Technical Paper No. 404

The Harvest and Use of Wild Resources in Tyonek, Alaska, 2013

by
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July 2015

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

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Measures (fisheries)

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

Mathematics, statistics

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

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by

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The Division of Subsistence Technical Paper Series was established in 1979 and represents the most complete collection of information about customary and traditional uses of fish and wildlife resources in Alaska. The papers cover all regions of the state. Some papers were written in response to specific fish and game management issues. Others provide detailed, basic information on the subsistence uses of particular communities which pertain to a large number of scientific and policy questions.

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.

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ABSTRACT

This report provides updated information about the harvests of fish, wildlife, and wild plant resources by the community of Tyonek, Alaska. This report details the results of a household survey administered in the study community in January 2014 for harvests and uses of wild resources by Tyonek households during the 2013 calendar year. Tyonek is located in the upper Cook Inlet of Southcentral Alaska. As in the past, during the 2013 study year many residents of the study community relied on hunting, fishing, and wild food gathering for nutrition and to support their way of life. They used a variety of resources, including salmon and nonsalmon fish, large land mammals, small land mammals, migratory waterfowl and upland game birds, and wild plants and berries. This study is part of the effort to collect data about the full range of subsistence harvests and uses, areas of harvest, as well as demographic and economic information to understand the subsistence way of life in all its complexity. The project was funded by Alaska LNG through a reimbursable services agreement with the State Pipeline Coordinator's Office. This information was collected by research staff of the Division of Subsistence, Alaska Department of Fish and Game.

Key words: Subsistence, Cook Inlet, Southcentral Alaska, Alaska LNG, and Tyonek

1. INTRODUCTION

This report provides updated information about the harvests of fish, wildlife, and wild plant resources by the community of Tyonek, which is located in Southcentral Alaska. This report details the results of a household survey administered in this community in January 2014 for the 2013 study year. This study was conducted as part of the effort by the State of Alaska to assess the feasibility of constructing a liquefied natural gas pipeline.

Project Background

Between 2011 and 2012, the Alaska Department of Fish and Game (ADF&G) Division of Subsistence conducted comprehensive subsistence baseline harvest assessment studies in 12 Alaska communities located along the proposed corridor of a natural gas pipeline. This project was referred to as the Alaska Pipeline Project (or APP). The 12 communities extend from the northern coastal plain of Alaska, through eastern Interior Alaska to Delta Junction, and along the Alaska Highway to the border with Canada. The survey was conducted because the Federal Energy Regulatory Commission (FERC) developed a set of "general requirements" for the analysis of information about subsistence uses of fish, wildlife, and plant resources for communities within 30 miles of the proposed project, and stipulated that the analysis be based on data "no more than 3 years old."[1] The State Pipeline Coordinator's Office (SPCO) at the Alaska Department of Natural Resources (DNR), which acted as the liaison to ADF&G for the subsistence component of the APP study, requested that the Division of Subsistence prepare a data gap analysis followed by a detailed study design to comply with the general requirements issued by FERC. The study design included surveying communities that did not have recent subsistence survey data available and that were located within 50 miles of the proposed pipeline route because, based on existing information, a 50-mile radius reflects the distance residents of road-connected communities generally travel for hunting, fishing, and gathering activities. This project was discontinued in June 2012, and a second phase of data collection in additional communities did not occur. The pipeline route has now been modified: it begins at the North Slope of Alaska, proceeds south to Fairbanks, and then follows the Parks Highway south to Cook Inlet to a terminus at Nikiski on the Kenai Peninsula. Figure 1-1 shows all the proposed study communities along this new proposed route. This revised project is called Alaska LNG, and it was funded by Alaska LNG through a reimbursable services agreement with the SPCO.

The proposed development of Alaska LNG requires updated baseline comprehensive data about the full range of subsistence harvests and uses, areas of harvest, as well as demographic and economic information to understand the subsistence way of life in all its complexity. Due to the large scope of this project the research was split between northern and southern Alaska. This report is the first in a series to summarize the research conducted in southern Alaska; a separate report series will present results for northern Alaska. Table 1-1 shows the study communities in southern Alaska that have been identified along the proposed pipeline route and near the liquefaction plant proposed for Nikiski. The table also identifies recent studies in each community to demonstrate when the last harvest assessment was conducted in each community to indicate which communities meet FERC's requirement of having data that are no more than 3 years old.

In order to complete the work in a timely manner the southern communities were broken down into a 2-year study plan. The project need was identified by Alaska LNG to ADF&G in October 2013. Since fieldwork needed to begin in January 2014, and there was not adequate lead time for full planning and community consultation, only 2 communities, Tyonek and Beluga, were identified to be completed in Year 1. The community of Tyonek chose to participate in the study, and the community of Beluga declined to participate.

1. Michael J. Boyle, Deputy Director, FERC, Office of Energy Projects, Division of Gas–Environment and Engineering, letter to TransCanada Alaska Company LLC, February 17, 2011.

