

Technical Paper No. 400

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# **Wild Resource Harvests and Uses, Land Use Patterns, and Subsistence Economies in Manley Hot Springs and Minto, Alaska, 2012**

by

**Caroline L. Brown,**

**Lisa J. Slayton,**

**Alida Trainor,**

**David S. Koster,**

and

**Marylynne L. Kostick**

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June 2014

Alaska Department of Fish and Game

Division of Subsistence



## Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the *Système International d'Unités* (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative Code	AAC	fork length	FL
deciliter	dL			mid-eye-to-fork	MEF
gram	g	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	mid-eye-to-tail-fork	METF
hectare	ha			standard length	SL
kilogram	kg	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	total length	TL
kilometer	km			Mathematics, statistics	
liter	L	at	@	all standard mathematical signs, symbols and abbreviations	
meter	m	compass directions:		alternate hypothesis	H <sub>A</sub>
milliliter	mL	east	E	base of natural logarithm	e
millimeter	mm	north	N	catch per unit effort	CPUE
		south	S	coefficient of variation	CV
Weights and measures (English)		west	W	common test statistics	(F, t, $\chi^2$ , etc.)
cubic feet per second	ft <sup>3</sup> /s	copyright	©	confidence interval	CI
foot	ft	corporate suffixes:		correlation coefficient (multiple)	R
gallon	gal	Company	Co.	correlation coefficient (simple)	r
inch	in	Corporation	Corp.	covariance	cov
mile	mi	Incorporated	Inc.	degree (angular)	°
nautical mile	nmi	Limited	Ltd.	degrees of freedom	df
ounce	oz	District of Columbia	D.C.	expected value	E
pound	lb	et alii (and others)	et al.	greater than	>
quart	qt	et cetera (and so forth)	etc.	greater than or equal to	?
yard	yd	exempli gratia		harvest per unit effort	HPUE
		(for example)	e.g.	less than	<
Time and temperature		Federal Information Code	FIC	less than or equal to	?
day	d	id est (that is)	i.e.	logarithm (natural)	ln
degrees Celsius	°C	latitude or longitude	lat. or long.	logarithm (base 10)	log
degrees Fahrenheit	°F	monetary symbols		logarithm (specify base)	log <sub>2</sub> , etc.
degrees kelvin	K	(U.S.)	\$, ¢	minute (angular)	'
hour	h	months (tables and figures): first three letters	Jan, ..., Dec	not significant	NS
minute	min	registered trademark	®	null hypothesis	H <sub>0</sub>
second	s	trademark	™	percent	%
		United States (adjective)	U.S.	probability	P
Physics and chemistry		United States of America (noun)	USA	probability of a type I error (rejection of the null hypothesis when true)	$\alpha$
all atomic symbols		U.S.C.	United States Code	probability of a type II error (acceptance of the null hypothesis when false)	$\beta$
alternating current	AC	U.S. state	use two-letter abbreviations (e.g., AK, WA)	second (angular)	"
ampere	A			standard deviation	SD
calorie	cal			standard error	SE
direct current	DC			variance	
hertz	Hz			population	Var
horsepower	hp			sample	var
hydrogen ion activity (negative log of)	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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SUBSISTENCE ECONOMIES IN MANLEY HOT SPRINGS AND MINTO,  
ALASKA, 2012**

by

Caroline L. Brown, Lisa J. Slayton, and Alida Trainor  
Alaska Department of Fish and Game, Division of Subsistence, Fairbanks

and

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

Alaska Department of Fish and Game  
Division of Subsistence  
Fairbanks, Alaska

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

*Caroline L. Brown, Lisa J. Slayton, and Alida Trainor*  
*Alaska Department of Fish and Game Division of Subsistence*  
*1300 College Road Fairbanks, AK 99701-1599 USA*

*and*  
*David S. Koster and Marylynne L. Kostick*  
*Alaska Department of Fish and Game Division of Subsistence*  
*333 Raspberry Road Anchorage, AK Mailing Address 99518-1565 USA*

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# Abstract

This report summarizes the results of systematic household surveys and key respondent interviews on the subsistence harvests and uses of wild foods in 2012 in the communities of Minto and Manley Hot Springs in the Tanana flats area of the Yukon River drainage. Data collection was supported by the Alaska Department of Transportation as part of its preparation for the proposed Tofty–Yukon River access road to assess impacts to subsistence. This research intended to describe the contemporary subsistence uses of fish, wildlife, and plant resources by the residents of Manley Hot Springs and Minto in Central Alaska.

The principal questions addressed the quantity of wild foods harvested for subsistence and how these foods were distributed within and among communities and between neighbors. The survey also collected data on the lands and waters used for subsistence activities in the area, as well as assessments of harvests, food security, and the impacts of competing uses for subsistence resources. The household surveys found that in the 2012 study year, subsistence harvests of fish, wildlife, and plant resources were substantial in the 2 communities: 39,772 lb total and 226 lb per person in Minto and 52,438 lb total and 426 lb per person in Manley Hot Springs. The research also found that changes in subsistence had occurred compared to earlier study years. In particular, harvests of salmon and nonsalmon fish species by Minto residents have declined dramatically since 1984. Additionally, Manley Hot Springs residents reported harvesting and using less moose over the last decade—likely due to access restrictions. Both communities are dealing with the recent restrictions on salmon fishing in the Yukon River drainage and Minto hunters, in particular, have experienced significant changes in moose hunting regulations in the Minto Flats Management Area. The results of this 2012 survey help fill the gap of harvest data for Manley Hot Springs and update the more than 30-year-old comprehensive data from Minto. Analyses of harvest levels of specific species, demographics, harvest areas, community economics, harvest assessments, food security, and wild food networks help to characterize contemporary subsistence economies in Central Alaska and contribute to our knowledge of subsistence harvests and uses statewide.

Key words subsistence hunting, subsistence fishing, subsistence harvests, Minto, Manley Hot Springs, moose hunting regulations, Athabaskan, central Alaska, Tanana Valley, Yukon River Chinook salmon declines

# 1. Introduction

*Caroline L. Brown, David S. Koster, and Marylynn L. Kostick*

This report summarizes the results of research conducted in 2013 on the subsistence harvests and uses of wild foods in 2012 in the communities of Minto and Manley Hot Springs in the Tanana Flats area of the Yukon River drainage (Figure 1-1). Residents of Central Alaska rely substantially on subsistence hunting, fishing, and gathering for nutrition and to support their customary and traditional ways of life. The Tanana Flats area is largely boreal forest; subsistence harvests of wild foods from this area include, but are not limited to, moose, salmon, whitefishes, northern pike, beavers, geese, ducks, wild berries, and greens. Table 1-1 presents a list, including the Linnaean taxonomic names, of resources used by the study communities in 2012. Throughout rural Alaska, harvests vary from community to community and may also fluctuate through time with regard to the amounts and species harvested in response to varied circumstances such as species availability, regulations, socioeconomic factors (e.g., cost of fuel), personal tastes, and many others.

The Alaska Department of Fish and Game (ADF&G) has conducted multiple research programs in the Yukon and Tanana river drainages, including comprehensive subsistence surveys and other species-specific research. In the past 5 years, the ADF&G Division of Subsistence has conducted comprehensive subsistence harvest baseline projects in numerous communities in the Yukon River region: the lower Yukon River community of Emmonak in 2009 (Fall et al. 2012); in 2011 5 Yukon River communities, including Marshall and Mountain Village in the lower river area, and Ruby, Galena, and Nulato in the middle river area<sup>1</sup>; and, finally, in 2012, Russian Mission, Anvik, and Grayling in the lower-middle river area (Ikuta et al. 2014). Harvest data for the projects listed above are available online at the Community Subsistence Information System (CSIS<sup>2</sup>) website maintained by the ADF&G Division of Subsistence. In order to understand socioeconomic patterns and trends of subsistence Chinook salmon fishing along the Yukon River, the Division of Subsistence has conducted an ethnographic project in 5 Yukon River communities—Emmonak, Marshall, Nulato, Beaver, and Eagle—in 2010–2011.<sup>3</sup> ADF&G has also produced annual salmon harvest estimates by community, based on fish rack or household surveys, since 1960. Other harvest data, primarily for large game, exist in the hunter–harvest database (WinfoNet<sup>4</sup>) maintained by ADF&G; however,

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1. Brown, Caroline L. et al. *Subsistence harvests in 5 Yukon River communities, 2010 an index approach*. Unpublished data. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. NNN: Fairbanks.

2. ADF&G Division of Subsistence, Community Subsistence Information System (CSIS): <http://www.adfg.alaska.gov/sb/CSIS>.

3. Brown, Caroline L. et al. *Socioeconomic effects of declining salmon runs on the Yukon River*. Unpublished data. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. NNN, Fairbanks.

4. ADF&G, WinfoNet: <http://winfonet.alaska.gov/>.

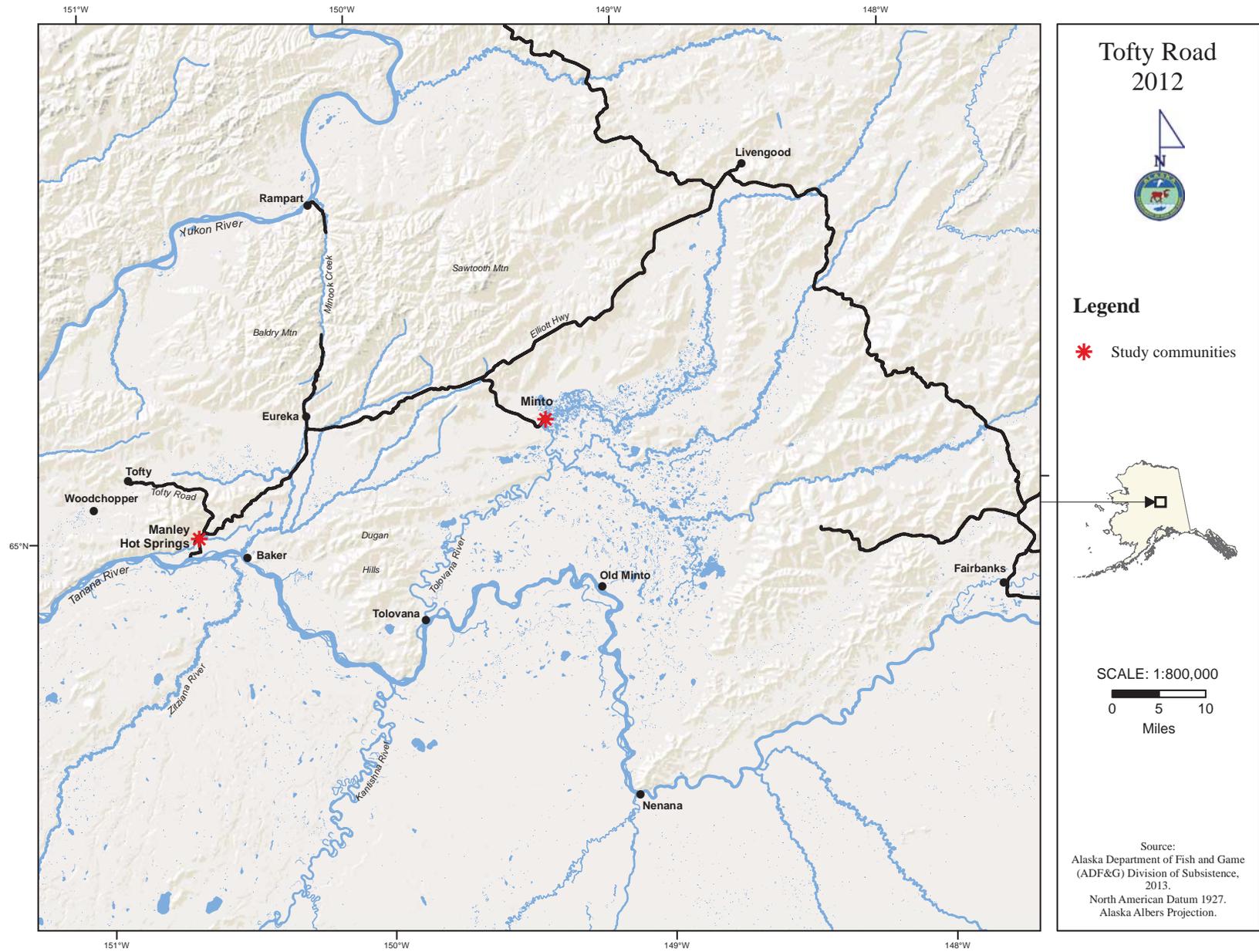


Figure 1-1.— Map of study communities, 2012.

Table 1-1.— Resources used by study communities, 2012.

Resource	Scientific name
Summer chum salmon	<i>Oncorhynchus keta</i>
Fall chum salmon	<i>Oncorhynchus keta</i>
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>
Salmon roe	
Unknown salmon	<i>Oncorhynchus</i> spp.
Pacific herring	<i>Clupea pallasii</i>
Lingcod	<i>Ophiodon elongatus</i>
Pacific halibut	<i>Hippoglossus stenolepis</i>
Arctic lamprey	<i>Lampetra</i> spp.
Black rockfish	<i>Sebastes melanops</i>
Yelloweye rockfish	<i>Sebastes ruberrimus</i>
Alaska blackfish	<i>Dallia pectoralis</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	<i>Esox lucius</i>
Sheefish	<i>Stenodus leucichthys</i>
Longnose sucker	<i>Catostomus catostomus</i>
Rainbow trout	<i>Oncorhynchus mykiss</i>
Broad whitefish	<i>Coregonus nasus</i>
Bering cisco	<i>Coregonus laurettae</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>
Mule deer	<i>Odocoileus hemionus</i>
Sitka black-tailed deer	<i>Odocoileus hemionus sitkensis</i>
Moose	<i>Alces alces</i>
Dall sheep	<i>Ovis dalli</i>
Beaver (American)	<i>Castor canadensis</i>
Coyote	<i>Canis latrans</i>
Red fox	<i>Vulpes vulpes</i>
Snowshoe hare	<i>Lepus americanus</i>
North American river (land) otter	<i>Lontra canadensis</i>
Lynx (Canadian)	<i>Lynx canadensis</i>
Marmot	<i>Marmota</i> spp.
Marten	<i>Martes</i> spp.
Mink (American)	<i>Neovison vison</i>
Muskrat	<i>Ondatra zibethicus</i>
Porcupine (North American)	<i>Erethizon dorsatum</i>

-continued-

Table 1-1.–Page 2 of 3.

Resource	Scientific name
Arctic ground (parka) squirrel	<i>Spermophilus parryii</i>
Red (tree) squirrel	<i>Tamiasciurus hudsonicus</i>
Least weasel	<i>Mustela nivalis</i>
Gray wolf	<i>Canis lupus</i>
Wolverine	<i>Gulo gulo</i>
Canvasback	<i>Aythya valisineria</i>
Goldeneye	<i>Bucephala</i> spp.
Mallard	<i>Anas platyrhynchos</i>
Long-tailed duck	<i>Clangula hyemalis</i>
Northern pintail	<i>Anas acuta</i>
Scaup	
Black scoter	<i>Melanitta nigra</i>
Surf scoter	<i>Melanitta perspicillata</i>
White-winged scoter	<i>Melanitta fusca</i>
Northern shoveler	<i>Anas clypeata</i>
Green-winged teal	<i>Anas crecca</i>
American wigeon	<i>Anas</i> spp.
Unknown duck	
Lesser Canada goose	<i>Branta canadensis parvipes</i>
Snow goose	<i>Chen caerulescens</i>
White-fronted goose	<i>Anser albifrons</i>
Unknown geese	
Tundra (whistling) swan	<i>Cygnus columbianus</i>
Unknown gull	
Sandhill crane	<i>Grus canadensis</i>
Unknown shorebirds–small	
Unknown shorebirds–large	
Unknown loon	
Arctic tern	<i>Sterna paradisaea</i>
Spruce grouse	<i>Falcapennis canadensis</i>
Unknown grouse	
Ptarmigan	<i>Lagopus</i> spp.
White-winged scoter eggs	
Duck eggs	
Canada goose eggs	
Unknown goose eggs	
Unknown small shorebird eggs	
Unknown large shorebird eggs	
Mew gull eggs	
Unknown gull eggs	
Unknown loon eggs	
Murre eggs	
Unknown eggs	
Razor clams	<i>Siliqua patula</i>
Unknown clams	
King crab	
Snow crab (Tanner crab, Opillio)	<i>Chionoecetes opilio</i>
Mussels	
Shrimp	

-continued-

Table 1-1.–Page 3 of 3.

Resource	Scientific name
Unknown marine invertebrates	
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>
Currants	<i>Ribes</i> spp.
Nagoonberry	<i>Rubus arcticus</i>
Raspberry	<i>Rubus idaeus</i>
Salmonberry	<i>Rubus spectabilis</i>
Strawberry	
Other wild berry	
Wild rhubarb	<i>Polygonum alaskanum</i>
Eskimo potato	<i>Hedysarum alpinum</i>
Fiddlehead ferns	
Nettle	<i>Urtica</i> spp.
Hudson's Bay (Labrador) tea	<i>Ledum palustre</i>
Dandelion greens	
Sourdock	<i>Rumex fenestratus</i>
Spruce tips	<i>Picea</i> spp.
Willow leaves	<i>Salix</i> spp.
Wild celery	<i>Angelica lucida</i>
Wild rose hips	<i>Rosa acicularis</i>
Other wild greens	
Unknown mushrooms	
Fireweed	<i>Epilobium angustifolium</i>
Plantain	
Stinkweed	<i>Artemisia tilesii</i>
Punk	
Puffballs	
Orange boletus	
Unknown vegetation	

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

because of cultural issues regarding reporting and management, the remoteness of many communities, and a lack of outreach regarding reporting needs and requirements, these data stored in WinfoNet often fail to capture a significant component of the harvest in rural Alaska (Andersen and Alexander 1992). Additional research provided by Wolfe and Scott (2010) produced comprehensive subsistence harvest estimates for Alakanuk, Anvik, Grayling, Tanana, and Stevens Village in their analysis of continuity and change in Yukon River salmon fisheries.

This study represents a significant update to the available data on the harvests and uses of subsistence foods in the Yukon River drainage, especially in Central Alaska. Community support for this harvest documentation effort was strong; the tribal council in each of the communities was contacted and subsequently approved the research in their respective communities. Indeed, many residents had long been calling for increased data collection to corroborate their own local observations of hunting and fishing trends. This harvest documentation program relied on financial support from the State of Alaska Department of Transportation as part of its preparation for the potential Tofty Road upgrade.

The communities of Minto and Manley Hot Springs lie in the Tanana River valley at the border between the middle Yukon River area and eastern Interior Alaska. The communities are primarily encompassed by ADF&G Game Management Unit (GMU) 20F; both are accessible by road. This area is owned and managed by a variety of entities, including Doyon, Ltd. (an Alaska Native Claims Settlement Act [ANCSA] corporation), Tanana Chiefs Conference (a non-profit Alaska Native corporation), U.S. Fish and Wildlife Service (Eastern Interior Region federal subsistence management areas), and ADF&G (Yukon Management Area fishing regulatory area, GMU 20F [including the Minto Flats Management Area], Minto Flats State Game Refuge, and Tanana Valley State Forest). The project area includes both state and federal waters used for subsistence fishing.

As outlined in more detail in the 2 chapters presenting results for each study community, Koyukon and lower Tanana Athabascan people have historically occupied the Tanana Flats. Koyukon Athabascan-speaking peoples migrated into the area during the late prehistoric and early historical period (Andrews 1988; Kari 1999; VanStone and Goddard 1981:560). Organized in small bands, they lived a semi-nomadic lifestyle centered around the seasonal pursuit of subsistence resources utilizing seasonal camps within discreet band territories along the Tanana River and its smaller tributaries (Andrews 1988:20, 1977; Clark 1981:585; Hosley 1981a:540; Olson 1981). By the early to mid-1800s, Alaska Natives in the Tanana River region were drawn into the burgeoning fur trade with Russian and British traders (Betts 1997). During the gold rush in the late 1800s, residents began to coalesce around newly established trading posts (Hosley 1981b), and later, around an established Episcopalian mission (McKenna 1981).

Historically, the seasonal round began in spring, before breakup, when families moved to spring camps to trap small land mammals (especially muskrats), fish for various nonsalmon fish species, and hunt migratory birds. Ice breakup on the Tanana River brought families to summer fish camps, usually on the Tanana and Tolovana rivers, to process large quantities of salmon used as food for both humans and dogs. In early fall, families traveled to fall camps, which were often the same sites as their spring camps, to fish for nonsalmon fish species and hunt ducks and geese before heading to winter villages to hunt for moose, caribou, and bears, trap small game, and fish under the ice. These seasonal activities continue, usually based out of the permanent communities, but some summer fish camps are still in operation along the Tanana and Yukon rivers. As a result, the residents of Minto and Manley Hot Springs continue to rely heavily on hunting, fishing, and gathering to provide for both their nutritional and their cultural needs.

## **Project Background**

To support the regulatory requirements of defining and prioritizing the customary and traditional uses of fish and wildlife resources, the ADF&G Division of Subsistence conducts systematic social science research “on all aspects of the role of subsistence hunting and fishing in the lives of the residents of the state” (AS 16.05.094). The duties of the division as an agency of state government include assisting the department and regulatory bodies “in determining what uses of fish and game, as well as which users and what methods, should be termed subsistence uses, users, and methods” (AS 16.05.094). The division also conducts research to contribute to the development of “statewide and regional management plans so that those plans recognize and incorporate the needs of subsistence users of fish and game” (AS 16.05.094).

This single-year project provided comprehensive baseline information about contemporary subsistence uses of fish, wildlife, and plant resources, and traditional knowledge about these resources, in Minto and Manley Hot Springs. These communities are situated in proximity to the proposed road that would link the existing road system at Tofty to the Yukon River near the community of Tanana. According to the Alaska Department of Transportation (DOT), the road would be constructed to provide access to the community of Tanana to lower the cost of living in Tanana and support economic growth through more business and employment opportunities for residents. To do so, DOT would require a public easement through multiple sections of land that is approximately 300 feet in width for approximately 36 miles, encompassing approximately 541 acres. DOT would like to complete this road extension by late 2014.<sup>5</sup> The area for the proposed road crosses sections of land currently used by vicinity residents, including those from Minto and

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5. DOT Public Facilities. Dec. 12, 2013. *Manley Hot Springs to Tanana road*. State of Alaska capital project summary, FY 2015 request, reference no. 50843.

Manley Hot Springs. The data collected as part of this project focused on identifying what resources were harvested, from where they were harvested, and when they were harvested, thereby creating a contemporary picture of subsistence uses in the proposed road corridor. This information may also be used as part of the National Environmental Policy Act (NEPA) review of the proposed Tofty–Yukon River access road to assess impacts to subsistence.

Comprehensive subsistence research has not been conducted in Manley Hot Springs, although some harvest data were obtained in 2005; the harvest data are available in the CSIS but the survey results are not yet published. Additionally, significant data gaps are present in the 2005 study: namely, the lack of comparable subsistence salmon harvest information and spatial data associated with subsistence resource and land use patterns. Comprehensive surveys were conducted in Minto in 1984 (Andrews 1988), but more current subsistence research has been limited to the same 2005 study mentioned above and a study by Betts (1997).

## **Regulatory Context**

The regulation of hunting and fishing for subsistence practices has a unique history in Alaska. As noted by Magdanz et al. (2007), both state and federal laws provide priorities for customary and traditional subsistence hunting and fishing over other consumptive uses, such as commercial fishing. In 1971, ANCSA extinguished aboriginal hunting and fishing rights. However, recognizing the importance of subsistence as well as the lack of legal protection for Alaska’s subsistence traditions, both the Alaska State Legislature and U.S. Congress subsequently adopted laws intended to preserve opportunities for customary and traditional uses of fish and wildlife in Alaska. In 1978, the Alaska State Legislature adopted priorities for subsistence over other consumptive uses of fish and game, including a subsistence fishing priority under AS 16.05.251(b) and a subsistence hunting priority under AS 16.05.255(b). In 1980, the U.S. Congress adopted a rural subsistence priority in the Alaska National Interest Lands Conservation Act (ANILCA). Between 1985 and 1992, aspects of Alaska’s subsistence statutes—primarily those dealing with eligibility for participation in subsistence fishing and hunting, and the role of a priority for rural residents in times of shortage—were amended such that state and federal subsistence laws became incongruent. In the *McDowell v. State of Alaska*<sup>6</sup> decision in 1989, the Alaska Supreme Court ruled that the rural priority in the state’s amended 1986 subsistence law was unconstitutional. Since then, the Alaska Board of Fisheries (BOF) and the Alaska Board of Game (BOG) have adopted subsistence regulations and made allocations on State-owned and private lands following procedures outlined in AS 16.05.258, titled “Subsistence Use and Allocation of Fish and Game.” Fishing and hunting regulations have been further refined by court rulings, such as elimination of the rural priority under state management rules, as well as by

6. *McDowell v. State of Alaska*. Supreme Court Files S-2732; 785 P. 2d (Alaska 1989).

state statutes authorizing board activities. The Federal Subsistence Board (FSB) adopts subsistence regulations and allocations on federal public lands (about 60% of the state) with options for managing for a rural priority for federally qualified users.

The regulation of subsistence harvests of fish and wildlife in Alaska is administered by the State of Alaska under Title 5 of the *Alaska Administrative Code* and by the federal government under Title 50, parts 92 and 100, of the *Code of Federal Regulations*. The federal government designates the majority of the Yukon River drainage as a rural subsistence region (50 CFR §100.23). All federal subsistence regulations apply to this region, and those specify that individuals practicing subsistence harvests of fish and wildlife on federal public lands outside nonsubsistence areas must be permanent rural residents of the area (50 CFR §100.5). State of Alaska regulations cannot require that subsistence harvesters be only rural residents: all Alaskans are eligible to participate in state subsistence programs. Customary and traditional use determinations for subsistence resources are administered by Alaska under AS 16.05.258 and by the federal government under 50 CFR §100.24. This section focuses on regulations of 2 major subsistence resources in the Yukon–Tanana river areas—salmon and moose—because of their prominence in the annual subsistence harvests of both study communities.

Recent sharp declines in Chinook salmon abundance have caused severe hardship for fishery-dependent communities in the Yukon Management Area; the implications of these declines and resulting regulatory actions will be discussed in more detail in the chapter “Discussion and Conclusions.” Briefly, the Chinook salmon run initially failed in 2000; the BOF designated Chinook salmon as a stock of yield concern in 2000 because it failed to produce expected returns. The federal government declared the Yukon River fishery an economic disaster in 2009. ADF&G has not provided a commercial harvest opportunity on Chinook salmon since 2008, and the subsistence fishery experienced restrictions in 2008–2009 and 2011–2013. The lowest subsistence harvest on record was in 2013 (an estimated 11,000 Chinook salmon) (JTC 2014)<sup>7</sup> that composed approximately 25% of the average annual subsistence harvest of 45,000–55,000 Chinook salmon for the Alaska portion of the Yukon River drainage. In 2005, border passage has been estimated using sonar, which is considered to be more reliable than the earlier mark/recapture method. Since then, despite conservative management and subsistence restrictions, U.S./Canadian border passage obligations outlined in the Pacific Salmon Treaty have not been met for 5 years (2007, 2008, 2010, 2012, and 2013).

Regulatory authority for salmon management for the Yukon River is shared by the FSB and Alaska’s BOF. On the Yukon River, ADF&G is responsible for implementing regulations in accordance with multiple species- and tributary-specific management plans and also assumes in-

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7. Harvest estimates were preliminary at the time this report was written.

season discretionary management authority over salmon in Alaska navigable waters. Yukon River salmon fisheries are also managed in accordance with the Pacific Salmon Treaty; the Yukon River Panel, a board of appointed members from both Alaska and Canada, meets twice a year to negotiate annual aspects of the treaty—such as escapement goals and border passage goals—and to approve funding of scientific research addressing salmon biology and use patterns.

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

Subsistence harvests of Pacific salmon species in the Yukon Management Area are allowed without a permit except for in a few locations, most of which are accessible by road; in those areas, a permit is required (5 AAC 01.230). The subsistence salmon fishing schedule for the Yukon Management Area is set per 5 AAC.01.210, which designates a “windows” schedule for subsistence salmon fishing that is implemented chronologically upstream and is consistent with migratory run timing. ADF&G may alter these periods by emergency order for conservation purposes. Fall et al. (2013) contains a description of the 2011 windows—times during which the river was open or closed to subsistence fishing—by district. Alaska law allows a variety of gear types to be used in the Yukon River drainage for subsistence salmon fishing and includes specifications regarding the use of gillnets and fish wheels (5 AAC 01.220). There are no federal or state bag or possession limits for subsistence salmon harvests in the Yukon River.

In addition to salmon, Minto and Manley Hot Springs residents rely heavily on moose. According to the survey, in 2012 Minto and Manley Hot Spring residents hunted moose and other large game mostly in GMU 20B around the community of Manley and to the east in the Minto Flats Management Area (MFMA); GMU 20F north of Eureka; and GMU 20C between the Cosna and Zitziana rivers. In most of GMUs 20C and 20F, residents can hunt 1 bull with a general harvest ticket between September 1–September 20 or 25. However, moose hunting regulations have undergone dramatic restructuring in the MFMA (GMU 20B). In 2004 an existing Tier II permitted hunt<sup>8</sup> for any moose was changed to a limited registration hunt for any moose. Since then, hunting regulations have undergone additional changes, which will be reviewed in detail in the chapter “Discussion and Conclusions.” Currently state residents can hunt moose in the MFMA in 1 of 3 ways: 1 bull by

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8. State Tier II hunts are held when there is not enough of a game population with customary and traditional uses to provide a reasonable opportunity for subsistence uses. Hunters must answer questions on an application concerning their dependence on the game for their livelihood and availability of alternative resources. Applications are scored based on responses to the questionnaire and permits are issued to those with the highest scores.

general harvest ticket from August 21–August 27; 1 antlerless moose by registration permit from October 15–February 28; or 1 bull (with spike-fork or 50-inch antlers with 4 or more brow tines on at least 1 side) by general harvest ticket from September 8–September 25. In February 2014, the BOG added a small non-resident season as well.

## **Study Objectives**

The project had the following objectives:

1. Estimate subsistence harvests and uses of wild fish, game, and vegetation resources in a 12-month study year (2012);
2. Map areas used for hunting, fishing, and gathering in study year (preceding 12 months);
3. Generate maps of historical use areas for subsistence hunting, fishing, and gathering that were developed from selective interviews with subject matter experts;
4. Collect demographic information about each community, including population size and composition, ethnicity, birthplace, and length of residency in the study community;
5. Collect information about involvement in the cash economy, including jobs and other sources of cash income;
6. Evaluate trends in subsistence harvests;
7. Document traditional knowledge observations regarding resources used for subsistence purposes;
8. Evaluate food security patterns for both store-bought and wild foods;
9. Document social networks of sharing subsistence resources among households and between communities; and
10. Conduct preliminary scoping of current issues related to subsistence hunting and fishing.

Within this harvest assessment project, the Division of Subsistence and cooperating organizations selected the study communities, trained community residents in administration of the survey instruments, and administered surveys to occupied households in each study community. After data collection, the researchers reviewed and interpreted survey findings and published this report of survey findings. Study findings were shared with the communities in community review meetings that were held in both participating communities. Summary results are published online at the CSIS website.

## Research Methods

### ETHICAL PRINCIPLES FOR THE CONDUCT OF RESEARCH

The project was guided by the research principles outlined in the *Alaska Federation of Natives Guidelines for Research*<sup>9</sup> and by the National Science Foundation, Office of Polar Programs in its *Principles for the Conduct of Research in the Arctic*<sup>10</sup>, the *Ethical Principles for the Conduct of Research in the North* (Association of Canadian Universities for Northern Studies 2003), as well as the Alaska confidentiality statute (AS 16.05.815). These principles stress community approval of research designs, informed consent, anonymity or confidentiality of study participants, community review of draft study findings, and the provision of study findings to each study community upon completion of the research.

### PROJECT PLANNING AND APPROVALS

As noted above, this research was funded by DOT as part of its background work for the proposed Tofty Road extension. Division of Subsistence staff were responsible for all aspects of the research, including survey and interview instrument development, survey administration, survey coding, data analysis and review, and results write-up. After a short discussion of project planning, these tasks will be discussed in more detail below.

Planning for this survey and interviewing work entailed extensive coordination with both communities. After developing a draft version of the survey form in coordination with Information Management (IM) staff, project research staff contacted the communities.

In mid-November 2012, Subsistence Resource Specialist (SRS) II Seth Wilson met with Liz Woods, the president of the Manley Hot Springs Traditional Council, to discuss project approval. A few days later, Lisa Slayton, SRS II and community research lead, spoke with Chuck Parker, the community association president, via telephone to approve the project. Prior to these meetings, Slayton sent a copy of the survey instrument, an informational letter about the project, 2 examples of community summaries from previous comprehensive survey projects, a Microsoft PowerPoint<sup>11</sup> presentation concerning the project, a household list of Manley Hot Springs residents, and a resource

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9. Alaska Federation of Natives. 2013. *Alaska Federation of Natives Guidelines for Research*. Alaska Native Knowledge Network. Accessed May 2013. <http://www.ankn.uaf.edu/IKS/afnguide.html>

10. National Science Foundation Interagency Social Science Task Force. 2012. *Principles for the Conduct of Research in the Arctic*. Accessed May 2013. <http://www.nsf.gov/od/opp/arctic/conduct.jsp>

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

Table 1-2.— Sample achievement, study communities, 2012.

	Manley	
	Hot Springs	Minto
Households in community	58	61
Sampled households	41	46
Percentage of households sampled	70.7%	75.4%
Households unable to be contacted	14	14
Households declined to be interviewed	3	1
Sampled population	87	133
Estimated population	123.1	176.4

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

list to the tribal council and community association for review. Incorporation of their input on all the materials was conducted over the phone and by email.

In Minto, SRS II Alida Trainor attended a tribal council meeting on April 23, 2013 to seek approval for the project. Members of the public were also present. Trainor reviewed the draft survey with the meeting participants; most of the discussion centered on the networking portion of the survey and its importance, as well as on the mapping component. Community members discussed the importance of documenting their use areas in light of historical relationships with non-local hunters also using the area, especially within the last decade.

### SYSTEMATIC HOUSEHOLD SURVEYS

The primary method for collecting subsistence harvest and use information in this project was a systematic household survey. Following receipt of comments at the community approval meetings, ADF&G finalized the survey instrument in February 2013. A key goal was to structure the survey instrument to collect demographic, resource harvest and use, and other economic data that are comparable with information collected in other household surveys in the study communities and with data in the CSIS. Appendix A shows the survey instrument used in this project. In addition to harvest and use data, staff collected demographic information and information on hunting and fishing participation levels, sharing of wild resources, and the seasonality of some harvests to provide important context for the harvest data. Based on retrospective recall, respondents were asked to provide specific information on numbers and species harvested.

A total of 58 households were identified in Manley Hot Springs, and 61 in Minto. Because of the relatively small size of each community, researchers attempted to survey all households in both communities. Table 1-2 shows the number of households contacted and surveyed in each community; surveys were completed with 71% of households in Manley Hot Springs and 75% of households in Minto. Refusal levels were low—3 households in Manley Hot Springs and 1 household in Minto.

Researchers were unable to contact 14 households in both communities (24% in Manley Hot Springs and 23% in Minto). The average survey length in Manley Hot Springs was 64 minutes; in Minto, surveys took an average of 32 minutes (Appendix Table D1-1).

## **MAPPING LOCATIONS OF SUBSISTENCE HUNTING, FISHING, AND GATHERING ACTIVITIES**

During household interviews, the researchers asked respondents to indicate the locations of their hunting, fishing, and gathering activities during the study year. ADF&G staff established a standard mapping method. Specifically, interviewers asked the respondents to mark on the maps the search areas for species harvested, the amounts harvested, and the location and months of harvest. Points were used to mark harvest locations and polygons (shaped areas) were used to indicate harvest effort areas, such as areas searched while hunting moose. Some lines were also drawn when the harvesting activity did not occur at a specific point, such as trapping.

The maps used for this project were produced by Terri Lemons from the Division of Subsistence using ArcGIS 10 software<sup>12</sup> on 11" x 17" paper. Maps were available at 2 different scales and 4 extents to accommodate both local and distant searches and harvests. The sets of 5 different paper maps for each community included: 1 grayscale high-resolution U.S. Geological Survey (USGS) topographic map at 1:200,000 (Minto) or at 1:250,000 (Manley Hot Springs), and 4 maps of similar resolution at 1:300,000 with different extents to cover the breadth of harvest areas in greater detail. Maps were not differentiated by harvesting activity. During each mapping session, researchers recorded the household's identification number, the date of the mapping interview, and the interviewer's initials on each map. All responses are confidential at the household level and only a community summary map for the various species searched for and harvested is included in this report.

With regard to the mapping effort, some mapping procedures differed from researcher to researcher. Some researchers chose to do the mapping while conducting the survey; that is, mapping each resource as it came up in the interview. Others chose to map all harvest areas immediately following the survey.

## **KEY RESPONDENT INTERVIEWS**

While researchers were in the study communities they consulted with tribal governments and other community members to identify key respondents to interview. The purpose of the key respondent interviews was to provide additional context for the quantitative data, and to provide information

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

for the community background section at the beginning of each chapter, the seasonal round sections, harvest over time analysis, and the community comments and concerns section at the end of each chapter. The number of key respondent interviews varied in each community and the demographic characteristics of key respondents are detailed at the beginning of each community chapter. Key respondent interviews were semi-structured and directed by a key respondent interview protocol designed by ADF&G staff in consultation with community members (see Appendix B). In addition to gathering qualitative data through the key respondent interview protocol, ADF&G staff took notes during interviews to provide additional context for this report. All key respondents' interviews were transcribed and then analyzed along with interview notes in preparation for writing this report. Key respondents were informed that, to maintain anonymity, their names would not be included in this report unless they consented to being identified.

## **HOUSEHOLD SURVEY IMPLEMENTATION**

### ***MANLEY HOT SPRINGS***

After obtaining community approval in November 2012, a team of 4 ADF&G staff traveled to Manley Hot Springs from February 19–24 to administer the surveys. They worked in teams of 2 with 3 local research assistants (LRAs). Table 1-3 outlines all project staff involved with surveying both communities and developing this report. The community lead for Manley Hot Springs, Slayton, trained LRAs on February 18–19 and the teams began collecting data on February 19. In addition to the harvest and use surveys, 6 ethnographic key respondent interviews were conducted with 7 active subsistence users, including 4 men and 3 women. After surveys were administered, researchers coded the surveys in the field and checked again for completeness and accuracy once they were back in Fairbanks at the Division of Subsistence office. Field work went smoothly with no problems and the research staff were well-received by community members.

### ***MINTO***

After obtaining community approval in April 2013, a team of 5 ADF&G staff traveled to Minto from May 28–June 1 to administer the surveys. Typically, ADF&G does not conduct comprehensive harvest surveys so late in the spring but the survey execution was rescheduled from an earlier date due to the loss of a community member. Once the research staff arrived in Minto, they worked in teams of 2 with 5 LRAs (Table 1-3). The community lead for Minto, Trainor, trained LRAs on May 28 and the teams began collecting data immediately afterward. In addition to the harvest and use surveys, researchers conducted interviews with 11 individuals, including elders, a married couple, and other active hunters and fishers. After surveys were administered, researchers coded the surveys

*Table 1-3.— Project staff, 2012–2013.*

Task	Name	Organization	
Northern Regional Program Manager	James Simon	ADF&G Division of Subsistence	
Principal Investigator	Caroline Brown	ADF&G Division of Subsistence	
Project Lead	Caroline Brown	ADF&G Division of Subsistence	
Data Management Lead	David S. Koster	ADF&G Division of Subsistence	
Administrative support	Pam Amundson	ADF&G Division of Subsistence	
	Tamsen Coursey-Willis	ADF&G Division of Subsistence	
	DeAnne Lincoln	ADF&G Division of Subsistence	
Programmer	Garrett Zimpelman	ADF&G Division of Subsistence	
Data entry	Theresa Quiner	ADF&G Division of Subsistence	
	Margaret Cunningham	ADF&G Division of Subsistence	
	Zayleen Kalalo	ADF&G Division of Subsistence	
	John Dwyer	ADF&G Division of Subsistence	
	Margaret Cunningham	ADF&G Division of Subsistence	
Data cleaning/validation	Margaret Cunningham	ADF&G Division of Subsistence	
Data analysis	Marylynn Kostick (lead analyst)	ADF&G Division of Subsistence	
	David S. Koster	ADF&G Division of Subsistence	
Cartography	Terri Lemons	ADF&G Division of Subsistence	
Editorial Review Lead	Mary Lamb	ADF&G Division of Subsistence	
Production Lead	Anita Humphries	ADF&G Division of Subsistence	
Field research staff	Alida Trainor (Minto lead)	ADF&G Division of Subsistence	
	Jeff Park	ADF&G Division of Subsistence	
	Andrew Brenner	ADF&G Division of Subsistence	
	Lorraine Navarro	ADF&G Division of Subsistence	
	Michelle Gilette	ADF&G Division of Subsistence	
	Lisa J. Slayton (Manley Hot Springs lead)	ADF&G Division of Subsistence	
	Odin Miller	ADF&G Division of Subsistence	
	Seth Wilson	ADF&G Division of Subsistence	
	Local research assistants	Timothy Gibson	Minto
		Emily Frank	Minto
Vanessa Joseph		Minto	
Kyle Titus		Minto	
Ronnie Silas		Minto	
Steve O'Brien		Manley Hot Springs	
Linda Johnson		Manley Hot Springs	
Lynette Woellert	Manley Hot Springs		

in the field and all questions for IM staff were flagged immediately and followed up on once staff returned to Fairbanks, where surveys were once again checked for completeness and accuracy. Field work went smoothly—community members were extremely friendly and the weather was phenomenal.

## DATA ANALYSIS AND REVIEW

### *SURVEY DATA ENTRY AND ANALYSIS*

All data were coded for data entry by Division of Subsistence staff during field work. Surveys were reviewed by project staff in each community for consistency. Responses were coded following standardized conventions used by the Division of Subsistence to facilitate data entry. Information Management staff within the Division of Subsistence set up database structures within Microsoft SQL Server at ADF&G in Anchorage to hold the survey data. The database structures included rules, constraints, and referential integrity to ensure that data were entered completely and accurately. Data entry screens were available on a secured Internet site. Daily incremental backups of the database occurred, and transaction logs were backed up hourly. Full backups of the database occurred twice weekly. This ensured that no more than 1 hour of data entry would be lost in the unlikely event of a catastrophic failure. All survey data were entered twice and each set compared in order to minimize data entry errors.

Once data were entered and confirmed, information was processed with the use of Statistical Package for the Social Sciences (SPSS) software<sup>13</sup>, version 21. Initial processing included the performance of standardized logic checks of the data. Logic checks are often needed in complex data sets where rules, constraints, and referential integrity do not capture all of the possible inconsistencies that may appear. Harvest data collected as numbers of animals, or in gallons or buckets, were converted to pounds usable weight using standard factors (see Appendix C for conversion factors).

ADF&G staff also used SPSS for analyzing the survey information. Analysis included review of raw data frequencies, cross tabulations, table generation, estimation of population parameters, and calculation of confidence intervals for the estimates. Missing information was dealt with on a case-by-case basis according to standardized practices, such as minimal value substitution or using an averaged response for similarly-characterized households. Typically, missing data are an uncommon, randomly-occurring phenomenon in household surveys conducted by the division. In unusual cases where a substantial amount of survey information was missing, the household survey was treated as a “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

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

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

where:

$$\bar{h}_i = \frac{h_i}{n_i} \text{ (mean harvest per returned survey)}$$

$H_i$  = the total harvest (numbers of resource or pounds) for the community  $I$ ,

$h_i$  = the total harvest reported in returned surveys,

$n_i$  = the number of returned surveys, and

$S_i$  = the number of households in a community.

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

Relative precision of the mean (CL%):

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

where:

$S$  = sample standard deviation,

$n$  = sample size,

$N$  = population size, and

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

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

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

## ***POPULATION ESTIMATES AND OTHER DEMOGRAPHIC INFORMATION***

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

There may be several reasons for the differences among the population estimates for each community generated from the division’s surveys and other demographic data developed by the 2010 federal census (U.S. Census Bureau 2011), the U.S. Census Bureau’s American Community Survey (U.S. Census Bureau n.d.), and the Alaska Department of Labor and Workforce Development (ADLWD n.d.). Sampling of households, depending on when surveys are conducted or eligibility criteria for inclusion in the survey, may explain differences in the population estimates. As will be seen in the community-specific results, seasonal employment is prevalent in rural communities. The extent to which this seasonal employment translates into seasonal occupancy, or seasonal occupancy for other reasons, may explain some of these differences depending on the presence or lack thereof of those households during the survey time.

## ***MAP DATA ENTRY AND ANALYSIS***

ADF&G IM staff checked maps for consistency with data recorded on the survey forms. They also removed extraneous marks from the maps to ensure the digitizing process would occur with minimal error. The map design included tick marks, similar to registration marks, used to pinpoint geographical features and thus provide accuracy during the digitizing process. Each map could then be aligned by the staff who digitized the polygons, points, and lines that researchers had drawn by hand on the paper maps during the interviews. The final wild resource harvest area maps included in this report were produced by ADF&G Division of Subsistence staff. Maps were reviewed at a community review meeting to ensure accuracy as well as identify any data the community wanted kept confidential.

## ***NETWORK ANALYSIS***

A “network” section of the survey asked households to document who harvested and processed the resources that the household used, even if household members did not harvest the resources themselves. It also asked household members to document which households or other communities

gave resources to their household. In this way, data analyzed from the network module provide a graphic representation of resource distribution webs by community.

### ***FOOD SECURITY***

A “food security” section of the survey used a standard national questionnaire to assess whether or not the household had enough food to eat, whether from subsistence sources or from market sources. The protocol used in this survey was a modified version of the 12-month food security scale questionnaire developed by the U.S. Department of Agriculture (USDA). This questionnaire is administered nationwide each year as part of the annual Current Population Survey (CPS). In 2007, approximately 125,000 U.S. households were interviewed, including 1,653 in Alaska (Nord et al. 2008). From CPS data, the USDA prepares an annual report on food security in the United States.

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

For this study, the food security protocol was modified by the addition of several questions designed to determine whether food insecurities, if any, were related to subsistence foods or store-bought foods. Additionally, the wording of some questions was changed slightly. As in Brazil (Pérez-Escamilla et al. 2004), the USDA term “balanced meals” was difficult to interpret for indigenous Alaska populations, and was replaced with the term “healthy meals” to reflect unique dietary and cultural circumstances in rural Alaska.

### ***COMMUNITY REVIEW MEETINGS***

ADF&G staff presented preliminary survey findings and associated search area and harvest maps at a meeting in each community. In Manley Hot Springs, the traditional council and the Manley Hot Springs community association assisted in organizing the community review meeting by posting flyers and opening the building. The community review meeting was held at the community hall on November 22, 2013, and approximately 12 community residents attended. The review went well and the community participants discussed specific data points; other concerns are described in more detail in chapter 2 “Manley Hot Springs.”

In Minto, Bessie Titus organized a community review meeting on October 14, 2013. The meeting

was publicized through flyers; approximately 9 community residents attended the meeting at the Minto Lakeview Lodge. At the review meeting, community residents expressed particular interest in the ethnographic portion of the report. The council was optimistic that this report would help them protect subsistence uses in the future. Comments and concerns are discussed in the section “Local Comments and Concerns” at the end of chapter 3 “Minto.”

Upon completion of draft chapters presenting community survey results, ADF&G provided copies to the study communities for their review and comment. After receipt of comments, the report was finalized and ADF&G mailed a short, 4-page summary of the study findings to every mailbox holder in the 2 study communities.

## **Final Report Organization**

This report summarizes the results of systematic household surveys, key respondent interviews, and use area mapping conducted by staff from ADF&G as well as LRAs, and the report also summarizes resident feedback provided at community review meetings. The findings are organized by study community. Each chapter includes tables and figures that report findings on demographic characteristics, employment characteristics, characteristics of resource harvests and uses—including the sharing of wild foods—and other topics such as food security, household self-assessments of use, and also harvest and use trends over time. Additionally, qualitative information gathered through key respondent interviews and researchers’ notes made during interviews is incorporated in each chapter. All key respondents interviews were transcribed and then analyzed, along with interview notes, in preparation for this report.

Maps depicting hunting, trapping, fishing, and gathering areas used by each community in 2012 are included in individual chapters. The final chapter of the report provides a short, general overview of the harvests and uses of wild resources in the study communities.

With regard to the 2012 harvest and use data in each chapter, the content is consistent in each chapter because the data are based on the survey instrument; however, there are differences among the chapters in terms of documenting historical trends because each community has a different history of subsistence harvesting practices and not all communities have had past comprehensive harvest surveys upon which to base comparisons. Minto had a comprehensive harvest survey completed for 1983–1984 and a modified comprehensive survey that focused on a limited set of resource categories for 2004, while Manley Hot Springs households only participated in the modified comprehensive survey for 2004. Both communities have participated in limited scope surveys such as annual subsistence salmon harvest monitoring or migratory bird surveys.

The 2 community-specific results chapters each begin with a brief synopsis of the data types collected followed by a description of the community's history and a description of its contemporary community. Each chapter then goes on to detail the data collected from the subsistence harvest surveys and key respondent interviews that highlight community demographic characteristics, employment and income characteristics of the community, harvest quantities and composition, sharing of resources, and harvest area trends over time. Each results chapter concludes with a comparison of this study's findings to earlier studies, which also forms the basis for the "Discussion and Conclusions" chapter of this report. Finally, the chapters provide a summary of concerns that local residents shared regarding wild resources collected during the surveys, key respondent interviews, and through feedback given by the community at the review meeting held to share preliminary survey results and harvest area maps with local residents.

Several appendices round out this report. Readers will find a copy of the survey instrument, ethnographic protocol, and the conversion factors used in data analysis in appendices A, B, and C, respectively. Appendix D contains additional tables described in the community survey results chapters but not included in the chapters themselves. Finally, Appendix E contains community-specific lists of place names used in each community chapter to aid in understanding of mapped information and descriptions provided by community residents. Appendix E also contains a short list of residents' comments collected from surveys conducted in Manley Hot Springs. Relevant comments documented on the Minto surveys are incorporated into the chapter 3 "Minto."

## 2. Manley Hot Springs

*Lisa J. Slayton*

In February 2013, ADF&G researchers surveyed 41 of 58 households (71%) in Manley Hot Springs (Table 1-2). This chapter summarizes findings from the household surveys, including demographic characteristics, responses to harvest assessment questions, harvest estimates, and also employment, income, and food security estimates for 2012. Harvest numbers are expanded estimates. Additional tables appear in Appendix D2. Results from this survey are available online in the Division of Subsistence Community Subsistence Information System (CSIS<sup>1</sup>).

In addition to the 2013 comprehensive survey, 6 ethnographic interviews were conducted with 7 active subsistence users: a married couple who were active in dog sledding competitions and used fur, bone, and wood for crafts; 2 single males; a rural Alaska (“bush”) pilot and his wife (who also used fur for crafts); and Gladys Dart, a female member of the Bean Ridge Corporation who was at the time of the survey the current and long-time owner of the Manley Hot Springs bath and greenhouse. These ethnographic interviews provide context for the quantitative data presented in this chapter. Findings from these interviews, historical background information, and comparisons to earlier studies are presented throughout the chapter.

### **Community Background**

The community of Manley Hot Springs is located on the Alaska road system at the terminus of the Elliott Highway, approximately 160 road miles west of Fairbanks. Most residents live approximately 5 miles north of the Tanana River near the banks of Hot Springs Slough (Figure 2-1). The Elliott Highway, completed for year-round use in 1959, runs through the community and terminates at the Tanana River at “The Landing.” The Tanana River Landing serves as a boat launching area for fishing, recreation, and transportation but lacks a docking facility. As a consequence, barge service is only occasionally provided during summer months. The State-owned gravel aircraft runway, built in 1938, operates year-round.<sup>2</sup> A new State-owned gravel runway, located approximately one-half mile from the original runway (constructed in 1938), was completed in 2013 and also operates year-round. Baker Creek drains the immediate area of the community. Facilities at Manley Hot

1. ADF&G CSIS: <http://www.adfg.alaska.gov/sb/CSIS>.

2. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. “Alaska Community Database Online: Community Information.” Accessed 2013–2014. <http://commerce.alaska.gov/cra/DCRAExternal/community>



ADCCED Division of Community and Regional Affairs, "Alaska Community Database Online: Community Information."

*Figure 2-1.– Manley Hot Springs welcome sign.*

Springs include a public school, the Gladys Dart School (completed in 1980<sup>3</sup>), a health care clinic, a washeteria, a post office, a small library, the Manley Trading Post (which sells groceries, gas, liquor, and gifts year-round), a privately-owned hot springs and greenhouse complex, 2 public campgrounds, a small number of independent businesses, and the Manley Roadhouse and Bar (open in summer months only). The local economy is a mixed cash-and-subsistence economy based on a wide variety of small business and government employment, and hunting, fishing, and gardening. TDX Manley

Generating, LLC, provides electricity. Most residents haul water from a well house located 1 mile east of town on the Elliott Highway, but some local facilities and businesses use private wells.<sup>4</sup> The community of Minto and the Minto Flats State Game Refuge lie to the east of the community.

Manley Hot Springs has a cold, continental climate. In the summer, the high average temperature is upper 50°F with minimum temperatures during winter ranging from –6 to –21°F. Average annual precipitation is approximately 15 in, with 59 in of snowfall.<sup>5</sup> The community has a history of flooding, with one of the worst in its history occurring in May 1956. Other notable floods occurred in 1961, 1962, and 1982. A portion of



ADF&G Staff

*Figure 2-2.– Manley Hot Springs in winter. Photo taken from bridge over the slough with view into downtown Manley Hot Springs.*

3. Clara J. Mayo. April 28, 1993. *Manley Hot Springs Community Profile*. Tanana Chiefs Conference, Inc., Planning and Development.

4. 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 2013–2014. <http://commerce.alaska.gov/cra/DCRAExternal/community>

5. 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 2013–2014. <http://commerce.alaska.gov/cra/DCRAExternal/community>

Hot Springs Slough, which runs through the community, is ice free year-round due to spring-heated water flowing from Karshner Creek (Sattler and Jordan 1986), which is a more recent change (Figure 2-2). In the past, the slough would typically be frozen in winter from the mouth of Karshner Creek to the confluence of the slough with the Tanana River due to cold water flowing in from the Tanana River. When the current of the Tanana River changed from the north bank to the south bank in this area sometime in the late 1940s to the early 1960s, the river channel started cutting into the mouth of the slough and constricting the flow of cooler water. Consequently, the water level in the slough decreased and the temperature of the water increased. At the turn of the 20th century higher water levels allowed most steamboats to push barges as far as the Northern Commercial Company located in “downtown” Manley Hot Springs (Yarber and Madison 1985).

Manley Hot Springs is home to 2 community non-profit organizations; the Manley Hot Springs Crafters Guild and the Manley Hot Springs Community Association. The community is governed by the Manley Hot Springs Community Association and the Manley Traditional Council (an entity of the federally recognized Athabascan tribe Manley Hot Springs Village). It is also represented by the Bean Ridge Native Corporation, which has offices located in Fairbanks. Manley Hot Springs is located on land now owned by Doyon Limited, Inc., the regional Native corporation.

A wide variety of subsistence resources are available to Manley Hot Springs residents within a diverse environment that includes the boreal forest, treeless bogs, alpine tundra, and open, low-growing spruce forests (Viereck and Little Jr. 1972:15). Table 1-1 identifies Linnaean taxonomic names for the species used by Manley Hot Springs residents. Salmon species available include Chinook or “king” salmon, summer and fall chum salmon, and coho salmon. Nonsalmon fish species include rainbow and lake trout, Dolly Varden, burbot, Arctic grayling, and northern pike. Several whitefish species, including sheefish, are also available. In addition to sheefish, broad whitefish, least cisco, and humpback whitefish are the most prevalent of the whitefishes available. Large land mammals include moose, brown and black bears, and occasionally caribou. Several furbearers, such as beavers, lynx, red foxes, martens, wolves, minks, red squirrels, muskrats, snowshoe hares, river otters, wolverines, and coyotes are found in the area. Porcupines and weasels/ermine are also present. Spruce, ruffed, and sharp-tailed grouse, and rock and willow ptarmigans are available year-round. Migratory birds available seasonally include several duck species, geese (both Canada geese and greater white-fronted geese), and sandhill cranes. There are many types of berries such as blueberries, cranberries, strawberries, and raspberries that are seasonally available. Edible plants, such as mushrooms, wild rhubarb, wild rose hips, Hudson’s Bay (Labrador) tea, and other wild greens are available seasonally as well. The areas surrounding the thermal springs are particularly lush with vegetation.

## PREHISTORY

Documented prehistory of Manley Hot Springs is limited, but Holmes (1973) and Schledermann and Olson (1969) offer information about archaeological findings in the lower Tanana River region. Four small-scale archaeological testing expeditions in the lower Tanana River region, including the Minto Flats area in the 1960s and 1970s, produced surface and subsurface artifacts such as lithic (stone) tools, flakes and points, and organic material. However, none of the organic material collected was radiocarbon dated. The Alaska Museum of the North (at the University of Alaska Fairbanks) houses several small collections of artifacts donated by residents of Manley Hot Springs at various times over the years. Most of these artifacts—including lithic flakes of chert and obsidian, a stone bowl, 2 whetstones, and stone tool fragments—were found in the plow zone of contemporary gardens near the thermal springs and on the surface of the old airstrip (Sattler and Jordan 1986). In 1985, Robert Sattler of Tanana Chiefs Conference (TCC), the regional nonprofit corporation that provides a wide variety of services to Interior Alaska communities, conducted an archeological survey. Testing occurred around the thermal springs, selected sites along Hot Springs Slough, and at the confluence of Baker Creek and the Tanana River. While several sites produced lithic remains, nothing conclusive could be stated about the prehistory of the area. In their summary, Sattler and Jordan (1986) state that while the historical record in Manley Hot Springs is rich, the prehistory remains obscure. They postulate that the historical occupation of the area, which includes extensive mining and agriculture, might explain the lack of prehistoric remains. They conclude, “Nevertheless, the sum of private and donated artifact collections from the region are typologically varied and suggest respectable prehistoric time depth in the lower Tanana River region” (Sattler and Jordan 1986:36). Archaeology in the Tanana drainage in general has shown prehistoric occupations extending back to the Late Pleistocene era, around 8,500 B.C. (Andrews 1977).

Manley Hot Springs is located within the Yukon–Koyukon Athabascan region (Andrews 1977:61). (See Appendix E for place name histories for locations used throughout this chapter.) During the late prehistoric and early historical period, Koyukon Athabascan-speaking peoples migrated into the area; some traveled via the Kantishna, Toklat, Zitziana, and Cosna rivers (Kari 1999:25; VanStone and Goddard 1981:560). Like other Interior Athabascans, they organized themselves into small bands, living a semi-nomadic life centered on the year-round and seasonal pursuit of subsistence resources within discreet band territories (Andrews 1988:20; Clark 1981:585; Hosley 1981a:540). Semi-permanent settlements existed along or near the Tanana River, hunting camps were strategically situated throughout the area, and summer fish camps were located along the Tanana River (Andrews 1977). According to Andrews (1977) moose were the primary target in early fall. In late fall to mid-December, group caribou hunting occurred near caribou fences or surrounds.<sup>6</sup>

6. Wallace M. Olson, “Minto, Alaska: cultural and historical influences on group identity” (master’s thesis, University of Alaska, 1968).

People continued hunting moose and caribou throughout the winter until late spring. Birds and small game were hunted throughout the winter as well. Spring was the primary time to trap beavers and muskrats for subsistence food and fur. As the numerous lakes in the area began to thaw, waterfowl became abundant during their annual spring migrations.<sup>7</sup> In the early summer people moved to their established fish camps along small rivers or along the Tanana River proper (Andrews 1977).

There is scant ethnographic information concerning past thermal springs use by Alaska Natives in general. However, those that do exist refer not only to therapeutic and spiritual uses (Book et al. 1983; Lund 1995), but also to the subsistence uses of hot springs. Sun and Libbey (1983) transcribed an interview with Joe Sun, a Shungnak elder, who described a process of using hot springs to thaw frozen furbearing mammals harvested by trapping so as to prepare them for skinning. While it is quite possible that early Native Alaskans in the area used the Manley thermal springs for various reasons, finding conclusive archaeological evidence of prehistoric use may not be possible due to the intensive and repeated man-made changes to the landscape over the years. Sattler and Jordan (1986) stated that the top of a prominent knoll overlooking the main thermal spring along Karshner Creek was leveled in the 1950s to construct an extensive greenhouse and baths. In addition, prior to the 1950s, Manley Hot Springs was the site of large-scale agriculture, and at the turn of the 20th century, served as the main supply center for intensive tin and gold mining activity.

Evidence of earlier historical use of the thermal springs is shown by the presence of “tubs” of rocks found in various places in Karshner Creek by Gladys Dart and her husband Charles “Chuck” Dart when they first bought the springs in the early 1950s. A key respondent stated that her mother remembered going to the thermal springs when she was a child, and that Alaska Natives from Tanana would take people who were sick to “soak” in the waters at Manley Hot Springs (02242013MAN05).

## HISTORY

A brief history of Manley Hot Springs provides historical context for data on land use and subsistence through time. (See Appendix E for place name histories for locations used throughout this chapter.) A component of the early subsistence economy in the area was trade, first between regional bands and other Alaska Native groups at trading centers such as Nuklakayet (at present-day Tanana), and later with Russian and British traders on their arrival beginning in the 1830s and 1840s (Betts 1997:12). The arrival of the Russian and British traders, and later the American settlement in the late 1860s, altered the dynamics of seasonal trapping and the existing regional fur trade. Some of the adaptations to trapping patterns after contact with Euro-Americans included targeting an increased variety of furbearers, trapping animals primarily for their pelts rather than

7. Wallace M. Olson, “Minto, Alaska: cultural and historical influences on group identity” (master’s thesis, University of Alaska, 1968).

for food, increasing late winter and spring trapping activities, adopting a more individual approach to trapping areas and traplines, and increasing efficiency with the introduction of steel traps and rifles around 1850 (Hosley 1981a:544). Another adaptation to the changing fur trade was the use of dog teams for pulling sleds. Prior to contact with Euro-Americans, dogs were used for packing and hunting (Andersen 1992:5). With the use of dog teams for trapping and pulling sleds, the need to fish for dog food increased (Andersen 1992:7). The need for dog food in turn led to further subsistence adaptations, this time concerning fishing practices. The use of the fish wheel, a highly effective gear type introduced by Euro-Americans on the Tanana and Yukon rivers in the first decade of the 20th century (Hosley 1981b), substantially increased the number of fish caught, making it easier for people to harvest the fish they needed to sustain their dog teams. The efficiency of the fish wheel also made it possible to harvest a surplus of fish to use for exchange.

In 1867, people in the Tanana River region began moving closer to newly established trading posts, including ones at present-day Tanana and Rampart. The centralization of bands at trading posts increased dramatically during the gold rush period, resulting in drastic changes to the traditional subsistence cycle (Hosley 1981b:549). In the summer of 1893 or 1894, John Minook of Rampart, an Alaskan of mixed Russian and Athabascan heritage, discovered traces of gold on a stream between Rampart and Manley Hot Springs that later became known as Little Minook Creek (L'Ecuyer 1997:5). In the fall of 1894 several prospectors began staking claims along the creek. In 1896, a group of miners created the Rampart Mining District and passed formal bylaws. One of the bylaws stated that, “no Indian except John Minook should hold or represent ground in the district” (L'Ecuyer 1997:5). Hunt (1990:176) stated, “With a few exceptions such as John Minook, the discoverer of the Rampart gold fields, Alaska Natives did not participate directly in prospecting and mining in this area in the early days. They chopped wood, fished, and hunted for the miners in exchange for trade goods.” With the establishment of the Rampart Mining District, the gold rush to the area began in earnest. In 1899, gold was discovered on Eureka and Pioneer creeks, and within a couple of years miners from the trading post community of Rampart and the surrounding area streamed into the hills north of what would later become Manley Hot Springs. Mining began on area creeks and mining settlements and supply points, such as Sullivan City (later renamed Tofty), sprang up seemingly overnight. Around this time, a small mining supply and service center named Baker—for the “Baker Boys,” prospectors from Boston who first discovered gold on Eureka Creek—was developed near the mouth of Baker Creek a few miles from Manley Hot Springs.

By 1902, Manley Hot Springs had become the primary supply center for the mining district (Smith et al. 2011). That year a prospector and former Kansas farmer named John Karshner staked a 278-acre homestead around the natural thermal spring (Figure 2-3) and began clearing the land for cultivation. A businessman, Frank G. Manley, locally known as “the mining magnate of Fairbanks,” wasted

no time in adding (by lease at \$30,000)<sup>8</sup> the thermal springs to his large holdings of gold claims in what was then occasionally referred to as Baker Creek country (L'Ecuyer 1997). Manley constructed a large hotel in 1907 in what is now the “downtown” area of Manley Hot Springs and began advertising his “Hot Springs Resort Hotel” (Figure 2-4). This resort hotel consisted of a large 4-story building with 45 guest rooms, steam heat, electric lights, hot baths, a restaurant, a billiard room, a bowling alley, a barber shop, and an Olympic-size indoor pool that used heated water from the thermal springs.<sup>9</sup>

As a result, 1902 was a year of rapid growth for the new community. In addition to the development of the thermal springs and cultivation of the surrounding land, a U.S. telegraph maintenance station was constructed by the Washington–Alaska Military Cable and Telegraph System (WAMCATS) crew, and the Alaska Road Commission began developing a network of dirt roads to accommodate the various local mines and settlements. One such road was the Tofty Road, which connected the mining camps in that area to the new community. The community continued to grow and prosper in the early 1900s



Howard Henry Collection,  
University of Alaska Fairbanks Archives

*Figure 2-3.— John F. Karshner, original owner of the thermal hot springs, circa 1907.*



Howard Henry Collection,  
University of Alaska Fairbanks Archives

*Figure 2-4.— Original Manley Hotel and Bathhouse with front porch under construction, circa 1907.*

as several businesses were established, including a bakery, clothing stores, an Alaska Commercial Company store, a hospital, and 2 local newspapers. Figure 2-5 shows Manley Hot Springs as a prosperous and growing community in 1907. As gold production increased in the area, it soon became its own mining district and began to be referred to as the Hot Springs District around 1906–1907 (Ellsworth 1910:239). By 1910, an estimated 500 people lived in Manley

8. John Robert Dart. 2010. “Manley Hot Springs history, part 2: 1902–agriculture.” Dart-AM, LLC. <http://www.manleyhotspring-produce.com/agriculture.html> (Accessed 2012.)

9. 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 2013–2014. <http://commerce.alaska.gov/cra/DCRAExternal/community>



Howard Henry Collection,  
University of Alaska Fairbanks Archives

*Figure 2-5.— Manley Hot Springs, circa 1907. View is north across the slough and includes Manley Hotel and Bathhouse, Northern Commercial Company Store and warehouses, and the stables.*



University of Alaska Fairbanks Archives

*Figure 2-6.— Hay fields, Manley Hot Springs, circa 1900.*



Anchorage Museum of History and Art

*Figure 2-7.— Manley Hot Springs crops, circa 1896–1913.*

Hot Springs.<sup>10</sup> As the area experienced a surge in population and in sled dog use for transportation of goods between mining settlements and camps, and for hauling the mail, the need for dried fish to feed the dogs increased even more. As elsewhere in the lower Tanana River area, several Alaska Native families continued to cut cord wood for steamboats traveling on the Tanana River and Hot Springs Slough, and to sell or barter fish (mostly dried and bailed salmon), furs, and other wild resources to the miners (Betts 1997). On May 23, 1908, the *Hot Springs Echo*, a local newspaper, reported, “One Indian brought in 139 ducks and geese killed within 48 hours. They found ready market.”<sup>11</sup> During this time period (and continuing through the 1950s) Alaska Native families at the mouth of Baker Creek, and the Tolovana, Cosna, and the Kantishna rivers, began relocating to the Manley Hot Springs area.

Manley Hot Springs has a long history of agricultural endeavors. Agriculture first developed in Manley Hot Springs as a direct result of gold prospecting and gold mining, and it has played a large role in the development of Manley Hot Springs ever since.<sup>12</sup> In 1902, John Karshner began cultivating

10. 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 2013–2014. <http://commerce.alaska.gov/cra/DCRAExternal/community>

11. George Hinton Henry and George A. Salisbury, editors, *Hot Springs Echo*, May 23, 1908.

12. John Robert Dart. 2010. “Manley Hot Springs history, part 2: 1902–agriculture.” Dart-AM, LLC.

hay and oats for horses and vegetables for the growing human population (Figure 2-6). Crops included peas, turnips, potatoes, cucumbers, pumpkins, beans, and lettuce (Figure 2-7). By 1904, Karshner had 3-1/2 acres cultivated and was selling his produce to local miners as well as to mining camps in the Fairbanks and Iditarod mining districts.<sup>13</sup> On September 14, 1907, one of the town newspapers reported, “From ‘Dad’ Karshner we learn that the potato crop will run from 150 to 200 tons” (Figure 2-8).<sup>14</sup> In the early 1900s, agricultural experimental grain plots were located in Manley Hot Springs as part of the University of Alaska Fairbanks’ Rampart area Agricultural Experimental Station research program (Gasser 1998).



University of Alaska Fairbanks Archives

*Figure 2-8.—Harvesting carrots in one of John Karshner’s fields.*



John Dart

*Figure 2-9.—Dart’s famous tomatoes in greenhouse heated with thermal spring water flowing through underground pipes.*



John Dart

*Figure 2-10.—Gladys Dart’s greenhouse and baths.*

Manley Hot Springs continues small-scale agriculture through greenhouse businesses and private vegetable gardening. The Dart greenhouses have sold or bartered vegetables in the communities since the mid-1950s. Bartering salmon, berries, and other wild resources for free access to the indoor baths at the hot springs or vegetables from the Dart greenhouses continues to be a long-standing, community wide tradition in Manley Hot Springs (Figure 2-9; Figure 2-10).

There are a number of other significant dates and time periods in the history of Manley Hot Springs. In 1907, a post office was established, and the community was officially named Hot Springs. By 1913, the Manley Hotel had been destroyed by fire and Frank Manley had left Baker Creek country.<sup>15</sup> Also, around this time the gold mining industry began to decline in the area and

<http://www.manleyhotspringsproduce.com/agriculture.html> (Accessed 2014.)

13. John Robert Dart. 2010. “Manley Hot Springs history, part 2: 1902–agriculture.” Dart-AM, LLC.

<http://www.manleyhotspringsproduce.com/agriculture.html>. (Accessed 2012-2013.)

14. George Hinton Henry and George A. Salisbury, editors, Hot Springs Echo, Sept. 14, 1907.

15. John Robert Dart. 2010. “Manley Hot Springs history, part 2: 1902–agriculture.” Dart-AM, LLC.

<http://www.manleyhotspringsproduce.com/agriculture.html>. (Accessed 2012-2013.)



Lisa J. Slayton

*Figure 2-11.— Steve O'Brien conducting a survey with Gladys Dart at her home.*

the population decreased (L'Ecuyer 1997). During the late 1920s the community increased in use again as a home base by local trappers, prospectors, miners, and woodcutters. According to long-time resident Stanley Dayo:

In the 20s' [sic] [1920s] was when trappers really made big money. About '25 to 29' [sic] through there. When the depression hit [in 1929], the bottom went out of the market. Fur was so high before that people were starting fur farms. Foxes were worth a lot of money. Guys would go find fox dens in the spring when they were having their young and dig them out. They sold them to fur farmers who raised them. (Yarber and Madison 1985:41)

Both Native and non-Native residents trapped and sold furs, dried fish, and cut wood for the stores, mines, and steamers at this time (Betts 1997). In the 1920s and 1930s, the town had a roadhouse, Tim Willard's fox farm, Luke Isaacson's mink ranch, a Northern Commercial Company store and warehouse, a sawmill, horse stable, silo, hay and grain fields, and several additional businesses. A territorial school called "Hot Springs School" ran from 1924 to 1925 (Barnhardt 1985). The first airfield was constructed in 1938. During the 1940s the advent of World War II and subsequent stoppage of gold mining drained the area of its population once again.

Many changes occurred in Manley Hot Springs in the 1950s. According to local residents, during the 1950s there was an increase in Alaska Native families moving to the community (Betts 1997:87). Gladys Dart and her husband Chuck Dart moved to Manley Hot Springs and purchased the thermal springs in 1955. The thermal springs were still owned and managed by Gladys Dart in 2012 (Figure

2-11). Gladys Dart was the only school teacher in 1956, which was “the year of the big flood.” A larger school was constructed in the community in 1958. Prior to that (from 1956–1958), school was taught by Gladys Dart in a 1-room building on the Dart property. Immediately after the flood of 1956, the Northern Commercial Company store closed. In 1957, the name of the community was changed to Manley Hot Springs by the postmaster.<sup>16</sup>

Wildfires are an ongoing agent of change in the area. Large forest fires in 1968–1969 changed the ecology of many subsistence locations around Manley Hot Springs. Subsistence users at that time adapted to the changes by using different areas or shifting their subsistence focus to different species. Wildfires are common occurrences that require attention from local residents. According to 1 household, small fires consistently flare up around the Mooseheart Lake area due to ongoing smoldering fires beneath the moss layer.

In the 1970s and 1980s, commercial fishing for salmon became lucrative. The number of fish wheels increased during these years, and 2 fish processing plants were established in the community. A key respondent noted:

One of the big things that happened on this river [Tanana River]—first of all, a commercial fishery developed. There were was one fish plant, and then another guy started a fish plant. So it went from essentially little or no fishing, at least from what I saw, to [a] tremendous amount of fishing. And then, they made it legal to sell subsistence salmon eggs for, I think 2 years. ... the main thing was just the take went up astronomically, and I think it killed this run on the Tanana here for 20 years. (02242013MAN03)

In addition to changes in commercial fishing throughout Manley Hot Spring’s history, land ownership and use issues arose throughout the history of the community as development and settlement entry increased. In 1915, the first meeting of the “Tanana Chiefs,” a group of Athabascan leaders, with judge James Wickersham marked the beginning of ownership, land use, and accompanying subsistence issues (Betts 1997). This group of leaders spoke with Judge Wickersham in opposition to the creation of a reservation system on their lands. They also stated that Euro-Americans were guests on the land, and must behave as respectful guests (Tanana Tribal Council 2000). In 1971, the Bean Ridge Native Corporation was formed after the Alaska Native Claims Settlement Act (ANCSA) of 1971.<sup>17</sup> Conveyed corporation lands included areas adjacent to the community approximately from Overland Bluff on the Elliott Highway (Baker Creek Bridge), to

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16. Clara J. Mayo. April 28, 1993. Manley Hot Springs Community Profile. Tanana Chiefs Conference, Inc., Planning and Development.

17. 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 2013–2014. <http://commerce.alaska.gov/cra/DCRAExternal/community>

the Tanana River, including Baker Creek on the east and Bean Ridge on the west; and both sides of the Tanana River from near Junction Island to a few miles downstream of the mouth of Hot Springs Slough (Manley Hot Springs Land Use Planning Committee 1991). This conveyance initially did not appear to affect the subsistence pursuits of residents until the early 2000s, when a conflict arose concerning wood cutting (specifically birch trees) on corporation lands by a community person who was not a corporation member. Subsequently, the Bean Ridge Corporation restricted use of all corporation lands to corporation members only. Some long-time community residents who were not corporation members felt that the corporation was unfairly restricting their use of historical hunting and fishing areas. As a result of the restrictions, as will be seen in the “Use and Harvest Characteristics” section of this chapter, subsistence uses of these areas dropped over a period of years. However, as of 2012, conflict over the woodcutting issues appears to have diminished, and the Bean Ridge Corporation is again allowing limited subsistence uses of its lands for corporation non-member local residents. According to several residents, feelings of trust and cooperation between members and non-members are once again growing.

## **Seasonal Round**

The contemporary harvest periods of subsistence resources for Manley Hot Springs occur throughout the year and follow a seasonal pattern dictated by the natural annual cycles of the local flora and fauna (Betts 1997). Spring is always welcome since it brings with it the beginning of a new annual cycle of subsistence pursuits, which include gathering, fishing, hunting, and trapping. Typically, most trapping activities began in late fall and extended into March. One respondent stated that his favorite time to be out trapping is in spring:

There’s nothing like a clear March day to be out on a beaver trapline. It’s very inspiring. You get these just absolutely magnificent clear March days, you know it’s probably facing into the sun, maybe 40 degrees, and back here on the back side of your head it might be about zero. It’s just very exhilarating. (02222013MAN02)

By mid-April the spring migrations of waterfowl arrive and bears emerge from their dens. In May, after the breakup of ice on the rivers and streams, nets are set for whitefishes. Northern pike and Arctic grayling are fished for at this time by rod and reel. In the summer months of June, July, and August, the primary subsistence activity is salmon fishing. This begins with a Chinook (king) salmon run in June. Many Manley Hot Springs residents set up fishing operations at this time, primarily on the Yukon River near the Rampart “Rapids” located approximately 40 miles upriver of the community of Tanana. Later in the summer and early fall, residents tend to fish closer to home on the Tanana

River (Betts 1997). Nonsalmon fish are harvested throughout the summer with rod and reel, and are also caught incidentally in nets and fish wheels while fishing for salmon. Plants, mushrooms, and berries are harvested throughout the summer and into the fall as they become available. Fall activities include continued berry picking and fishing. In September, the main subsistence activity is moose hunting. Additional activities include bear, grouse, ptarmigan, and waterfowl hunting. The fall waterfowl migrations are hunted more extensively than are the spring migrations. One respondent spoke of his fall subsistence activities:

In terms of bird hunting I go out every year and I try to get a bunch of grouse, which I take the breasts out and eat myself, and then get [use] the rest for marten bait. It actually is an important activity that I have, you know, so I go out and try to get myself 20–30 grouse every fall. (02242013MAN03)

After freeze-up, residents ice fish for northern pike on frozen creeks and lakes. In winter, residents trap, ice fish, hunt moose, and cut firewood. During the 2012 seasonal round, Manley Hot Springs households searched for and harvested subsistence resources in an area consisting of 781 square miles.

