estimated to take 60 minutes. Please direct comments regarding any aspect of this collection to:

Barbara Cellarius, Wrangell-St. Elias National Park and Preserve, Resources Division, Mile 106.8 Richardson Highway, P.O. Box 439, Copper Center, AK 99573, Barbara.Cellarius@nps.gov (email).

COOPERATING ORGANIZATIONS

**WRANGELL-ST. ELIAS NATIONAL
PARK AND PRESERVE**
P.O. BOX 439
COPPER CENTER, AK 99573
907-822-5234

NORTHWAY VILLAGE
P.O. BOX 516
NORTHWAY, AK 99764
907-778-2311

**ALASKA DEPARTMENT OF FISH
AND GAME**
1300 COLLEGE RD.
FAIRBANKS, AK 99701
907-328-6116

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?	In what YEAR was this person born?	Where were parents living when this person was born?	How many years has this person lived in Northway?	Highest level of education attained by this person?	
ID #	(circle)	(relation)	(circle)	(circle)	(year)	(AK city or state)	(number)	(number in years)
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

NORTHWAY: 256

HOUSEHOLD PARTICIPATION

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/ FURBEARERS		BIRDS AND EGGS		PLANTS / BERRIES / WOOD	
	FISH FOR	PROCESS	HUNT / TRAP	PROCESS	HUNT / TRAP	PROCESS	HUNT / GATHER	PROCESS	GATHER	PROCESS
	<i>(circle)</i>	<i>(circle)</i>	<i>(circle)</i>	<i>(circle)</i>	<i>(circle)</i>	<i>(circle)</i>	<i>(circle)</i>	<i>(circle)</i>	<i>(circle)</i>	<i>(circle)</i>
HEAD 1	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
2										
PERSON 03	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
4										
PERSON 05	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
6										
PERSON 07	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
8										
PERSON 09	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
10										
PERSON 11	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
12										
PERSON 13	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

NORTHWAY: 256

HOUSEHOLD PARTICIPATION

HOUSEHOLD ID

... Continued from previous page

Between January 1, 2014 and December 31, 2014

Did this person

PERSON ID# FROM PAGE 2	BUILD FISH WHEELS	BUILD FISH TRAPS	BUILD DOG SLEDS	SEW SKINS/CLOTH	COOK WILD FOODS	
	<i>(circle)</i>		<i>(circle)</i>		<i>(circle)</i>	
	Y	N	Y	N	Y	N
HEAD 1	Y	N	Y	N	Y	N
1						
HEAD 2	Y	N	Y	N	Y	N
2						
PERSON 03	Y	N	Y	N	Y	N
3						
PERSON 04	Y	N	Y	N	Y	N
4						
PERSON 05	Y	N	Y	N	Y	N
5						
PERSON 06	Y	N	Y	N	Y	N
6						
PERSON 07	Y	N	Y	N	Y	N
7						
PERSON 08	Y	N	Y	N	Y	N
8						
PERSON 09	Y	N	Y	N	Y	N
9						
PERSON 10	Y	N	Y	N	Y	N
10						
PERSON 11	Y	N	Y	N	Y	N
11						
PERSON 12	Y	N	Y	N	Y	N
12						
PERSON 13	Y	N	Y	N	Y	N
13						

PERMANENT HH MEMBERS: 01

NORTHWAY: 256

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 ...

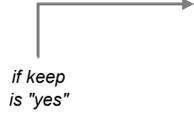
During the last year,¹

did you or members of your household...

A ... FISH commercially for _____?

B ... KEEP any _____ from your commercial catch for your own use² or to share?

C Was the _____ that you kept INCIDENTAL⁴ catch?



Please estimate how many fish ALL MEMBERS OF YOUR HOUSEHOLD removed from commercial harvests for personal use during the last year.

Include COMMERCIALY 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		B		C		How many were removed for your OWN USE? ⁵ <i>number</i>	How many were removed for your CREW? ⁵ <i>number</i>	How many were removed to give to OTHERS? <i>number</i>	Units ³ <i>specify</i>	<i>comments</i>
	COMM FISH?		KEEP?		INCI?						
CHINOOK (KING) SALMON	Y N		Y N		Y N					IND.	
113000001											
SOCKEYE (RED) SALMON	Y N		Y N		Y N					IND.	
115000001											
COHO (SILVER) SALMON	Y N		Y N		Y N					IND.	
112000001											
CHUM (DOG) SALMON	Y N		Y N		Y N					IND.	
111000001											
PINK (HUMPIES) SALMON	Y N		Y N		Y N					IND.	
114000001											
HALIBUT	Y N		Y N		Y N					LB.	
121800001											
HERRING	Y N		Y N		Y N					GAL.	
120200001											
HERRING ROE	Y N		Y N		Y N					GAL.	
120300001											
CRAB	Y N		Y N		Y N					IND.	
501099001											
	Y N		Y N		Y N						

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 commerial fishery.
 5 Double counting (captains' removals for crew members and crew members' removal for own uses) is fixed in analysis. Collect both.

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 ... use² _____?
- B ...receive _____ from another HH or community
- C ...give _____ to another HH or community?
- D ...try² 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.