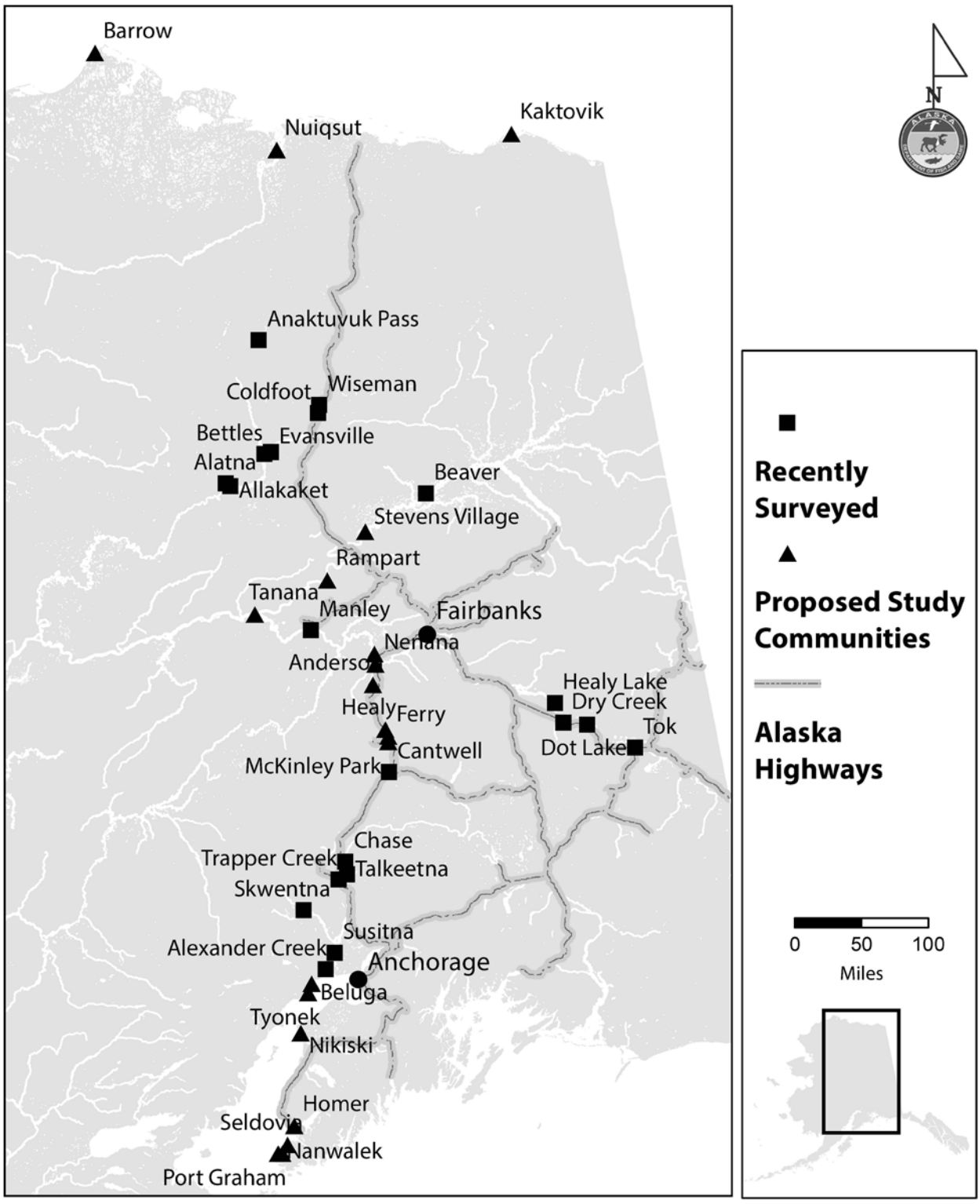

Figure 1-1.–Map of study communities.

Table 1-1.–History of Susitna River Basin and Cook Inlet communities studied.

	Communities to update						
	Susitna River Basin–Cook Inlet		*Cook Inlet–Outside nonsubsistence area*			*Cook Inlet–Nonsubsistence area*	
	Beluga	Tyonek	Nanwalek	Port Graham	Seldovia	Homer	Nikiski
Estimated number of households 2010[a]	10	70	55	79	121	2,235	1,689
1982					All	All	
1983		All					
1984							
1985							
1986							
1987			All	All			
1988							
1989			All	All			
1990			All	All			
1991			All	All	All		
1992			All	All	All		
1993			All	All	All		
1994			MM	MM			
1995			MM	MM	MM		MM
1996			MM	MM	MM		MM
1997							MM
1998							MM
1999							
2000			MM/BMW	MM/BMW	MM/BMW		MM
2001		MM	MM	MM	MM	MM	
2002		MM	MM	MM	MM	MM	
2003		MM	All	All	MM	MM	
2004		MM	MM	MM	MM	MM	
2005		MM	MM	MM		MM	
2006	All	All	MM	MM	MM	MM	
2007		MM	MM	MM	MM	MM	
2008		MM	MM	MM	MM	MM	
2009							
2010							
2012							
Proposed							
2013	All	All					
2014			All	All	All	All	All

-continued-

Table 1-1.–Page 2 of 2.

	Updated communities					
	Susitna River Basin					
	Chase	Cantwell	Skwentna	Susitna	Talkeetna	Trapper Creek
Estimated number of households 2010[a]	18	83	35	13	374	148
1982		All				
1983						
1984		All				
1985					All	All
1986		All				
1987						
1988						
1989						
1990						
1991						
1992						
1993						
1994						
1995						
1996						
1997						
1998						
1999		All				
2000		MW				
2001						
2002						
2003						
2004						
2005						
2006						
2007						
2008						
2009						
2010						
2012	All	All	All	All	All	All
Proposed						
2013						
2014						

Note The key for this table is:
All = "comprehensive" baseline survey of all resources used for subsistence purposes.
BMW = Birds and migratory waterfowl.
MM = Marine mammals.
a. *Source* U.S. Census Bureau (2011)

Regulatory Context

The State of Alaska provides subsistence salmon fishing opportunities for all Alaska residents in the Tyonek Subdistrict subsistence fishery, which is located in the Northern District of the Cook Inlet Area. The subdistrict includes those marine waters of the Northern District within mean lower low tide from a point 1 mile south of the southern edge of the Chuitna River south to the easternmost tip of Granite Point (5 AAC 01.555 (b)). Under state regulations, subsistence fishing is open during 2 seasons per year. The early season, which runs from May 15 through June 15, is open for 3 periods per week—Tuesdays, Thursdays, and Fridays—and for 16 hours per period lasting from 4:00 a.m. through 8:00 p.m. The late season, which runs from June 16 through October 15, is open for 1 period per week—Saturdays—and for 12 hours (from 6:00 a.m. through 6:00 p.m.) (5 AAC 01.560 (b)(1)(A)–(B)). A subsistence fishing permit is required. The permit is a household permit. The total annual possession limit for each permit is 25 salmon per head of household and 10 salmon for each dependent of the household permit holder (5 AAC 01.595 (a)(2)); in addition, Tyonek Subdistrict subsistence salmon fishing permit holders may take 70 Chinook (king) salmon (5 AAC 01.595 (a)(3)). Allowable gear for the Tyonek Subdistrict subsistence salmon fishery is set gillnets not exceeding 10 fathoms in length, no deeper than 45 meshes, and with a stretched mesh size no larger than 6 inches (5 AAC 01.570 (b)(1)).

The state also manages sport fishing opportunities in the West Cook Inlet Area. Sport fisheries provide opportunities for harvesting resident freshwater species and salmon by use of rod and reel, as long as a fishing license has been purchased (5 AAC 62.101; 5 AAC 75.005).

Hunting opportunities near Tyonek include those available in Game Management Unit (GMU) 16 (containing subunits 16A, which is a state nonsubsistence area, and 16B). GMU 16 hunts include opportunities for harvesting black and brown bears, caribou, Dall sheep, moose, gray wolves, and wolverines, as well as hunting and trapping opportunities for small game and furbearers. The majority of the Alaska resident hunting opportunity for large game hunts is provided under general season regulations, which require a harvest ticket or a first-come, first-served registration permit. In addition, under state regulations, there is a Tier II hunt for bull moose within GMU 16B from December 15 through March 31. Tier II subsistence permits are available to Alaska residents only.[2] Hunting that occurred by residents of Tyonek in 2013 occurred on state lands, although residents do have access to hunting opportunities as a resident zone community of Lake Clark National Park and Preserve. This includes moose hunting in the Kustatan River drainage from September 1–15 with a limit of 1 bull. Besides state migratory bird hunting opportunities, residents of Tyonek are also able to participate in federal subsistence hunting regulations—including a season from April 2 through May 31 in that portion of GMU 16B south of the Skwentna River and west of the Yentna River and from August 1–31 in that portion of GMU 16B south of the Beluga River, Beluga Lake, and the Triumvirate Glacier.

Study Objectives

The project had the following objectives:

A. Design a survey instrument to produce updated comprehensive baseline information about subsistence hunting, fishing, and gathering and other topics that address subsistence needs and is compatible with information collected in past household interviews.