## **Demography**

The 41 Manley Hot Springs households surveyed by ADF&G staff in 2013 included 87 residents (Table 2-1). Household sizes ranged from 1 to 6 persons, with an average of 2 persons per household. The average age of residents was 42; the oldest person was 88. On average, residents had lived in Manley Hot Springs approximately 16 years. In a departure from most rural communities, the majority of household heads were born either in urban areas of Alaska, such as Fairbanks (10%), or in another state (75%) (Appendix Table D2-1). Only 5% were born in Manley Hot Springs. Expanding for the 17 unsurveyed households, the estimated population in 2012 was 123 residents (54% male, 46% female) (Table 2-1; Figure 2-12). The total estimated population of 123 included 57 females and 67 males (Figure 2-12), with self-identified Alaska Natives accounting for 24% (14 households) of total households (Table 2-1).

The population in Manley Hot Springs is, and always has been, dynamic. Like many communities in Alaska, the population of Manley Hot Springs has experienced cycles of “boom and bust” based primarily on the waxing and waning of the gold mining industry. In 1910, at the zenith of the major gold mining period, the local population for the community was estimated to be around 500, although the population for the entire area that used the community as a “home base” (including Tofty, Eureka, and Woodchopper Creek) was said to be in the thousands (L’Ecuyer 1997; Yarber and Madison 1985). Ten years later, in 1920, after World War I and the decline of gold mining, the

Table 2-1.— Demographic characteristics, Manley Hot Springs, 2012.

Characteristics	Community Manley Hot Springs
<b>Sample achievement</b>	
Sampled households	41
Eligible households	58
Percentage sampled	70.7%
Sampled population	87
Estimated population	123.1
<b>Household size</b>	
Mean	2.1
Minimum	1
Maximum	6
<b>Age</b>	
Mean	42.2
Minimum	1
Maximum	88
Median	51
<b>Sex</b>	
Estimated male	
Number	66.5
Percentage	54.0%
Estimated female	
Number	56.6
Percentage	46.0%
<b>Length of residency</b>	
Population	
Mean	16.1
Minimum	1
Maximum	58
Household heads	
Mean	19.5
Minimum	1
Maximum	58
<b>Alaska Native</b>	
Estimated households	
Number	14.1
Percentage	24.4%
Estimated population	
Number	28.3
Percentage	23.0%

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

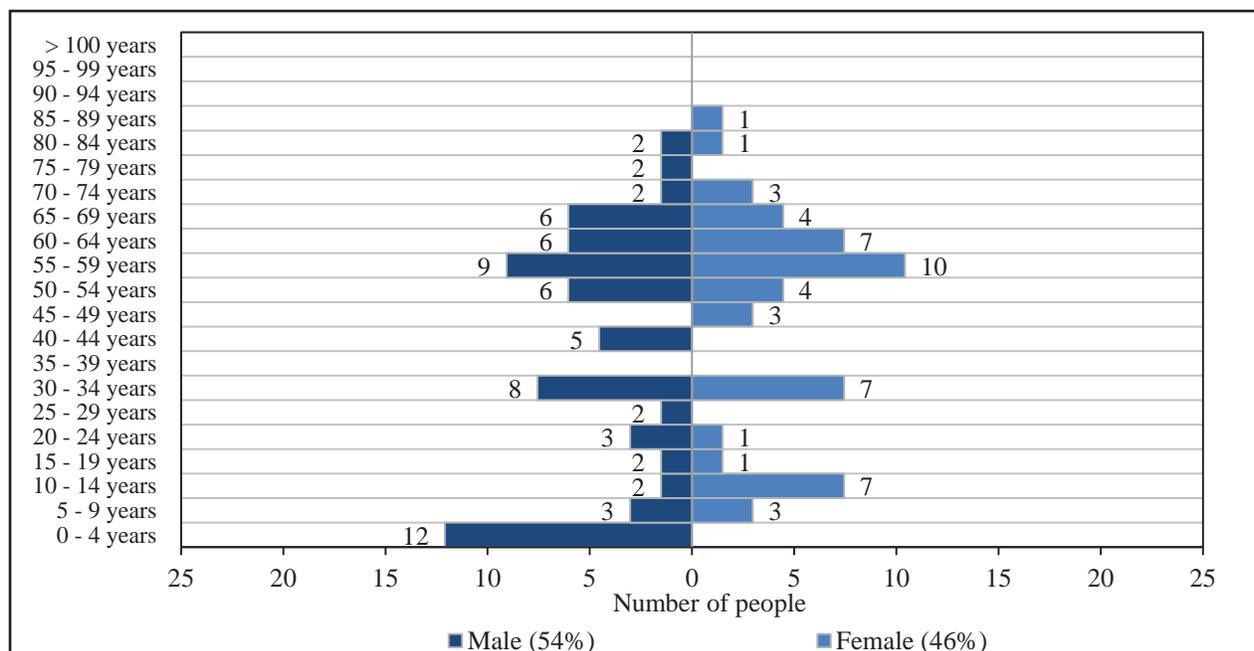


Figure 2-12.— Population profile, Manley Hot Springs, 2012.

population was a mere 29.<sup>18</sup> The community population increased in the late 1920s with increased fur trapping opportunities, and again in the 1930s when a trail from Manley Hot Springs to the mining community of Eureka became a graded road and gold mining jobs/activities increased. At that time, the Hot Springs District was reportedly “the busiest mining camp on the Tanana River.” (L’Ecuyer 1997:145). When Stanley Dayo first settled in Manley Hot Springs around 1935–1936, the majority of people lived in the area surrounding the community rather than in the community itself. Stanley Dayo remembered:

When I first came to Manley there were a lot of people in the area, but they lived out of town. Not many more here then than there is right now. In the winter there might be a few more, but like Woodchopper, Tofty, and Eureka had a lot of people, too. Manley was just for supplies. That’s all. Supplies would come in here by boat, and all the miners came in for it. Woodchopper and American Creek. There was people all over, you know. And then there was a lot of people living along the river. Trappers, Whites, and Natives come in for their supplies. There was at least a few hundred people depended on this place all the time. I imagine there must have been probably three or four hundred people through the area then. (Yarber and Madison 1985:44–45)

With the advent of World War II in the 1940s, Manley Hot Springs once again experienced a

18. 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 2013–2014. <http://commerce.alaska.gov/cra/DCRAExternal/community>

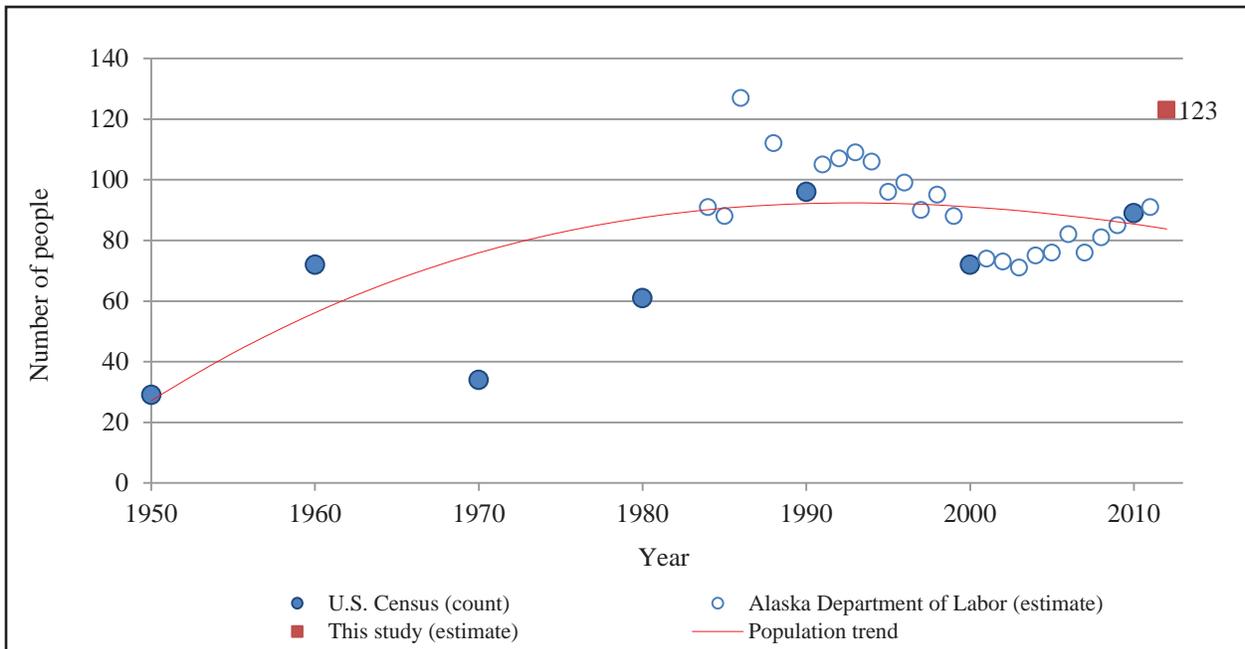


Figure 2-13.— Historical population estimates, Manley Hot Springs, 1950–2012.

marked decrease in population as gold mining was curtailed. The population began to increase once again in the early 1950s. Gladys Dart, who was a key respondent for this survey effort, described the population of Manley Hot Springs from 1958 to 1979:

Since ‘58 [1958], there has been a steady increase in population and buildings. I’m pleased to say there are a lot more young people around now, too. During our 27-year involvement with Manley the character has changed 3 or 4 times. When we first came here [1956] it was primarily old miners and childless couples, which then changed to a few families with children when the school started. Then a number of young people in their early 20s moved in. It wasn’t long before the population became as it is now—young couples with children who are staying and raising families. (Yarber and Madison 1983:68)

While mining still occurs in outlying areas, it no longer drives the population of Manley Hot Springs. Some residents today view their town as a “retirement” community. Several current residents are seasonal, maintaining winter homes in Fairbanks, other areas of Alaska, and in other states, while spending summers at their homes in Manley Hot Springs. The overall population today is a mix of Alaska Native and non-Natives of all ages. Some elderly residents have spent most of their lives in the community. Many non-Native adults moved to the community in the 1970s and 1980s to pursue a rural way of life. This is reflected in the number of people between the ages of 50 to 69, which creates the “top heavy” appearance of the population profile (see Figure 2-12) of the community. In addition, during the 1980s the state’s open-to-entry land disposals brought many

new people (mostly non-Natives) to outlying areas around Manley Hot Springs. Many of the Native families have moved back to Manley Hot Springs after some years of absence.<sup>19</sup>

For population comparisons, the U.S. Census Bureau in 2010 reported a total population of 89 people residing in 41 households in Manley Hot Springs, including 40 females and 49 males; 26 (25%) were self-identified Alaska Natives (alone or in combination with other races) and 77 (75%) were non-Native.<sup>20</sup> The Alaska Native population in Manley Hot Springs has increased over the past 23 years. The population trend from 1950 to 2012 is shown in Figure 2-13. During fieldwork for this study, several residents expressed their belief that the U.S. Census figures for past years were low and did not necessarily reflect the true population of the area, particularly during the peak years early in the 20th century.

## **Income and Jobs**

Respondents for this survey were asked about both earned income (jobs held and wages earned by all household members 16 years and older) and unearned income (e.g., Alaska Permanent Fund dividend, Social Security, public assistance, etc.). For 2012, Manley Hot Springs households earned or received an estimated total of \$2,414,344, of which \$1,954,454 was from wage employment and \$459,891 was from other income sources (Table 2-2). The average household income for Manley Hot Springs in 2012 was \$41,627 and the average per capita income was \$19,629. Chuck Dart described employment opportunities in the 1980s:

There are some jobs that open up here every once in a while. The only full-time, year round work is the postmaster's job. The three highway positions are for a six-month period. The school teacher has a nine month position and now Gladys and Damaris split the school year, it's only four and a half months each. The gold mines operate about six months and there is work for some there. There's fishing and work at the fish processing plants of J.L. Wood and Bill Taylor. Sometimes an exploration crew comes in here and will hire a few people. Some people are self-employed, but they have small operations that don't hire outside the family. (Yarber and Madison 1983:77)

A respondent for this survey described the employment situation in 2012:

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19. 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 2013–2014. <http://commerce.alaska.gov/cra/DCRAExternal/community>

20. 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 2013–2014. <http://commerce.alaska.gov/cra/DCRAExternal/community>

Table 2-2.— Estimated earned and other income, Manley Hot Springs, 2012.

Income source	Number of people	Number of households	Total for community	Mean per household <sup>a</sup>	Percentage of total <sup>b</sup>
<b>Earned income</b>					
Local government	28.3	21.8	\$604,143	\$10,416	25.0%
Construction	15.6	13.1	\$603,168	\$10,399	25.0%
Transportation, communication, and utilities	5.7	5.8	\$252,117	\$4,347	10.4%
Services	15.6	13.1	\$161,472	\$2,784	6.7%
Mining	4.2	2.9	\$110,071	\$1,898	4.6%
State government	1.4	1.5	\$72,847	\$1,256	3.0%
Agriculture, forestry, and fishing	11.3	11.6	\$43,183	\$745	1.8%
Manufacturing	2.8	2.9	\$37,263	\$642	1.5%
Federal government	4.2	4.4	\$36,279	\$625	1.5%
Retail trade	5.7	4.4	\$33,911	\$585	1.4%
<b>Earned income subtotal</b>	<b>79.7</b>	<b>53.7</b>	<b>\$1,954,454</b>	<b>\$33,697</b>	<b>81.0%</b>
<b>Other income</b>					
Social Security		17.0	\$156,914	\$2,705	6.5%
Pension/retirement		17.0	\$125,684	\$2,167	5.2%
Alaska Permanent Fund dividend		52.3	\$88,185	\$1,520	3.7%
Unemployment		11.3	\$48,269	\$832	2.0%
Supplemental Security income		1.4	\$8,912	\$154	0.4%
Native corporation dividend		12.7	\$8,797	\$152	0.4%
Meeting honoraria		1.4	\$8,488	\$146	0.4%
Energy assistance		7.1	\$8,145	\$140	0.3%
Food stamps		4.2	\$3,966	\$68	0.2%
Longevity bonus		2.8	\$2,175	\$38	0.1%
Adult public assistance		2.8	\$213	\$4	0.0%
Child support		1.4	\$71	\$1	0.0%
Other		1.4	\$71	\$1	0.0%
Workers' compensation/insurance		0.0	\$0	\$0	0.0%
Disability		0.0	\$0	\$0	0.0%
Veterans assistance		0.0	\$0	\$0	0.0%
Foster care		0.0	\$0	\$0	0.0%
Citgo fuel voucher		0.0	\$0	\$0	0.0%
<b>Other income subtotal</b>		<b>58.0</b>	<b>\$459,891</b>	<b>\$7,929</b>	<b>19.0%</b>
<b>Community income total</b>			<b>\$2,414,344</b>	<b>\$41,627</b>	<b>100.0%</b>

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

a. The mean is calculated using the total number of households in the community, not the number of households for this income category.

b. Income by category as a percentage of the total community income from all sources (wage-based income and non-wage-based income.)

There's no jobs, that's the thing here, there's no employment for people. But that is the biggest thing too, 'cause when we first moved here [in 1974] there was no jobs either but people subsisted enough that it really wasn't a big problem. And now, people need money more than we used to. (02212013MAN06)

This respondent went on to say:

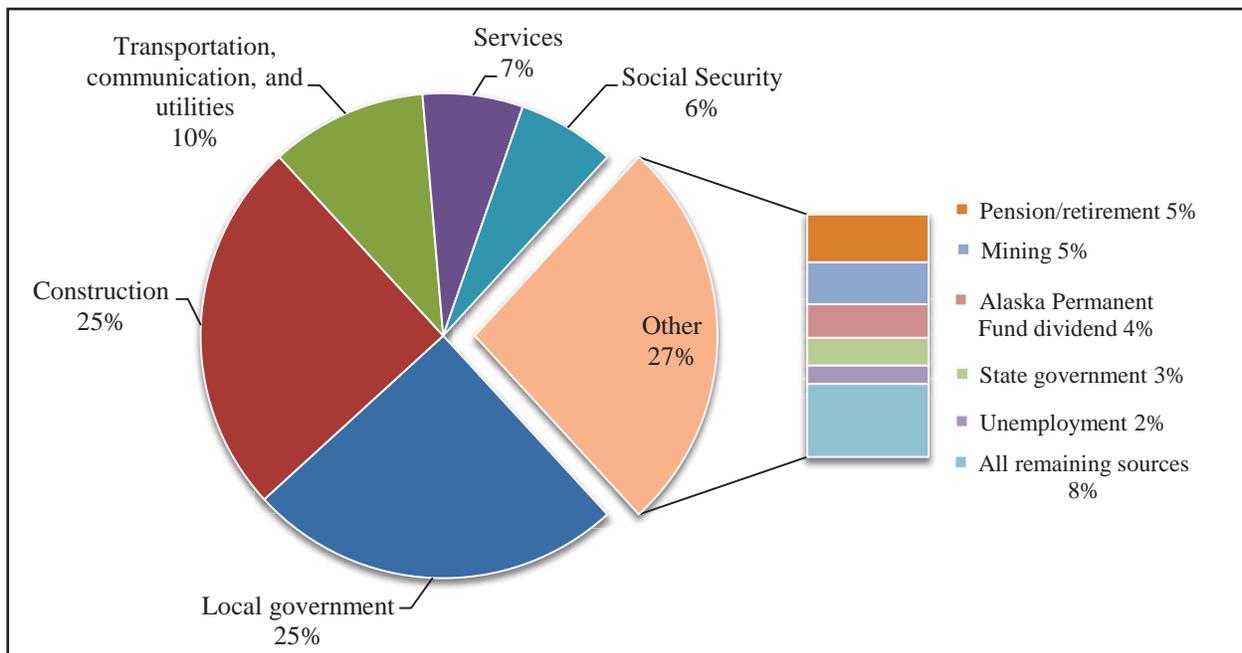


Figure 2-14.— Top 10 income sources, Manley Hot Springs, 2012.

Table 2-3.— Reported job schedules, Manley Hot Springs, 2012.

Schedule	Jobs		Employed persons		Employed households	
	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	61.7	57.7%	54.2	67.9%	37.7	70.3%
Part-time	36.1	33.8%	28.6	35.8%	24.7	45.9%
Shift	1.5	1.4%	1.5	1.9%	1.5	2.7%
On-call (occasional)	7.5	7.0%	7.5	9.4%	7.3	13.5%
Part-time shift	0.0	0.0%	0.0	0.0%	0.0	0.0%
Schedule not reported	0.0	0.0%	0.0	0.0%	0.0	0.0%

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

I would say [that] one of the biggest changes that I can see, is the fact that we can't live out here without money anymore, without an income ... even though we do everything we can to live off the land. And, that's true of almost everybody in town [Manley Hot Springs], we all subsist to a certain point. (02212013MAN06)

Figure 2-14 shows the top 10 income sources ranked by estimated contribution to total income in 2012. Local government (\$604,143) and construction (\$603,168) composed the largest portion of the earned income category (Table 2-2); together those industries constituted 50% of the total earned income for the community in 2012 (Figure 2-14). Local government employment consisted primarily of public school and tribal government jobs. According to several households, the contributions from construction jobs were higher than usual due to construction of a new community runway and

Table 2-4.— Employment characteristics, Manley Hot Springs, 2012.

Characteristic	Community Manley Hot Springs
<b>All adults</b>	
Number	95.9
Mean weeks employed	32.0
<b>Employed adults</b>	
Number	79.7
Percentage	83.2%
Jobs	
Number	106.8
Mean	1.3
Minimum	1
Maximum	3
Months employed	
Mean	8.9
Minimum	1
Maximum	12
Percentage employed year-round	45.3%
Mean weeks employed	38.4
<b>Households</b>	
(Total) number	58
Employed	
Number	53.7
Percentage	92.5%
Jobs per employed household	
Mean	1.9
Minimum	1
Maximum	4
Employed adults	
Minimum	1
Maximum	4
Mean	1
Employed households	1.5
Total households	1.4
Mean person-weeks of employment	55.0

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

ongoing road improvements. Other important earned income sources were jobs for transportation, communications, and utilities (10% of total income), services (7% of total income), and mining (5% of total income) (Table 2-2; Figure 2-14). Most jobs were full-time (62) or part-time (36) while 8 were on-call (Table 2-3). Two jobs were shift work. The number of employed adults in 2012 was 80 with a mean of 2 jobs per employed household (Table 2-4). In the category of “other income,” Social Security was the largest contributor to community income at \$156,914 (7%), followed by pension and retirement income at \$125,684 (5%) (Table 2-2). In 2012, 8 Manley Hot Springs residents were reported as “retired,” while 11 reported receiving some kind of retirement or Social Security income but did not consider themselves fully retired. This is markedly different from other rural communities where the Alaska Permanent Fund is often the primary source of unearned income. Income from the Alaska Permanent Fund in Manley Hot Springs for 2012 was \$88,185, or 4% of the total income for the community.

## **Household Harvest and Use Patterns of Wild Resources**

Appendix Table D2-2 summarizes resource harvest and use characteristics for Manley Hot Springs in 2012 at the household level. All households (100%) used wild resources in 2012, while 98% attempted to harvest or harvested resources. The average household harvest was 904 lb edible weight or 426 lb per capita. During the study year, households harvested an average of 9 kinds of resources and used an average of 14 kinds of resources. The maximum number of resources used by any household was 30. In addition, demonstrating the importance of sharing, households gave away an average of 3 kinds of resources and 71% of households reported sharing resources with other households. According to most households, moose and salmon in particular were frequently shared. Elders, single-parent households, and others in need were usually the first recipients of shared subsistence foods.

Figure 2-15 shows by resource category how many households used, attempted to harvest, or harvested wild foods. In a departure from many rural communities, most Manley Hot Springs households used (100%), attempted to harvest (98%) and harvested (95%) vegetation. This was more than any other subsistence resource. To understand this, one need only look at the land use history of the community with its historical focus on agriculture, personal gardening, and extensive gathering. Many residents continue to garden, and to gather wild vegetation such as mushrooms, medicinal plants, and greens. Bartering and sharing these resources was common.

Ninety-three percent of households reported using salmon while 27% harvested and 34% attempted to harvest salmon. Eighty percent of households reported using nonsalmon fish species while 39%

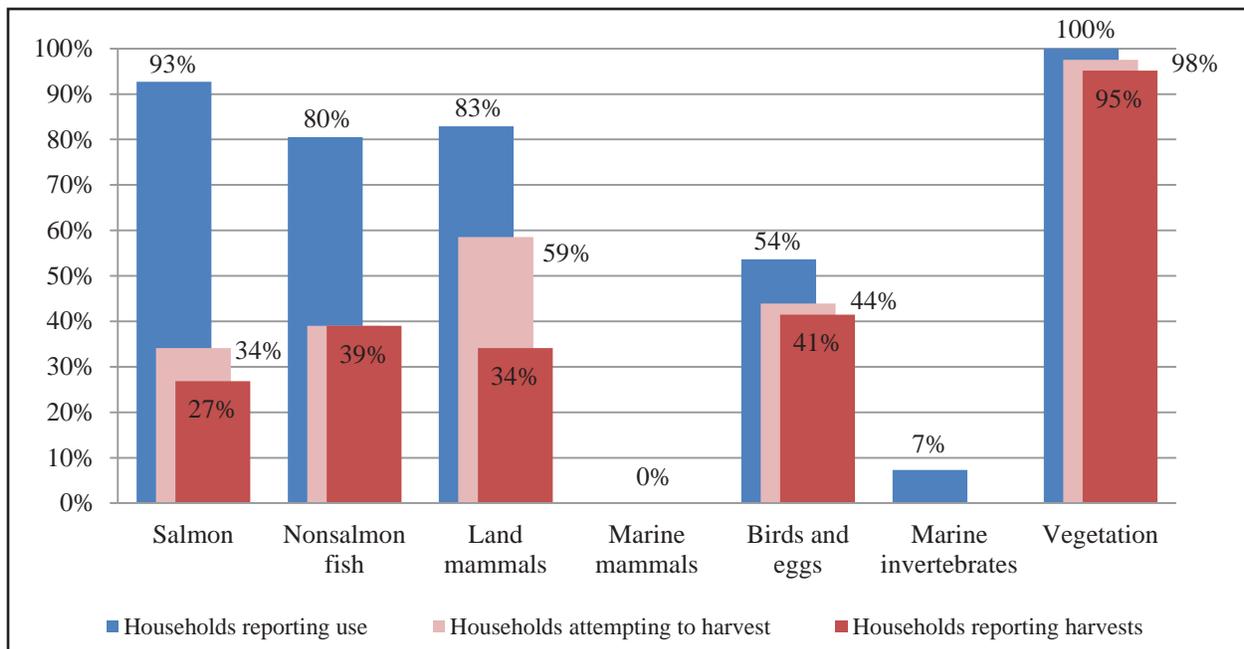


Figure 2-15.— Percentages of household using, attempting to harvest, or harvesting wild resources, by category, Manley Hot Springs, 2012.

reported both attempting to harvest and harvesting nonsalmon fish. Land mammals were used by 83% of households and harvested by 34%, while 59% attempted harvest. Households in 2012 used (54%), harvested (41%), and attempted to harvest (44%) birds and eggs. While marine invertebrates such as crabs were received and used by 7% of households, there was no harvest within the community. This likely indicates existing sharing or bartering relationships with people in other communities.

## Harvest Quantities and Composition

Tables 2-5 through 2-10 report estimated wild resource harvests and uses by Manley Hot Springs residents in 2012; each table represents a resource category and is organized by species. All edible resources are reported in pounds usable weight (see Appendix C for conversion factors<sup>[21]</sup>). The estimated harvest includes resources harvested by any member of the surveyed household during the study year. The use data include all resources taken, given away, or used by any member of a household, and resources acquired from other harvesters, either as gifts, by barter or trade, or through hunting partnerships. Purchased foods are not included but resources such as firewood are included because they are an important part of the subsistence way of life in Interior Alaska. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

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

Table 2-5.— Estimated use and harvest of fish, Manley Hot Springs, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup> harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
<b>Fish</b>										
<b>Salmon</b>										
Summer chum salmon	17.1%	12.2%	12.2%	4.9%	9.8%	3,548.8 lb	61.2 lb	28.8 lb	707.3 ind	± 57%
Fall chum salmon	22.0%	9.8%	7.3%	14.6%	7.3%	14,443.4 lb	249.0 lb	117.4 lb	2,878.8 ind	± 74%
Unknown chum	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Coho salmon	39.0%	12.2%	12.2%	26.8%	9.8%	11,858.2 lb	204.5 lb	96.4 lb	1,834.8 ind	± 73%
Chinook salmon	80.5%	29.3%	19.5%	68.3%	29.3%	12,958.1 lb	223.4 lb	105.3 lb	978.9 ind	± 53%
Pink salmon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Sockeye salmon	29.3%	2.4%	2.4%	26.8%	9.8%	212.2 lb	3.7 lb	1.7 lb	35.4 ind	± 109%
Salmon roe	2.4%	0.0%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown salmon	7.3%	2.4%	0.0%	7.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>92.7%</b>	<b>34.1%</b>	<b>26.8%</b>	<b>80.5%</b>	<b>39.0%</b>	<b>43,020.6 lb</b>	<b>741.7 lb</b>	<b>349.6 lb</b>	<b>6,435.2 ind</b>	<b>± 61%</b>
<b>Char</b>										
Dolly Varden	2.4%	2.4%	2.4%	0.0%	0.0%	1.3 lb	0.0 lb	0.0 lb	1.4 ind	± 109%
Lake trout	7.3%	0.0%	0.0%	7.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>9.8%</b>	<b>2.4%</b>	<b>2.4%</b>	<b>7.3%</b>	<b>0.0%</b>	<b>1.3 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>1.4 ind</b>	<b>± 109%</b>
<b>Trout</b>										
Rainbow trout	7.3%	2.4%	2.4%	4.9%	0.0%	79.2 lb	1.4 lb	0.6 lb	56.6 ind	± 109%
<b>Subtotal</b>	<b>7.3%</b>	<b>2.4%</b>	<b>2.4%</b>	<b>4.9%</b>	<b>0.0%</b>	<b>79.2 lb</b>	<b>1.4 lb</b>	<b>0.6 lb</b>	<b>56.6 ind</b>	<b>± 109%</b>
<b>Whitefishes</b>										
Sheefish	22.0%	17.1%	14.6%	14.6%	9.8%	509.3 lb	8.8 lb	4.1 lb	84.9 ind	± 57%
Broad whitefish	12.2%	9.8%	7.3%	4.9%	2.4%	537.6 lb	9.3 lb	4.4 lb	134.4 ind	± 67%
Bering cisco	4.9%	4.9%	2.4%	2.4%	2.4%	594.1 lb	10.2 lb	4.8 lb	424.4 ind	± 109%
Least cisco	9.8%	7.3%	4.9%	4.9%	2.4%	141.5 lb	2.4 lb	1.1 lb	353.7 ind	± 90%
Humpback whitefish	26.8%	12.2%	9.8%	17.1%	2.4%	717.9 lb	12.4 lb	5.8 lb	410.2 ind	± 77%
Round whitefish	2.4%	4.9%	2.4%	0.0%	0.0%	7.1 lb	0.1 lb	0.1 lb	7.1 ind	± 109%
Unknown whitefishes	4.9%	0.0%	0.0%	4.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>43.9%</b>	<b>22.0%</b>	<b>19.5%</b>	<b>34.1%</b>	<b>12.2%</b>	<b>2,507.4 lb</b>	<b>43.2 lb</b>	<b>20.4 lb</b>	<b>1,414.6 ind</b>	<b>± 72%</b>
<b>Anadromous/marine fish</b>										
Pacific herring	2.4%	0.0%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Lingcod	2.4%	2.4%	2.4%	0.0%	0.0%	5.7 lb	0.1 lb	0.0 lb	1.4 ind	± 109%
Pacific halibut	24.4%	2.4%	2.4%	22.0%	2.4%	135.8 lb	2.3 lb	1.1 lb	4.2 lb	± 109%
Arctic lamprey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Yelloweye rockfish	2.4%	2.4%	2.4%	0.0%	0.0%	6.4 lb	0.1 lb	0.1 lb	4.2 ind	± 109%
<b>Subtotal</b>	<b>24.4%</b>	<b>2.4%</b>	<b>2.4%</b>	<b>22.0%</b>	<b>2.4%</b>	<b>147.8 lb</b>	<b>2.5 lb</b>	<b>1.2 lb</b>		<b>± 109%</b>
<b>Other freshwater fish</b>										
Alaska blackfish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Burbot	17.1%	12.2%	12.2%	7.3%	2.4%	101.9 lb	1.8 lb	0.8 lb	42.4 ind	± 75%
Arctic grayling	7.3%	2.4%	2.4%	4.9%	0.0%	24.8 lb	0.4 lb	0.2 lb	35.4 ind	± 109%
Northern pike	39.0%	29.3%	29.3%	17.1%	7.3%	1,018.0 lb	17.6 lb	8.3 lb	363.6 ind	± 65%
Longnose sucker	2.4%	2.4%	2.4%	0.0%	0.0%	14.1 lb	0.2 lb	0.1 lb	7.1 ind	± 109%
<b>Subtotal</b>	<b>46.3%</b>	<b>29.3%</b>	<b>29.3%</b>	<b>26.8%</b>	<b>7.3%</b>	<b>1,158.7 lb</b>	<b>20.0 lb</b>	<b>9.4 lb</b>	<b>448.4 ind</b>	<b>58%</b>
<b>All fish</b>	<b>97.6%</b>	<b>46.3%</b>	<b>46.3%</b>	<b>90.2%</b>	<b>43.9%</b>	<b>46,915.1 lb</b>	<b>808.9 lb</b>	<b>381.2 lb</b>		<b>± 52%</b>
<b>All resources</b>	<b>100.0%</b>	<b>97.6%</b>	<b>97.6%</b>	<b>92.7%</b>	<b>70.7%</b>	<b>52,437.6 lb</b>	<b>904.1 lb</b>	<b>426.1 lb</b>		<b>± 44%</b>

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

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

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

Table 2-6.— Estimated use and harvest of land and marine mammals, Manley Hot Springs, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup>	
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	harvested by community	95% conf. limit
<b>Land mammals</b>										
<b>Large land mammals</b>										
Black bear	12.2%	9.8%	2.4%	9.8%	2.4%	82.0 lb	1.4 lb	0.7 lb	1.4 ind	± 109%
Brown bear	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Caribou	24.4%	0.0%	0.0%	24.4%	4.9%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Deer	4.9%	0.0%	0.0%	4.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Moose	68.3%	56.1%	9.8%	61.0%	24.4%	2,546.3 lb	43.9 lb	20.7 lb	5.7 ind	± 53%
<b>Subtotal</b>	<b>78.0%</b>	<b>56.1%</b>	<b>12.2%</b>	<b>70.7%</b>	<b>29.3%</b>	<b>2,628.4 lb</b>	<b>45.3 lb</b>	<b>21.4 lb</b>	<b>7.1 ind</b>	<b>± 46%</b>
<b>Small land mammals</b>										
Beaver	17.1%	9.8%	9.8%	10.0%	7.3%	65.3 lb	1.1 lb	0.5 lb	16.0 ind	± 67%
Coyote	7.3%	7.3%	7.3%	0.0%	0.0%	<i>Not usually eaten.</i>			2.9 ind	± 75%
Red fox	14.6%	14.6%	14.6%	0.0%	0.0%	<i>Not usually eaten.</i>			18.9 ind	± 62%
Snowshoe hare	12.2%	12.2%	9.8%	5.0%	0.0%	14.9 lb	0.3 lb	0.1 lb	7.4 ind	± 76%
River (land) otter	9.8%	7.3%	7.3%	2.4%	0.0%	<i>Not usually eaten.</i>			4.4 ind	± 80%
Lynx	17.1%	17.1%	17.1%	0.0%	0.0%	6.1 lb	0.1 lb	0.0 lb	34.8 ind	± 51%
Marmot	0.0%	0.0%	0.0%	0.0%	0.0%	<i>Not usually eaten.</i>			0.0 ind	± 0%
Marten	22.0%	22.0%	22.0%	0.0%	0.0%	<i>Not usually eaten.</i>			191.4 ind	± 61%
Mink	12.2%	12.2%	12.2%	2.4%	0.0%	<i>Not usually eaten.</i>			7.3 ind	± 55%
Muskrat	2.4%	2.4%	0.0%	0.0%	0.0%	<i>Not usually eaten.</i>			0.0 ind	± 0%
Porcupine	4.9%	7.3%	4.9%	0.0%	0.0%	13.1 lb	0.2 lb	0.1 lb	2.9 ind	± 108%
Arctic ground (parka) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Red (tree) squirrel	2.4%	2.4%	2.4%	2.4%	0.0%	17.0 lb	0.3 lb	0.1 lb	34.0 ind	± 109%
Flying squirrel	2.4%	2.4%	2.4%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	1.4 ind	± 109%
Weasel	12.2%	12.2%	12.2%	0.0%	2.4%	<i>Not usually eaten.</i>			31.9 ind	± 80%
Gray wolf	7.3%	7.3%	4.9%	2.4%	0.0%	<i>Not usually eaten.</i>			7.3 ind	± 108%
Wolverine	4.9%	4.9%	4.9%	0.0%	0.0%	<i>Not usually eaten.</i>			2.9 ind	± 108%
<b>Subtotal</b>	<b>34.1%</b>	<b>34.1%</b>	<b>29.3%</b>	<b>17.1%</b>	<b>9.8%</b>	<b>116.3 lb</b>	<b>2.0 lb</b>	<b>0.9 lb</b>	<b>363.3 ind</b>	<b>± 43%</b>
<b>Marine mammals</b>										
<i>No activities surrounding marine mammals in Manley Hot Springs, 2012.</i>										
<b>Subtotal</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 ind</b>	<b>± 0%</b>
<b>All land mammals</b>	<b>82.9%</b>	<b>58.5%</b>	<b>34.1%</b>	<b>75.6%</b>	<b>34.1%</b>	<b>2,744.6 lb</b>	<b>47.3 lb</b>	<b>22.3 lb</b>	<b>370.3 ind</b>	<b>± 42%</b>
<b>All marine mammals</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 ind</b>	<b>± 0%</b>
<b>All resources</b>	<b>100.0%</b>	<b>97.6%</b>	<b>97.6%</b>	<b>92.7%</b>	<b>70.7%</b>	<b>52,437.6 lb</b>	<b>904.1 lb</b>	<b>426.1 lb</b>		<b>± 44%</b>

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

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

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

Table 2-7.— Estimated use and harvest of birds, Manley Hot Springs, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup> harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
<b>Migratory birds</b>										
<b>Ducks</b>										
Goldeneye	2.4%	2.4%	2.4%	0.0%	0.0%	2.3 lb	0.0 lb	0.0 lb	2.8 ind	± 109%
Mallard	17.1%	12.2%	9.8%	7.3%	0.0%	21.2 lb	0.4 lb	0.2 lb	21.2 ind	± 62%
Long-tailed duck	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Northern pintail	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Scaup	2.4%	2.4%	2.4%	0.0%	0.0%	2.5 lb	0.0 lb	0.0 lb	2.8 ind	± 109%
Black scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Surf scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
White-winged scoter	2.4%	2.4%	2.4%	0.0%	0.0%	16.2 lb	0.3 lb	0.1 lb	7.1 ind	± 109%
Northern shoveler	2.4%	2.4%	2.4%	0.0%	0.0%	3.1 lb	0.1 lb	0.0 lb	2.8 ind	± 109%
Unknown teal	2.4%	2.4%	2.4%	0.0%	0.0%	1.4 lb	0.0 lb	0.0 lb	2.8 ind	± 109%
American wigeon	2.4%	2.4%	2.4%	0.0%	0.0%	5.6 lb	0.1 lb	0.0 lb	4.2 ind	± 109%
<b>Subtotal</b>	<b>22.0%</b>	<b>14.6%</b>	<b>9.8%</b>	<b>12.2%</b>	<b>0.0%</b>	<b>52.3 lb</b>	<b>0.9 lb</b>	<b>0.4 lb</b>	<b>43.9 ind</b>	<b>± 67%</b>
<b>Geese</b>										
Canada goose	9.8%	4.9%	0.0%	9.8%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Snow goose	0.0%	2.4%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
White-fronted goose	7.3%	4.9%	2.4%	4.9%	4.9%	23.8 lb	0.4 lb	0.2 lb	9.9 ind	± 109%
Unknown geese	0.0%	2.4%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>12.2%</b>	<b>7.3%</b>	<b>2.4%</b>	<b>9.8%</b>	<b>4.9%</b>	<b>23.8 lb</b>	<b>0.4 lb</b>	<b>0.2 lb</b>	<b>9.9 ind</b>	<b>± 109%</b>
<b>Other migratory birds</b>										
Unknown swan	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Sandhill crane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown shorebirds—small	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown shorebirds—large	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown gull	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown loon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Arctic tern	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 ind</b>	<b>± 0%</b>
<b>Other birds</b>										
Unknown grouse	46.3%	41.5%	39.0%	14.6%	9.8%	195.1 lb	3.4 lb	1.6 lb	278.7 ind	± 35%
Unknown ptarmigan	2.4%	4.9%	2.4%	0.0%	0.0%	1.4 lb	0.0 lb	0.0 lb	2.8 ind	± 109%
<b>Subtotal</b>	<b>46.3%</b>	<b>41.5%</b>	<b>39.0%</b>	<b>14.6%</b>	<b>9.8%</b>	<b>196.5 lb</b>	<b>3.4 lb</b>	<b>1.6 lb</b>	<b>281.5 ind</b>	<b>± 35%</b>
<b>All migratory birds</b>	<b>22.0%</b>	<b>14.6%</b>	<b>9.8%</b>	<b>17.1%</b>	<b>4.9%</b>	<b>76.1 lb</b>	<b>1.3 lb</b>	<b>0.6 lb</b>	<b>53.8 ind</b>	<b>± 64%</b>
<b>All other birds</b>	<b>46.3%</b>	<b>41.5%</b>	<b>39.0%</b>	<b>14.6%</b>	<b>9.8%</b>	<b>196.5 lb</b>	<b>3.4 lb</b>	<b>1.6 lb</b>	<b>281.5 ind</b>	<b>± 35%</b>
<b>All resources</b>	<b>100.0%</b>	<b>97.6%</b>	<b>97.6%</b>	<b>92.7%</b>	<b>70.7%</b>	<b>52,437.6 lb</b>	<b>904.1 lb</b>	<b>426.1 lb</b>		<b>± 44%</b>

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

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

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

Table 2-8.— Estimated use and harvest of bird eggs, Manley Hot Springs, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup> harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
<b>Bird eggs</b>										
White-winged scoter eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown duck eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Canada goose eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown geese eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown small shorebird eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown large shorebird eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Mew gull eggs	4.9%	4.9%	4.9%	0.0%	0.0%	7.6 lb	0.1 lb	0.1 lb	25.5 ind	± 81%
Unknown gull eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown loon eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Murre eggs	2.4%	0.0%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown eggs	2.4%	0.0%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>9.8%</b>	<b>4.9%</b>	<b>4.9%</b>	<b>4.9%</b>	<b>0.0%</b>	<b>7.6 lb</b>	<b>0.1 lb</b>	<b>0.1 lb</b>	<b>25.5 ind</b>	<b>± 81%</b>
<b>All birds and eggs</b>	<b>53.7%</b>	<b>43.9%</b>	<b>41.5%</b>	<b>29.3%</b>	<b>12.2%</b>	<b>280.2 lb</b>	<b>4.8 lb</b>	<b>2.3 lb</b>	<b>360.7 ind</b>	<b>± 31%</b>
<b>All resources</b>	<b>100.0%</b>	<b>97.6%</b>	<b>97.6%</b>	<b>92.7%</b>	<b>70.7%</b>	<b>52,437.6 lb</b>	<b>904.1 lb</b>	<b>426.1 lb</b>		<b>± 44%</b>

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

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

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

Table 2-9.— Estimated use and harvest of marine invertebrates, Manley Hot Springs, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup> harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
<b>Marine invertebrates</b>										
Razor clams	2.4%	0.0%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Unknown clams	2.4%	0.0%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
King crab	2.4%	0.0%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Tanner crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Mussels	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Shrimp	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
<b>Subtotal</b>	<b>7.3%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>7.3%</b>	<b>0.0%</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>		<b>± 0%</b>
<b>All marine invertebrates</b>	<b>7.3%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>7.3%</b>	<b>0.0%</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>		<b>± 0%</b>
<b>All resources</b>	<b>100.0%</b>	<b>97.6%</b>	<b>97.6%</b>	<b>92.7%</b>	<b>70.7%</b>	<b>52,437.6 lb</b>	<b>904.1 lb</b>	<b>426.1 lb</b>		<b>± 44%</b>

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

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

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

Table 2-10.— Estimated use and harvest of vegetation, Manley Hot Springs, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup> harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
<b>Berries</b>										
Blueberry	78.0%	65.9%	61.0%	26.8%	26.8%	953.5 lb	16.4 lb	7.7 lb	238.4 gal	± 28%
Lowbush cranberry	75.6%	65.9%	61.0%	19.5%	19.5%	650.7 lb	11.2 lb	5.3 lb	162.7 gal	± 23%
Highbush cranberry	29.3%	26.8%	26.8%	4.9%	4.9%	90.2 lb	1.6 lb	0.7 lb	22.5 gal	± 41%
Crowberry	9.8%	12.2%	9.8%	4.9%	0.0%	14.5 lb	0.3 lb	0.1 lb	3.6 gal	± 63%
Currants	4.9%	4.9%	4.9%	0.0%	0.0%	7.1 lb	0.1 lb	0.1 lb	1.8 gal	± 90%
Nagoonberry	4.9%	4.9%	4.9%	0.0%	0.0%	31.1 lb	0.5 lb	0.3 lb	7.8 gal	± 100%
Raspberrry	65.9%	65.9%	63.4%	7.3%	7.3%	220.3 lb	3.8 lb	1.8 lb	55.1 gal	± 21%
Salmonberry	14.6%	12.2%	12.2%	9.8%	4.9%	62.2 lb	1.1 lb	0.5 lb	15.6 gal	± 53%
Strawberry	2.4%	2.4%	2.4%	0.0%	0.0%	2.8 lb	0.0 lb	0.0 lb	2.8 gal	± 109%
Other wild berry	2.4%	2.4%	2.4%	0.0%	0.0%	11.3 lb	0.2 lb	0.1 lb	2.8 gal	± 109%
<b>Subtotal</b>	<b>87.8%</b>	<b>75.6%</b>	<b>73.2%</b>	<b>41.5%</b>	<b>31.7%</b>	<b>2,043.8 lb</b>	<b>35.2 lb</b>	<b>16.6 lb</b>	<b>510.9 gal</b>	<b>± 20%</b>
<b>Plants/greens/mushrooms</b>										
Wild rhubarb	17.1%	17.1%	17.1%	2.5%	0.0%	21.4 lb	0.4 lb	0.2 lb	21.4 gal	± 70%
Eskimo potato	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Fiddlehead ferns	17.1%	14.6%	14.6%	2.5%	0.0%	4.4 lb	0.1 lb	0.0 lb	4.4 gal	± 54%
Nettle	2.4%	2.4%	2.4%	0.0%	2.4%	4.2 lb	0.1 lb	0.0 lb	4.2 gal	± 109%
Hudson's Bay (Labrador) tea	22.0%	22.0%	22.0%	0.0%	0.0%	5.7 lb	0.1 lb	0.0 lb	5.7 gal	± 59%
Dandelion greens	9.8%	9.8%	9.8%	0.0%	0.0%	8.9 lb	0.2 lb	0.1 lb	8.9 gal	± 90%
Sourdock	4.9%	4.9%	4.9%	0.0%	0.0%	2.9 lb	0.1 lb	0.0 lb	2.9 gal	± 108%
Spruce tips	4.9%	4.9%	4.9%	0.0%	0.0%	0.3 lb	0.0 lb	0.0 lb	0.3 gal	± 82%
Willow leaves	9.8%	9.8%	9.8%	2.5%	0.0%	2.0 lb	0.0 lb	0.0 lb	2.0 gal	± 81%
Wild celery	2.4%	2.4%	2.4%	0.0%	0.0%	1.4 lb	0.0 lb	0.0 lb	1.4 gal	± 109%
Wild rose hips	34.1%	34.1%	34.1%	2.4%	7.3%	63.3 lb	1.1 lb	0.5 lb	15.8 gal	± 34%
Other wild greens	24.4%	22.0%	22.0%	2.4%	2.4%	112.0 lb	1.9 lb	0.9 lb	112.0 gal	± 67%
Unknown mushrooms	17.1%	19.5%	17.1%	2.4%	2.4%	170.0 lb	2.9 lb	1.4 lb	170.0 gal	± 92%
Fireweed	19.5%	19.5%	19.5%	2.5%	0.0%	12.1 lb	0.2 lb	0.1 lb	12.1 gal	± 68%
Plantain	4.9%	4.9%	4.9%	0.0%	0.0%	2.8 lb	0.0 lb	0.0 lb	2.8 gal	± 55%
Stinkweed	7.3%	7.3%	7.3%	0.0%	2.5%	2.9 lb	0.1 lb	0.0 lb	2.9 gal	± 75%
Punk	4.9%	4.9%	4.9%	0.0%	0.0%	2.9 lb	0.1 lb	0.0 lb	2.9 gal	± 108%
Puffballs	12.2%	12.2%	12.2%	0.0%	2.4%	4.4 lb	0.1 lb	0.0 lb	4.4 gal	± 53%
Orange boletes	26.8%	26.8%	26.8%	4.9%	2.4%	32.3 lb	0.6 lb	0.3 lb	32.3 gal	± 39%
<b>Subtotal</b>	<b>53.7%</b>	<b>53.7%</b>	<b>53.7%</b>	<b>14.6%</b>	<b>19.5%</b>	<b>453.9 lb</b>	<b>7.8 lb</b>	<b>3.7 lb</b>	<b>406.5 gal</b>	<b>± 44%</b>
<b>Wood</b>										
Other wood	82.9%	75.6%	75.6%	29.3%	19.5%	<i>Primarily used as firewood.</i>			328.2 cord	± 18%
<b>Subtotal</b>	<b>82.9%</b>	<b>75.6%</b>	<b>75.6%</b>	<b>29.3%</b>	<b>19.5%</b>	<i>Primarily used as firewood.</i>			<b>328.2 cord</b>	<b>± 18%</b>
<b>All vegetation</b>	<b>100.0%</b>	<b>97.6%</b>	<b>95.1%</b>	<b>61.0%</b>	<b>51.2%</b>	<b>2,497.7 lb</b>	<b>43.1 lb</b>	<b>20.3 lb</b>		<b>± 19%</b>
<b>All resources</b>	<b>100.0%</b>	<b>97.6%</b>	<b>97.6%</b>	<b>92.7%</b>	<b>70.7%</b>	<b>52,437.6 lb</b>	<b>904.1 lb</b>	<b>426.1 lb</b>		<b>± 44%</b>

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

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

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

The total estimated harvest for all subsistence resources in 2012 was 52,438 lb, or 426 lb per capita. Fish, including both salmon and nonsalmon species, contributed the most by weight to the total annual subsistence harvest, at 46,915 lb, or 381 lb per capita (Table 2-5). Land mammals (combined large land mammals and small land mammals) contributed the next greatest amount by weight, at 2,745 lb, or 22 lb per capita (Table 2-6). Vegetation, such as berries, plants, greens, and mushrooms, contributed the third highest amount by weight overall, at 2,498 lb, or 43 lb per capita (Table 2-10). Households also harvested an estimated 76 lb (1 lb per capita) of migratory birds and

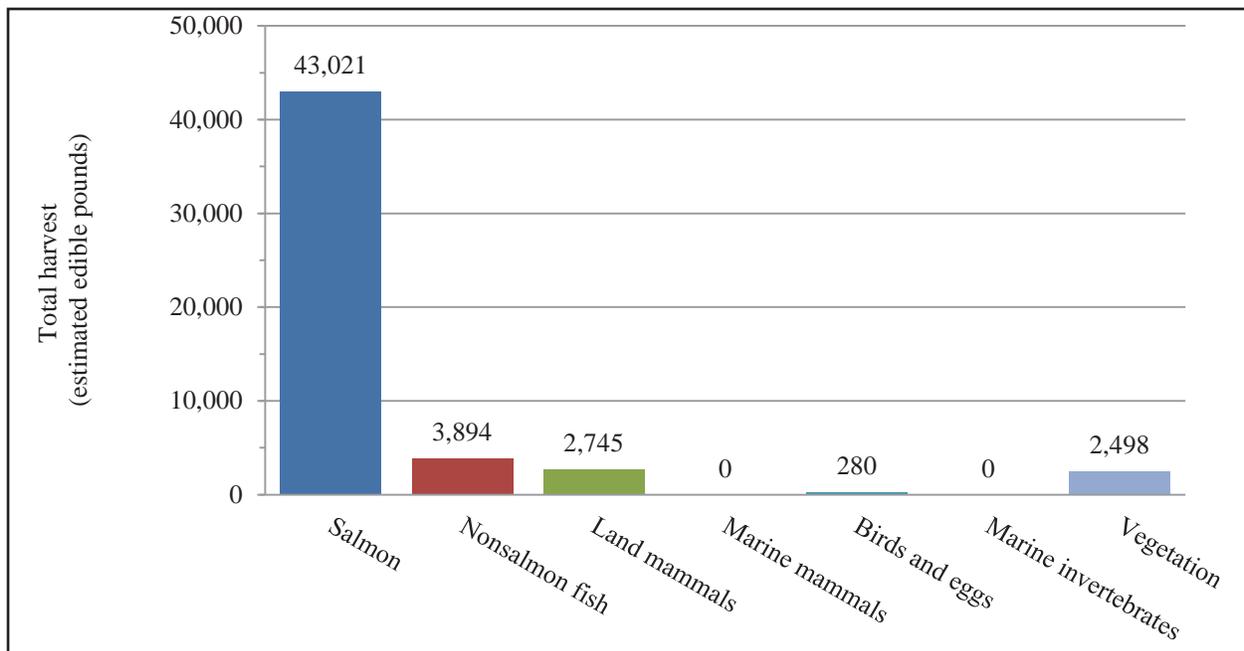


Figure 2-16.— Total estimated edible pounds harvested, by resource category, Manley Hot Springs, 2012.

197 lb (3 lb per capita) of non-migratory birds for an estimated total of 273 lb, or 5 lb of birds per capita (Table 2-7). Bird eggs contributed only 8 lb, or less than 1 lb per capita (Table 2-8). Manley Hot Springs households did not report any harvest of marine mammals or marine invertebrates in 2012 (Table 2-6; Table 2-9). The total harvest by resource category is presented in Figure 2-16.

### USE AND HARVEST CHARACTERISTICS BY RESOURCE CATEGORY

Figure 2-17 lists the top 10 resources harvested, in terms of total estimated edible pounds, by Manley Hot Springs households during the 2012 study year. Three salmon species—Chinook salmon (25%), chum salmon (fall chum 27%, summer chum 7%), and coho salmon (23%)—accounted for 82% of the overall total community subsistence harvest in 2012. The chum and coho estimates include salmon used for consumption by both humans and dogs. These 3 salmon species alone contributed 42,809 lb of edible weight to the total community harvest. Moose, from the large land mammal category, contributed 5% (2,546 lb) to the estimated total edible harvest. Top contributors from the nonsalmon fish category included northern pike, which contributed 2% of the harvest (1,018 lb) followed by humpback whitefish (718 lb), and the final of the 10 top resources was Bering cisco

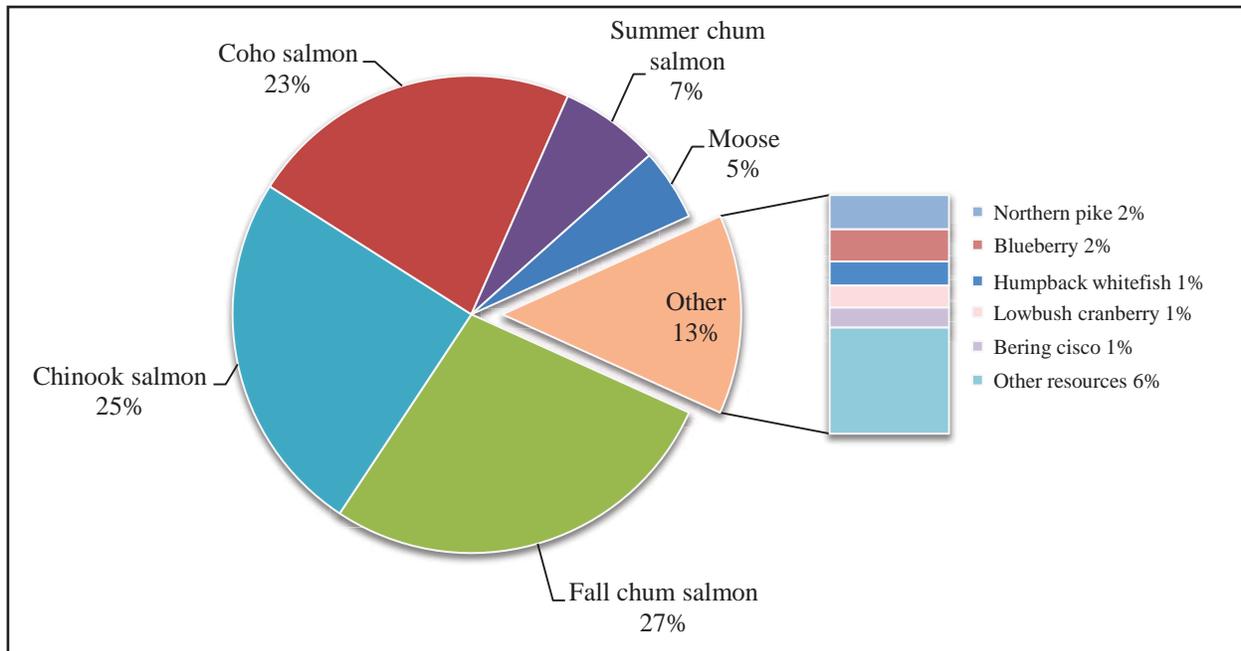


Figure 2-17.— Top 10 species harvests ranked by estimated edible weight, Manley Hot Springs, 2012.

(594 lb). Blueberries (954 lb) and lowbush cranberries (651 lb), from the vegetation category, were also among the top 10 resources harvested.

### **SALMON**

Salmon contributed more in edible pounds than any other single resource category to the total community harvest. In 2012, Manley Hot Springs households harvested an estimated 6,435 salmon for an estimated total community harvest of 43,021 edible pounds (350 lb per capita) (Table 2-5). Chinook salmon were the most desired and most shared of the salmon species.

In 2012, residents harvested an estimated 12,958 lb (105 lb per capita) of Chinook salmon. Of the 2 varieties of chum salmon available for harvest by Manley Hot Springs residents, fall chum were more heavily harvested than summer chum. In 2012, residents harvested an estimated 14,443 lb (117 lb per capita) of fall chum salmon and 3,549 lb (29 lb per capita) of summer chum salmon. The coho salmon harvest contributed an estimated 11,858 lb (96 lb per capita) to the total community harvest. Sockeye salmon (harvested from the Copper River) contributed 212 lb (2 lb per capita) in 2012.

Salmon were harvested for long-term storage, eating fresh, or, in some cases, for dog food. Preservation methods included drying, smoking, freezing, salting, and pressure canning. Chinook salmon are often cut into long strips, soaked in a brine, and smoked until dry. These “fish strips” are very desirable, and are often used for exchange and sharing. According to Betts (1997), residents bartered salmon and salmon strips for resources they did not harvest or otherwise produce themselves,

such as berries, homemade bread and other baked goods, or artwork. One respondent who no longer actively fishes described his current system of acquiring salmon:

I do, however, always trade with [name] in the summer to get at least 10 Chinook salmon that come off the Yukon over here at the Rapids, so I have a winter's supply in the freezer, and I'll also get a few, maybe 10 lb of fish strips from him. And, there again, it's all legit, it's a trade [barter]. He'll come and use the hangar here to work on his airplane, and I'll do something to his airplane. It's not a cash arrangement. So, you know what I'm saying is, even if it sounds like a small amount, it's very important to me, to always try and get a few Chinook salmon in the summer and if possible some fish strips also. (02222013MAN02)

The same respondent went on to describe his bartering activities in the past when he was actively fishing with his own fish wheel:

I'd have barter deals with people around here for chum and silver [coho] salmon. I had a local surveyor survey some property for me in exchange for some silvers and chum that I traded him for his dog team use. (02222013MAN02)

Dogs have played a large part in the history of Manley Hot Springs through the years. The first recorded use of dogs was for transporting trappers and gold prospectors. Later, dog teams were also used for hauling the mail. Airplanes did not start delivering the mail in the area until the early 1940s, and even then dogs were still used for several years to haul the mail to Rampart (Yarber and Madison 1985). The primary food for dogs was salmon. Today, dogs are kept mostly for racing, breeding, and selling; as pets; and some are still used for transportation. In 1991, 83,813 lb of salmon were harvested by Manley Hot Springs households for dogs, and in 2008, 56,365 lb of salmon were harvested for dogs (Andersen and Scott 2010). According to Andersen and Scott (2010:31) there was a significant decline in the number of sled dogs and the amount of fish being utilized for dog food between 1991 and 2008 in all 6 of the report's study villages in the Yukon River drainage, including Manley Hot Springs. They attributed the decline to a number of reasons, most significantly a decrease in use of dogs for trapline transportation. In 2012, Manley Hot Springs households used an estimated total of 26,469 lb of salmon (4,767 individual salmon) for dog food (Appendix Table D2-3). Trapping, and the use of dogs for trapping, continues to decline in the community, according to most households.

A key respondent had this to say concerning the decline of trapping in recent years:

Well, like I said, in fairness to everyone that lives around here and traps around here, it's true right now it seems to be a down cycle for just about all species [small mammals], but

the key thing that will forever hold back any glory days of trapping around here is that we are just encircled with human habitation. There are, the open areas for movement of animals is just not what it used to be. (02222013MAN02)

By far the salmon species most favored for use as dog food in 2012 was fall chum salmon. This was the case for 1991 and 2008 as well (Andersen and Scott 2010). An estimated 13,414 lb of fall chum salmon (2,674 individual salmon) were harvested for consumption by dogs in 2012. Many residents reported harvesting fall chum specifically for dog food. Only 1,987 lb of summer chum salmon (396 fish) were fed to dogs. Households also reported feeding Chinook salmon (187 lb, or 14 fish) to dogs, but only because the fish had spoiled.

### ***NONSALMON FISH***

Nonsalmon fish were harvested year-round. In 2012, Manley Hot Springs residents harvested an estimated 3,894 lb of nonsalmon fish (32 lb per capita) (Table 2-5). The largest harvest of nonsalmon fish by weight was northern pike, which contributed an estimated 1,018 lb (8 lb per capita). As mentioned above, northern pike represented 2% of the estimated total harvest of subsistence foods for residents in 2012 (Figure 2-17). Other freshwater fish harvested by residents included burbot (102 lb), Arctic grayling (25 lb), and longnose suckers (14 lb). Whitefish species contributed an estimated 2,507 lb (20 lb per capita) to the total annual harvest. Specifically, humpback whitefish was the second largest contributor to the nonsalmon fish harvest by weight at an estimated 718 lb (6 lb per capita). Residents harvested a variety of other whitefish species, including Bering cisco, broad whitefish, sheefish, least cisco, and round whitefish (in descending order by pounds harvested). Of marine fish, respondents reported harvesting 148 lb of Pacific halibut, lingcod, and yelloweye rockfish; all fish were harvested in other areas of the state. Residents also harvested in small amounts Dolly Varden (1 lb) and rainbow trout for a combined total of 81 lb harvested.

Nonsalmon fish species were also used for dog food in 2012. Households used an estimated total of 1,855 lb of nonsalmon fish for dog food (Appendix Table D2-3). Of this total, whitefishes accounted for 83% by weight, including 361 (631 lb) humpback whitefish, 354 (495 lb) Bering ciscoes, 212 (85 lb) least ciscoes, 71 (283 lb) broad whitefish, and 7 (42 lb) sheefish. Northern pike (109 individuals, 305 lb) and longnose suckers (7 individuals, 14 lb) were also used for dog food in 2012. In comparison, in 1991, Manley Hot Springs households used 920 lb of nonsalmon fish for dog food, and in 2008 used 2,255 lb of nonsalmon fish were used for dog food (Andersen and Scott 2010).

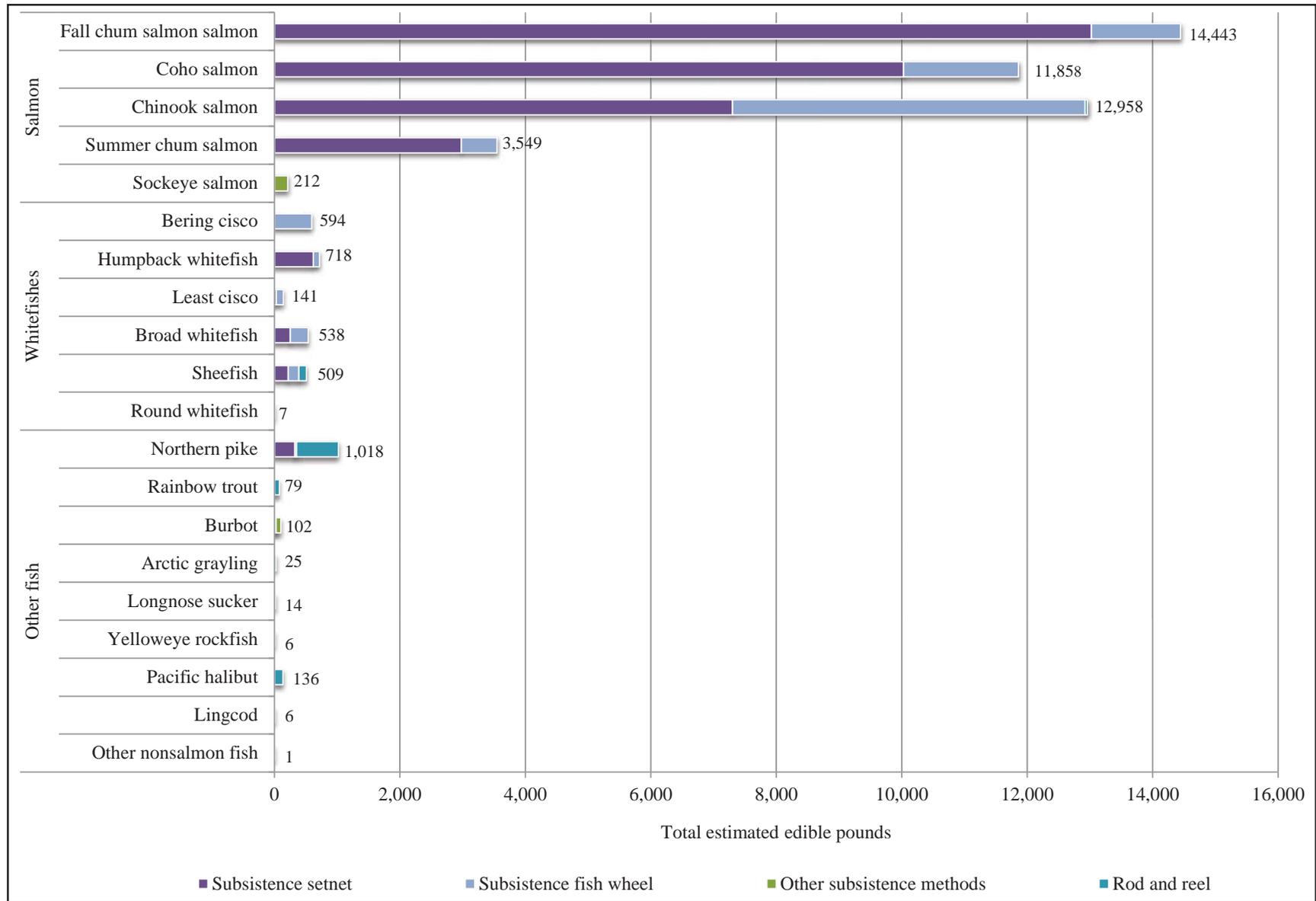


Figure 2-18.— Salmon and nonsalmon fish harvest by gear type, Manley Hot Springs, 2012.

## *FISHING GEAR AND HARVEST LOCATIONS*

Figure 2-18 shows pounds of fish (both salmon and nonsalmon species) harvested by gear type by Manley Hot Springs households in 2012. By far the most commonly used gear types were set gillnets and fish wheels. Setnets were the most common type of fishing gear used. Both salmon and nonsalmon fish species were harvested by set gillnet. The majority of salmon species, with the exception of sockeye salmon, were harvested with the use of set gillnets in 2012. Gillnets for Chinook salmon are a standard nylon net of large mesh (typically 7 in). Nets are typically attached to the river bank at one end, and driven by boat to the far edge of an eddy where they are anchored. Nets are checked and emptied on a regular basis (Betts 1997). Fish wheels are usually homemade and are typically situated on rafts anchored to the riverbank. O'Neill (2012) supplies a description of the typical fish wheel in use currently:

A fish wheel is a big gangling contraption something like a paddle wheel with four arms. It's perhaps 25 feet in diameter, mounted on a log raft, and turned by the current. Log spars and heavy cables keep the wheel positioned just off shore. Two opposed baskets project from the axle, and as the current sweeps them downstream, they strain the water intercepting fish migrating upstream. At right angles to the baskets, 2 paddles keep the wheel rotating during the moment when neither basket is submerged. As a basket rises in its rotation, it drops any fish onto a slide that sends it into a box alongside. It may seem like an artifact from some prehistoric stick culture, but when made the old-time way, with the sweeping curves of peeled and bent tamarack and spruce poles, it is a thing of beauty, graceful in motion, ingeniously practical. (O'Neill 2012:148)

Several survey respondents stated that they missed seeing the numerous large wheels turning along the rivers and at the landing when the commercial fish processing plants were in operation. During those times, fishermen used wheels for both commercial and subsistence harvests as commercial and subsistence openings were, and continue to be, concurrent. Multiple wheels meant that salmon were more abundant. During those years of healthy salmon runs, people experienced the fulfillment of the demanding, yet satisfying, work connected to their quest for subsistence resources. One key respondent fondly recalled advice from his elders:

That's what Jimmy Huntington told me years ago. Those are the 3 rules of fish wheels. Lester Earhart's rule is, "Get it out there and get it spinning." Stan Dayo's rule is, "Put it in a good spot." Jimmy Huntington said, "Before I do anything with a fish wheel, I think about it for a long time." I think if you do those three things you'll be OK. (02222013MAN02)

The use of fish wheels has fluctuated over time. Two fish processing plants—the Woods plant, which opened in the 1970s, and the Taylor plant, which opened in the 1980s—increased the use of fish wheels for commercial harvests in Manley Hot Springs for a time. Today, fewer Manley Hot Springs residents use fish wheels. The closing of the fish processing plants, fluctuating salmon populations, and regulatory changes have impacted fish wheel use both for subsistence and commercial fishing. Also, the declining reliance on large dog teams for transportation reduced the need for large fish harvests. This in turn caused a decline in the use of fish wheels, the primary gear used for large harvests. Despite the reduction in use, fish wheels continue to be an important gear type—particularly for harvesting salmon. In addition to salmon, many households reported harvesting whitefishes and other nonsalmon fish species incidentally in their fish wheels.

Rod and reel gear was the third most common type of gear used. This gear type was used primarily for nonsalmon fish, particularly northern pike. Hooks on lines were used for jigging for northern pike, whitefishes, or Arctic grayling through the ice.

In contrast to modern gear types made of materials such as nylon, metal, fiberglass, etc., inhabitants of the area in protohistorical and early historical times used all natural materials. Gear types included willow bast gillnets, dip nets made of wood and sinew, fish traps and weirs (i.e., fences) made of wooden stakes and strips of wood, leister spears made of wood, and hooks of barbed antler with lines of sinew (Betts 1997).

Manley Hot Springs households harvested fish in a variety of locations in 2012 including from both the Yukon and Tanana rivers, Hot Springs Slough, and various lakes and streams in the surrounding area. Salmon were primarily harvested from the Yukon and Tanana rivers and Hot Springs Slough (Figure 2-19). Some households fished for salmon from their fish camps located along the Yukon and Tanana rivers. Fish camps, a vital component of salmon fishing, are primarily used by families and extended families and are often used by the same family for many generations. Family camps typically include smokehouses, drying racks, and cutting tables necessary for salmon processing. They are usually dispersed along the rivers so as to reduce competition, and are placed in strategically located areas, such as along an eddy where the river current becomes slack or reverses near the bank (Alaska Department of Fish and Game 1987).

The major Chinook salmon harvesting area on the Yukon River used by Manley Hot Springs households was at an area called “the Rapids”—an area long known for its salmon productivity. Archaeological investigations in the Rapids area have shown that this location has been used by people since prehistoric times (Andrews 1977). A respondent described his experience with the area:

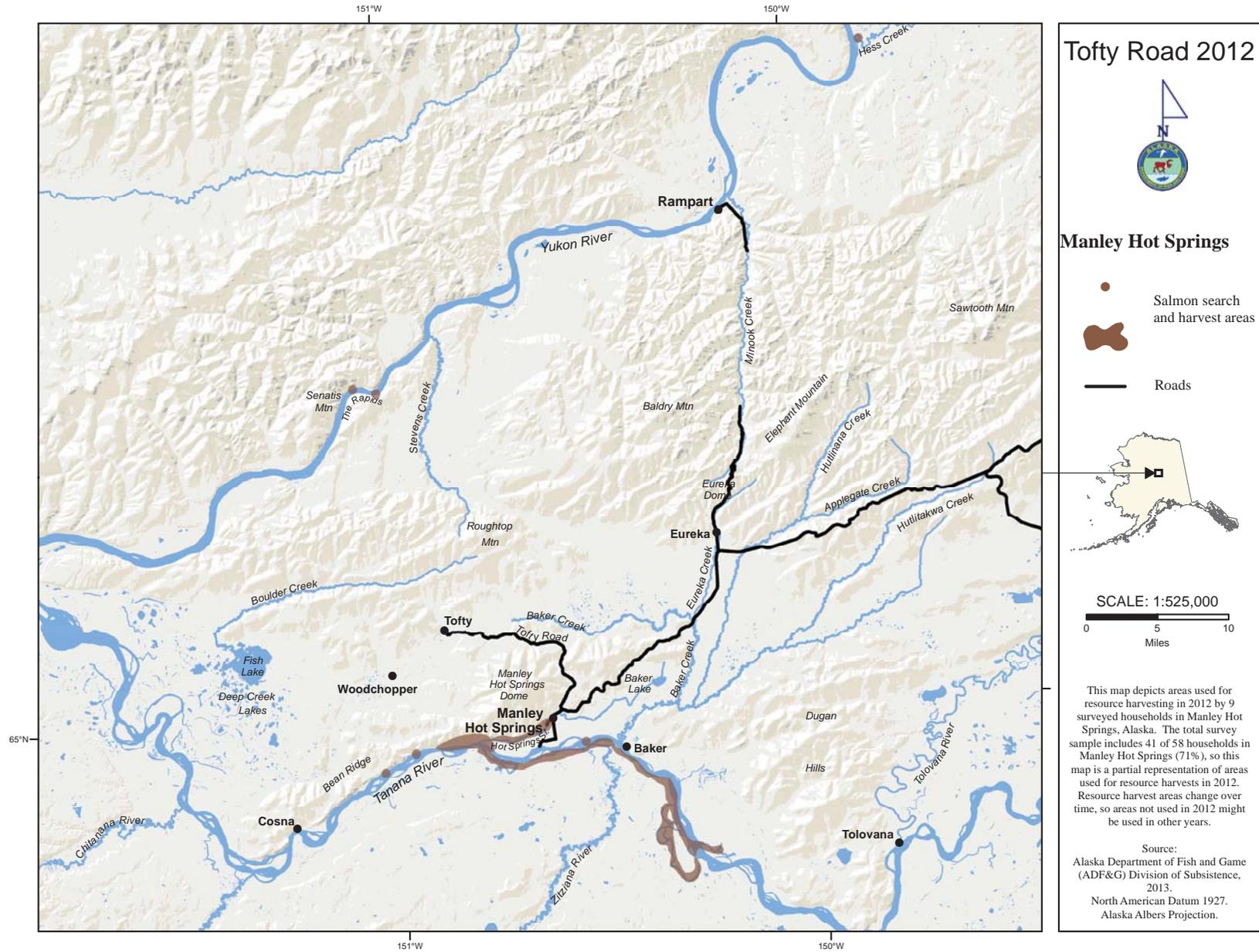


Figure 2-19.— Salmon search and harvest areas, Manley Hot Springs, 2012.

I finally decided to go over to the Yukon Rapids, which is halfway between Tanana and Rampart, because that's where good fishing is. The river takes a tight bend there and forces the fish in, and ... I mean, in the old days every Native in the country would go to Rapids because that was where you, you know, people could catch fish and [get] lots of 'em. And so, I started fishing over there. I actually, occasionally would run a wheel [fish wheel] over there in the fall time. In 1982 I went over to the Yukon and pretty much fished there ever since, every summer but one. (02222013MAN04)

The Rapids is a steep canyon-like area that dramatically narrows the Yukon River. In this area the current is very swift but the water is still calm. It is an ideal location for fish wheels because the fish basically have no other option than to swim right into the basket (Alida Trainor, Subsistence Resource Specialist II, ADF&G, Fairbanks, personal communication, 2014).

Chum and coho salmon are fished for later in the season on the Tanana River near Manley Hot Springs. Salmon fishing on the Tanana River and its tributaries occurred from approximately 20 miles upriver of the community to approximately 15 miles downriver. According to several households, a 5-mile stretch on the Tanana River downriver from its confluence with Hot Springs Slough, as well as the entire length of the slough itself, were also salmon harvest areas in 2012.

Households searched for and harvested nonsalmon fish in several locations according to species. Search and harvest areas for northern pike were the most varied (Figure 2-20). Households searched for and harvested northern pike along the length of Hot Springs Slough from the community to its mouth at the Tanana River and at a location on the Tanana River approximately 10 miles downriver from the mouth of the slough. Households also fished for northern pike on the Tanana River and its tributaries upriver of the mouth of the slough for approximately 25 miles. Other major areas for harvesting northern pike included the mouth of, and approximately 5 miles up, the Zitziana River and in Mooseheart Lake (known locally as "Big Lake"), which is located near Mooseheart Mountain between the Cosna and the Zitziana rivers.