DIP NET	GILL NET OR SEINE	FISH WHEEL	ROD & REEL ³	OTHER GEAR (specify type)	Units ⁴	
<i>(number harvested by each gear type)</i>					<i>amount / type</i>	<i>specify</i>

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	DIP NET	GILL NET OR SEINE	FISH WHEEL	ROD & REEL ³	OTHER GEAR (specify type)	Units ⁴
CHUM (DOG) SALMON	Y N	Y N	Y N	Y N	Y N					/	IND.
111090000											
SUMMER CHUM	Y N	Y N	Y N	Y N	Y N					/	IND.
111010000											
FALL CHUM	Y N	Y N	Y N	Y N	Y N					/	IND.
111020000											
COHO SALMON	Y N	Y N	Y N	Y N	Y N					/	IND.
112000000											
CHINOOK SALMON	Y N	Y N	Y N	Y N	Y N					/	IND.
113000000											
PINK SALMON	Y N	Y N	Y N	Y N	Y N					/	IND.
114000000											
SOCKEYE SALMON	Y N	Y N	Y N	Y N	Y N					/	IND.
115000000											
SPAWNOUTS	Y N	Y N	Y N	Y N	Y N					/	IND.
117000000											
UNKNOWN SALMON	Y N	Y N	Y N	Y N	Y N					/	IND.
119000000											
	Y N	Y N	Y N	Y N	Y N					/	
	Y N	Y N	Y N	Y N	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 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: SALMON

HOUSEHOLD ID

If this household did NOT USE or HARVEST salmon last year, go to the ASSESSMENT section below.
 Otherwise, continue with mapping, 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 noticeable? ... minor ? ... major? ... Severe?

(0) (1) (2) (3)

¹ "LAST YEAR" means between January 1, 2014 and December 31, 2014.

HARVESTS: OTHER FISH

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for other 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 other 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 ... use² _____?
- B ... receive _____ from another HH or community
- C ... give _____ to another HH or community?
- D ... try² to harvest _____?
- E ... actually harvest any _____?

if
harvest
is "yes"

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested with
INCLUDE other fish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest. DO NOT INCLUDE catch and release fish or retained commercial harvests.

Read names below in blanks above	A	B	C	D	E	FISH WHEEL	GILL NET OR SEINE	ICE FISHING	ROD & REEL ³	OTHER GEAR (specify type)	Units ⁴
	USE	REC	GIVE	TRY	HAR	(number harvested by each gear type)			amount / type	specify	
HUMPBACK WHITEFISH	Y N	Y N	Y N	Y N	Y N					/	IND.
126408000											
ROUND WHITEFISH	Y N	Y N	Y N	Y N	Y N					/	IND.
126412000											
LEAST CISCO	Y N	Y N	Y N	Y N	Y N					/	IND.
126406060											
BROAD WHITEFISH	Y N	Y N	Y N	Y N	Y N					/	IND.
126404000											
BERING CISCO	Y N	Y N	Y N	Y N	Y N					/	IND.
126406040											
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											
PIKE	Y N	Y N	Y N	Y N	Y N					/	IND.
125500000											
BURBOT (LINGCOD)	Y N	Y N	Y N	Y N	Y N					/	IND.
124800000											
ARCTIC GRAYLING	Y N	Y N	Y N	Y N	Y N					/	IND.
125200000											

...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 "ROD AND REEL" includes fish caught in open water with a hook 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: OTHER FISH

HOUSEHOLD ID

...continued from previous page

IF the answer is YES, continue on this page ...

During the last year,¹

did you or members of your household...

- A ... use² _____?
- B ... receive _____ from another HH or community
- C ... give _____ to another HH or community?
- D ... try² to harvest _____?
- E ... actually harvest any _____?

if
harvest
is "yes"

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested with

INCLUDE other fish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest. 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
	(number harvested by each gear type)					amount / type		specify			
DOLLY VARDEN	Y N	Y N	Y N	Y N	Y N					/	IND.
125006000											
LAKE TROUT	Y N	Y N	Y N	Y N	Y N					/	IND.
125010000											
UNKNOWN TROUT	Y N	Y N	Y N	Y N	Y N					/	IND.
126299000											
LONGNOSE SUCKER	Y N	Y N	Y N	Y N	Y N					/	IND.
126000000											
	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					/	
	Y N	Y N	Y N	Y N	Y N					/	

Did anyone in the household harvest or receive any other nonsalmon fish, such as halibut, hooligan, or char?..... 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 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, 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? _____

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 noticeable? (0) ... minor ? (1) ... major? (2) ... Severe? (3)

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 ... use² _____?
- B ...receive _____ from another HH or community
- C ...give _____ to another HH or community?
- D ...try² 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	B	C	D	E	AMOUNT <i>(amt)</i>	Units ⁴ <i>specify</i>	COMMENTS <i>(text)</i>
	USE	REC	GIVE	TRY	HAR			
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			

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 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: 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 ... use² _____?
- B ...receive _____ from another HH or community
- C ...give _____ to another HH or community?
- D ...try² 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	B	C	D	E
	USE	REC	GIVE	TRY	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)	

MOOSE	Y	N	Y	N	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	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	Y	N	Y	N		IND.
210600000																
BROWN BEAR	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
210800000																
GOAT	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
211600000																
DALL SHEEP	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
212200000																
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.

During the last year, did your household use any other kind of 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.

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 ... use² _____?
- B ...receive _____ from another HH or community
- C ...give _____ to another HH or community?
- D ...try² 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	B	C	D	E	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	NUMBER USED FOR FOOD OR FOR FOOD & FUR	UNITS ³
	USE	REC	GIVE	TRY	HAR	(specify amount harvested per month)													(amount)	specify
BEAVER	Y N	Y N	Y N	Y N	Y N															IND.
220200000 MUSKRAT	Y N	Y N	Y N	Y N	Y N															IND.
222400000 PORCUPINE	Y N	Y N	Y N	Y N	Y N															IND.
222600000 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 COYOTE	Y N	Y N	Y N	Y N	Y N															IND.
220400000 FOX (SPECIFY)	Y N	Y N	Y N	Y N	Y N															IND.
220800000 SNOWSHOE HARE	Y N	Y N	Y N	Y N	Y N															IND.
221004000 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																				

...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.