B. Conduct community scoping meetings.

C. Train local research assistants (LRAs) to assist in administering the systematic household survey.

2. State Tier II hunts are held when there is not enough of a game population with a positive customary and traditional use finding to provide a reasonable opportunity for subsistence uses by all potential users. 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.

D. Conduct household surveys to record the following information:

   1. Demographic information;

   2. Involvement in the harvest, use, and sharing of fish, wildlife, and wild plants in the study year;

   3. Estimated amounts of resources harvested in the study year;

   4. Information about employment and cash income;

   5. Assessments of changes in wild resource harvest and use patterns in the past 5 years;

   6. Location of fishing, hunting, and gathering activities in the study year.

E. Collaboratively review and interpret study findings.

F. Communicate study findings to the communities.

G. Produce a final report.

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*[3] and by the National Science Foundation, Office of Polar Programs in its *Principles for the Conduct of Research in the Arctic*[4], as well as the Alaska confidentiality statute (AS 16.05.815). These principles stress community approval of research designs, informed consent, anonymity 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 Approval

As noted, the SPCO provided the funding from Alaska LNG to ADF&G. This study was a partnership between ADF&G, the Alaska Department of Health and Social Services (DHSS), and HDR Alaska, Inc. (HDR). HDR provided geographic information system (GIS) support by providing a new version of a custom Apple iPad[5] application as well as managing all associated map data on an HDR server. ADF&G provided funding directly to HDR. DHSS partnered with ADF&G so that health impact assessment questions could be added to the survey form to avoid duplication of survey efforts by ADF&G and DHSS. The results of this component of the survey will be reported in a publication by DHSS. The ADF&G Subsistence Program Manager for Southern Alaska, Davin Holen, attended several meetings sponsored by the SPCO in fall 2013 and spring 2014 to describe the survey to the planning team. These meetings were open to agencies, contractors, Alaska Native tribal organizations, and community representatives. Holen and the Northern Alaska Program Manager, James Simon, prepared a study design with assistance from Assistant Director Monica Wellard for the SPCO and it was initially funded prior to the start of fieldwork in January 2014.

3. Alaska Federation of Natives. 2013. "Alaska Federation of Natives Guidelines for Research." Alaska Native Knowledge Network. Accessed February 25, 2014. http://www.ankn.uaf.edu/IKS/afnguide.html.
4. National Science Foundation Interagency Social Science Task Force. 2012. "Principles for the Conduct of Research in the Arctic." Accessed February 25, 2014. http://www.nsf.gov/od/opp/arctic/conduct.jsp.
5. Product names are given because they are established standards for the State of Alaska or for scientific completeness; they do not constitute product endorsement.

Scoping Meeting

In advance of survey administration, ADF&G research Project Lead Sarah Hazell contacted and attempted to set up public meetings about the proposed research project with the 2 proposed Year 1 study communities of Tyonek and Beluga. For this project, division staff contacted Tyonek in November 2013 and held a public community scoping meeting in Tyonek in December 2013 and received approval to conduct the survey. In February 2014 Division of Subsistence researchers contacted several residents of Beluga and attempted to set up a public community meeting. The community of Beluga declined to be part of this study. Therefore the data presented in this report only represent the community of Tyonek.

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 scoping meeting where the project was described to residents, ADF&G finalized the survey instrument in January 2014. Appendix A is an example of the survey instrument used in this project. 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 across Alaska and with data in the Community Subsistence Information System (CSIS[6]). In addition to the core data collected, there were questions in the survey on the use of wood for home heating. This is in response to observations by division researchers working in Cook Inlet as well as other parts of Alaska, such as Bristol Bay, the Copper River Basin, and the Susitna River Basin. There are several programs to install efficient woodstoves in households in response to the high cost of fuel oil for heating.

The objective of this study was to survey all Tyonek households. In order to complete a census survey, Division of Subsistence researchers worked with a combination of LRAs, knowledgeable community members, and tribal administrators to develop a community household list. These efforts established an estimate of 63 eligible households to be surveyed. During the survey effort, for each residence that researchers attempted to contact, a disposition was applied. The disposition categories included:

- Contains residents that are eligible to participate in the survey based on length of residency (survey attempted).
- Vacant (no survey attempted).
- Not a dwelling (commercial building or no dwelling exists) (no survey attempted).

If researchers were initially unsuccessful at making contact with an eligible household, 2 more attempts to survey the household were made. When a reasonable effort was made to survey the household and no contact could be made, this household was assigned a "no contact" disposition. Overall, surveys lasted approximately 40 minutes, which included the standard survey form and a mapping component, which is discussed below.

Mapping Locations of Subsistence Hunting, Fishing, and Gathering

During household interviews, the researchers asked respondents to indicate the locations of their hunting, fishing, and gathering activities during the 2013 study year. Division researchers were guided by a standard mapping protocol. Features included points, polygons (shapes), and lines. Points were used for harvest locations that were specific to a small area; polygons were used for search areas, such as when hunting moose, and harvest areas, such as for migratory waterfowl or small game where respondents might indicate a larger area where there were multiple harvests; and lines were used occasionally to depict traplines. Overall, the protocol for documenting harvests is a guide and researchers were trained to use the feature that best captured the activity that was related by the respondent.

6. ADF&G CSIS: http://www.adfg.alaska.gov/sb/CSIS/.

Harvest locations and hunting and gathering areas were documented using an application designed on the ArcGIS Runtime SDK for iOS platform. As mentioned previously, the application was developed by HDR, an environmental research firm located in Anchorage. The device used to collect the data was an iPad. The point, polygon, or line was drawn on a U.S. Geological Survey topographic relief map displayed on the iPad. The iPad allowed the user to zoom in and out to the appropriate scale and the ability to document search and harvest activities wherever they occurred in the state of Alaska. Once a feature was accepted, an attribute box was filled out by the researcher that noted the species harvested, amount, method of access to the resource, and month(s) of harvest. The data were uploaded via Wi-Fi to a server. Data uploads to the server were undertaken once daily in the field when cellular networks or Wi-Fi connections were available. This provided a back-up of the spatial harvest data. During the check-in process, the number of successful point, line, and polygon uploads was displayed on the device. Upload failures were also displayed on the device and recorded by the researchers. Data that failed to upload were later downloaded directly from the device and added to an ArcGIS file geodatabase. Researchers periodically conducted quality control checks on uploaded data with a website developed by HDR as a means of validating successful uploads. Once data collection was complete, the data were downloaded into an ArcGIS file database. Paper maps were also available to be used as a reference for respondents as well as by an LRA when an ADF&G researcher was not available for the interview to provide an iPad. These maps were 11x17 inches at a scale of 1:250,000 and 1:500:000 and only documented areas within the Cook Inlet region.

Household Survey Implementation

Sarah Hazell was the research lead for the community of Tyonek. For the survey effort, the following people were involved: division researchers Margaret Cunningham, Rosalie Grant, Sarah Hazell, Davin Holen, Bronwyn Jones, Theresa Quiner, and Eric Schacht. Project staff arrived on January 27, 2014 and trained LRAs Gwen Chickalusion, Patrick Chuitt, and Fedora Constantine in the afternoon of the same day. Survey administration occurred until January 31, 2014. Some remaining surveys were left with LRAs to complete over the ensuing 2 weeks. These surveys were completed by the LRAs and then mailed to the Anchorage ADF&G office.