Residents traveled to the mouth of Hot Springs Slough and approximately 3 miles down the Tanana River from the slough to harvest whitefish. Other areas included Mooseheart Lake, Yukon Rapids, and 2 areas on the Tanana River upriver from the mouth of Hot Springs Slough. One area was approximately 2.5 miles upriver and the other was approximately 10 miles upriver near the mouth of Baker Creek. Households searched for and harvested sheefish at the mouth of Baker Creek, in the Tanana River approximately 2.5 miles downriver of the mouth of Baker Creek, and

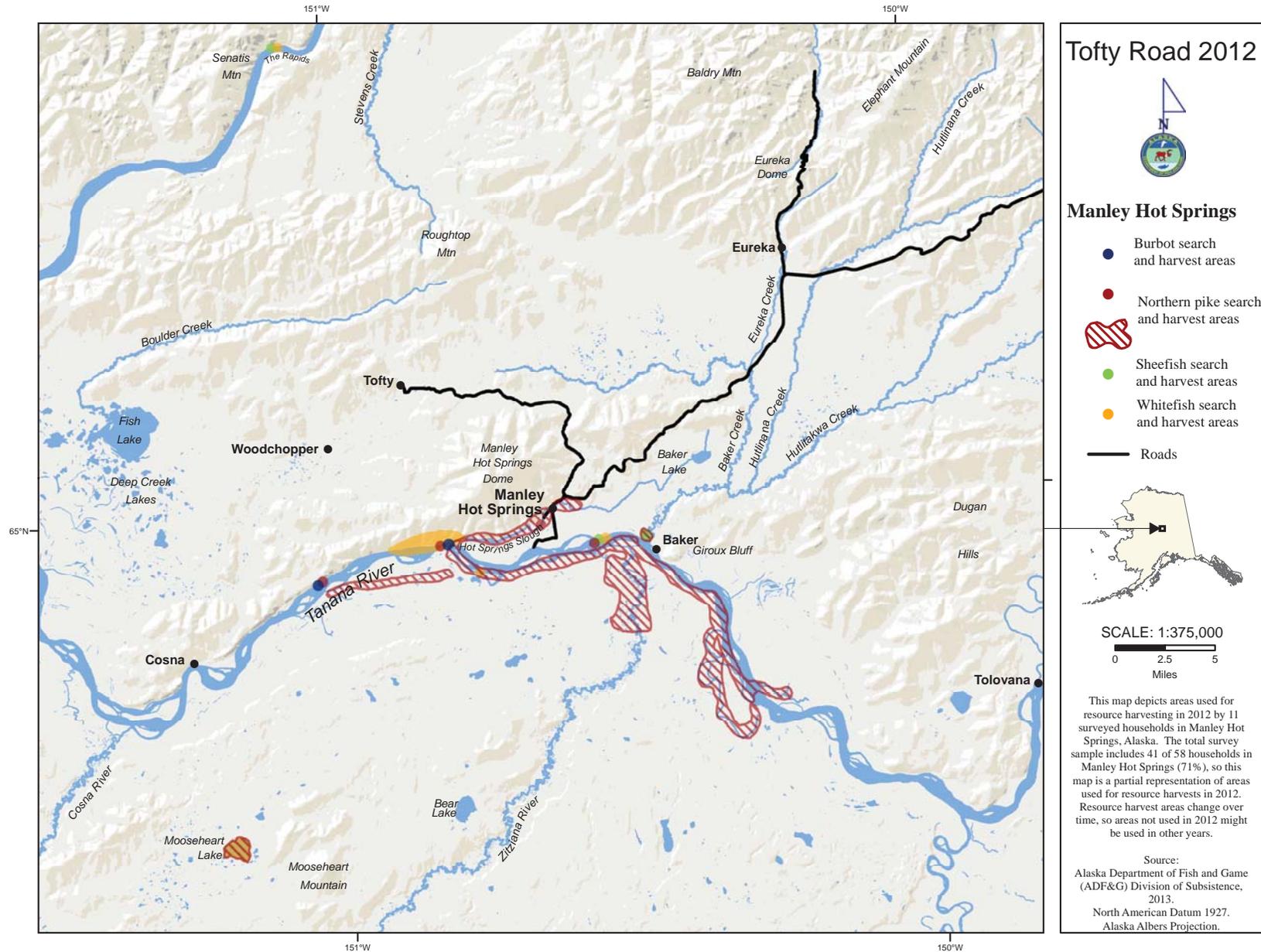


Figure 2-20.— Burbot, northern pike, sheefish, and whitefishes search and harvest areas, Manley Hot Springs, 2012.

at Rapids on the Yukon River. Burbot were searched for and harvested at the mouth of Hot Springs Slough and on the Tanana River approximately 7.5 miles downriver from the mouth of the slough.

### ***LAND AND MARINE MAMMALS***

Table 2-6 summarizes the large land mammal, small land mammal/furbearer, and marine mammal harvest, use, and sharing data collected for Manley Hot Springs for the study year. This section discusses harvest and use characteristics and concludes with a discussion about mapped hunting and harvest locations. Note that there was no harvest of marine mammals in Manley Hot Springs for 2012—not a surprise given its location within Interior Alaska.

Manley Hot Springs households used, attempted to harvest, harvested, received, and gave away a variety of both small and large land mammals in 2012. The majority of small mammals were not eaten, but rather were harvested for their fur. The exceptions to this were beavers, snowshoe hares, squirrels, and 1 lynx that was used for food. In 2012, 83% of households used, 34% harvested, 76% received, and 34% gave away or shared land mammals. Harvest by season of all land mammals is shown in Appendix Table D2-4 and Appendix Table D2-5.

#### **Large Land Mammals**

Large land mammals contributed 2,628 lb to the community total, while small mammals/furbearers contributed 116 lb (Table 2-6). The species that contributed the most by weight was moose, at 2,546 lb (21 lb per capita). Although the harvest of moose in recent years has been declining in the area according to many residents, Manley Hot Springs households were successful in harvesting 6 moose in 2012.

A key respondent cited competition from bears and hunters from Fairbanks as reasons for a decline in the moose population:

We get [have] a lot of bears around here. Fish and Game imported a bunch here about 15 years ago from McGrath, and dumped them off. Grizzlies and black, boy, was that a mistake. ‘Cause I told them, I said, “You know, we have local hunters, we have hunters from Fairbanks, trying to get these moose,” and I said, “Now you’ve got grizzlies and black bears helping us out to get all these moose.” Yeah, and so it was, but they haven’t done that again. It was kind of a bad deal, but, there’s still a lot of black bears around. We get a lot of [moose] hunters. (02212013MAN06)

A sizable portion (78%) of households used moose in 2012, with 12% harvesting, 71% receiving,

and 29% giving away moose, indicating a high degree of sharing. All moose harvested in 2012 were bull moose harvested in the month of September (Appendix Table D2-4).

Although black bears are prevalent in the area, neither black nor brown bears contributed significantly to the overall total of the subsistence harvest for Manley Hot Springs in 2012. Only 1 household reported harvesting a black bear. This household harvested the black bear in May. The 1 black bear contributed just 82 lb to the community total. Participation rates reflect this low harvest: only 12% of households reported using, 10% attempted to harvest, 2% harvested, 10% received, and 2% gave away black bears in 2012. There was no reported harvest of brown bears.

Manley Hot Springs residents did not report harvesting any caribou in 2012. Several households stated that caribou did not migrate close enough to town to make it worthwhile to hunt them due to the cost of gasoline. Despite the lack of harvest, 24% of households reported receiving and using caribou, while 5% reported giving it away, suggesting sharing and trading networks exist with sources outside of the community. Caribou are not currently searched for or harvested as much as they were in the past, according to several households. According to Andrews (1977) caribou were widely harvested in the lower Tanana River area until the 1930s. Betts (1997) reported that, according to local information, thousands of caribou once migrated through the area, but that the caribou herds shifted their migration routes in the 1940s. Some residents remembered a time when most Manley Hot Springs households did actively hunt caribou.

The search and harvest areas for moose were extensive, and covered a total of 606 square miles. This large area was only 175 square miles less than the total search and harvest for subsistence resources by Manley Hot Springs households in 2012 (Figure 2-21). Moose are generally found in forests and meadows of the floodplains and the upland portions of the Tanana and Yukon watersheds (Betts 1997). In 2012, Manley Hot Springs households used the existing State road system, old mining roads, and waterways to access most moose search and harvest areas. Upland areas were accessed by road vehicle, ATV, snowmachine, or on foot. Many households reported using 1 large search area for moose (approximately 25 miles by 40 miles) that extended south of the Tanana River between Manley Hot Springs and Cosna Bluffs. This area encompassed Mooseheart Mountain, Mooseheart Lake (Big Lake), and Bear Lake, and included a 5-mile stretch of the Zitziana River. This area is generally accessed by boat. Residents launch boats from the Tanana River landing or from Hot Springs Slough in town. These launch sites are also used by non-local hunters, producing what 1 local resident described as a “congested nuisance” of vehicles and trailers during moose hunting season. Moose were also hunted in areas accessed by local residents using private planes. Additional areas used for moose hunting were along Serpentine Ridge located west of the community, a 5-mile section of Boulder Creek to the west, and a 10-mile section of Baker Creek east of Tofty. A large search area for moose extended from Eureka north along both sides of Eureka Road for

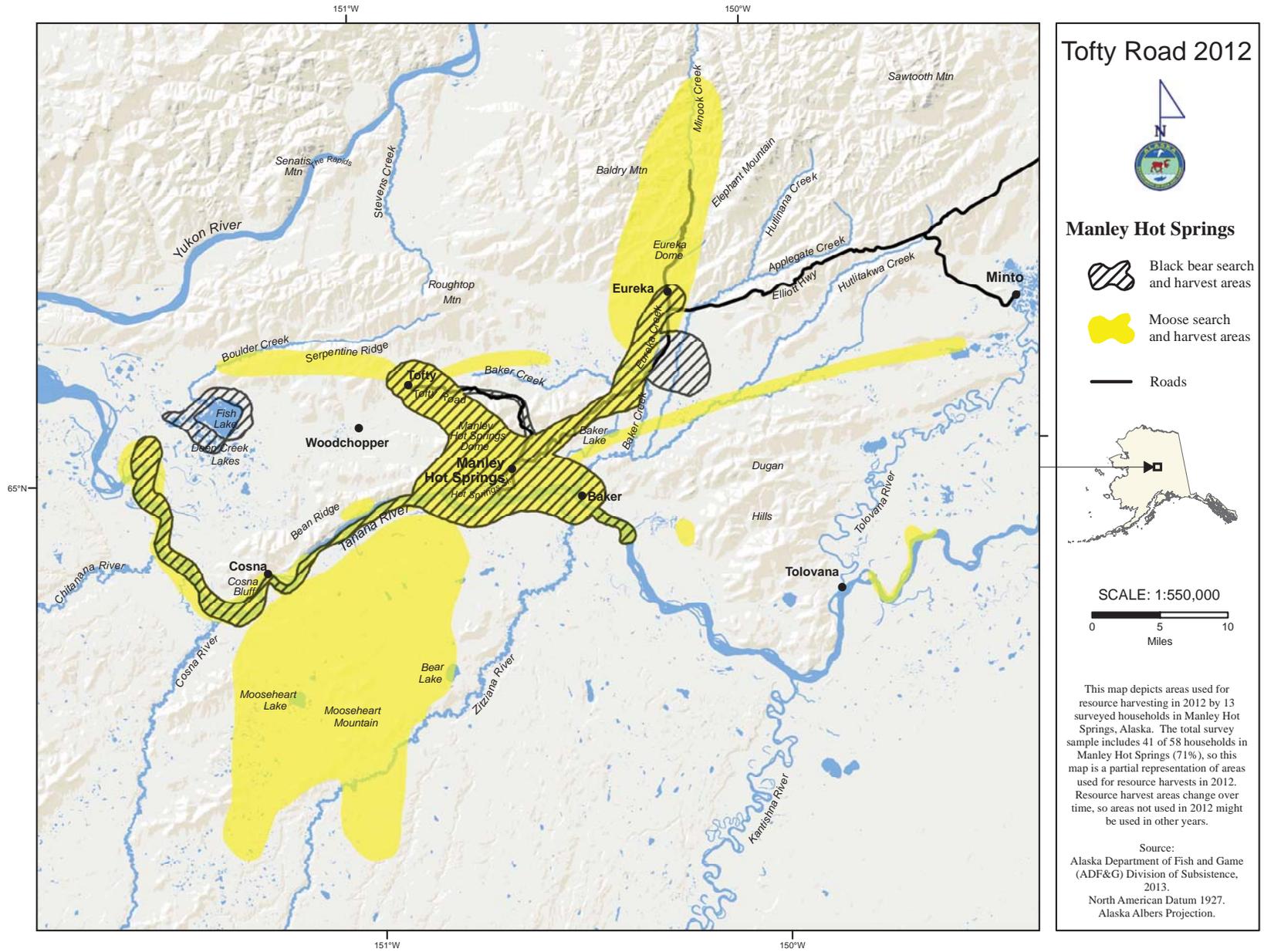


Figure 2-21.— Black bear and moose search and harvest areas, Manley Hot Springs, 2012.

approximately 20 miles. This area encompassed parts of Baldry Mountain and Minook Creek. Yet another search area for moose extended in a narrow band (1–2 miles wide) from the community approximately 40 miles east toward Minto and parallel to the northern edge of the Dugan Hills. A final search area extended along the Tanana River for approximately 10 miles that started northeast and upriver from the confluence of the Tanana River and the Tolovana River.

In 2012, the search and harvest areas for black bears were much the same as those for moose since black bears are often hunted during moose hunting activities (Betts 1997). According to Betts (1997), black bears are found throughout the area, often appearing on the south-facing slopes of ridges facing rivers in springtime. In 2012, Manley Hot Springs residents searched for black bears from town to the abandoned mining site of Tofty, which is located approximately 15 miles northwest of Manley Hot Springs. This area also included Manley Hot Springs Dome (Figure 2-21). Residents also searched for bears along Bean Ridge and the Tanana River at its confluence with the Cosna River. This area included Cosna (old telegraph station site) and the Cosna Bluffs. Households searched for black bears along both sides of the Tanana River from the confluence with the Cosna River northwest for approximately 30 miles. Another important search area for black bears was from the community east to the old site of Baker (including the area surrounding the mouth of the Zitziana River) and approximately 5 miles up the Tanana River from Baker. Yet another area extended from the community north and northeast along the Elliott Highway encompassing parts of Baker and Eureka creeks. This search area extended along the road to Eureka, an old mining community at the headwaters of Pioneer and Eureka creeks approximately 20 miles inland from Manley Hot Springs. A final area was around Fish Lake to the west of Tofty.

### **Small Land Mammals/Furbearers**

As noted earlier, some small mammals were used for both food and fur by Manley Hot Springs households in 2012. Beavers (used for both food and fur) contributed the most to the community harvest by weight at 65 lb and were used by 17% of households. Sixteen beavers



Lisa J. Slayton

*Figure 2-22.— Carol James displaying fox and lynx pelts intended for clothing and crafts.*



Lisa J. Slayton

*Figure 2-23.— Fur hats and gloves available for sale made by a local craftsperson.*

were harvested in May, September, and November by 10% of households (Appendix Table D2-5; Table 2-6). Other small land mammals used for both food and fur included snowshoe hares, tree squirrels, and—in 1 instance—lynx. Based on level of use by households, the primary furbearers trapped for their fur were martens (191 individuals by 22% of households), lynx (35 individuals by 17% of households), and red foxes (19 individuals by 15% of households). Other furbearers used included mink and weasels (by 12% of households each), river otters (by 10%), coyotes and wolves (7% each), wolverine (5%), and muskrats (by 2% of households) (Table 2-6). April and October are the only months in which no harvests occurred. (Appendix Table D2-5).

Several households described using the fur from small land mammals in arts and crafts. Hats, gloves, ruffs, boots, artwork, and decorative items were bartered for other items or were sold at art and craft fairs both in the community and elsewhere in the state (Figure 2-22; Figure 2-23). During this study, the author accompanied a respondent in his private plane as he delivered a large bag of accumulated mail to a couple living on Mooseheart (Big) Lake. The couple gave a river otter to the respondent in thanks for bringing their mail. The respondent and author then flew to another couple's trapping cabin where the river otter was exchanged for a lynx. The respondent did not know how to skin the otter, but he did know how to skin the lynx. Conversely, the trapping couple did not know how to skin the lynx, but did know how to skin the river otter, so the animals were exchanged for processing of the fur and then returned to their respective owners. In a follow-up

telephone call from the respondent to the author, the author inquired as to the status of the river otter and the respondent replied, “I’m wearing it on my head!” (02242012MAN03). This example illustrates the complex network of barter in Manley Hot Springs.

As mentioned earlier, some households observed a decline in trapping of small land mammals. One key respondent cited several reasons as to why he felt this to be true:

Some of the guys [trappers] are getting older and a few guys I know, that used to trap pretty hard, are hardly doing anything anymore. [The] price of gas has a lot to do with it ‘cause around here you really need to go on a snowmachine, cover a little country. Um, I’d say it’s [trapping] is down from what it was. (02242012MAN03)

When asked if younger people seemed interested in trapping this same respondent said:

I don’t, I don’t see it. Very, it’s a little bit maybe, but not much; I mean there’s a bunch of young guys around that aren’t doing it at all. (02242012MAN03)

Search and harvest areas for small land mammals included the same large 25- by 40-mile search and harvest area used for moose, which included Mooseheart Mountain, Mooseheart Lake (Big Lake), and Bear Lake; each are located to the south of the Tanana River between Manley Hot Springs and Cosna Bluffs. A portion of the Dugan Hills to the southeast of Manley Hot Springs was also used. Additionally, households searched for and harvested small land mammals along the Elliott Highway between Manley Hot Springs and Baker Lake, encompassing a part of Tofty Road. Several narrow lines on the search and harvest map for small mammals indicate individual traplines as reported by some respondents (Figure 2-24). Trapline lengths varied among households. Some trapping occurred on small traplines close to home, while other longer lines extended from the community to outlying areas.

### ***BIRDS AND EGGS***

Table 2-7 shows the degree of use and harvest of birds by Manley Hot Springs households in 2012. Households reported harvesting (39%), using (46%) and sharing (10%) grouses more than any other bird (72% of the total bird harvest). Grouses, along with ptarmigan, are available year-round and are a welcome addition of fresh meat to the diet in spring when other fresh subsistence meat is not available. The second most used and harvested bird species was mallard ducks, a migratory species that is hunted both in the fall and in the summer (Appendix Table D2-6). In 2012, 17% of Manley Hot Springs households reported using mallards while 10% reported harvesting them (Table 2-7). This bird species contributed 21 lb of food for the community. Other ducks used

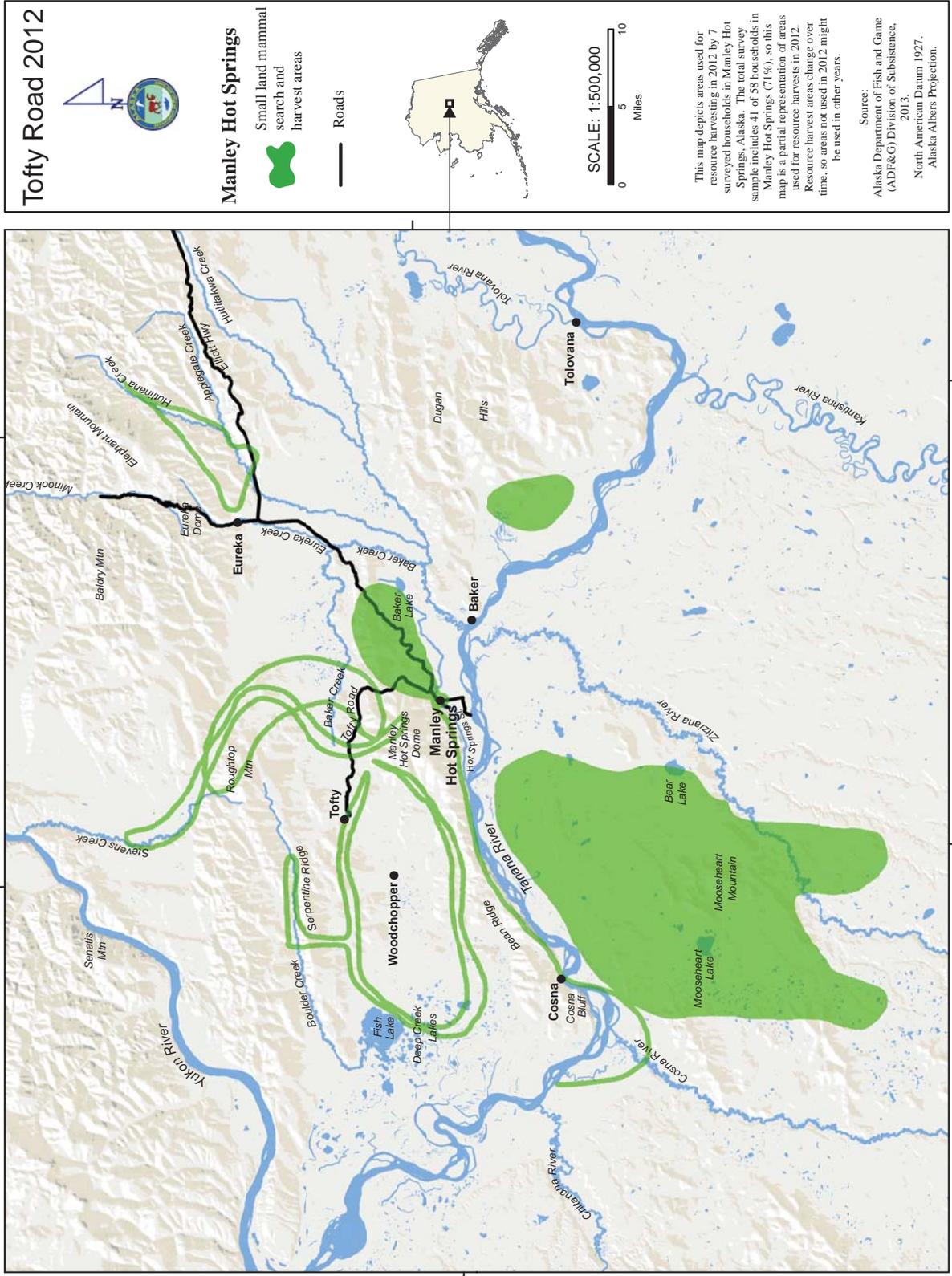


Figure 2-24. – Small land mammal/furbearer search and harvest areas, Manley Hot Springs, 2012.

and harvested included goldeneyes, scaups, white-winged scoters, northern shovelers, teals and American wigeons. Each of these duck species was used by 2% of households, and harvested by 2%. Households (2%) reported harvesting white-fronted geese. However, they reported using both white-fronted geese (7%) and Canada geese (10%). The Canada geese were most likely acquired through sharing networks since they were not harvested by community residents. Some households felt that geese numbers were declining in recent years; however, they felt that the geese that they were harvesting were fatter than they had been for several years. The total weight of edible meat from both migratory and nonmigratory birds for 2012 was 273 lb, or 2 lb per capita. One respondent noted that migratory bird harvests have decreased in the Manley Hot Springs area since the establishment of Creamer's Field Migratory Waterfowl Refuge in Fairbanks in the 1980s. The respondent believes that the large numbers of migratory birds that used to come to Manley Hot Springs in the spring and fall now divert to safer feeding areas at Creamer's Field. Other respondents also stated that even though they live near Minto Flats, a large wetland area near the community of Minto, they do not feel welcome to hunt birds in that area. Out of respect for Minto residents, they do not search for or harvest birds in that area.

Figure 2-25 shows the search and harvest areas for birds by Manley Hot Springs residents in 2012. Again, as with moose and small land mammals, the same 25- by 40-mile area south of the Tanana River between Manley Hot Springs and the Cosna/Cosna Bluffs area encompassing Mooseheart Mountain, Mooseheart Lake, and Bear Lake was used as a search and harvest area for ducks and geese. In addition to Mooseheart and Bear lakes, this area also contains several smaller lakes and low-lying wetland areas that are attractive to migratory waterfowl. Residents searched for and harvested grouse and ptarmigan closer to home. Although mainly staying in town, residents also traveled, including along Elliott Highway, which leads out of town, and along Tofty Road. Additional areas included portions of Baker Creek at Baker and between Baker and the Elliot Highway, the Manley Hot Springs Dome area, Eureka Creek, Hutlinana Creek, and a small area north of Baker Creek near its headwaters.

Manley Hot Springs households did not report using many bird eggs in 2012 (Table 2-8). Only 5% of households reported harvesting bird eggs and these were the eggs of mew gulls. Just 5% of households used mew gull eggs, 2% used murre eggs, and 2% used unknown eggs. No one in the community reported giving eggs away; however, 2% of households reported receiving murre eggs and unknown eggs each, indicating that they were either acquired from people outside Manley Hot

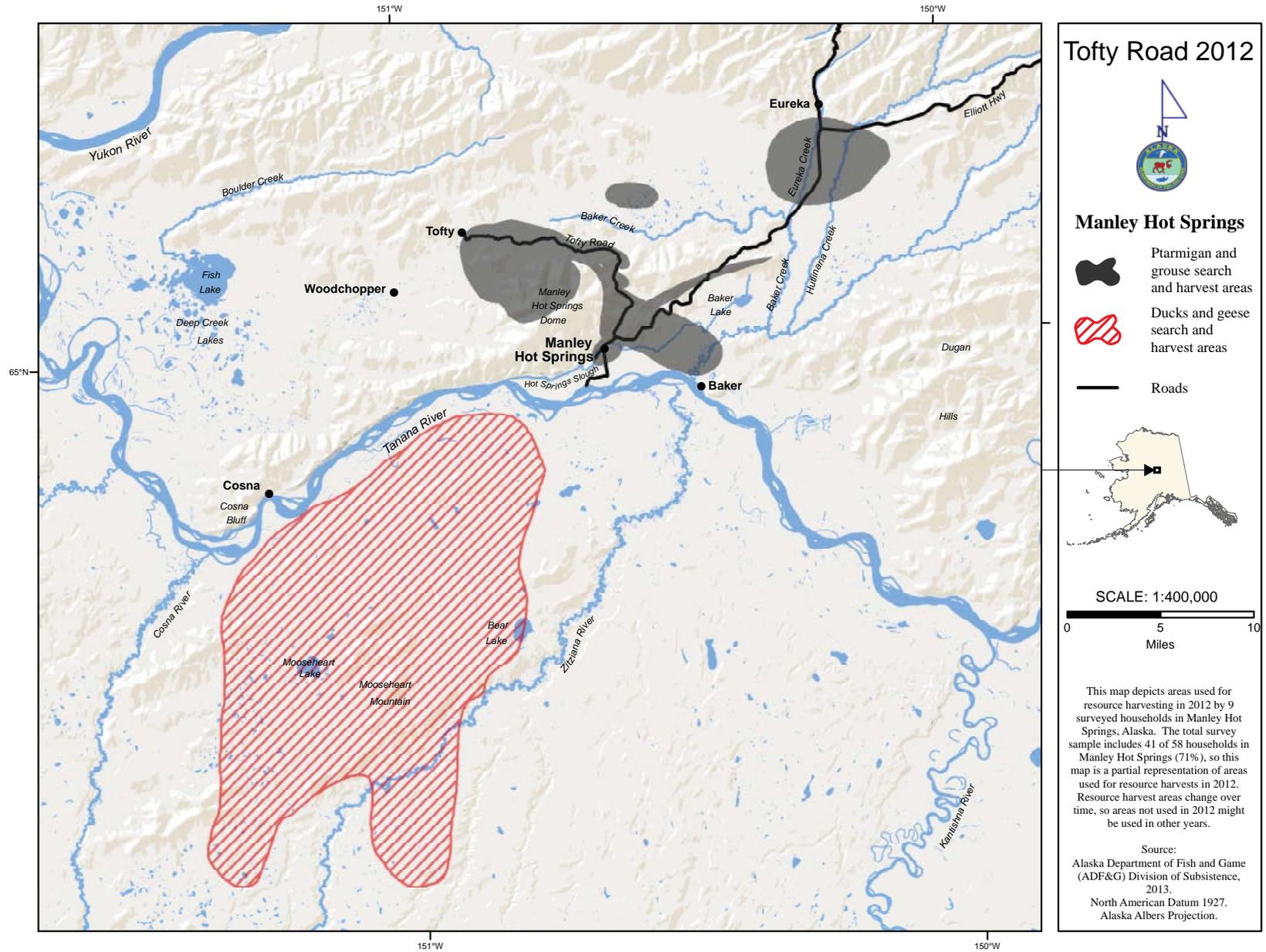


Figure 2-25.— Ptarmigan, grouse, duck, and goose search and harvest areas, Manley Hot Springs, 2012.

Springs or were harvested by households that this study did not survey. The total amount of food garnered from bird eggs in 2012 was 8 lb.

### *MARINE INVERTEBRATES*

Table 2-9 shows that 7% of Manley Hot Springs households received and used marine invertebrate resources in 2012. In 2012 households (2%) reported receiving and using razor clams, king crabs, and unknown crabs through sharing networks. No harvest of marine invertebrates was reported.

### *VEGETATION*

The consumption of vegetation (i.e., berries, plants, greens, and mushrooms) for food by Manley Hot Springs households in 2012 was high. Approximately 88% of households reported using berries, with 73% harvesting and 32% sharing with others. More than half (54%) reported using plants/greens/mushrooms, with 54% harvesting them, and 20% sharing them (Table 2-10). Berries contributed 2,044 lb (17 lb per capita) to the total community harvest while all other vegetation contributed 454 lb, or 4 lb per capita. Specifically, of all edible vegetation resources the most used (78%) and one of the second most harvested (61%), were blueberries. The community gathered 954 lb (8 lb per capita) of blueberries in 2012. The second most used (76%), and one of the second most harvested (61%) resources from the vegetation category were lowbush cranberries. In 2012, Manley households harvested 651 lb (5 lb per capita) of lowbush cranberries. Raspberries, the third most used (66%) and the most harvested (63%) plant, contributed 220 lb to the community harvest.

Vegetation other than berries (i.e., plants, greens, and mushrooms) were also sources of nutrition for Manley Hot Springs households in 2012. In looking at which items were most used and harvested, wild rose hips were used and harvested by 34% of households (63 lb), followed by orange boletes mushrooms (32 lb), which were used and harvested by 27% of households. Known mushrooms that were used and harvested but not listed on the survey included shaggy mane, corals, morels, and chanterelles.

A key respondent explained his increasing interest in gathering wild mushrooms and other vegetation:

Last summer there was gobs of mushrooms everywhere. Sometimes [blank] and I hustle and get out ahead of somebody, and we get quite a bit of morels and stuff like that, you know what I mean? Or, I put up some, some other ones, but I wished I knew more, more about 'em because I'm kind of, I've always been leery of, of getting myself sick, you know.

He went on to say:

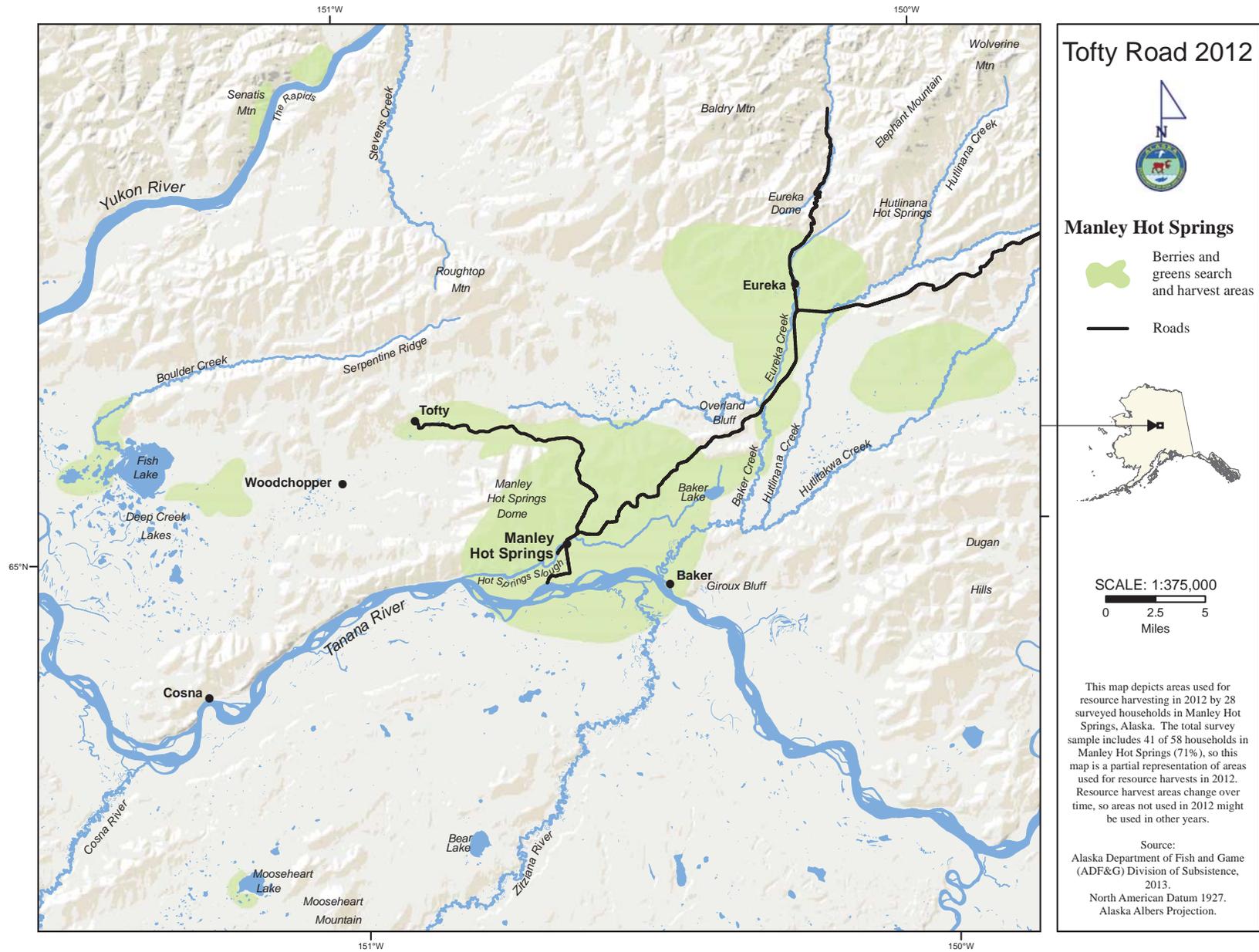


Figure 2-26.— Berries and plants/greens/mushrooms search and harvest areas, Manley Hot Springs, 2012.

You know what I mean, if a person likes mushrooms—mushrooms we got lots of it around. [It's] just a question of knowing what you can gather and what you can't, and how to preserve it, you know. I was kind of interested in some of this study here because you guys [ADF&G] have a great opportunity to learn what people can gather what. I'd like to know a little bit more about some of these, wild potatoes and different stuff around, you know. I've been meaning to. (02222012MAN04)

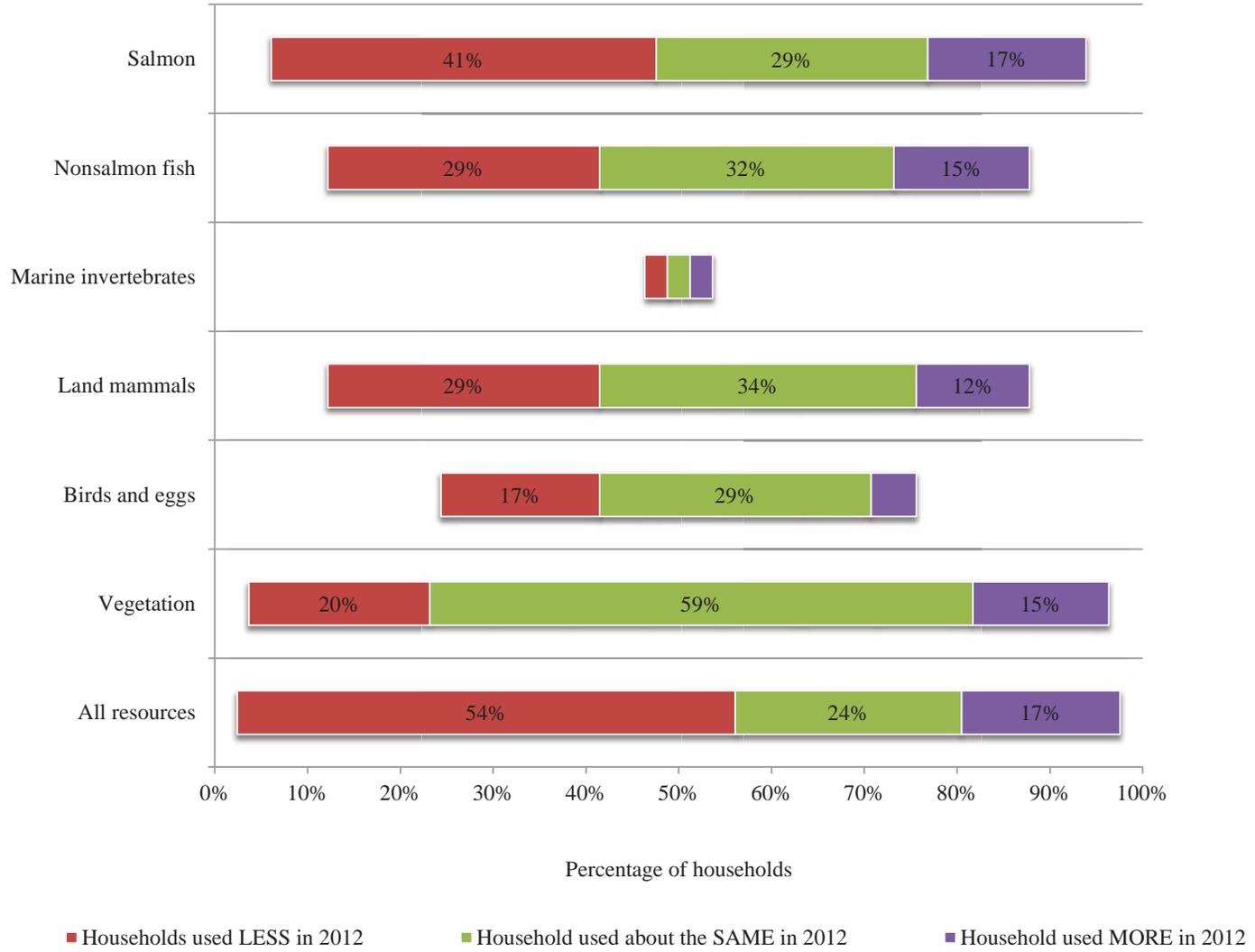
“Other wild greens,” consisting mainly of arnica, coltsfoot, chamomile, chickweed, bluebells, lamb’s quarters, and clover (none of which are specifically listed on the survey), were used by 24% and harvested by 22% of households; “other wild greens” contributed 112 lb, or 1 lb per capita. Some of these, such as chamomile, coltsfoot, and arnica, were used medically, while others, such as bluebells and clover, were used as ingredients in salads.

Wood (i.e., cottonwood, alder, spruce, and birch) was used and harvested primarily for heating purposes. The recent construction of a new runway in the community provided a large supply of downed wood for residents. A majority of households (83%) used wood, while 76% harvested and 20% shared wood. According to 1 household, the high cost of heating oil has been an inducement to use more wood for heating in recent years.

Search and harvest locations for vegetation are shown in Figure 2-26. The majority of locations are found within and around the community itself, along the road corridors of the Elliott Highway and the Tofty and Eureka roads, along both sides of the Tanana River from Baker to the confluence of the Tanana River and Hot Springs Slough, the slough itself, and in several outlying areas. One of the outlying areas is located on the Yukon River around the Rapids, a well-known salmon fishing spot described above. Some households reported picking berries and greens in conjunction with seasonal fishing activities there in 2012. Other outlying areas were located on the west side of Fish Lake to the west of Manley Hot Springs, between Fish Lake and the old town site of Woodchopper, and along a short (2.5-mile) section of Boulder Creek where it encounters Fish Lake. The west and south sides of Mooseheart Lake were favorite areas for berry picking and plant gathering. A 5-mile stretch of Hutlitakwa Creek, and the surrounding area between the Elliott Highway and Dugan Hills northeast of Manley Hot Springs, were also locations for the search and harvest of vegetation.

## **Harvest Assessments**

The survey asked respondents to assess their household’s harvests—by category, such as “salmon” or “land mammals”—in 2 ways. The survey asked:



Note Unlabeled percentages are less than 5%; figure represents households that reported using the identified resource during the survey period.

Figure 2-27.— Household uses of resources compared to recent years, Manley Hot Springs, 2012.

- During the last year, did your household use LESS, SAME, or MORE [resource category] than in recent years?
- During the last year, did your household GET ENOUGH [resource category]?

“Recent years” was defined as about the last 5 years. If a respondent indicated a change in the household’s use (by providing a response of “less” or “more”), a follow-up question was asked (“WHY was your use different?”). Households that reported not getting enough of a resource category were asked several follow-up questions:

- What KIND of [resources within the category] did you need?
- WHY did your household NOT get enough [resource category]?
- How would you describe the impact to your household of not getting enough in the last year?
- Did your household do anything DIFFERENTLY because you did NOT get enough [resource category]? IF YES, what did your household do differently?

Figure 2-27 depicts responses to the “less, same, more” assessment question. Households that said they do not ordinarily “use” something are not included within the results. This results in fewer responses for less commonly used categories, and manifests in the chart as a very short bar compared to categories such as salmon or vegetation which are ordinarily used by most households. Some households did not respond to the question. Fifty-four percent of households said that they used fewer subsistence resources in 2012 than in recent years, while 17% said they used more, and 24% said that their use of all subsistence resources in 2012 had not changed. Answers to the question about why use was less varied depending on the resource category (Appendix Table D2-7).

Figure 2-28 depicts responses to the “get enough” assessment questions. Households that said they did not ordinarily “use” something are not included within the results. Appendix Table D2-8 depicts responses to the question asking how severe the impact was to the household when not enough resources were harvested. In 2012, a majority (56%) of households said that they did not get enough of subsistence resources, compared with 41% who said that they did get enough (Figure 2-28). In regard to the individual resource categories, the majority of households (54%) said that they did not get enough salmon, while 39% said that they got enough.

Most households (41%) reported using less salmon in 2012, while 17% used more and 29% said they used the same amount as in recent years (Figure 2-27). The main reason given for getting less salmon in 2012 was restrictive regulations such as inopportune timing of “fishing “windows” (Appendix Table D2-7). Households also cited as a prominent reason for getting fewer fish less availability of the resource, and the third most common reason given was employment and not having enough time to fish (e.g., could not fish during the open “windows” due to work schedule).

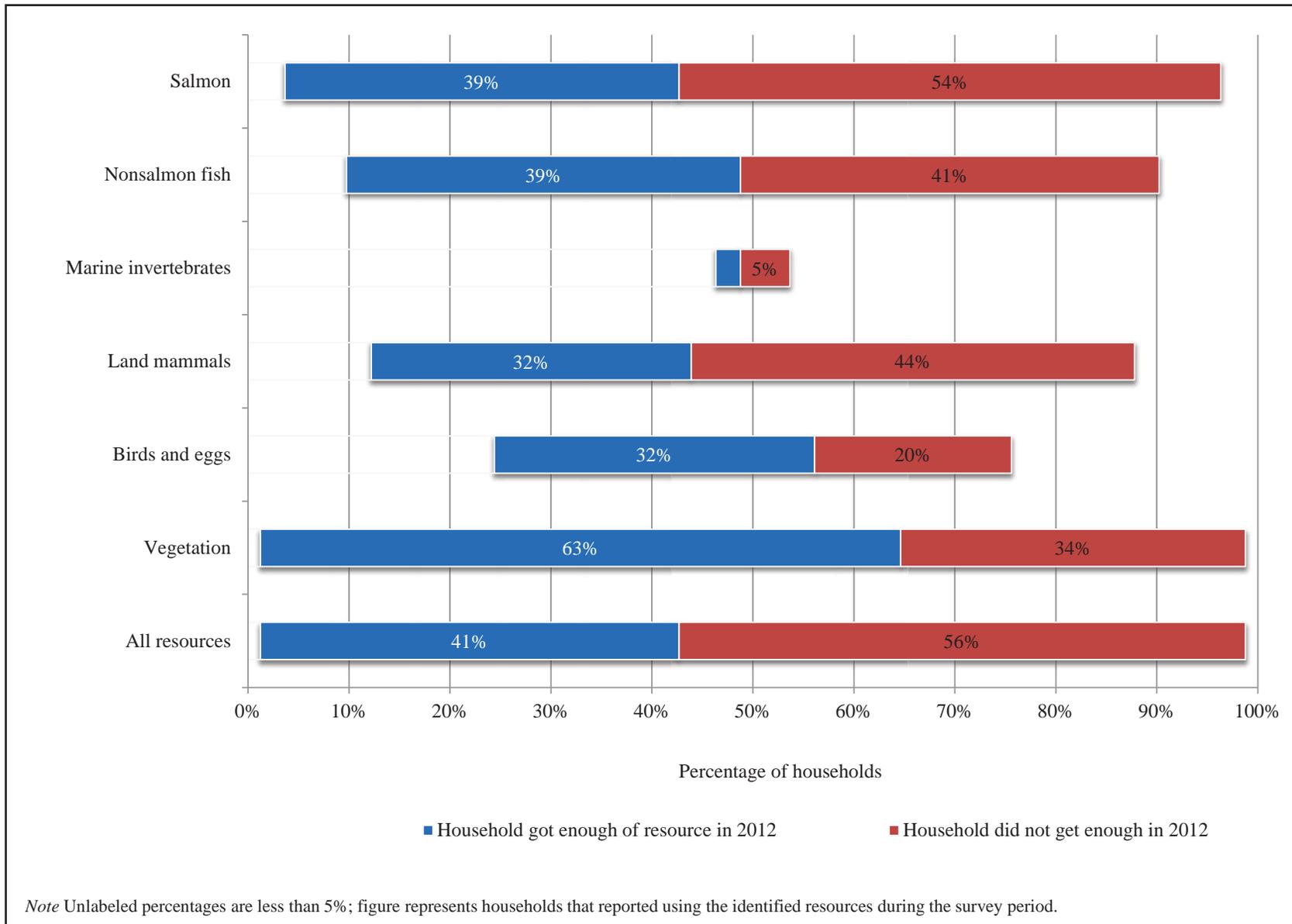


Figure 2-28.— Percentage of household reporting whether they had enough resources, Manley Hot Springs, 2012.

One household summed up reasons for getting fewer salmon, “Times change, [the Yukon River] fishery has collapsed. [I] used to make a living fishing and trapping [which is] not possible anymore. [The] cost of fuel and supplies [is] prohibitive” (Appendix E). Two households said that they got more salmon in 2012 because they received more from others and 2 households said that they got more because they increased their fishing effort (Appendix Table D2-9). Nine households reported the impact on their household of not getting enough salmon during the study year as being minor; however, 7 households reported the impact as major and 2 households described the impact as being severe (Appendix Table D2-8). The salmon species that most (14) households said they needed more of was Chinook salmon (Appendix Table D2-10).

Thirty-two percent of households reported that their use of nonsalmon fish species remained the same in 2012 compared to recent years while 29% said that their use was less (Figure 2-27). Forty-one percent of households said that they did not get enough nonsalmon fish in 2012, while 39% said that they did (Figure 2-28). The majority of households (7) reported that not having enough nonsalmon fish had a minor impact on their household, while 2 households reported it being a major impact and 2 households reported a severe impact (Appendix Table D2-8). Sheefish, northern pike, and Arctic grayling were the 3 types of nonsalmon fish that households needed more of during the study year (Appendix Table D2-10).

Forty-four percent of households stated that they did not get enough land mammals in 2012, while 32% said that they got enough (Figure 2-28). For 2012, 34% of households stated that their use of land mammals remained the same as in recent years, while 29% said they used less and 12% said they used more (Figure 2-27). Of the households that used more, 2 households said that they received more compared to other years (Appendix Table D2-9). Of those who said they got less, the main reason given was that they were unsuccessful or unlucky (Appendix Table D2-7). The second reason for getting less was that they were not given enough, and the third most common reason for not getting enough land mammals was that their work schedule did not allow them enough time to hunt or trap. One household wrote:

Subsistence users that depend heavily on subsistence resources need to expend a lot of money and time to get to camps to access the resources. They need early notification if there may be a shortage or problem with the resources in advance from the appropriate agencies, and timely notice of regulatory changes. Gas is too high to do subsistence fishing and hunting these days. (Appendix E)

Some degree of impact from not getting enough land mammals was felt by most households. Eight households said that the impact was minor, 5 said that the impact was major, and 5 households stated that it was severe (Appendix Table D2-8). The large land mammal needed most by responding

households was moose (Appendix Table D2-10). Seventeen households (49%) said that they needed more moose during the study year.

Household responses to questions about getting enough with regard to birds and eggs, and also vegetation, suggest that most households had a satisfactory year; in fact, slightly more so than that reported for land mammals. About 29% of households reported using the same amount of birds and eggs while 17% said they used less (Figure 2-27). Lack of resource availability was the main reason cited for getting less birds and eggs in 2012 (Appendix Table D2-7). Reflecting the history of, and emphasis on, gardening and gathering of wild vegetation, 59% of households said that they got the same amount in 2012 while only 20% said that they got less (Figure 2-27). The primary reason for getting less vegetation was lack of time due to employment schedules (Appendix Table D2-7).

Twenty percent of households reported not getting enough birds and eggs, while 32% said they got enough (Figure 2-28). Three households said that the impact was minor and 1 said that it was major (Appendix Table D2-8). Most households met their needs for vegetation, with 63% of households reporting that they got enough; 34% of households reported that they did not get enough (Figure 2-28). Of those households that said they did not get enough, 10 said that the impact was minor and 3 said that it was major (Appendix Table D2-8). The vegetation most needed by those who did not get enough was blueberries (6 households), berries in general (4 households), and wood (5 households) (Appendix Table D2-10). Appendix Table D2-11 shows some of the factors responding households identified as limitations to getting enough of various wild foods.

Manley Hot Springs households, like many households in rural communities, constantly have to make choices concerning the balance of time between cash employment and subsistence activities. More time at work means less time to fill freezers with wild foods. More time spent pursuing subsistence activities usually means less cash income. For example, oftentimes open subsistence fishing “windows” fall on work days or during work hours, preventing subsistence users from participating in subsistence fishing. This is a common concern in most rural communities and Manley Hot Springs is no exception. Some respondents felt that better dissemination of ADF&G regulations and fishery schedules to rural residents would help them plan their subsistence activities around work commitments more efficiently.

## **Food Security**

Survey respondents were asked a set of questions intended to assess their household’s food security, defined as “access by all people at all times to enough food for an active, healthy life” (Coleman-Jensen et al. 2012:2). The food security questions were modeled after those developed by the U.S.

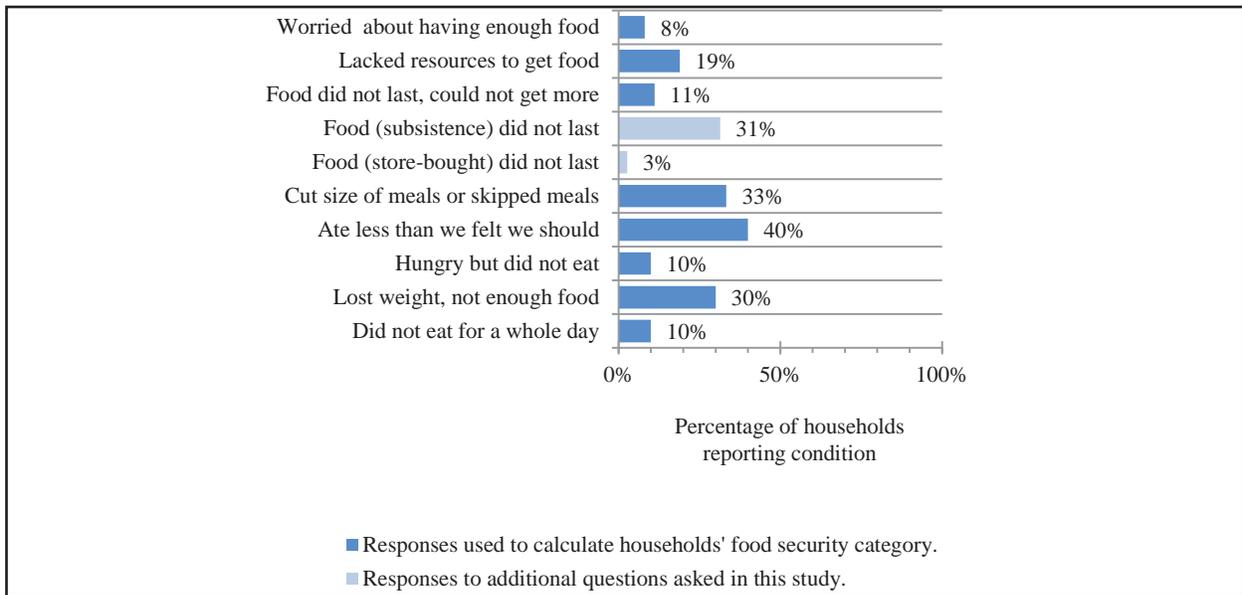


Figure 2-29.— Responses to questions about food insecure conditions, Manley Hot Springs, 2012.

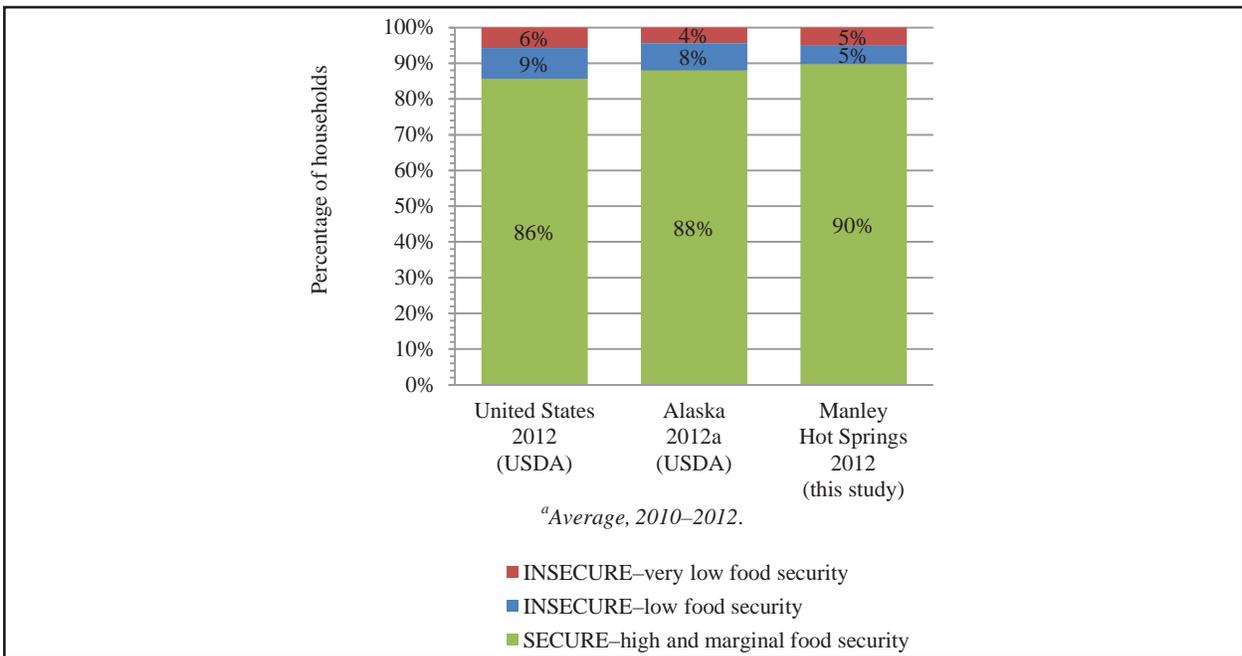


Figure 2-30.— Food security categories, Manley Hot Springs, 2012.

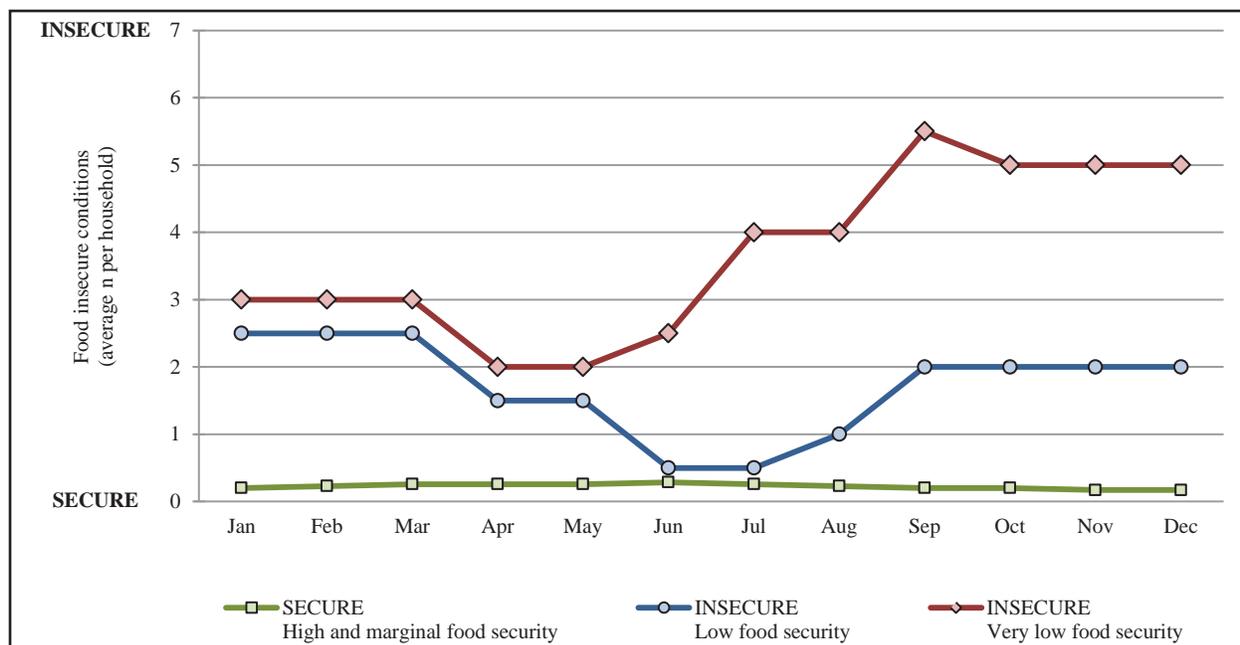


Figure 2-31.— Mean number of food insecure conditions by month and by household security category, Manley Hot Springs, 2012.

Department of Agriculture (USDA) but modified by ADF&G to account for differences in access to subsistence and store-bought foods. Based on their responses to these questions, households were broadly categorized as being food secure or food insecure following a USDA protocol (Bickel et al. 2000). Food secure households were broken down further into 2 subcategories—high or marginal food security. Food insecure households were divided into 2 subcategories: low food security or very low food security.

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

Core questions and responses from Manley Hot Springs residents are summarized in Figure 2-29. Food security results for surveys for Manley Hot Springs, the state of Alaska, and the United States are summarized in Figure 2-30.

In 2012, 90% of the Manley Hot Springs households were categorized as having high or marginal

food security; USDA considers households in both categories to be “food secure” (Figure 2-30). Of the remaining households, 5% had low food security and 5% had very low food security. In 2012, Manley Hot Springs households had slightly higher levels of food security than the state of Alaska and the nation as a whole.

Figure 2-31 portrays the mean number of food insecure conditions for households in each of 3 food security categories by month. For Manley Hot Springs households with very low food security, the instances of food insecure conditions rose between May and July, remained stable in July and August (prime salmon fishing months), and peaked in September. For those with low food security, the winter months of January and February, and the early spring month of March, were the months with the highest instances of food insecure conditions. Households with low food security and households with very low food security fluctuate alongside each other for most months, with the exception of the summer months (i.e., May through August) where they diverge. The role of cash in the overall economy may be 1 reason for the divergence. It takes money to buy gas and fishing gear. If households that struggled through the winter cannot afford to fish in the summer, their food insecurity will likely increase, whereas households that are a little better off economically might have more opportunities to fish effectively, decreasing the instances of food insecure conditions. Households that were food secure were generally unaffected by seasonal changes.

## **Household Specialization in Resource Harvesting**

Previous studies by the Division of Subsistence and others (Wolfe 1987; Wolfe et al. 2010) have shown that in most rural, predominately Alaska Native 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). This is known generally as the “30/70” rule. Although overall the set of very productive households was diverse, factors that were associated with higher levels of subsistence harvests included larger households with a pool of adult male labor, higher wage income, involvement in commercial fishing, and community location. It is interesting to note that the 30/70 rule still holds up even in this predominately Euro-American community.

In the 2012 study year in Manley Hot Springs, about 96% of the harvest of wild resource as estimated in usable pounds was harvested by 30% of the community’s households, making this community an example of a highly specialized harvest pattern (Figure 2-32). The characteristics of highly productive households will be discussed in the Wild Food Networks section of the chapter.

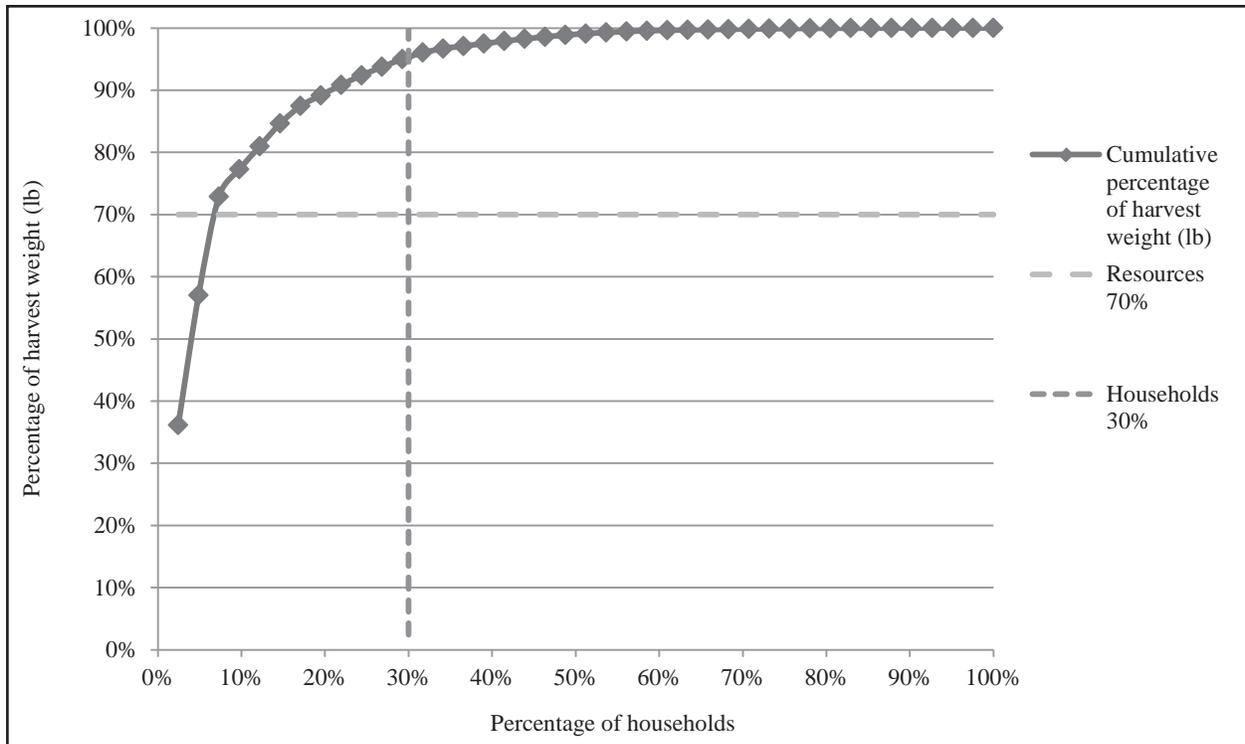


Figure 2-32.— Household specialization, Manley Hot Springs, 2012.

## Wild Food Networks

It is important to me to gather and share with other people, and a lot of people appreciate all that I can share with them. We prefer the food we can gather and hunt because it is healthier food and [it is] healthy to go out and get it ourselves. (Appendix E)

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

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

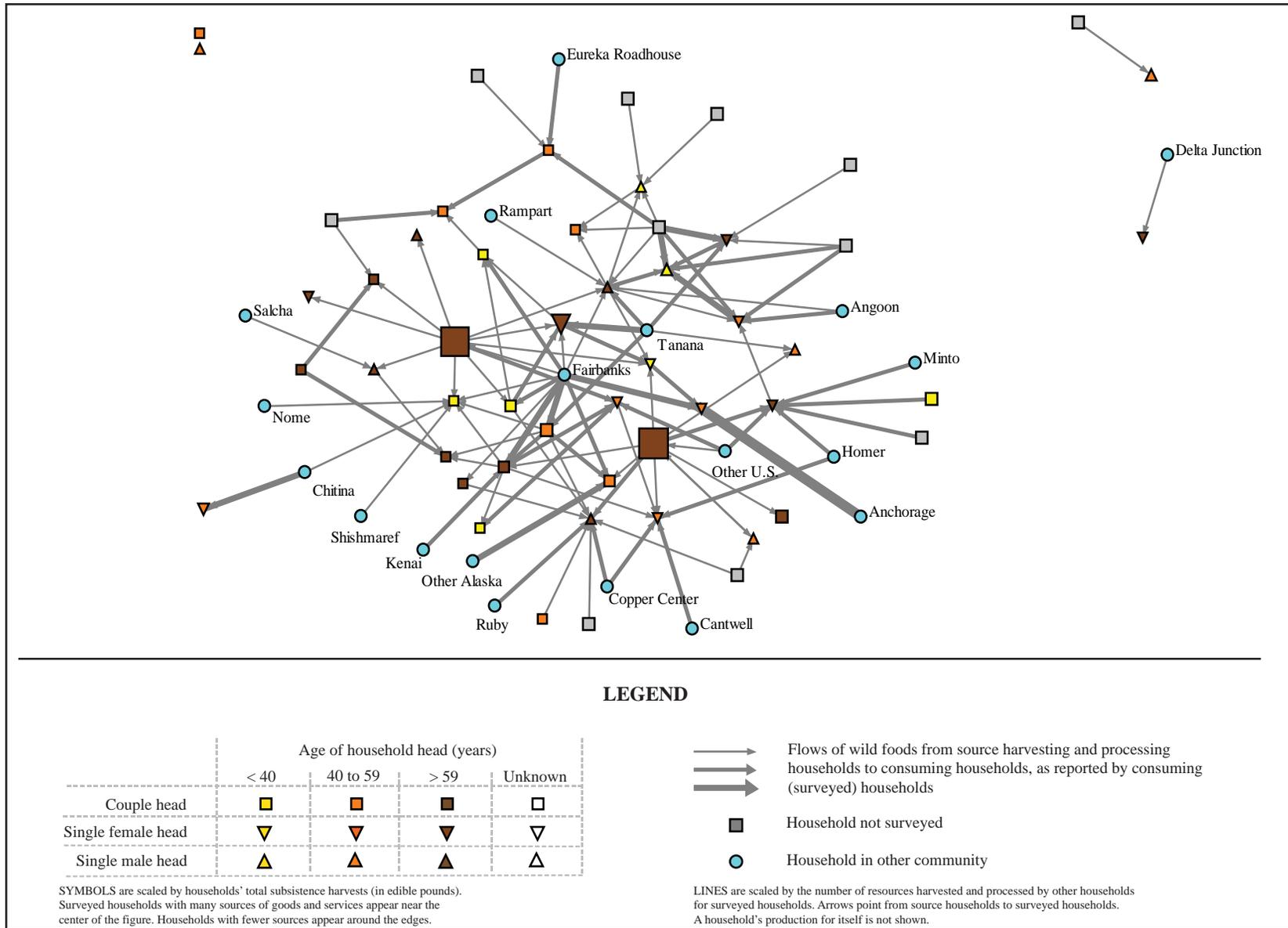


Figure 2-33.— Wild food processing and harvesting network, Manley Hot Springs, 2012.

research on subsistence in Alaska has shown that more than just the range and number of resources harvested is important. Cooperation in conducting subsistence activities and sharing of subsistence resources is central for integrating households and maintaining communities (Endter-Wada and Levine 1996; Langdon and Worl 1981; Wolfe et al. 1984).

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

Figure 2-33 shows the flow of wild foods into surveyed households from other Manley Hot Springs households and communities in Alaska. The symbol shape depicts the type of household; symbol color shows the age of the head of household, and symbol size indicates the amount of the household's subsistence harvest in 2012 by edible weight. Arrows show the direction of food from one household to another, with the weight of lines showing the volume of resources shared. The position of a household relative to the center of the figure shows how connected it was to other households in Manley Hot Springs. The figure is a partial representation of sharing, trade, and barter in 2012 because it only documents food flows into the 41 surveyed households.<sup>22</sup>

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

In 2012, the 2 most productive Manley Hot Springs households, in terms of harvesting and sharing subsistence foods, were headed by mature (59 years of age or older) couples. These households are depicted by the 2 large brown squares near the center of the figure. Other households following this pattern of higher productivity were several households headed by mature (40–59 years of age) couples (orange squares), and households headed by older (age 59 and older) couples.

Those receiving a good deal of subsistence foods and connected to several other households within the community were 1 household headed by an older single male (brown upright triangle)

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22. It is possible to include data from grey nodes in the network analysis because survey respondents described their connections to these unsurveyed households.

and 1 headed by an older single female (brown inverted triangle). This reflects the characteristics common to lower producing households presented in Wolfe et al. (2010).

Manley Hot Springs households reported receiving wild foods from numerous communities throughout the state. Fairbanks, a significant location of households that shared wild foods, appears at the center of the figure, indicating that Manley households receive many resources from households in Fairbanks. Many households in Manley Hot Springs were directly connected to this relatively nearby road-accessible regional hub. Typically, the majority of the flow of subsistence resources occurs between rural communities, and from rural to urban areas. For Manley Hot Springs with its predominantly Euro-American population however, Fairbanks appears to be a “clearing house” of subsistence foods flowing into a rural area from friends and family in an urban area.

The community of Tanana also appears near the center of the figure. Tanana and Manley Hot Springs are closely related to one another by both proximity and by family connections. Many other communities were connected with Manley Hot Springs households as well. Coastal communities such as Shishmaref, Nome, Homer, and Anchorage may have provided the coastal resources used by Manley Hot Springs households. Relationships with residents of communities such as Chitina, Kenai; and Copper Center provided excellent opportunities to obtain certain types of salmon. Connections with other Interior locations such as Eureka, Cantwell, and Salcha reflected ties with family and friends. Manley households received wild foods from the Yukon River communities of Ruby and Rampart. Betts (1997:104) gives an example of Manley Hot Springs residents giving moose to Rampart when little or no moose had been harvested there 1 winter. One outlying community, Delta Junction, on the far upper right of the figure, had connections with 1 household (a single older female) in Manley Hot Springs. This household did not have connections with any other households in Manley Hot Springs. Another household, headed by a single mature female (orange inverted triangle to the left of the figure), had only a peripheral connection to the community through a sharing relationship with a household from Chitina that was connected to another household in Manley Hot Springs. Surprisingly, there was little connection (only 1 household) with the nearby community of Minto, which is only a few miles away by road. One survey respondent had this to say concerning subsistence and sharing:

I choose a subsistence lifestyle because I believe it is a healthy lifestyle, mentally, physical, and spiritually. Job opportunities are limited in the bush [rural Alaska], so subsistence gathering is a must. Sharing these resources shows respect, responsibilities, and appreciation for the resource, and passes it on to others. (Appendix E)

A key respondent described his trading relationships with other communities:

I trade ‘em [salmon] for some [other things], I mean, some Native woman over in Minto that wants a couple of kings [Chinook] I might trade her for a birch bark basket, or that type of deal. It’s just, and then I trade fish for berries, and even clear to Shishmaref, you know I got friends in Shishmaref that I send them a king salmon, and then they send me a bag of salmonberries, you know. (02222012MAN04)

## **Comparing Uses and Harvests in 2012 with Previous Years**

### **HARVEST DATA**

This section compares the major findings of the 2012 study with previously published data. This is the first full-scale comprehensive subsistence survey conducted by ADF&G in Manley Hot Springs. Betts (1997) documented community history, seasonal round, and subsistence harvest and use patterns in 1996, and other ethnographic information in Manley Hot Springs as part of an environmental assessment (EA) to address potential impacts on subsistence uses for the then-proposed Eureka-to-Rampart road. The study provides a point of comparison for this study. The ADF&G Subsistence Division documented the harvest and use of nonsalmon fish, large land mammals, and small land mammals/furbearers from April 2004 through March 2005 in Manley Hot Springs as part of a study involving 10 Tanana River Valley communities (CSIS). However, the report did not document the harvest and use of salmon, birds and eggs, or vegetation, or any contextual ethnographic data. The data from this study presents a general, if limited, snapshot of subsistence harvests and uses in Manley Hot Springs in 2004–2005, and also provides a point of comparison for this study. In addition, ADF&G Division of Commercial Fisheries has also conducted subsistence salmon surveys in Manley Hot Springs from 1980 to the study year. Finally, ADF&G estimated migratory bird harvests as part of the Alaska Migratory Birds Co-Management program from 2004 to 2008. However, estimates were calculated on the regional level only, and Manley Hot Springs was not surveyed in every year of the project. Note that these previous studies differ in methodology, data collection timing, and lengths of study. Additionally, fluctuations in animal populations can contribute to reported changes in the harvests and uses of wild resources.

In regard to salmon, Manley Hot Springs households reported that Chinook salmon was the preferred salmon species by households in all 3 studies (CSIS data for 2004–2005, Betts [1997], and the current survey). Additionally, the yearly run of fall chum salmon was greater than the summer chum run according to all 3 studies. Sockeye salmon were not reported as being used or harvested in either Betts (1997) or the 2004–2005 data (CSIS), but were reported as being used by 29%, harvested by 2%, and shared by 10% of Manley Hot Springs households in 2012 (Table

2-5). The 2012 harvest was the result of fishing trips by a few households (2%) for Copper River sockeye salmon.

The use and harvest of nonsalmon fish offers another point of comparison between the 3 studies. According to both the CSIS data for 2004–2005 and the current survey, Manley Hot Springs households used and harvested more northern pike than any other nonsalmon fish species. Betts (1997) reported that whitefishes (all species combined) were the most used and harvested nonsalmon fish. However, whitefishes were not divided by species in Betts' report and therefore it is not possible to state what the most used and harvested nonsalmon species was for that year. Twenty-three northern pike were used and harvested in 1996. According to the CSIS data for 2004–2005, households used and harvested humpback and broad whitefishes, and also sheefish—these were the only nonsalmon fish used and harvested as documented in this data. In 2012, households reported using and harvesting round whitefish, least cisco, and Bering cisco (although least cisco were likely misidentified as Bering cisco) in addition to humpback and broad whitefishes, and also sheefish (Table 2-5). The only nonsalmon fish species that was reported as being used and harvested less in 2012 compared with the CSIS 2004–2005 data and Betts (1997) was Arctic grayling.

There are several points of comparison between the 2004-2005 CSIS data, Betts (1997), and this study regarding the use and harvest of large land mammals. The results of all 3 studies show that Manley Hot Springs households used and harvested more moose than any other large land mammal in all 3 study years. According to the CSIS data and the current study year, more than one-half of Manley Hot Springs households used moose. This data shows that 2 moose were harvested for ceremonial purposes between April 2004 and March 2005. No household reported harvesting moose for ceremonial (i.e., funeral or memorial potlatch) purposes in either Betts' (1997) study or this study. The 2004–2005 CSIS data shows that all moose were harvested in GMU 20F during the study year, whereas moose were harvested in units 20F and 20C in 2012 (Figure 2-21). For the 2004–2005 survey, households responded to questions comparing their present use and harvest of moose to past use and harvest (CSIS). When comparing their use and harvest to an earlier year (i.e., 1999), approximately 63% of households believed they used and harvested less moose in 2004–2005, 37% thought they used and harvested the same amount, and none felt they used and harvested more moose. When they were asked to compare their current use and harvest of moose to 10 years ago (i.e., 1994), the same pattern was reflected. In 2012, about the same percentage (34%) of households reported that their use and harvest of land mammals was the same as in past years and 12% stated that it was more (Figure 2-27).

The harvest and use of other large land mammals did not occur during the 2004–2005 study year (CSIS). Betts (1997) reported that residents used but did not harvest caribou, and that black bears were used and harvested but no numbers were recorded for the 1996 study year. In 2012, Manley

Hot Springs households reported the use and harvest of black bears, and the use of caribou and Sitka black-tailed deer in addition to moose (Table 2-6). The harvest and use of moose have remained consistent subsistence activities over these years, as has the use of caribou obtained from outside the community. The harvest and use of black bears has been less consistent.

Small mammal use and harvest in 2012 was quite different from that of 2004–2005. In 2012, Manley Hot Springs households used 15 different types of small mammals and harvested 14 different species (Table 2-6). In comparison, households in 2004–2005 used and harvested only 5 different types of small mammals (CSIS). According to the survey for 2004–2005, red (tree) squirrels were harvested for their meat (though this is generally rare in most of rural Alaska), and composed the largest number of small mammals used and harvested, while beavers, used for food and fur, were the primary small mammal harvested by edible weight. Other small mammals harvested for fur only included lynx, wolves, and martens. In 2012, households reported shooting red squirrels as pests rather than for food (Table 2-6). Residents harvested more furbearing animals in 2012 than in prior study years. Unlike in prior study years, in 2012, households reported using and/or harvesting coyotes, red foxes, snowshoe hares, river otters, minks, muskrats, weasels, and wolverines. The formation of a crafters guild in more recent years, and reports from several households that participate in making fur products for sale, likely account for the increased use and harvest of furbearing mammals. Additional small mammals used and harvested in 2012 but not in 2004–2005 include porcupines (used for quills and meat) and 1 flying squirrel used for meat. Betts (1997) did not record numbers of specific small land mammals used or harvested; however, she does state that red (tree) squirrels were harvested primarily as a means of pest control, cooked and fed to dogs, and occasionally eaten. The 2004-2005 study reports the harvest of 36 tree squirrels were taken for their meat, but does not specify if the meat was used for consumption by humans or by dogs. It is interesting to note that all marten from the 2004–2005 study year were reported as being used for both food and fur whereas all marten used and harvested in 2012 were reported as being used and harvested only for their fur.

ADF&G Division of Commercial Fisheries has conducted post-season subsistence salmon surveys in Manley Hot Springs since at least 1980. This presents an opportunity to look at changes in salmon harvests over time. Figure 2-34 shows estimated Manley Hot Springs subsistence salmon harvests between 1980 and 2012, with 2012 data coming from this study. The ADF&G Division of Commercial Fisheries provided the salmon harvest estimates shown in Figure 2-34 for the years prior to 2012. The methods of estimation used by the Division of Commercial Fisheries differ from those used in this study. In 2012, the Division of Commercial Fisheries estimated a total Chinook salmon harvest of 174 fish (Deena Jallen, ADF&G Yukon Area commercial fisheries biologist, Fairbanks, June 2014, personal communication). This study estimated a harvest of 979 Chinook salmon. The difference in sampling methods, mentioned above, may explain the difference in estimated harvest.