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 ... use² _____?
- B ...receive _____ from another HH or community
- C ...give _____ to another HH or community?
- D ...try² 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	B	C	D	E
	USE	REC	GIVE	TRY	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

LAND OTTER	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
221200000														
MARMOT	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
221800000														
MINK	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
222200000														
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		IND.

During the last year, did your household use any other kind of 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.

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, and assessment sections...

MAPPING

Refer to data collection maps and mapping instructions to map small land mammals...

ASSESSMENTS: SMALL LAND MAMMALS/FURBEARERS

22000000

To conclude our small land mammals/furbearers section, I am going to ask a few general questions about small land mammals/furbearers.

During the last year,¹

... did your household use LESS, SAME, or MORE small land mammals/furbearers 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 mammals/furbearers?..... Y N

If NO...

What KIND of small land mammals/furbearers did you need? _____

How would you describe the impact to your household of not getting enough small land mammals/furbearers last year? ... not noticable? ... minor ? ... major? ... Severe?

(0) (1) (2) (3)

¹ "LAST YEAR" means between January 1, 2014 and December 31, 2014.

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 ... use² _____?
- B ...receive _____ from another HH or community
- C ...give _____ to another HH or community?
- D ...try² 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	B	C	D	E	SEX	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS ³	
	USE	REC	GIVE	TRY	HAR	M/F	(specify amount harvested per month)													(specify)	
HARBOR SEAL	Y N	Y N	Y N	Y N	Y N																IND.
300806000																					
STELLER SEA LION	Y N	Y N	Y N	Y N	Y N																IND.
301200000																					
SEA OTTER	Y N	Y N	Y N	Y N	Y N																IND.
301000000																					
FUR SEAL	Y N	Y N	Y N	Y N	Y N																IND.
300804000																					
WHALE (SPECIFY)	Y N	Y N	Y N	Y N	Y N																IND.
301600000																					
UNKNOWN SEAL (OR SEAL OIL)	Y N	Y N	Y N	Y N	Y N																IND.
300899000																					
	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.

HARVESTS: MIGRATORY WATERFOWL

HOUSEHOLD ID

...continued from previous page

**During the last year,¹
did you or members of your household...**

- A** ... use² _____?
- B** ...receive _____ from another HH or community
- C** ...give _____ to another HH or community?
- D** ...try² 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	B	C	D	E	January	February	July	October	Season of harvest unknown	UNITS ³
	USE	REC	GIVE	TRY	HAR	April	May	August	November		
						WINTER	SPRING	SUMMER	FALL	(number)	(specify)
						(number killed in each season)					
NORTHERN SHOVELER	Y N	Y N	Y N	Y N	Y N						IND.
410230000											
BLACK SCOTER (BLACK DUCKS)	Y N	Y N	Y N	Y N	Y N						IND.
410228020											
WHITE-WINGED SCOTER	Y N	Y N	Y N	Y N	Y N						IND.
410228060											
UNKNOWN SCOTER	Y N	Y N	Y N	Y N	Y N						IND.
410228990											
BUFFLEHEAD	Y N	Y N	Y N	Y N	Y N						IND.
410202000											
GOLDENEYE	Y N	Y N	Y N	Y N	Y N						IND.
410210000											
SCAUP	Y N	Y N	Y N	Y N	Y N						IND.
410226990											
LONG-TAILED DUCK (OLDSQUAW)	Y N	Y N	Y N	Y N	Y N						IND.
410218000											
	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 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 ... use² _____?
- B ...receive _____ from another HH or community
- C ...give _____ to another HH or community?
- D ...try² 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	B	C	D	E					Season of harvest unknown	UNITS ³
	USE	REC	GIVE	TRY	HAR	January February March November December	April May June	July August	September October	FALL	(number)
						(number killed in each season)					

PTARMIGAN	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	IND.
421804000													
SPRUCE GROUSE	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	IND.
421802020													
RUFFED GROUSE	Y	N	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	Y	N	IND.
421802040													
	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	Y	N	Y	N	Y	N	Y	N	

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 ... use² _____?
- B ...receive _____ from another HH or community
- C ...give _____ to another HH or community?
- D ...try² 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	B	C	D	E	AMOUNT <i>(amt)</i>	Units ⁴ <i>specify</i>	COMMENTS <i>(text)</i>
	USE	REC	GIVE	TRY	HAR			
GULL EGGS <i>(SPECIFY)</i>	Y N	Y N	Y N	Y N	Y N		IND.	
431212000								
GEESE EGGS <i>(SPECIFY)</i>	Y N	Y N	Y N	Y N	Y N		IND.	
430400000								
DUCK EGGS <i>(SPECIFY)</i>	Y N	Y N	Y N	Y N	Y N		IND.	
430200000								
	Y N	Y N	Y N	Y N	Y N		IND.	
	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			
	Y N	Y N	Y N	Y N	Y N			

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.
 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: 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, 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 noticeable? ... minor? ... major? ... Severe?

(0) (1) (2) (3)

¹ "LAST YEAR" means between January 1, 2014 and December 31, 2014.