Data Analysis and Review

Survey Data Entry and Analysis

All data were coded for data entry by division staff; Project Lead Hazell coded all surveys for consistency. Responses were coded following standardized conventions used by the division to facilitate data entry. Information Management staff within the division 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, version 20. 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 B for conversion factors).

Division analysts 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. Division researchers documented all adjustments.

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

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

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*,

$\bar{h}_i =$ the total harvest reported in returned surveys,

$h_i =$ 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%):

$$CL\%(\pm) = \frac{t_{\alpha/2} \times \frac{s}{\sqrt{n}} \times \sqrt{\frac{N-n}{N-1}}}{\overline{x}} \tag{2}$$

where:

$s =$ sample standard deviation,

$n =$ sample size,

$N =$ population size,

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

$\bar{x} =$ sample mean.

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

The corrected final data from the household survey will be added to the ADF&G 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 the study community by surveying a population census. 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 calendar (January 1–December 31) study year 2013. Because not all households were interviewed, population estimates for the community were calculated by multiplying the average household size of interviewed households by the total number of year-round households, as identified by division researchers in consultation with community officials and other knowledgeable respondents. There may be several reasons for the differences among the population estimates and other demographic data that are generated from the division's household survey (as of December 31, 2013), estimates developed by the 2010 federal census (U.S. Census Bureau 2011), and estimates by the Alaska Department of Labor and Workforce Development (Alaska Department of Labor and Workforce Development 2015). Observed differences in population estimates may be attributed to a variety of reasons, including differing survey methods, seasonal differences in populations, and rapid outmigration events (i.e., when large businesses or institutions leave small communities).

Map Data Entry and Analysis

As discussed above, maps were generated based on data collected using an iPad or on paper maps sized 11x17 inches. All data were entered on the iPad, whether in the field during interviews or by ADF&G or project research staff while coding survey data. Map features were matched to the survey form to ensure that all harvest data were recorded accurately. Once all data were entered, an ArcGIS file geodatabase was downloaded by ADF&G researcher Jones from the server and maps showing harvest locations for each species were created by ArcGIS 10.2 using a standard template for reports. Maps show harvest locations for fish species, harvest areas for plants, berries, wood, and birds, and hunting areas for large and small land mammals. To ensure confidentiality, harvest locations for large and small land mammals are not produced for the report. Maps were reviewed at a community review meeting to ensure accuracy as well identify any data the community would like to keep confidential.

Community Review Meeting

Holen and Jones presented preliminary survey findings and associated search area and harvest maps at a Native Village of Tyonek tribal council meeting in October 2014. The purpose of the community review meeting was to provide an opportunity for community members to comment on the findings of the study, for researchers to capture concerns that were not documented during the survey but community members felt were important, and to clarify any issues that researchers encountered during analysis.

The community review meeting was held in Tyonek on October 8, 2014. The local research assistants and tribal administrators from the Native Village of Tyonek were informed about the review meeting. These community members hung flyers and informed residents of the meeting. A total of 9 community members and council members attended the review meeting at the Native Village of Tyonek community center.

Final Report Organization

This report summarizes the results of systematic household surveys and mapping interviews conducted by researchers from the division, as well as LRAs, and the report also summarizes resident feedback provided at the community review meeting. The second chapter includes tables and figures that disseminate report findings on demographic characteristics, employment characteristics, individual participation in harvesting and processing of wild resources, and characteristics of resource harvests and uses—including the sharing of wild foods—and also harvest and use trends over time. Additional analysis is available in a table presented in Appendix C.

The second chapter of this report begins with background information about Tyonek's physical, historical, and contemporary settings followed by the demographic, employment and income, and subsistence harvest and use sections. Following a discussion of the 2013 findings, the chapter also contains a section that compares the 2013 study findings with the results from comprehensive subsistence harvest surveys that were conducted in Tyonek for study years 1983–1984 (Fall et al. 1984) and 2005–2006 (Stanek et al. 2007). This section also compares historical spatial harvest data with the 2013 study year to determine changes in the search and harvest areas for wild food resources over time. The second chapter concludes with a summary of concerns that residents shared regarding wild resources. These comments were documented during survey administration and at the community review meeting.

ADF&G provided a draft report to the SPCO and Alaska LNG for their review. After the review period the report was finalized. ADF&G mailed a short (2-page) summary of the study findings (Appendix D) to the Native Village of Tyonek tribal council, which made copies available to residents for pick up at the tribal hall.

2. TYONEK

Community Background

Tyonek is a mostly Dena'ina Athabascan community located in the upper Cook Inlet region of Southcentral Alaska. Although located fewer than 50 miles from Anchorage, Alaska's largest city, Tyonek remains relatively remote. It is not connected to the Alaska road system; one must travel by air or boat to reach the community. The community is situated on a bluff facing the northwest shore of Cook Inlet, and this position allows for easy access to the beach and offers spectacular views of the numerous surrounding volcanos and mountain ranges. The coastal area includes expansive sandy tidal zones and mudflats, and much of the beach is enclosed by steep sandy bluffs. To the north of Tyonek, the geography is composed of a mixture of rolling hills, birch and black spruce forests, boggy tundra, and lakes, streams, and rivers that make up the Chuitna River watershed. The broad array of environmental features in this area supports a productive ecosystem that provides habitat for both marine and freshwater aquatic species as well as land mammals and birds.

Tyonek has long been the home of the *Tubughna*, "the beach people" in the Upper Inlet Dena'ina dialect. The current location of the community at *Qaggeyshlat* ("little place between the toes") dates to 1932, but according to de Laguna (1934:139), Qaggeyshlat was an old Dena'ina village site. There have been 3 communities called Tyonek, all within the area between the Beluga River and Granite Point (Kari and Fall 2003:56). The first inhabited site (*Ch'elehtnu*, or "spawning stream") was occupied in the late 19th century and was located south of the present community, near Robert's Creek (also called "Old Tyonek Creek"). Due to tidal erosion, in the early 20th century the village was moved north to *Tobona*, or "Second Tyonek." This site, too, was abandoned because of flooding whereupon Chief Simeon Chickalusion resettled the Tyonek people at the present location of "New Tyonek" in 1932 (Kari and Fall 2003:56–68).

President Woodrow Wilson signed Executive Order No. 2141 and created the Tyonek Indian Reserve (also called the "Moquawkie Indian Reserve") in 1915. The community was incorporated as the Native Village of Tyonek (NVT) under bylaws ratified by its members on November 27, 1939, by the authority of the federal Indian Reorganization Act of 1934 (Fall et al. 1984:29).

The population of Tyonek today consists primarily of the descendants of people originally from several nearby Dena'ina communities, including Susitna Station, Kroto Village, Polly Creek, Kustatan, Kenai, and Old Tyonek. In 1918, many of the Dena'ina at Susitna Station died during the influenza pandemic. Consequently, in 1934, almost all of the remaining Susitna Station Dena'ina moved to Tyonek at the invitation of Chief Chickalusion (Kari and Fall 2003:89–92).