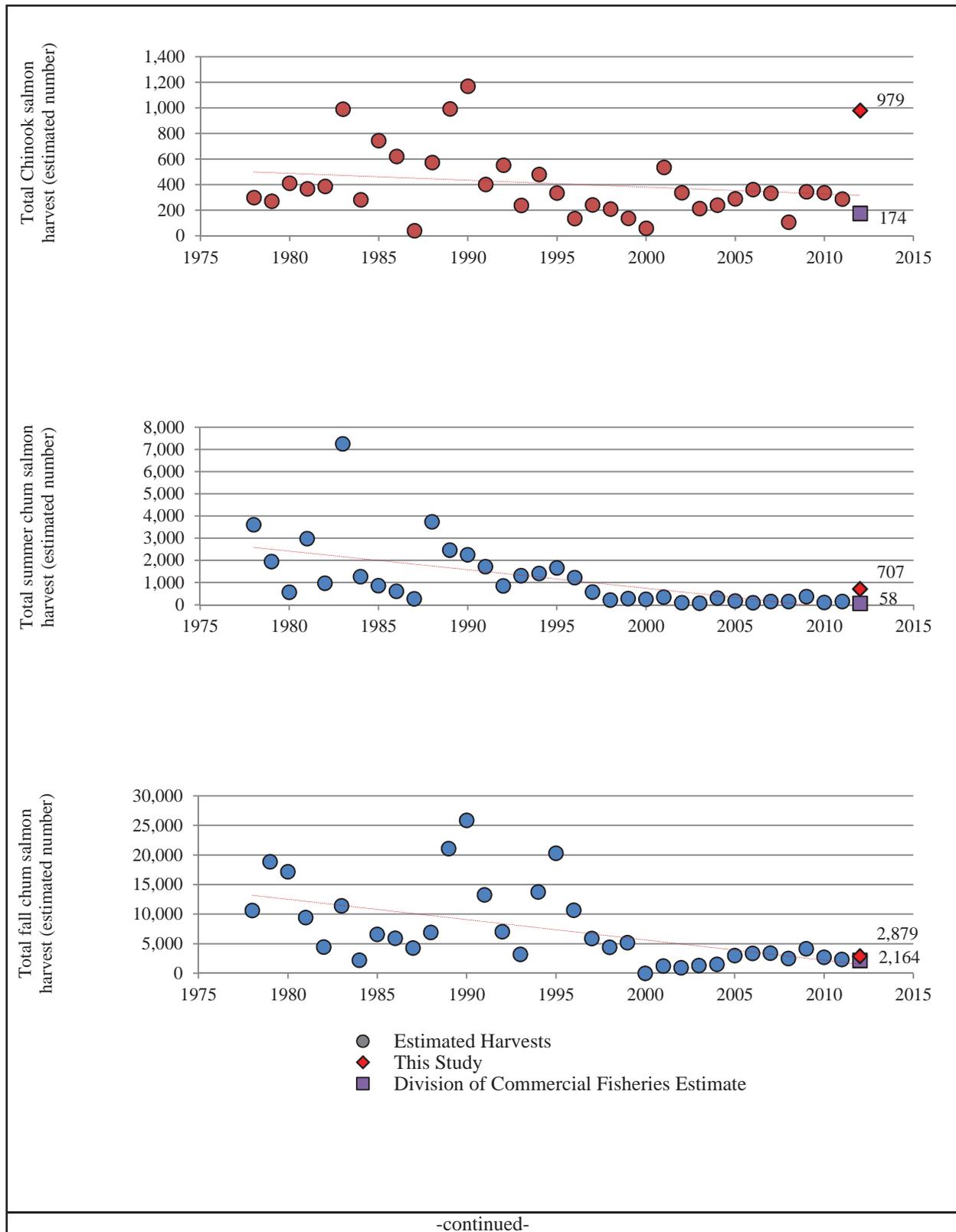
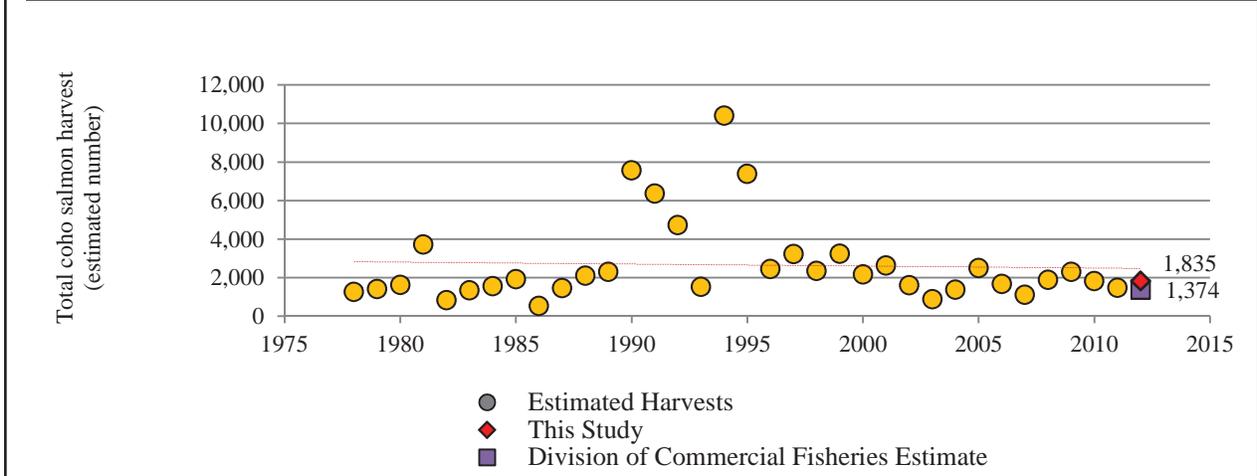


Figure 2-34.— Estimated total number of Chinook salmon, chum salmon, and coho salmon harvested, Manley Hot Springs, 1978–2012.

Figure 2-34.—Page 2 of 2.



The 4 salmon species are ordered according to their run timing, beginning with Chinook salmon in June and ending with coho salmon in late August or early September. The trend line for Chinook salmon reflects a relatively steady harvest pattern with a slight decline since 1980. The peak years for Chinook salmon harvests for Manley Hot Springs households occurred during the mid-1980s, and the apex was in 1990. In that year, the harvest reached an estimated 1,169 fish. In 1991 there was a steep drop in the harvest. By this point in time the fish processing plants had closed. The Chinook salmon harvests have not rebounded to their 1990 levels since that time. Prior to the mid-1980s, Manley Hot Springs residents harvested an annual average of 346 Chinook salmon.

The trend line for summer chum salmon shows a decrease in harvest levels over the years. The highest harvest year occurred in 1983, with a harvest of approximately 7,245 fish. The second and third highest harvest years were 1988 (3,731) and 1978 (3,601). Since 1998 the summer chum salmon harvests have remained low. The trend line for fall chum salmon also shows a decrease in harvests over the years. The peak years of harvest occurred between 1989 and 1995, with the exception of 2 high harvest years in 1979 and 1980. The apex for this salmon species was in 1990 with a harvest of approximately 25,000 fish. The harvest in recent years has not risen above 5,000 since 1999.

The trend line for coho salmon has remained relatively steady throughout the years. The peak harvest years for this species were between 1990 and 1995, with the highest harvest occurring in 1994 with approximately 10,410 fish. The average estimated yearly harvest between 1978 and 2012 has been between 2,000–4,000 coho salmon.

Figure 2-35 depicts the harvest history of large (i.e., moose, and black bears) and small (i.e., beavers, martens, wolves, and lynx) land mammals. Trend lines are based on 2012 harvest estimates and harvest estimates for 2004 recorded in CSIS. According to the moose trend line, moose harvests have decreased from approximately 10 moose in 2004 to 6 in 2012. The trend line for beavers also

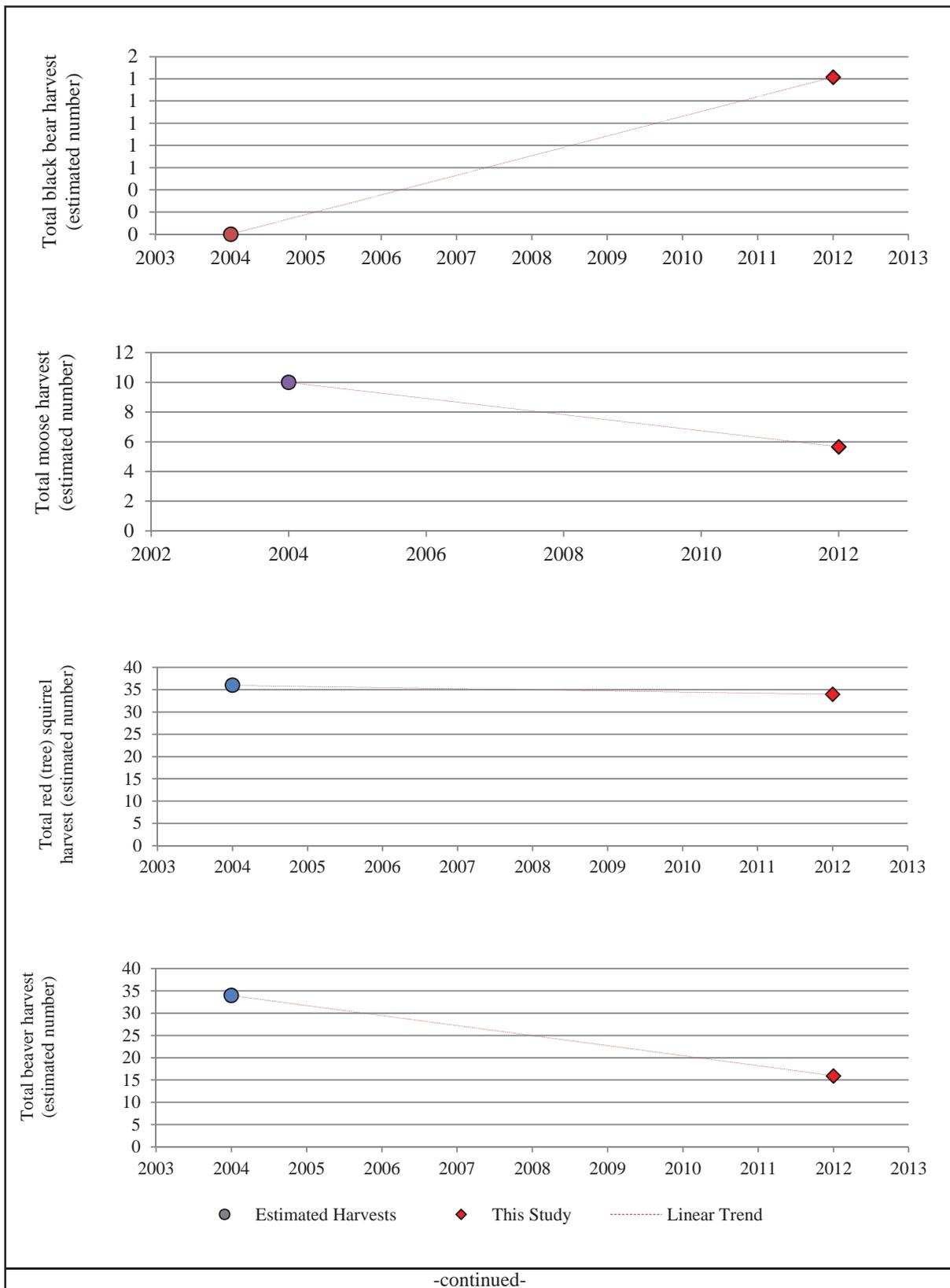
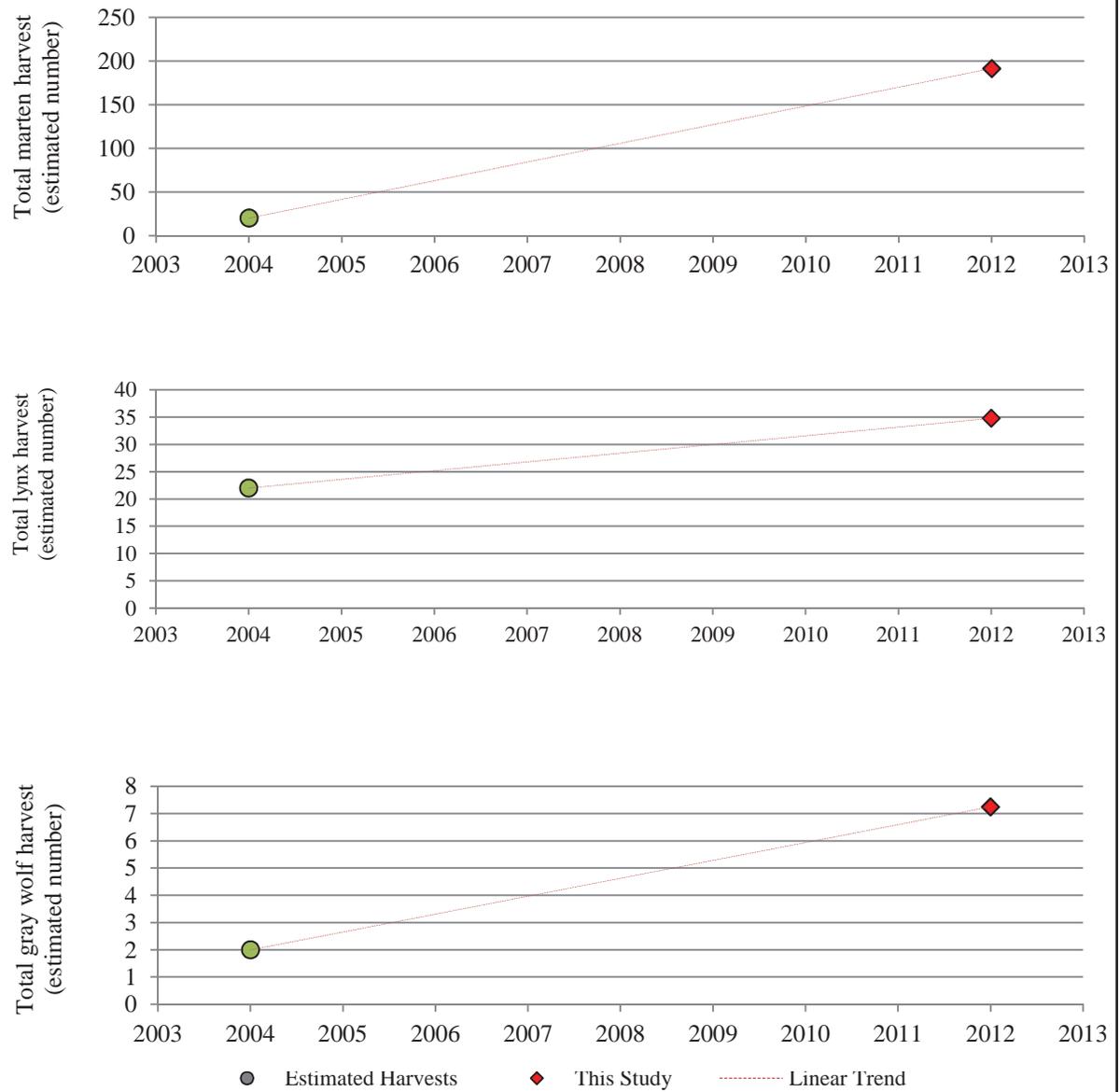


Figure 2-35.— Estimated total number of black bears, moose, red squirrels, beavers, martens, lynx, and gray wolves harvested, Manley Hot Springs, 2004 and 2012.

Figure 2-35.—Page 2 of 2.



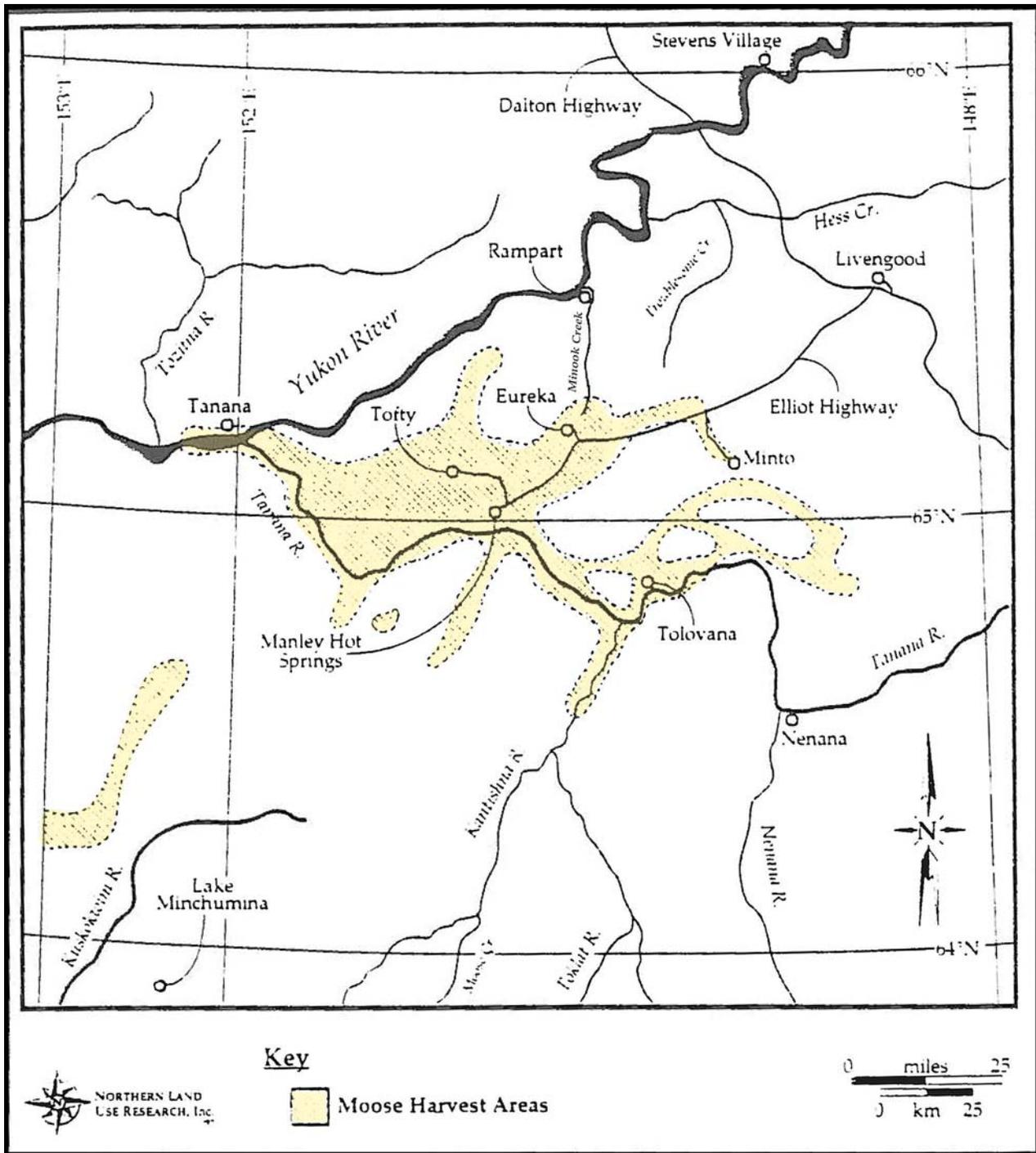


Figure 2-36.— Historical harvest map from Betts (1997) showing moose hunting areas, Manley Hot Springs, 1976–1996.

shows a decrease. Approximately 35 beavers were harvested in 2004 whereas only an estimated 16 were harvested for 2012. Interestingly, although several households reported that the trapping of small mammals was declining, the trend lines for martens, lynx, and gray wolves show an increase. The marten trend line shows an increase in harvest from 20 in 2004 to 191 in 2012. The lynx trend line shows an increase as well. The gray wolf trend line also slightly increased from 2 in 2004 to 7 in 2012. At least 2 of the households surveyed had a member who was a fur craftsman who made and sold fur hats, ruffs, gloves, and so forth, made from marten, lynx, and wolf fur.

### **Current and Historical Harvest Areas**

Many households said that their hunting opportunities for large land mammals have diminished in recent years due to the land use restrictions implemented by the Bean Ridge Corporation. Described above, the restrictions came after an incident involving a local resident who the corporation believed abused the privilege of cutting trees for firewood on Bean Ridge Corporation lands. One respondent stated that he was concerned by “restrictions to natural surroundings [of] our community due to tribal land corporations” (Appendix E). Figure 2-36 is the harvest area map produced by Betts (1997) documenting moose harvest areas for a 20-year period between 1975 and 1997; in comparison to this study’s map (Figure 2-21) it is evident that moose search and harvest areas have changed to a great extent. A major shift in areas was from the east near Minto and Tolovana, to a large area southwest encompassing Mooseheart Mountain. Another major change was a shift away from Bean Ridge, Woodchopper, and the Serpentine Ridge area, which, for the most part, are corporation lands. Some areas used for the search for, and harvest of, moose in 2012 shifted to locations that were not under the jurisdiction of the Bean Ridge Corporation. However, some moose hunting in 2012 also occurred on portions of corporation land around the community that corporation non-member local residents have traditionally used. This may reflect the growing trust and cooperation between corporation members and non-members in the past few years. Another reason for shifting search and harvest areas for moose over the years may be attributed in part to the number and location of wildfires, which increased the browsing areas for moose in different locations.

### **Local Comments and Concerns**

During the household surveys, the key respondent interviews, and the community review meeting of preliminary data, local observations and concerns regarding wild resources were documented. This section summarizes those comments. This report does not imply that these concerns are representative of the entire community or that there is consensus within the community regarding issues and concerns; however, the issues described here were frequently described. One of the most common concerns expressed by Manley Hot Springs households in 2012 was regarding competition

for resources with people from outside of the community. In particular, most households reported that it was becoming increasingly harder to harvest moose due to a number of reasons. First, competition with people from Fairbanks, Delta Junction, and elsewhere made it difficult for Manley Hot Springs residents to access areas undisturbed by other hunters. Several households expressed concern about the increasing amount of hunters from elsewhere using all-terrain vehicles (ATVs) to access areas far from the Elliott Highway. Others were not sure how the opening of a new road would further impact their subsistence harvests. One longtime resident speaking about the opening of the Elliott Highway said:

As soon as that road [Elliott Highway] went through we became “the end of the road.” And now, when hunting season comes on, if you look in front of the roadhouse, there will be cars parked and empty trailers because they have taken their boats down [down the Hot Springs Slough to the Tanana River]. Bill Burke told us when we arrived here [in the 1950s], he said, “Chuck [Dart], you never have to worry about getting a moose. If you want to, all you have to do is just go about 30 miles downriver there will always be a moose there for as long as you are around and as long as your children are around.” When the road came through it wasn’t that many years before sometimes they [Manley Hot Springs residents] came back with empty boats. (02242013MAN01)

Another longtime resident speaking about the proposed Tofty-Tanana Road project discussed in more detail in Chapter 1 said:

So, ah, the last open area that is really around here is off to the north, to [the] northwest, over towards the Yukon River there. There’s human predation for trapping and hunting over there now. And, ah, it would be my fear that if they built that highway [Tofty-Tanana Road] through that area, that the predation would really become rampant. And it’s not necessarily just limited to people in automobiles or trucks, I mean most of them [hunters from other areas] now have ATVs that go 20–30 miles off the highway without any problem at all. So, my biggest reason for being against the proposed highway over here is that it’s just gonna bring in more and more human predation on very limited resources that we’re dealing with right now. (02222013MAN02)

Along similar lines, one resident noted in her survey:

[I’m] not happy about the road project. Subsistence areas can only take so much pressure. More development projects and increased people [and] traffic will push animals farther back and [be] harder for locals to harvest. Google Earth and GPS [global positioning system

units] help outside hunters locate lakes and sloughs off rivers that years ago only locals knew where they were. (Appendix E)

Another resident who was concerned about more competition from “outsiders” and increased use of ATVs for hunting activities said, “They [hunters from “outside”] don’t care now if it’s [moose] 35 miles off the road ... they’ll make a trail to it with these winches and these big 4-wheelers that they got now. So they’re going 35 miles out there to get that big bull now.”

This resident went on to say:

There’s trails everywhere out there, where these guys go through the brush now. And, with these winches and stuff, and 35 miles to get a moose ... big moose is nothing. It used to be it [hunting moose] was a few miles off the road; a guy could pack it out. (02222013MAN04)

Speaking in favor of the road, one resident wrote in her survey comments:

I can’t wait for the road to go through. We will have more access to hunting and fishing and to see my relatives [in Tanana] more often. (Appendix E)

## **Acknowledgements**

The author wishes to thank everyone involved with this project. This study could not have been completed without the tireless efforts of our locally hired research assistants Steve O’Brien, Linda Johnson, and Lynette Woellert. Their effort on behalf of the Division of Subsistence and the Manley Hot Springs community is greatly appreciated. Our key respondents graciously gave hours of their time to help us understand the history of their community, their relationship with the land and wild resources, and their current subsistence activities. And finally, thanks go to the residents of Manley Hot Springs who kindly invited researchers into their homes to complete the often 1-hour long survey, to share with us their reminiscences, knowledge, and insights about the continuing importance of subsistence activities and subsistence resources in their lives.

## **Dedication**

This chapter is dedicated to two respected Manley Hot Springs residents who passed away during the writing of this report: Don de Lima (1928-2013), an Alaskan pioneer, miner, trapper, and storyteller who shared some of his stories of the early days of Manley Hot Springs with the author; and Tommy Hetherington (1958-2014), life-long trapper, fisherman, pilot, and mechanic who served as a key respondent for this chapter.

### 3. Minto

*“It’s a good place to be quiet, to listen, and to learn” – [personal communication with Minto youth]*

*Alida Trainor*

In May 2013, researchers surveyed 46 out of 61 households (75%) in Minto (Table 1-2). This chapter summarizes findings from the household surveys, including demographic characteristics, responses to harvest assessment questions, harvest estimates, employment and income information, and responses to food security questions. Harvest numbers are expanded estimates. Additional tables appear in Appendix D3. Results from this survey are available online as part of the Community Subsistence Information System (CSIS<sup>1</sup>).

During the study year (2012), the community of Minto harvested 55 known species of fish, wildlife, and plants. Survey participants documented the search areas for the wild resources they harvested. In total, these households used 491 square miles. Moose (*denigi*<sup>2</sup>) and 5 varieties of salmon—Chinook (*gath*), coho (*khwyhts’en’luk’a*), fall chum salmon (*nulaghi*), summer chum salmon, and sockeye salmon—account for 77% of the total community harvest.

In addition to the 2013 comprehensive survey, ADF&G staff conducted 10 ethnographic interviews with 11 individuals, including 3 elders, a married couple, and active hunters and fishers. These ethnographic interviews provide context for the quantitative data presented in this chapter. Findings from these interviews, historical background information, and comparisons to earlier studies are presented throughout this chapter.

#### Community Background

Minto<sup>3</sup> is located at the northwest corner of the Minto Flats State Game Refuge (Minto Flats) on the west bank of the Tolovana River; it is 40 air miles from Fairbanks and 130 road miles from Fairbanks when traveling northwest on the Elliott Highway before reaching the 11-mile Minto Spur road. The community is situated on the Tolovana River and also has access to the Tanana River, which is approximately 20 air miles away. Figure 3-1 shows the community of Minto in the spring.

1. ADF&G CSIS: <http://www.adfg.alaska.gov/sb/CSIS>.

2. Where available, words in the lower Tanana Athabascan dialect used by Minto people for various plants, animals, and local place names are included throughout this report. Translations used in this report were taken from *Benhti Kokht’ana Kenaga’: Minto lower Tanana Athabascan pocket dictionary* compiled by Siri G. Tuttle (2009).

3. In the lower Tanana Athabascan language, Minto is known as *Menok’oget*, which translates to “the place where his face is chapped” (Kari 2012:37).



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*Figure 3-1.– Front Street. Minto, Alaska.*

Minto is 70 miles downstream from Nenana on the Tanana River (Betts 1997). Prior to the 1970s, a settlement, now known as Old Minto, was located on the Tanana River. The history of Old Minto and the circumstances surrounding the relocation to Minto’s present location are discussed below in further detail.

The Minto Flats area, located in central Alaska, is a low-lying basin surrounded by hills and ridges generally reaching 1,000 to 1,500 ft in elevation (Andrews 1988:9). Many lakes and portages characterize the flats, which are drained by 5 major waterways: the Tolovana, Chatanika, and Tatalina rivers, and Goldstream and Washington creeks. These waterways combine together and flow into the Tanana River, which enters the Yukon River and creates a region that benefits from extensive waterway transportation and access to fish and wild game. A portion of Minto Flats is located within the Tanana Valley State Forest.

Most of Minto’s residents are descendants of lower Tanana Athabascans who lived along the numerous clearwater streams described above. Seasonal settlements were common throughout Minto

Flats but most were located in the northern and eastern portions of the region (Andrews 1988:17). Prior to contact with non-Natives, the lower Tanana people traveled in small groups—roughly 100 individuals or fewer.<sup>4</sup> These groups moved seasonally following wild game. Depending on the season and the availability of subsistence foods, these groups would either subdivide or join with others to work together and share resources. When the weather began to warm in the spring months of March and April, beaver (*tso'*) and muskrat (*dzenh*) hunting became a primary objective. During the spring, people could enjoy fresh meat and stock up on valuable furs. Into the early 20th century, it was common for people from Tanana and Stevens Village, both on the Yukon River, to travel to Minto Flats to hunt muskrats (Andrews 1988:59). Before the ice melted, traps were set under the ice to harvest Alaska blackfish (*unyiyh*). In late spring and early summer, people began to settle at their primary fishing locations along the Tolovana and Tanana rivers, which were prominent locations for salmon. For those families that did not camp along these rivers, whitefishes (*tsabaya*) and other nonsalmon fish species were the main fish harvested. In the fall and winter, many people began trapping small land animals and hunting moose and caribou (*bedzeyh*). Caribou fences were used to corral the migrating animals and Minto hunters often traveled with neighbors in Nenana to herd and harvest caribou (Andrews 1988:59). Families remained in these hunting locations until December. In mid-winter, groups would often gather together to hold potlatches to honor the deceased and to trade with one another. Trapping and hunting land mammals continued through the winter months.

In the early contact period (i.e., 1850–1900) the Minto people had little interaction with non-Natives and were one of the last groups in subarctic Alaska to have direct contact with them.<sup>5</sup> During his 1883 reconnaissance, Lt. Frederick Schwatka observed that many people of the Yukon–Tanana region lived in moose skin tents and some had “underground houses” (Schwatka 1983rep.:346). The following year, Lt. Henry T. Allen descended the Tanana River, but did not record seeing any people, likely because their primary settlements were located along smaller Tanana River tributaries (Allen 1985rev.:451).

In the 1890s and early 1900s, rapid economic growth began occurring in the Tanana valley. In 1902, the discovery of gold north of Fairbanks—on Tolovana tributaries and in the nearby Rampart Mining District near present-day Manley Hot Springs—brought steamboat traffic and new settlers to the Tanana River. A telegraph line, constructed by the U.S. Signal Corps along the Tanana River, operated from 1902 to 1918 necessitating numerous telegraph stations, including 1 only a few miles upriver from where the village of Old Minto was once located (Shepherd and Matthews 1985). At this time the primary settlement of Minto people was centrally located in the flats at a place called

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4. Wallace M. Olson, “Minto, Alaska: cultural and historical influences on group identity,” pp. 704 (master’s thesis, University of Alaska, 1968).

5. Wallace M. Olson, “Minto, Alaska: cultural and historical influences on group identity,” pp. 704 (master’s thesis, University of Alaska, 1968).

Cache. This site is still marked by a few elevated caches<sup>6</sup> and a small graveyard.<sup>7</sup> Roadhouses were built to lodge travelers and workers. To accommodate the influx of people, trading posts increased in number and size, increasing the demand for furs, dried fish for dog teams, and cordwood for steamboats (Andrews 1988:20). Some Minto people in the area began participating in the trade and sale of these items, drawing them closer to the Tanana and Yukon rivers for more extended periods of time. Cutting wood for steamboats, for example, became a common fall time activity. Additionally, people began spending more of their winter harvesting furbearing animals and hauling freight by dog team (Andrews 1988:63). A number of trails were created to connect Minto Flats with trading posts in Tanana, Rampart, and Fort Hamlin near the present site of Steven's Village, as well as to stores in Nenana. Muskrat furs, for example, were traded in exchange for staples like flour and sugar.

In the early 1900s, economic changes introduced new fishing gear to the area, creating more productive fishing opportunities for the Minto people. In the early 1900s, the introduction of the fish wheel to the interior of Alaska changed the way people in Minto Flats fished for salmon.<sup>8</sup> Prior to its introduction, fishermen relied on weirs, nets, or fish traps made of natural materials. While effective, these methods were time-consuming—both to build and to maintain. Fish wheels allowed fishermen to catch large numbers of fish, primarily salmon, faster and with less effort than before. They could also be operated in the mainstem of the Yukon or Tanana rivers, expanding fishing areas beyond smaller tributaries. The change in fishing gear enabled people in the area to establish themselves as a vital component of the growing economy in the region. More salmon harvested meant more trade, but it also meant that Minto people could keep larger dog teams, allowing them to maintain longer, more profitable traplines. Increased participation in the growing cash economy created a logistical incentive to settle closer to trade centers.

In 1915, some Minto people began building cabins on the Tanana River. The location had always been used for portions of the yearly seasonal round but the establishment of an Episcopalian missionary school in nearby Nenana, and proximity to jobs and trade on the Tanana River, led to the establishment of a more enduring community. Some Minto children, mostly boys, attended school in Nenana where they learned to read and write, and increased their use of the English language (McKenna 1981:567). Children often spent a few years in school before returning home to their families to hunt, fish, and trap. Within a few years after its founding every Minto family had a cabin in the new village. However, these cabins were not occupied year-round until the 1940s when the location became the permanent settlement of the Minto people (Andrews 1988:61).<sup>9</sup>

6. Caches are wooden structures, often built on stilts to store food, supplies and other goods.

7. Wallace M. Olson, "Minto, Alaska: cultural and historical influences on group identity," pp. 705 (master's thesis, University of Alaska, 1968).

8. Wallace M. Olson, "Minto, Alaska: cultural and historical influences on group identity," pp. 705 (master's thesis, University of Alaska, 1968).

9. Wallace M. Olson, "Minto, Alaska: cultural and historical influences on group identity," pp. 706 (master's thesis, University of Alaska, 1968).

Between 1935 and 1955, contact with Euro-Americans intensified. Consequently, features of local diet, language, and political organization began to change. At the same time, a natural decline in caribou abundance led to the consumption of more store-bought food and a rise in the planting of gardens. These dietary changes kept Minto people from traveling long distances to pursue their subsistence activities.<sup>10</sup> In 1937 a local, federally run school opened in Minto. In 1937, the same year the school opened, Minto organized a village council that received a charter from the U.S. Department of the Interior in 1939.<sup>11</sup> School teachers at the time documented these changes and noted that very few children born after 1940 became fluent speakers of the lower Tanana Athabascan language. In the 1940s, children began leaving Minto to attend boarding schools in Sitka, Alaska, Chemawa, Oregon, or Chilocco, Oklahoma. At this time, boarding schools often prohibited students from speaking their native languages and, consequently, further diminished the number of fluent Athabascan speakers from Minto.

In 1970, after reoccurring flooding on the Tanana River, the community of Minto (now known as Old Minto) decided to move to its current location on the Tolovana River in the northwestern portion of Minto Flats. Higher ground, access to the Elliot Highway, and continued proximity to hunting, fishing, and trapping grounds made the location desirable.

Presently, social, political, and familial contact continues with people along the Yukon and Tanana rivers. Some residents return to Old Minto each year to visit and maintain a historical graveyard there. Additionally, a rehabilitation program located in Old Minto serves people in the area. Despite the history of relocation and resettlement of particular areas, the large geographical area known as Minto Flats is still a significant area for subsistence hunting and fishing and is of great cultural importance to the Minto people.

## **Seasonal Round**

The contemporary seasonal round of Minto residents includes most of the same wild resources as in pre-contact times, with a few exceptions. For example, caribou no longer migrate through Minto Flats and consequently are no longer part of fall or winter hunting efforts. Additionally, muskrat hunting in the spring has decreased significantly because of a decline, observed locally, in the muskrat population. However, many key respondents in this study remember traveling to “rat camps” with their parents and extended families. As will be discussed below, respondents have

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10. Wallace M. Olson, “Minto, Alaska: cultural and historical influences on group identity,” pp. 706 (master’s thesis, University of Alaska, 1968).

11. Wallace M. Olson, “Minto, Alaska: cultural and historical influences on group identity,” pp. 707 (master’s thesis, University of Alaska, 1968).



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*Figure 3-2.– South view from Minto of the Tolovana River and the lake-dense Minto Flats area.*

observed signs that muskrats are returning to Minto Flats and are hopeful that hunting them will once again be a key component of springtime activities.

Today the migration of geese (*khwhh*), cranes, ducks (*dets'eni*), and swans (*tobo*) across Minto Flats signals the arrival of spring and presents an opportunity for ample waterfowl hunting. Minto residents paddle throughout the numerous lakes to the south of town in search of birds (Figure 3-2). Birds are either cooked immediately, frozen whole, or dried for later consumption. Sharing birds with other individuals and families in the community is common. Prior to the return of salmon each summer, fishing for nonsalmon fish species—including northern pike (*ch'ulkoya*) and whitefishes—is common. In June and July, families begin preparing for salmon fishing. At one time, nearly all families traveled to fish camps along the Tanana and lower Tolovana rivers. Today, however, fewer families fish for salmon. Instead, a few heavy harvesters distribute their catch throughout the community. Mesh gillnets and fish wheels are used by fishermen who do target salmon. Reduced salmon fishing by Minto residents, and explanations for these changes over time, are discussed below in the “Use and Harvest Characteristics by Resource Category” section. In addition to salmon

fishing, summer is a welcome season for berry pickers. Blueberries, cranberries, and raspberries (*nekotl*) are favorites among Minto residents.

In late August when the weather begins to cool, residents prepare for moose hunting. Moose harvests generally occur in September but moose are also harvested during an annual winter season. Special hunting opportunities are available to harvest moose for ceremonial purposes.<sup>12</sup> Small hunting groups travel together, mostly by boat along the primary waterways, in search of moose. Some respondents described camping for a few days at a time at nearby locations. Hunting in groups is beneficial because the cost and effort associated with moose hunting are distributed among participants. Respondents described fall hunting as an enjoyable time of year that brings families and friends together. Other fall-time activities include migratory bird hunting and harvesting firewood (*dul*).

For residents who trap, winter is an important time of year. Between December and May, trapping for small game and furbearing animals is a time-consuming activity; although today Minto residents harvest very few furbearing animals. Key respondents cite a decline in fur prices and reduction in the use of dog teams for the reduced trapping effort by Minto residents. Some ptarmigan and grouse (*trogwda*) hunting occurs during winter months.

In summary, while Minto people no longer travel throughout the year to seasonal settlements, subsistence activities continue on a seasonal round.

## Demography

Table 3-1 presents Minto's demographic characteristics and survey sample information. The 46 surveyed households included 133 people. Expanding for the unsurveyed households, the estimated population of Minto was 176, of which 102 were males (58%) and 74 were females (42%), and 168 were Alaska Native (96%). The average age was 33 years old, and the oldest person was 89 years old. The average household size was 3 occupants, and there were as many as 7 living in 1 household. The average length of residency in Minto was 17 years. Figure 3-3 is a population profile that shows the age and sex distribution of residents. In 2012, more than one-half of the population was male (58%) with most men under the age of 39 (59 individuals). Most women in Minto were younger than 50 years old. Forty-three women were under the age of 35 (58%). Figure 3-4 compares this

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12. Under statewide regulations, communities are able to hunt large land mammals, outside of an open season, "for food in customary and traditional Alaska Native funerary or mortuary religious ceremonies." The tribal chief, village council president, or other chief representative for the community or family must contact ADF&G and identify the dates for which hunting will occur, how many animals are expected to be harvested and the name(s) of the hunters (5 AAC 92.019). Because of Minto's cultural affiliation with Koyukon Athabascan heritage, the community is allowed to take big game for funerary or mortuary religious ceremonies without contacting ADF&G prior to the hunt. The tribal chief or village council president must notify the department after the harvest is made (5 AAC 92.017).

Table 3-1.— Demographic characteristics, Minto, 2012.

Characteristics	Community Minto
<b>Sample achievement</b>	
Sampled households	46
Eligible households	61
Percentage sampled	75.4%
Sampled population	133
Estimated population	176.4
<b>Household size</b>	
Mean	2.9
Minimum	1
Maximum	7
<b>Age</b>	
Mean	32.9
Minimum	1
Maximum	89
Median	28
<b>Sex</b>	
Estimated male	
Number	102.1
Percentage	57.9%
Estimated female	
Number	74.3
Percentage	42.1%
<b>Length of residency</b>	
Population	
Mean	17.3
Minimum	1
Maximum	51
Household heads	
Mean	21.0
Minimum	1
Maximum	51
<b>Alaska Native</b>	
Estimated households	
Number	58.3
Percentage	95.7%
Estimated population	
Number	168.4
Percentage	95.5%

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

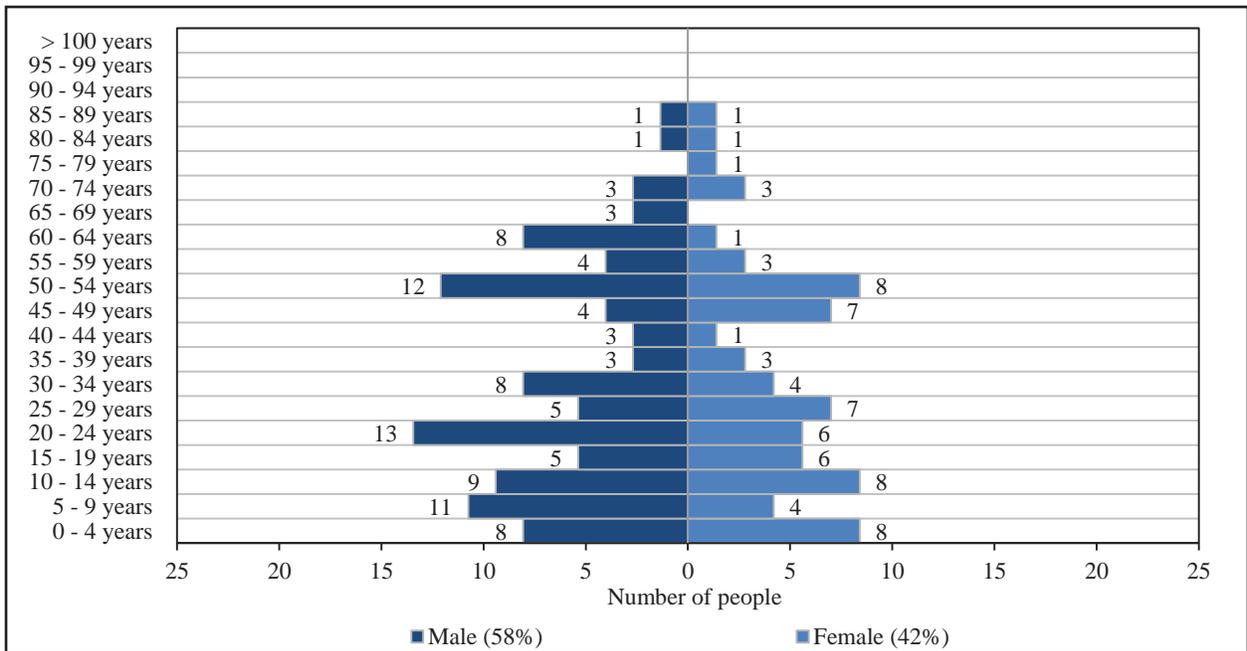


Figure 3-3.— Population profile, Minto, 2012.

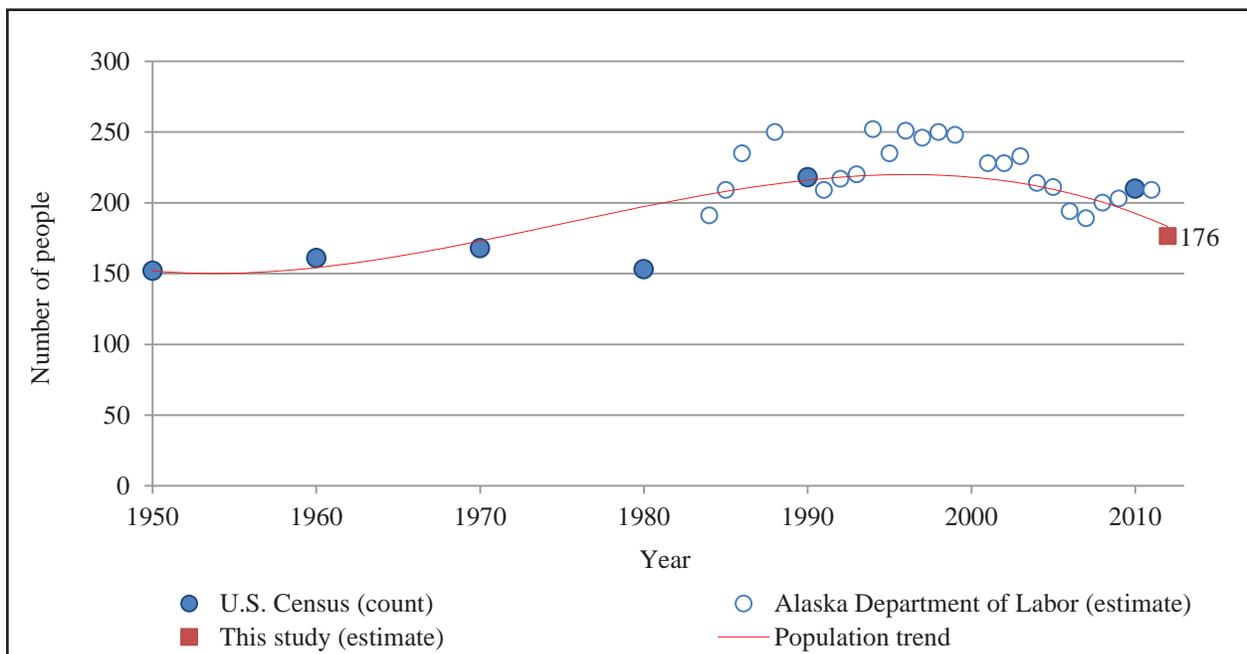


Figure 3-4.— Historical population estimates, Minto, 1950–2012.

study's population estimate to the U.S. Census Bureau's decennial estimates and the Alaska Department of Labor's annual estimate. In 2010, the U.S. Census Bureau reported an estimated 210 people resided in Minto. The following year, the Alaska Department of Labor made a similar estimate of 209 people. In 2012, this study estimated a total population 176, a much lower figure than the other 2 recent studies. Methodology used by the U.S. Census, the Alaska Department of Labor, and this study differ and may account for the variance between the 3 estimates. Appendix Table D3-1 shows the birthplace locations of the surveyed heads of households. Most (75%) of Minto household heads were born in Minto. Other birthplace locations included Tanana (6%), Fairbanks (4%), and other places within the United States (6%).

## **Income and Jobs**

Respondents were asked about both earned income (jobs held and wages earned by all household members 16 and older) and unearned income (Alaska Permanent Fund dividend, Social Security, public assistance, etc.). In 2012, Minto households earned or received an estimated \$2,341,629 of which \$1,725,320 (74%) was from wage employment and \$616,309 (26%) was from other sources (Table 3-2). The average earned income was \$28,284 per household and \$13,277 per capita (Appendix Table D1-1). Figure 3-5 shows the top 10 income sources ranked by estimated contribution to total income in 2012.

Employed residents earned the most income from local government jobs, which included administrators, clerks, and other tribal staff—a total of \$723,750. Thirteen percent of Minto residents' total income came from construction jobs (\$306,146). The location of Minto off the Elliot Highway allows residents to easily travel outside the village for a variety of jobs, including those in the construction and mining industries. The Alaska Permanent Fund dividend was the largest contributor to the "other income" category, with \$134,024 or 6% of the total community income. Table 3-3 documents the employment characteristics of working-age residents in Minto. Approximately 85 of the community's estimated 127 working-age adults had some form of wage employment (67%) in the 2012 study year. Employed respondents reported as few as 1 job and as many as 4 jobs; working-age adults held, on average, 1 job. The mean number of months worked was 8. Only 55 of residents 16 years and older were employed year-round (43%). Table 3-4 reports the job schedules of employed residents in Minto. Most jobs were full-time (57%) while roughly one-quarter of jobs (26%) were part-time. Some residents worked occasionally in on-call positions (10%).

Table 3-2.— Estimated earned and other income, Minto, 2012.

Income source	Number of people	Number of households	Total for community	Mean per household <sup>a</sup>	Percentage of total <sup>b</sup>
<b>Earned income</b>					
Local government	42.4	32.6	\$723,750	\$11,865	30.9%
Construction	4.0	4.3	\$306,146	\$5,019	13.1%
Mining	6.6	5.7	\$208,966	\$3,426	8.9%
Services	15.9	15.6	\$203,503	\$3,336	8.7%
Other employment	4.0	4.3	\$124,293	\$2,038	5.3%
Federal government	11.9	9.9	\$85,766	\$1,406	3.7%
Retail trade	2.7	2.8	\$29,042	\$476	1.2%
State government	1.3	1.4	\$23,298	\$382	1.0%
Transportation, communication, and utilities	2.7	2.8	\$20,557	\$337	0.9%
<b>Earned income subtotal</b>	<b>85.1</b>	<b>49.7</b>	<b>\$1,725,320</b>	<b>\$28,284</b>	<b>73.7%</b>
<b>Other income</b>					
Alaska Permanent Fund dividend		51.7	\$134,024	\$2,197	5.7%
Food stamps		25.2	\$108,089	\$1,772	4.6%
Social Security		14.6	\$75,485	\$1,237	3.2%
Native corporation dividend		55.9	\$74,902	\$1,228	3.2%
Unemployment		15.9	\$74,284	\$1,218	3.2%
Pension/retirement		10.6	\$74,098	\$1,215	3.2%
Disability		1.3	\$28,230	\$463	1.2%
Energy assistance		18.6	\$18,577	\$305	0.8%
Supplemental Security income		2.7	\$14,484	\$237	0.6%
Longevity bonus		5.3	\$10,343	\$170	0.4%
Adult public assistance		1.3	\$3,262	\$53	0.1%
Other		1.3	\$530	\$9	0.0%
Workers' compensation/insurance		0.0	\$0	\$0	0.0%
Child support		0.0	\$0	\$0	0.0%
Veterans assistance		0.0	\$0	\$0	0.0%
Foster care		0.0	\$0	\$0	0.0%
Citgo fuel voucher		0.0	\$0	\$0	0.0%
Meeting honoraria		0.0	\$0	\$0	0.0%
<b>Other income subtotal</b>		<b>14.6</b>	<b>\$616,309</b>	<b>\$10,103</b>	<b>26.3%</b>
<b>Community income total</b>			<b>\$2,341,629</b>	<b>\$38,387</b>	<b>100.0%</b>

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

a. The mean is calculated using the total number of households in the community, not the number of households for this income category.

b. Income by category as a percentage of the total community income from all sources (wage-based income and non-wage-based income.)

Table 3-3.— Employment characteristics, Minto, 2012.

Characteristics	Community Minto
<b>All adults</b>	
Number	126.6
Mean weeks employed	23.8
<b>Employed adults</b>	
Number	85.1
Percentage	67.2%
<b>Jobs</b>	
Number	102.7
Mean	1.2
Minimum	1
Maximum	4
<b>Months employed</b>	
Mean	8.3
Minimum	1
Maximum	12
Percentage employed year-round	43.1%
Mean weeks employed	35.3
<b>Households</b>	
(Total) number	61
<b>Employed</b>	
Number	49.7
Percentage	81.4%
<b>Jobs per employed household</b>	
Mean	2.0
Minimum	1
Maximum	6
<b>Employed adults</b>	
Minimum	1
Maximum	4
Mean	2
Employed households	1.7
Total households	1.4
Mean person-weeks of employment	58.6

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

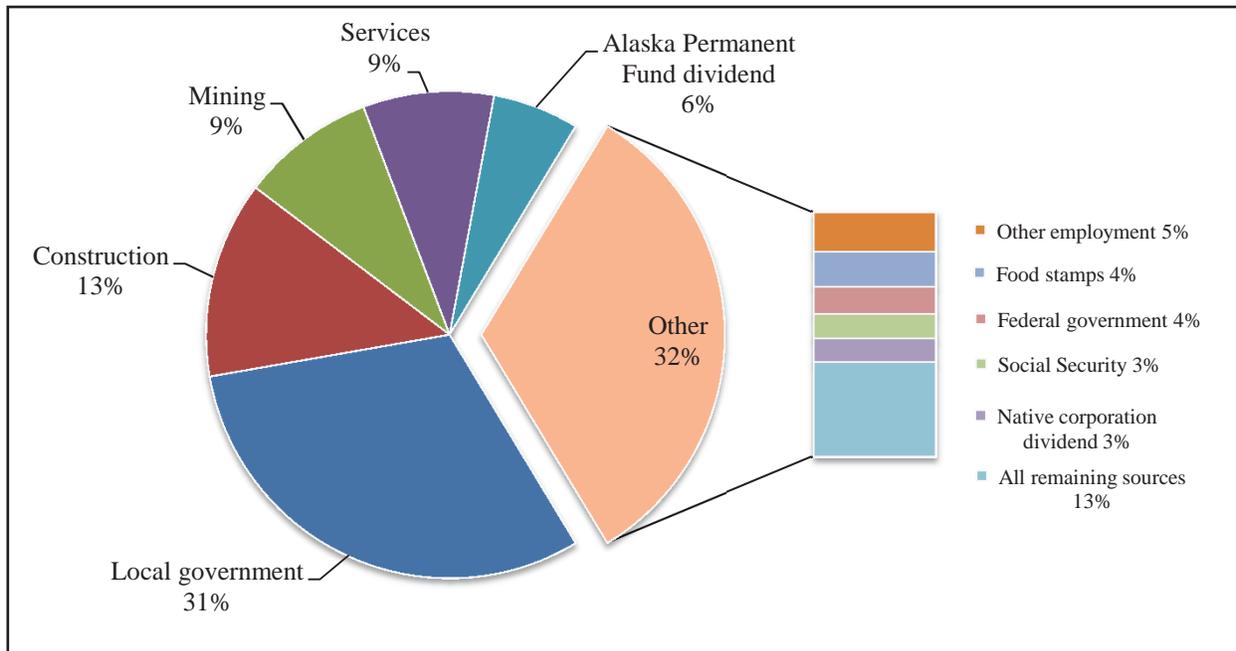


Figure 3-5.— Top 10 income sources, Minto, 2012.

Table 3-4.— Reported job schedules, Minto, 2012.

Schedule	Jobs		Employed persons		Employed households	
	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	58.7	57.1%	48.4	56.9%	35.5	71.4%
Part-time	26.4	25.7%	26.4	31.0%	25.5	51.4%
Shift	5.9	5.7%	4.4	5.2%	4.3	8.6%
On-call (occasional)	10.3	10.0%	10.3	12.1%	9.9	20.0%
Part-time shift	1.5	1.4%	1.5	1.7%	1.4	2.9%
Schedule not reported	0.0	0.0%	0.0	0.0%	0.0	0.0%

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

## Household Harvest and Use Patterns of Wild Resources

Appendix Table D3-2 summarizes resource harvest and use characteristics for Minto in 2012 at the household level. Most households (98%) used wild resources in 2012, while 96% attempted to harvest resources, and 94% harvested resources. The average harvest was 652 lb of edible weight per household, or 226 lb per capita. During the study year, households harvested an average of 8 resources and used an average of 12 resources. The maximum number of resources used by any household was 32. In addition, households gave away an average of 4 kinds of resources and 74% of households shared resources with other households.

Figure 3-6 shows, by resource category, how many households used, attempted to harvest, or harvested wild foods. More than one-half of households used 5 out of the 7 resource categories.

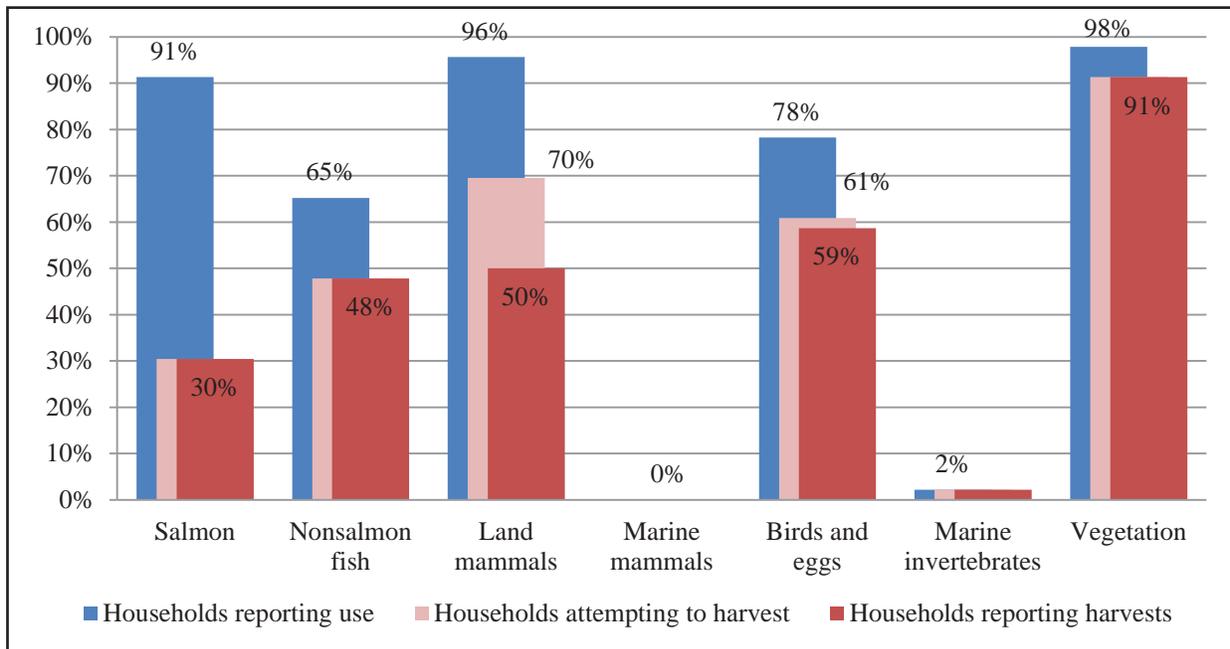


Figure 3-6.— Percentages of household using, attempting to harvest, or harvesting wild resources, by category, Minto, 2012.

More households reported attempting to harvest, actually harvesting, and using vegetation—including berries, greens, and firewood—than any other resource category, with an estimated 98% of households using and 91% harvesting vegetation. Minto residents also used land mammals at high rates (96%) though a smaller percentage of households harvested them (50%). Unlike the other categories in Figure 3-6, the land mammals category almost entirely comprises a single species; moose accounted for 95% of the total land mammal harvest by weight, or 14,919 edible pounds (85 lb per capita) of a total 15,626 edible pounds of land mammals (Table 3-5). The heavy harvest and use of moose, and simultaneous low harvest and use of other land mammal species, could be explained by a variety of factors, including limited availability of other large land mammals, or a decline in use of other available land mammals.

The difference between harvest and use percentages in the salmon category was greater than in other categories (Figure 3-6). Only 30% of households harvested salmon, but 91% of households used salmon during 2012. Unlike for land mammals, however, 30% of households attempted to harvest salmon and the same percentage (30%) actually harvested salmon; this indicates that any household that tried to catch salmon successfully did so. A 20 percentage point difference exists between the rate of households that attempted harvest of land mammals (70%) and the actual percentage of households harvesting (50%). Very little use, attempted harvest, or harvest of marine invertebrates (all 2%) occurred in 2012. Marine invertebrates are not available to harvest in Interior Alaska, requiring any Minto resident interested in harvesting them to travel elsewhere or to obtain

Table 3-5.— Estimated use and harvest of land and marine mammals, Minto, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup> harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
<b>Land mammals</b>										
<b>Large land mammals</b>										
Black bear	10.9%	6.5%	6.5%	4.3%	6.5%	230.7 lb	3.8 lb	1.3 lb	4.0 ind	± 56%
Brown bear	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Caribou	15.2%	0.0%	0.0%	15.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Moose	95.7%	67.4%	37.0%	71.7%	34.8%	14,918.5 lb	244.6 lb	84.6 lb	33.2 ind	± 26%
Dall sheep	2.2%	2.2%	2.2%	0.0%	2.2%	106.1 lb	1.7 lb	0.6 lb	1.3 ind	± 100%
<b>Subtotal</b>	<b>95.7%</b>	<b>67.4%</b>	<b>39.1%</b>	<b>73.9%</b>	<b>39.1%</b>	<b>15,255.3 lb</b>	<b>250.1 lb</b>	<b>86.5 lb</b>	<b>38.5 ind</b>	<b>± 24%</b>
<b>Small land mammals</b>										
Beaver	32.6%	8.7%	8.7%	23.9%	6.5%	298.4 lb	4.9 lb	1.7 lb	21.2 ind	± 67%
Coyote	0.0%	0.0%	0.0%	0.0%	0.0%	<i>Not usually eaten.</i>			0.0 ind	± 0%
Red fox	0.0%	0.0%	0.0%	0.0%	0.0%	<i>Not usually eaten.</i>			0.0 ind	± 0%
Snowshoe hare	13.0%	6.5%	6.5%	6.5%	2.2%	55.7 lb	0.9 lb	0.3 lb	30.5 ind	± 87%
River (land) otter	0.0%	0.0%	0.0%	0.0%	0.0%	<i>Not usually eaten.</i>			0.0 ind	± 0%
Lynx	4.3%	2.2%	2.2%	2.2%	0.0%	<i>Not usually eaten.</i>			4.0 ind	± 100%
Marmot	0.0%	0.0%	0.0%	0.0%	0.0%	<i>Not usually eaten.</i>			0.0 ind	± 0%
Marten	6.5%	6.5%	6.5%	0.0%	0.0%	<i>Not usually eaten.</i>			19.9 ind	± 71%
Mink	0.0%	0.0%	0.0%	0.0%	0.0%	<i>Not usually eaten.</i>			0.0 ind	± 0%
Muskrat	6.5%	6.5%	4.3%	2.2%	2.2%	16.7 lb	0.3 lb	0.1 lb	9.3 ind	± 76%
Porcupine	2.2%	4.3%	0.0%	2.2%	2.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Arctic ground (parka) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Red (tree) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Weasel	0.0%	0.0%	0.0%	0.0%	0.0%	<i>Not usually eaten.</i>			0.0 ind	± 0%
Gray wolf	0.0%	0.0%	0.0%	0.0%	0.0%	<i>Not usually eaten.</i>			0.0 ind	± 0%
Wolverine	0.0%	0.0%	0.0%	0.0%	0.0%	<i>Not usually eaten.</i>			0.0 ind	± 0%
<b>Subtotal</b>	<b>43.5%</b>	<b>26.1%</b>	<b>21.7%</b>	<b>26.1%</b>	<b>10.9%</b>	<b>370.8 lb</b>	<b>6.1 lb</b>	<b>2.1 lb</b>	<b>84.9 ind</b>	<b>± 58%</b>
<b>Marine mammals</b>										
<i>No activities surrounding marine mammals in Minto, 2012.</i>										
<b>Subtotal</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 ind</b>	<b>± 0%</b>
<b>All land mammals</b>	<b>95.7%</b>	<b>69.6%</b>	<b>50.0%</b>	<b>78.3%</b>	<b>41.3%</b>	<b>15,626.1 lb</b>	<b>256.2 lb</b>	<b>88.6 lb</b>	<b>123.3 ind</b>	<b>± 43%</b>
<b>All marine mammals</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 ind</b>	<b>± 0%</b>
<b>All resources</b>	<b>97.8%</b>	<b>95.7%</b>	<b>93.5%</b>	<b>93.5%</b>	<b>73.9%</b>	<b>39,772.2 lb</b>	<b>652.0 lb</b>	<b>225.5 lb</b>		<b>± 33%</b>

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

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

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

them through sharing or trading networks. No use or harvest of marine mammals was reported; they are also not available locally.

## Harvest Quantities and Composition

Tables 3-5 through 3-10 report estimated wild resource harvests and uses by Minto residents in 2012; each table represents a resource category and is organized by species. All edible resources are reported in pounds usable weight (see Appendix C for conversion factors<sup>[13]</sup>). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources taken, given away, or used by any member of a household, and resources acquired from other harvesters, either as gifts, by barter or trade, through hunting

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

Table 3-6.— Estimated use and harvest of fish, Minto, 2012.

Fish	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup>	
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	harvested by community	95% conf. limit
<b>Fish</b>										
<b>Salmon</b>										
Summer chum salmon	26.1%	15.2%	15.2%	10.9%	8.7%	3,592.5 lb	58.9 lb	20.4 lb	716.0 ind	± 68%
Fall chum salmon	28.3%	13.0%	13.0%	15.2%	8.7%	3,867.0 lb	63.4 lb	21.9 lb	770.8 ind	± 65%
Unknown chum salmon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Coho salmon	34.8%	10.9%	10.9%	26.1%	8.7%	4,456.7 lb	73.1 lb	25.3 lb	689.6 ind	± 54%
Chinook salmon	60.9%	21.7%	21.7%	43.5%	21.7%	3,543.4 lb	58.1 lb	20.1 lb	267.7 ind	± 44%
Pink salmon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Sockeye salmon	17.4%	6.5%	6.5%	10.9%	2.2%	1,615.1 lb	26.5 lb	9.2 lb	269.2 ind	± 77%
Unknown salmon	15.2%	0.0%	0.0%	15.2%	2.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>91.3%</b>	<b>30.4%</b>	<b>30.4%</b>	<b>80.4%</b>	<b>28.3%</b>	<b>17,074.7 lb</b>	<b>279.9 lb</b>	<b>96.8 lb</b>	<b>2,713.2 ind</b>	<b>± 58%</b>
<b>Char</b>										
Dolly Varden	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Lake trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 ind</b>	<b>± 0%</b>
<b>Trout</b>										
Rainbow trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 ind</b>	<b>± 0%</b>
<b>Whitefishes</b>										
Sheefish	26.1%	17.4%	17.4%	13.0%	10.9%	612.7 lb	10.0 lb	3.5 lb	102.1 ind	± 43%
Broad whitefish	30.4%	15.2%	15.2%	21.7%	6.5%	684.3 lb	11.2 lb	3.9 lb	171.1 ind	± 53%
Bering cisco	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Least cisco	15.2%	8.7%	8.7%	10.9%	2.2%	18.0 lb	0.3 lb	0.1 lb	45.1 ind	± 55%
Humpback whitefish	28.3%	15.2%	15.2%	15.2%	8.7%	399.2 lb	6.5 lb	2.3 lb	228.1 ind	± 48%
Round whitefish	4.3%	2.2%	2.2%	4.3%	2.2%	19.9 lb	0.3 lb	0.1 lb	19.9 ind	± 100%
Unknown whitefishes	8.7%	4.3%	4.3%	4.4%	2.2%	243.7 lb	4.0 lb	1.4 lb	139.2 ind	± 95%
<b>Subtotal</b>	<b>52.2%</b>	<b>30.4%</b>	<b>30.4%</b>	<b>34.8%</b>	<b>19.6%</b>	<b>1,977.7 lb</b>	<b>32.4 lb</b>	<b>11.2 lb</b>	<b>705.5 ind</b>	<b>± 38%</b>
<b>Anadromous/marine fish</b>										
Pacific herring	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Pacific halibut	4.3%	0.0%	0.0%	4.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 lb	± 0%
Arctic lamprey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>4.3%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>4.3%</b>	<b>0.0%</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>		<b>± 0%</b>
<b>Other freshwater fish</b>										
Alaska blackfish	2.2%	2.2%	2.2%	0.0%	0.0%	39.8 lb	0.7 lb	0.2 lb	26.5 ind	± 100%
Burbot	4.3%	4.3%	4.3%	0.0%	0.0%	79.6 lb	1.3 lb	0.5 lb	33.2 ind	± 71%
Arctic grayling	0.0%	2.2%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Northern pike	52.2%	41.3%	41.3%	13.0%	15.2%	1,528.0 lb	25.0 lb	8.7 lb	545.7 ind	± 37%
Longnose sucker	2.2%	2.2%	2.2%	0.0%	0.0%	26.5 lb	0.4 lb	0.2 lb	13.3 ind	± 100%
<b>Subtotal</b>	<b>52.2%</b>	<b>41.3%</b>	<b>41.3%</b>	<b>13.0%</b>	<b>15.2%</b>	<b>1,673.8 lb</b>	<b>27.4 lb</b>	<b>9.5 lb</b>	<b>618.6 ind</b>	<b>35%</b>
<b>All fish</b>	<b>91.3%</b>	<b>56.5%</b>	<b>56.5%</b>	<b>82.6%</b>	<b>43.5%</b>	<b>20,726.2 lb</b>	<b>339.8 lb</b>	<b>117.5 lb</b>		<b>± 43%</b>
<b>All resources</b>	<b>97.8%</b>	<b>95.7%</b>	<b>93.5%</b>	<b>93.5%</b>	<b>73.9%</b>	<b>39,772.2 lb</b>	<b>652.0 lb</b>	<b>225.5 lb</b>		<b>± 33%</b>

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

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

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

Table 3-7.— Estimated use and harvest of birds, Minto, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup> harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
<b>Migratory birds</b>										
<b>Ducks</b>										
Canvasback	2.2%	2.2%	2.2%	0.0%	0.0%	21.2 lb	0.3 lb	0.1 lb	10.6 ind	± 100%
Goldeneye	10.9%	10.9%	10.9%	0.0%	4.3%	20.2 lb	0.3 lb	0.1 lb	25.2 ind	± 46%
Mallard	47.8%	32.6%	32.6%	17.4%	15.2%	152.5 lb	2.5 lb	0.9 lb	152.5 ind	± 38%
Long-tailed duck	21.7%	17.4%	17.4%	4.3%	13.0%	155.2 lb	2.5 lb	0.9 lb	103.4 ind	± 40%
Northern pintail	28.3%	21.7%	21.7%	6.7%	11.1%	59.4 lb	1.0 lb	0.3 lb	74.3 ind	± 33%
Scaup	2.2%	2.2%	2.2%	0.0%	2.2%	6.0 lb	0.1 lb	0.0 lb	6.6 ind	± 100%
Black scoter	23.9%	17.4%	15.2%	10.9%	8.7%	181.4 lb	3.0 lb	1.0 lb	201.6 ind	± 54%
Surf scoter	17.4%	10.9%	10.9%	6.5%	6.5%	78.8 lb	1.3 lb	0.4 lb	87.5 ind	± 63%
White-winged scoter	13.0%	10.9%	10.9%	2.2%	8.7%	182.2 lb	3.0 lb	1.0 lb	79.6 ind	± 47%
Northern shoveler	2.2%	2.2%	2.2%	0.0%	0.0%	2.9 lb	0.0 lb	0.0 lb	2.7 ind	± 100%
Unknown teal	2.2%	2.2%	2.2%	0.0%	2.2%	3.3 lb	0.1 lb	0.0 lb	6.6 ind	± 100%
American wigeon	10.9%	8.7%	8.7%	4.3%	4.3%	42.6 lb	0.7 lb	0.2 lb	32.5 ind	± 58%
Unknown ducks	6.5%	4.3%	4.3%	2.2%	0.0%	5.4 lb	0.1 lb	0.0 lb	6.8 ind	± 99%
<b>Subtotal</b>	<b>76.1%</b>	<b>54.3%</b>	<b>52.2%</b>	<b>37.0%</b>	<b>28.3%</b>	<b>911.0 lb</b>	<b>14.9 lb</b>	<b>5.2 lb</b>	<b>789.9 ind</b>	<b>± 27%</b>
<b>Geese</b>										
Canada goose	54.3%	39.1%	39.1%	19.6%	19.6%	151.3 lb	2.5 lb	0.9 lb	126.1 ind	± 35%
Snow goose	10.9%	4.3%	2.2%	8.7%	0.0%	4.0 lb	0.1 lb	0.0 lb	1.3 ind	± 100%
White-fronted goose	45.7%	37.0%	37.0%	10.9%	28.3%	544.2 lb	8.9 lb	3.1 lb	226.8 ind	± 31%
Unknown geese	4.3%	2.2%	0.0%	2.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>71.7%</b>	<b>47.8%</b>	<b>47.8%</b>	<b>30.4%</b>	<b>32.6%</b>	<b>699.5 lb</b>	<b>11.5 lb</b>	<b>4.0 lb</b>	<b>354.2 ind</b>	<b>± 30%</b>
<b>Other migratory birds</b>										
Unknown swan	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown crane	2.2%	2.2%	2.2%	0.0%	0.0%	11.1 lb	0.2 lb	0.1 lb	1.3 ind	± 100%
Unknown shorebirds—small	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown shorebirds—large	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown gull	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown loon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Arctic tern	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>2.2%</b>	<b>2.2%</b>	<b>2.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>11.1 lb</b>	<b>0.2 lb</b>	<b>0.1 lb</b>	<b>1.3 ind</b>	<b>± 100%</b>
<b>Other birds</b>										
Unknown grouse	30.4%	23.9%	23.9%	6.5%	2.2%	151.3 lb	2.5 lb	0.9 lb	216.2 ind	± 44%
Unknown ptarmigan	8.7%	4.3%	4.3%	4.3%	2.2%	10.6 lb	0.2 lb	0.1 lb	21.2 ind	± 72%
Unknown other birds	2.2%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>32.6%</b>	<b>23.9%</b>	<b>23.9%</b>	<b>6.5%</b>	<b>2.2%</b>	<b>161.9 lb</b>	<b>2.7 lb</b>	<b>0.9 lb</b>	<b>237.4 ind</b>	<b>± 46%</b>
<b>All migratory birds</b>	<b>78.3%</b>	<b>56.5%</b>	<b>54.3%</b>	<b>45.7%</b>	<b>39.1%</b>	<b>1,621.7 lb</b>	<b>26.6 lb</b>	<b>9.2 lb</b>	<b>1,145.4 ind</b>	<b>± 26%</b>
<b>All other birds</b>	<b>32.6%</b>	<b>23.9%</b>	<b>23.9%</b>	<b>6.5%</b>	<b>2.2%</b>	<b>161.9 lb</b>	<b>2.7 lb</b>	<b>0.9 lb</b>	<b>237.4 ind</b>	<b>± 46%</b>
<b>All resources</b>	<b>97.8%</b>	<b>95.7%</b>	<b>93.5%</b>	<b>93.5%</b>	<b>73.9%</b>	<b>39,772.2 lb</b>	<b>652.0 lb</b>	<b>225.5 lb</b>		<b>± 33%</b>

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

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

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

Table 3-8.— Estimated use and harvest of bird eggs, Minto, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup> harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
<b>Bird eggs</b>										
White-winged scoter eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown duck eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Canada goose eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown geese eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown small shorebird eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown large shorebird eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown gull eggs	2.2%	2.2%	2.2%	0.0%	2.2%	3.2 lb	0.1 lb	0.0 lb	10.6 ind	± 100%
Unknown loon eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
<b>Subtotal</b>	<b>2.2%</b>	<b>2.2%</b>	<b>2.2%</b>	<b>0.0%</b>	<b>2.2%</b>	<b>3.2 lb</b>	<b>0.1 lb</b>	<b>0.0 lb</b>	<b>10.6 ind</b>	<b>± 100%</b>
<b>All birds and eggs</b>	<b>78.3%</b>	<b>60.9%</b>	<b>58.7%</b>	<b>45.7%</b>	<b>39.1%</b>	<b>1,786.8 lb</b>	<b>29.3 lb</b>	<b>10.1 lb</b>	<b>1,393.3 ind</b>	<b>± 28%</b>
<b>All resources</b>	<b>97.8%</b>	<b>95.7%</b>	<b>93.5%</b>	<b>93.5%</b>	<b>73.9%</b>	<b>39,772.2 lb</b>	<b>652.0 lb</b>	<b>225.5 lb</b>		<b>± 33%</b>

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

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

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

Table 3-9.— Estimated use and harvest of marine invertebrates, Minto, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup> harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
<b>Marine invertebrates</b>										
Unknown clams	2.2%	2.2%	2.2%	0.0%	0.0%	0.2 lb	0.0 lb	0.0 lb	0.1 gal	± 100%
King crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Tanner crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Mussels	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Shrimp	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Unknown marine invertebrates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
<b>Subtotal</b>	<b>2.2%</b>	<b>2.2%</b>	<b>2.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.2 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.1</b>	<b>± 100%</b>
<b>All marine invertebrates</b>	<b>2.2%</b>	<b>2.2%</b>	<b>2.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.2 lb</b>	<b>0.0 lb</b>	<b>0.0 lb</b>	<b>0.1</b>	<b>± 100%</b>
<b>All resources</b>	<b>97.8%</b>	<b>95.7%</b>	<b>93.5%</b>	<b>93.5%</b>	<b>73.9%</b>	<b>39,772.2 lb</b>	<b>652.0 lb</b>	<b>225.5 lb</b>		<b>± 33%</b>

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

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

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

Table 3-10.— Estimated use and harvest of vegetation, Minto, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount <sup>a</sup> harvested by	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
<b>Berries</b>										
Blueberry	80.4%	76.1%	76.1%	13.0%	41.3%	915.0 lb	15.3 lb	5.2 lb	231.4 gal	± 20%
Lowbush cranberry	45.7%	43.5%	43.5%	2.2%	21.7%	417.5 lb	6.8 lb	2.4 lb	104.4 gal	± 26%
Highbush cranberry	19.6%	19.6%	19.6%	0.0%	2.2%	136.6 lb	2.2 lb	0.8 lb	34.1 gal	± 61%
Crowberry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Currants	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Raspberry	26.1%	28.3%	26.1%	0.0%	4.3%	56.9 lb	0.9 lb	0.3 lb	14.2 gal	± 32%
Salmonberry	10.9%	10.9%	10.9%	0.0%	0.0%	15.9 lb	0.3 lb	0.1 lb	4.0 gal	± 50%
<b>Subtotal</b>	<b>84.8%</b>	<b>78.3%</b>	<b>78.3%</b>	<b>15.2%</b>	<b>43.5%</b>	<b>1,541.9 lb</b>	<b>25.3 lb</b>	<b>8.7 lb</b>	<b>388.1 gal</b>	<b>± 23%</b>
<b>Plants/greens/mushrooms</b>										
Wild rhubarb	34.8%	34.8%	34.8%	0.0%	11.1%	86.0 lb	1.4 lb	0.5 lb	86.0 gal	± 49%
Eskimo potato	2.2%	0.0%	0.0%	2.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Fiddlehead ferns	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Hudson's Bay (Labrador) tea	2.2%	2.2%	2.2%	0.0%	0.0%	1.3 lb	0.0 lb	0.0 lb	1.3 gal	± 100%
Dandelion greens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Sourdock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Willow leaves	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Wild rose hips	4.3%	4.3%	4.3%	0.0%	0.0%	3.3 lb	0.1 lb	0.0 lb	0.8 gal	± 82%
Other wild greens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Unknown mushrooms	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Fireweed	2.2%	2.2%	2.2%	0.0%	0.0%	0.1 lb	0.0 lb	0.0 lb	0.1 gal	± 100%
Stinkweed	2.2%	2.2%	2.2%	0.0%	0.0%	0.3 lb	0.0 lb	0.0 lb	0.3 gal	± 100%
Punk	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Puffballs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Orange boletes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Unknown vegetation	2.2%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
<b>Subtotal</b>	<b>37.0%</b>	<b>37.0%</b>	<b>34.8%</b>	<b>2.2%</b>	<b>10.9%</b>	<b>91.0 lb</b>	<b>1.5 lb</b>	<b>0.5 lb</b>	<b>88.5 gal</b>	<b>± 48%</b>
<b>Wood</b>										
Other wood	87.0%	73.9%	73.9%	19.6%	8.7%	<i>Primarily used as firewood.</i>			234.5 cord	± 14%
<b>Subtotal</b>	<b>87.0%</b>	<b>73.9%</b>	<b>73.9%</b>	<b>19.6%</b>	<b>8.7%</b>	<i>Primarily used as firewood.</i>			<b>234.5 cord</b>	<b>± 14%</b>
<b>All vegetation</b>	<b>97.8%</b>	<b>91.3%</b>	<b>91.3%</b>	<b>34.8%</b>	<b>45.7%</b>	<b>1,633.0 lb</b>	<b>26.8 lb</b>	<b>9.3 lb</b>		<b>± 17%</b>
<b>All resources</b>	<b>97.8%</b>	<b>95.7%</b>	<b>93.5%</b>	<b>93.5%</b>	<b>73.9%</b>	<b>39,772.2 lb</b>	<b>652.0 lb</b>	<b>225.5 lb</b>		<b>± 33%</b>

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

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

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

partnerships, or as meat given by hunting guides and non-local hunters. Purchased foods are not included but resources such as firewood are included because they are an important part of the subsistence way of life in Interior Alaska. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

In 2012, Minto residents harvested an estimated 39,772 edible pounds of wild resources, or 226 lb per person. Figure 3-7 shows the total harvest for each resource category. Salmon contributed 17,075 edible pounds—the largest contribution of the 7 resource categories. Residents harvested an estimated 97 lb of salmon per person and roughly 280 lb per household (Table 3-6). Land mammal (large and small land mammals combined) harvests were much higher than other resource categories, with 256 edible pounds harvested per household, or 15,626 lb harvested by the community (89 lb

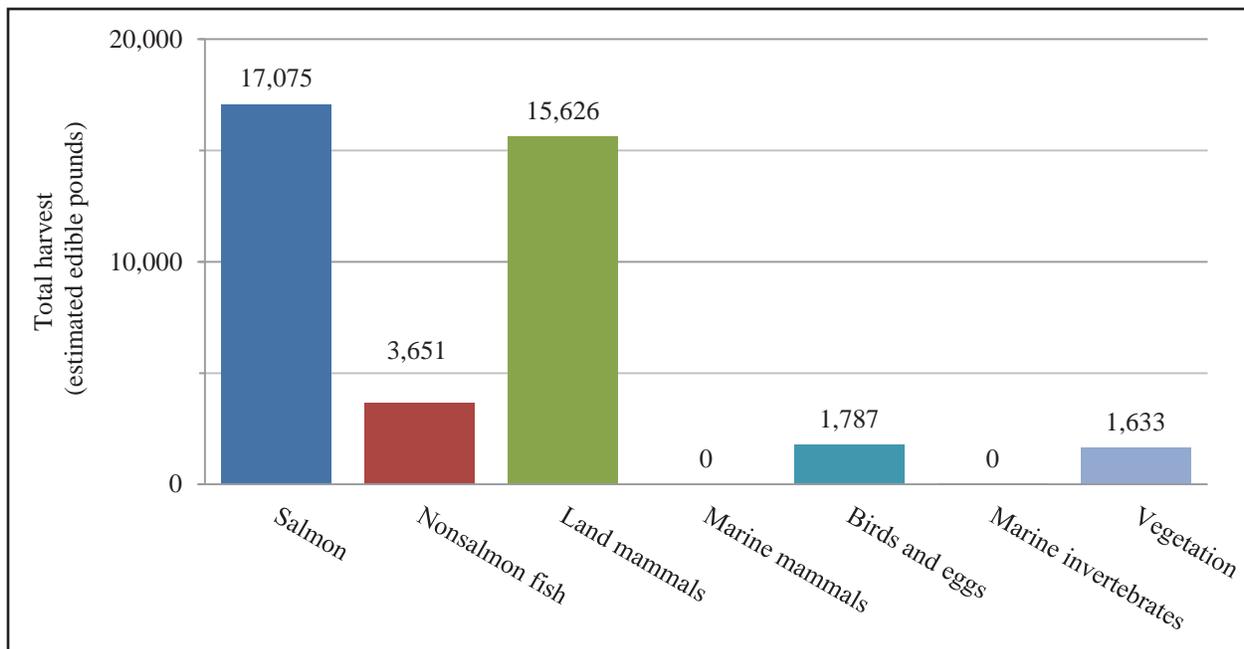


Figure 3-7.— Total estimated edible pounds harvested, by resource category, Minto, 2012.

per capita) (Table 3-5). The harvests of the 5 other resource categories were each less than one-third of either the salmon or land mammal harvests and were each less than 10% of the total community harvest. Households harvested an estimated 3,652 lb of nonsalmon species—such as northern pike, whitefishes, and burbot—with a per capita harvest of 21 lb (Table 3-6). A variety of birds were harvested by Minto residents for a total community harvest of 1,784 lb (29 lb per household) (Table 3-7). Vegetation added 1,633 edible pounds to the community harvest (27 lb per household) (Table 3-10). Only 3 lb of bird eggs were harvested in 2012, which calculates to less than a pound per person (Table 3-8). Marine invertebrates added less than a pound to the total community harvest (0.2 lb) (Table 3-9).