HARVESTS: PLANTS AND BERRIES (INCLUDING WOOD)

HOUSEHOLD ID

1. Do you or members of your household USUALLY harvest plants and berries (including wood)?..... 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 berries (including wood)?..... 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 ... use² _____?
- B ...receive _____ from another HH or community
- C ...give _____ to another HH or community?
- D ...try² to harvest _____?
- E ...actually harvest any _____?

if harvest is "yes"

Please estimate how many plants and berries (including wood) ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.
 INCLUDE plants and berries (including wood) 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	B	C	D	E
	USE	REC	GIVE	TRY	HAR

AMOUNT	Units ⁴	COMMENTS
(amt)	specify	(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							
RASPBERRY	Y N	Y N	Y N	Y N	Y N	GAL.	
601020000							
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 (SALMONBERRY)	Y N	Y N	Y N	Y N	Y N	GAL.	
601016000							
LABRADOR TEA	Y N	Y N	Y N	Y N	Y N	GAL.	
602018000							
ROOTS (FOR FOOD)	Y N	Y N	Y N	Y N	Y N	GAL.	
602009000							
ROSE HIPS NCHOO	Y N	Y N	Y N	Y N	Y N	GAL.	
602036000							
MUSHROOMS CH'INAIY'	Y N	Y N	Y N	Y N	Y N	GAL.	
602040000							

...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.
 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: PLANTS AND BERRIES (INCLUDING WOOD) HOUSEHOLD ID

...continued from previous page

During the last year,¹
did you or members of your household...

- A ... use² _____?
- B ... receive _____ from another HH or community
- C ... give _____ to another HH or community?
- D ... try² to harvest _____?
- E ... actually harvest any _____?

if harve
is "yes"

Please estimate how many plants and berries (including wood) ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many were harvested with
INCLUDE plants and berries (including wood) that members of this household gave away, are 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	B	C	D	E	AMOUNT <i>(amt)</i>	Units ⁴ <i>specify</i>	COMMENTS <i>(text)</i>
	USE	REC	GIVE	TRY	HAR			
MUSKRAT CANDY (MOUSEFOODS)	Y N	Y N	Y N	Y N	Y N		GAL.	
602060000								
SPRUCE TIPS	Y N	Y N	Y N	Y N	Y N		GAL.	
602030000								
WILD RHUBARB	Y N	Y N	Y N	Y N	Y N		GAL.	
602006000								
CHAGA	Y N	Y N	Y N	Y N	Y N		GAL.	
602046040								
PUNK	Y N	Y N	Y N	Y N	Y N		GAL.	
602046010								
FIREWOOD	Y N	Y N	Y N	Y N	Y N		CORD	
604000000								
WOOD (OTHER) (SPECIFY USE)	Y N	Y N	Y N	Y N	Y N		CORD	
604098000								
	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 PLANTS AND BERRIES (INCLUDING WOOD)?..... 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.
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, and assessment sections...

MAPPING

Refer to data collection maps and mapping instructions to map plants, berries, and wood...

ASSESSMENTS: PLANTS AND BERRIES (INCLUDING WOOD)

60000000

To conclude our plants and berries (including wood) section, I am going to ask a few general questions about plants and berries (including wood).

During the last year,¹

... did your household use LESS, SAME, or MORE plants and berries (including wood) 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 (including wood)?..... Y N

If NO...

What KIND of plants and berries (including wood) did you need? _____

How would you describe the impact to your household of not getting enough plants and berries (including wood) last year? ... not noticeable? ... minor? ... major? ... Severe?
(0) (1) (2) (3)

¹ "LAST YEAR" means between January 1, 2014 and December 31, 2014.

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 noticeable? ... minor ? ... major? ... Severe?
 (0) (1) (2) (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	Less than once per week	1 - 3 times per week	4 - 6 times per week	Once per day	2 times per day	3 Times per day	<input type="checkbox"/>
	(0)	(1)	(2)	(3)	(4)	(5)	(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	<input type="text"/>				

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 FOODS²
(1 TO 5) | <input type="text"/> |
| OTHER FOODS²
(6 TO 10) | <input type="text"/> |

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).

ADDITIONAL ASSESSMENTS

HOUSEHOLD ID

Resource Health

Between January 1, 2014 and December 31, 2014... were there any resources that your household avoided harvesting due to poor resource health?

If YES, which resources did you avoid and why?

Transportation and Motorized Equipment

Between January 1, 2014 and December 31, 2014... did members of your household use the following when harvesting or attempting to harvest wild foods?

	<i>circle</i>		
boat	Y	N	<input type="text"/>
snowmachine	Y	N	<input type="text"/>
4-wheeler/ORV	Y	N	<input type="text"/>
airplane	Y	N	<input type="text"/>
dogsled	Y	N	<input type="text"/>

Does your household own, borrow, lease, or charter this equipment?

	Own	Borrow	Lease	Charter	
<i>Circle only responses that the respondent answered yes to above.</i>					
boat	Y N	Y N	Y N	Y N	<input type="text"/>
snowmachine	Y N	Y N	Y N	Y N	<input type="text"/>
4-wheeler/ORV	Y N	Y N	Y N	Y N	<input type="text"/>
airplane	Y N	Y N	Y N	Y N	<input type="text"/>
dogsled	Y N	Y N	Y N	Y N	<input type="text"/>

Comments:

Between January 1, 2014 and December 31, 2014... did members of your household use the following or motorized equipment when harvesting or attempting to harvest wild foods?

	<i>circle</i>		
chainsaw	Y	N	<input type="text"/>
ice auger	Y	N	<input type="text"/>
winch	Y	N	<input type="text"/>
generator	Y	N	<input type="text"/>
Other (specify) _____	Y	N	<input type="text"/>

Heating

What proportion of your household's heating comes from firewood?

<i>circle</i>		
0%	<input type="text"/>	<input type="text"/>
1-25%	<input type="text"/>	<input type="text"/>
26-50%	<input type="text"/>	<input type="text"/>
51-75%	<input type="text"/>	<input type="text"/>
76-99%	<input type="text"/>	<input type="text"/>
100%	<input type="text"/>	<input type="text"/>

In the past 5 years has your harvest area for firewood changed?

<i>circle</i>		
Y	N	<input type="text"/>

If yes, please explain why?