By the 1930s, the Dena'ina at Tyonek had become fully engaged in the Cook Inlet commercial salmon fishery. However, according to Fall et al. (1984) and Braund and Behnke (1980:181), most Tyonek residents describe the 1930s, 1940s, and 1950s as a period of poverty caused by poor commercial fishing prices, low fur prices, and generally scarce subsistence resources. In the 1960s, the community benefited from the sale of oil and gas leases on its lands and the NVT invested in 60 new homes and other public infrastructure (Stanek et al. 2006:86). For additional in-depth background on the history of Tyonek, see *West Cook Inlet Ethnographic Overview and Assessment for Lake Clark National Park & Preserve* by Stanek et al. (2006).

In 2013, Tyonek remained a predominately Dena'ina Athabascan community. The community itself consists of 2 parts. The older, core village center has a community center and a school with surrounding single-family dwellings, mostly dating to those built in the 1960s. There is also a separate residential subdivision consisting of approximately 35 single-family homes built around 1980. During the 2013 study year construction of a health clinic was underway and the clinic was expected be in operation by the end of 2015. The NVT council oversees the operation of water and sewer systems and maintains the roads while private companies manage the electrical and telephone systems. Being some distance from Anchorage, many services are provided via entities on the Kenai Peninsula. The Tebughna Elementary/High School, with around 35

students enrolled and 5 teachers, is run by the Kenai Peninsula School District.[1] As mentioned above, no roads connect Tyonek to the state's highway system. Access to the community is primarily by airplane, and the NVT operates a private lighted gravel runway. Located at the Tyonek airstrip is a single fuel tank that is open 2 times per week for residents to purchase fuel. The Tyonek Native Corporation (TNC) owns lands surrounding the community; these lands have a network of gravel roads maintained jointly by TNC and oil and gas companies with developments in the area, including Aurora Gas, LLC, Union Oil Company of California, and Chevron USA. Some of these roads were originally built to extract timber on TNC lands. Tyonek is also connected to the system of roads in and around Beluga by a bridge over the Chuitna River.

Demography

This study found an estimated population for Tyonek in 2013 of 143 individuals, represented by 63 households (Table 2-1). A study by Holen (2014) conducted in 2012 for the 2011 study year found 153 residents in 63 households. These estimates are lower than the 2010 U.S. Census Bureau estimate of 171 individuals represented by 70 households, and the American Community Survey 5-year (2007–2011) average estimate of 291 individuals represented by 95 households. The reasons for these differing estimates may include differences in agency parameters for determining full-time residency. This study required at least 3 consecutive months of occupancy in the community during the study year (2013) and self-identification as a full-time resident.

The division's study for the 2005–2006 study year estimated a somewhat higher population than the 2013 findings with 202 people living in 66 permanent households (Stanek et al. 2007), and the division's estimate was higher in January 1984, finding 273 Tyonek residents (Fall et al. 1984). For all 3 studies for which subsistence harvest surveys were completed in Tyonek (1983–1984, 2005–2006, and 2013), the division found fewer individuals than estimates provided by other agencies. The overall population of Tyonek has declined almost by half since 1983–1984, the study year of the first comprehensive survey (Figure 2-1).

Of the 63 qualifying households found in 2013, 49 were successfully surveyed resulting in a sample achievement of 78% (Table 2-2). Five households declined to participate in the study, and 9 households could not be contacted after 3 attempts. The average size of Tyonek households was 2.3 individuals; 59 households (94%) contained Alaska Native residents (Table 2-3).

Overall, the 2013 population profile indicates that the ratio of females versus males is evenly distributed within many age cohorts in Tyonek (Figure 2-2). This study found the average age of Tyonek residents to be 37 years old with the youngest individual being 1 year old and the oldest individual being 73 years old (Table 2-3). The largest age cohort was both males and females between the ages of 55–59, representing 14% of the population (Table 2-4). In 2013, 27% of the population was children (i.e., residents between 0 and 19 years of age).

The 2013 survey found that most household heads' parents were living in Tyonek when they were born (81%) (Table 2-5). Similarly, for the overall population, 79% of residents were born in Tyonek, and an estimated 10% were born in Anchorage (Table 2-6).

Cash Employment and Monetary Income

The total income for the community of Tyonek in 2013 was $2,313,825 (Table 2-7). This total comprises both earned income ($1,684,048; 73% of the total) and other income ($629,777; 27% of the total). Approximately 57% of the other income in Tyonek was composed of Native corporation dividends, and this made up approximately 16% of the total community income.

The mean household income for Tyonek in 2013 was $36,727. In Tyonek, 46% of the earned income came from local government jobs, which includes tribal government; 18% came from the services industry; 18% from construction; and 9% from agriculture, forestry, and fishing jobs (primarily commercial fishing) (Table

1. Tebughna School. "Tebughna School: Home," http://tebughnaschool.blogs.kpbsd.k12.ak.us/wpmu/ (accessed April 2015).

Table 2-1.–Population estimates, Tyonek, 2010 and 2013.

	Census (2010)	5-year American Community Survey (2007–2011)	This study (2013)
Total population			
Households	70	95	63.0
Population	171	291	142.7
Alaska Native			
Population	162	284	136.3
Percentage	94.7%	97.6%	95.5%

Sources U.S. Census Bureau (2011) for 2010 estimate; U.S. Census Bureau for American Community Survey 5-year survey estimate; and ADF&G Division of Subsistence household surveys, 2014, for 2013 estimate.