### USE AND HARVEST CHARACTERISTICS BY RESOURCE CATEGORY

Figure 3-8 lists the top 10 resources harvested, in terms of total estimated edible pounds, by Minto households during the 2012 study year. Moose accounted for a far larger percentage of Minto’s estimated annual harvest than any other species, with 38% (14,919 lb) of the edible pounds harvested in 2012 (Figure 3-8; Table 3-5). Fish species, primarily salmon, made up the remainder of the top contributing species (Figure 3-8). Eight of the top 10 species are fish species. Coho salmon, fall chum salmon, summer chum salmon, Chinook salmon, and sockeye salmon were all part of the top 10 resources harvested by edible weight. Combined, nonsalmon species, including northern pike, broad whitefish, and sheefish, accounted for 7% (2,825 total edible pounds, or 16 lb per capita) of

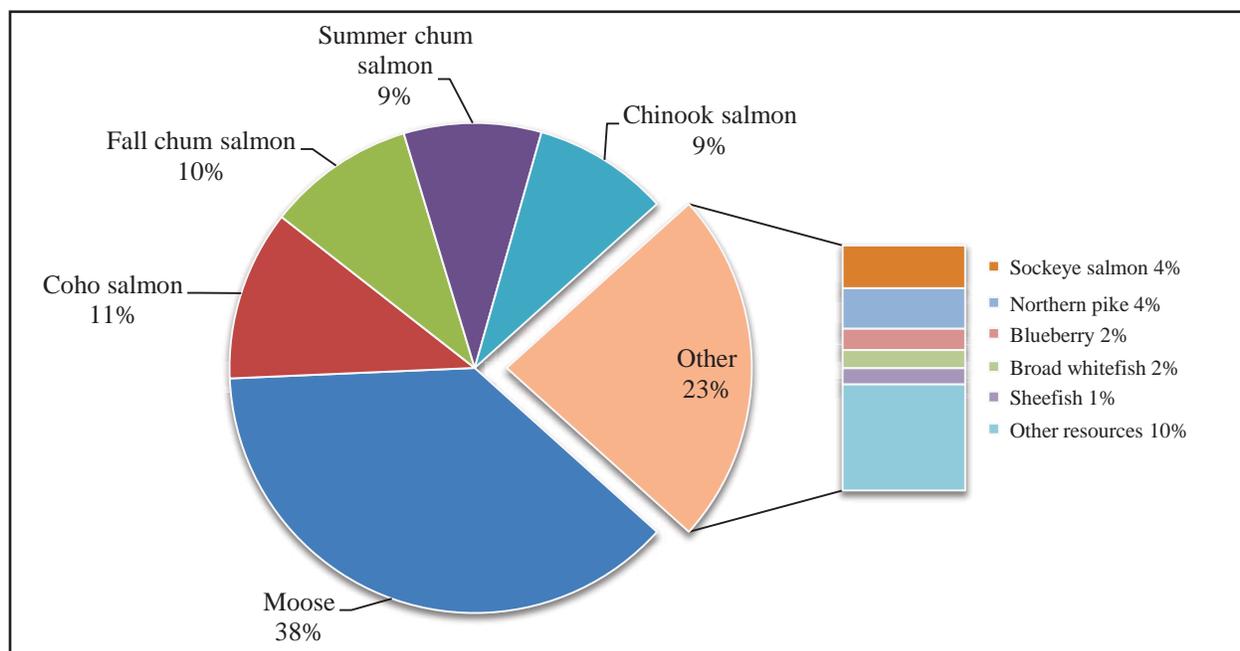


Figure 3-8.— Top 10 species harvests ranked by estimated edible weight, Minto, 2012.

the total community harvest (Figure 3-8; Table 3-6). In terms of edible weight, Minto’s subsistence harvest profile consists almost entirely of species in the fish and land mammal categories.

### **SALMON**

Key respondents emphasized the importance of salmon to the diets of residents and to the culture of the Minto people, “It’s very important. It’s one of the preferred foods that we eat. They save the best for potlatch so everybody can get, get part of it” (05302013MIN2). In 2012, Minto residents harvested a total of 17,075 edible pounds of salmon, or 43% of the total community harvest of all resources (Table 3-6). In total, 91% of households used salmon while only 30% harvested a salmon species. High levels of sharing occurred in this category: 80% of households received salmon (either from other households in the community or from others outside of Minto) and 28% of households gave some away. Five types of salmon were harvested by residents: Chinook salmon, summer chum salmon, fall chum salmon, coho salmon, and sockeye salmon (likely from a different river system such as the Copper River). Prior to the mid- to late 20th century, the majority of salmon harvests took place at family fish camps. Fish camps have influenced the lives of key respondents who gave ethnographic interviews for this study. All key respondents mentioned or described the hard work and enjoyment they experienced at family fish camps. While fish camps are not as prevalent today as they once were, respondents emphasized their practical and cultural importance to the people of Minto. One respondent compared the work at fish camp to that found on a farm:

It was really just like a farm. Get up early, and go to the fish wheel. Bring in that fish to shore and start cutting it, cutting fish all morning. After breakfast, everybody is moving around in camp. Everybody cut fish. Some bring wood to burn in the smokehouse, to dry the fish. Even kids is busy. They hang up the fish eggs, fish heads for dogs for wintertime. (05312013MIN8)

Other subsistence activities also occurred at fish camp. Berry picking and bird hunting, for example, took place when fishing was slow. Respondents noted that in the past all the families in Minto had fish camps along the Tanana and Tolovana rivers; in some places, camps were within walking distance of each other. One respondent described that there has been a “big change ... everybody’s family used to go to fish camp. There used to be camps up and down the river, now you can’t see nobody out there” (05302013MIN1). Middle-aged respondents estimated that the prevalence of fish camps began to decline in the 1970s when young men began leaving the community to join the army or to find employment elsewhere. A respondent in his 20s gave other explanations for the decline in fish camps: “I guess just the environment, the technology changes, I guess [people are] working more ... it’s hard to find time these days” (05302013MIN1).

While use of fish camps has declined, the use of salmon continues. Chinook salmon, one of the most valuable salmon species to the Minto people, is typically harvested in mid-July “when the cotton starts blowing” (05302013MIN1). Sixty-one percent of Minto households used Chinook salmon in 2012; this was more than any other salmon species (Table 3-6). The rate of use of Chinook salmon was nearly double that of coho salmon, the salmon species with the highest harvest (4,457 lb total, or 25 lb per capita). While many more households reported using Chinook salmon, Chinook salmon, in terms of edible pounds, contributed less weight (3,543 edible pounds harvested in 2012) than all other salmon species except sockeye salmon. Despite this lower harvest, Minto residents shared Chinook salmon more than any other fish species. Twenty-two percent of households gave some Chinook salmon away while 44% received some from others. One respondent described the practice of sharing Chinook salmon:

[We give them away to] everybody. Start with elders and stuff, pick out your best ones and take ‘em to your elders, and then family members, then friends. And then just stop at ... every house and ask if they have freezer space and if they want fish, let them take their pick, take as many as they want. (05212013MIN1)

Recent declines of Chinook salmon abundance, increased fishing restrictions, and a decrease in fishing effort have reduced Chinook salmon harvests. Respondents expressed concern for the health of the Chinook salmon population. One respondent explained that in the past, run strength was never an issue, and contributed the declines to overfishing, “It never used to be like that. Fish

used to come naturally, they used to come good, no problem. Right now, they are bothered so much that they just wear that poor fish out” (05302013MIN3). Despite declines in size and abundance, the significance of Chinook salmon, in both the diets of residents and in the local culture, has not declined.

While not exchanged as often as Chinook, coho salmon were received by 26% of households and given away by 9%, with 35% of households using coho salmon (Table 3-6). Minto residents harvested 3,867 lb of fall chum salmon, with an average per household harvest of 63 lb. Key respondents noted that fall chum salmon are primarily used for dog food. Fall chum salmon reach the lower Tanana River in late August and can run through September. By that time, they have lost much of their stores of fat and are not usually ideal for human consumption. One respondent described how fall chum salmon were stored for winter use:

We used to get a lot of fall fish in Old Minto. For dogs. We catch a lot of dog salmon, we put it up for dogs and just split them. Sometimes it get cold enough you know, we just poke a hole in the tail, put a stick through them, about 6 on a stick. Just hang them up whole like that. “Whole fish” they call it. (05292013MIN5)

Fishing for fall chum salmon occurs late in the season and often continues when weather conditions become difficult: “By that time ice is forming on the wheel. Even if it’s turning, there is icicles. That’s how late we keep it in. We keep it until ice starts running on the Tanana, then we pull the wheel [out]” (05292013MIN5). Prior to the widespread use of snowmachines in the 1970s, many Minto families maintained dog teams for transportation purposes. At the time, fall chum salmon were the fish of choice for dog food and sustained many dog teams. Today, dog teams are less prevalent, and in 2012, no chum salmon were fed to dogs (Appendix Table D3-3). The use of fish for dogs is discussed in further detail below.

It is estimated that Minto households used and harvested summer chum salmon at similar levels to that of fall chum salmon. Twenty-six percent of households used summer chum salmon; the estimated total community harvest was 3,593 lb (59 lb per household) (Table 3-6). Fifteen percent of households received salmon but were unable to identify the species.

Minto residents rely on a variety of preservation methods for the salmon they use. Drying and smoking fish has long been a way to keep salmon throughout the winter. Respondents remembered having large smokehouses at fish camps that were 2 or even 3 stories high, and bigger than most cabins. Smokehouses were used to dry fish strips, egg sacks, and salted fish. Key respondents who were born in the early 20th century remember that, in the past, smoking salted fish was an additional way to preserve salmon for the winter. Elders recalled the process of burying fish in the ground as

part of a fermenting process that is believed to leave fish with a high nutritional and caloric value (05052013MIN7). Fresh salmon of any species can be buried in a birch bark basket and kept in the ground for as long as 30 days. After this time, the fish smells so strongly that, “if you smelled it, you wouldn’t want to eat it ... but if you just take a little bit of that and put a little in your pocket, go out hunting, you eat that, it’s like eating a whole lunch” (05052013MIN7). As long as no air reaches the fish while it is buried, the fish is usually safe to eat, according to key respondents.

### ***NONSALMON FISH***

Historically, Minto people have fished for and used nonsalmon fish species for human food and for dog food. One respondent remembered how in the past they stored a variety of species for later consumption:

We used to have a smokehouse made out of willows, even on the roof or maybe a tarp over that to keep the rain out ... they would hang the whitefish, freshwater fish and dry them out like that. They bailed them just like we do the salmon, but the, with the burlap sack, that came in very handy to store all that food in. (05052013MIN7)

Nonsalmon species used and harvested by Minto residents include whitefishes, such as humpback whitefish and broad whitefish, and other freshwater fishes such as Alaska blackfish, burbot, northern pike, and longnose suckers (Table 3-6).

Northern pike harvests constituted 42% of the total nonsalmon fish harvest and contributed 1,528 lb to the total community harvest—more than double the harvest weight of broad whitefish. More than half of Minto households used northern pike (52%) with an average household harvest of 25 lb (9 lb per capita). Forty-one percent of respondents fished for, and successfully harvested, northern pike.

Whitefish species made up more than half (54%) of Minto’s nonsalmon harvest. Whitefish species were shared less frequently than salmon species and only accounted for 5% of the total community harvest (1,978 edible pounds). Broad and humpback whitefishes had the highest use of all whitefishes. Minto residents harvested 684 edible pounds of broad whitefish and 399 lb of humpback whitefish. Together, broad and humpback whitefishes accounted for 55% of the total whitefishes harvest. Seventeen percent of households harvested sheefish, which was the highest household harvest rate of any whitefish species. Some key respondents described their preference for whitefishes. One respondent noted, “I used to think to myself I would rather eat half-dried whitefish than fresh fish because it tastes better” (05302013MIN3). The preservation of whitefish species can include a smoking process similar to that of salmon where flavor is absorbed from the smoke.

Some people save the livers of whitefishes for elders in the community. Whitefish livers, typically fried in a pan, are considered a delicacy, but are infrequently eaten by the younger generations. In the summer months, respondents explained that whitefishes are often harvested incidentally while salmon fishing with a setnet.

Minto residents harvested small amounts of Alaska blackfish, burbot, and longnose suckers (40 lb, 80 lb, and 27 lb, respectively). One respondent, who regularly harvested Alaska blackfish, described the process of building and using a fyke net (which residents call a “fish trap”) to harvest them. In the wintertime, Alaska blackfish keep holes open in the ice. The respondent believes they may do this because they need more oxygen than other fish; regardless of the reason, these holes allow a fisherman to easily identify a viable fishing location. In the past the cone-shaped fyke nets have been built out of willow, but this respondent uses small mesh chicken wire instead. The net is pushed down through the open hole in the ice and left, at an angle, under the water. The net is typically left overnight and retrieved in the morning when it is full (05312013MIN6).

Burbot are often caught with a hook and line. One respondent explained that they are easy to catch with the right bait. Chicken livers, bacon, or duck guts are all common bait used by Minto residents (05312013MIN6).

Appendix Table D3-3 shows the estimated harvest of salmon and nonsalmon fish for consumption by dogs. Only a small portion of salmon were fed to dogs (643 edible pounds or 4% of total salmon harvest) while a much larger percentage of nonsalmon species, including whitefishes and other freshwater fish, were used as dog food (1,380 edible pounds, or 38% of total nonsalmon fish harvest). Out of the 5 available types of salmon, only coho salmon were fed to dogs. The fish fed to dogs includes fishes that were caught specifically for consumption by dogs and fish harvested for human consumption but were lost to spoilage.

### ***HARVEST LOCATIONS AND FISHING GEAR***

Figure 3-9 shows the mapped salmon search and harvest areas reported by Minto survey participants. Salmon harvests primarily occurred on the Tanana and Tolovana rivers. Of the households that participated in the mapping portion of the survey, Minto residents identified 6 salmon search areas on the Tanana River. Fishing on the Tanana River occurred between the mouth of the Tolovana River and the town of Nenana. Some salmon fishing occurred on the Tolovana River near Swanneck Slough and near the confluence of the Chatanika River. Key respondents described the historical importance of Swanneck Slough to summer salmon fishing within their lifetimes. In the mid-20th century, numerous fish camps occupied the banks of Swanneck Slough. The location

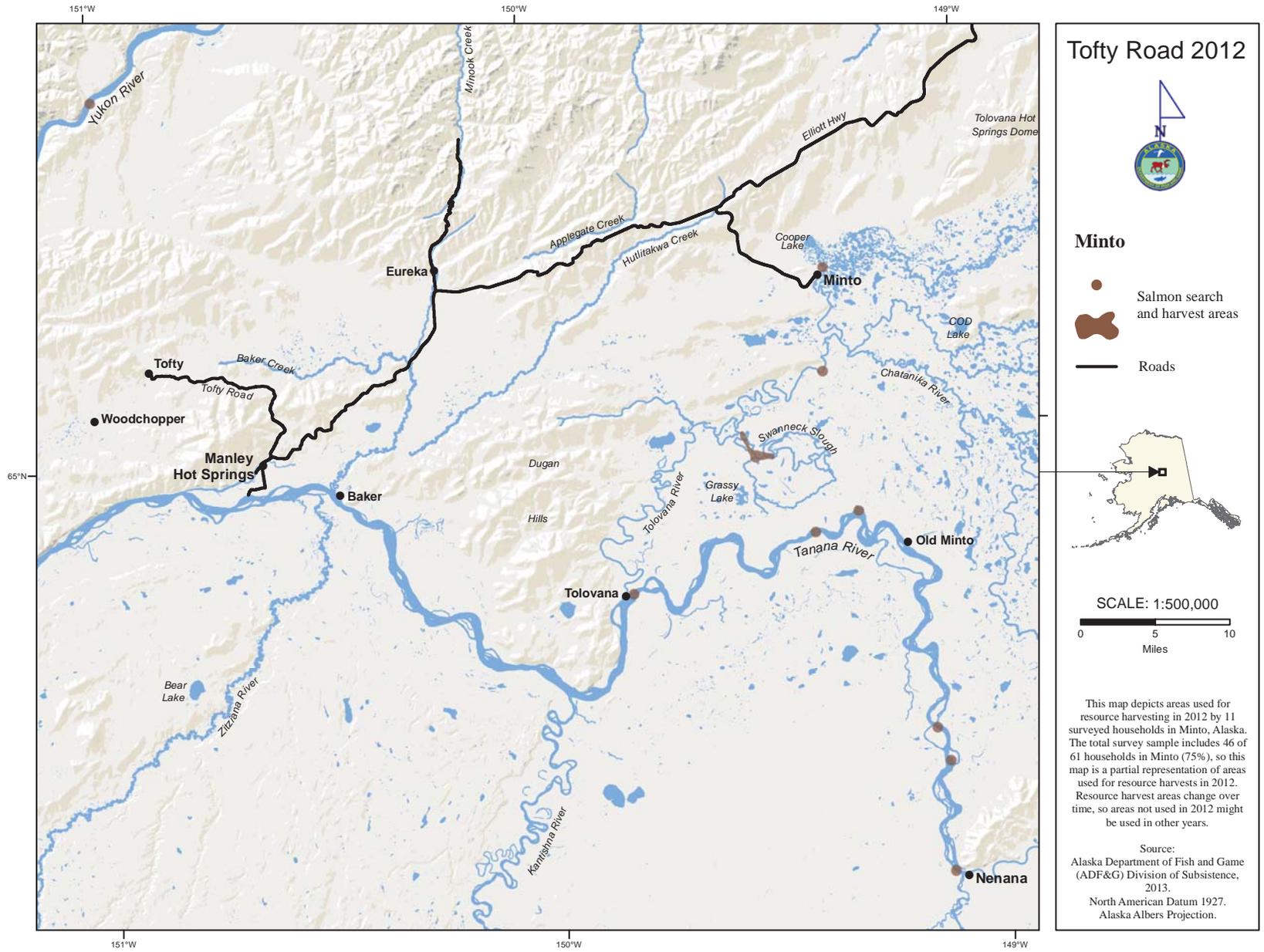


Figure 3-9.— Salmon search and harvest areas, Minto, 2012.

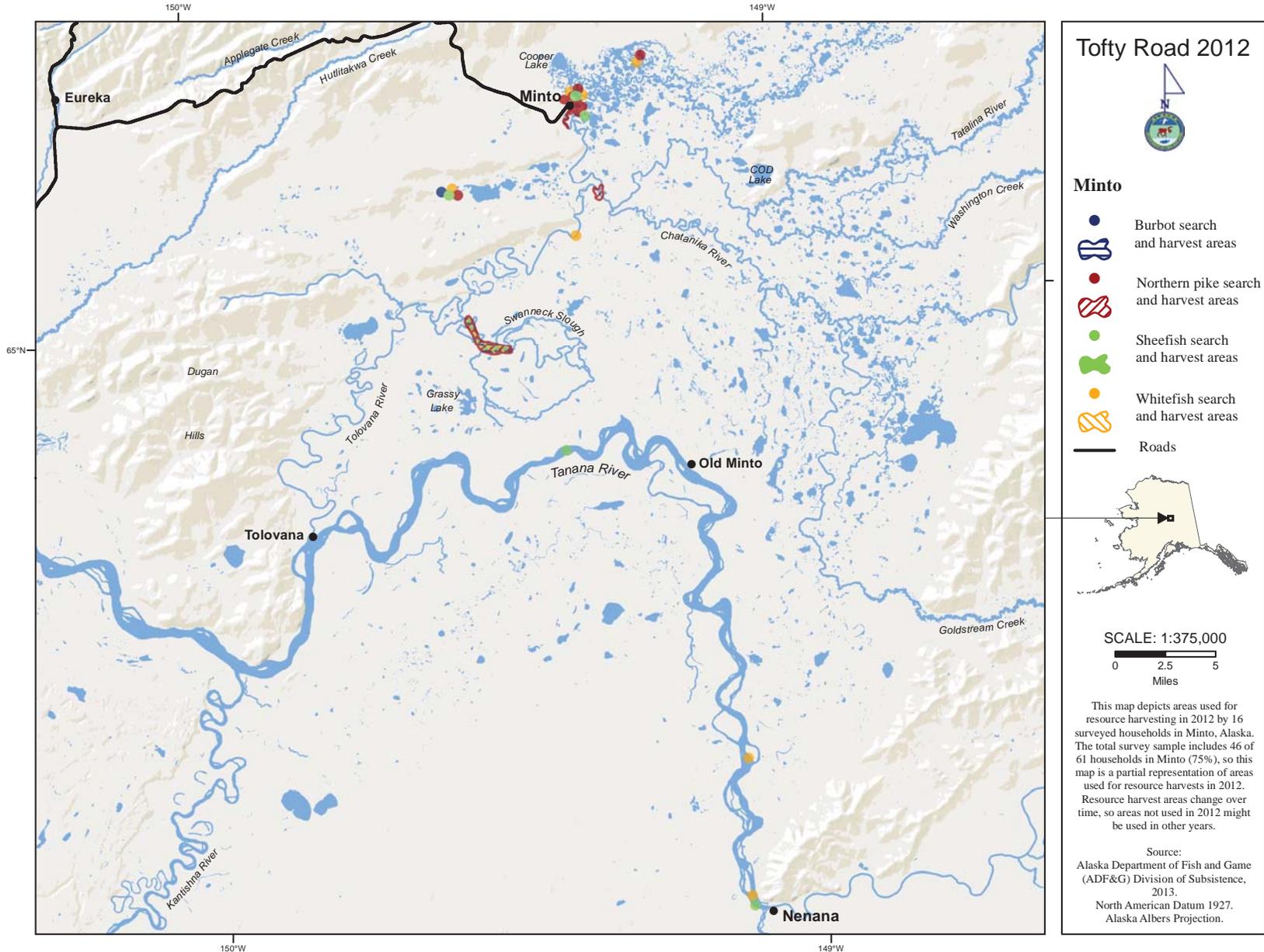


Figure 3-10.— Burbot, northern pike, sheefish, and whitefishes search and harvest areas, Minto, 2012.

was ideal because it was close to town and provided good fishing opportunities for everyone who fished in the area (05302013MIN1).

Nonsalmon search areas occurred in lakes, sloughs, and rivers (Figure 3-10). The highest concentration of nonsalmon search and harvest areas occurred in the many lakes surrounding Minto. Burbot, northern pike, sheefish, and whitefish species were harvested in the lakes on the southern edge of the community, in a lake roughly 5 miles southwest of the community, and near the mouth of Swanneck Slough. Individual nonsalmon species were caught along the Tolovana and the Tanana rivers. Sheefish were harvested along the Tanana River at Nenana and roughly 20 river miles from the mouth of the Tolovana River. Comparing the salmon and nonsalmon harvest maps, it appears that the sheefish harvest on the Tanana River occurred in the same locations as salmon harvests. Sheefish are often caught in salmon setnets, and it is possible that the sheefish harvested in these locations were an incidental harvest or were targeted simultaneously in the same nets. Unspecified species of whitefishes were harvested near Nenana as well, and closer to Minto about 10 miles downstream on the Tolovana River. Some northern pike harvest was reported on the Tolovana River about 5 miles from Minto and also in the lakes in front of the community.

Figure 3-11 shows the fish harvest, in edible pounds, by gear type. Minto residents used a variety of fishing gear to harvest their subsistence fish. Fish wheels harvested the majority of the fish used by Minto households. Fish wheels caught 60% of the total fish harvest (12,336 edible pounds). Key respondents preferred using fish wheels over setnets because wheels harvested fewer nonsalmon fish species than nets. One respondent explained why fish wheels are “easier” to use:

I mean, it's a lot of work when you first get going but then it is just easier to maintain—you sit there and if you get a bad fish<sup>14</sup> you just sit there and just get a bucket and throw 'em back in the water instead of with a gillnet, what you catch is what you catch. [With a fish wheel] they're still alive and you can just throw them back in the river. If you know, if you know how much fish you want, you can just shut your wheel off. (05312013MIN6)

Using a fish wheel allows the fisherman to have more control over what is harvested and what is kept. Fish wheels are also capable of catching large amounts of salmon in a short period of time if there is a strong run of fish. One respondent recalled, “When I was a little kid, fish wheels were so heavy with fish, 500 fish, they were just sinking” (05312013MIN6). Another respondent noted that fish wheels were an especially efficient gear type in past years when salmon runs were stronger. They were so effective that “a family of 8 could live well [off] of one fish wheel” for an entire year (05282013MIN4). Fish wheels consist of 2 “baskets,” either round or square in construction, that rotate around an axle, scooping fish out of the water. Fish fall into a chute and are deposited into a

14. In this context, “bad fish” could refer to an undesirable species or a fish that appears in poor quality.

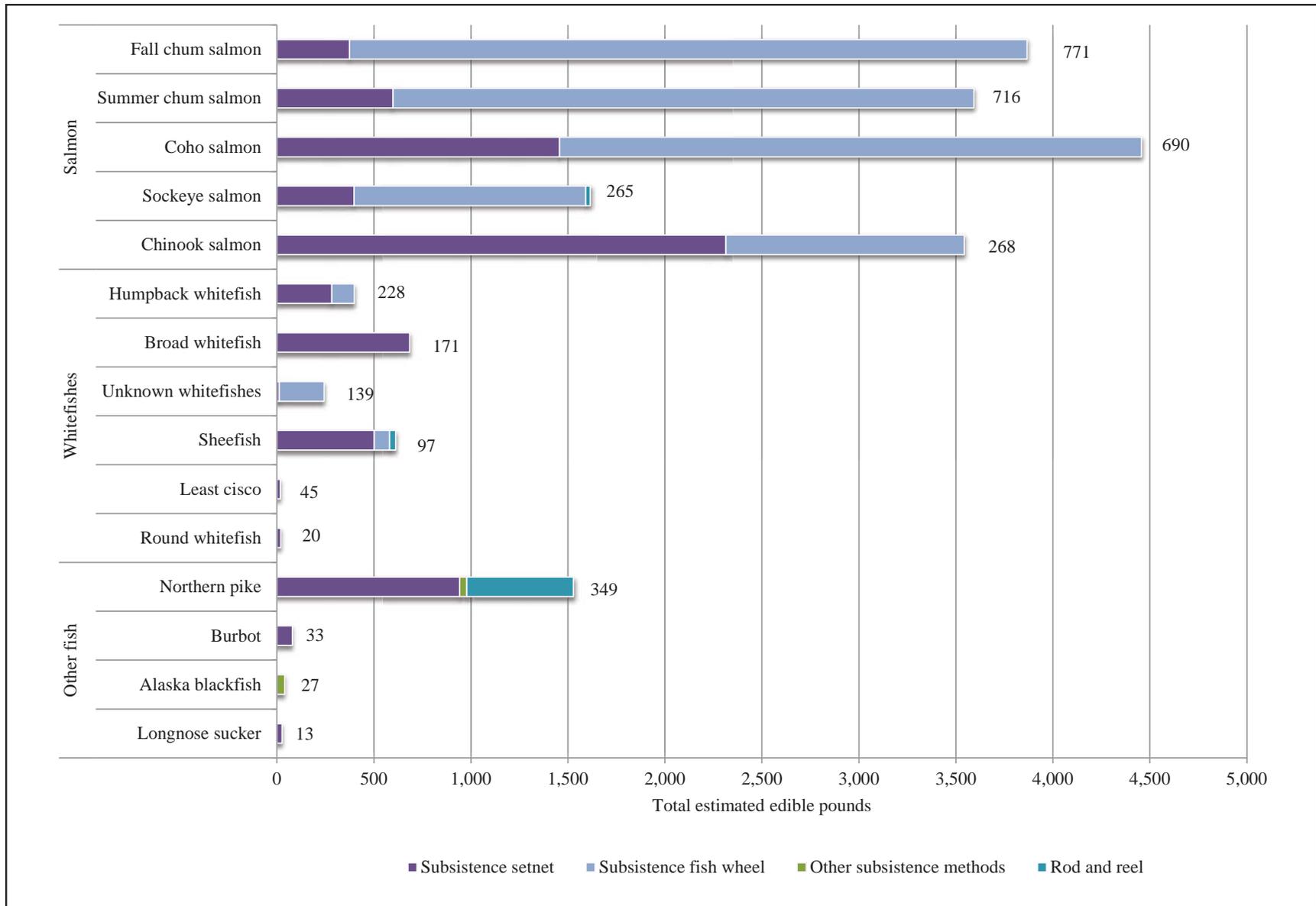


Figure 3-11.— Salmon and nonsalmon fish harvest by gear type, Minto, 2012.

holding box. Minto respondents described the effort involved in building a fish wheel. Respondents agreed that a wheel with square baskets is easier to construct, but is not as durable as ones with round baskets. For those who choose round baskets, long spruce poles are cut and soaked in water until they are flexible enough to bend into the desired shape.

In the fall, wheels are removed from the water and stored for winter. Respondents described the process of pulling the wheel up onto nearby sandbars to avoid damage caused by river ice in the fall and spring. Because the baskets are the most difficult component to construct they are sometimes brought to higher ground where high water or large ice chunks are unlikely to reach them. Oftentimes however, either part or all of the fish wheel is damaged during spring break-up. Respondents agreed that rebuilding damaged fish wheels was a common spring activity.

Setnets, a gear type used to catch 30% of the edible weight of fish (7,708 lb), primarily targeted Chinook salmon, coho salmon, broad whitefish, and northern pike in the summer but were also utilized in the winter to fish under the ice for nonsalmon fish species, including whitefishes, northern pike, and burbot. Unless reduced by ADF&G emergency order, the maximum stretched mesh net size is 7.5 in. Prior to the 2011 Board of Fisheries decision that reduced the maximum stretched mesh net size to 7.5 in, an 8 in or 8-¼ in stretched mesh was the preferred mesh size by used by fishers in the Tanana and Yukon rivers to target Chinook salmon. An elder respondent remembers her grandmother braiding fish nets out of willows. To make a net, green willow branches were pulled apart into thin strips and tied together by hand. In the fall, “they put it in a bundle, they tie it up really good, and they put it away, and when it is time to use it, they put it in water and soak it, and it will come apart again” (05302013MIN3). Ranging in size, setnets used today are typically made of nylon and are used in summer and winter months.

Respondents recalled storing northern pike, harvested in nets set under the ice during the winter months, for dog teams. One respondent remembered that northern pike fishing was an important fall time activity: “In the fall time, when the ice come, they get on top of the ice and fish. People used to go out from here, way out to Lake Minto and they’d set up camp and stay out there and fish for pike.” Harvests were so abundant that fishermen were unable to bring all the northern pike back to community and would have to store their fish near the lakes for later use. Today, people target northern pike closer to town, catch fewer fish, and no longer rely on under-the-ice setnets as a primary gear type. Minto households reported using rod and reel gear to catch 605 edible pounds of northern pike, sheefish, and sockeye salmon. Seventy-seven pounds of northern pike and Alaska

blackfish were caught with other subsistence gear types (that may have included fyke nets or jigging for fish under the ice).

## ***LAND AND MARINE MAMMALS***

Table 3-5 summarizes the large land mammal, small land mammal/furbearer, and marine mammal harvest, use, and sharing data collected for Minto for 2012. This section discusses harvest and use characteristics by category and concludes with a discussion about mapped hunting and harvest locations by category.

### **Large Land Mammals**

Land mammals contribute substantially to the diets of Minto residents. Overall, 96% of households used land mammals while 50% harvested at least 1 land mammal (Table 3-5). As noted above, the majority of land mammals harvested were moose. Moose, the only land mammal in the top 10 harvested resources (by edible weight), constituted 38% of the total community harvest (14,919 edible pounds harvested). Thirty-three moose provided 95% of the total land mammal harvest. Appendix Table D3-4 shows the months that moose were harvested. Minto hunters harvested an average of 85 lb of moose per person, or 245 lb per household. Key respondents described the process of hunting moose, the methods of preservation, the significance of the resource, the value of sharing moose with others, and their experiences with both non-local and nonresident hunters. Moose hunting in the Minto Flats has been subject to a great deal of regulations and conservative management strategies. Further information on the history of moose hunting regulations in the Minto Flats can be found in the section “Moose Hunting in Minto Flats” of chapter 4 “Discussion and Conclusions.” Active hunters interviewed during this study agreed that moose hunting, while labor- and time-intensive, is an enjoyable activity. One respondent noted:

It’s fun! There is a lot of places you can go. A lot of different creeks and rivers you could add up, and a lot of moose. There is a lot of moose. It seems like there is a lot of people too coming around, you know? From outside ... there is a boat around every bend sometimes. So it’s kind of tough there but it’s usually pretty good. (05302013MIN1)

Several respondents described hunting in small groups with friends and family members, often traveling throughout Minto Flats to camp for several days at a time. Hunters pool resources, sharing food and gas expenses. In the morning hunters gather together, listening and watching for signs of moose. Hunters often use a dried moose shoulder blade, or scapula, to rub against trees or willows to mimic the sound of a moose moving through the forest. Several respondents described the process:

Take a shoulder blade, call them. You call them and we climb trees and everything. We spot them. Like you get up in the morning and then you go up the tree, like spruce tree. Look out the trees and you'll spot them. If they are close by you can even shoot them from the tree if they are close enough, you know? (05292013MIN5)

Another respondent used the same method to call moose but preferred to search the rivers in the morning rather than climbing trees:

I'll just cruise until I get to a certain area, where there are bigger grass flats and where you usually see moose, and you start early in the morning, and you'll stop, usually rub your horn, try to get some attention. Wait. Then just idle up the river as quiet as you can. I like using canoe, though. I usually go out to our camp and then from there push the canoe in because I'm just dead silent. (05312013MIN6)

Sometimes hunters use a combination of calling methods to attract bull moose:

We got horns or else a shoulder blade of a moose. We wrap that in willow trees and we just make a lot of grunting noises and then try to find the best female moose caller in camp. We've got a couple of those. It's pretty, pretty hard to do ... but a good cow call always works. And then, because you usually do that all night for a while and then go to bed, you wake up in the morning, climb a tree and sometimes [a moose] is just right down there. (05302013MIN1)

All the active hunters interviewed in this study were male and under the age of 60. They all described similar hunting methods, noted above. One elderly woman however, remembered a time when moose were snared rather than shot. Moose hide was cut into strips and braided into cord. The cords were strung between 2 trees and were durable enough to tangle and stop a running moose. A bow and arrow or a spear was then used to kill the animal (05312013MIN8).

More than half (67%) of households attempted to harvest moose in 2012, but only 37% successfully harvested moose. Key respondents did not express concern over the moose population in Minto Flats. Instead, they described a healthy population that thrives on the abundant vegetation in the area. The high use rate among Minto households (96%) suggests a strong network of food distribution within the community. Many households (72%) received moose from others while 35% gave some of their moose away. Respondents described the traditional practice of sharing a first moose with everyone in the community. When a young person harvests a moose for the first time, a potlatch is organized and the moose is distributed throughout the community. Sharing your first moose is an important part of "becoming a hunter, a provider" (05302013MIN1).

After the meat is distributed throughout the community, a variety of processing and preservation methods begin. Key respondents described the uses for each part of a moose and emphasized the importance of minimizing waste. One respondent described the parts he used:

We usually debone most of the rear legs, the hindquarters, we'll take most of the meat off of those and we go put it through the meat grinder. That's usually pretty good. Ah, dry meat or just package it up, save it for stews, steaks, and then usually cut up the leg bones, leave some meat on there, cut those up for soup bones, potlatch. Put the ribs away, usually just in case you need them for potlatch or something, backbone, everything, separate them. Pretty much everything. (05312013MIN6)

Several respondents also described making jerky, also known as dry meat. Cutting meat into thin strips allows it to dry quickly. Simple seasonings or a short period of time in a smokehouse adds extra flavor to the popular snack.

In addition to preserving the meat, Minto residents process a variety of other organs and bones for consumption. Two distinct portions of the stomach are commonly used by Minto residents; the omasum and the reticulum, known locally as "the bible" and "the troth" respectively. These 2 stomach sections are thoroughly cleaned in the field then boiled or cooked over a fire before consumption. They have high fat content and are considered a delicacy. One respondent described the stomach:

You usually get those 2 pieces [of the stomach] and then just turn inside out and clean it out, really good. And you just cut it up, and then boil it, and then it's just pretty good. Yeah, it's just like, I don't know what it would taste like but the texture is pretty good. It's probably mostly a texture thing, it's what people like about that ... it's a little chewy but not bad, it's actually really good. It's got some flavor to it, probably from the grass where the moose has been eating. (05302013MIN1)

Other organs, including the kidneys, heart, and liver, are also eaten (05312013MIN6). The tongue is either eaten fresh or sometimes half-dried for later use (05302013MIN3). Many respondents described making moose nose soup for family and friends. The head and nose of the moose are filled with flavorful fat, that, when boiled, makes a hearty soup stock (05302013MIN9).

The brain of the moose is valuable for tanning moose hide, a traditional process once common in Minto Flats. Tanned moose hide was once used for everyday clothing. Today, moose hide clothing is less common but the durable hide is still used when making slippers, vests, dresses, and beaded barrettes, coin purses, or other items. The brain is sometimes fermented and mixed in water to create a brine solution. The mixture is rubbed over the moose skin at various stages of the tanning

process to soften the hide. The hide is then soaked, scraped, and smoked numerous times until it is soft and supple enough to sew with. While the practice of smoking brain-tanned moose hide is not as common as it once was, a respected elder from Minto is beginning to teach the process to interested youth.

While moose figured prominently in the ethnographic and harvest data for this research, other large land mammals seemed less significant today in terms of community harvest or dietary and cultural significance. Black bears (*sresh*), for example, were only used by 11% of households. Four black bears accounted for 231 edible pounds, or an average of 4 lb per household. Five key respondents had some experience bear hunting but did not regularly attempt harvest. During fishing season, some respondents reported shooting bears that entered fish camps:

Actually, we had a lot of problems with bears [in camp]. I had to shoot them, right in the camp. Right by the smokehouse and yeah, I haven't had any real major incidents but when we'd go to check our nets or something we'd come back and a bear would be trying to get into our smokehouse ... they would come around and be a nuisance and we would have to shoot them, sometimes we'd just chase them away, but if they don't go away we would have to shoot them. And we would eat the meat, though; we'd take the meat and eat it. (05302013MIN1)

Respondents reported more directed hunting efforts in winter months by searching for bear dens. When covered in snow, a bear den is difficult to see. Hunters must pay close attention to changes in the consistency of the snow. For example, one respondent described the opening of a bear den as a small hole, "the size of a sauce pan, with some frost around it, a little bit of steam coming out" (05282013MIN4). One respondent explained the process of hunting bears in the winter months:

You go out and look for a den. You look for moisture in the ground ... you just look for frost, or steam, or hair maybe, and stuff. And then, if there is one you just look in the hole, he is in there and then you just, you try to jab and wake him up, poke. You try to get him out of the den first. If you can't do that, you gotta tie a rope around a stick or just use a snare. (05302013MIN1)

Hunters either pull the bear out of the den or wait for the bear to wake up and come out voluntarily. At this point, hunters stand back and shoot the bear with a high-powered rifle or a pistol. An alternative method uses smoke to disturb the sleeping bear. A respondent explained how he lights a dry piece of birch bark and throws it into the den. The smoldering birch bark forces the bear to exit the den (05312013MIN6). Bears waking from their winter hibernation are typically groggy and disoriented, affording the hunter time to retreat to a safer distance. However, as the respondent

described, “It’s pretty scary sometimes because you gotta stick your head in there to see, if there is anything in there ... but it seems like they are just so sleepy you know? They’ve been napping” (05302013MIN1). No households reported harvest or use of brown bears (*Nuniya tliga*’).

There were no caribou harvested in 2012, but 15% of households did receive caribou from others. Caribou no longer migrate in easy hunting range of the village, but residents often have relationships with people in other communities who share or exchange caribou with them. Key respondents described a time when caribou regularly migrated near Minto, though there was no agreement as to when caribou stopped passing through the area. Several remembered seeing caribou in Minto Flats during the late 1980s while 1 respondent believed caribou have been absent from Minto Flats since the early 1950s. Elder respondents recalled a time when, prior to a shift in migratory patterns, Minto people relied heavily on caribou. One explained, “... when I was small, they used [caribou] for everything. Whatever they need it for. There were a lot of people and for dog food” (05312013MIN8).

Lastly, a small percentage of households (2%) harvested Dall sheep. Dall sheep harvests did not appear on the mapping portion of the survey and ethnographic respondents did not mention current sheep hunting. Without this information it is difficult to identify where these sheep were harvested.

Figure 3-12 documents the search areas for moose and black bears, the 2 primary large land mammal species targeted. Hunters used a much larger search area to look for moose (shown in yellow) than black bears. Moose hunting areas encompassed portions of the Elliot Highway, the Tanana, Tolovana, and Chatanika rivers as well as many smaller lakes and waterways. The use of waterways suggests hunters travel by boat in the fall to search for moose. Some traveled as far as Nenana on the Tanana River while others stayed closer to Minto, relying heavily on the lakes south of town and traveling on land between the Tolovana and Tatalina rivers.

Black bear search areas, shown in black hash marks, have similar concentrations around primary waterways, including the Chatanika and Tolovana rivers. Washington Creek and the lake-dense area south of Minto were also recorded as black bear search areas.

### **Small Land Mammals/Furbearers**

The remaining mammal use came from small land mammals. Most small land mammals are caught while trapping, either on land, or, in some cases, under water. Twenty-six percent of households attempted to harvest a small land mammal in 2012 (Table 3-5). Overall, 44% of households used some of the 371 edible pounds harvested. Appendix Table D3-5 shows the months that small land mammals were harvested. Beavers, an animal commonly trapped and eaten by Minto residents,

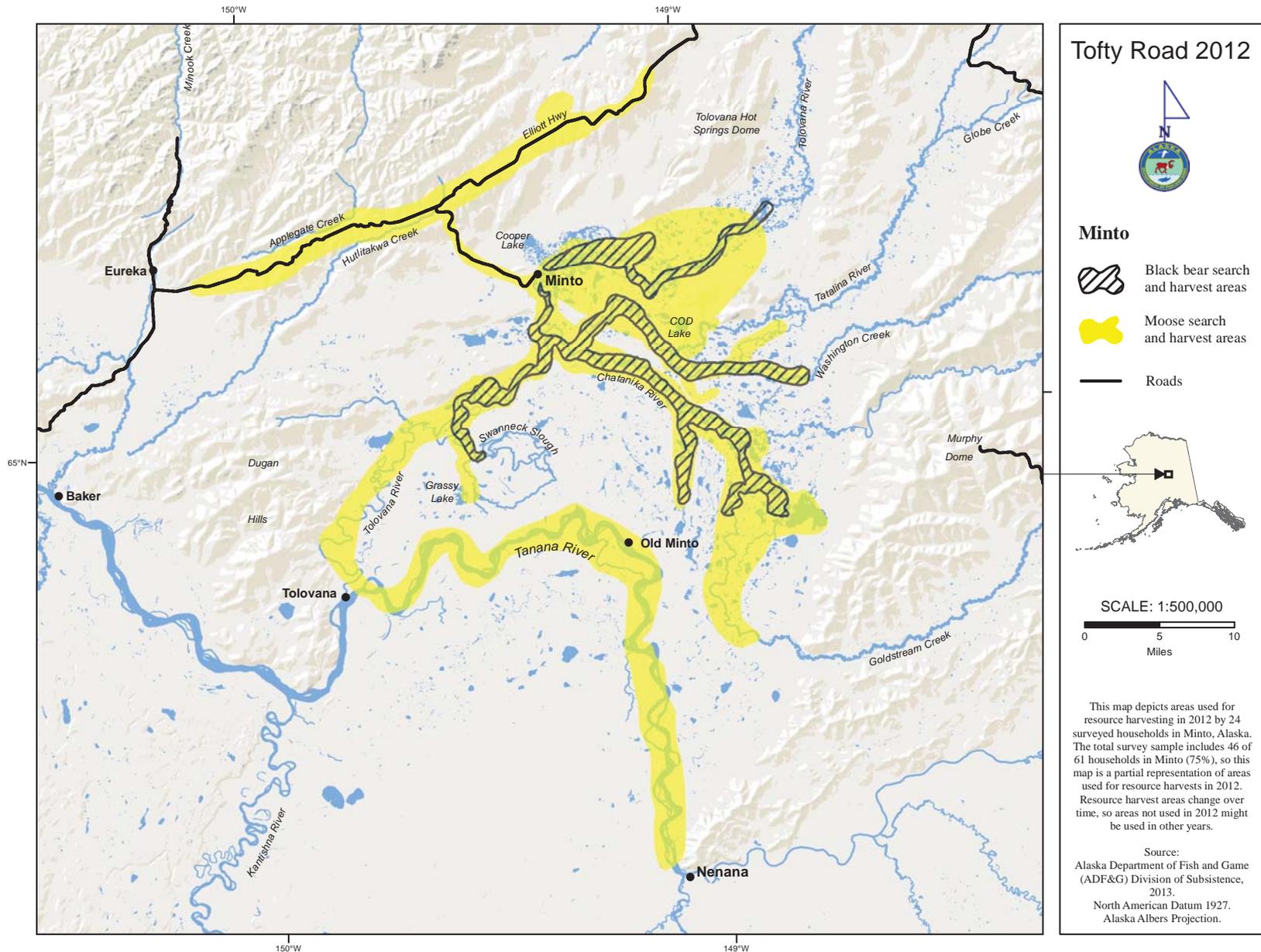


Figure 3-12.— Black bear and moose search and harvest areas, Minto, 2012.

contributed 298 lb (80% of the small land mammals harvest) to Minto's total community harvest (Table 3-5). Thirty-three percent of households used beavers, with an average 5 lb harvested per household (2 lb per capita). Nine percent of households attempted to harvest beavers, all of whom reported successful harvests. Minto residents harvested and used beavers at a greater rate than any other small land mammal. Most key respondents either currently trap beavers or remember trapping them as children or young adults. Up until the 1970s beaver trapping was a primary source of income. When people were still living in Old Minto, "... everybody had to go out and trap some, for fur ... that's all they depended on in Old Minto, no employment in them days" recalled 1 respondent (05292013MIN5). Fur buyers from other parts of the state, such as Koyukuk and Fairbanks, would come to Minto in the winter and select the best pelts in exchange for cash. Respondents agreed that the number of beavers in Minto Flats has decreased over time. One respondent believes that the beaver population began decreasing in the 1970s around the same time people began moving to the current Minto site (05282013MIN4). In the past, however, beavers were so abundant that a middle-aged respondent remembered his father catching more than 60 beavers in less than 2 months. Techniques for trapping beavers were consistent among respondents. In the winter months, a hole is cut in the ice near a beaver den. Snares are placed under the ice and birch, cottonwood, or willow branches are used as bait. This method works well but is a lot of work. One respondent described the process:

It was a lot of hard work, that beaver trapping, you know. Everything about it was hard work. Cutting through 5 feet of ice and all that, skinning all night because you caught a bunch. (05302013MIN2)

Sometimes the beavers "wise up to them snares," requiring the trapper to change snare placement and strategy. One respondent recalled a time when the beavers in 1 lake began learning how to get the bait without getting caught in the snare. To work around this, he placed 2 snares at the bottom of the lake and 2 snares near the top of the ice, then connected all 4 in a box configuration with bait placed in the center. When he returned the next day he had trapped 3 beavers. Several respondents emphasized the importance of catching no more than 2 beavers out of 1 den. Taking more than 2 beavers from a den can kill an entire family, leaving that den uninhabited for many years. Despite a decrease in harvest over time, beavers continue to be a common part of diets in Minto.

Snowshoe hares followed beavers with 13% of households using the rabbit species in 2012. Only 7% of households attempted to harvest snowshoe hares. Respondents who participated in snowshoe hare harvesting described the activity as an enjoyable one that got them outdoors. Respondents described that trapping snowshoe hares is not difficult. One respondent added that they are "easy to catch, I mean, they don't suffer much ... you can do it by hand, no tools because the picture

wire is flexible. You make a little loop, you put there, then you bring it, and you put it in these little paths in the willows. He only got 1 path to his feeding site or den and that is where you put your trap” (05282013MIN4). Snowshoe hares are mostly eaten but their soft pelts are sometimes used as trim on clothing.

Muskrats, an animal once abundant in Minto Flats, were used by only 7% of households in 2012. Key respondents discussed the historical prevalence of muskrats in Minto Flats, their role in the seasonal round, a period of overharvest by area residents that led to a decimated muskrat population, and recent signs that muskrats are returning to the area. Up until the semi-permanent settlement of Old Minto, people in the area would travel to “rat camps” near lakes where muskrat trapping and hunting was common. Muskrats were once a heavily relied-upon resource for food and for fur. Respondents described preparing the lean meat by either roasting or boiling it. Muskrat meat was never wasted and constituted a substantial portion of people’s diets. For many people, from the late 19th to mid-20th century, trapping muskrats was a primary source of income. Pelts typically sold for \$1.50 to \$2.00. Because of their abundance and the minimal effort needed to harvest and skin the animals, respondents believed this was a very good price for the time. One respondent remembers his grandparents telling him that muskrats were once so abundant that people from Tanana and Nenana would come to the Minto area to trap them. In the springtime, people would gather together and gamble with their muskrat pelts (05302013MIN2) (05312013MIN8) (05292013MIN5).

Respondents described the process of leisurely paddling around lakes looking for swimming muskrats. The small animal could be shot with a .22 caliber rifle and easily collected from the water. One respondent demonstrated a vocal muskrat call that attracted male muskrats to the side of the boat. In the spring, before the lake ice melts, muskrats can be caught in small burrows, also known as “push-ups” or “pineapples” because of their cone shape. This process was described by a key respondent:

Trapping is usually easier [than hunting from a canoe]. ‘Cause they’re so wild they’re hard to catch when you’re out in a canoe and stuff, but ya, trap ‘em. You go down to the lakes, you’ll find little, what we call, pineapples, little houses, cut ‘em open. They’ll be a little grassy heap that they built, set your trap in there, cover it back up, close it back up where you cut it open and you’ll catch ‘em. (05312013MIN8)

When Minto children began attending school full-time, the practice of hunting muskrats at spring camp as a family began to change. One respondent noted that in the early 1900s, young people did not hunt muskrats because they were in school. After class, however, children would run to the lakes in search of muskrats (05292013MIN5). In the 20th century, as fur prices rose, the hunting effort for muskrats intensified, and the population began declining. In 1947, a year in which elder

respondents remembered particularly abundant muskrat populations, it was not uncommon to catch 1,000 muskrats at spring camp (05292013MIN5). For decades muskrats went unseen in Minto Flats. Today, however, respondents reported seeing anywhere from 1 to 8 muskrats in an area and are cautiously beginning to hunt a few of them. An elder respondent discussed having “fond memories” of muskrat trapping, an activity that was “the only life that I really enjoyed” (05302013MIN2). All respondents expressed hope that muskrats are returning to Minto Flats and that one day trapping them will, once again, be a favored pastime of Minto youth.

Very little trapping of non-edible furbearers occurred in 2012. Of the non-edible furbearers, only lynx (*nuduyi*) and martens (*tsugi*) were used by Minto residents in 2012.

Figure 3-13 documents the search and harvest areas for small land mammals. Furbearer harvests often occurred on a trapline and was mapped either as a distinct line or as a less specific polygon. Traplines are passed down through families from father to son or from uncle to nephew. Key respondents explained that traplines are often kept in the family for generations. On the map presented here, there is only 1 clear line located on the west side of the Minto Spur Road. One large polygon to the west of Minto and north of Dugan Hills shows a large search area surrounding a tributary of the Tolovana River. The remaining small land mammals search areas surrounded the Tolovana and Chatanika rivers. As noted above, beavers, the most heavily used small land mammal species, were often shot or trapped in their dams underwater. The presence of beaver dams along river banks and in lakes could explain why much of the search areas surround water.

### **Marine Mammals**

Minto residents did not report any use or harvest of marine mammals (Table 3-5).

### ***BIRDS AND EGGS***

Minto residents harvested 19 species of birds for a total harvest of 1,784 edible pounds in 2012, or 9 lb per capita (Table 3-7). The majority of the bird harvest came from migratory waterfowl. Ducks represented 51% of the total edible bird harvest while lesser amounts were harvests of geese (39% of total edible harvest) and non-migratory species such as grouse and ptarmigan (9% of total edible harvest). Birds accounted for 4% of the community harvest.

Each year, geese, ducks, cranes, and other migratory birds pass over Minto Flats in the spring and fall. Minto residents hunt a variety of these birds and use them throughout the year (Appendix Table D3-6). In 2012, 54% of households harvested a migratory bird while 78% of households used at least 1 type of migratory bird (Table 3-7). In total, 1,145 individual migratory birds were

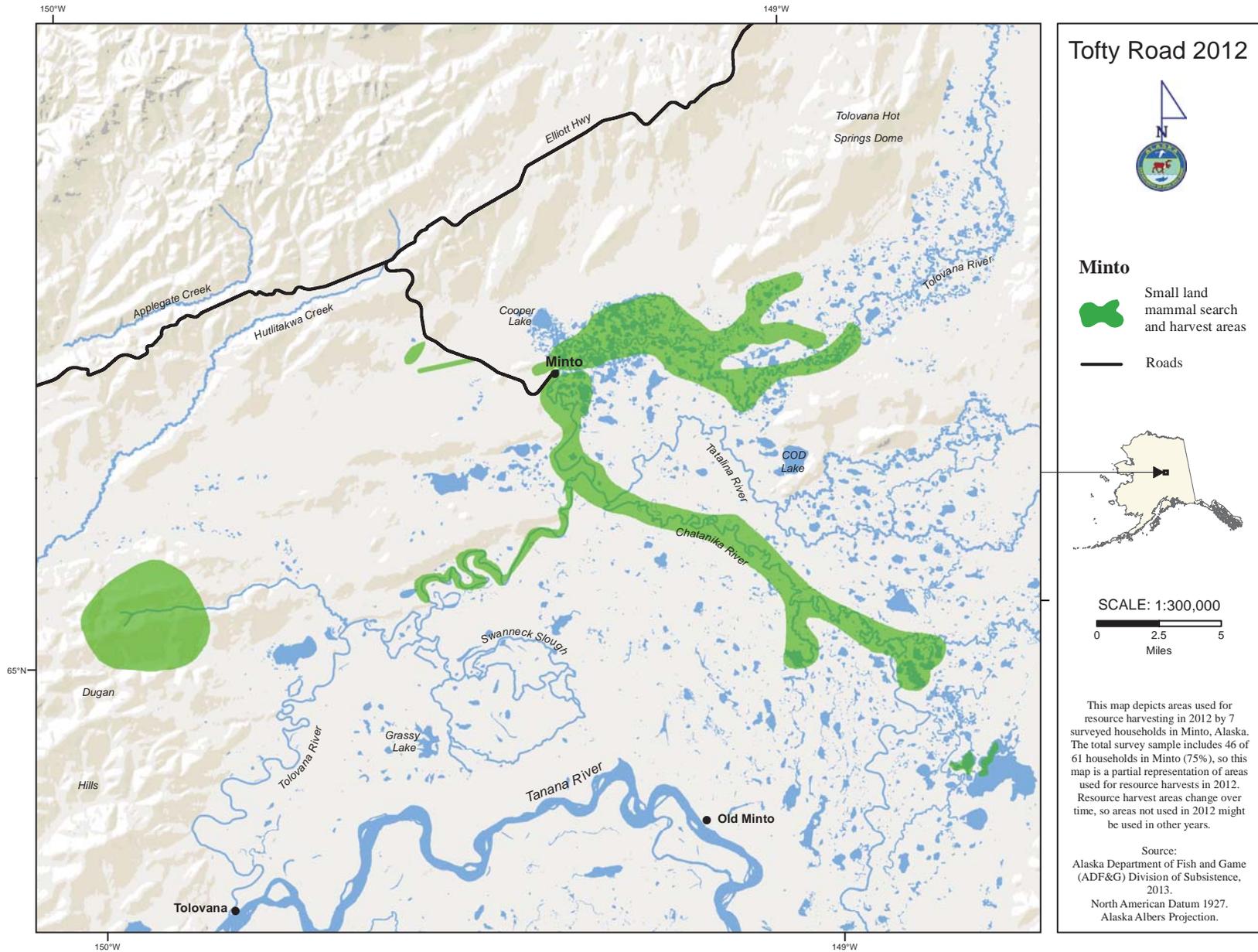
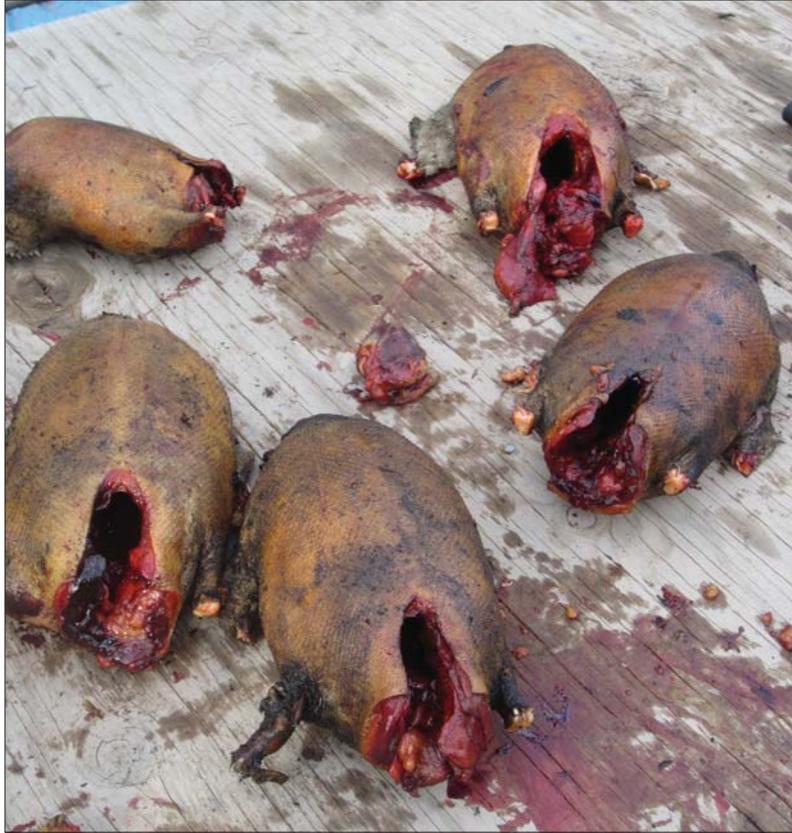


Figure 3-13.— Small land mammal/furbearer search and harvest areas, Minto, 2012.



Alida Trainor

*Figure 3-14.– Ducks harvested by a Minto resident in the spring. The birds are gutted and quickly singed to remove feathers before being further processed.*

harvested, accounting for approximately 1,622 edible pounds (9 lb per capita) or 4% of the total community harvest. The methods for processing and preserving ducks and geese were similar. After plucking, the birds were eaten fresh; either fried, baked, or cooked in a soup; smoked or dried like jerky; or freezer-packed for later consumption (Figure 3-14). In the past, before people had freezers, birds were stored in underground cellars to keep cool. Residents used and harvested more ducks than any bird category. All 13 species of ducks listed on the survey instrument were harvested and used by Minto residents. Mallard ducks had the highest level of household use and harvest (48% and 33%, respectively). While not used as much as mallards, white-winged scoters (used by 13% of households) contributed the most edible weight in the duck category (182 lb). More than one-half (52%) of households harvested a duck while 76% used ducks. Most households that attempted to harvest were successful. Respondents described hunting a variety of ducks. Goldeneyes (*thik'oneya*), pintails, and mallards (*not'wghi chwkh*) were preferred species because of their larger size. Respondents who actively hunt ducks agreed that, while harvest varies from year to year, the general abundance of ducks is stable. Key respondents shared a number of methods to harvest

ducks. Most respondents “call” ducks, either with their voice or with an old bullet shell, a common technique in Minto. One respondent explained:

Where the shell comes out, you cut that off and then you burn a hole like right in the dead center of it. You make a kind of whistling noise and then you hold it [at your mouth] “shushushu–shushushu,” it makes a pretty good specklebelly call ... they are easy to carry, cheap, you know? And you can make one really easy. Some people order [duck callers] from Cabela’s but I usually stick with the shell, it works pretty good. (05302013MIN1)

Other respondents preferred to sit in the grasses on the lake shores and wait for ducks to waddle or fly past them. Almost everyone who tries to hunt ducks is successful. Sometimes “they get more than what they need but they put [the extra] in their freezers and they save it for potlatch” (05302013MIN3). One respondent explained that it would be impossible to keep all the ducks he gets:

My freezer space fills up, so that if I keep everything I just give away mostly to family members or to people who can’t go, that don’t go hunting for themselves or something, we’ll stop by an’ leave them some stuff. (05312013MIN6)

Respondents agreed that sharing birds with others or saving them for potlatches is an important practice for the entire community.

Geese did not contribute as much edible weight as ducks, but were used by nearly as many households (72%). Forty-eight percent of households attempted to and succeeded in harvesting geese. The arrival of geese signifies the arrival of spring, and respondents described the happiness associated with the change in season. After a long winter, 1 respondent explained that, “...the most important thing I think about is when geese come back, the first thing we think of is a pot of goose soup” (05302013MIN3). Another agreed:

We just went through a hard, cold winter and when you warm up and you go out there and get something to eat, you know? Which is good food, fresh food, when [the birds] come back [they are] just fat, you know, a lot of fat on them and they taste good!” (05302013MIN2)

Unlike ducks, hunting and processing geese is sometimes more labor-intensive.

It’s pretty tough, your thumbs get pretty sore and stuff ... [but] I usually try to pluck my geese when I’m out hunting, right after I shoot them. I start plucking them while they are nice and fresh. It’s easier, it seems like. To pluck them while they are fresh. The meat doesn’t tear up as much and it’s just a good way to be traditional. That’s what I’m told you know?

Make sure you take care of your birds right away. That's what I was taught so I just keep doing it. (05302013MIN1)

White-fronted geese, used by 46% of households, contributed 544 lb (78% of the total goose harvest) to the total community harvest, which was far more than any other goose species. Minto households shared white-fronted geese more than any other species of goose (given by 28% of households and received by 11%).

Other non-migratory bird species, including grouses and ptarmigans, provided winter hunting opportunities. Ruffed and spruce grouses both inhabit the Minto area but survey respondents did not report specific species for 216 birds. Thirty percent of households used grouses in 2012, and nearly one-quarter (24%) of households harvested grouses.

With the exception of a small number of gull eggs, Minto residents did not harvest any bird eggs in 2012 (Table 3-8). Two percent of households used and harvested approximately 11 unknown gull eggs. Only 1 key respondent reported a history of collecting seagull eggs. Seagull eggs are about the same size as a chicken egg but are less oval and with a more pointed end. After boiling them in water, the respondent either eats them plain or with a little salt. In comparison to a chicken egg, the flavor is "hard to explain but it's just really good. It's like an egg but 10 times better. It's got more flavor, everything. Not [as] bland and funky-tasting as a chicken egg" (05312013MIN6). Gull eggs are found either on logs, or, in the spring when the lakes are flooded, at the top of standing trees "that are in the middle of the water" (05312013MIN6).

Figure 3-15 shows the search areas for 4 species of birds. Ducks and geese, the primary migratory species, are shown in hashed red polygons, while ptarmigans and grouses are shown in grey. Ducks and geese were harvested along the upper Tolovana River where Minto is located and in the numerous lakes near town. Swanneck Slough was the southwestern extent of duck and goose search areas. Minto residents used Minto Spur Road and Elliot Highway to hunt for ptarmigan and grouse. These birds were hunted close to, or directly in, town and were also harvested along the Tolovana and Tanana rivers. Search areas for birds extended as far as Nenana.

### ***MARINE INVERTEBRATES***

Residents in Minto households who traveled to a coastal community in Alaska harvested less than 1 gallon of clams (0.1 gal) (Table 3-9). No household reported giving or receiving clams. No

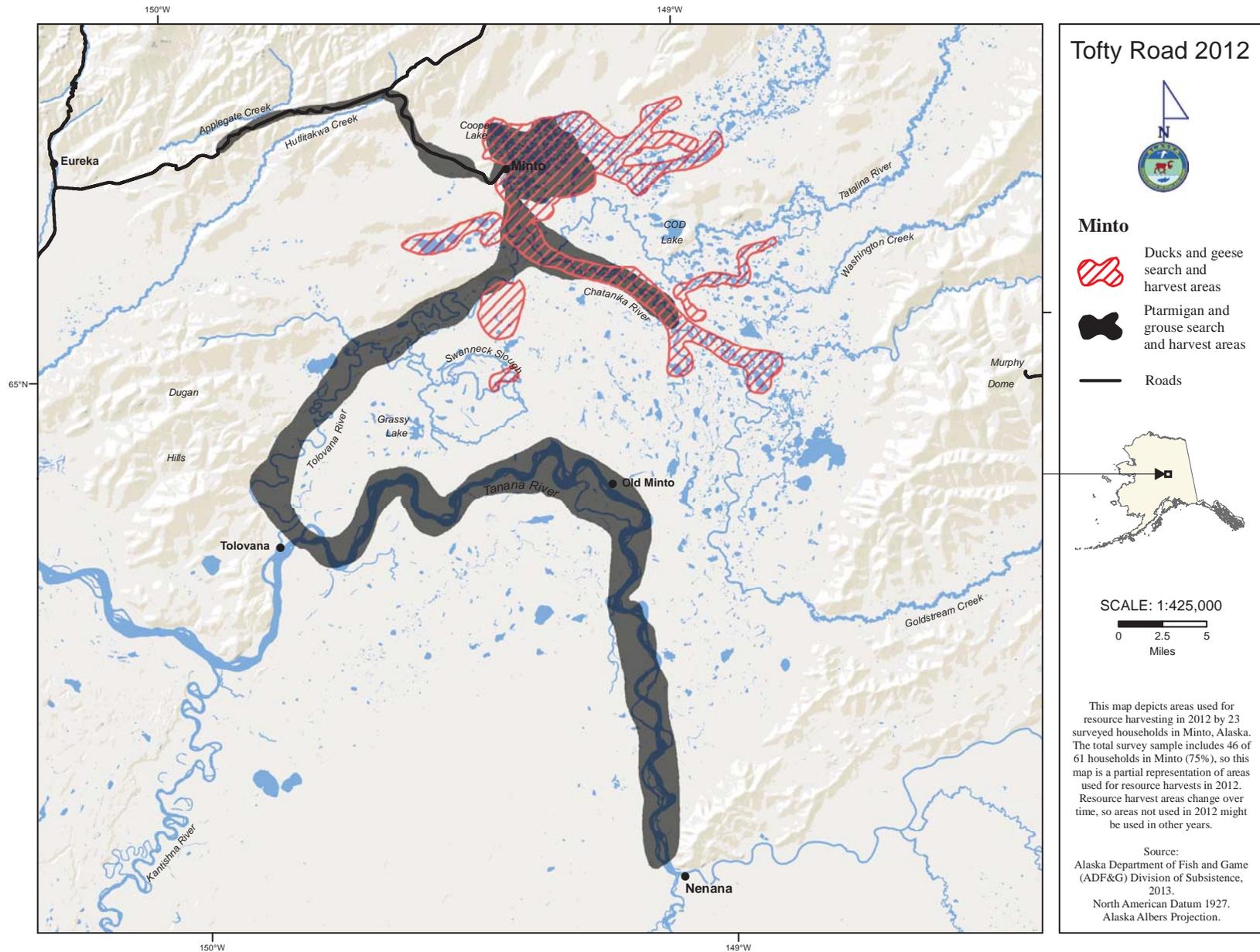


Figure 3-15.— Duck, goose, ptarmigan, and grouse search and harvest areas, Minto, 2012.

other marine invertebrate was used or harvested. Because of this small harvest that occurred far away from the community, no search and harvest map for marine invertebrates was produced.

## *VEGETATION*

The use of berries and greens by Minto residents included 10 species of plants and contributed a total of 1,633 lb to the total community harvest, or 9 lb per capita (Table 3-10). The majority of vegetation harvest came from berries (1,542 lb, or 94% of vegetation harvest). Minto households used blueberries, raspberries, salmonberries, and both lowbush and highbush cranberries (*tronelttha* is the lower Tanana Athabascan common word for an undesignated species of cranberry). Blueberries, harvested by 76% of households and used by 80%, contributed 231 gallons, or 915 lb, to the total community harvest. Blueberries made up 59% of the total berry harvest and 2% of the total subsistence harvest in 2012. One hundred and four gallons, or 418 lb, of lowbush cranberries (*nitl'et*), also known locally as red berries, were harvested by 44% of households. Almost one-half (44%) of households that used berries gave some away to others, while 15% of households received berries from another household. Several key respondents recalled the method of berry preservation before freezers became common. Berries were wrapped in birch bark and buried in the frozen ground to stay cool. One respondent explained:

We didn't have no freezer, or refrigerator, no electricity. We dried most of our food. Dried fish, dried meat, all of that. The only thing we didn't dry is the berries [*laughs*]. They used to make birch bark. Rough birch bark. Kind of large tree. They make basket out of it. Sew the corners. That's what they store the berries in, fall time. They sew another birch bark over, to cover it. And they dig out a little place, where they pick the berries, and they bury it there. After it freeze up and little snow they send the boys there after they mark it. They tell them what kind of mark is their berries. And they bring it home, to the village. (05312013MIN8)

Buried berries were marked above ground with a piece of clothing, typically a colorful bandana. In addition to freezing, other methods of preservation included canning or making jam. Berry picking occurred in the summer and fall months often alongside other subsistence activities. When at fish camp, for example, people often pick berries when fishing is slow.

Minto residents harvested a variety of other edible plants, including wild rhubarb (*guth*), rosehips, Hudson's Bay (Labrador) Tea, and fireweed (*ch'etth'ena't'on'tr'el'ani*). In total, 91 edible pounds of plants were harvested. Wild rhubarb accounted for 95% (86 lb) of plant harvests (not including berries). Thirty-five percent of households harvested and used wild rhubarb. No household received wild rhubarb, but 11% reported giving some away. It is possible that 11% of households gave wild rhubarb to households outside of the community or gave it to households that were not surveyed.

Respondents described making a pudding out of wild rhubarb. The fibrous plant is peeled, diced, and boiled, then sugar and flour are stirred in until the mixture thickens.

Key respondents described a variety of plants used by Minto residents. While these plants did not show up in the 2012 harvest data, the historical use patterns and contemporary cultural significance of vegetation in Minto continues. Several plants, including Hudson's Bay tea (known locally as Labrador tea), spruce tips, and stinkweed were identified as important medicinal plants. Labrador tea (used by 2% of households in 2012) is boiled in water to make a tea "just used for cold. Sickness, fever, flu," noted 1 respondent (05302013MIN1). Similarly, boughs of white spruce trees are sometimes boiled in water and the steam inhaled to clear congested sinuses. One respondent explained:

It helps fight off disease. When you have a bad cold or something, you get spruce boughs, you put it in a bucket, like a coffee can, put it in there, put it on the stove. Steam from that spruce, it's like mint, it's like Vic's [Vapor Rub]. (05282013MIN4)

The bark of spruce trees is occasionally chewed to decrease coughing, while the pitch of spruce trees can be chewed to clean teeth (05312013MIN8). One respondent described burning stinkweed (used by 2% of households in 2012) and mixing the ashes with a little oil to create an ointment. The ointment is then rubbed on the skin to sooth arthritic joints (05302013MIN3).

Wood, primarily used for heating, was harvested by 74% of households. A total of 235 cords of wood were harvested in the Minto area. Elder female respondents spoke at length about the importance of birch bark to the subsistence way of life they lived as young women. Making baskets was a common task for women. Baskets were useful in storing food underground and also demonstrated a person's individual craftsmanship. While birch bark was not a plant included on the survey form, younger key respondents mentioned collecting birch bark on behalf of the elder women in Minto who continue to make birch bark baskets. Bark of the right texture and thickness is collected to make each basket. Additionally, long spruce roots, used to stitch the bark together, are dug up from densely wooded areas, while fresh willow branches are collected to frame the outside of each basket (05302013MIN3). One respondent remembered her grandmother traveling to the Nenana mission to exchange basket-quality birch bark for children's clothes (05302013MIN3). Today, only a small number of women continue to make baskets. The majority are sold throughout Alaska as a form of income.