How much do you spend annually to heat your home? \$

Handicrafts

Between January 1, 2014 and December 31, 2014... did members of your household participate in the making of handicrafts using the following materials?

	<i>circle</i>		
birchbark	Y	N	<input type="text"/>
horns	Y	N	<input type="text"/>
antlers	Y	N	<input type="text"/>
other natural material (specify) _____	Y	N	<input type="text"/>

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..... } 1 2 3 HH1 C
 STATEMENT 2. We had enough food, but not always the KIND of food we wanted to eat..... }
 STATEMENT 3. Sometimes, or often, we did **NOT HAVE ENOUGH** food to eat..... } 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.

4 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

5 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

6 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...

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

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 ?

In the last 12 months, were adults in the HH ever HUNGRY BUT DID NOT EAT because there was not enough food?..... N Y ?

In the last 12 months, did adults in the HH LOSE WEIGHT because there was not enough food?..... N Y ?

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					In the past year how much did hee or she earn in this job? ³													
Person code from page 2 (ID #)	What kind of work did he or she do in this job? (job title ¹)	For whom did he or she work in this job? (employer)	In the past year, what months did he or she work in this job? (circle each month worked)	FULL TIME	PART TIME	SHIFT - FULL TIME	ON-CALL, VARIES	SHIFT - PART TIME	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 COMMERCIALY 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

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...

DIVIDENDS		Did anyone in your household receive income from		TOTAL amount all members of your household received from		Alaska PFD IN 2014	Regional corporations	Dividend
		in 2014		in 2014				
		(circle one)		(dollars)				
	ALASKA PERMANENT FUND DIVIDEND	Y	N	\$	/ YR	1 PFD = \$1,884	Doyon	\$4.95
	32					2 PFDs = \$3,768	AHTNA	\$4.43
	NATIVE CORPORATION DIVIDENDS	Y	N	\$	/ YR	3 PFDs = \$5,652	CIRI	\$8.42
	13					4 PFDs = \$7,536		
						5 PFDs = \$9,420	Village Corporation(s) Dividend	
						6 PFDs = \$11,304		
						7 PFDs = \$13,188		
						8 PFDs = \$15,072		
						9 PFDs = \$16,956		
						10 PFDs = \$18,840		
						11 PFDs = \$20,724		

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?	Total amount?			Received?	Total amount?				
			(circle one)	(dollars)			(circle one)	(dollars)		
EMPLOYMENT RELATED	UNEMPLOYMENT	Y	N	\$	/ YR	TANF (say "taniif", used to be AFDC)	Y	N	\$	/ YR
	12					2				
	WORKERS' COMP	Y	N	\$	/ YR	CHILD SUPPORT	Y	N	\$	/ YR
	8					15				
	SOCIAL SECURITY	Y	N	\$	/ YR	FOSTER CARE	Y	N	\$	/ YR
	7					41				
	PENSION & RETIREMENT	Y	N	\$	/ YR	FUEL VOUCHERS	Y	N	\$	/ YR
	5					49				
DISABILITY	Y	N	\$	/ YR	MEETING HONORARIA (not per diem*)	Y	N	\$	/ YR	
31					50					
VETERANS ASSISTANCE	Y	N	\$	/ YR	OTHER (describe)	Y	N	\$	/ YR	
35					OTHER (describe)	Y	N	\$	/ YR	
ENTITLEMENTS	FOOD STAMPS (QUEST CARD)	Y	N	\$	/ YR					
	11									
	ADULT PUBLIC ASSISTANCE	Y	N	\$	/ YR					
3										
SUPPLEMENTAL SECURITY INCOME (SSI)	Y	N	\$	/ YR						
10										
STATE BENEFITS	ENERGY ASSISTANCE	Y	N	\$	/ YR					
	9									
ALASKA SENIOR BENEFITS (LONGEVITY)	Y	N	\$	/ YR						
6										

* 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

**APPENDIX C–ETHNOGRAPHIC INTERVIEW
PROTOCOL**

KEY INFORMANT INTERVIEW

NPS NORTHWAY HARVEST UPDATE 2014

Date:

Name of interviewer:

Name of respondent:

If households has been surveyed and given informed consent to the interview, we can verify but shouldn't have to ask:

Age of respondent:

How many members in your household?

How long have you lived in this community?

Would you like to have your name included in the report? Yes No

Notes:

MAJOR HISTORICAL EVENTS TO IDENTIFY TIME FRAME

- 1941-'42: Construction of Airfield / ALCAN / relocation of village
- 1941-'67: BIA school at airfield
- 1947-'76: DOE/territorial school in village
- 1971: ANCSA
- 1975: Haines Fairbanks Pipeline deactivated
- 1980: ANILCA (Tetlin Refuge and Wrangell St. Elias Park established)
- 1992-5: Major remediation
- 2002 (November 3rd): Magnitude 7.9 Denali earthquake

PROJECT OVERVIEW

We (ADF&G, NPS, NVC) are conducting comprehensive subsistence surveys about last year, 2014. We are asking about the use of subsistence resources for the entire year of 2014. In the survey, we asked specific questions about your harvest of fish, game, and plants, and your general areas of harvest for the 2014 year only – but that is just a snapshot of life in Northway.

Now we are asking for your help to understand resource uses in your area and how last year compares to other years and other decades. Your experience of subsistence activities, recently and over your lifetime, will make the information that we are collecting about 2014 more meaningful. We also mentioned a fish study that will be coming up this summer. Contamination is not necessarily a focus of this interview, but please describe related concerns if they come up.

INTERVIEW TOPICS (USE CONVERSATIONALLY, AS A GUIDELINE)

Maybe you would start by telling us a little about yourself and where you grew up...

Would you talk a little about how you learned your subsistence skills? [Where, when, how, from who, did you learn?]