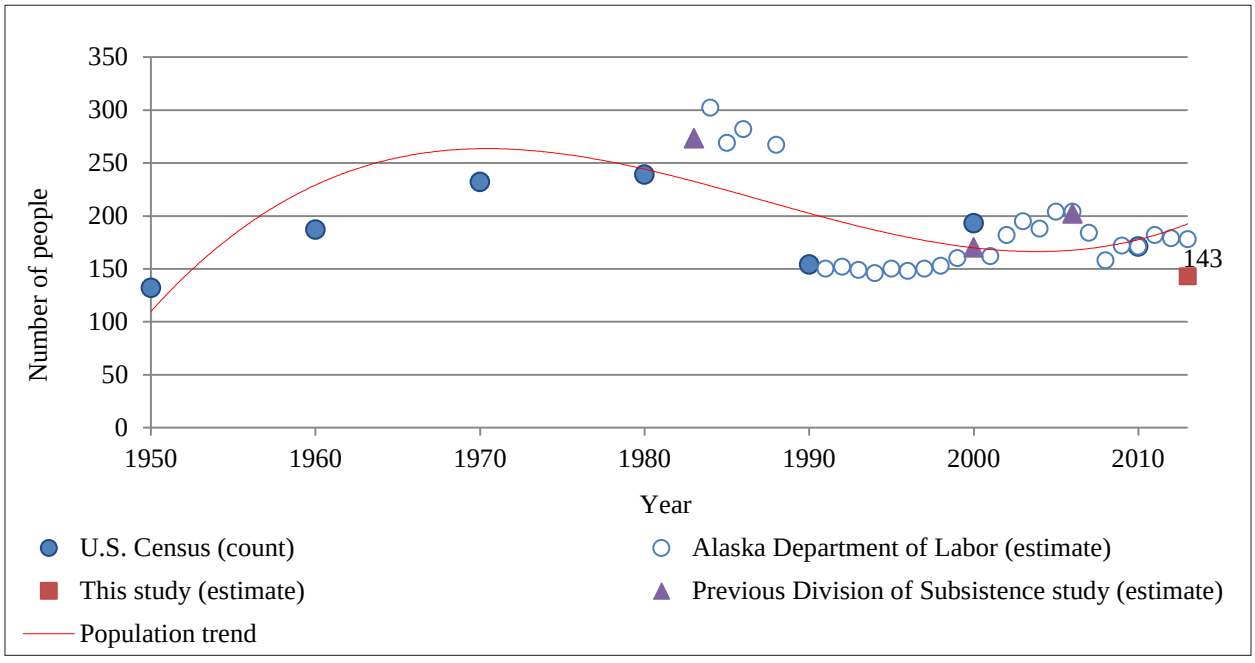

Figure 2-1.–Historical population estimates, Tyonek, 1950–2013.

Table 2-2.–Sample achievement, Tyonek, 2013.

Sample information	Tyonek
Number of dwelling units	63
Interview goal	63
Households interviewed	49
Households failed to be contacted	9
Households declined to be interviewed	5
Households moved or occupied by nonresident	0
Total households attempted to be interviewed	54
Refusal rate	9.3%
Final estimate of permanent households	63
Percentage of total households interviewed	77.8%
Interview weighting factor	1.3
Sampled population	111
Estimated population	142.7

Source ADF&G Division of Subsistence household surveys, 2014.

Table 2-3.–Demographic characteristics, Tyonek, 2013.

Characteristic	Tyonek
Household size	
Mean	2.3
Minimum	1
Maximum	7
Age	
Mean	37.1
Minimum[a]	1
Maximum	73
Median	40
Length of residency	
Total population	
Mean	30.4
Minimum[a]	0
Maximum	76
Heads of household	
Mean	41.2
Minimum[a]	3
Maximum	76
Alaska Native households[b]	
Number	59.1
Percentage	93.9%

Source ADF&G Division of Subsistence household surveys, 2014.

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

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

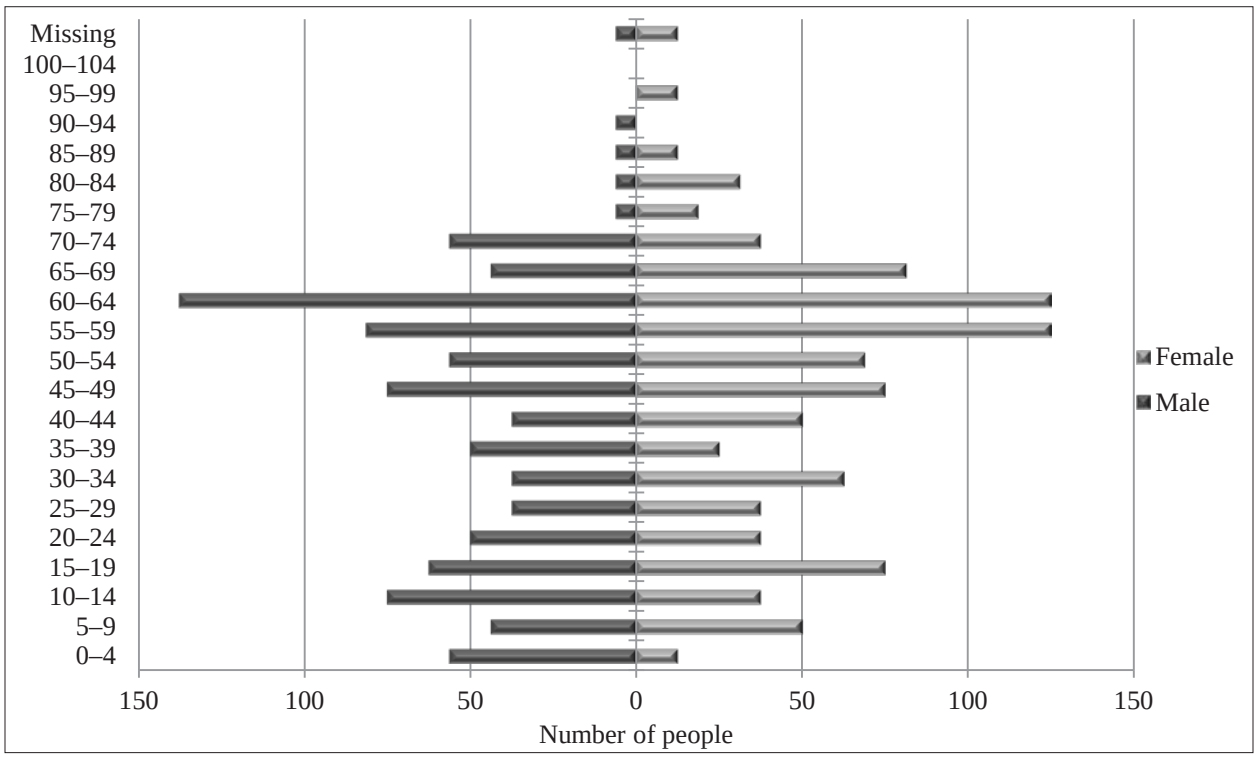

Figure 2-2.–Population profile, Tyonek, 2013.

Table 2-4.–Population profile, Tyonek, 2013.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	2.6	3.5%	3.5%	1.3	1.9%	1.9%	3.9	2.7%	2.7%
5–9	10.3	14.0%	17.5%	1.3	1.9%	3.7%	11.6	8.1%	10.8%
10–14	3.9	5.3%	22.8%	9.0	13.0%	16.7%	12.9	9.0%	19.8%
15–19	5.1	7.0%	29.8%	5.1	7.4%	24.1%	10.3	7.2%	27.0%
20–24	2.6	3.5%	33.3%	5.1	7.4%	31.5%	7.7	5.4%	32.4%
25–29	3.9	5.3%	38.6%	2.6	3.7%	35.2%	6.4	4.5%	36.9%
30–34	0.0	0.0%	38.6%	6.4	9.3%	44.4%	6.4	4.5%	41.4%
35–39	2.6	3.5%	42.1%	6.4	9.3%	53.7%	9.0	6.3%	47.7%
40–44	5.1	7.0%	49.1%	3.9	5.6%	59.3%	9.0	6.3%	54.1%
45–49	9.0	12.3%	61.4%	1.3	1.9%	61.1%	10.3	7.2%	61.3%
50–54	9.0	12.3%	73.7%	3.9	5.6%	66.7%	12.9	9.0%	70.3%
55–59	10.3	14.0%	87.7%	10.3	14.8%	81.5%	20.6	14.4%	84.7%
60–64	3.9	5.3%	93.0%	3.9	5.6%	87.0%	7.7	5.4%	90.1%
65–69	1.3	1.8%	94.7%	2.6	3.7%	90.7%	3.9	2.7%	92.8%
70–74	2.6	3.5%	98.2%	2.6	3.7%	94.4%	5.1	3.6%	96.4%
75–79	0.0	0.0%	98.2%	0.0	0.0%	94.4%	0.0	0.0%	96.4%
80–84	0.0	0.0%	98.2%	0.0	0.0%	94.4%	0.0	0.0%	96.4%
85–89	0.0	0.0%	98.2%	0.0	0.0%	94.4%	0.0	0.0%	96.4%
90–94	0.0	0.0%	98.2%	0.0	0.0%	94.4%	0.0	0.0%	96.4%
95–99	0.0	0.0%	98.2%	0.0	0.0%	94.4%	0.0	0.0%	96.4%
100–104	0.0	0.0%	98.2%	0.0	0.0%	94.4%	0.0	0.0%	96.4%
Missing	1.3	1.8%	100.0%	3.9	5.6%	100.0%	5.1	3.6%	100.0%
Total	**73.3**	**100.0%**	**100.0%**	**69.4**	**100.0%**	**100.0%**	**142.7**	**100.0%**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2014.