Figure 3-16 shows the search and harvest areas for vegetation in the Minto area. The map does not differentiate between areas used for plant harvest and those used for wood harvest. Areas along Minto Spur Road and Elliot Highway were utilized for vegetation harvest. Road access can make harvesting and hauling firewood home more convenient. One polygon located around Globe Creek

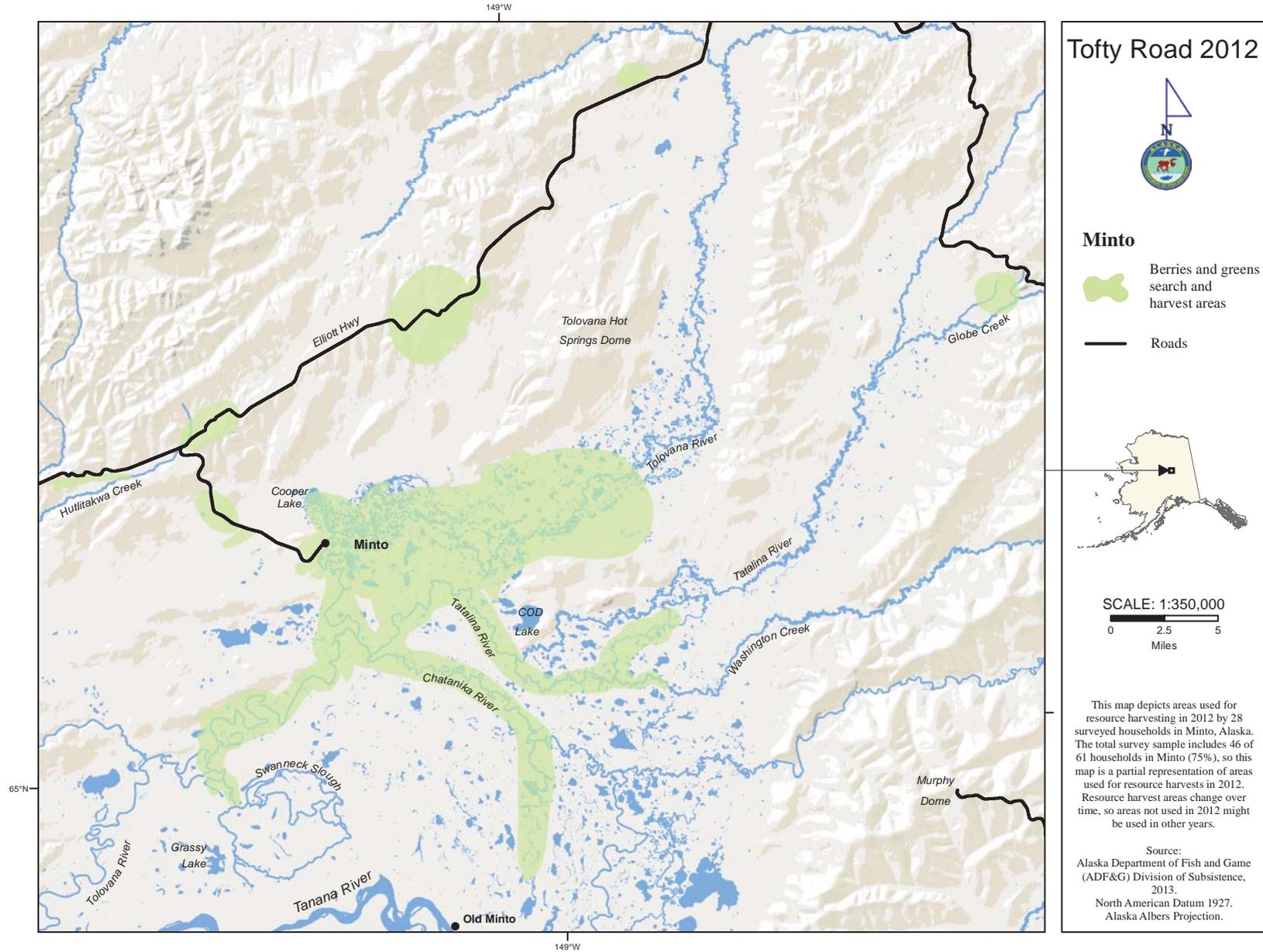


Figure 3-16.— Berries and plants/greens/mushrooms search and harvest areas, Minto, 2012.

was likely accessed from the Elliot Highway. The Chatanika, Tatalina, and Tolovana rivers were all used in the pursuit of vegetative plants.

## Harvest Assessments

The survey asked respondents to assess their household’s harvests—by category, such as “salmon” or “land mammals”—in 2 ways. The survey asked:

- During the last year, did your household use LESS, SAME, or MORE [resource category] than in recent years?
- During the last year, did your household GET ENOUGH [resource category]?

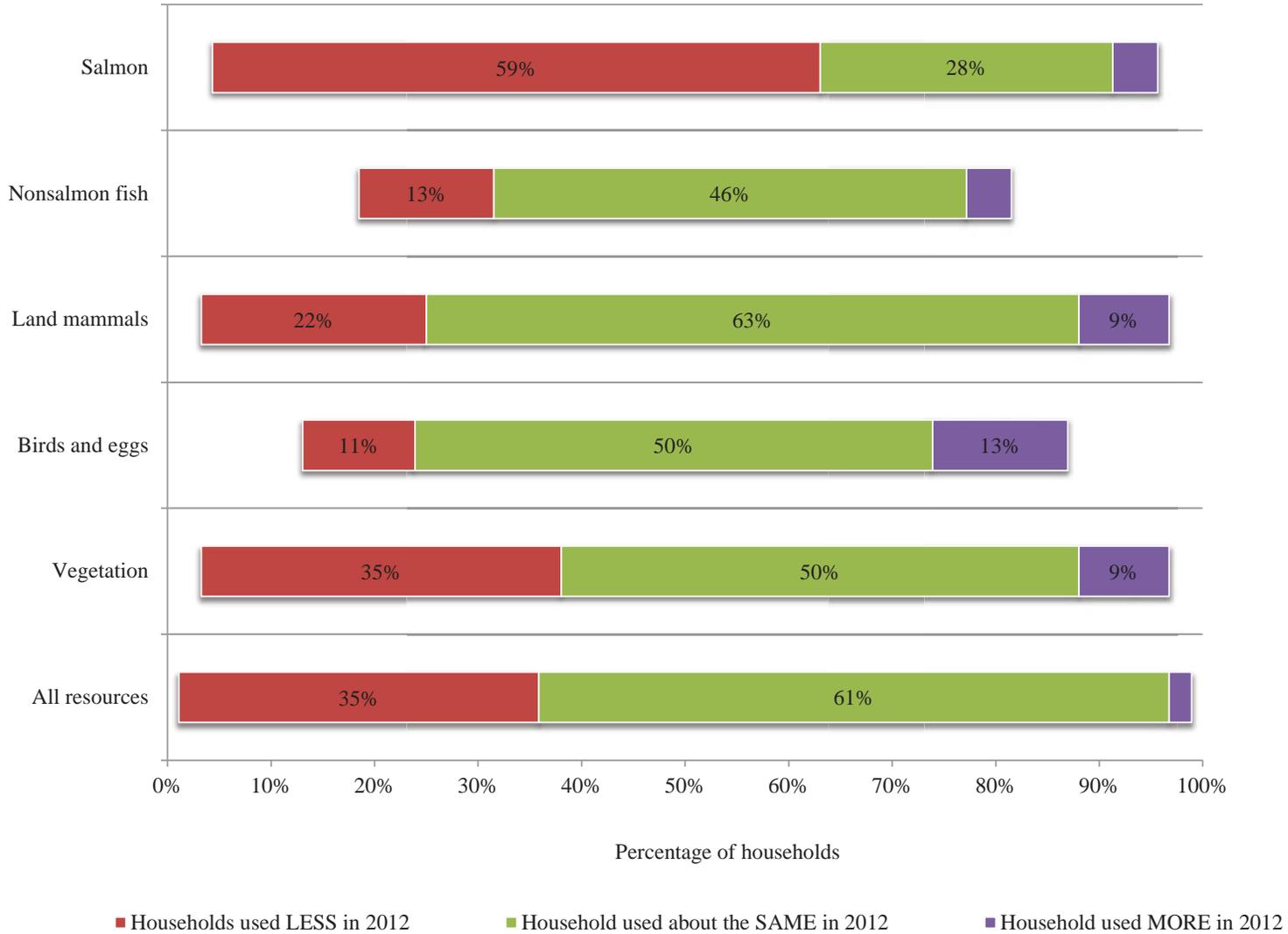
“Recent years” was defined as about the last 5 years. If a respondent indicated a change in the household’s use (by providing a response of “less” or “more”), a follow-up question was asked (“WHY was your use different?”). Households that reported not getting enough of a resource category were asked several follow-up questions:

- What KIND of [resources within the category] did you need?
- WHY did your household NOT get enough [resource category]?
- How would you describe the impact to your household of not getting enough in the last year?
- Did your household do anything DIFFERENTLY because you did NOT get enough [resource category]? IF YES, what did your household do differently?

Figure 3-17 depicts responses to the “less, same, more” assessment question. Households that said they do not ordinarily “use” something are not included within the results. This results in fewer responses for less commonly used categories, such as nonsalmon fish or birds and eggs, and shows up in the chart as a shorter bar compared to categories such as land mammals, which are ordinarily used by most households. Some households did not respond to the question. Figure 3-18 depicts responses to the “get enough” assessment questions. Households that said they did not ordinarily “use” something are not included within the results.

In 2012, 72% of responding Minto households reported getting enough wild resources while roughly one-quarter (26%) did not believe they got enough (Figure 3-18). In each of the resource categories used by Minto households, more than 50% of responding households reported getting enough.

Households reported the highest level of decreased use in the salmon category (59%) (Figure 3-17). Appendix Table D3-7 reports the reasons given by survey respondents that explain why their use was



Note Unlabeled percentages are less than 5%; figure represents households that reported using the identified resource during the survey period.

Figure 3-17.— Household uses of resources compared to recent years, Minto, 2012.

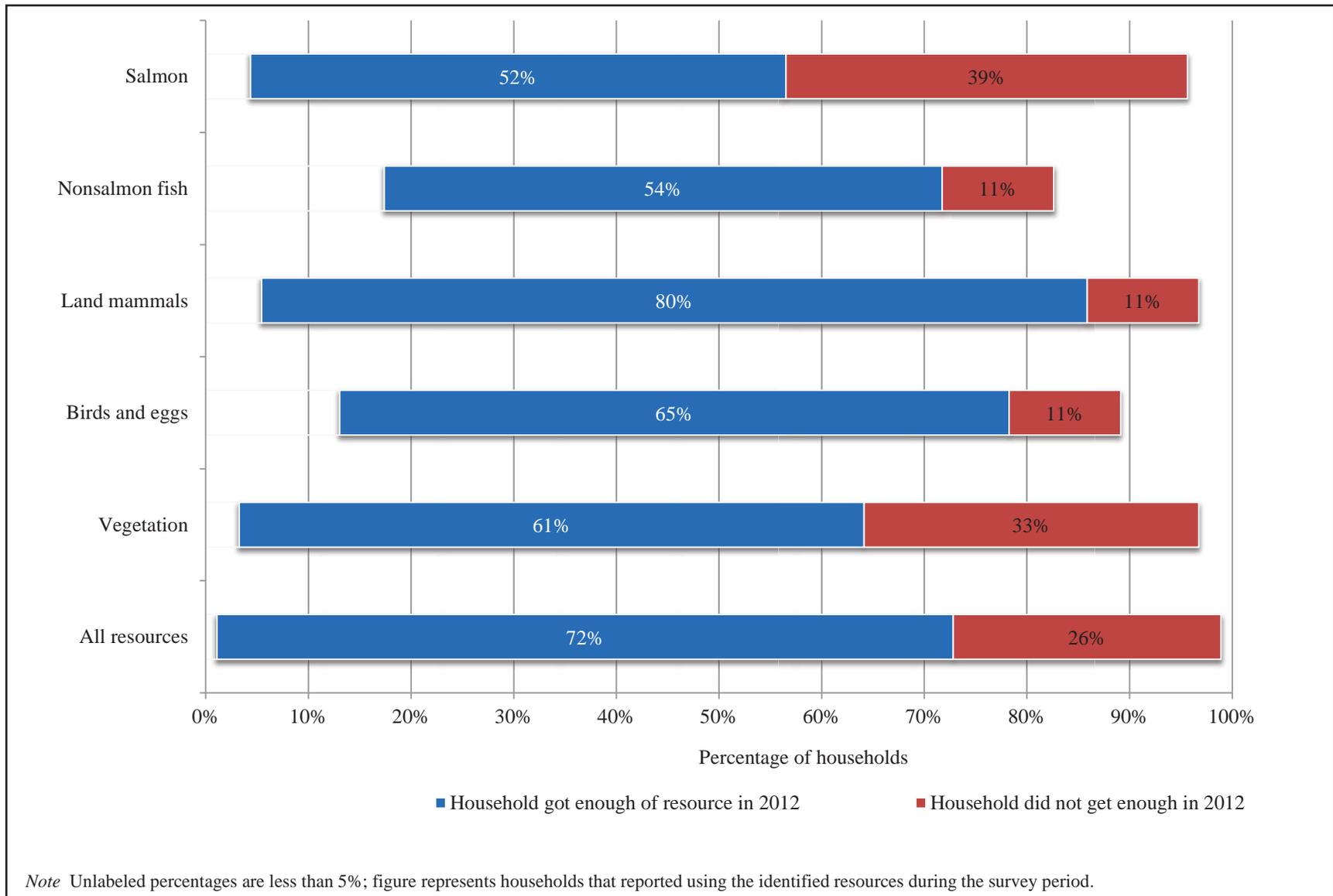


Figure 3-18.— Percentage of household reporting whether they had enough resources, Minto, 2012.

less. Thirty-nine percent of responding households credited a decline in the availability of salmon for their decreased use. Regulations that restricted salmon fishing activity were identified by 21% of the responding households as the primary reason they used less salmon in 2012. The decreased use of salmon by Minto residents contributed to a substantial portion of responses that households did not meet their harvest needs. Only slightly more than one-half of responding households (52%) reported getting enough salmon; 39% of households reported they did not get enough salmon in 2012 (Figure 3-18). Half of the households that reported not getting enough salmon described the impact on their household as major (Appendix Table D3-8). Out of all the resources used by Minto residents, 64% of responding households identified Chinook salmon as the primary resource of which they needed more (Appendix Table D3-9).

Land mammals had the highest percentage of households that said that their needs were met; 80% of responding households got enough land mammals (Figure 3-18). In 2012, 50% of the 6 households that responded that they did not get enough land mammals indicated it caused a severe impact; this was the highest percentage reporting a severe impact of any resource category (Appendix Table D3-8). A higher percentage of households (63%) used the same amount of land mammals when compared to recent years (Figure 3-17); this was more than any other resource category, suggesting that the use of land mammals has fluctuated less in recent years than for other resource categories. Only 9% of households reported using less land mammals than compared to recent years.

The birds and eggs category showed the highest increase in use (13%) (Figure 3-17). Overall, very few households reported using more of any resource category (less than 10% in all other resource categories). Appendix Table D3-10 reports the reasons respondents gave when they reported a change of more use of wild resources.

Appendix Table D3-8 depicts responses to the question asking how severe the impact was to the household when not enough resources were harvested. Responding households assessed the impacts of not getting enough of a certain type of resource as being not noticeable, minor, major, or severe. Households that reported not getting enough land mammals or salmon experienced more severe impacts from not getting enough than households that did not get enough of other resource categories. Overall, minor impacts were reported by 25% of households that did not get enough wild resources. Appendix Table D3-11 shows some of the factors responding households identified as limitations to getting enough wild foods. Some common factors include resource unavailability and a low harvest effort.

## Food Security

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

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

Core questions and responses from Minto residents are summarized in Figure 3-19. Food security results for surveys for Minto, the state of Alaska, and the United States are summarized in Figure 3-20. The percentages of Minto households in each food security category were very similar to the percentages of households in the United States and throughout Alaska. In 2012, 85% of Minto households had high or marginal food security; USDA considers households in both categories to be "food secure." Of the remaining households, 9% had low food security, while 7% fell into the very low food security category. The percentage of food secure households in Minto is the nearly the same as the 2012 estimates for the United States (86%) and only 3% lower than the state of Alaska estimate in 2012 (88% food secure). Three percent more households in Minto had very low food security compared to those in other parts of the state.

Figure 3-19 shows the food insecure conditions that households reported experiencing during the 12-month study period. Minto residents are able to buy some groceries at a small store in town or can drive the 126 miles to Fairbanks to go shopping. Twenty-five percent of responding households said that they ran out of store-bought food during some point in the year, while a higher percentage (30%) reported that their subsistence food did not last. Thirteen percent of households reported that once their food, either store-bought or subsistence, ran out, they were unable to get more. Thirty-six

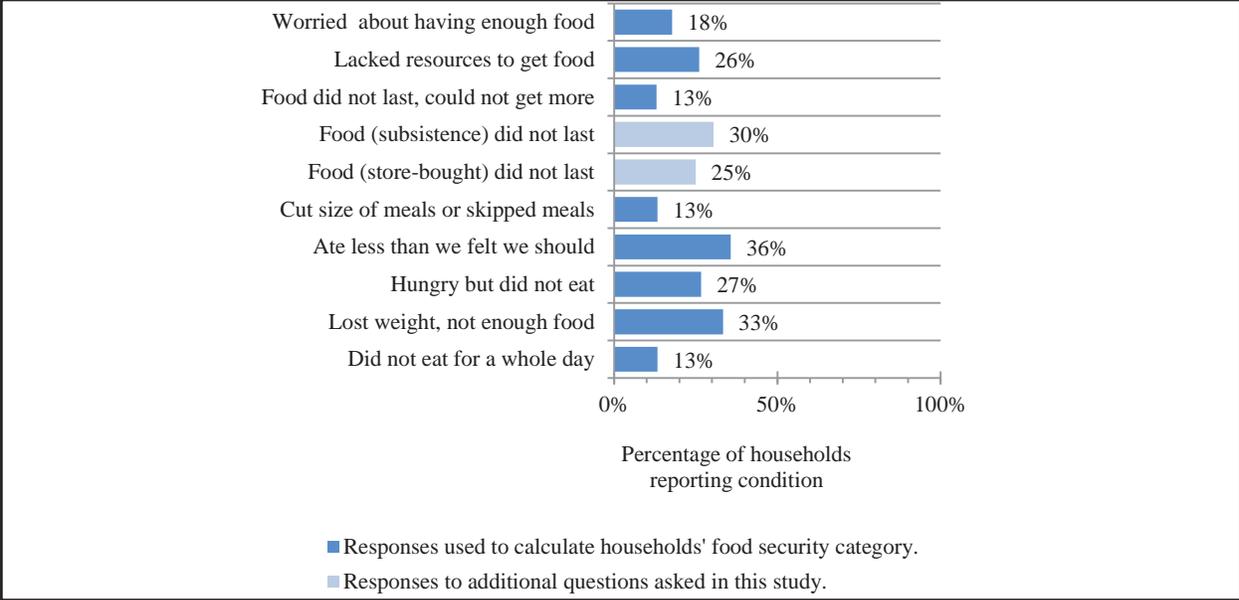


Figure 3-19.— Responses to questions about food insecure conditions, Minto, 2012.

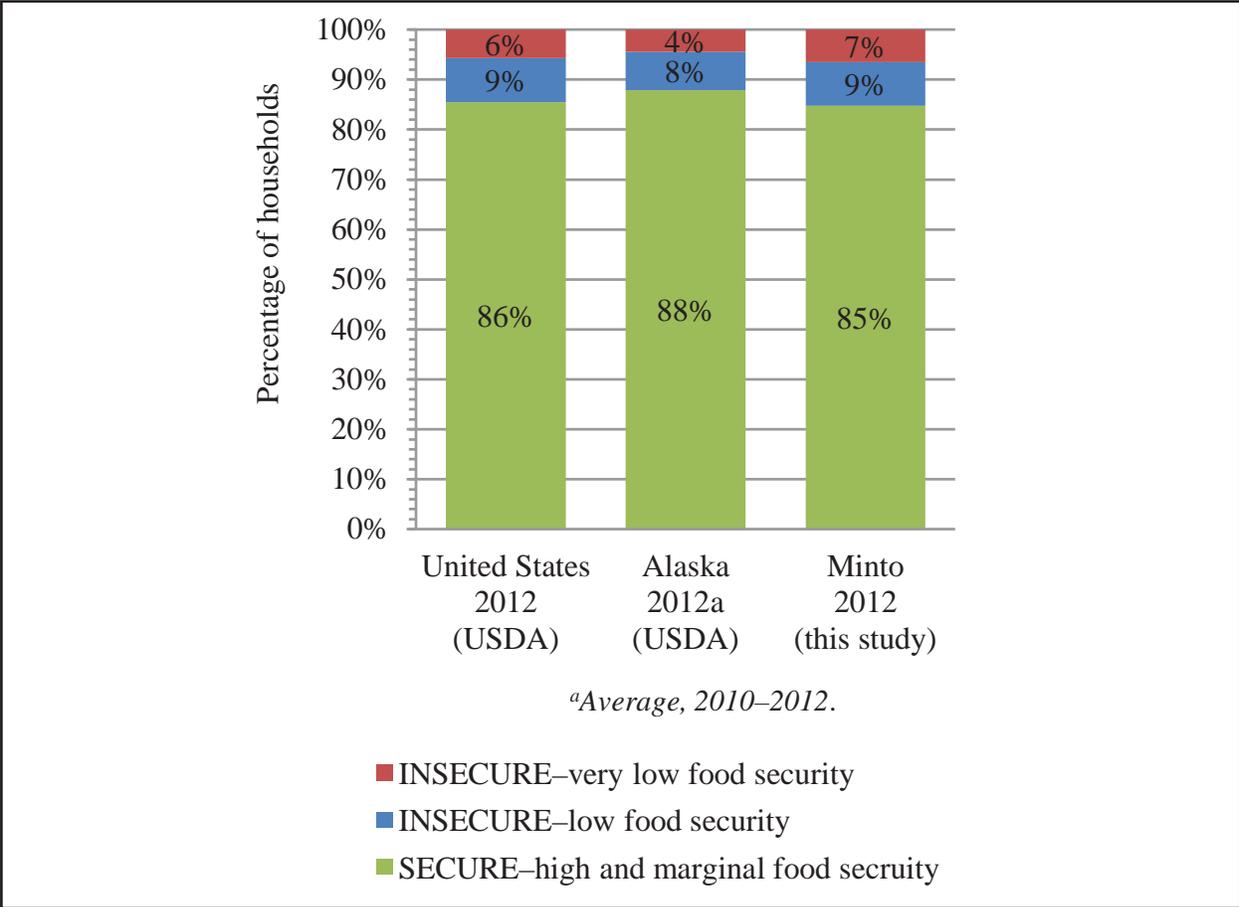


Figure 3-20.— Food security categories, Minto, 2012.

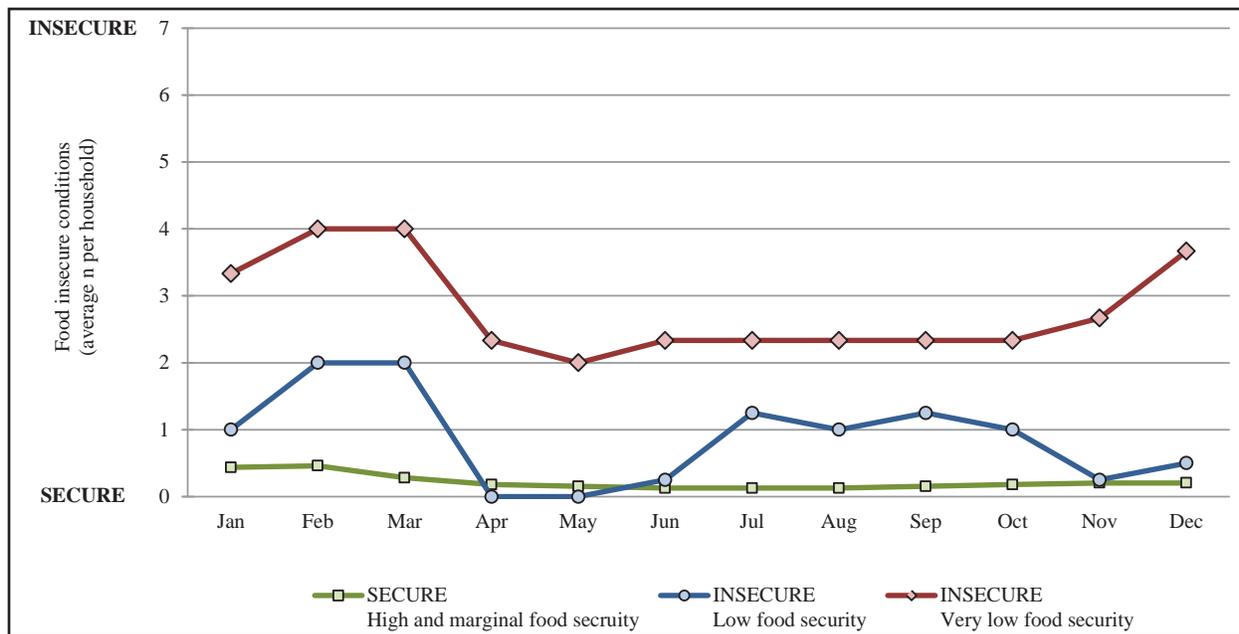


Figure 3-21.— Mean number of food insecure conditions by month and by household security category, Minto, 2012.

percent of households reported that 1 or more adult members in their household ate less than they felt they should because they could not get the foods they needed. Other responses associated with low food security included household members who were hungry but did not eat (27%), household members who lost weight because they did not have enough food (33%), and those who did not eat for a whole day (13%).

Figure 3-21 illustrates the instances of reported food insecurity by season. As discussed previously, subsistence harvests occur year-round based on the seasonal availability of wild resources. The availability of wild resources fluctuates throughout the year and may affect the food security of households participating in subsistence activities from month to month. Households with high and marginal food security (shown in green) remained relatively stable and secure throughout the year. Low food secure households (shown in blue) showed the greatest variation throughout the year. During late winter (February and March), households reported experiencing an average of 2 food insecure conditions. For some households, reserves of food run low in the spring. The arrival of migratory birds and the increased opportunity for fishing likely contribute to a decrease in food insecurity. By April, households with low food security experienced less food insecurity; however, by late summer and fall, these households again reported an average of 1 food insecure condition. Shown in red, households with very low food security have less variability in the number of food insecure conditions they experience than those with low food security (shown in blue) though on

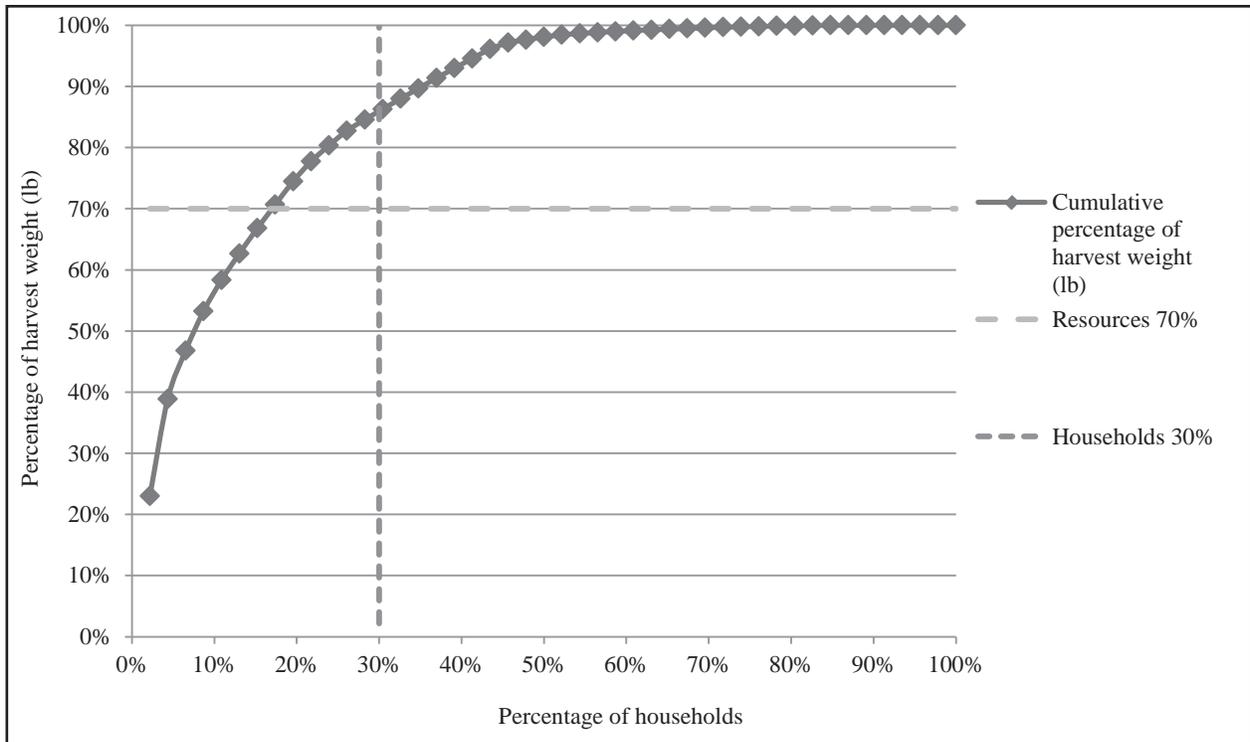


Figure 3-22.— Household specialization, Minto, 2012.

average reported consistently more instances of food insecure conditions throughout the year. All households classified as having very low food security experienced at least 2 food insecure conditions throughout the year. Like households with low food security, these households reported the highest levels of food insecure conditions in the late winter and early spring (February and March). April through October showed no change in insecure conditions.

### Household Specialization in Resource Harvesting

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

As shown in Figure 3-22, in the 2012 study year in Minto, approximately 86% of the harvests of

wild resources as estimated in usable pounds was harvested by 30% of the community's households. The characteristics of these highly productive households will be discussed in the Wild Food Networks section of the chapter.

## **Wild Food Networks**

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

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

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

Figure 3-23 shows the flow of wild foods between surveyed households within Minto and households and communities in other parts of Alaska in 2012. Symbol shapes depict the type of household, colors show the age of heads of household, and size indicates the amount of its subsistence harvest in 2012 by edible weight. Arrows show the direction of food from one household to another, with the weight of lines showing the frequency of exchanges. The position of a household relative to the center of the figure shows how connected it was to other households in Minto. The figure is a partial representation of sharing, trade, and barter in 2012 because it only documents the food flows into the 46 surveyed households.<sup>15</sup>

Previous studies have found a positive association between the ages of household heads and the amount of subsistence foods harvested. Household characteristics associated with higher food

15. It is possible to include data from grey nodes in the network analysis because survey respondents described their connections to these unsurveyed households.

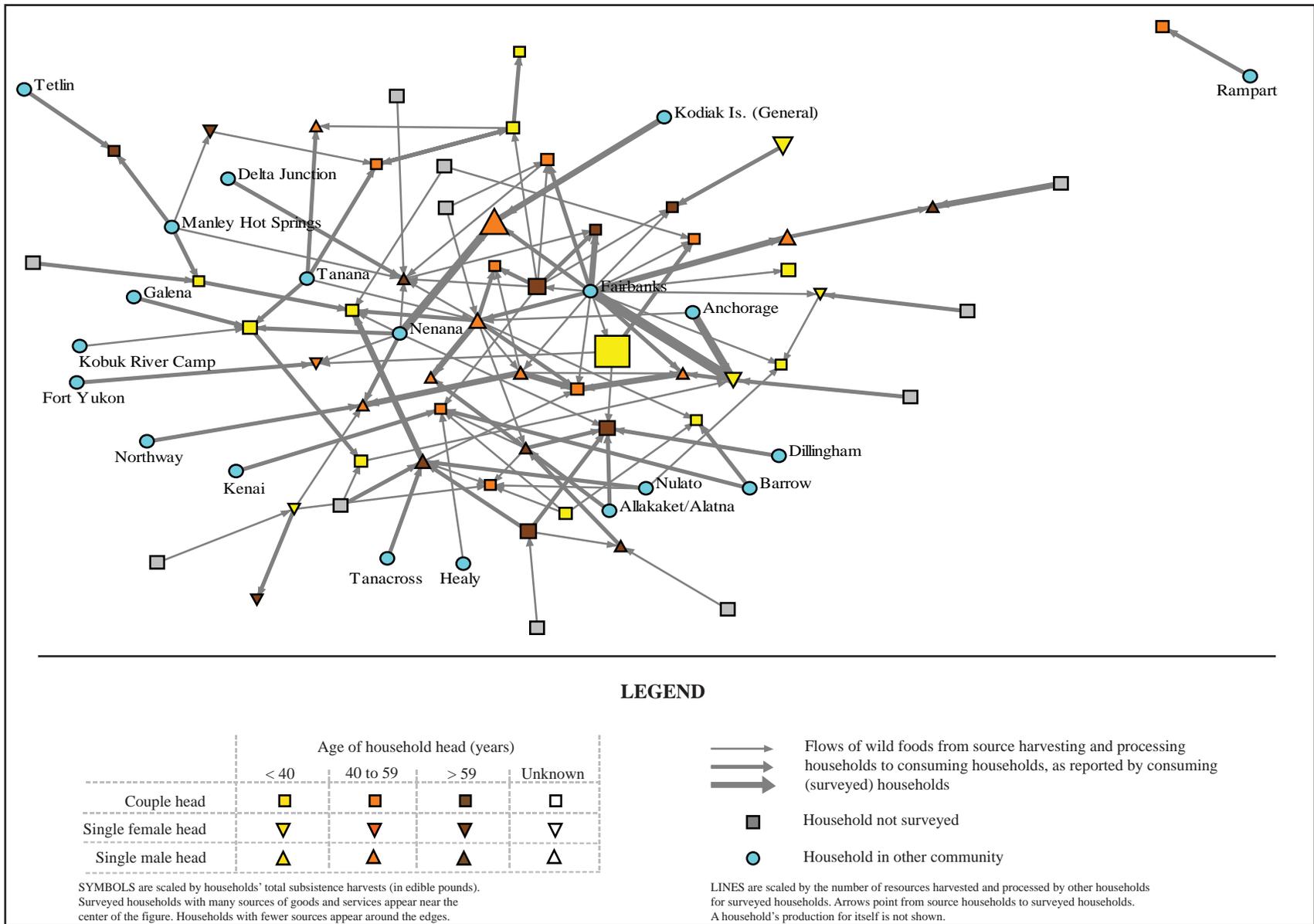


Figure 3-23.— Wild food processing and harvesting network, Minto, 2012.

production include those households with multiple working-age males, involvement with commercial fishing, and higher wage incomes. Characteristics common to lower producing households included female household heads, age of elders, non-Native household heads, and single-person households (Wolfe et al. 2010). Household developmental cycles (i.e., the relative age or “maturity” of household heads and number of productive household members) have also been associated with harvests.

All of the Minto households that appear on the network graph have at least 1 food distribution connection with another household, either in the community or elsewhere in Alaska. Twenty communities from different regions of the state appear on Minto’s network diagram. Minto households reported receiving food from the neighboring communities of Manley Hot Springs, Tanana, and Nenana; the Yukon River communities of Nulato, Galena, Rampart, and Fort Yukon; Barrow on the arctic coast; Dillingham, Kenai, and Kodiak in the coastal southern region of the state; and other communities on the road system including Fairbanks, Anchorage, Northway, Delta Junction, and Healy. The nearby communities of Nenana, Fairbanks, and Tanana appear closer to the center of the figure indicating more instances of resource sharing with these communities than other, more distant ones. Sharing with households in other communities is clearly integrated into Minto’s food distribution profile.

In the direct center of the figure is a small, orange triangle indicating a single male household head between the ages of 40 and 59. This household did not harvest much wild food but did report receiving food from at least 4 other households. Further, despite being a low harvester, 8 households reported receiving food from this household. Its central location suggests that this particular household reported more food flow connections than any other household on the figure. It is possible that this household either gave away most of what they harvested or acted as a “middle man,” redistributing some of the food they were given to other households. Appearing below the large yellow square representing a high-harvesting household is a mid-size brown square representing an elderly couple over the age of 59. This household is a low harvesting household, but reported receiving food from 6 households, which is more than any other. Other low producing households, most having household heads between the ages of 40 and 49, also appear at the center of the figure thus demonstrating that sharing often occurs with those who do not, or cannot, harvest food themselves.

Also near the center are 2 heavy harvesting households. The first, led by a couple under the age of 40, is represented by a large yellow square. Three households of varying demographics reported receiving food from this household. The other high harvesting household, led by a single male between 40 and 59 years old, did not show any outward food flow. Thickly scaled lines from Nenana, Kodiak, and Fairbanks show additional food received from households outside of Minto. While this household appears to receive a lot of food without giving much away, at least 2 factors might provide a greater understanding of this household’s role in a food distribution network. The

network diagram only shows the demographics for the heads of each household rather than for all the occupants in the household. However, the survey does indicate that this household contains other occupants, suggesting more harvest was made for these additional household members. Additionally, not every household in Minto was surveyed, making it possible that this heavy harvester shared with others in the community.

One outlying household, represented by an orange square at the top right of the diagram, reported receiving food from Rampart but did not report any shared foods from other Minto households.

## **Comparing Uses and Harvests in 2012 with Previous Years**

### **HARVEST DATA**

This section discusses the results of the 2012 study in comparison to previously collected data. Historical quantitative information on subsistence harvests in Minto is limited. In 1983 and 1984 the Division of Subsistence administered a comprehensive study in Minto (Andrews 1988) in order to quantify use and harvest levels of wild resources in the area. Additionally, Andrews (1988) conducted ethnographic interviews with knowledgeable Minto residents to contextualize the harvest and use data.

In addition to Andrews' (1988) comprehensive report, several smaller studies have produced data regarding Minto residents' resource use. In 1996, Betts (1997) collected subsistence harvest and use data in 5 upper Tanana River communities, including Minto, as part of an environmental assessment (EA) to assess possible impacts of the then-proposed Eureka Road to Rampart, Alaska. Betts (1997) provided information on the methods and locations of harvest for primary subsistence resources including salmon, nonsalmon fish, moose, waterfowl, small game, and black and brown bears. Betts did not estimate the harvest quantities of these resources by Minto residents. In 2004, the Division of Subsistence administered a quantitative subsistence survey that estimated the harvest and use of all subsistence resources except birds, vegetation, and salmon; the data are recorded in the CSIS. The Division of Commercial Fisheries has collected subsistence salmon harvest data through a postseason survey in Minto since at least 1980. The Alaska Department of Fish and Game conducted migratory bird surveys in Minto in 2006 and 2010; however, community level data are used only to generate subregional harvest estimates. Estimates are not published for individual communities.

These previous studies differ in methodology, data collection timing, and lengths of study. Additionally, fluctuations in animal populations can contribute to reported changes in the harvests

and uses of wild resources. Overall, however, comparisons of the existing data show that the harvests and uses of wild resources by residents of Minto have dropped substantially in the last 3 decades.

Figure 3-24 shows estimated Minto subsistence salmon harvests between 1980 and 2012, with 2012 data coming from this study. The ADF&G Division of Commercial Fisheries provided the salmon harvest estimates shown in Figure 3-24 for the years prior to 2012. Harvests made by Minto residents each summer are recorded on a subsistence fishing permit and are mailed back to ADF&G in the fall. The methods of estimation used by the Division of Commercial Fisheries differ from those used in this study.

In 2012, the Division of Commercial Fisheries estimated a total Chinook salmon harvest of 99 fish.<sup>16</sup> This study estimated a harvest of 268 Chinook salmon. The difference in sampling methods, mentioned above, may explain the difference in estimated harvest. Both estimates for the Chinook salmon harvest in 2012 are higher than any estimated harvest since 2003 (Figure 3-24). Other species experienced higher harvests in 2012 as well; 716 summer chum salmon (this study) and 64 summer chum<sup>17</sup> was the highest harvest since 2006. However, harvest levels were still significantly lower than the historical averages of the 1980s and 1990s.

Between 1980 and 2000 salmon harvests declined steadily. Summer chum salmon experienced the most dramatic decline in harvests. In the 1980s, harvests averaged 2,471 salmon; for the 2000s the average harvest dropped to 124 salmon. The decline of summer chum salmon harvests could be attributed to the decline of the summer chum roe commercial fishery in the 1990s. The harvest of fall chum salmon experienced similar declines by dropping from an average 3,580 fish in the 1980s to 205 fish in the 2000s. In the past 10 years harvests have continued to decline with harvests falling to record low numbers. In years when management conservation measures decreased available fishing time, salmon harvests by Minto residents fell to almost 0. In 2000, for example—the first year with restrictions on summer season salmon fishing—no harvest of Chinook salmon or fall chum salmon was reported by Minto households. Only 3 summer chum salmon and coho salmon were harvested that year. Similarly, in 2009 when the U.S. Secretary of Commerce declared Chinook salmon fishing on the Yukon River a disaster, ADF&G instituted complete fishing closures on pulses of Chinook salmon, and with the exception of 1 summer chum salmon, salmon harvest fell to 0 for all species.

In addition to declines in harvest, participation has also decreased. In 1983, Andrews (1988) estimated that 35 out of 45 (78%) Minto households fished for salmon. In 2012, an estimated 30% of households attempted to harvest salmon. Explanations for the decline in harvest participation vary. Key respondents identified a decline in dog teams, increased fishing restrictions, poor returns of salmon, and the high cost of gas as reasons for reduced fishing effort.

16. Deena Jallen, ADF&G Yukon Area commercial fisheries biologist, Fairbanks, June 2014, personal communication.

17. Deena Jallen, ADF&G Yukon Area commercial fisheries biologist, Fairbanks, June 2014, personal communication.

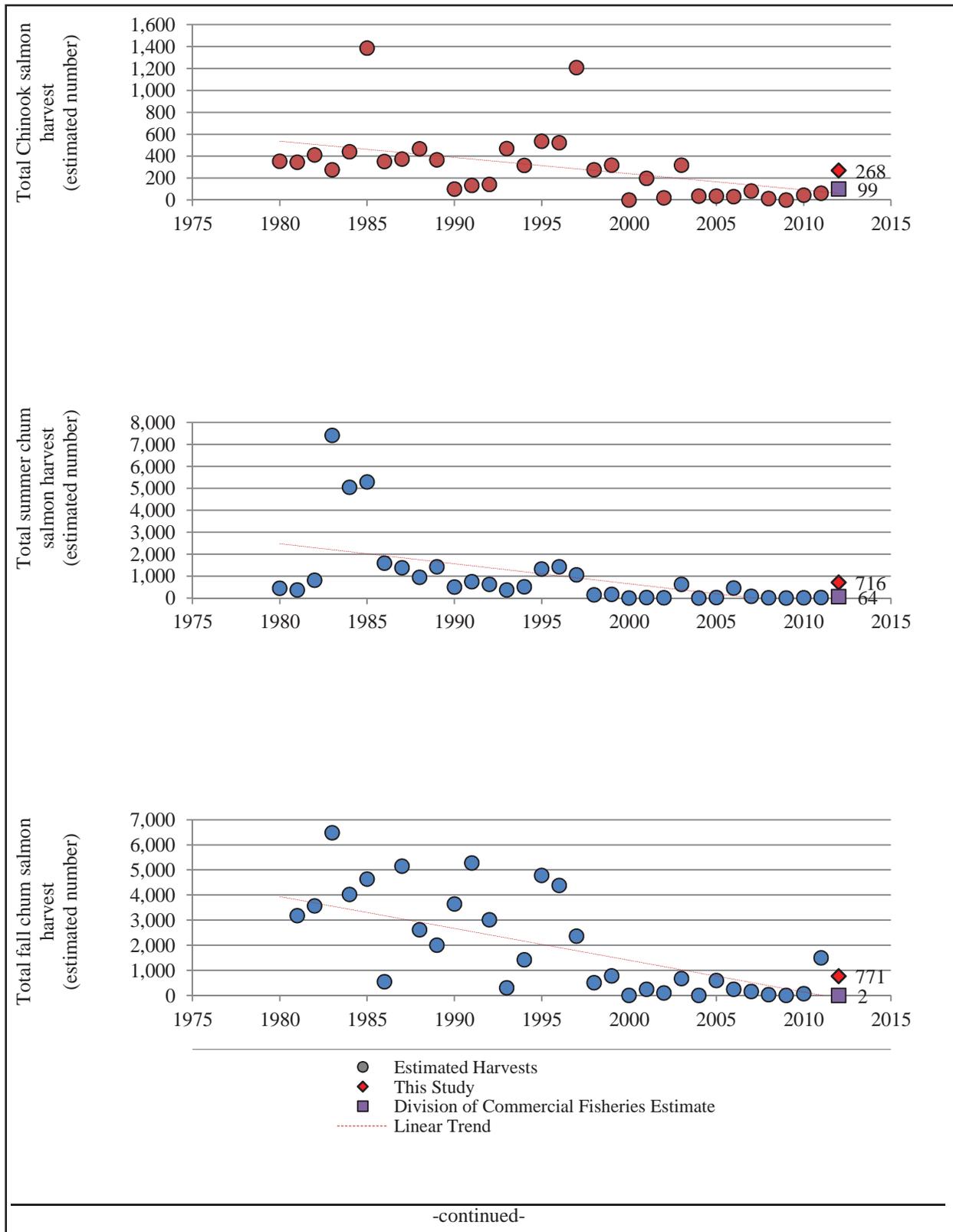
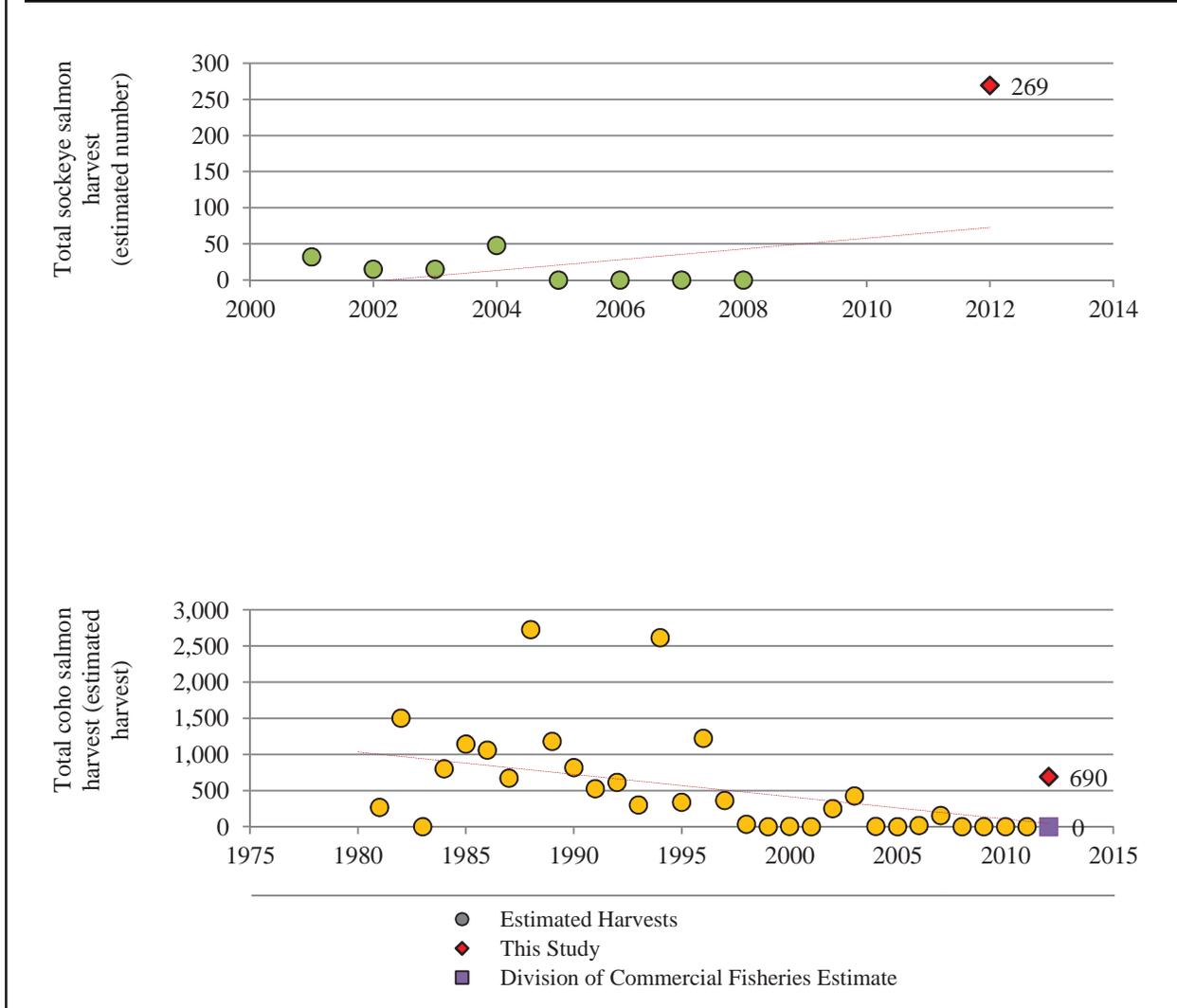


Figure 3-24.— Estimated total number of Chinook salmon, chum salmon, sockeye salmon, and coho salmon harvested, Minto, 1980–2012.

Figure 3-24.—Page 2 of 2.



Nonsalmon fish data (collected by ADF&G for 1984, 2004–2005, and 2012) demonstrate heavy harvest and use of northern pike and whitefish species (Andrews 1988). Andrews reported that northern pike accounted for a substantial percentage of the freshwater fish used by Minto residents (Andrews 1988:130). The quantity of northern pike harvested has fluctuated over time, but the harvest as a percentage of the total nonsalmon fish harvest has remained relatively stable. In 1984, Minto residents harvested 18,018 edible pounds of northern pike (101 lb per capita), constituting 45% of the total nonsalmon species harvested by weight (Andrews 1988:145). By 2004, northern pike remained a primary nonsalmon species but the estimated harvest decreased substantially. In 2004, residents harvested 974 edible pounds of northern pike (5 lb per capita), representing 46% of the total nonsalmon fish harvest (CSIS). In 2004, 45% of Minto households used northern pike. During the 2012 study year, the harvest of northern pike (1,528 lb, or 9 lb per capita) remained lower

than the estimates from Andrews' 1984 study when a total of 18,018 lb (128 lb per capita) were harvested. As a percentage of the total nonsalmon fish harvest, however, northern pike remained consistent with prior study years. In 2012, northern pike made up 42% of nonsalmon fish harvest.

In addition to northern pike, the 3 studies estimated the use and harvest of whitefish species (CSIS). Andrews (1988:143) noted that the common use of whitefishes is evident in Minto because nearly all fishing households (31 out of 33) harvested whitefishes. In 1984, Minto households harvested an estimated 14,755 edible pounds (82 lb per capita). Twenty years later, in 2004, 20% of community households harvested 616 lb (3 lb per capita)—a significant decrease (CSIS). By 2012, whitefishes harvests rose to 1,978 edible pounds (11 lb per capita), harvested by 30% of households (sheefish accounted for 613 lb of the total whitefishes harvest).

Figure 3-25 shows the estimated land mammal harvests in the 3 study years since 1984. In the 28 years between the 1984 and 2012 study years, the estimated number of black bears harvested by Minto residents fell from 16 to 4. Moose, the only other large land mammal represented in Figure 3-25, fluctuated with an increasing trend line. For the survey period of July 1983–June 1984, out of the 84% of households attempting harvest, 47% of Minto households successfully harvested 19 moose, resulting in approximately 53 edible pounds of moose harvested per capita (Andrews 1988:172). For 2004, Minto households harvested 42 moose in Minto Flats, contributing 27,090 lb (129 lb per capita) to the total community harvest (CSIS). In 2012, an estimated 33 moose were harvested by Minto households, contributing 14,919 lb (245 lb per household, or 85 lb per capita) to the total community harvest. Ethnographic respondents discussed a relative abundance of moose in Minto Flats compared to prior years. The higher availability of moose could explain the increased harvest in the 2012 study year. In each of the 3 studies, Minto residents reported harvesting moose for ceremonial purposes. Andrews (1988:182) recorded that in 1984 harvested moose were immediately redistributed to all hunters who contributed to the successful harvest and elders within the community. Harvested moose are often donated to the community for “ceremonial occasions, both religious and non-religious” (Andrews 1988:183). The most coveted portions of a moose, including the ribs, head, brisket, and backbone are referred together as “potlatch meat” and are saved for communal events. From April 2004 to March 2005, Minto residents harvested 7 moose for ceremonial purposes (17% of the total harvest), which notes the significance of moose harvests for community gatherings (CSIS). During this study, ethnographic respondents also emphasized the importance of saving meat for community events such as memorial potlatches. Survey participants considered their ability to contribute to memorial potlatches when evaluating whether they got enough moose for the year. Generally speaking, regardless of the quantity harvested, the cultural and dietary importance of moose to the Minto people remained consistent between each study.

Over the course of the 3 study years, all small land mammal harvests decreased. Trapping as

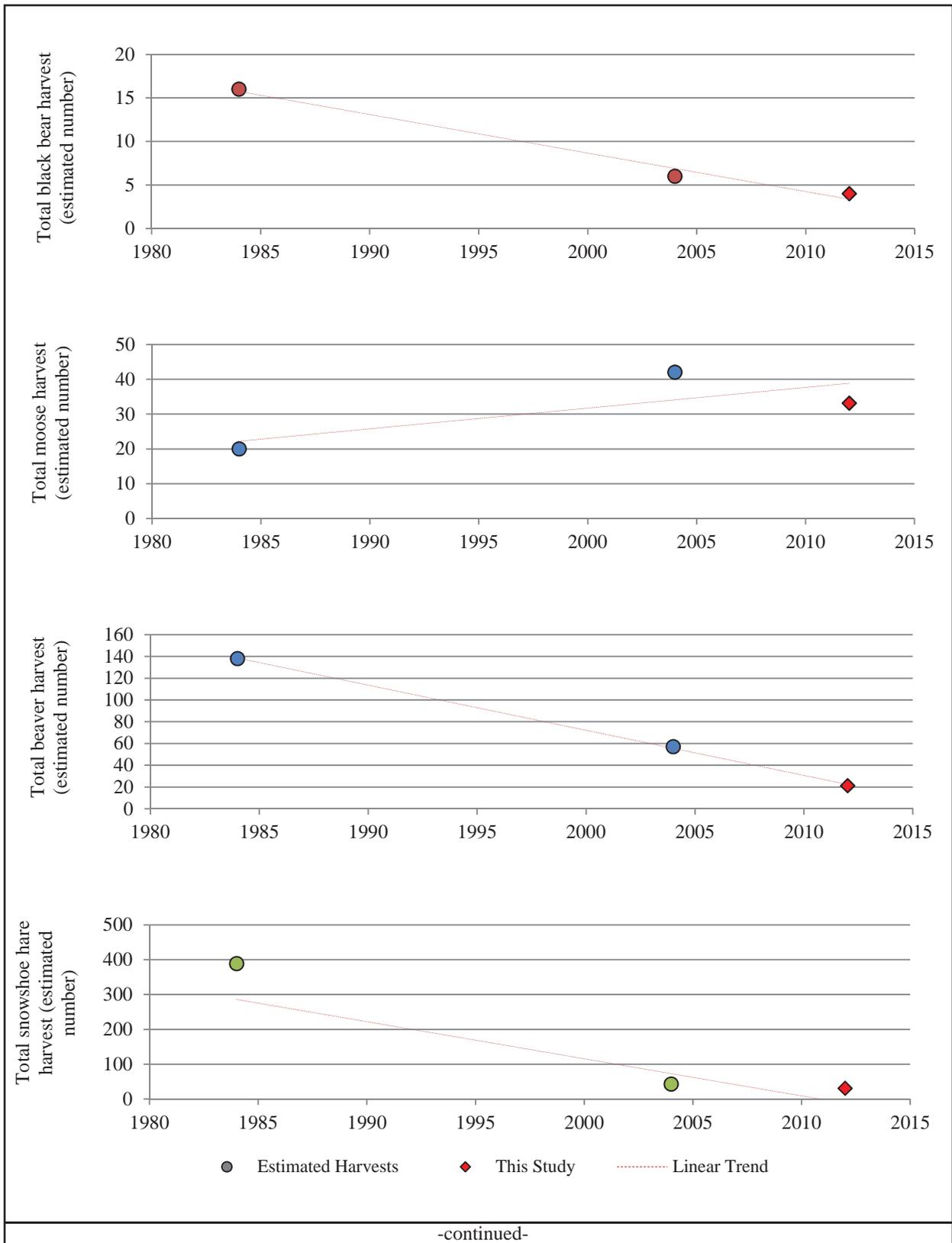
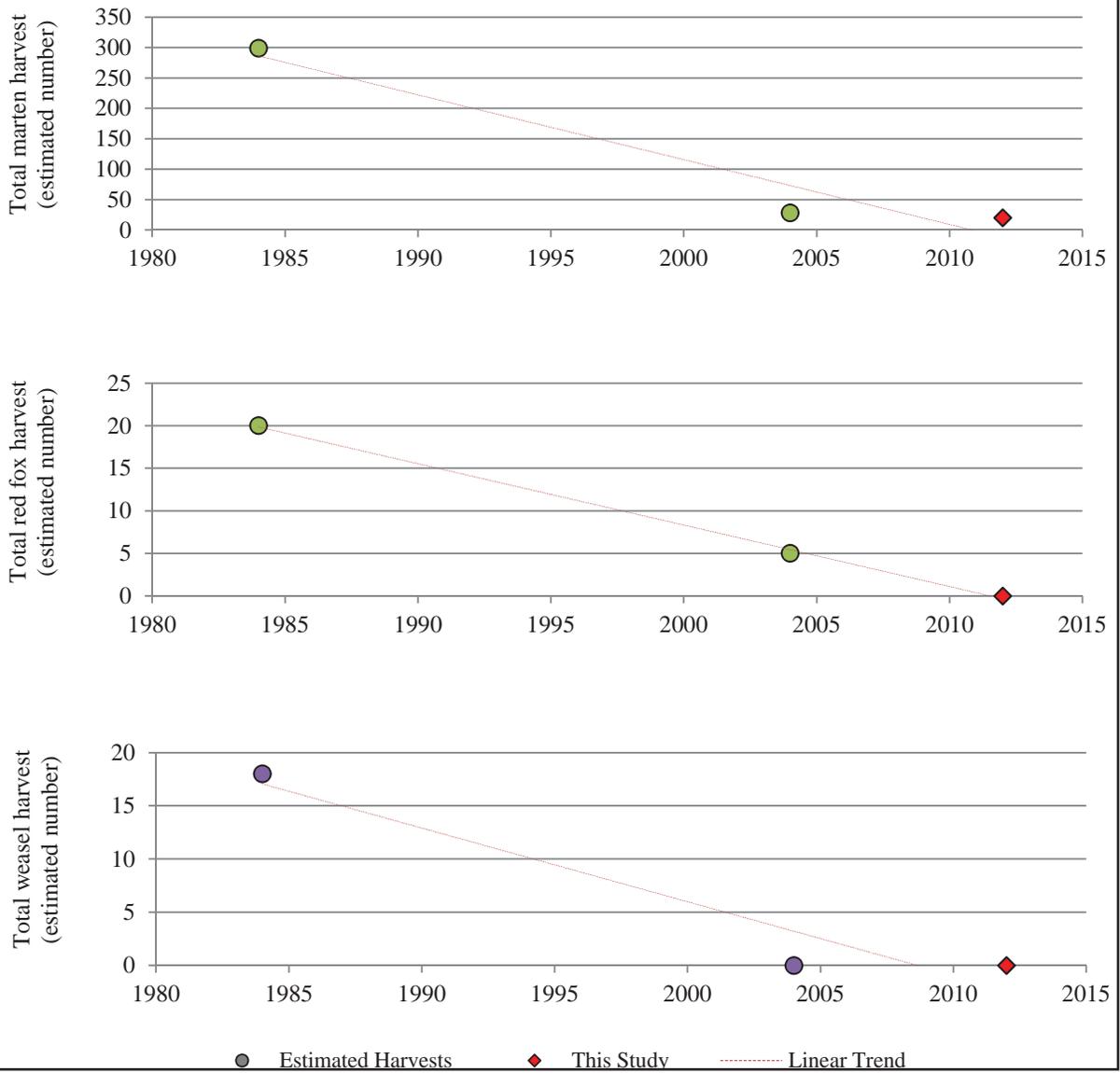


Figure 3-25.— Estimated total number of black bears, moose, beavers, snowshoe hares, martens, red foxes, and weasels harvested, Minto, 1984, 2004, and 2012.

Figure X-X.-Page 2 of 2



a source of income was common in 1984 at the time of Andrews' 1983–1984 study, but by 2012 very few Minto residents harvested furbearing animals, either for sale or personal use. For 1984, Andrews (1988:218) reported that 88% of households had at least 1 member who actively trapped or had a history of trapping. Nearly half (49%) of households had a member who trapped during the 1983–1984 season. After Andrews' (1988) study, trapping activity began to decline. For example, in 1984, 40% of households trapped 569 muskrat. In 2012, only 7% of households harvested 9 muskrats, representing the largest decrease in harvest participation among small land mammals. Key respondents in this study, as discussed above, agreed that the decrease in muskrat hunting is due to a decline in the muskrat population rather than a decline in interest for harvesting the animal. Harvest numbers of beavers, an animal prized for its fur and meat, decreased from 138 in 1984 to 21 in 2012 (Figure 3-25). In 2004, only 3% of households sold the pelts of the beaver they harvested, indicating that trapping as a source of cash was no longer common.<sup>18</sup> The remaining small land mammals, including hares, martens, foxes (*nogeddha*), weasels (*choghozrena*), and mink (*tats'udza*), all experienced cyclical population fluctuations that affect the abundance and availability of each species from year to year. With only 3 data points, it is difficult to identify how much these natural fluctuations are related to declining harvests. However, the general decline in harvests of all furbearing animals possibly suggests that broader changes in trapping effort or changes in the long-term status of certain populations explain why harvest has continued to drop during nearly 3 decades.

Comparing bird harvests in 2012 to prior years is more difficult than other resource categories because there are fewer data points. Data from the 1983–1984 and 2012 comprehensive surveys offer points of comparisons for both migratory and resident bird species. Andrews (1988:191) noted that, in 1983–1984, nearly all Minto households participated in waterfowl hunting, both as a primary activity in the spring and fall, and as a secondary activity during the course of other subsistence hunting or gathering activities, such as spring muskrat hunting or fall berry picking. In 1983–1984, 82% of households participated in waterfowl hunting. During Andrews' study year, hunting demographic information was collected. In 1983–1984, bird hunting was a male-dominated activity; every household that had a male between the ages of 15 and 59 participated in waterfowl hunting. Typically, fathers and sons, grandfathers and grandsons, or pairs of brothers would hunt together. Women rarely participated in bird hunting even if the hunting took place at muskrat or fish camps where women were present (Andrews 1988:191). In total, Minto households harvested 1,255 ducks (9 lb per capita) and 475 geese (0.5 lb per capita) in 1983–1984.<sup>19</sup> No swans were harvested. In the 2012 study, no hunting demographic information was collected but key respondents confirmed

18. Michael Koskey. *Subsistence Resource Use Among Ten Tanana River Valley Communities, 2004–2005*. Unpublished data. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. NNN: Fairbanks.

19. Andrews (1988) did not estimate the edible weight of the wild foods harvested by Minto residents in 1983–1984. Conversion factors from this study were used to estimate the pounds per capita values for the ducks and geese reported in Andrews' (1988) report.

that bird hunting often occurred with male family members or close male friends. Overall, in 2012 Minto households harvested fewer ducks and geese (790 and 354, respectively, or 5 lb per capita and 4 lb per capita). Both study years show a higher harvest of ducks than geese, with a limited crane harvest (fewer than 5 in 1983–1984 and only 1 in 2012).

For 2004 harvest and use data for migratory or resident bird species were not collected (CSIS). ADF&G has collected migratory bird data in Minto in 2006 and 2010, as noted above, but community harvests are aggregated at the regional level and isolation of Minto's harvest during those study years is not available (Naves 2010rev., 2012). Minto, along with the communities of Manley Hot Springs, Nenana, Healy Lake, Dot Lake, Dry Creek, Tanacross, Tetlin, Northway, and Eagle, is part of the Tanana Villages subregion (Interior Alaska region). The Tanana Villages subregion accounts for about one-half of the total migratory bird harvest in the Interior area region. Minto contained 10% of the households in the subregion, but the percentage of the harvest for which Minto residents are responsible is not available.

The use and harvest of vegetation, including plants and berries, documented in this study are consistent with the practices recorded in the early 1980s. Andrews (1988) collected extensive ethnographic information for the harvest and use of plants and berries that were important to Minto residents in 1983–1984. With the exception of wild rhubarb, discussed below, Andrews did not report harvest data for any other plant or berry and gave no explanation for this omission.<sup>20</sup> Ethnographic testimony from the 1988 report is discussed in this section. The 2012 comprehensive study recorded both the harvest of vegetation and ethnographic information relating to the use of plants and berries. In 1983–1984, Minto residents used and harvested 4 species of berries and 82% of households participated in the harvest. With one exception, the only households that did not go berry picking were ones occupied by single men who were not related to other households and who had no transportation (i.e., boats, ATVs, etc.) (Andrews 1988:246). In 1983–1984, 155 gallons of blueberries, a favored berry among Minto residents, were harvested by 80% of households. A total of 112 gallons of lowbush cranberries and 31 gallons of highbush cranberries also were harvested. In 2012, blueberries were still the primary berry harvested (Table 3-10). Seventy-six percent of households harvested 231 gallons of blueberries. Lowbush and highbush cranberries followed with 104 and 34 gallons harvested, respectively. Andrews (1988) documented similar uses of berries as those of the 2012 study. In 1983–1984, Minto residents reported storing berries by freezing them for later use, or making jams and jellies (Andrews 1988:246). Berries are sometimes added

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20. While it is unclear as to why the Andrews (1988) report lacks comprehensive data and ethnographic discussion about harvests and uses of vegetation, it is likely that berries and other plants harvested for subsistence uses were not included in the earlier research due to the fact that these resources are not managed by the Alaska Department of Fish and Game and are not subject to the subsistence priority statute under state law (James Simon, ADF&G Division of Subsistence Northern Region Program Manager, ADF&G, Fairbanks, April 2014, personal communication).

to vegetable shortening (Crisco) and sugar to make “Indian ice cream.” In 2012, Minto residents reported similar preservation and preparation methods.

In 1983–1984, 38% of Minto residents harvested wild rhubarb; no quantitative harvest data of any other edible wild plants were included in Andrews (1988). Spruce, willow, and birch woods were harvested for non-edible uses, such as fuel, construction materials, and basket making. Andrews (1988) recorded that birch bark is often used as a clean, non-slip cutting surface for freshly harvested fish. Additionally, moose, out of respect for the animal, because birch is a plant that moose often feed upon. Residents believed that the use of birch, a favored plant by moose, honors the animal more than other type of wood might (Andrews 1988:258). Key respondents in this study discussed at length the importance of birch bark in basket making and beaver baiting, but did not mention its use during moose hunting.

Comparing harvest fluctuations across time requires some understanding of local culture, changes in lifestyles, natural animal population cycles, changes in demographics, the health of species, and management regulations. In Minto, a variety of factors, such as changing resource availability, personal preferences, decreased trapping activity and a fewer number of elders, contribute to a harvest and use profile that differs from the one presented in Andrews’ 1983–1984 comprehensive study. Despite the overall declines in wild food harvests in the past 30 years, results in the “Wild Food Networks” section demonstrate that the community of Minto still actively distributes food to those who did not harvest resources themselves. Sharing plays a vital role in mitigating the difference between low harvest numbers and a household’s ability to “get enough.” Consequently, the use of subsistence resources remains high, the importance of wild foods remains significant, and the communal nature of the subsistence way of life continues to be substantial.

## **CURRENT AND HISTORICAL HARVEST AREAS**

In an ADF&G report, Andrews (1988) documented Minto people’s historical harvest areas for 3 resources and 4 resource categories between 1960 and 1984. After mapping geographic use areas with a sample of key respondents from 25% of Minto households at the time, Andrews (1988) reported a total use area of 2,400 square miles during the prior 24 years. Mapped harvest data for each resource category in this report have either decreased or remained the same since Andrews’ study; however, the total use area documented in 2012 decreased to 491 square miles. This section will compare the available mapped harvest areas for salmon and large land mammals, which are the 2 most heavily used and harvested resource categories in this study.

Salmon harvest areas did not change substantially between the 2 study years. Andrews’ (1988) salmon harvest map is shown in Figure 3-26. Between 1960 and 1984, Minto residents fished for

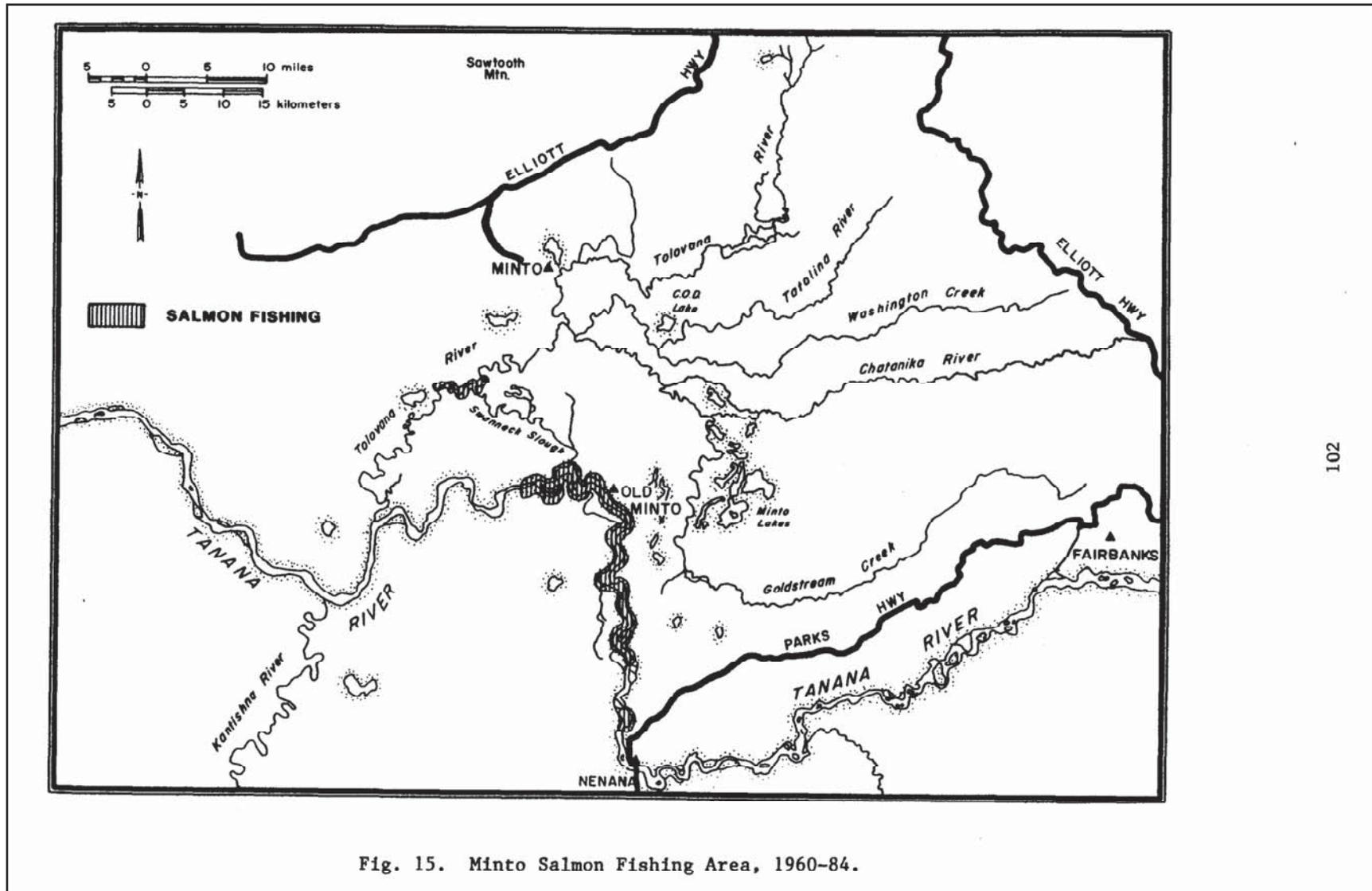


Figure 3-26.— Historical harvest map from Andrews (1988) showing salmon fishing areas, Minto, 1960–1984..

salmon from the mouth of Swanneck Slough to Nenana and on a small portion of the Tolovana River near Swanneck Slough. In 2012, the same areas were used. In the 1960–1984 map, the salmon harvest area appears as an unbroken polygon along the Tanana River. On the 2012 map, only a few specific setnet or fish wheel locations are documented in the same area. Andrews' (1988) report also collected the locations of specific historic and contemporary fish camps. Fourteen fish camps were recorded during the summer of 1984; most of the camps were located on the Tanana River, "40 to 60 river miles" away from Minto (Andrews 1988:111). As noted by key respondents, because of the high price of fuel, it has become very costly to travel this distance. In 2012, rather than mapping fish camp locations, researchers collected the locations of salmon fishing gear such as setnets or fish wheels. Consequently, it is impossible to make comparisons between the number of active fish camps today with those in 1984. However, the declines in salmon harvest since the 1980s, and the accounts from key respondents discussed above, suggests that the number of Minto families that fish for salmon, either from a camp or from the community, has declined since 1984. While narrower in extent, the areas that Minto residents use for salmon fishing still fall within the areas documented in Andrews' study.

In Andrews' 1983–1984 study, and in this study, large land mammals had high use and harvest rates by Minto residents. Figure 3-27 shows moose hunting areas between 1960 and 1984. With the exception of the Kantishna River, the harvest areas documented in 2012 are nearly identical. Minto residents still heavily use the Tanana River, Goldstream Creek, and the numerous other waterways in Minto Flats. Black bear harvest areas have not changed much either. Between 1960 and 1984 Minto residents reported hunting in and around Old Minto (Figure 3-28). In 2012, respondents rarely traveled to Old Minto to hunt or harvest wild resources. In 2012, residents continued to rely heavily on the areas southeast of Minto and also reported using a portion of the Tolovana River near Minto, which is an area unused between 1960 and 1984.

Between 1984 and 2012, the harvest areas for small land mammals declined more than any other resource category.<sup>21</sup> Figure 3-30 and Figure 3-31 show Andrews' (1988) figures depicting selected traplines used by Minto trappers and Minto muskrat hunting areas. Numerous traplines existed throughout the Minto Flats. Washington Creek, Goldstream Creek, and the Tatalina River were all heavily used. In 2012, with the exception of an area near Dugan Hills, small land mammal harvests were confined to a corridor along the Chatanika River and the lakes directly south of Minto. Ethnographic respondents emphasized the heavy harvest of muskrats in Minto Flats during the mid-20th century and the subsequent decline of the furbearing animal. Andrews' (1988) mapped

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21. Andrews' (1988) report produced a small game hunting area map (Figure 3-29) that included the harvest areas of grouse and "rabbits." An additional map titled, "Selected Traplines Used by Minto Trappers, 1960–84," (Figure 3-30) shows the harvest areas for furbearing animals. Andrews' (1988) report also documented muskrat harvest areas in Minto Flats on a map titled, "Minto Muskrat Hunting Areas, 1960–84" (Figure 3-31). The small land mammals map produced in this report consists primarily of furbearing animals and is most comparable to Andrews' (1988) trapping and muskrat maps combined (Figure 3-30; Figure 3-31).



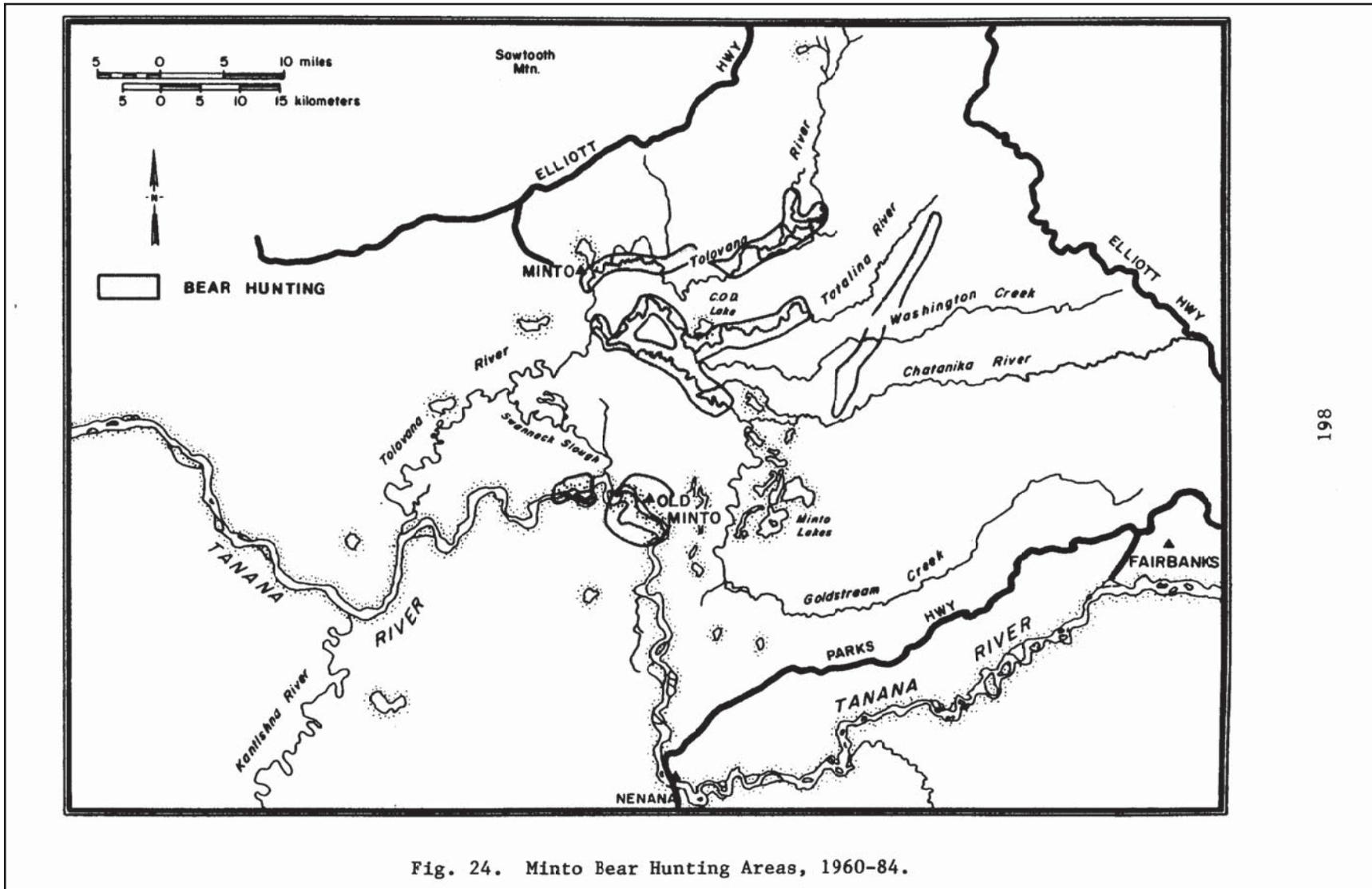


Fig. 24. Minto Bear Hunting Areas, 1960-84.