Fish (Non-salmon/Salmon) – What kinds of fish are important to your household and community? How has fishing changed over your lifetime?

- Has harvest timing changed?
- What kind of gear/transportation did you use in the past? What about now?
- Have there been changes to how different fish are processed and stored? [When and why?]
- Are there certain organs–different parts–that you like to eat? [Is that popular? Do kids eat?]
- We know about the flooding and all the mud in fish camp, but I've never been really clear on the timing – I guess because it happened over many years. Would you talk about when the river started getting into Charlieskin and Fish Creeks and how that impacted fishing?
- What other kinds of changes have affected fishing in Northway during your life?
- Would you talk about salmon? - How people get it, and how that's changed over the years.

[Do people still exchange whitefish for salmon? Do people go get more of their own than they used to? If yes, talk about timing of and reasons for shifts.]

- Do people go get or receive much fish or marine resources from other places, such as halibut or seal oil? Has this changed over the years?

Large Land Mammals – What large animals are most important to your household and community? Has what you harvest and how you harvest changed over your lifetime?

- Has harvest timing changed?
- Are the places you go to find game different now than in the past? [ask about changes to caribou patterns,
- What kind of gear/transportation did you use in the past? What about now?
- Have there been changes to how meat and fat are processed and stored? [When and why?]
- Are there certain organs–different parts–that you like to eat?
- Are hides tanned locally? Are they used for slippers and gloves or other handicrafts?

Small Land Mammals/Furbearers – What small game and furbearers are most important to your household and community? Has what you harvest and how you harvest changed over your lifetime?

- What small game do you harvest to eat and which game do you harvest for fur?
- Has harvest timing changed?
- Are the places you go to find game different now than in the past?
- What kind of gear/transportation did you use in the past? What about now?
- Have there been changes to how furs are processed or marketed? [When and why?]

Birds and Eggs – What kinds of birds are most important to your household and community?

- How has bird hunting changed since you were young?
- Are eggs important to your household or community?
- Has harvest timing changed?
- Are the places you go to find birds and eggs different now than in the past?
- What kind of gear/transportation did you use in the past? What about now?

- What kinds of changes have there been to processing and storing birds? [When and why?]

Plants/Berries/Wood – What plants, berries, and wood are most important to your household and community? Has what you harvest and how you harvest changed over your lifetime?

- Has harvest timing changed?
- Are the places you go to find plants, berries, or wood different now than in the past?
- What kind of gear/transportation did you use in the past? What about now?

Natural Products / handicrafts

- Do you use any natural materials for handicrafts or other products, like soap or medicine?
- Do you mostly make handicrafts for gifts (at Potlatch?) or for sale? [Ask about advantages or disadvantages of natural vs store materials in terms of use, social value, sale value, etc.]

Sharing and exchange

- What kinds of resources are shared most often in your community?
- What kinds of resources do people exchange? Has this changed over the course of your life?
- Do you share your harvest with other communities? Are there resources that you receive from other communities, resources that are difficult to get here? Has sharing between villages changed over the course of your life? How do you think the road affected barter and trade between communities?

Other

- Are there resources that you feel are unique to your community, or hold a special value to your community? Maybe resources other communities don't rely on as much as Northway?
- What pattern of resource use do you feel most defines your community?
- Do you remember hunting and fishing without regulations? When and how did regulations change hunting and fishing?
- What other things have changed subsistence in Northway over your lifetime? [When was that? How did things change?]
- Do you have concerns about subsistence in the future?
- Is there anything else you would like to share?

APPENDIX D—ADDITIONAL TABLES

Table D-1.—Conversion factors, Northway, 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	7.62
Fall chum salmon	individual	7.62
Unknown chum salmon	individual	7.62
Unknown chum salmon [CF retention]	individual	7.62
Coho salmon	individual	8.08
Coho salmon [CF retention]	individual	8.08
Chinook salmon	individual	17.69
Chinook salmon [CF retention]	individual	17.69
Pink salmon	individual	3.37
Pink salmon [CF retention]	individual	3.37
Sockeye salmon	individual	5.93
Sockeye salmon [CF retention]	individual	5.93
Spawnouts	individual	5.93
Unknown salmon	individual	6.46
Pacific herring [CF retention]	gallons	3.95
Pacific herring roe [CF retention]	gallons	3.95
Flounder	individual	3.00
Pacific halibut	individual	21.00
Pacific halibut	pounds	1.00
Pacific halibut [CF retention]	pounds	1.00
Burbot	individual	2.40
Dolly Varden	individual	0.90
Lake trout	individual	2.00
Arctic grayling	individual	1.00
Northern pike (small, pickle)	individual	1.00
Northern pike (small, pickle)	pounds	1.00
Northern pike	individual	4.50
Northern pike	pounds	1.00
Sheefish	individual	6.00
Longnose sucker	individual	2.00
Rainbow trout	individual	1.40
Unknown trout	individual	2.10
Broad whitefish	individual	3.20
Bering cisco	individual	1.40
Least cisco	individual	1.00
Humpback whitefish	individual	3.00
Round whitefish	individual	0.50
Unknown whitefishes	individual	2.94
Black bear	individual	100.00
Brown bear	individual	141.00
Caribou	individual	130.00
Mountain goat	individual	102.00
Moose	individual	660.00

-continued-

Table D-1.–Page 2 of 3.