Table 2-5.–Birthplaces of household heads, Tyonek, 2013.

Birthplace	Percentage
Anchorage	3.0%
Fairbanks	1.5%
Noorvik	1.5%
Tyonek	80.6%
Mount Edgecumbe	1.5%
Missing	4.5%
Other U.S.	7.5%

Source ADF&G Division of Subsistence household surveys, 2014.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

Table 2-6.–Birthplaces of population, Tyonek, 2013.

Birthplace	Percentage
Anchorage	9.9%
Beluga	0.9%
Fairbanks	0.9%
Noorvik	0.9%
Tyonek	79.3%
Mount Edgecumbe	0.9%
Missing	2.7%
Other U.S.	4.5%

Source ADF&G Division of Subsistence household surveys, 2014.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

Table 2-7.–Estimated earned and other income, Tyonek, 2013.

Income source	Number of employed adults	Number of households	Total for community	± 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government, including tribal	32.0	41.4	$772,711	$442,093 – $1,198,585	$12,265	33.4%
Services	12.0	18.2	$301,679	$96,764 – $676,792	$4,789	13.0%
Construction	6.0	9.9	$295,847	$64,830 – $782,070	$4,696	12.8%
Agriculture, forestry, and fishing	8.0	13.3	$151,471	$20,677 – $410,555	$2,404	6.5%
Transportation, communication, and utilities	1.0	1.7	$80,188	$74,915 – $163,654	$1,273	3.5%
Federal government	2.0	3.3	$69,062	$15,539 – $195,530	$1,096	3.0%
Other employment	2.0	3.3	$7,429	$3,316 – $17,595	$118	0.3%
Retail trade	1.0	1.7	$5,660	$5,288 – $11,251	$90	0.2%
Earned income subtotal	**54.0**	**63.0**	**$1,684,048**	**$1,129,205 – $2,429,547**	**$26,731**	**72.8%**
Other income						
Native corporation dividend		60.4	$371,259	$287,565 – $456,999	$5,893	16.0%
Alaska Permanent Fund dividend		55.3	$111,038	$87,943 – $140,014	$1,763	4.8%
Pension/retirement		3.9	$30,944	$707 – $98,385	$491	1.3%
Food stamps		7.7	$26,933	$6,870 – $64,029	$428	1.2%
Social Security		6.4	$24,514	$1,176 – $67,899	$389	1.1%
Supplemental Security income		2.6	$20,475	$15,925 – $60,171	$325	0.9%
Unemployment		12.9	$19,258	$6,364 – $37,956	$306	0.8%
Child support		3.9	$6,307	$164 – $18,920	$100	0.3%
CITGO fuel voucher		12.9	$6,130	$2,791 – $10,946	$97	0.3%
Disability		1.3	$4,330	$3,368 – $9,430	$69	0.2%
Meeting honoraria		2.6	$4,050	$1,087 – $10,671	$64	0.2%
Heating assistance		5.1	$3,092	$556 – $7,984	$49	0.1%
Other		1.3	$1,174	$913 – $2,440	$19	0.1%
Adult public assistance (OAA, APD)		1.3	$242	$188 – $689	$4	0.0%
Longevity bonus		1.3	$32	$25 – $96	$1	0.0%
TANF (Temporary Cash Assistance for Needy Families)		0.0	$0	$0 – $0	$0	0.0%
Workers' compensation/insurance		0.0	$0	$0 – $0	$0	0.0%
Veterans assistance		0.0	$0	$0 – $0	$0	0.0%
Foster care		0.0	$0	$0 – $0	$0	0.0%
Other income subtotal		**3.9**	**$629,777**	**$489,366 – $780,978**	**$9,996**	**27.2%**
Community income total			**$2,313,825**	**$1,699,881 – $3,066,886**	**$36,727**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2014

2-8). In comparison, the number of jobs provided by each sector included 54% from local government; 16% from services; 14% from agriculture, forestry, and fishing; and 8% from construction.

Eighty-five percent of adults (age 16 or older) in Tyonek were employed in 2013 (Table 2-9). The mean duration of employment was 6.4 months for employed individuals and 32% of employed adults were employed year-round. The average number of jobs that each employed individual held in 2013 was 1.4.

In 2013, the per capita income for Tyonek was $16,213 (Appendix C). In comparison, the 2013 Tyonek per capita income was less than the 2013 per capita income for the entirety of the Kenai Peninsula Borough ($48,485), and it was also less than the 2013 per capita income for the entire state of Alaska ($50,150).[2]

2. Alaska Department of Labor and Workforce Development, Research and Analysis Section. 2015. "Income Data for Alaska and U.S.: 2013 Per Capita Personal Income." http://laborstats.alaska.gov/income/income.htm (accessed May 2015).