Figure 3-28.— Historical harvest map from Andrews (1988) showing bear hunting areas, Minto, 1960–1984.

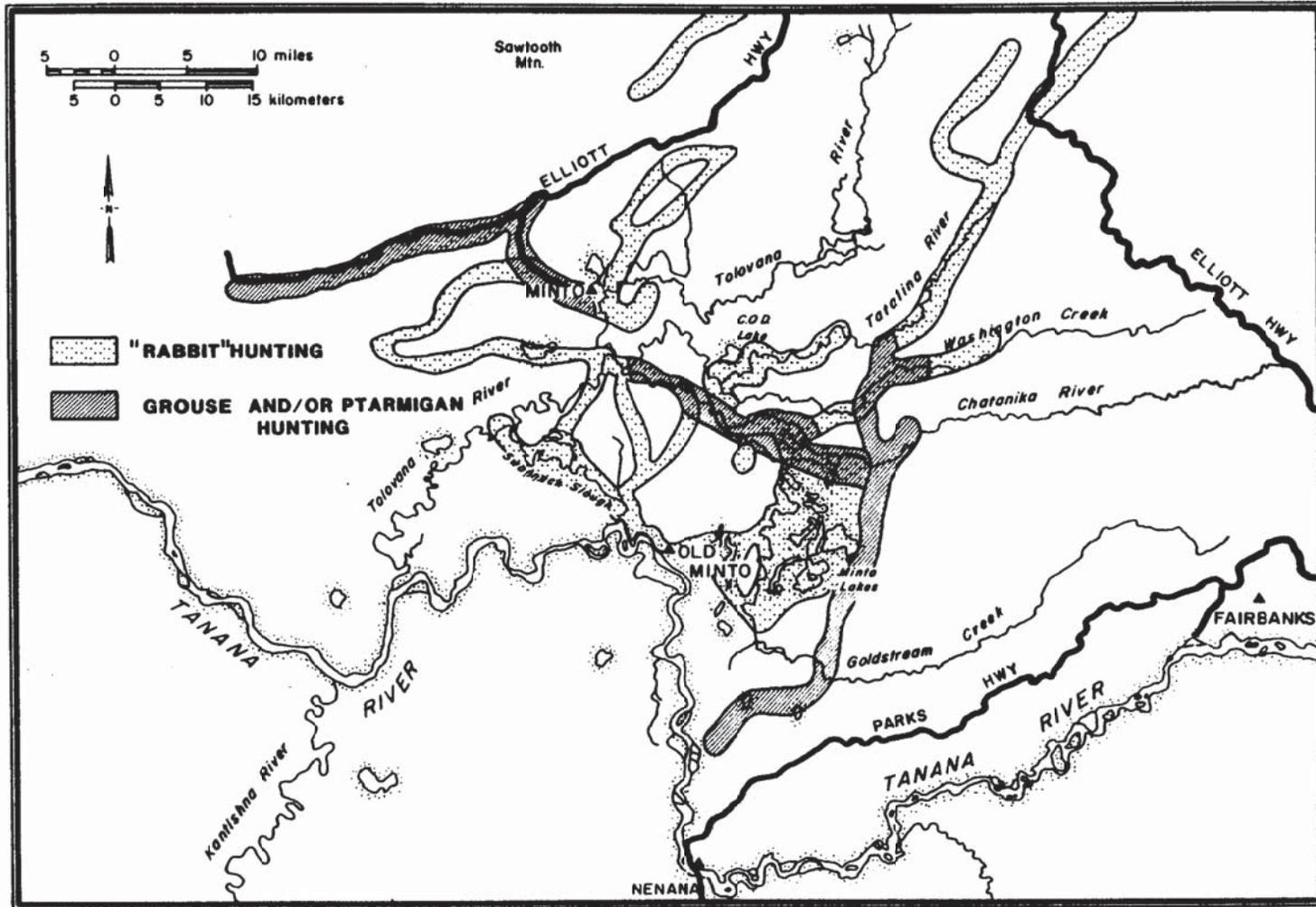


Fig. 25. Minto Small Game Hunting Areas, 1960-84.

Figure 3-29.— Historical harvest map from Andrews (1988) showing small land mammal hunting areas, Minto, 1960–1984.

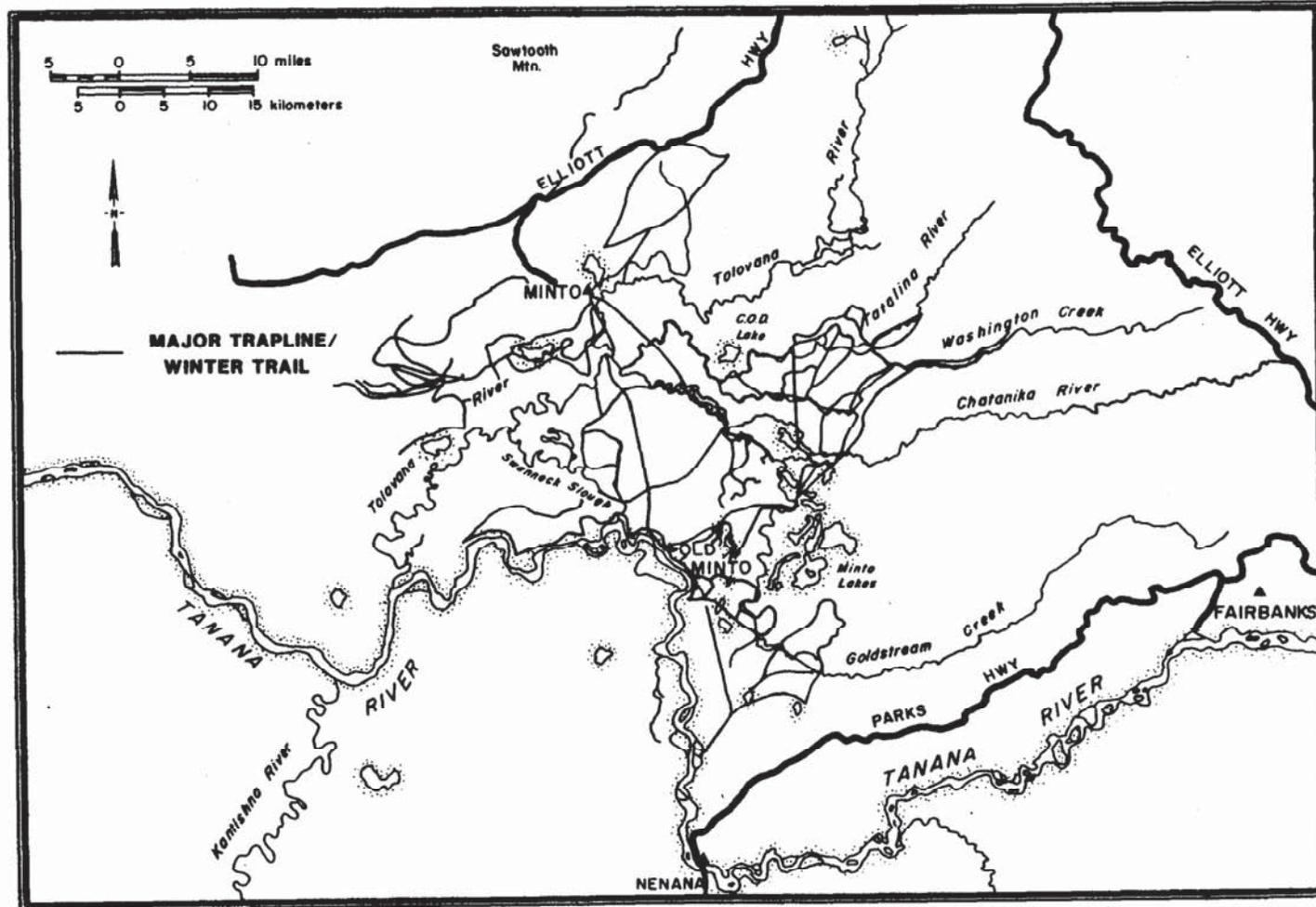


Fig. 26. Selected Traplines Used by Minto Trappers, 1960-84.

Figure 3-30.— Historical harvest map from Andrews (1988) showing selected trapline locations, Minto, 1960–1984.

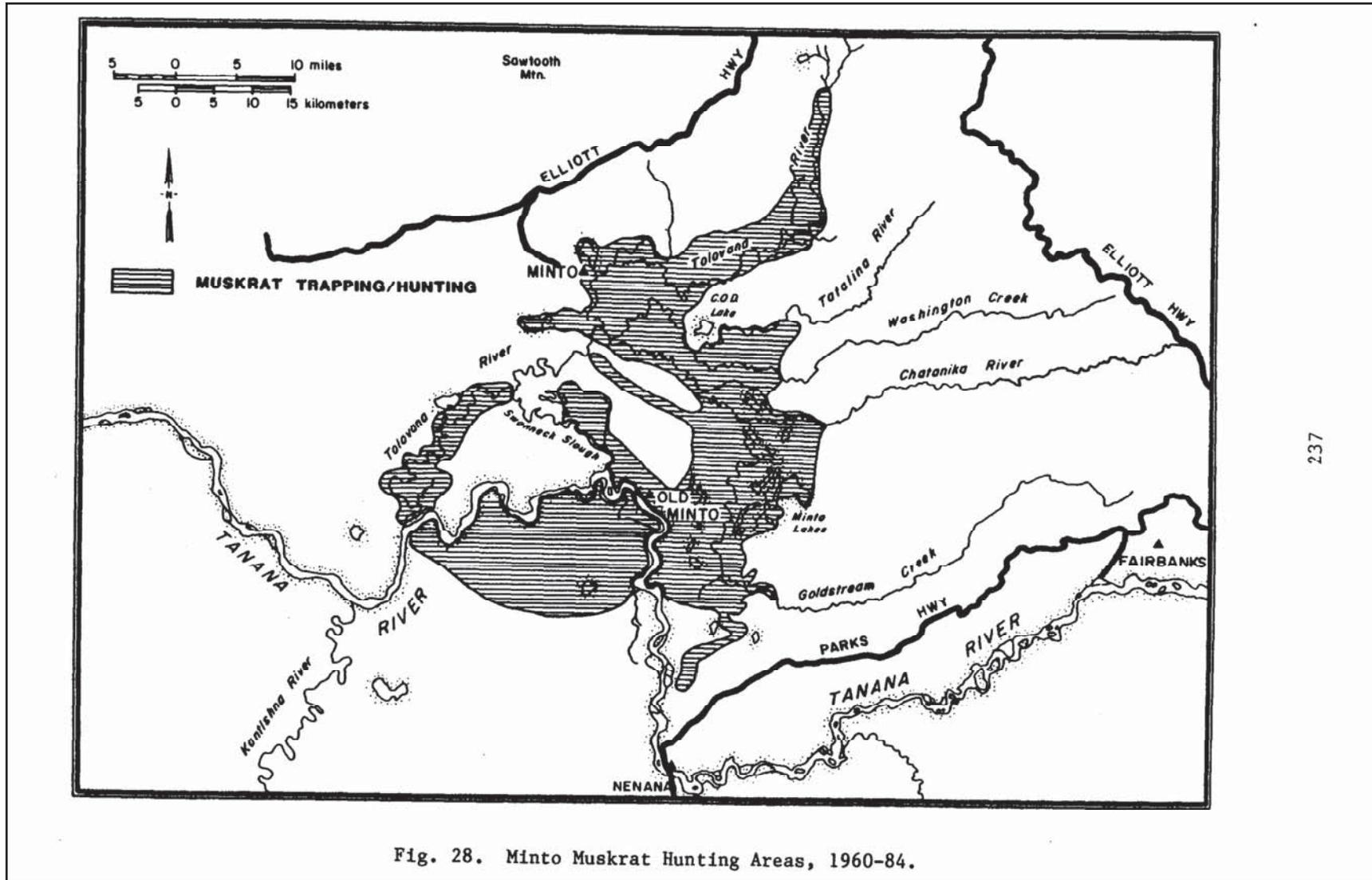


Fig. 28. Minto Muskrat Hunting Areas, 1960-84.

Figure 3-31.— Historical harvest map from Andrews (1988) showing muskrat hunting areas, Minto, 1960–1984.

data confirm these reports. Minto residents utilized a large area south of the Tanana River between 1960 and 1984 to harvest muskrat. With the exception of large land mammals, muskrat harvest areas during Andrew's study period had a larger extent than any other resource category.

Noted above, the total number of square miles used by Minto residents to harvest wild resources has declined significantly in the last 3 decades. Andrews (1988) identified possible factors contributing to the declining harvests and uses of subsistence resources. Possible factors included an increase in the cash economy and use of store-bought food, salmon and moose hunting regulations that limited the harvest opportunities for key resources, and the land use restrictions resulting from the Alaska Native Claims Settlement Act. Ethnographic respondents in this study identified similar factors—including the increased availability of store-bought food, state fishing and hunting regulations, a high cost of gas, decreasing abundance of resources such as Chinook salmon, the 1970 move from Old Minto, and the Vietnam War that drew young men away from the community—as explanations for the lower harvest and use of wild resources. While decreased harvest levels and land use are documented quantitatively in this study, consideration of the ethnographic data in this report is crucial in understanding the historical and contemporary subsistence profile of Minto.

## **Local Comments and Concerns**

The following is a summary of local observations and concerns regarding wild resource populations, fish and wildlife management, and opinions of construction development in the area that were shared in Minto during the household surveys, the key respondent interviews, and a post-survey community review meeting of preliminary data. The summary of these opinions are not necessarily shared by the entire community. However, the issues described here were common, and provide important points of discussion.

Key respondents were asked to give their opinion on the establishment of the Tanana–Tofty road. Respondents did not believe the road would have substantial impacts on their community. Rather, some viewed the road as an opportunity for increased tourism and for local job creation. One household cited a potential for increased trade opportunities with Tanana as a reason to support the road project. Others, however, were concerned that a new road in the area would bring more “sport” hunters to Minto Flats during moose hunting season or negatively impact the land near Tanana and surrounding habitat.

Survey participants made more general comments about the subsistence fishery, wanton waste by “sport” hunters in the area, and the necessity of subsistence harvests. One household expressed concern regarding the Bering Sea commercial fisheries; they stated that without more oversight and

restrictions on salmon bycatch, the Yukon River subsistence salmon fishery is suffering, making it difficult to pass on traditional knowledge to younger generations. Several households described observations of wasted moose meat by non-local hunters. Survey participants believed that ADF&G should monitor “sport” hunting in Minto Flats more closely and that unwanted meat should be donated to elders in Minto rather than being left to rot. Finally, many households emphasized the significance of subsistence resources to the lives of people in Minto. Subsistence harvesting “is not a matter of cost, it is a matter of tradition. I would go crazy with no fish and moose.”

## **Acknowledgements**

The author would like to express gratitude to all the residents of Minto for their interest and participation in the 2012 comprehensive study. During fieldwork in May 2013, Minto residents were generous with their time and hospitable to Division of Subsistence researchers who spent a week in the community, often sharing food and inviting researchers to go fishing. Special thanks goes to the Minto elders who contributed their time and wisdom through participation as key respondents. Their knowledge of the Minto Flats, the history of the Minto people, and the customary and traditional uses of fish and wildlife adds invaluable context for this report. Additionally, the Minto Village Council was critically important to the feasibility and completion of this study. Bessie Titus, the Minto tribal administrator who had endless patience for the author and advice for the research team, deserves recognition for her contributions to this study. Finally, this research would not have been possible without the help of local research assistants who scheduled and administered surveys and shared their knowledge of the community with Division of Subsistence research staff.

# 4. Discussion and Conclusions

*Caroline L. Brown*

## **Overview of Findings for the Study Communities, 2012**

During this survey, the residents of Manley Hot Springs and Minto described long-standing traditions of engaging in a variety of subsistence activities, including harvesting large and small mammals, several species of salmon and nonsalmon fishes, migratory waterfowl, upland game birds, and a variety of edible and medicinal plants. Many expressed that access to subsistence resources is essential to maintaining their cultural heritage and strengthening community ties.

This research intended to describe the contemporary subsistence uses of fish, wildlife, and plant resources by the residents of Manley Hot Springs and Minto in Central Alaska. The principal questions addressed the quantity of wild foods harvested for subsistence and how these foods were distributed within and among communities and between neighbors. The survey also collected data on the lands and waters used for subsistence activities in the area, as well as assessments of harvests, food security, and the impacts of competing uses for subsistence resources. The collection of these harvest data was part of a larger effort to consider the implications of building a road from Tofty, a historical mining site associated with the Hot Springs Mining District, to the community of Tanana. The road would go through areas used by residents of both study communities.

Between January and December 2012, residents of Manley Hot Springs and Minto harvested an estimated total of 92,210 edible pounds of subsistence resources, with an average harvest level of 326 lb per person, which is comparable to other Interior Alaska communities (Fall 2014). This chapter reviews the salient differences of the subsistence profiles of Minto and Manley Hot Springs before moving on to discuss the contemporary regulatory issues surrounding the harvests of salmon and moose—the primary subsistence resources for both communities.

## **Subsistence in the Tanana Flats**

Despite being located relatively close together in the same habitats and accessing a similar resource base, the subsistence harvest profiles of Minto and Manley Hot Springs are quite different. Figure 4-1 shows the 10 fish, wildlife, and plant species that contributed the most to subsistence uses in

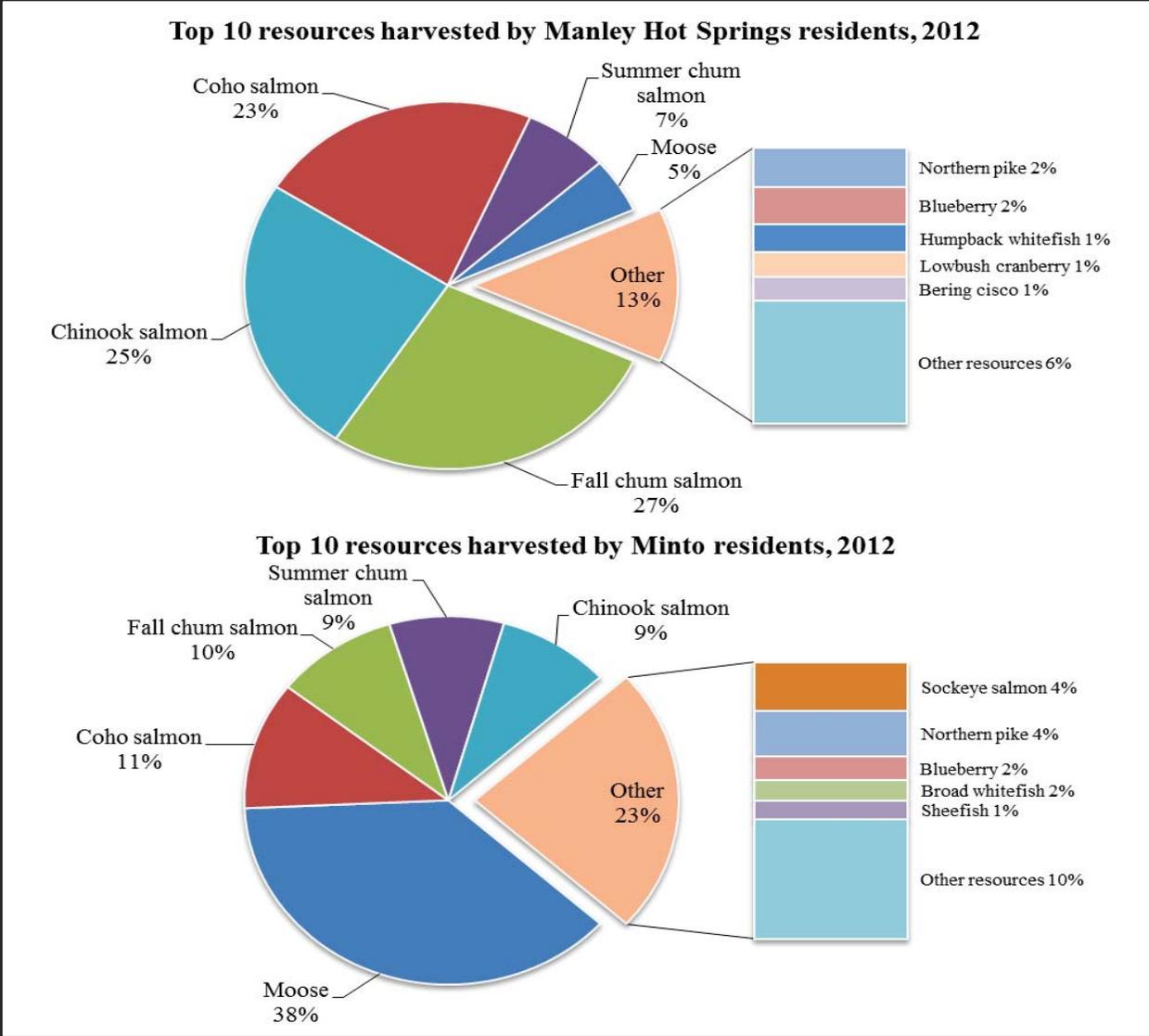


Figure 4-1.— Top 10 species harvested, ranked by estimated edible weight, Manley Hot Springs and Minto, 2012.

Minto and Manley Hot Springs in 2012. The harvest patterns of these 2 communities largely mirror historical patterns of reliance on moose and salmon harvests. However, the biggest differences between the 2 communities can be seen in those salmon and moose harvests. While salmon are clearly important to both communities, as they are to most Yukon River drainage communities, Minto and Manley Hot Springs residents relied on salmon at very different levels in 2012. While salmon accounted for an important 43% (17,075 lb) of Minto’s total subsistence harvest, salmon made up 82% (43,021 lb) of Manley Hot Springs’ total subsistence harvest (Table 2-5; Table 3-6). Manley Hot Springs fishers harvested roughly 2.5 times more salmon than Minto fishers. Further, the composition of the harvest was largely the same: Minto fishers caught about equal percentages of all 3 salmon species available in the vicinity (Chinook salmon–21%, or 3,543 lb; the summer and

fall components of chum salmon—21%, or 3,593 lb and 23%, or 3,867 lb, respectively; and coho salmon—26%, or 4,457 lb), while Manley Hot Springs fishers' harvests also focused on Chinook salmon (30%, or 12,958 lb), fall chum salmon (34%, or 14,443 lb), and coho salmon (28%, or 11,858 lb) in nearly equal percentages. Summer chum salmon harvests were low in both communities likely because of the decreased distribution of summer chum salmon in the upper reaches of the drainage and also possibly because of the fishing restrictions during the summer season to protect Chinook salmon, which also affected fishers' ability to harvest summer chum salmon; this is described in more detail below. The increased harvest levels of salmon by Manley Hot Springs fishers compared to Minto is likely linked to the presence of a few large dog teams in the community and possibly to decreased access to moose, which is described in more detail in the previous chapters discussing community survey results. Not surprisingly, these higher harvests led to a higher per capita harvest rate of all salmon species combined (350 lb in Manley Hot Springs compared to Minto residents' 97 lb). Additionally, Manley Hot Springs is located closer to salmon resources on the Tanana River, while Minto residents have to travel a greater distance to the Tanana River to access more abundant populations of salmon.

While Minto residents harvested less salmon than their Manley Hot Springs neighbors, they harvested much more moose than Manley Hot Springs residents. Moose accounted for 38% (14,919 lb) of Minto's total subsistence harvest, or about the same percentage (43%) as all salmon species combined (Table 3-5). In Manley Hot Springs, however, harvest estimates indicate that moose made up only 5% (2,546 lb) of the annual harvest (Table 2-6). As described earlier, this may be the result of a decline in hunting effort from earlier years after non-shareholders could no longer hunt on corporation lands around the community. While moose appear to remain important to Manley Hot Springs residents, according to ethnographic sources, salmon may be a replacement species for moose if hunters cannot easily access hunting areas. At the same time, Minto is located within the MFMA where there are healthy moose populations and easier access to animals despite a dramatically changing regulatory structure, described below.

## **SUBSISTENCE SALMON FISHING**

Since 1998, depressed Chinook salmon runs have led to severe management restrictions resulting in substantial changes to the subsistence fisheries in the Yukon River. After a fish population crash in 2000, Chinook salmon returns began to slowly increase until 2008, when the return was too low to fulfill adequate escapement goals, Canadian border passage requirements, or to provide for unrestricted subsistence harvests or a directed commercial fishery. In 2010, the BOF reduced the maximum stretched mesh net size to 7.5 in to be implemented in all Alaska waters of the Yukon River drainage in 2011. Prior to this, Yukon Area fishers widely used 8–8.5 in mesh nets to target

Chinook salmon. This change was considered a conservation tool that should allow more of the older and larger Chinook salmon, especially females, to escape to their spawning grounds. In 2011, restrictions to subsistence fishing included first pulse protection (no fishing on the first pulse of Chinook salmon throughout the length of the river to the border), and net size reductions. In 2012, the study year for this research, the arrival of Chinook salmon was delayed due to coastal ice near the river mouths as late as June 20, which delayed salmon from entering the river.<sup>1</sup> The run contained a near record low number of fish, prompting requests for another disaster declaration from Alaska's governor to the U.S. Department of Commerce.<sup>2</sup> The projected low return of Chinook salmon prompted ADF&G fisheries managers to implement a variety of conservation methods that imposed restrictions on allowable fishing time and gear type. The preseason management plan included the continuation of first pulse protection for Chinook salmon; the Tanana River fisheries were managed to meet Chinook salmon escapement goals for the Chena and Salcha rivers. In subdistricts 6A (Manley Hot Springs) and 6B (Minto), including the Old Minto Area, subsistence salmon fishing gear was restricted to fish wheels which had to be equipped with a live chute, the fish wheel had to be attended at all times while in operation, and all Chinook salmon caught had to be returned to the water alive. These restrictions were in effect from July 20 through July 25 (JTC 2013).

The effects of the Chinook salmon declines and associated restrictions are described in an upcoming report by the Division of Subsistence.<sup>3</sup> The Chinook salmon crash is a substantial threat to food security in the Yukon River drainage (Loring and Gerlach 2009). Long-term effects of and adaptive responses to the changes wrought by the recent pattern of Chinook salmon declines are still in process. In 2012, this decline could be seen in the harvest survey results. Minto's harvest history shows a declining trend from the late 1990s, even more dramatic than what is seen on the Yukon River as a whole. The 2012 harvest of Chinook salmon by Minto fishers was lower than any other salmon species from the Yukon River drainage harvested by Minto residents. In fact, nearly 60% of Minto households reported using less salmon than in previous years (Figure 3-17). Despite this lower harvest, a greater percentage of Minto households reported using and sharing Chinook salmon than any other salmon species (Table 3-6). Manley Hot Springs also has a long history of Chinook salmon harvest and use. Manley Hot Springs' harvest estimates are more variable over time, showing a lesser decline since 2000 than seen in Minto. Nonetheless, more than half of Manley Hot Springs households (54%) reported not getting enough salmon (Figure 2-28). Like Minto, however, Manley Hot Springs residents used and shared Chinook salmon at much higher levels than any other salmon species (Table 2-5).

1. Alaska Department of Fish and Game Division of Commercial Fisheries, "2012 Preliminary Yukon River Summer Season Summary," news release, October 1, 2012. <https://www.adfg.alaska.gov/static/applications/dfnewsrelease/229271472.pdf>

2. Gov. Sean Parnell to Acting Secretary of the U.S. Department of Commerce Rebecca Blank, August 16, 2012. Subject: "Re: Federal Fishery Disaster." [http://gov.alaska.gov/parnell\\_media/resources\\_files/081612\\_fishery.pdf](http://gov.alaska.gov/parnell_media/resources_files/081612_fishery.pdf)

3. Brown, Caroline L. et al. *In prep.* "Socioeconomic effects of declining salmon runs on the Yukon River." Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 398, Fairbanks.

## MOOSE HUNTING IN MINTO FLATS

As described in the previous chapters discussing community survey results, moose have played an important role in the annual subsistence harvests of both Minto and Manley Hot Springs residents through time. In 2012, Minto hunters harvested an estimated 33 moose representing 14,919 total pounds, or 85 lb per person, or 95% of the total land mammal harvest and 38% of the total subsistence harvest (Table 3-5). Nearly all Minto households reported using moose (96%). Minto households also reported high levels of sharing moose: an estimated 35% of households gave moose away to others and 72% of households reported receiving moose. Manley Hot Springs hunters harvested fewer moose—an estimated 6 moose representing 2,546 total pounds, or 21 lb per person, or 93% of the total land mammal harvest, though only 5% of the total subsistence harvest—for reasons described earlier. Despite low harvests, 68% of households used moose. More than one-half of Manley Hot Springs households hunted moose (56%), 24% gave moose away, and 61% of households received moose. Clearly, hunters in both communities spend a great deal of energy procuring moose meat for their families and communities, and moose meat remains culturally and socially important in both communities. Hunters from both communities identified large areas used to look for moose, attesting to the commitment of time and resources—such as gasoline—to moose hunting.

According to this research, Minto and Manley Hot Springs hunters searched for moose in GMU 20B (Minto and Manley Hot Springs) and GMUs 20F and 20C (Manley Hot Springs) in 2012. However, there was minimal overlap in their search areas for moose during 2012 (see harvest area maps in the previous chapters discussing community survey results). While the hunting regulations for GMUs 20F and 20C are relatively straightforward, the hunting regulations for the MFMA have been the focus of significant contention and change since 2004. This section reviews that change and concludes with a consideration of the effects on these changes on moose hunting by Minto residents.

Moose hunting regulations around the Minto area have been characterized by allocation issues since the early days of state management. According to Andrews (1988:154), hunting regulations in GMU 20B around Minto were fairly liberal until the mid-1970s, allowing for between 63 to 79 days of hunting between late August and late November. By 1978, an increasing human population around Fairbanks led to increased hunting pressure on area moose populations. Concern about this pressure led to increased restrictions: the 1987 season length was only 11 days. In 1979, declining moose populations in the Minto flats region prompted the creation of the MFMA. By 1980, a limited registration permit hunt provided 100 permits for a quota of 15 bulls, with 25 permits available in Fairbanks, 25 in Nenana, and 50 permits in Minto. Most of the hunting occurred in September with additional harvests in October or November as the quota allowed. In 1984, the BOG modified the hunt to add a winter hunt, which was the traditional hunting period for Minto residents, though the

number of issued permits remained the same (Andrews 1988:159). In 1985, 31 permits were issued to Minto residents and 29 permits were issued to residents of Fairbanks, Nenana, and surrounding communities (Andrews 1988:160). In 1986, amendments to the state subsistence law (SCS CSHB 288 Ch.52, 1986) required limiting subsistence hunts to residents of rural communities only and hence registration permits were issued in only Minto and Nenana in 1987 (Andrews 1988:160).

Because of the relatively low moose population in the MFMA, the BOG determined that the population could not sustain the total demand of all subsistence hunters in the state and therefore permits would be issued under a “Tier II” permit structure, beginning in 1990, that determined eligibility based on 3 criteria: customary and traditional use of the resource, local residency, and lack of alternative resources. Additional changes to the state subsistence law in 1992 eliminating a rural priority, and increases in the moose population throughout the 1990s, again changed the way the Tier II moose hunt was implemented in the MFMA. Tier II applicants were scored on only 2 of the 3 criteria: customary use and direct dependence by the subsistence user and the availability of alternative food sources; the residency requirement was no longer allowed to be considered. Also in 1992, the BOG established an amount necessary for subsistence (ANS)<sup>4</sup> for MFMA moose at 20–40 moose based on subsistence moose harvest patterns by only Minto and Nenana residents. By 1994, with a moose population of approximately 2,526 within a 967 square-mile are (or 2.6 moose per square mile), a total of 195 permits were issued.<sup>5</sup> Hunters from Fairbanks and other parts of the state made up 59% of the permit holders while residents of Minto, Manley Hot Springs, and Nenana accounted for 41% of the permit holders.<sup>6</sup>

In 1995, the BOG bifurcated the moose population into 2 separately managed populations—a cow/calves component and a bull component—in order to expand hunting opportunity. The BOG determined that the Tier II hunt was no longer necessary for the bull component of the moose population because of a sufficient harvestable surplus. As a result, the BOG removed the bull component from the Tier II hunt and provided opportunity to hunt bulls through a residents-only (Tier I) spike-fork/50 in antler-restricted general hunt. However, the harvestable surplus of cows and calves was determined to be insufficient for an unrestricted hunt; as a result, the cow component of the population stayed under a Tier II hunt and 100 permits were provided during the winter hunt that is critical to subsistence practices. The Tier II hunt for any moose, TM785, continued until 2004; between 1993 and 2003, Minto residents received an average of 19% of the permits per year. During

4. According to the state subsistence statute (16.05.258), the BOF and BOG shall determine the “amount of the harvestable portion that is reasonably necessary for subsistence” [ANS] of those fish and game stocks that are customarily and traditionally taken or used for subsistence. ANS estimates are estimated using a variety of methods usually based on historic harvests that have occurred consistent with customary and traditional practices.

5. Alaska Department of Fish and Game Division of Wildlife Conservation Fairbanks Area Biologist Robin M. Eagan to MFMA Management Coordinator Kenton P. Taylor, November 29, 1994. Subject: “Minto Flats Moose Surveys, 14–22 November 1994.”

6. Alaska Department of Fish and Game Division of Wildlife Conservation Assistant Area Biologist Toby Boudreau to Alaska Department of Fish and Game Division of Wildlife Conservation Fairbanks Area Biologist Robin M. Eagan, September 13, 1994. Subject: “Results of 1993–94 Minto Tier II Moose Hunt (TM785).”

*Table 4-1.— Changes in hunting regulations in the Minto Flats Management Area, 1996–2014.*

Regulatory year	Seasons	Total days	Bag limit, etc.
1996–2004	Sept. 1–20 Jan. 10–Feb. 28	75	1 moose by Tier II permit OR 1 bull with spike-fork or 50" antlers, with at least 4 brow tines on at least 1 side
	Sept. 11–25	10	
2004–2006	Sept. 1–25 Jan. 10–Feb. 28	75	1 moose by registration permit; limited number of permits available in person in Minto and Nenana; 1 permit available per household OR 1 bull with spike-fork or 50" antlers, with at least 4 brow tines on at least 1 side
	Sept. 11–25	15	
2007–2010	Sept. 1–25 Jan. 10–Feb. 28	75	1 moose by registration permit; limited number of permits available in person in Fairbanks, Minto, and Nenana; 1 permit available per household OR 1 bull with spike-fork or 50" antlers, with at least 4 brow tines on at least 1 side
	Sept. 11–25	15	
2012–present	Aug. 21–27 Oct. 15–Feb. 28	139	1 bull by harvest ticket 1 antlerless moose by permit available in person in Fairbanks beginning Sept. 12 OR 1 bull with spike-fork or 50" antlers, with at least 4 brow tines on at least 1 side
	Sept. 8–25	18	

that time, Nenana residents received an average of 9% of permits and other GMU 20B residents, including Fairbanks residents, received an average of 60% of permits.<sup>7</sup> A second hunt existed in the area: a September 11–25 hunt under a general harvest ticket for antler-restricted bulls that was open to all state residents.

With a generally increasing moose population, the BOG changed the MFMA Tier II hunt to a limited registration hunt in early 2004. Table 4-1 outlines regulatory changes since the Tier II hunt. Despite an established pattern of non-local Alaska residents receiving Tier II permits throughout the 1990s and early 2000s, non-local Alaska resident subsistence use patterns of the MFMA were not included in the amount reasonably necessary for subsistence (ANS) finding by the BOG. During deliberations, the department presented the BOG with data for these uses if they chose to modify their ANS finding to reflect subsistence harvest patterns during the previous 10 years of the Tier II hunt, but the BOG declined. With an ANS of only 20–40 moose and a harvestable surplus of approximately 100 to 164 moose, the BOG decided that the herd was healthy enough to increase

7. Tom Seaton, Assistant Area Biologist, “Proposal 46–GMU 20B Moose” (PowerPoint presentation, Board of Game meeting, Fairbanks, February 26–March 7, 2010). Staff presentations PDF available online (pages 371–379): <http://www.adfg.alaska.gov/index.cfm?adfg=gameboard.meetinginfo&date=02-26-2010&meeting=fairbanks>



Mike Taras, ADF&G

*Figure 4-2.– Lines at ADF&G, Fairbanks, for the fall RM 775 moose hunt in Minto Flats.*

opportunity beyond the more restrictive Tier II; the Tier II subsistence hunt was eliminated and replaced with a limited registration permit hunt (RM775 in the fall and RM785 in the winter), with permits available on a first-come-first-served basis in Minto and Nenana. In both communities, this resulted in long lines of hunters, many of them from Fairbanks or the surrounding areas, forming days before the permit issuance date, which created hard feelings and tension with local community members. The fall 2004 permit issuance resulted in 30 permits being issued in Minto and 20 being issued in Nenana for the fall season. As the moose population continued to increase, the department offered additional permits and added Fairbanks as a location to get a permit in order to decrease tensions in Minto and Nenana. While this effort did relieve some of the pressure, it also resulted in long lines at the ADF&G building in Fairbanks which caused some strain on working conditions at the department and concerns about public safety (Figure 4-2; Figure 4-3).

To address these ongoing concerns in the permit issuance locations, ADF&G and the BOG worked together with local communities to provide an alternative hunt structure that would eliminate standing in line but that continued to effectively limit harvest to within sustainable levels. In March 2012, the BOG adopted regulations to replace the limited registration fall and winter hunts with a 7-day season from August 21–27 for bulls under a general harvest ticket and a registration hunt for



Mike Taras, ADF&G

*Figure 4-3.– Lines at ADF&G, Fairbanks, for the winter RM 785 moose hunt in Minto Flats.*

antlerless moose (RM785) from October 15–February 28, with no limit on the number of permits that could be issued. Further, the existing antler-restricted general harvest hunt was modified from September 11–25 to September 8–25, adding 3 days of opportunity but beginning after the Labor Day weekend when Minto Flats experiences an influx of waterfowl hunters. This change eliminated the need to stand in line, but the department predicted that fall harvest rates would likely be low because of difficult access to the hunt area in August.<sup>8</sup> The October–February season provided critical winter hunting opportunity over a longer period of time with little risk of closing early when the quota was met due to poor local travel conditions until later in the winter. The proposed hunt was supported by both the Fairbanks and Minto–Nenana fish and game advisory committees. The first year of this new hunt structure in the MFMA was the 2012–2013 regulatory year; this survey captured moose harvests for the August “any bull” season, the antler-restricted September hunt, and much of the winter opportunity.

The question remains as to how hunters have fared under this changing regulatory structure. A generally increasing trend line of moose harvests by Minto residents from 1983–1984 (beginning of

8. Alaska Department of Fish and Game Division of Wildlife Conservation and Division of Subsistence. March 2012. “*Proposal 216*” [in] *Final Recommendations: Board of Game Proposals*. RC 3–ADF&G Final Recommendations for Interior Region (March 2–11, 2012) Board of Game meeting. Accessed June 6, 2014.  
<http://www.adfg.alaska.gov/static-f/regulations/regprocess/gameboard/pdfs/2011-2012/interior-3-2-12/deptar-int2012.pdf>

Tier II hunt, approximately 53 lb per capita) (Andrews 1988:172) to 2004–2005 (transition to limited registration hunt, 129 lb per capita) (CSIS) to 2012 (beginning of general season with unlimited registration hunt, 85 lb per capita) (Table 3-5) suggests that Minto residents are harvesting more moose now. Of course, this increase in harvest might also be a reflection of an increasing moose population, better access due to environmental factors, or increased effort in light of more hunters in the field as the number of permits has increased, among other factors. Tracking how other GMU 20B residents experience these changes would require tracking which non-local hunters have used the area through the time period marked by these regulatory changes and surveying them. Recall that in 2012 moose accounted for 95% of Minto residents' land mammal harvest. In 2012, 63% of Minto households reported using the same amount of land mammals as they have in recent years; 9% of households reported using more, and 22% of households reported using less (Figure 3-17). Within the context of these percentages, 80% of households reported getting enough land mammals while 11% reported not getting enough (Figure 3-18). These statistics suggest that, during several of the years after the transition away from the Tier II to the limited registration hunt and in the first year of the most recent regulatory change, the majority of Minto households were getting the moose they needed. However, it is not clear that changing regulations contribute to or detract from hunter success. In Minto, many hunters discussed their frustration with a worsening hunt experience resulting from an increase in non-local hunters and their behavior in the field. Considering the larger picture of subsistence resource harvests, where salmon populations and the use of nonsalmon fish resources have declined, a stable moose harvest seems particularly important. Indeed, concerns about the moose population were reflected in comments made by residents of both communities as part of this survey. Manley Hot Springs residents expressed the most concern—particularly that the road could further increase access and hunter competition and threaten the sustainability of the area's moose populations. Minto residents offered more varied comments, but it was clear that a healthy moose population and continued opportunities to hunt remained a major concern.

In conclusion, the results of this 2012 survey help fill the gap of harvest data for Manley Hot Springs and update the over 30-year-old comprehensive data from Minto. Analyses of harvest levels of specific species, demographics, harvest areas, community economics, harvest assessments, food security, and wild food networks help to characterize contemporary subsistence economies in Central Alaska and contribute to our knowledge of subsistence harvests and uses statewide.

The 2 communities surveyed here have experienced a great deal of change in their subsistence patterns despite continuing their historical and traditional hunting, fishing, trapping, and gathering practices. As with other communities around rural Alaska, Minto and Manley Hot Springs experience the effects of increasing fuel costs (for both transportation and heating homes), the requirements

of more regular employment and the impacts on subsistence activities, the challenges and expense of rural infrastructures, and many other changes.

Described above, several issues emerge that have variable effects on the communities. Annual Chinook salmon returns have been poor for the last several years, causing hardship for most users. Fishers have dealt with increasing restrictions on subsistence fishing, and in some cases, the extended closures of the fisheries. Salmon, especially Chinook salmon, account for a large component of the total subsistence harvests for both Minto and Manley Hot Springs residents; a decline in fishing opportunities for Chinook salmon pose serious concerns for many subsistence-based communities. Many households in this study alone discussed the need to replace Chinook salmon with store-bought food, other subsistence species, or simply go without. It remains to be seen what the long-term effects of these declines will be or how communities will reorganize to accommodate lesser salmon harvests should the declines continue. Area moose populations, another central resource for both communities, appear relatively healthy. Moose are increasing in the MFMA and are stable at low densities in the surrounding GMUs used by Manley Hot Springs hunters. However, it remains to be seen what effect recent changes in moose hunting regulations for MFMA will have on local hunters.

All of these issues underscore the vulnerability of subsistence economies, even those for communities located along the road system. This survey included harvest assessment data across species, subsistence food distribution networks, and food security levels for both of the study communities; in all cases, this is the first time these types of data were collected. Communities in this study reported variable levels of use of different resource categories compared to the last several years; however, a large percentage of households in both communities used less salmon (59% in Minto and 41% in Manley Hot Springs) (Figure 3-17; Figure 2-27). Reasons for this varied widely, but regulations and resource availability were 2 of the top 3 reasons provided most often by residents of both communities (Appendix Table D2-7; Appendix Table D3-7). Food security reports also varied by community. While Manley Hot Springs residents generally reported fewer instances of food insecurity conditions than Minto residents, Manley Hot Springs residents reported greater levels of food insecurity during the fall months than Minto residents, despite reporting greater subsistence harvests per capita (Figure 2-31; Figure 3-21). At the same time, all respondents reported dense sharing networks that linked many, if not all, households in each community. While Minto and Manley Hot Springs display somewhat different patterns regarding the communities they share with, such practices are a clear measure against the insecurity of fluctuating harvests and external pressures. In sum, subsistence in Minto and Manley Hot Springs remains a vital part of the cultural, economic, and social aspects of community life. However, these communities also experience a great deal of external pressures that can affect their subsistence practices, highlighting the need for sound management of resources and the regulatory protection of subsistence patterns.

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# **Appendix A–Survey Instrument**

# COMPREHENSIVE SUBSISTENCE SURVEY

TOFTY ROAD

MINTO, ALASKA

PRINTED  
2013-02-27

From January 1, 2012 to December 31, 2012

This survey is used to estimate subsistence harvests and to describe community subsistence economies. We will publish a summary report, and send it to all households in your community. We share this information with the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service and the National Park Service. We work with the Federal Regional Advisory Councils and with local Fish and Game Advisory Committees to better manage subsistence, and to implement federal and state subsistence priorities.

We will NOT identify your household. We will NOT use this information for enforcement. Participation in this survey is voluntary. Even if you agree to be surveyed, you may stop at any time.

HOUSEHOLD ID:		
STRATUM ID:		
COMMUNITY ID:	MINTO	228
INTERVIEWER:		
INTERVIEW DATE:		
START TIME:		
STOP TIME:		
	DATA CODED BY:	
	DATA ENTERED BY:	
	SUPERVISOR:	



PHOTO BY JAMES VAN LANEN

## COOPERATING ORGANIZATIONS

**DIVISION OF SUBSISTENCE**  
ALASKA DEPARTMENT OF FISH & GAME  
1300 COLLEGE RD  
FAIRBANKS, AK 99701

907-459-7320

**HOUSEHOLD MEMBERS** HOUSEHOLD ID

First, I would like to ask about the people in your household, permanent members of your household who sleep at your house. This includes students who return home every summer. I am NOT interested in people who lived with you temporarily, even if they stayed several months.

Last year, that is, between January 1, 2012, and December 31, 2012, WHO were the head or heads of this household?

Is this person answering questions on this survey?	How is this person related to HEAD 1?	Is this person MALE or FEMALE?	Is this person an ALASKA NATIVE?	How OLD is this person?	Except for school or military service, has this person always lived in Minto?	If person has NOT always lived in Minto...			
						WHEN did they LAST move here?	From WHERE did this person move?	Where is this person's birth home?*	TOTAL years lived here?
ID#	circle	relation	circle	circle	age	circle	year	community in Alaska, OR state in the US, OR country	years
HEAD	Y N		M F	Y N		Y N			
1									
<i>NEXT enter spouse or partner. If household has a SINGLE HEAD, leave HEAD 2 row BLANK, and move to PERSON 3.</i>									
HEAD	Y N		M F	Y N		Y N			
2									
<i>BELOW, enter children (oldest to youngest), grandchildren, grandparents, or anyone else living full-time in this household.</i>									
PERSON 3			M F	Y N		Y N			
3	0								
PERSON 4			M F	Y N		Y N			
4	0								
PERSON 5			M F	Y N		Y N			
5	0								
PERSON 6			M F	Y N		Y N			
6	0								
PERSON 7			M F	Y N		Y N			
7	0								
PERSON 8			M F	Y N		Y N			
8	0								
PERSON 9			M F	Y N		Y N			
9	0								
PERSON 10			M F	Y N		Y N			
10	0								
PERSON 11			M F	Y N		Y N			
11	0								
PERSON 12			M F	Y N		Y N			
12	0								
PERSON 13			M F	Y N		Y N			
13	0								
PERSON 14			M F	Y N		Y N			
14	0								

\* "BIRTH HOME" means the place this person's PARENTS WERE LIVING when this person was born.

**PERMANENT HH MEMBERS: 01** **MINTO: 228**

**EMPLOYMENT STATUS** HOUSEHOLD ID

The next few pages ask about jobs, income, expenses, and equipment. We ask about these things because we are trying to understand all parts of the community economy. Many people use wages from jobs to support subsistence activities, and subsistence equipment can be very expensive.

Starting with the first head of your household, what job or jobs did he or she have last year?

**INCLUDE EVERY PERSON 16 YEARS AND OLDER ON THIS PAGE, EVEN IF THEY DO NOT HAVE A JOB!**

For each member of this household born before 1997, list EACH JOB held last year. For household members who did not have a job, write: RETIRED, UNEMPLOYED, STUDENT, HOMEMAKER, DISABLED, etc. There should be AT LEAST one row for each member of this household born before 1997 (this includes anyone who is 16 years old or older).

**WORK SCHEDULE... \*\***

order	role	res.	Person Code from page 2	What kind of work did he or she do in this job?	For whom did he or she work in this job?	In the past year, what months did he or she work in this job?	FULL TIME	PART TIME	SHIFT - FULL TIME	ON-CALL, VARIES	SHIFT - PART TIME	In the past year how much did he or she earn in this job?
			00	job title*	employer	circle each month worked	circle one					gross income***
				1ST JOB		J F M A M J J A S O N D	FT	PT	SF	OC	SP	\$ / Yr
1	6	910100000										
				2ND JOB		J F M A M J J A S O N D	FT	PT	SF	OC	SP	\$ / Yr
2	6	910100000										
				3RD JOB		J F M A M J J A S O N D	FT	PT	SF	OC	SP	\$ / Yr
3	6	910100000										
				4TH JOB		J F M A M J J A S O N D	FT	PT	SF	OC	SP	\$ / Yr
4	6	910100000										
				5TH JOB		J F M A M J J A S O N D	FT	PT	SF	OC	SP	\$ / Yr
5	6	910100000										
				6TH JOB		J F M A M J J A S O N D	FT	PT	SF	OC	SP	\$ / Yr
6	6	910100000										
				7TH JOB		J F M A M J J A S O N D	FT	PT	SF	OC	SP	\$ / Yr
7	6	910100000										
				8TH JOB		J F M A M J J A S O N D	FT	PT	SF	OC	SP	\$ / Yr
8	6	910100000										
				9TH JOB		J F M A M J J A S O N D	FT	PT	SF	OC	SP	\$ / Yr
9	6	910100000										
				10TH JOB		J F M A M J J A S O N D	FT	PT	SF	OC	SP	\$ / Yr
10	6	910100000										

\* If a person FISHES 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+ hours/week) 1
- PT - Parttime (<35 hours/week) 2
- SF - Shift (2 wks on/2 off, etc.) 3
- OC - On Call, Irregular 4
- SP - Shift - part time 5
- Unemployed 0

**\*\*\* GROSS INCOME**

is the same as TAXABLE INCOME on a W-2 form. Self-employment, enter revenue -

**OTHER INCOME** THIS PAGE IS ONLY FOR INCOME THAT IS NOT EARNED FROM WORKING HOUSEHOLD ID

Between JANUARY 1, 2012, and DECEMBER 31, 2012...

...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		<b>Alaska PFD IN 2012</b>		<b>Regional Corporations</b>		<b>Dividend</b>
	in 2012?		in 2012.						
	circle one		dollars						
ALASKA PERMANENT FUND DIVIDEND	Y	N	\$	YR	1 PFD = \$878	Calista Corp.....	\$	3.00	
32					2 PFDs = \$1,756	Calista Corp.....	\$	3.00	
NATIVE CORPORATION DIVIDENDS	Y	N	\$	YR	3 PFDs = \$2,634				
13					4 PFDs = \$3,512				
					5 PFDs = \$4,390				
					6 PFDs = \$5,268	<b>Village Corporation(s)</b>		<b>Dividend</b>	
					7 PFDs = \$6,146	.....	\$	-	
					8 PFDs = \$7,024				
					9 PFDs = \$7,902				
					10 PFDs = \$8,780				
					11 PFDs = \$9,658				
					12 PFDs = \$10,536				

Between JANUARY 1, 2012, and DECEMBER 31, 2012...

...Did any members of your household receive OTHER income such as SENIOR BENEFITS or UNEMPLOYMENT?..... Y N

*IF NO, go to the next page.*

*if YES, continue below...*

	Received?	Total Amount?									
	circle one	dollars							circle one	dollars	
EMPLOYMENT RELATED	UNEMPLOYMENT	Y	N	\$	YR	FAMILY & CHILD	TANF	Y	N	\$	YR
	12						(say "Tanif," used to be AFDC)				
	WORKERS' COMP	Y	N	\$	YR		2				
	8						CHILD SUPPORT	Y	N	\$	YR
	SOCIAL SECURITY	Y	N	\$	YR		15				
	7						FOSTER CARE	Y	N	\$	YR
PENSION & RETIREMENT	Y	N	\$	YR	41						
5					FUEL VOUCHERS	Y	N	\$	YR		
DISABILITY	Y	N	\$	YR							
31					MEETING HONORARIA	Y	N	\$	YR		
VETERANS ASSISTANCE	Y	N	\$	YR	(not per diem*)						
35					OTHER (describe)	Y	N	\$	YR		
FOOD STAMPS (QUEST CARD)	Y	N	\$	YR							
11					OTHER (describe)	Y	N	\$	YR		
ADULT PUBLIC ASSISTANCE	Y	N	\$	YR							
3											
SUPPLEMENTAL SECURITY INCOME (SSI)	Y	N	\$	YR							
10											
HEATING 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 \_\_\_\_\_ months =  
 \* for \_\_\_\_\_ weeks =  
 for \_\_\_\_\_ months =  
 Senior benefits of \$125 per month for 12 months = \$1,500 per elder  
 Senior benefits of \$175 per month for 12 months = \$2,100 per elder  
 Senior benefits of \$250 per month for 12 months = \$3,000 per elder



**RETAINED COMMERCIAL HARVESTS**

HOUSEHOLD ID

*Fish on this page are fished for commercial and subsistence purposes at the same time, and subsistence permits are not required.*

...RETAINED COMMERCIAL HARVESTS continued from previous page.

During the last year,<sup>1</sup>  
did you or members of your household...

- A** ...FISH commercially for \_\_\_\_\_ ?
- B** ...KEEP any \_\_\_\_\_ from your commercial catch for your own use<sup>2</sup> or to share?
- C** Was the \_\_\_\_\_ that you kept INCIDENTAL catch?

Read names below in blanks above	If KEEP is "yes"			Report retained harvest on SUBSISTENCE HARVEST pages. comments
	A COM FISH?	B KEEP?	C INCI?	
LAMPREY	Y N	Y N	Y N	
EEL				
122,000,001				
SHEEFISH	Y N	Y N	Y N	
125,600,001				
BROAD WHITEFISH	Y N	Y N	Y N	
126,404,001				
HUMPBACK WHITEFISH	Y N	Y N	Y N	
126,408,001				
LEAST CISCO	Y N	Y N	Y N	
126,406,061				
BERING CISCO	Y N	Y N	Y N	
126,406,041				
	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 fish COMMERCIALY for any other kind of fish?..... Y N   
IF YES, enter the name in a blank row above, and answer the questions in that row.

<sup>1</sup> "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
<sup>2</sup> "USE" includes eating, feeding to dogs, sharing or trading with others, etc.  
<sup>3</sup> UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.  
<sup>4</sup> "INCIDENTAL CATCH" means the fish kept was not being commercially fished. For example, a king salmon kept from a chum commercial fisher

**SUBSISTENCE HARVESTS: SALMON** HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for salmon for subsistence?..... Y N
2. During the last year (between JANUARY 1, 2012, AND DECEMBER 31, 2012),  
did you or members of your household USE or TRY TO FISH FOR salmon?..... Y N

*IF the answer to QUESTION 2 is NO, go to the SALMON summary page.*

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

During the last year<sup>1</sup>,  
did you or members of your household....

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- D ...try<sup>3</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

Please estimate how many salmon ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many were...

*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.*

How many of THOSE were used for dog food?

Read names below in blanks above	A	B	C	D	E	Caught with a SET NET	Caught with a DRIFT NET	Caught with a SEINE NET	Caught with a FISH WHEEL	Caught with a ROD & REEL <sup>3</sup>	Caught with OTHER GEAR (specify type)	Units <sup>4</sup>	How many of THOSE were used for dog food?
	USE?	REC?	GIVE?	TRY?	HAR?	number harvested by each gear type	amount / type	specify	dogfood				
CHINOOK SALMON	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	/
KING SALMON													
113,000,000													
COHO SALMON	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	/
112,000,000													
SUMMER CHUM SALMON	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	/
DOG SALMON													
111,010,000													
FALL CHUM SALMON	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	/
111,020,000													
SOCKEYE SALMON	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	/
RED SALMON													
115,000,000													
SALMON - UNKNOWN	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	/
119,000,000													
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	/
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	/
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	/

During the last year, did your household use any other kind of salmon?..... Y N

*IF YES, enter the name in a blank row above, and answer the questions in that row.*

<sup>1</sup> "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
<sup>2</sup> "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
<sup>3</sup> "ROD AND REEL" includes fish caught in open water with a hook and a line attached to a rod or a pole. Jiggling through the ice is "other gear."  
<sup>4</sup> UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.

**SUBSISTENCE SUMMARY: SALMON** HOUSEHOLD ID

*If this household did NOT USE or HARVEST salmon last year, go to the ASSESSMENT section below.*

*Otherwise, continue with mapping, network, and assessment sections...*

**MAPPING** *Refer to data collection maps and mapping instructions to map salmon...*

**NETWORKS** *...then ask the network and assessment questions below*

During the last year<sup>1</sup>,

...who CAUGHT the SALMON your household used? (Enter most important sources first.)

110,000,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER Minto Households (Enter Household ID# of other Households)	People in OTHER communities (Other community name)
------	--	---	---

CAUGHT SALMON

1

...who PROCESSED the SALMON your household used? (Enter most important sources first.)

PROCESSED SALMON

2

...who else GAVE SALMON to your household? (Enter most important sources first.)

GAVE SALMON TO US

3

**ASSESSMENTS:** 110,000,000

To conclude our salmon section, I am going to ask a few general questions about salmon.

During the last year<sup>1</sup>,

...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<sup>1</sup>,

...did your household GET ENOUGH salmon?..... Y N

If NO...

What KIND of salmon did you need?.....   1

WHY did your household NOT get enough salmon?.....   2

How would you describe the impact to your household of not getting enough last year?..... not noticeable? minor? major? severe?  
(0) (1) (2) (3)

Did your household do anything DIFFERENTLY because you did NOT get enough salmon?..... Y N

IF YES...

What did your household do differently?.....   1

2

**NETWORKS & ASSESSMENTS OF SALMON: 66, 67** **MINTO: 228**

**SUBSISTENCE HARVESTS: WHITEFISH**

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for whitefish for subsistence?..... Y N
2. During the last year (between JANUARY 1, 2012, AND DECEMBER 31, 2012),  
did you or members of your household USE or TRY TO FISH FOR whitefish?..... Y N

*IF the answer to QUESTION 2 is NO, go to the next harvest page.*

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

During the last year<sup>1</sup>,  
did you or members of your household....

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- D ...try<sup>3</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

Please estimate how many whitefish ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many

*INCLUDE whitefish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.*

Caught with a SET NET	Caught with a DRIFT NET	Caught with a SEINE NET	Caught with a FISH WHEEL	Caught with a ROD & REEL <sup>3</sup>	Caught with OTHER GEAR (specify type)	Units <sup>4</sup>	How many of THOSE were used for dog food?	
number harvested by each gear type						amount / type	specify	dogfood

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?				
SHEEFISH	Y N	Y N	Y N	Y N	Y N		/		
125,600,000									
HUMPBACK WHITEFISH	Y N	Y N	Y N	Y N	Y N		/		
126,408,000									
BROAD WHITEFISH	Y N	Y N	Y N	Y N	Y N		/		
126,404,000									
ROUND WHITEFISH	Y N	Y N	Y N	Y N	Y N		/		
126,412,000									
LEAST CISCO	Y N	Y N	Y N	Y N	Y N		/		
126,406,060									
UNKNOWN WHITEFISH	Y N	Y N	Y N	Y N	Y N		/		
126,499,000									
	Y N	Y N	Y N	Y N	Y N		/		
	Y N	Y N	Y N	Y N	Y N		/		

During the last year, did your household use any other kind of whitefish?..... Y N

*IF YES, enter the name in a blank row above, and answer the questions in that row.*

<sup>1</sup> "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
<sup>2</sup> "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
<sup>3</sup> "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 "other gear."  
<sup>4</sup> 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

1. Do you or members of your household USUALLY fish for other fish for subsistence, such as BURBOT (LUSH), GRAYLING, or any other other fish?..... Y N
2. During the last year (between JANUARY 1, 2012, AND DECEMBER 31, 2012), did you or members of your household USE or TRY TO FISH FOR other fish?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

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

During the last year<sup>1</sup>, did you or members of your household....

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- D ...try<sup>3</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many

*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.*

How many of THOSE were used for dog food?

Caught with a SET NET	Caught with a DRIFT NET	Caught with a SEINE NET	Caught with a FISH WHEEL	Caught with a ROD & REEL <sup>3</sup>	Caught with OTHER GEAR (specify type)	Units <sup>4</sup>	How many of THOSE were used for dog food?
number harvested by each gear type						amount / type	specify dogfood

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?							
BURBOT LUSH	Y N	Y N	Y N	Y N	Y N							/
124,800,000												
NORTHERN PIKE	Y N	Y N	Y N	Y N	Y N							/
125,500,000												
GRAYLING	Y N	Y N	Y N	Y N	Y N							/
125,200,000												
RAINBOW TROUT	Y N	Y N	Y N	Y N	Y N							/
126,204,000												
DOLLY VARDEN CHAR	Y N	Y N	Y N	Y N	Y N							/
125,006,000												
LAKE TROUT	Y N	Y N	Y N	Y N	Y N							/
125,010,000												
BLACKFISH	Y N	Y N	Y N	Y N	Y N							/
124,600,000												
HERRING	Y N	Y N	Y N	Y N	Y N							/
120,200,000												
LONG-NOSED SUCKER	Y N	Y N	Y N	Y N	Y N							/
126,000,000												
HALIBUT	Y N	Y N	Y N	Y N	Y N							/
121,800,000												

<sup>1</sup> "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
<sup>2</sup> "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
<sup>3</sup> "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 "other gear."  
<sup>4</sup> UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.

**SUBSISTENCE SUMMARY: FISH OTHER THAN SALMON**

HOUSEHOLD ID

*If this household did NOT USE or HARVEST fish other than salmon last year, go to the ASSESSMENT section below.  
Otherwise, continue with mapping, network, and assessment sections...*

**MAPPING** *Refer to data collection maps and mapping instructions to map fish other than salmon...*

**NETWORKS** *...then ask the network and assessment questions below*

**During the last year<sup>1</sup>,**  
...who CAUGHT the WHITEFISH your household used? (Enter most important sources first.) 128,400,000

role	People in THIS household <i>(enter person ID# from page 2)</i>	People in OTHER Minto Households <i>(Enter Household ID# of other Households)</i>	People in OTHER communities <i>(Other community name)</i>
------	---	--	--

CAUGHT WHITEFISH  
1

...who PROCESSED the WHITEFISH your household used? (Enter most important sources first.)  
PROCESSED WHITEFISH  
2

...who else GAVE WHITEFISH to your household? (Enter most important sources first.)  
GAVE WHITEFISH TO US   
3

**During the last 12 months...**  
...who CAUGHT the OTHER FISH your household used? (Enter most important sources first.) 960,300,500

role	People in THIS household <i>(enter person ID# from page 2)</i>	People in OTHER Minto Households <i>(Enter Household ID# of other Households)</i>	People in OTHER communities <i>(Other community name)</i>
------	---	--	--

CAUGHT OTHER FISH  
1

...who PROCESSED the OTHER FISH your household used? (Enter most important sources first.)  
PROCESSED OTHER FISH  
2

...who else GAVE OTHER FISH to your household? (Enter most important sources first.)  
GAVE OTHER FISH TO US   
3

**ASSESSMENTS:** 100,000,002

To conclude our fish other than salmon section, I am going to ask a few general questions about fish other than salmon.

**During the last year<sup>1</sup>,**  
...did your household use LESS, SAME, or MORE fish other than salmon than in recent years?..... X L S M   
If LESS or MORE... X = do not use  
WHY was your use different?.....  1   
 2

**During the last year<sup>1</sup>,**  
...did your household GET ENOUGH fish other than salmon?..... Y N   
If NO...  
What KIND of fish other than salmon did you need?.....   
WHY did your household NOT get enough fish other than salmon?.....  1   
 2   
How would you describe the impact to your household  
of not getting enough last year?..... not noticeable? minor? major? severe?  
(0) (1) (2) (3)   
Did your household do anything DIFFERENTLY because you did NOT get enough fish other than salmon?..... Y N   
IF YES...  
What did your household do differently?.....  1   
 2

**NETWORKS & ASSESSMENTS OF FISH OTHER THAN SALMON: 66, 67** **MINTO: 228**

**SUBSISTENCE HARVESTS: MARINE INVERTEBRATES** HOUSEHOLD ID

1. Do you or members of your household USUALLY get marine invertebrates for subsistence, such as KING CRAB, , or any other marine invertebrates?..... Y N
2. During the last year (between JANUARY 1, 2012, AND DECEMBER 31, 2012), did you or members of your household USE or TRY TO GET marine invertebrates?..... Y N

*IF the answer to QUESTION 2 is NO, go to the MARINE INVERTEBRATES summary page.*

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

During the last year<sup>1</sup>,

did you or members of your household....

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- D ...try<sup>2</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

Please estimate how many marine invertebrates ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. INCLUDE marine invertebrates that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If harvest with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A	B	C	D	E	How many did your HH get? <i>amount</i>	Units <sup>3</sup> <i>specify</i>	comments
	USE?	REC?	GIVE?	TRY?	HAR?			
KING CRAB	Y N	Y N	Y N	Y N	Y N		IND	
501,008,000								
TANNER CRAB	Y N	Y N	Y N	Y N	Y N		IND	
501,012,000								
MUSSELS	Y N	Y N	Y N	Y N	Y N		GAL	
502,099,000								
CLAMS	Y N	Y N	Y N	Y N	Y N		GAL	
500,600,000								
SHRIMP	Y N	Y N	Y N	Y N	Y N		GAL	
503,400,000								
OTHER INVERTEBRATES	Y N	Y N	Y N	Y N	Y N		GAL	
509,900,000								
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	

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.*

<sup>1</sup> "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
<sup>2</sup> "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
<sup>3</sup> UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, et

**SUBSISTENCE SUMMARY: MARINE INVERTEBRATES**

HOUSEHOLD ID

*If this household did NOT USE or HARVEST marine invertebrates last year, go to the ASSESSMENT section below.  
Otherwise, continue with mapping, network, and assessment sections...*

**MAPPING** *Refer to data collection maps and mapping instructions to map marine Invertebrates...*

**NETWORKS** *...then ask the network and assessment questions below*

During the last year<sup>1</sup>,

...who HARVESTED (GOT) the INVERTEBRATES your household used? (Enter most important sources first.)

602,020,002

role	People in THIS household (enter person ID# from page 2)	People in OTHER Minto Households (Enter Household ID# of other Households)	People in OTHER communities (Other community name)
HARVESTED (GOT) INVERTEBRATES			
1			
...who PROCESSED the INVERTEBRATES your household used? (Enter most important sources first.)			
PROCESSED INVERTEBRATES			
2			
...who else GAVE INVERTEBRATES to your household? (Enter most important sources first.)			
GAVE INVERTEBRATES TO US			
3			

**ASSESSMENTS:**

500,000,000

To conclude our marine invertebrates section, I am going to ask a few general questions about marine invertebrates.

During the last year<sup>1</sup>,

...did your household use LESS, SAME, or MORE marine invertebrates than in recent years?..... X L S M

If LESS or MORE...

X = do not use

WHY was your use different?.....

1  
2

During the last year<sup>1</sup>,

...did your household GET ENOUGH marine invertebrates?..... Y N

If NO...

What KIND of marine invertebrates did you need?.....

WHY did your household NOT get enough marine invertebrates?.....

1  
2

How would you describe the impact to your household

of not getting enough last year?..... not noticeable? minor? major? severe?  
(0) (1) (2) (3)

Did your household do anything DIFFERENTLY because you did NOT get enough marine invertebrates?..... Y N

IF YES...

What did your household do differently?.....

1  
2

**NETWORKS & ASSESSMENTS OF MARINE INVERTEBRATES: 66, 67**

**MINTO: 228**

**SUBSISTENCE HARVESTS: LARGE LAND ANIMALS**

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt large land animals for subsistence, such as MOOSE, or any other large land animals?..... Y N
2. During the last year (between JANUARY 1, 2012, AND DECEMBER 31, 2012), did you or members of your household USE or TRY TO HUNT large land animals?..... Y N

*IF the answer to QUESTION 2 is NO, go to the next harvest page.*

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

During the last year<sup>1</sup>, did you or members of your household....

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- D ...try<sup>2</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

Please estimate how many large land animals ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. INCLUDE large land animals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A	B	C	D	E	SEX	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units <sup>3</sup>	
	USE?	REC?	GIVE?	TRY?	HAR?		number killed in each month														specify
MOOSE	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	IND
211,800,000																					IND
211,800,001																					IND
211,800,002																					IND
211,800,009																					IND
CARIBOU	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	IND
211,000,000																					IND
211,000,001																					IND
211,000,002																					IND
211,000,009																					IND
BLACK BEAR	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	IND
210,600,000																					IND
BROWN BEAR	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	IND
210,800,000																					IND
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	IND
																					IND
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	IND
																					IND
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	IND

During the last year, did your household use any other kind of large land animals?..... Y N

*IF YES, enter the name in a blank row above, and answer the questions in that row.*

<sup>1</sup> "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
<sup>2</sup> "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
<sup>3</sup> UNITS will differ by species and situation. Units may be pounds (lbs), Individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc

**SUBSISTENCE HARVESTS: SMALL LAND ANIMALS**

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt small land animals for subsistence, such as BEAVER, , or any other small land animals?..... Y N
2. During the last year (between JANUARY 1, 2012, AND DECEMBER 31, 2012), did you or members of your household USE or TRY TO HUNT small land animals?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

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

During the last year<sup>1</sup>, did you or members of your household....

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- D ...try<sup>2</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

Please estimate how many small land animals ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.  
 INCLUDE small land animals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	IF harvest is YES					number killed in each month												Units <sup>3</sup>	Number Used For Food or for Food & Fur			
	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January	February	March	April	May	June	July	August	September	October	November	December			Unknown		
BEAVER	Y N	Y N	Y N	Y N	Y N															IND		
220,200,000																						
MUSKRAT	Y N	Y N	Y N	Y N	Y N															IND		
222,400,000																						
SNOWSHOE HARE	Y N	Y N	Y N	Y N	Y N															IND		
221,004,000																						
PORCUPINE	Y N	Y N	Y N	Y N	Y N															IND		
222,600,000																						
TREE SQUIRREL	Y N	Y N	Y N	Y N	Y N															IND		
222,804,000																						
PARKA SQUIRREL (GROUND)	Y N	Y N	Y N	Y N	Y N															IND		
222,802,000																						
MARMOT	Y N	Y N	Y N	Y N	Y N															IND		
221,800,000																						
	Y N	Y N	Y N	Y N	Y N															IND		
	Y N	Y N	Y N	Y N	Y N															IND		

During the last year, did your household use any other kind of small land animals?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
 2 "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
 3 UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc

**LAND MAMMALS: 10** **MINTO: 228**

**SUBSISTENCE HARVESTS: FUR ANIMALS** HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt or trap for fur animals for subsistence, such as MARTEN, , or any other fur animals?..... Y N
2. During the last year (between JANUARY 1, 2012, AND DECEMBER 31, 2012), did you or members of your household USE or TRY TO HUNT OR TRAP FOR fur animals?..... Y N

*IF the answer to QUESTION 2 is NO, go to the LAND ANIMALS summary page.*

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

During the last year<sup>1</sup>, did you or members of your household....

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- D ...try<sup>2</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

Please estimate how many fur animals ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.  
 INCLUDE fur animals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting or trapping with or helping others, report ONLY this household's share of the

Read names below in blanks above	A	B	C	D	E	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units <sup>3</sup>	Number Used For Food or for Food & Fur
	USE?	REC?	GIVE?	TRY?	HAR?	number caught in each month													specify	
MARTEN	Y N	Y N	Y N	Y N	Y N														IND	
222,000,000																				
WOLVERINE	Y N	Y N	Y N	Y N	Y N														IND	
223,400,000																				
WOLF	Y N	Y N	Y N	Y N	Y N														IND	
223,200,000																				
RED FOX	Y N	Y N	Y N	Y N	Y N														IND	
220,804,000																				
LAND OTTER	Y N	Y N	Y N	Y N	Y N														IND	
221,200,000																				
LYNX	Y N	Y N	Y N	Y N	Y N														IND	
221,600,000																				
MINK	Y N	Y N	Y N	Y N	Y N														IND	
222,200,000																				
WEASEL	Y N	Y N	Y N	Y N	Y N														IND	
223,000,000																				
COYOTE	Y N	Y N	Y N	Y N	Y N														IND	
220,400,000																				
	Y N	Y N	Y N	Y N	Y N														IND	

During the last year, did your household use any other kind of fur animals?..... Y N

*IF YES, enter the name in a blank row above, and answer the questions in that row.*

<sup>1</sup> "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
<sup>2</sup> "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
<sup>3</sup> UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc

**SUBSISTENCE SUMMARY: LAND ANIMALS**

HOUSEHOLD ID

If this household did NOT USE or HARVEST land animals last year, go to the ASSESSMENT section below.  
 Otherwise, continue with mapping, network, and assessment sections...

**MAPPING**

Refer to data collection maps and mapping instructions to map land animals...

**NETWORKS**

... then ask the network and assessment questions below

During the last year<sup>1</sup>,

...who HARVESTED (GOT) the MOOSE your household used? (Enter most important sources first.)

211,800,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER Minto Households (Enter Household ID# of other Households)	People in OTHER communities (Other community name)
------	--	---	---

HARVESTED (GOT) MOOSE

1

...who PROCESSED the MOOSE your household used? (Enter most important sources first.)

PROCESSED MOOSE

2

...who else GAVE MOOSE to your household? (Enter most important sources first.)

GAVE MOOSE TO US

3

During the last 12 months...

...who HARVESTED (GOT) the CARIBOU your household used? (Enter most important sources first.)

211,000,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER Minto Households (Enter Household ID# of other Households)	People in OTHER communities (Other community name)
------	--	---	---

HARVESTED (GOT) CARIBOU

1

...who PROCESSED the CARIBOU your household used? (Enter most important sources first.)

PROCESSED CARIBOU

2

...who else GAVE CARIBOU to your household? (Enter most important sources first.)

GAVE CARIBOU TO US

3

**ASSESSMENTS:**

200,000,000

To conclude our land animals section, I am going to ask a few general questions about land animals.

During the last year<sup>1</sup>,

...did your household use LESS, SAME, or MORE land animals than in recent years?..... X L S M

If LESS or MORE...

X = do not use

WHY was your use different?.....

1

2

During the last year<sup>1</sup>,

...did your household GET ENOUGH land animals?..... Y N

If NO...

What KIND of land animals did you need?.....

WHY did your household NOT get enough land animals?.....

1

2

How would you describe the impact to your household

of not getting enough last year?..... not noticeable? minor? major? severe?  
 (0) (1) (2) (3)

Did your household do anything DIFFERENTLY because you did NOT get enough land animals?..... Y N

IF YES...

What did your household do differently?.....

1

2

**NETWORKS & ASSESSMENTS OF LAND ANIMALS: 66, 67**

**MINTO: 228**

**HARVESTS: BIRDS**

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt birds for subsistence, such as AMERICAN WIGEON, , or any other birds?..... Y N
2. During the last year (between JANUARY 1, 2009, AND DECEMBER 31, 2009), did you or members of your household USE or TRY TO HUNT birds?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

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

During the last year<sup>1</sup>, did you or members of your household....

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- D ...try<sup>2</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

IF harvest is YES

Please estimate how many birds ALL MEMBERS OF YOUR HOUSEHOLD killed for subsistence uses during the last year.

INCLUDE birds that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A	B	C	D	E	January February March April May June July August September October November December				Season of harvest unknown	Units <sup>3</sup>	
	USE?	REC?	GIVE?	TRY?	HAR?	WINTER	SPRING	SUMMER	FALL	number	specify	
AMERICAN WIGEON	Y N	Y N	Y N	Y N	Y N							IND
410,236,020												
TEAL	Y N	Y N	Y N	Y N	Y N							IND
410,232,990												
MALLARD	Y N	Y N	Y N	Y N	Y N							IND
410,214,000												
NORTHERN PINTAIL	Y N	Y N	Y N	Y N	Y N							IND
410,220,000												
LONG-TAILED DUCK (OLDSQUAW)	Y N	Y N	Y N	Y N	Y N							IND
410,218,000												
NORTHERN SHOVELER	Y N	Y N	Y N	Y N	Y N							IND
410,230,000												
BLACK SCOTER	Y N	Y N	Y N	Y N	Y N							IND
410,228,020												
SURF SCOTER	Y N	Y N	Y N	Y N	Y N							IND
410,228,040												
WHITE-WINGED SCOTER	Y N	Y N	Y N	Y N	Y N							IND
410,228,060												
SCAUP (BLUE-BILL)	Y N	Y N	Y N	Y N	Y N							IND
410,226,000												

BIRDS continued on next page...

<sup>1</sup> "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
<sup>2</sup> "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
<sup>3</sup> UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.

**HARVESTS: BIRDS**

HOUSEHOLD ID

*BIRDS continued from previous page...*

During the last year<sup>1</sup>, did you or members of your household...

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- E ...try<sup>2</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

IF harvest is YES

Please estimate how many birds ALL MEMBERS OF YOUR HOUSEHOLD killed for subsistence uses during the last year.

INCLUDE birds that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A	B	C	D	E	January	February	March	April	May	June	July	August	September	October	Season of harvest	Units <sup>3</sup>
	USE?	REC?	GIVE?	TRY?	HAR?	WINTER	SPRING	SUMMER	FALL	unknown	number	number	number	number	number	specify	

GOLDENEYE	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
410,210,990																	
DUCK (SPECIFY)	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
410,299,000																	
CANADA GEESE	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
410,404,990																	
WHITE-FRONTED GEESE	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
410,410,000																	
SNOW GEESE	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
410,408,000																	
GEESE (SPECIFY)	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
410,499,000																	
SWAN	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
410,699,000																	
SANDHILL CRANE	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
410,802,000																	
GROUSE	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
421,802,990																	
PTARMIGAN	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
421,804,000																	
GULL (SPECIFY)	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
411,212,990																	
ARCTIC TERN	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			IND
411,226,040																	

\* "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
 \*\* "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
 \*\*\* UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc

**HARVESTS: BIRDS** HOUSEHOLD ID

BIRDS continued from previous page...

During the last year<sup>1</sup>, did you or members of your household...