Resource name	Reported units	Conversion factor
Dall sheep	individual	65.00
Beaver	individual	15.00
Coyote	individual	0.00
Foxes	individual	0.00
Snowshoe hare	individual	2.00
River (land) otter	individual	3.00
Lynx	individual	4.00
Marmot	individual	5.00
Marten	individual	0.50
Mink	individual	2.00
Muskrat	individual	0.75
Porcupine	individual	5.00
Squirrel	individual	0.50
Weasels	individual	0.00
Gray wolf	individual	0.00
Wolverine	individual	0.00
Fur seal	individual	0.00
Harbor seal	individual	56.00
Unknown seals	individual	56.00
Sea otter	individual	0.00
Steller sea lion	individual	200.00
Unknown whale	individual	0.00
Bufflehead	individual	0.40
Goldeneyes	individual	1.54
Mallard	individual	1.95
Long-tailed duck	individual	1.50
Northern pintail	individual	1.50
Unknown scaups	individual	0.90
Black scoter	individual	0.90
Surf scoter	individual	0.90
White-winged scoter	individual	2.29
Unknown scoters	individual	1.54
Northern shoveler	individual	1.09
Unknown teals	individual	0.52
American wigeon	individual	1.31
Canada goose	individual	4.00
Snow goose	individual	3.99
White-fronted goose	individual	4.24
Unknown swans	individual	8.00
Sandhill crane	individual	8.40
Unknown loons	individual	5.44
Spruce grouse	individual	0.70
Sharp-tailed grouse	individual	0.70
Ruffed grouse	individual	0.70
Ptarmigans	individual	0.70
Duck eggs	individual	0.15
Goose eggs	individual	0.30
Gull eggs	individual	0.30
Butter clams	gallons	3.00

-continued-

Table D-1.–Page 3 of 3.

Resource name	Reported units	Conversion factor
Freshwater clams	gallons	3.00
Razor clams	gallons	4.00
Unknown clams	gallons	4.00
Dungeness crab	individual	1.32
King crabs	individual	2.10
Tanner crabs	individual	1.60
Unknown crabs [CF retention]	individual	1.60
Blueberry	gallons	4.00
Blueberry	quarts	1.00
Lowbush cranberry	gallons	4.00
Lowbush cranberry	quarts	1.00
Highbush cranberry	gallons	4.00
Crowberry	gallons	4.00
Crowberry	cups	0.25
Cloudberry	gallons	4.00
Cloudberry	quarts	1.00
Cloudberry	pints	0.50
Raspberry	gallons	4.00
Raspberry	pints	0.50
Raspberry	cups	0.25
Soapberry	gallons	4.00
Wild rhubarb	gallons	1.00
Indian potato (roots)	pounds	1.00
Indian potato (roots)	gallons	4.00
Hudson's Bay (Labrador) tea	gallons	1.00
Spruce tips	gallons	1.00
Wild rose hips	gallons	4.00
Unknown mushrooms	gallons	1.00
Unknown mushrooms	quarts	0.25
Punk	gallons	0.00
Chaga	gallons	1.00
Muskrat candy	gallons	1.00
Wood	ords	0.00
Bark	gallons	0.00
Other wood	individual	0.00
Other wood	ords	0.00

Source ADF&G Division of Subsistence, 2015.

Table D-2.—Population estimates by individual and combined CDPs, Northway, 2014.

	Census			5-year American Community Survey (2009–2013)						This study (2014)	
	Northway CDP	Northway Junction	Northway Village	Northway CDP		Northway Junction CDP		Northway Village CDP		Estimate	Range ^b
				Estimate	Range ^a	Estimate	Range ^a	Estimate	Range ^a	Estimate	Range ^b
Total population											
Households	27	20	30	31.0	14–48	16.0	9–23	27.0	16–38	73.0	
Population	71	54	98	116.0	56–176	49.0	29–69	70.0	30–110	193.8	177–210
Alaska Native											
Population	60	42	96	76.0	26–126	42.0	30–110	70.0	30–110	169.9	153–186
Percentage	84.5%	77.8%	98.0%	65.5%	48.1%–233.3%	85.7%	61.2%–224.5%	100.0%	61.2%–224.5%	87.7%	79.2%–96.2%

Sources U.S. Census Bureau (2011) for 2010 estimate; U.S. Census Bureau for American Community Survey (ACS) 2012 estimate (5-year average); and ADF&G Division of Subsistence household surveys, 2015, for 2014 estimate.

Note Division of Subsistence household survey eligibility 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 D-3.—Individual participation in harvesting and processing activities, Northway, 2014.

Total number of people	194
Fish	
Fish	
Number	107.5
Percentage	55.5%
Process	
Number	98.2
Percentage	50.7%
Large land mammals	
Hunt	
Number	107.5
Percentage	55.5%
Process	
Number	88.9
Percentage	45.9%
Small land mammals	
Hunt or trap	
Number	66.4
Percentage	34.2%
Process	
Number	61.1
Percentage	31.5%
Birds and eggs	
Hunt/gather	
Number	69.0
Percentage	35.6%
Process	
Number	69.0
Percentage	35.6%
Vegetation	
Gather	
Number	146.0
Percentage	75.3%
Process	
Number	135.4
Percentage	69.9%
Any resource	
Attempt harvest	
Number	163.3
Percentage	84.2%
Process	
Number	157.9
Percentage	81.5%

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

**APPENDIX E–TANANA RIVER VALLEY
SUBSISTENCE HARVEST BASELINE PROJECT
SURVEY FORM, STUDY YEAR 2004**

TANANA RIVER BASELINE

How many people live in this household? _____ Alaska Native? **YES** **NO**

COMMUNITY _____ ()
 HOUSEHOLD ID # _____
 Date _____ Interviewer's Initials _____

Subsistence Non-Salmon Fishing

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE FISH OTHER THAN SALMON BETWEEN APRIL 2004 AND MARCH 2005? **YES** **NO**

IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (units should indicate the number of individual fish unless noted otherwise.)