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- E ...try<sup>2</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

IF harvest is YES

Please estimate how many birds ALL MEMBERS OF YOUR HOUSEHOLD killed for subsistence uses during the last year.  
 INCLUDE birds that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A	B	C	D	E	January	February	March	April	May	June	July	August	September	October	Season of harvest	Units <sup>3</sup>
	USE?	REC?	GIVE?	TRY?	HAR?	WINTER	SPRING	SUMMER	FALL	unknown	number	number	number	number	number	specify	
SMALL SHOREBIRD (SPECIFY) 411,099,010	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N		IND
LARGE SHOREBIRD (SPECIFY) 411,099,020	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N		IND
LOON (SPECIFY) 411,216,990	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N		IND

During the last year, did your household use any other kind of birds?..... Y N

IF YES, enter the name in a blank row below and answer the questions in that row.

	A	B	C	D	E												
	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N		IND
	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N		IND
	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N		IND
	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N		IND
	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N		IND
	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N		IND
	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N		IND
	Y	N	Y	N	Y	Y	N	Y	N	Y	N	Y	N	Y	N		IND

\* "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
 \*\* "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
 \*\*\* UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc

**SUBSISTENCE HARVESTS: EGGS** HOUSEHOLD ID

1. Do you or members of your household USUALLY gather eggs for subsistence, such as WHITE-WINGED SCOTER (EGGS), CANADA GEESE EGGS, , or any other eggs?..... Y N
2. During the last year (between JANUARY 1, 2012, AND DECEMBER 31, 2012), did you or members of your household USE or TRY TO GATHER eggs?..... Y N

IF the answer to QUESTION 2 is NO, go to the BIRD & EGG summary page.

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

During the last year<sup>1</sup>, did you or members of your household...  
**A** ...use<sup>2</sup> \_\_\_\_\_?  
**B** ...receive \_\_\_\_\_ from another HH or community?  
**C** ...give \_\_\_\_\_ to another HH or community?  
**D** ...try<sup>2</sup> to harvest \_\_\_\_\_?  
**E** ...actually harvest any \_\_\_\_\_?

IF harvest is YES

Please estimate how many eggs ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.  
 INCLUDE eggs that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If gathering with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A	B	C	D	E	How many did you gather? amount	Units <sup>3</sup> specify	comments
	USE?	REC?	GIVE?	TRY?	HAR?			
WHITE-WINGED SCOTER EGGS	Y N	Y N	Y N	Y N	Y N		Ind.	
430,228,060								
DUCK EGGS (SPECIFY)	Y N	Y N	Y N	Y N	Y N		Ind.	
430,299,000								
CANADA GEESE EGGS	Y N	Y N	Y N	Y N	Y N		Ind.	
430,404,990								
GEESE EGGS (SPECIFY)	Y N	Y N	Y N	Y N	Y N		Ind.	
430,499,000								
GULL EGGS (SPECIFY)	Y N	Y N	Y N	Y N	Y N		Ind.	
431,212,990								
LARGE SHOREBIRD EGGS (SPECIFY)	Y N	Y N	Y N	Y N	Y N		Ind.	
431,099,020								
SMALL SHOREBIRD EGGS (SPECIFY)	Y N	Y N	Y N	Y N	Y N		Ind.	
431,099,010								
LOON EGGS (SPECIFY)	Y N	Y N	Y N	Y N	Y N		Ind.	
431,216,990								
	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 eggs?..... Y N   
 IF YES, enter the name in a blank row above, and answer the questions in that row.

<sup>1</sup> "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
<sup>2</sup> "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
<sup>3</sup> UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc

**SUBSISTENCE SUMMARY: BIRDS & EGGS**

HOUSEHOLD ID

*If this household did NOT USE or HARVEST birds & eggs last year, go to the ASSESSMENT section below.  
Otherwise, continue with mapping, network, and assessment sections...*

**MAPPING**

*Refer to data collection maps and mapping instructions to map birds & eggs...*

**NETWORKS**

*...then ask the network and assessment questions below*

During the last year<sup>1</sup>,

...who HARVESTED (GOT) the BIRDS your household used? (Enter most important sources first.)

430,000,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER Minto Households (Enter Household ID# of other Households)	People in OTHER communities (Other community name)
------	--	---	---

HARVESTED (GOT) BIRDS

1

...who PROCESSED the BIRDS your household used? (Enter most important sources first.)

PROCESSED BIRDS

2

...who else GAVE BIRDS to your household? (Enter most important sources first.)

GAVE BIRDS TO US

3

During the last 12 months...

...who GATHERED the EGGS your household used? (Enter most important sources first.)

121,200,002

role	People in THIS household (enter person ID# from page 2)	People in OTHER Minto Households (Enter Household ID# of other Households)	People in OTHER communities (Other community name)
------	--	---	---

GATHERED EGGS

1

...who PROCESSED the EGGS your household used? (Enter most important sources first.)

PROCESSED EGGS

2

...who else GAVE EGGS to your household? (Enter most important sources first.)

GAVE EGGS TO US

3

**ASSESSMENTS:**

400,000,000

To conclude our birds & eggs section, I am going to ask a few general questions about birds & eggs.

During the last year<sup>1</sup>,

...did your household use LESS, SAME, or MORE birds & eggs than in recent years?..... X L S M

If LESS or MORE...

X = do not use

WHY was your use different?.....

1

2

During the last year<sup>1</sup>,

...did your household GET ENOUGH birds & eggs?..... Y N

If NO...

What KIND of birds & eggs did you need?.....

WHY did your household NOT get enough birds & eggs?.....

1

2

How would you describe the impact to your household

of not getting enough last year?..... not noticeable? minor? major? severe?  
(0) (1) (2) (3)

Did your household do anything DIFFERENTLY because you did NOT get enough birds & eggs?..... Y N

IF YES...

What did your household do differently?.....

1

2

**NETWORKS & ASSESSMENTS OF BIRDS & EGGS: 66, 67**

**MINTO: 228**

**SUBSISTENCE HARVESTS: BERRIES** HOUSEHOLD ID

1. Do you or members of your household USUALLY pick berries for subsistence, such as BLUEBERRIES, , or any other berries?..... Y N
2. During the last year (between JANUARY 1, 2012, AND DECEMBER 31, 2012), did you or members of your household USE or TRY TO PICK berries?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

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

During the last year<sup>1</sup>, did you or members of your household....

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- D ...try<sup>2</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

Please estimate how many berries ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.  
 INCLUDE berries that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If picking with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A	B	C	D	E	How many did you pick? amount	Units <sup>3</sup> specify	comments
	USE?	REC?	GIVE?	TRY?	HAR?			
BLUEBERRIES	Y N	Y N	Y N	Y N	Y N		GAL	
601,002,000								
SALMONBERRY CLOUDBERRIES	Y N	Y N	Y N	Y N	Y N		GAL	
601,022,000								
BLACKBERRIES CROWBERRIES	Y N	Y N	Y N	Y N	Y N		GAL	
601,007,000								
LOW-BUSH CRANBERRIES	Y N	Y N	Y N	Y N	Y N		GAL	
601,004,000								
HIGH-BUSH CRANBERRIES	Y N	Y N	Y N	Y N	Y N		GAL	
601,006,000								
CURRANTS	Y N	Y N	Y N	Y N	Y N		GAL	
601,012,000								
RASPBERRY	Y N	Y N	Y N	Y N	Y N		GAL	
601,020,000								
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	

During the last year, did your household use any other kind of berries?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

<sup>1</sup> "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
<sup>2</sup> "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
<sup>3</sup> UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.

**SUBSISTENCE HARVESTS: GREENS** HOUSEHOLD ID

1. Do you or members of your household USUALLY pick greens for subsistence, such as DANDILION GREENS, , or any other greens?..... Y N
2. During the last year (between JANUARY 1, 2012, AND DECEMBER 31, 2012), did you or members of your household USE or TRY TO PICK greens?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

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

During the last year<sup>1</sup>, did you or members of your household....

- A ...use<sup>2</sup> \_\_\_\_\_?
- B ...receive \_\_\_\_\_ from another HH or community?
- C ...give \_\_\_\_\_ to another HH or community?
- D ...try<sup>2</sup> to harvest \_\_\_\_\_?
- E ...actually harvest any \_\_\_\_\_?

Please estimate how many greens ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.  
 INCLUDE greens that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If picking with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A		B		C		D		E		How many did you pick? <i>amount</i>	Units <sup>3</sup> <i>specify</i>	comments
	USE?	REC?	GIVE?	TRY?	HAR?	USE?	REC?	GIVE?	TRY?	HAR?			
DANDILION GREENS	Y	N	Y	N	Y	N	Y	N	Y	N		GAL	
602,027,000													
WILD RHUBARB	Y	N	Y	N	Y	N	Y	N	Y	N		GAL	
602,006,000													
FIREWEED	Y	N	Y	N	Y	N	Y	N	Y	N		GAL	
602,042,000													
STINKWEED	Y	N	Y	N	Y	N	Y	N	Y	N		GAL	
602,044,000													
HUDSON BAY TEA LABRADOR TEA	Y	N	Y	N	Y	N	Y	N	Y	N		GAL	
602,018,000													
FIDDLEHEAD FERNS	Y	N	Y	N	Y	N	Y	N	Y	N		GAL	
602,014,000													
WILD CELERY	Y	N	Y	N	Y	N	Y	N	Y	N		GAL	
602,032,000													
SOURDOCK	Y	N	Y	N	Y	N	Y	N	Y	N		GAL	
602,028,000													
WILLOW LEAVES	Y	N	Y	N	Y	N	Y	N	Y	N		GAL	
602,031,000													
OTHER WILD GREENS	Y	N	Y	N	Y	N	Y	N	Y	N		GAL	
602,038,000													

During the last year, did your household use any other kind of greens?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

<sup>1</sup> "LAST YEAR" means between JANUARY 1, 2012, and DECEMBER 31, 2012.  
<sup>2</sup> "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.  
<sup>3</sup> UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.



**SUBSISTENCE SUMMARY: BERRIES & GREENS**

HOUSEHOLD ID

*If this household did NOT USE or HARVEST berries & greens last year, go to the ASSESSMENT section below.  
Otherwise, continue with mapping, network, and assessment sections...*

**MAPPING** *Refer to data collection maps and mapping instructions to map berries & greens...*

**NETWORKS** *...then ask the network and assessment questions below*

**During the last year<sup>1</sup>,**  
...who PICKED the PLANTS your household used? (Enter most important sources first.) 602,043,002

role	People in THIS household <i>(enter person ID# from page 2)</i>	People in OTHER Minto Households <i>(Enter Household ID# of other Households)</i>	People in OTHER communities <i>(Other community name)</i>
------	---	--	--

PICKED PLANTS

1			
---	--	--	--

...who PROCESSED the PLANTS your household used? (Enter most important sources first.)

PROCESSED PLANTS

2			
---	--	--	--

...who else GAVE PLANTS to your household? (Enter most important sources first.)

GAVE PLANTS TO US

3			
---	--	--	--

**During the last 12 months...**  
...who CUT the FIREWOOD your household used? (Enter most important sources first.) 602,042,002

role	People in THIS household <i>(enter person ID# from page 2)</i>	People in OTHER Minto Households <i>(Enter Household ID# of other Households)</i>	People in OTHER communities <i>(Other community name)</i>
------	---	--	--

CUT FIREWOOD

1			
---	--	--	--

...who PROCESSED the FIREWOOD your household used? (Enter most important sources first.)

PROCESSED FIREWOOD

2			
---	--	--	--

...who else GAVE FIREWOOD to your household? (Enter most important sources first.)

GAVE FIREWOOD TO US

3			
---	--	--	--

**ASSESSMENTS:** 601,000,000

To conclude our berries & greens section, I am going to ask a few general questions about berries & greens.

**During the last year<sup>1</sup>,**  
...did your household use LESS, SAME, or MORE berries & greens 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<sup>1</sup>,**  
...did your household GET ENOUGH berries & greens?..... Y N   
If NO...  
What KIND of berries & greens did you need?.....   
WHY did your household NOT get enough berries & greens?.....  1   
 2

How would you describe the impact to your household  
of not getting enough last year?..... not noticeable? minor? major? severe?  
(0) (1) (2) (3)

Did your household do anything DIFFERENTLY because you did NOT get enough berries & greens?..... Y N   
IF YES...  
What did your household do differently?.....  1   
 2

**ASSESSMENTS** HOUSEHOLD ID

**SUBSISTENCE ASSESSMENTS: ALL RESOURCES** 0

To conclude our subsistence harvest section, I am going to ask a few general questions about ALL SUBSISTENCE RESOURCES.

Last year...

...did your household use LESS, SAME, or MORE subsistence resources than in recent years?..... X L S M

If LESS or MORE... *X = do not use*

WHY was your use different?.....   1   
  2

Last year...

...did your household GET ENOUGH subsistence resources?..... Y N

If NO...

What KIND of subsistence resources did you need?.....

WHY did your household NOT get enough all resources?.....   1   
  2

How would you describe the impact to your household  
of not getting enough all resources last year?.....  ...not noticable? ...minor? ...major? severe?  
(0) (1) (2) (3)

Did your household do anything DIFFERENTLY because you did NOT get enough all resources?..... Y N

IF YES...

What did your household do differently?.....   1   
  2

**FOOD SECURITY** HOUSEHOLD ID

The questions on this page have been asked all over the United States to find out if Americans have enough to eat. We would like to know if people in your community have enough to eat. I am going to read you FIVE statements about different food situations. Please tell me whether EACH statement was true for your household (HH) in the last 12 months.

Think about all your household's food, both subsistence and store-bought...

**STATEMENT 1. We WORRIED that our household would 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 Y

If YES...

...in which months did this happen?..... J F M A M J J A S O N D

...did this happen because your HH couldn't get SUBSISTENCE foods, your HH couldn't get STORE-BOUGHT foods, or your HH couldn't get BOTH KINDS of food?..... SUB STOR BOTH

**STATEMENT 2. We could not get the kinds of foods we needed to eat because of a LACK OF RESOURCES.**

HH4

By "lack of resources," we mean your household (HH) did NOT have what you needed to hunt, fish, gather, or buy food.

In the last 12 months, was this ever true for your household?..... N Y ?  if Y

If YES...

...in which months did this happen?..... J F M A M J J A S O N D

...did this happen because your HH couldn't get SUBSISTENCE foods, your HH couldn't get STORE-BOUGHT foods, or your HH couldn't get BOTH KINDS of food?..... SUB STOR BOTH

**STATEMENT 3. The food we had JUST DID NOT LAST, and we could not get more.**

HH3

In the last 12 months, was this ever true for your household?..... N Y ?  if Y

If YES, in which months did this happen?..... J F M A M J J A S O N D

Now, think just about your household's SUBSISTENCE food...

**STATEMENT 4. The SUBSISTENCE food we had just did not last, and we could not get more.**

In the last 12 months, was this ever true for your household?..... N Y ?

If YES, in which months did this happen?..... J F M A M J J A S O N D

Now, think just about your household's STORE-BOUGHT food...

**STATEMENT 5. The STORE-BOUGHT food we had just did not last, and we could not get more.**

In the last 12 months, was this ever true for your household?..... N Y ?

If YES, in which months did this happen?..... J F M A M J J A S O N D

If Statements 1, 2, AND 3 were ALL "NO," go to the next page.

If any ONE of Statements 1, 2, OR 3 was "YES," continue on this page...

In the last 12 months, did you or other adults in your household ever CUT THE SIZE OF YOUR MEALS OR SKIP MEALS because the HH could not get the food that was needed?..... N Y ?  AD1

If YES, in which months did this happen?..... J F M A M J J A S O N D

In the last 12 months, did you or other adults in your household ever EAT LESS THAN YOU FELT YOU SHOULD because the HH could not get the food that was needed?..... N Y ?  AD2

In the last 12 months, were adults in the HH ever HUNGRY BUT DID NOT EAT because there was not enough food?..... N Y ?  AD3

In the last 12 months, did adults in the HH LOSE WEIGHT because there was not enough food?..... N Y ?  AD4

In the last 12 months, did you or other adults in your household ever NOT EAT FOR A WHOLE DAY because there was not enough food?..... N Y ?  AD5

If YES, in which months did this happen?..... J F M A M J J A S O N D



# **Appendix B–Ethnographic Interview Protocol**

## Tofty Road Survey Ethnographic Protocol

### Part 1. Demographic Information

In the beginning of each interview, I recommend asking some basic demographic questions:

1. name
2. year/location born
3. parents names and where from?
4. how long has respondent been hunting/fishing?

Then, it is often useful to take the seasonal round approach when doing interviews and let people answer the questions below through the structure of a description of the parts of the seasonal round that they participate in. That way, you can also document seasonal camps used in the past or currently used by respondent. **[Keep in mind that you do not have to do it this way, but the species sections below are ordered by a seasonal round. Skip around if that works better for you and your respondent.]**

Beginning in the spring with bird hunting...

### Part 2. Migratory Bird hunting

*1. Please describe your current migratory bird hunting practices:*

- a. what are the primary species you try to get every year? Do you collect eggs (which kinds?)*
- b. who do you hunt with year to year? How is this determined?*
- c. if you are successful, what do you do with the birds – how do you distribute/share it?*
- d. How do you preserve/process your harvest?*
- e. how do you feel the different bird populations are doing right now? Why do you think the population is declining/increasing? Are the different bird species healthy?*
- f. Are there environmental factors that contribute to changes in bird migrations and hunting? (changing weather patterns, changing habitat, etc)*
- g. are younger people learning to hunt birds? If so, how do they do that? How did you learn?*

*h. can you show us where you hunt now (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?*

*i. are there any rules about hunting or the treatment of birds during hunting/harvest?*

*j. native names for birds or other aspects of bird hunting? Do you remember any traditional stories about birds or bird hunting in your village?*

*k. are there any natural seasonal indicators that you use to know when the birds will come?*

**Part 3. Non-salmon fishing – ask questions for each species** (households are likely to harvest multiple species. While we want to document all species they harvest, the most important species to cover will be: whitefish [differentiate species if possible], sheefish, and pike. If a household heavily harvests another species, document that as much as possible.)

*1. Please describe your current non-salmon fishing practices:*

*a. which species do you harvest? Timing of that harvest (for each species)?*

*b. do you fish with other people? How is this determined?*

*c. what are the primary means you use to harvest different species of non-salmon? (gear type by species?)*

*d. what do you do with the non-salmon you harvest – how do you distribute/share it?*

*e. are younger people learning to fish? If so, how do they do that? How did you learn?*

*f. how do you feel the non-salmon population is doing right now? Why do you think the population is declining/increasing? Are the non- salmon healthy?*

*g. Have your fishing areas changed at all? (map changes in area – currently and 10-20 years ago)*

*h. if there are changes to your fishing areas, what explains those changes? (environmental conditions, personal circumstances, traditional areas, changes in the fish population, regulations, etc)*

*i. Are there environmental factors that contribute to changes in non-salmon fishing? (weather, river conditions, etc)*

*g. which parts of the fish do you use? How do you preserve/process these parts?*

*h. are there any rules about fishing or the treatment of fish/nets during fishing?*

*i. native names for non- salmon species or other aspects of fishing? Do you remember any traditional stories about non-salmon species or fishing in your village?*

#### **Part 4. Salmon fishing**

*1. Please describe your current salmon fishing practices:*

*a. do you fish with other people? How is this determined?*

*b. which species do you harvest? Timing of that harvest?*

*c. what are the primary means you use to harvest salmon? (gear type by species?)*

*d. what do you do with the salmon you harvest – how do you distribute/share it?*

*e. which parts of the salmon do you use? How do you preserve/process these parts?*

*f. how do you feel the salmon population is doing right now? Why do you think the population is declining/increasing? Are the salmon healthy?*

*g. Have your fishing areas changed at all? (map changes in area – currently and 10-20 years ago)*

*h. if there are changes to your fishing areas, what explains those changes? (environmental conditions, personal circumstances, traditional areas, changes in the fish population, regulations, etc)*

*i. Are there environmental factors that contribute to changes in salmon fishing? (weather, river conditions, etc)*

*j. many people say that the elders used observations of the environment (changes in the land or water, weather, other animals' behavior) to know when salmon were coming and how many might come. Do you remember any of these 'natural indicators'?*

*k. are younger people learning to fish? If so, how do they do that? How did you learn?*

*l. are there any rules about fishing or the treatment of fish/nets during fishing?*

*m. native names for salmon species or other aspects of fishing? Do you remember any traditional stories about salmon or fishing in your village?*

## **Part 5. Moose hunting**

### *1. Please describe your current moose hunting practices*

- a. who do you hunt with year to year? How is this determined?*
- b. if you are successful, what do you do with the moose – how do you distribute/share it?*
- c. which parts of the moose do you use? How do you preserve/process these parts?*
- d. how do you feel the moose population is doing right now? Why do you think the population is declining/increasing (e.g. predation concerns, hard winters, good habitat, etc)? Are the moose healthy?*
- e. Are there environmental factors that contribute to changes in moose hunting? (weather, river conditions, etc)*
- f. are younger people learning to hunt? If so, how do they do that? How did you learn?*
- g. can you show us where you hunt now (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?*
- h. are there any rules about hunting or the treatment of moose or other animals during moose hunting/harvest?*
- i. native names for moose or other aspects of moose hunting? Do you remember any traditional stories about moose or moose hunting in your village?*

## **Part 6. Other large game hunting (brown bear, black bear, caribou)**

### *1. Please describe your current big game hunting practices (for each...)*

- a. who do you hunt with year to year? How is this determined?*
- b. if you are successful, what do you do with the bear/caribou – how do you distribute/share it?*
- c. which parts of the bear/caribou do you use? How do you preserve/process these parts?*
- d. how do you feel the bear/caribou population is doing right now? Why do you think the population is declining/increasing? Are they healthy?*
- e. can you show us where you hunt now (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?*

*f. Are there environmental factors that contribute to changes in bear/caribou hunting? (weather, river conditions, winter conditions, migratory routes (caribou), etc)*

*g. are younger people learning to hunt? If so, how do they do that? How did you learn?*

*h. are there any rules about hunting or the treatment of bear/caribou or other animals during moose hunting/harvest?*

*i. native names for bear/caribou or other aspects of bear/caribou hunting? Do you remember any traditional stories about bear/caribou or bear/caribou hunting in your village?*

## **Part 7. Trapping**

*1. Please describe your current trapping practices:*

*a. do you trap with anyone else? How is this determined?*

*b. how do you 'hold' your trapline? From whom (if anyone) did you get it/take it over?*

*c. are younger people learning to trap? If so, how do they do that? How did you learn?*

*d. what species do you trap? Why?*

*e. how do you feel the population of the animals you trap is doing right now? Why do you think the population is declining/increasing? Are the species you trap healthy?*

*f. can you show us where you trap now (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?*

*g. Are there environmental factors that contribute to changes in trapping? (changing weather, snow pack, river conditions, etc)*

# **Appendix C–Conversion Factors**

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 6 fall chum salmon, the quantity would be multiplied by the appropriate conversion factor ( in this case 5.0172) to show a harvest of 30.1 lb of fall chum salmon.

Resource name	Reported units	Conversion factor
Summer chum salmon	ind	5.0172
Fall chum salmon	ind	5.0172
Unknown chum salmon	ind	5.0172
Coho salmon	ind	6.4630
Coho salmon [CF retention]	ind	6.4630
Chinook salmon	ind	13.2370
Chinook salmon [CF retention]	ind	13.2370
Pink salmon [CF retention]	ind	3.6340
Sockeye salmon	ind	5.9997
Sockeye salmon [CF retention]	ind	5.9997
Salmon roe	ind	7.0000
Unknown salmon	ind	4.3200
Pacific herring	gal	6.0000
Pacific herring [CF retention]	gal	6.0000
Lingcod	ind	4.0000
Pacific halibut	lb	1.0000
Pacific halibut [CF retention]	lb	2.0000
Arctic lamprey [CF retention]	ind	0.6000
Yelloweye rockfish	ind	1.5000
Alaska blackfish	ind	0.7000
Burbot	ind	2.4000
Dolly Varden	ind	0.9000
Lake trout	ind	2.0000
Arctic grayling	ind	0.7000
Northern pike	ind	2.8000
Sheefish	ind	6.0000
Longnose sucker	ind	2.0000
Rainbow trout	ind	1.4000
Broad whitefish	ind	4.0000
Bering cisco	ind	1.4000
Least cisco	ind	0.4000
Humpback whitefish	ind	1.7500
Round whitefish	ind	1.0000
Unknown whitefishes	ind	1.7500
Black bear	ind	58.0000
Brown bear	ind	150.0000
Caribou	ind	130.0000
Muskox	ind	295.0000
Moose	ind	450.0000
Beaver	ind	15.0000
Coyote	ind	0.0000
Red fox	ind	0.0000

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Resource name	Reported units	Conversion factor
Snowshoe hare	ind	2.0000
North American river (land) otter	ind	3.0000
Lynx	ind	4.0000
Marmot	ind	8.0000
Marten	ind	0.0000
Mink	ind	2.0000
Muskrat	ind	1.8000
Porcupine	ind	4.5000
Arctic ground (parka) squirrel	ind	0.6000
Red (tree) squirrel	ind	0.5000
Northern flying squirrel	ind	0.5000
Weasel	ind	0.0000
Wolf	ind	0.0000
Wolverine	ind	0.0000
Goldeneye	ind	0.8000
Mallard	ind	1.0000
Long-tailed duck	ind	1.5000
Northern pintail	ind	0.8000
Scaup	ind	0.9000
Black scoter	ind	0.9000
Surf scoter	ind	0.9000
White-winged scoter	ind	2.2900
Northern shoveler	ind	1.0900
Unknown teal	ind	0.5000
American wigeon	ind	1.3100
Unknown ducks	ind	0.8000
Canada goose	ind	1.2000
Snow goose	ind	3.0000
White-fronted goose	ind	2.4000
Unknown goose	ind	5.0000
Unknown swan	ind	6.0000
Sandhill crane	ind	8.4000
Unknown shorebirds–small	ind	0.1000
Unknown shorebirds–large	ind	0.1000
Unknown gull	ind	1.0000
Unknown loon	ind	3.0000
Arctic tern	ind	1.0000
Grouse	ind	0.7000
Unknown grouse	ind	0.7000
Unknown ptarmigan	ind	0.5000
White-winged scoter eggs	ind	0.1500
Unknown duck eggs	ind	0.1500
Canada geese eggs	ind	0.2500
Unknown geese eggs	ind	0.2500
Unknown small shorebird eggs	ind	0.0500
Unknown large shorebird eggs	ind	0.0500
Mew gull eggs	ind	0.3000
Unknown gull eggs	ind	0.3000
Unknown loon eggs	ind	0.1800

-continued-

Resource name	Reported units	Conversion factor
Murre eggs	ind	0.1800
Unknown eggs	ind	0.1500
Unknown clams	gal	3.0000
Unknown clams [CF retention]	gal	3.0000
Razor clams	gal	3.0000
Unknown crabs [CF retention]	ind	2.1000
King crab	ind	2.3000
Tanner crab	ind	1.6000
Mussels	gal	1.5000
Shrimp	gal	2.0000
Unknown marine invertebrates	gal	2.1300
Blueberry	gal	4.0000
Lowbush cranberry	gal	4.0000
Highbush cranberry	gal	0.2500
Crowberry	gal	4.0000
Currants	gal	1.0000
Nagoonberry	gal	4.0000
Raspberry	gal	4.0000
Salmonberry	gal	4.0000
Strawberry	gal	4.0000
Other wild berry	gal	4.0000
Wild rhubarb	gal	1.0000
Eskimo potato	gal	4.0000
Fiddlehead ferns	gal	1.0000
Nettle	gal	1.0000
Hudson's Bay (Labrador) tea	gal	1.0000
Dandelion greens	gal	1.0000
Sourdock	gal	1.0000
Spruce tips	gal	0.1300
Willow leaves	gal	0.1300
Wild celery	gal	1.0000
Wild rose hips	gal	1.0000
Other wild greens	gal	0.2500
Unknown mushrooms	gal	1.0000
Fireweed	gal	0.0600
Plantain	gal	1.0000
Stinkweed	gal	1.0000
Punk	gal	1.0000
Puffballs	gal	1.0000
Orange boletes	gal	0.2500
Other wood	cord	0.0000

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

## **Appendix D–Additional Tables**

Table D1-1. – Comparison of selected findings, study communities, 2012.

Category	Manley Hot Springs	Minto
<b>Demography</b>		
Population	123.1	176.4
Percentage of population that is Alaska Native	23.0%	95.5%
Percentage of household heads born in Alaska	23.0%	94.4%
Average length of residency of household heads (year)	19.5	21.0
<b>Cash Economy</b>		
Average number of months employed	8.4	8.1
Percentage of employed adults working year-round	41.5%	42.1%
Percentage of income from sources other than employment	19.0%	26.3%
Average household income <sup>a</sup>	\$41,627	\$38,387
Per capita income <sup>a</sup>	\$19,617	\$13,277
<b>Resource harvest and use</b>		
Per capita harvest, pounds usable weight	426.1	225.5
Average household harvest, pounds usable weight	904.1	652.0
Number of resources used by 50% or more households	6.0	6.0
Average number of resources used per household	13.9	12.2
Average number of resources attempted to be harvested per household	10.7	8.6
Average number of resources harvested per household	9.3	8.1
Average number of resources received per household	5.8	4.8
Average number of resources given away per household	2.6	3.8
Percentage of total harvest taken by top 25% ranked households	92.4%	80.1%
Percentage of households that harvested 70% of harvest	7.3%	17.4%
Per capita harvest by lowest ranked 50% of households	4.8	5.6
Percentage of total harvest taken by lowest ranked 50% of harvesting households	1.1%	2.5%
Average number of resources used by lowest ranked 50% of households	9.4	9.2
Average number of resources used by top 25% ranked households	22.3	18.7

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

a. Includes income from sources other than employment.

Table D2-1. – Residence of parents of households heads when born, Manley Hot Springs, 2012.

Residence of parents of household heads	Community of residence of household head
	Manley Hot Springs
Fairbanks	9.8%
Gakona	1.6%
Manley Hot Springs	4.9%
Shishmaref	1.6%
Tanana	3.3%
Folger	1.6%
Other U.S.	75.4%
Foreign	1.6%

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

Table D2-2. – Resource harvest and use characteristics, Manley Hot Springs, 2012.

Characteristic	
<b>Number of resources used per household</b>	
Minimum	2
Maximum	30
95% confidence limit (±)	10.4%
Mean	13.9
Median	11
<b>Number of resources attempted to harvest per household</b>	
Minimum	0
Maximum	28
95% confidence limit (±)	12.4%
Mean	10.7
Median	9
<b>Number of resources harvested per household</b>	
Minimum	0
Maximum	27
95% confidence limit (±)	14.0%
Mean	9.3
Median	7
<b>Number of resources received per household</b>	
Minimum	0
Maximum	21
95% confidence limit (±)	14.0%
Mean	5.8
Median	5
<b>Number of resources given away per household</b>	
Minimum	0
Maximum	11
95% confidence limit (±)	19.0%
Mean	2.6
Median	2
<b>Household harvest (pounds)</b>	
Minimum	0
Maximum	13,400
Mean	904.1
Median	84.5
Total harvest weight (pounds)	52,437.6
Community per capita harvest (pounds)	426.1
Percentage of households using any resource	100.0%
Percentage of households attempting to harvest any resource	97.6%
Percentage of households harvesting any resource	97.6%
Percentage of households receiving any resource	92.7%
Percentage of households giving away any resource	70.7%
Number of households in sample	41
Number of resources asked about and identified voluntarily by respondents	126

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

Table D2-3. – Estimated harvest of salmon and nonsalmon fish for consumption by dogs, Manley Hot Springs, 2012.

Resource	Amount	Pounds
<b>Nonsalmon fish</b>		
Lingcod	0.0 ind	0.0 lb
Yelloweye rockfish	0.0 ind	0.0 lb
Longnose sucker	7.1 ind	14.1 lb
Arctic grayling	0.0 ind	0.0 lb
Burbot	0.0 ind	0.0 lb
Rainbow trout	0.0 ind	0.0 lb
Pacific halibut	0.0 ind	0.0 lb
Northern pike	108.8 ind	304.5 lb
Whitefishes	1,004.4 ind	1,536.6 lb
<b>Salmon</b>		
Unknown chum salmon	0.0 ind	0.0 lb
Pink salmon	0.0 ind	0.0 lb
Salmon roe	0.0 ind	0.0 lb
Unknown salmon	0.0 ind	0.0 lb
Sockeye salmon	0.0 ind	0.0 lb
Summer chum salmon	396.1 ind	1,987.3 lb
Chinook salmon	14.1 ind	187.3 lb
Coho salmon	1,683.4 ind	10,879.9 lb
Fall chum salmon	2,673.7 ind	13,414.3 lb
<b>Total fish</b>	<b>5,887.5 ind</b>	<b>28,324.0 lb</b>
<b>Whitefishes</b>		
Unknown whitefishes	0.0 ind	0.0 lb
Round whitefish	0.0 ind	0.0 lb
Sheefish	7.1 ind	42.4 lb
Broad whitefish	70.7 ind	282.9 lb
Least cisco	212.2 ind	84.9 lb
Humpback whitefish	360.7 ind	631.3 lb
Bering cisco	353.7 ind	495.1 lb
<b>Subtotal</b>	<b>1,004.4 ind</b>	<b>1,536.6 lb</b>

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

Table D2-4. – Estimated large land mammal harvest by month and sex, Manley Hot Springs, 2012.

Harvest month	Black bear	Brown bear	Caribou			Moose		
	Unknown	Unknown	Male	Female	Unknown	Male	Female	Unknown
January	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
February	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
March	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
April	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
June	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
August	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
September	0.0	0.0	0.0	0.0	0.0	5.7	0.0	0.0
October	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
November	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
December	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total harvest</b>	<b>1.4</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>5.7</b>	<b>0.0</b>	<b>0.0</b>

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

Table D2-5. – Estimated small land mammal harvest by month, Manley Hot Springs, 2012.

Resource	Estimated harvest by month												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk
Beaver	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	4.2	0.0	8.5	0.0	0.4
Coyote	0.0	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Red fox	7.1	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9
Snowshoe hare	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	2.8	0.0	0.4
River (land) otter	2.8	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Lynx	8.5	15.6	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Marten	43.9	43.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.7	29.7	44.3
Mink	2.8	2.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Porcupine	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red (tree) squirrel	0.0	0.0	0.0	0.0	0.0	11.3	11.3	11.3	0.0	0.0	0.0	0.0	0.0
Northern flying 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	1.4
Weasel	5.7	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.4
Gray wolf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3
Wolverine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9
<b>Total harvest</b>	<b>70.7</b>	<b>76.4</b>	<b>5.7</b>	<b>0.0</b>	<b>2.8</b>	<b>18.4</b>	<b>11.3</b>	<b>11.3</b>	<b>4.2</b>	<b>0.0</b>	<b>41.0</b>	<b>29.7</b>	<b>91.6</b>

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

Table D2-6. – Estimated bird harvest by season, Manley Hot Springs, 2012.

Resource	Estimated harvest by season				Season unknown
	Winter	Summer	Spring	Fall	
Goldeneye	0.0	0.0	0.0	2.8	0.0
Mallard	0.0	5.7	0.0	15.6	0.0
Long-tailed duck	0.0	0.0	0.0	0.0	0.0
Northern pintail	0.0	0.0	0.0	0.0	0.0
Scaup	0.0	0.0	0.0	2.8	0.0
Black scoter	0.0	0.0	0.0	0.0	0.0
Surf scoter	0.0	0.0	0.0	0.0	0.0
White-winged scoter	0.0	0.0	0.0	7.1	0.0
Northern shoveler	0.0	0.0	0.0	2.8	0.0
Unknown teal	0.0	2.8	0.0	0.0	0.0
American wigeon	0.0	0.0	0.0	4.2	0.0
Unknown ducks	0.0	0.0	0.0	0.0	0.0
Canada goose	0.0	0.0	0.0	0.0	0.0
Snow goose	0.0	0.0	0.0	0.0	0.0
White-fronted goose	0.0	0.0	9.9	0.0	0.0
Unknown goose	0.0	0.0	0.0	0.0	0.0
Unknown swan	0.0	0.0	0.0	0.0	0.0
Sandhill crane	0.0	0.0	0.0	0.0	0.0
Unknown shorebirds–small	0.0	0.0	0.0	0.0	0.0
Unknown shorebirds–large	0.0	0.0	0.0	0.0	0.0
Unknown gull	0.0	0.0	0.0	0.0	0.0
Unknown loon	0.0	0.0	0.0	0.0	0.0
Arctic tern	0.0	0.0	0.0	0.0	0.0
Unknown grouse	2.8	4.2	5.7	249.0	17.0
Unknown ptarmigan	0.0	0.0	0.0	2.8	0.0
<b>Total harvest</b>	<b>2.8</b>	<b>12.7</b>	<b>15.6</b>	<b>287.2</b>	<b>17.0</b>

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

Table D2-7. – Reasons use of resources was less than recent years, by category, Manley Hot Springs, 2012.

Reason	Reasons for less use as compared to recent years													
	Marine												All resources	
	Salmon		Nonsalmon fish		invertebrates		Land mammals		Birds and eggs		Vegetation		Number	Percentage
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Family or personal	0.0	0.0%	1.0	8.3%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	4.5%
Resource availibility	5.0	27.8%	1.0	8.3%	0.0	0.0%	1.0	7.1%	4.0	57.1%	3.0	37.5%	8.0	36.4%
Resources too far	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	7.1%	0.0	0.0%	0.0	0.0%	0.0	0.0%
No equipment/equipment problems	2.0	11.1%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	4.5%
Did not recieve	1.0	5.6%	0.0	0.0%	0.0	0.0%	4.0	28.6%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Did not try/low effort	0.0	0.0%	1.0	8.3%	0.0	0.0%	1.0	7.1%	2.0	28.6%	0.0	0.0%	1.0	4.5%
Unsuccessful (unlucky)	1.0	5.6%	1.0	8.3%	0.0	0.0%	6.0	42.9%	0.0	0.0%	0.0	0.0%	4.0	18.2%
Weather/environment	3.0	16.7%	2.0	16.7%	0.0	0.0%	1.0	7.1%	0.0	0.0%	0.0	0.0%	1.0	4.5%
Other	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Working/not enough time	4.0	22.2%	4.0	33.3%	0.0	0.0%	3.0	21.4%	1.0	14.3%	4.0	50.0%	12.0	54.5%
Regulations	8.0	44.4%	3.0	25.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	4.0	18.2%
Resources too small/diseased	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Did not get enough	0.0	0.0%	1.0	8.3%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	12.5%	0.0	0.0%
Did not need	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	12.5%	1.0	4.5%
Did not give any away	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Too expensive (fuel)	0.0	0.0%	1.0	8.3%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Used other resources	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%

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

Table D2-8. – Reported impacts to households responding that they did not get enough of a type of resource, Manley Hot Springs, 2012.

Resource category	Sampled households	Households not getting enough _____ .				Impact to those not getting enough _____ .									
		Valid responses		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
Salmon	41	39	95.1%	23	59.0%	1	4.3%	4	17.4%	9	39.1%	7	30.4%	2	8.7%
Nonsalmon fish	41	34	82.9%	17	50.0%	3	17.6%	3	17.6%	7	41.2%	2	11.8%	2	11.8%
Marine invertebrates	41	3	7.3%	2	66.7%	1	50.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Land mammals	41	34	82.9%	20	58.8%	3	15.0%	0	0.0%	8	40.0%	5	25.0%	4	20.0%
Birds and eggs	41	22	53.7%	8	36.4%	1	12.5%	3	37.5%	3	37.5%	1	12.5%	0	0.0%
Vegetation	41	40	97.6%	14	35.0%	0	0.0%	1	7.1%	10	71.4%	3	21.4%	0	0.0%
All resources	41	40	97.6%	23	57.5%	4	17.4%	0	0.0%	8	34.8%	8	34.8%	3	13.0%

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

Table D2-9. – Reasons use of resources was more than recent years, by category, Manley Hot Springs, 2012.

Reason	Reasons for more use as compared to recent years													
	Marine													
	Salmon		Nonsalmon fish		invertebrates		Land mammals		Birds and eggs		Vegetation		All resources	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Increased availability	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Used other resources	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Good weather	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Received more	2.0	40.0%	2.0	33.3%	0.0	0.0%	2.0	50.0%	0.0	0.0%	1.0	16.7%	0.0	0.0%
Needed more	1.0	20.0%	1.0	16.7%	0.0	0.0%	2.0	50.0%	0.0	0.0%	2.0	33.3%	4.0	66.7%
Increased effort	2.0	40.0%	2.0	33.3%	0.0	0.0%	0.0	0.0%	0.0	0.0%	3.0	50.0%	1.0	16.7%
Got more help	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	16.7%	0.0	0.0%
Other	0.0	0.0%	0.0	0.0%	1.0	100.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	16.7%
Regulations	0.0	0.0%	1.0	16.7%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Traveled farther	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Increased success	0.0	0.0%	1.0	16.7%	0.0	0.0%	0.0	0.0%	1.0	100.0%	0.0	0.0%	0.0	0.0%
Needed less	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Store-bought too expensive	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Had more equipment	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%

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

Table D2-10. – Resources households reported needing more of, Manley Hot Springs, 2012.

Resource	Households needing	Percentage of households responding
Unknown	7	20.0%
Fish	3	8.6%
Salmon	8	22.9%
Chum salmon	1	2.9%
Chinook salmon	14	40.0%
Sockeye salmon	1	2.9%
Nonsalmon fish	3	8.6%
Pacific halibut	1	2.9%
Arctic grayling	2	5.7%
Northern pike	2	5.7%
Sheefish	3	8.6%
Whitefishes	1	2.9%
Broad whitefish	1	2.9%
Unknown whitefishes	1	2.9%
Black bear	1	2.9%
Moose	17	48.6%
Snowshoe hare	1	2.9%
Marten	1	2.9%
Mink	1	2.9%
Birds and eggs	3	8.6%
Ducks	1	2.9%
Geese	1	2.9%
Grouse	1	2.9%
Clams	1	2.9%
Crabs	1	2.9%
Vegetation	2	5.7%
Berries	4	11.4%
Blueberry	6	17.1%
Lowbush cranberry	1	2.9%
Wood	5	14.3%

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

Table D2-11. – Reasons households reported for why they did not get enough of a resource, Manley Hot Springs, 2012.

Resource by category	Reasons															
	Households reporting wanting more	No reason given	Personal/family	Resource not available	Too far to get it	No equipment/problems	Not given any	No hunting/low effort	Unsuccessful (unlucky)	Weather/environment	Other	Working/no time	Regulations	Resources too small/diseased	Gas prices too high	Did not get enough
Salmon	23	5	1	4	0	3	3	0	0	3	7	4	0	0	0	0
Nonsalmon fish	17	6	1	1	0	0	0	1	1	0	2	6	0	0	1	1
Marine invertebrates	2	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Land mammals	20	3	0	3	1	0	3	3	7	1	0	3	0	0	0	1
Birds and eggs	8	4	0	1	0	0	0	2	0	0	0	1	0	0	0	0
Vegetation	14	5	1	4	0	0	0	0	0	0	1	5	0	0	0	0
All resources	23	3	1	7	0	1	0	1	4	1	2	12	0	0	1	0

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

Note Households were able to give more than one response.

Table D3-1. – Residence of parents of households heads when born, Minto, 2012.

Residence of parents of household heads	Community of residence of household head
	Minto
Barrow	1.4%
Beaver	1.4%
Fairbanks	4.2%
Huslia	1.4%
Kaltag	1.4%
Minto	74.6%
Nulato	1.4%
Stevens Village	2.8%
Tanana	5.6%
Other U.S.	5.6%

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

Table D3-2. – Resource harvest and use characteristics, Minto, 2012.

Characteristic	
<b>Number of resources used per household</b>	
Minimum	0
Maximum	32
95% confidence limit (±)	9.7%
Mean	12.2
Median	10.5
<b>Number of resources attempted to harvest per household</b>	
Minimum	0
Maximum	30
95% confidence limit (±)	12.8%
Mean	8.6
Median	7
<b>Number of resources harvested per household</b>	
Minimum	0
Maximum	30
95% confidence limit (±)	13.5%
Mean	8.1
Median	7
<b>Number of resources received per household</b>	
Minimum	0
Maximum	23
95% confidence limit (±)	12.6%
Mean	4.8
Median	3.5
<b>Number of resources given away per household</b>	
Minimum	0
Maximum	19
95% confidence limit (±)	17.2%
Mean	3.8
Median	2
<b>Household harvest (pounds)</b>	
Minimum	0
Maximum	6,886
Mean	652.0
Median	122
Total harvest weight (pounds)	39,772.2
Community per capita harvest (pounds)	225.5
Percentage of households using any resource	97.8%
Percentage of households attempting to harvest any resource	95.7%
Percentage of households harvesting any resource	93.5%
Percentage of households receiving any resource	93.5%
Percentage of households giving away any resource	73.9%
Number of households in sample	46
Number of resources asked about and identified voluntarily by respondents	114

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

Table D3-3. – Estimated harvest of salmon and nonsalmon fish for consumption by dogs, Minto, 2012.

Resource	Amount	Pounds
<b>Nonsalmon fish</b>		
Longnose sucker	13.3 ind	26.5 lb
Alaska blackfish	0.0 ind	0.0 lb
Burbot	0.0 ind	0.0 lb
Northern pike	262.6 ind	735.2 lb
Whitefishes	212.2 ind	618.3 lb
<b>Salmon</b>		
Unknown chum salmon	0.0 ind	0.0 lb
Pink salmon	0.0 ind	0.0 lb
Unknown salmon	0.0 ind	0.0 lb
Chinook salmon	0.0 ind	0.0 lb
Sockeye salmon	0.0 ind	0.0 lb
Coho salmon	99.5 ind	642.8 lb
<b>Total fish</b>	<b>587.5 ind</b>	<b>2,022.8 lb</b>
<b>Whitefishes</b>		
Bering cisco	0.0 ind	0.0 lb
Round whitefish	0.0 ind	0.0 lb
Least cisco	0.0 ind	0.0 lb
Sheefish	26.5 ind	159.1 lb
Unknown whitefishes	66.3 ind	116.0 lb
Broad whitefish	59.7 ind	238.7 lb
Humpback whitefish	59.7 ind	104.4 lb
<b>Subtotal</b>	<b>212.2 ind</b>	<b>618.3 lb</b>

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

Table D3-4. – Estimated large land mammal harvest by month and sex, Minto, 2012.

Harvest month	Black bear	Brown bear	Caribou			Moose			Dall sheep
	Unknown	Unknown	Male	Female	Unknown	Male	Female	Unknown	Unknown
January	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
February	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
March	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
April	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
June	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
August	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0
September	2.7	0.0	0.0	0.0	0.0	19.9	2.7	0.0	0.0
October	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
November	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0
December	0.0	0.0	0.0	0.0	0.0	0.0	5.3	0.0	1.3
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total harvest</b>	<b>4.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>21.2</b>	<b>11.9</b>	<b>0.0</b>	<b>1.3</b>

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

Table D3-5. – Estimated small land mammal harvest by month, Minto, 2012.

Resource	Estimated harvest by month													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	
Beaver	13.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Red fox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Snowshoe hare	6.6	6.6	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	
River (land) otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lynx	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Marten	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.0	
Mink	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Muskrat	0.0	0.0	0.0	0.0	6.6	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Red (tree) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Weasel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Gray wolf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wolverine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Total harvest</b>	<b>30.5</b>	<b>8.0</b>	<b>2.7</b>	<b>0.0</b>	<b>6.6</b>	<b>2.7</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>19.9</b>	<b>0.0</b>	

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

Table D3-6. – Estimated bird harvest by season, Minto, 2012.

Resource	Estimated harvest by season				Season
	Winter	Summer	Spring	Fall	unknown
Canvasback	0.0	0.0	10.6	0.0	0.0
Goldeneye	0.0	0.0	19.9	5.3	0.0
Mallard	0.0	0.0	80.2	72.3	0.0
Long-tailed duck	0.0	0.0	103.4	0.0	0.0
Northern pintail	0.0	0.0	62.3	11.9	0.0
Scaup	0.0	0.0	6.6	0.0	0.0
Black scoter	0.0	0.0	201.6	0.0	0.0
Surf scoter	0.0	0.0	87.5	0.0	0.0
White-winged scoter	0.0	0.0	79.6	0.0	0.0
Northern shoveler	0.0	0.0	2.7	0.0	0.0
Unknown teal	0.0	0.0	6.6	0.0	0.0
American wigeon	0.0	0.0	20.6	11.9	0.0
Unknown ducks	0.0	0.0	0.0	6.6	0.1
Canada goose	0.0	0.0	94.2	27.8	2.7
Snow goose	0.0	0.0	1.3	0.0	0.0
White-fronted goose	0.0	0.0	185.7	41.1	0.0
Unknown goose	0.0	0.0	0.0	0.0	0.0
Unknown swan	0.0	0.0	0.0	0.0	0.0
Sandhill crane	0.0	0.0	1.3	0.0	0.0
Unknown shorebirds–small	0.0	0.0	0.0	0.0	0.0
Unknown shorebirds–large	0.0	0.0	0.0	0.0	0.0
Unknown gull	0.0	0.0	0.0	0.0	0.0
Unknown loon	0.0	0.0	0.0	0.0	0.0
Arctic tern	0.0	0.0	0.0	0.0	0.0
Unknown grouse	0.0	0.0	0.0	216.2	0.0
Unknown ptarmigan	0.0	0.0	0.0	21.2	0.0
Unknown other birds	0.0	0.0	0.0	0.0	0.0
<b>Total harvest</b>	<b>0.0</b>	<b>0.0</b>	<b>964.1</b>	<b>414.4</b>	<b>2.9</b>

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

Table D3-7. – Reasons use of resources was less than recent years, by category, Minto, 2012.

Reason	Reasons for less use as compared to recent years													
	Marine													
	Salmon		Nonsalmon fish		invertebrates		Land mammals		Birds and eggs		Vegetation		All resources	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Family or personal	0.0	0.0%	2.0	16.7%	0.0	0.0%	2.0	20.0%	1.0	11.1%	0.0	0.0%	2.0	12.5%
Resource availability	11.0	39.3%	2.0	16.7%	0.0	0.0%	1.0	10.0%	2.0	22.2%	6.0	37.5%	6.0	37.5%
Resources too far	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
No equipment/equipment problems	2.0	7.1%	0.0	0.0%	0.0	0.0%	2.0	20.0%	0.0	0.0%	0.0	0.0%	1.0	6.3%
Did not receive	7.0	25.0%	1.0	8.3%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	6.3%	1.0	6.3%
Did not try/low effort	4.0	14.3%	4.0	33.3%	0.0	0.0%	0.0	0.0%	4.0	44.4%	4.0	25.0%	1.0	6.3%
Unsuccessful (unlucky)	1.0	3.6%	0.0	0.0%	0.0	0.0%	4.0	40.0%	0.0	0.0%	0.0	0.0%	5.0	31.3%
Weather/environment	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	10.0%	0.0	0.0%	4.0	25.0%	1.0	6.3%
Other	2.0	7.1%	1.0	8.3%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	6.3%	0.0	0.0%
Working/not enough time	3.0	10.7%	0.0	0.0%	0.0	0.0%	1.0	10.0%	2.0	22.2%	2.0	12.5%	1.0	6.3%
Regulations	6.0	21.4%	1.0	8.3%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	6.3%
Resources too small/diseased	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Did not get enough	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	6.3%	1.0	6.3%
Did not need	0.0	0.0%	1.0	8.3%	0.0	0.0%	1.0	10.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Did not give any away	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Too expensive (fuel)	0.0	0.0%	1.0	8.3%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	6.3%
Used other resources	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%

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

Table D3-8. – Reported impacts to households responding that they did not get enough of a type of resource, Minto, 2012.

Resource category	Sampled households	Households not getting enough _____ .				Impact to those not getting enough _____ .									
		Valid responses		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
Salmon	46	44	95.7%	20	45.5%	0	0.0%	1	5.0%	8	40.0%	10	50.0%	1	5.0%
Nonsalmon fish	46	36	78.3%	9	25.0%	0	0.0%	1	11.1%	5	55.6%	2	22.2%	1	11.1%
Marine invertebrates	46	1	2.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	46	43	93.5%	6	14.0%	0	0.0%	0	0.0%	2	33.3%	1	16.7%	3	50.0%
Birds and eggs	46	39	84.8%	7	17.9%	0	0.0%	1	14.3%	4	57.1%	0	0.0%	2	28.6%
Vegetation	46	43	93.5%	15	34.9%	1	6.7%	1	6.7%	8	53.3%	4	26.7%	1	6.7%
All resources	46	46	100.0%	12	26.1%	0	0.0%	0	0.0%	3	25.0%	7	58.3%	2	16.7%

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

Table D3-9. – Resources households reported needing more of, Minto, 2012.

Resource	Households needing	Percentage of households responding
Unknown	4	14.3%
All resources	1	3.6%
Fish	4	14.3%
Salmon	2	7.1%
Coho salmon	1	3.6%
Chinook salmon	18	64.3%
Nonsalmon fish	1	3.6%
Northern pike	1	3.6%
Sheefish	2	7.1%
Whitefishes	3	10.7%
Land mammals	1	3.6%
Moose	6	21.4%
Birds and eggs	1	3.6%
Ducks	3	10.7%
Geese	2	7.1%
Berries	1	3.6%
Blueberry	10	35.7%
Salmonberry	1	3.6%
Wild rhubarb	1	3.6%

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

Table D3-10. – Reasons use of resources was more than recent years, by category, Minto, 2012.

Reason	Reasons for more use as compared to recent years													
	Marine												All resources	
	Salmon		Nonsalmon fish		invertebrates		Land mammals		Birds and eggs		Vegetation		Number	Percentage
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Increased availability	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	16.7%	0.0	0.0%	0.0	0.0%
Used other resources	0.0	0.0%	1.0	50.0%	0.0	0.0%	1.0	25.0%	1.0	16.7%	0.0	0.0%	0.0	0.0%
Good weather	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Received more	1.0	50.0%	1.0	50.0%	0.0	0.0%	1.0	25.0%	2.0	33.3%	0.0	0.0%	0.0	0.0%
Needed more	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	25.0%	0.0	0.0%	0.0	0.0%	1.0	100.0%
Increased effort	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	3.0	100.0%	0.0	0.0%
Got more help	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Other	0.0	0.0%	0.0	0.0%	0.0	0.0%	2.0	50.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Regulations	1.0	50.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Traveled farther	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Increased success	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	16.7%	0.0	0.0%	0.0	0.0%
Needed less	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Store-bought too expensive	0.0	0.0%	0.0	0.0%	0.0	0.0%	1.0	25.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Had more equipment	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%

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

Table D3-11. – Reasons households reported for why they did not get enough of a resource, Minto, 2012.

Resource by category	Reasons															
	Households reporting wanting more	No reason given	Personal/family	Resource not available	Too far to get it	No equipment/problems	Not given any	No hunting/low effort	Unsuccessful (unlucky)	Weather/environment	Other	Working/no time	Regulations	Resources too small/diseased	Gas prices too high	Did not get enough
Salmon	20	7	0	6	0	0	1	1	0	0	7	1	0	0	1	0
Nonsalmon fish	9	3	1	2	0	0	0	3	0	0	0	0	0	0	0	0
Marine invertebrates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land mammals	6	1	1	0	0	1	1	0	3	0	0	1	0	0	0	0
Birds and eggs	7	2	1	0	0	2	0	1	0	0	0	1	0	0	0	0
Vegetation	15	5	0	3	0	0	0	5	0	1	1	1	0	0	2	1
All resources	12	5	0	4	0	1	0	0	1	0	1	0	0	0	1	1

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

Note Households were able to give more than one response.

# **Appendix E—Place Names and Survey Comments**

## Manley Hot Springs Area Place Names

**American Creek**—This stream has its headwaters at the west end of Serpentine Ridge and flows southwest 8.5 miles to Fish Lake; the lake is 23 miles east southeast of Tanana. The name “American Creek” was given to the creek by a prospector according to H.M. Eakin of the 1911 U.S. Geological Survey (USGS) (Orth 1971rep.:71).

**Baker**—Located on the north bank of the Tanana River at the mouth of Baker Creek (Orth 1971rep.:100). Once called “Baker Station,” the Northern Manley Commercial Company of New Jersey installed a trading post here in 1901 (L’Ecuyer 1997).

**Baker Creek**—Creek flowing east, then southwest 28 miles to the Tanana River; located 57 miles northeast of the Bitzshini Mountains. Name “Baker Creek” first reported in 1885 by Lt. H.T. Allen (Orth 1971rep.:101).

**Baldry Mountain**—3,846-foot mountain 14 miles south–southwest of Rampart (Orth 1971rep.:102). Named for prospector George C. Baldry (L’Ecuyer 1997).

**Boulder Creek**— This stream is a tributary of Hot Springs Slough; located 60 miles south of Rampart (L’Ecuyer 1997).

**Bean Ridge**— A ridge having 1,300-foot to 2,700-foot elevation and extending northeast–southwest 30 miles between the Yukon and Tanana rivers; ridge is located 5 miles northwest of Manley Hot Springs. Named in 1898 by W.J. Peters and H.A. Brooks, USGS, for the first trader to establish a post on the Tanana River. The post was located at Harper Bend (Orth 1971rep.:112). The Manley Hot Springs Native Corporation is named for this ridge.

**Bear Lake**—This lake is 1.5 miles northwest of the Zitziana River and 41 miles northeast of the Bitzshini Mountains. Lake is approximately 1.3 miles across (Orth 1971rep.:115).

**Big Lake**—Also sometimes called Mooseheart Lake by locals; it is located west of Mooseheart Mountain. This lake is known locally for its abundance of whitefishes. A forest fire in the early 2000s revealed areas of scattered prehistoric lithic flakes and some stone tools. This shows human use of the area through a long period of time (Steve O’Brien, former Alaska Department of Fish and Game employee, Manley Hot Springs, personal communication, 2013).

**COD Lake**— Lake located in Minto Flats; the lake is 1.2 miles across. The local name was published by USGS in the 1950s (Orth 1971rep.:228).

**Cos Jacket (or Cross Jacket)**—Located on the south bank of the Tanana River at the mouth of the Cosna River approximately 25 miles southwest of Manley Hot Springs. This location was a small Tanana Native village as reported in 1899 by Lt. J.S. Herron who wrote the name “Cos-chaget,” meaning “the mouth of the Cos [River]” (Orth 1971rep.:239).

**Cosna**—On the north bank of the Tanana River 37 miles northeast of the Bitzshini Mountains. This was a telegraph station named in 1903 for the Cosna River by the U.S. Army Signal Corps (Orth 1971rep.:240).

**Cosna Bluff**—A bluff on the north side of the Tanana River 20 miles southwest of Manley Hot Springs (Orth 1971rep.:240).

**Cosna River**—This river flows northeast 44 miles to the Tanana River. The Alaska Native name (Coskakak, Goschacket, Koskakak, Kosna) was reported in 1899 by Lt. J.S. Herron (Orth 1971rep.:240).

**Deep Creek Lakes**—Two lakes, each one-half of a mile long, that drain west to Deep Creek, which is south of Fish Lake. This local name was reported in 1952 by USGS (Orth 1971rep.:263).

**Dugan Hills**—Located 33 miles from the Tolovana River, the hills trend westward along the north side of the Tanana River. Local name was reported in 1963 by USGS and was derived from nearby Dugan River (now called the Kantishna River) (Orth 1971rep.:288).

**Eureka**—Site of a mining camp at the junction of Pioneer and Eureka creeks that is 3 miles south of Eureka Dome and 23 miles south of Rampart (Orth 1971:321).

**Eureka Creek**—This stream flows southwest 12 miles to Baker Creek at Overland Bluff. It comes from a prospector's name as shown on a manuscript map by Gibbs and Patterson dated 1902. Gold was discovered here in 1899 (Orth 1971rep.:321).

**Fish Lake**—This lake is 3.5 miles across and is located at the head of Fish Creek 21 miles east-southeast of Tanana. Prospectors named this lake, which was reported in 1906 by USGS (Orth 1971rep.:338).

**Giroux Bluff**—On the south bank of the Tanana River one-half mile southeast of Baker (Orth 1971rep.:368). The bluff was named for prospector Joseph Giroux in 1899 (L'Ecuyer 1997).

**Hutlitakwa Creek/Hootalaqua Creek**—This stream flows southwest 32 miles to Hutlinana Cree. (Orth 1971rep.:440).

**Hutlinana Creek/Hootlanana Creek**—This creek flows southwest 28 miles to Baker Creek (Orth 1971rep.:440).

**Hot Springs Slough**—This slough has its headwaters at Baker Lake and flows southwest 15 miles to the Tanana River. This feature was once known as the Slough of Superstition (Orth 1971rep.:433).

**Junction Island**—This is a 0.8 mile-long island in the Tanana River located 12 miles southeast of Manley Hot Springs (Orth 1971rep.:480).

**Kantishna River**—This river has its headwaters at the junction of Birch Creek and McKinley River and flows north 108 miles to the Tanana River; its headwaters are 32 miles northwest of Nenana (Orth 1971rep.:495).

**Karshner Creek**—This stream flows southeast 2.3 miles to Hot Springs Slough, which is north of Manley Hot Springs. The name was reported in 1916 by USGS (Orth 1971rep.:497). This creek was named for prospector John Karshner.

**Little Minook Creek**—This stream, named for prospector John Minook, flows northwest 5 miles to Minook Creek between Idaho and California bars (Orth 1971rep.:585).

**Manley Hot Springs Dome**—A 2,649-foot mountain on Bean Ridge located 3.5 miles northwest of Manley Hot Springs (Orth 1971rep.:619).

**Minook Creek**—This stream has its headwaters on Eureka Dome and flows north 22 miles to the Yukon River and connects 1 mile north of Rampart. It was named for prospector John Minook. The Native name for this creek was reported by Capt. Raymond in 1871 as “Clanachargut” or “Klanakakat,” meaning the “mouth of the Kla River” (Orth 1971rep.:646).

**Minto (new)** —Community located approximately 78 miles east of Manley Hot Springs on a spur road of the Elliot Highway.

**Minto Flats**—This is a large wetlands area to the southeast of Manley Hot Springs that is home to Minto Flats State Game Refuge.

**Mooseheart Mountain**—A 2,136-foot mountain that is 34 miles northeast of the Bitzshini Mountains. The local name was reported in 1937 by the USGS (Orth 1971rep.:656). It has been said that this mountain was named for Chitsia Mountain (meaning “mooseheart”)—a mountain near the Toklat River in Denali National Park. Chitsia Mountain was considered a sacred place by Native Athabascans.

**Overland Bluff**—This is a bluff west of the junction of Eureka and Baker creeks that is 29 miles south of Rampart. Name was reported in 1963 by Bond Taber, USGS, as having long local usage (Orth 1971rep.:733). Travelers pass by Overland Bluff on the Elliott Highway on their way to and from Manley Hot Springs.

**Pioneer Creek**—This stream is formed by the junction of its north fork and Deadwood Creek, and flows southwest 3.8 miles to Eureka Creek at Eureka (Orth 1971rep.:759).

**Rampart**—A settlement on the south bank of the Yukon River located 61 miles east–northeast of Tanana. It became a miners’ supply point on the Yukon River after the discovery of gold in the Minook Creek drainage in 1896 (Orth 1971rep.:791). At a miners meeting on June 6, 1897, James S. Langford proposed the name Rampart for the settlement (L’Ecuyer 1997).

**Roughtop Mountain**—A 3,150-foot mountain at the northeast end of Boulder Ridge that is 37 miles east of Tanana. Prospector's name reported in 1906 by Prindle of the USGS.

**Stevens Creek**—This stream's headwaters are on Roughtop Mountain and flow northwest 20 miles to the Yukon River and intersect 22 miles west-southwest of Rampart (Orth 1971rep.:918).

**Sullivan/Sullivan City**—A former miner's settlement established in 1907 on Michael J. Sullivan's Discovery Claim on Sullivan Creek. It was renamed Tofty in 1908 after Herman Tofty, a local prospector (Smith et al. 2011).

**Tanana**—A community near the junction of the Tanana and Yukon rivers formerly known as "Nuklukayet," a Native trading camp and settlement (Orth 1971rep.:497). The army post of Fort Gibbon was established here in 1899 by Capt. Charles S. Farnsworth (L'Ecuyer 1997).

**Tofty**—A former miner's settlement on the east bank of Sullivan Creek, 7 miles southwest of Roughtop Mountain, 15 miles northwest of Manley Hot Springs, and 35 miles east-southeast of Tanana (Orth 1971rep.:972). It was originally named Sullivan City in 1907. It was renamed Tofty in 1908 for Herman Tofty, an early prospector in the area. By spring 1909, Tofty consisted of 3 roadhouses, several stores, and a post office (Ellsworth 1910:242). The abandonment of the community is thought to have occurred around 1943. A large wildfire burned the region in 1969, destroying all standing or partially collapsed structures and leaving only foundations. Archaeological investigations at Tofty from 1994 to 1997 mapped the town site (Smith et al. 2011).

**Toklat River**—This river flows northwest 85 miles to the Kantishna River. The Tanana Native name was reported as "Toclat River" in 1885 by Lt. H.T. Allen, with the translation of "dish water." Allen applied the name to the stream presently known as the Kantishna River and the name "Toklat" is now relegated to a major tributary of the Kantishna River (Orth 1971rep.:973).

**Tolovana**—A settlement on the north bank of the Tanana River near the mouth of the Tolovana River that is 64 miles west of Fairbanks. Named for Tolovana Creek by the U.S. Army Signal Corps in 1903 (Orth 1971rep.:974).

**Tolovana River**—This river has its headwaters at the junction of Livengood and Olive creeks and flows southwest 117 miles to the Tanana River. The stream had been given the Native name "Nilkoka" by W.J. Peters and A.H. Brooks in 1898 (Orth 1971rep.:974).

**Woodchopper**—Former mining settlement established about 1907 on Woodchopper Creek at the junction of Deep Creek that is 33 miles east-southeast of Tanana (Orth 1971rep.:1,058). The abandoned settlement is located approximately 15 miles west of Manley Hot Springs.

**Woodchopper Creek**—This stream has its headwaters on Serpentine Ridge and flows south-southeast 8.5 miles to Patterson Creek and intersects 33 miles southeast of Tanana (Orth 1971:1058).

**Zitziana River**—This river flows northeast 63 miles to the Tanana River. It was a Tanana Native name reported in 1909 by C.E. Giffin and R.B. Oliver. Once known as the “Nushakantna River” (1880) and the Lorenz River (1885) (Orth 1971rep.:1,071).

### Minto Area Place Names

**Applegate Creek**—In Lower Tanana Athabascan “Khwk’wy’ditonh No” means “willow grove extends creek.” This creek flows southwest to Hutlinana Creek, east of the Tanana River (Orth 1971rep.:84).

**Cache**—“Dwkhtso Dedhdloenh”—meaning “where there are caches” in Lower Tanana Athabascan—is the local name of former the Athabascan settlement centrally located in the Minto Flats. This site is still marked by a few elevated caches and a small graveyard (Kari 2012:58; Olson 1981:705).

**Chatanika River**—This stream has its headwaters at the junction of McManus and Smith creeks and flows southwest 128 miles to the Tolovana River. This Tanana Native name was obtained in 1903 by T.G. Gerdine of the U.S. Geological Survey (USGS) (Orth 1971rep.:201).

**COD Lake**—“The’odi Mena” —meaning “all the time lake” in Lower Tanana Athabascan—is located 33 miles from Livengood (Kari 2012:44; Orth 1971rep.:228).

**Cooper Lake**—“Menh Dasr Mena” means “shallows lake” in Lower Tanana Athabascan (Kari 2012:38).

**Dugan Hills**—“Ttha Ch’edroddha’ No” means “ragged rocks” in Lower Tanana Athabascan (Kari 2012:34). These hills trend west and are 33 miles from the Tolovana River along the north side of the Tanana River. Local name was reported in 1963 by USGS and was derived from nearby Dugan River (also called the Kantishna River) (Orth 1971rep.:288).

**Fort Hamlin**—Located on the “left bank” of the Tanana River 40 miles northeast of Rampart. This was the home of a trading post of the Alaska Commercial Company that was named for Charles Sumner Hamlin. Name was published by U.S. Coast and Geodetic Survey in 1897 (Orth 1971rep.:346).

**Goldstream Creek**—“Ts’eba Yik’a Tadhlenhkhw” means “where current flows into spruce” in Lower Tanana Athabascan. This stream has its headwaters at the junction of Gilmore and Pedro creeks and flows west 70 miles to the Chatanika River (Kari 2012:62; Orth 1971rep.:376).

**Hutlitawka Creek**—“Khutl-‘onh No” means “he has a place creek” in Lower Tanana Athabascan (Kari 2012:24). This creek flows southwest to Baker Creek, approximately 55 miles from the Tanana River (Orth 1971rep.:440).

**Kantishna River**—This river heads at the confluence of Birch Creek and McKinley River and then flows approximately 108 miles to the Tanana River (Orth 1971rep.:495).

**Manley Hot Springs**—“Tu Nadheldenh” means “where there is hot water” in Lower Tanana Athabascan. Manley Hot Springs is located on Hot Springs Slough (at the end of the Elliot Highway). J.F. Karshner located a homestead here in 1902 after gold was discovered in the area. The community has been referred to by many names through the years. The present name was established in 1957 (Kari 2012:23; Orth 1971rep.:619). Manley Hot Springs is approximately 78 miles east of Minto.

**Minto Flats**—The Minto Flats State Game Refuge encompasses approximately 500,000 acres and is located about 35 miles west of Fairbanks between the communities of Minto and Nenana. The refuge was established by the Alaska Legislature in 1988. Minto Flats is a large wetland complex lying along a northerly loop of the middle Tanana River in Interior Alaska. The area is fed by waters from the Tatalina, Chatanika, and Tolovana rivers and Goldstream and Washington creeks. It drains into the Tanana River in a generally southwest-west direction.<sup>1</sup>

**Minto Lakes**—“Menhti”—meaning “among the lakes” in Lower Tanana Athabascan—consist of a group of lakes near the mouth of Goldstream Creek located 34 miles northwest of Fairbanks. This is a Tanana Native name published in 1861 by P. Tikhmeniev as “Oz [ero] Mintokh” or “Lake Mintokh” (Kari 2012:55; Orth 1971rep.:647).

**Minto Spur Road**—An 11-mile road connecting the community of Minto with the Elliott Highway.

**Murphy Dome Mountain**—“Bedzeyh T’okh No” —meaning “beneath the caribou creek headwaters” in Lower Tanana Athabascan—is located northwest of Fairbanks (Kari 2012:53; Orth 1971rep.:666).

**Nenana**—“Toghotili”—meaning “elongated object that is floating” in Lower Tanana Athabascan—is a community located on the Parks Highway along the “left bank” of the Tanana River east of the mouth of the Nenana River; named after the Nenana River (Kari 2012:80). The

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<sup>1</sup>. Alaska Department of Fish and Game, Juneau n.d. “Minto Flats—State Game Refuge Area Overview.” Accessed June 30, 2014. <http://www.adfg.alaska.gov/index.cfm?adfg=mintoflats.main>

Nenana post office was established in 1908, but the area was populated many years before this date. The origin of the name “Nenana” remains unknown (Orth 1971rep.:681).

**Old Minto**—“Menhti Khwghothhit” means “toward the water from among the lakes” in Lower Tanana Athabascan (Kari 2012:30). Old Minto is located on the east bank of the Tanana River 44 miles west of Fairbanks. The name was derived from Minto Lakes, which was reported by a chief signal officer for the U.S. Army in 1909 as Minto Telegraph Station; this is the name that was published in 1911 by the USGS (Orth 1971rep.:647).

**Rampart**—“Ch’edheth Ech’edetadle’o”—meaning “where skin is stretched” in Lower Tanana Athabascan— is a community located on the south bank of the Yukon River 61 miles east-northeast of Tanana (Kari 2012:90). This was established as a supply center when gold was discovered in nearby Minook Creek drainage in 1896. This community was first named “Rampart City” by gold miners (Orth 1971rep.:791).

**Swanneck Slough**—“Srajela Telakh Teya” means “grayling run creek” in Lower Tanana Athabascan.” This is an anabranch that flows northwest 21 miles from the Tanana River to Tolovana River. Descriptive name derived from “Swanneck Bend” in the Tanana River. Reported by USGS in 1940 (Orth 1971rep.:936).

**Tanana River**—“Tth’itu” means “straight water; trail river” in Lower Tanana Athabascan (Kari 2012:21). The Tanana River stems from the confluence of the Chisana and Nabesna rivers at Northway Junction and flows northwest 440 miles to the Yukon River (Orth 1971rep.:947).

**Tatalina River**—This stream flows southwest 60 miles to the Chatanika River, 48 miles northwest of Fairbanks. This Athabascan name was published in 1907 by USGS (Orth 1971rep.:950).

**Tolovana River**—“Tolbo No” means “grey water river” in Lower Tanana Athabascan. This stream has its headwaters at the junction of Livengood and Olive creeks and flows 117 miles to the Tanana River. This was an Athabascan name reported in 1902 by A.H. Brooks and D.L. Reaburn of USGS (Kari 2012:27; Orth 1971rep.:974).

**Washington Creek**—“Tat’ali No” —meaning “wading creek” in Lower Tanana Athabascan— flows southwest 50 miles to the Tatalina River, 40 miles northwest of Fairbanks. This creek was named by prospectors and in 1908. An Athabascan name—“Benikakat”—appeared on an early railroad map (Kari 2012:49; Orth 1971rep.:1,029).

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## Manley Hot Springs Survey Form Comments

**The following are written comments some respondents chose to write in the space provided for comments/concerns at the end of the survey.**

- Make questions more concise and to the point!
- More fur trappers than in the past. People from Fairbanks come out here and trap as a hobby.
- How do you define subsistence? Rather call it Traditional Use. It's easy to understand.
- There is a firewood disaster coming because the airstrip was put in and the council's logs were bought up. The road may make wood available. The road would open up economy. Seems like there is not enough resources.
- Less salmon consumed negatively affects my arthritis, hurt more. The subsistence foods help me with my struggles with diabetes.
- Concern about the questions on the income pages.
- Times change, fishery [Yukon] has collapsed. Used to make a living fishing and trapping ... not possible anymore. Cost of fuel and supplies prohibitive.
- Diet isn't as healthy when you lose subsistence foods.
- Difficult to find anyone who will work for a reasonable wage for home help for the elderly to help get subsistence foods.
- Against the access that the road will provide. Would have got more but they axed the season. New subdivisions will adversely affect trapping and hunting.
- Humidity higher in recent years—affects fish, firewood drying—processing various plants. Mold issues this year.
- Dependent on other people for fish and there are fewer and fewer people fishing. Could become a problem. Need to consider a low price for reimbursing subsistence fishermen so they can buy gas. Possibly one or two dollars per fish. Need better dissemination of information to rural residents so we can plan ahead better.
- No more land disposals—subsistence resources are stretched too thin already.
- I can't wait for the road to go through. Will have more access to hunting and fishing, and to see my relatives [in Tanana] more often.
- This comprehensive survey should have been done before the road project began. DOT [Alaska Department of Transportation] obviously didn't need to consider if the road was disturbing any resource habitat or resource use in order to put the road in wherever they wanted. If I did not have berries, salmon, and plants, large and small game to gather, eat and process, I would need more public assistance because I do not make enough money to buy everything in a store in Fairbanks. I choose a subsistence lifestyle because I believe it is a healthy lifestyle, mentally, physically, and spiritually. Job opportunities are

limited in the bush, so subsistence gathering is a must. Sharing these resources shows respect, responsibilities, and appreciation for the resource, and passes it on to others.

- Strongly support closures. Yukon king run has been very poor. I strongly support more closures and pulse protection. Marten population had declined in Interior.
- Now retired and will have opportunity to go out and harvest the resources.
- Restrictions to natural surrounding our community due to Tribal Land corporations. Allow a more flexible fishing times for subsistence fishing due to high water.
- Negative impact on berry picking and parking out to Tofty if/when the road is built.
- Lots of people say poor berry year.
- I would prefer a Manley resident preference hunt before other hunters are allowed to hunt in the area.
- A lot of barter going on in Manley. Nice system.
- Subsistence users that depend heavily on subsistence resources need to expend a lot of money and time to get to camps to access the resources. They need early notification if there may be a shortage or problem with the resources in advance from the appropriate agencies, and timely notice of regulatory changes. Gas is too high to do subsistence fishing and hunting these days. Strong proponent of barter...fish, berries, meat, for hot springs baths etc.
- I am self-employed and running a small business providing services to tribal governments which limit the amount of time because of traveling to secure meat, berries, etc., but in the past I have had time to secure these things. I appreciate any Native foods that people share with me.
- The road to Tanana would be good economically, but I prefer it not to go through Manley itself.
- Cut off fishing fleets in the ocean so more fish will be available for Interior families.
- It is important to me to gather and share with other people, and a lot of people appreciate all that I can share with them. We prefer the food we can gather and hunt because it is healthier food and healthy to go out and get it ourselves. Berries are not always available in the same places. You have to look all over or choose a lot of ground to get what you need. Gas too high.
- As I live here, I want to gather more local resources. When I work a job, the time to go out and gather is less. But, I can live so much healthier and cheaper when I have more local resources. I have no fear of not living as long as I live here. I would like to see the road open so that they open the land to private purchase. Everybody should experience this style of living and I would like to buy my land instead of lease it.
- I raise chickens and goats and use wild plants to feed them which helps on the food bill for them. As family grows we want to add more subsistence food to their diet. Need to learn more how to harvest these resources. We were so hunted out, that we had a hard time with everyone competing. Taking job opportunities sometimes reduces our opportunities to harvest local resources when available. I am NOT in favor of the road

project. It will increase traffic that lots of people come to the end-of-the-road community to avoid. It will increase competition for local subsistence resources.

- We need more balanced diets that local resources could help us and we are still learning what is available (new to area). Wood supply is always a concern because that is the only heating supply and we cook on wood stove in the winter.
- Just moved to Manley in 6/2011. We are still getting established to store food at home. Since moving out here in 2011 until recently, you notice a sharp decline in animal population. Less common sightings. Due to working, I didn't have time to fish, hunt, or gather anything last year.
- Not happy about the road project. Subsistence areas can only take so much pressure—more development projects and increased people, traffic will push animal's [farther] back and harder for locals to harvest. Google Earth and GPS help outside hunters locate lakes and sloughs off rivers that years ago only locals knew where they were.