SPECIES	USED? Y/N	TRIED TO HARVEST Y/N	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Unknown	RECEIVED? Y/N	GAVE AWAY? Y/N
			#	#	#	#	#	#	#	#	#	#	#	#	#	#	
DOLLY VARDEN																	
LAKE TROUT																	
GRAYLING																	
PIKE																	
BURBOT																	
SHEEFISH																	
SUCKER																	
Broad Whitefish																	
Humpback Whitefish																	
Round Whitefish																	
Least Cisco																	
Bering Cisco																	
Other/Unknown Whitefish																	
BLACKFISH																	
OTHER FISH																	

TANANA RIVER BASELINE

Small Land Mammals / Furbearers

YES NO

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE SMALL LAND MAMMALS/FURBEARERS BETWEEN APRIL 2004 AND MARCH 2005?

IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (UNITS SHOULD INDICATE NUMBER OF INDIVIDUAL ANIMALS):

SPECIES	USED? Y / N	TRIED TO HARVEST? Y / N	NUMBER HARVESTED			RECEIVED? Y / N	GAVE AWAY? Y / N	Do you sell your pelts? (Record number if offered or note if more than half) Y / N
			FOOD NUMBER	FUR ONLY NUMBER	TOTAL NUMBER			
FOX (all species)								
BEAVER								
COYOTE								
SNOWSHOE HARE								
LAND OTTER								
LYNX								
MARMOT								
MARTEN								
MINK								
MUSKRAT								
PORCUPINE								
WEASEL								
TREE SQUIRREL (RED)								
PARKA SQUIRREL (GROUND)								
OTHER								

TANANA RIVER BASELINE

Large Land Mammals

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE LARGE LAND MAMMALS BETWEEN APRIL 2004 AND MARCH 2005? YES NO

IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (UNITS SHOULD BE INDIVIDUALS):

SPECIES	Used? Y/N	Hunt? Y/N	For Ceremonial Use? Y/N	HARVESTED					Receive? (from another subsistence household) Y/N	Receive? (from a guiding operation) Y/N	GAVE AWAY? Y/N	LOCATION OF HARVESTS (GMU SUBUNITS)						
				Harvest? Y/N	For Food/Fur Number	FUR ONLY Number	TOTAL Number	UNITS				ANIMAL 1 UCU	ANIMAL 2 UCU	ANIMAL 3 UCU	ANIMAL 4 UCU			
BLACK BEAR								IND										
BROWN BEAR								IND										
CARIBOU								IND										
MOOSE								IND										
DALL SHEEP								IND										
WOLVERINE								IND										
BISON								IND										
WOLF								IND										
OTHER								IND										

HOW MANY MEMBERS OF YOUR HOUSEHOLD HUNTED MOOSE IN THE LAST 12 MONTHS? _____

HOW MANY DAYS DID EACH HUNTER SPEND HUNTING MOOSE IN THE LAST 12 MONTHS? #1 _____ #2 _____ #3 _____ #4 _____ #5 _____ days

HOW MANY MOOSE WERE HARVESTED LAST YEAR BY MEMBERS OF THIS HOUSEHOLD? _____ (include any potlatch moose taken by this household)

PLEASE CHECK ALL THAT APPLY FOR THE PERIOD BETWEEN APRIL 2004 AND MARCH 2005.

MOOSE

WHAT PARTS OF THE MOOSE DID YOU USE?

- (1) MEAT
- (2) HEART
- (3) LIVER
- (4) KIDNEYS
- (5) STOMACH
- (6) HIDE
- (7) ANTLERS
- (8) BONES
- (9) SINEW
- (10) HOOVES
- (11) FAT
- (12) HEAD
- (14) BRAIN (TANNING)
- (15) URINE (TANNING)

HOW DID YOU PRESERVE MOOSE?

- (1) FREEZING
- (2) DRYING
- (3) SAUSAGE
- (4) GROUND MEAT
- (5) OTHER TECHNIQUE, SPECIFY:

HOW DID YOUR HARVEST AND USE OF MOOSE FROM 2004 - 2005 COMPARE TO THE LAST:

4 - 5 YEARS?

(more)
(less)
(same)

(more)
(less)
(same)

HOW WOULD YOU DESCRIBE THE AVAILABILITY OF MOOSE IN YOUR AREA FOR SUBSISTENCE HUNTING:

THIS SEASON?

(poor)
(fair)
(good)

(poor)
(fair)
(good)

4 - 5 YEARS
AGO?

9 - 10 YEARS
AGO?

(poor)
(fair)
(good)

CARIBOU

WHAT PARTS OF THE CARIBOU DID YOU USE?

- (1) MEAT
- (2) HEART
- (3) LIVER
- (4) KIDNEYS
- (5) STOMACH
- (6) HIDE
- (7) ANTLERS
- (8) BONES
- (9) SINEW
- (10) HOOVES
- (11) FAT
- (12) HEAD

HOW DID YOU PRESERVE CARIBOU?

- (1) FREEZING
- (2) DRYING
- (3) SAUSAGE
- (4) GROUND MEAT
- (5) OTHER TECHNIQUE, SPECIFY:

HOW DID YOUR HARVEST AND USE OF CARIBOU FROM 2004 - 2005 COMPARE TO THE LAST:

4 - 5 YEARS?

(more)
(less)
(same)

9 - 10 YEARS?

(more)
(less)
(same)

HOW WOULD YOU DESCRIBE THE AVAILABILITY OF CARIBOU IN YOUR AREA FOR SUBSISTENCE HUNTING:

THIS SEASON?

(poor)
(fair)
(good)

(poor)
(fair)
(good)

4 - 5 YEARS
AGO?

9 - 10 YEARS
AGO?

(poor)
(fair)
(good)