Table 2-8.–Employment by industry, Tyonek, 2013.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**126.9**	**63.0**	**92.6**	
Federal government	**2.7%**	**5.3%**	**3.7%**	**4.1%**
Executive, administrative, and managerial	2.7%	5.3%	3.7%	4.1%
Local government, including tribal	**54.1%**	**65.8%**	**59.3%**	**45.9%**
Executive, administrative, and managerial	5.4%	10.5%	7.4%	4.3%
Social scientists, social workers, religious workers, and lawyers	1.4%	2.6%	1.9%	2.0%
Teachers, librarians, and counselors	5.4%	10.5%	7.4%	8.4%
Health technologists and technicians	2.7%	5.3%	3.7%	2.9%
Technologists and technicians, except health	2.7%	5.3%	3.7%	1.9%
Administrative support occupations, including clerical	6.8%	13.2%	9.3%	9.5%
Service occupations	12.2%	15.8%	11.1%	2.4%
Agricultural, forestry, and fishing occupations	1.4%	2.6%	1.9%	0.2%
Construction and extractive occupations	1.4%	2.6%	1.9%	2.7%
Transportation and material moving occupations	4.1%	7.9%	5.6%	7.0%
Handlers, equipment cleaners, helpers, and laborers	9.5%	18.4%	13.0%	4.1%
Occupation not indicated	1.4%	2.6%	1.9%	0.6%
Agriculture, forestry, and fishing	**13.5%**	**21.1%**	**14.8%**	**9.0%**
Agricultural, forestry, and fishing occupations	13.5%	21.1%	14.8%	9.0%
Construction	**8.1%**	**15.8%**	**11.1%**	**17.6%**
Administrative support occupations, including clerical	1.4%	2.6%	1.9%	2.1%
Mechanics and repairers	1.4%	2.6%	1.9%	1.5%
Construction and extractive occupations	1.4%	2.6%	1.9%	0.2%
Transportation and material moving occupations	2.7%	5.3%	3.7%	11.3%
Handlers, equipment cleaners, helpers, and laborers	1.4%	2.6%	1.9%	2.5%
Transportation, communication, and utilities	**1.4%**	**2.6%**	**1.9%**	**4.8%**
Precision production occupations	1.4%	2.6%	1.9%	4.8%
Retail trade	**1.4%**	**2.6%**	**1.9%**	**0.3%**
Executive, administrative, and managerial	1.4%	2.6%	1.9%	0.3%
Services	**16.2%**	**28.9%**	**22.2%**	**17.9%**
Technologists and technicians, except health	2.7%	5.3%	3.7%	0.2%
Service occupations	2.7%	5.3%	3.7%	2.5%
Mechanics and repairers	1.4%	2.6%	1.9%	1.5%
Transportation and material moving occupations	1.4%	2.6%	1.9%	7.0%
Handlers, equipment cleaners, helpers, and laborers	8.1%	15.8%	11.1%	6.7%
Industry not indicated	**2.7%**	**5.3%**	**3.7%**	**0.4%**
Precision production occupations	2.7%	5.3%	3.7%	0.4%

Source ADF&G Division of Subsistence household surveys, 2014.

Table 2-9.–Employment characteristics, Tyonek, 2013.

Characterisstic	Tyonek
All adults	
Number	109.3
Mean weeks employed	23.7
Employed adults	
Number	92.6
Percentage	84.7%
Jobs	
Number	126.9
Mean	1.4
Minimum	1
Maximum	5
Months employed	
Mean	6.4
Minimum	0
Maximum	12
Percentage employed year-round	31.9%
Mean weeks employed	27.9
Households	
Number	63
Employed	
Number	63.0
Percentage	100.0%
Jobs per employed household	
Mean	2.0
Minimum	1
Maximum	6
Employed adults	
Mean	
Employed households	1.5
Total households	1.5
Minimum	1
Maximum	3
Mean person-weeks of employment	31.2

Source ADF&G Division of Subsistence household surveys, 2014.

Levels of Individual Participation in the Harvesting and Processing of Wild Resources

Table 2-10 reports the expanded levels of individual participation in the harvest and processing of wild resources by all Tyonek residents in 2013. Many community members participated in gathering plants and berries (81%), fishing activities (74%), and hunting large land mammals (51%). A smaller percentage of people were involved in hunting birds (15%) or hunting or trapping small land mammals (9%). In terms of processing wild resources, many residents were involved in processing plants and berries (82%) and fish (81%), and almost one-half (45%) of Tyonek residents participated in processing large land mammals. A smaller percentage of the community was involved in processing birds (18%) and small land mammals (4%).

Household Resource Harvest and Use Patterns and Sharing of Wild Resources

Table 2-11 summarizes resource harvest and use characteristics for Tyonek in 2013 at the household level. The average harvest was 385 lb usable weight per household. During the study year, community households harvested an average of 6 kinds of wild resources and used an average of 8 kinds of wild resources. The maximum number of resources used by any household was 27. In addition, households gave away an average of 3 kinds of resources to other households.

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

As shown in Figure 2-3, in the 2013 study year in Tyonek, about 70% of the harvested wild resources as estimated in usable pounds were harvested by 31% of the community's households. Further analysis of the study findings, beyond the scope of this report, might identify characteristics of the highly productive households in Tyonek.

Harvest Quantities and Composition

Table 2-12 reports estimated wild resource harvests and uses by Tyonek residents in 2013 and is organized first by general category and then by species. All edible resources are reported in pounds usable weight (see Appendix B for conversion factors[3]). The "harvest" category includes resources harvested by any member of the surveyed household during the study year. The "use" category includes all resources taken, given away, or used by a household, and resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and 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. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

The total harvest by Tyonek residents was 24,249 lb in 2013 (Table 2-12). The composition of the harvest is represented by salmon (69% of the total harvest), followed by large land mammals (14%), nonsalmon fish (8%), and vegetation (6%); additionally, each contributing 1% or less of the total harvest were birds and eggs, small land mammals, marine mammals, and marine invertebrates (Figure 2-4). The community harvest by wild resource category in order of most to least was: salmon (16,766 lb total, or 118 lb per capita), large land mammals (3,471 lb total, or 24 lb per capita), nonsalmon fish (1,863 lb total, or 13 lb per capita), vegetation (1,352 lb total, or 10 lb per capita), and marine mammals (360 lb, or 2 lb per capita) (Table 2-12).

3. 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 2-10.–Individual participation in subsistence harvesting and processing activities, Tyonek, 2013.

Total number of people	**142.7**
Fish	
Fish	
Number	105.7
Percentage	74.1%
Process	
Number	115.0
Percentage	80.6%
Large land mammals	
Hunt	
Number	72.7
Percentage	50.9%
Process	
Number	64.0
Percentage	44.9%
Small land mammals	
Hunt or trap	
Number	13.2
Percentage	9.3%
Process	
Number	6.6
Percentage	4.6%
Birds and eggs	
Hunt/gather	
Number	21.1
Percentage	14.8%
Process	
Number	25.1
Percentage	17.6%
Vegetation	
Gather	
Number	115.0
Percentage	80.6%
Process	
Number	117.6
Percentage	82.4%
Any resource	
Attempt harvest	
Number	126.0
Percentage	88.3%
Process	
Number	131.1
Percentage	91.9%

Source ADF&G Division of Subsistence household surveys, 2014.

Table 2-11.–Resource harvest and use characteristics, Tyonek, 2013.

Characteristic	
Mean number of resources used per household	**8.0**
Minimum	1
Maximum	27
95% confidence limit (±)	9.0%
Median	7
Mean number of resources attempted to harvest per household	**7.4**
Minimum	1
Maximum	28
95% confidence limit (±)	10.0%
Median	7
Mean number of resources harvested per household	**6.3**
Minimum	1
Maximum	25
95% confidence limit (±)	10.1%
Median	5
Mean number of resources received per household	**3.4**
Minimum	0
Maximum	12
95% confidence limit (±)	11.7%
Median	3
Mean number of resources given away per household	**3.2**
Minimum	0
Maximum	17
95% confidence limit (±)	14.7%
Median	2
Household harvest (pounds)	
Minimum	0
Maximum	1,945
Mean	384.9
Median	224.5
Number of resources asked about and identified voluntarily by respondents	134

Source ADF&G Division of Subsistence household surveys, 2014.

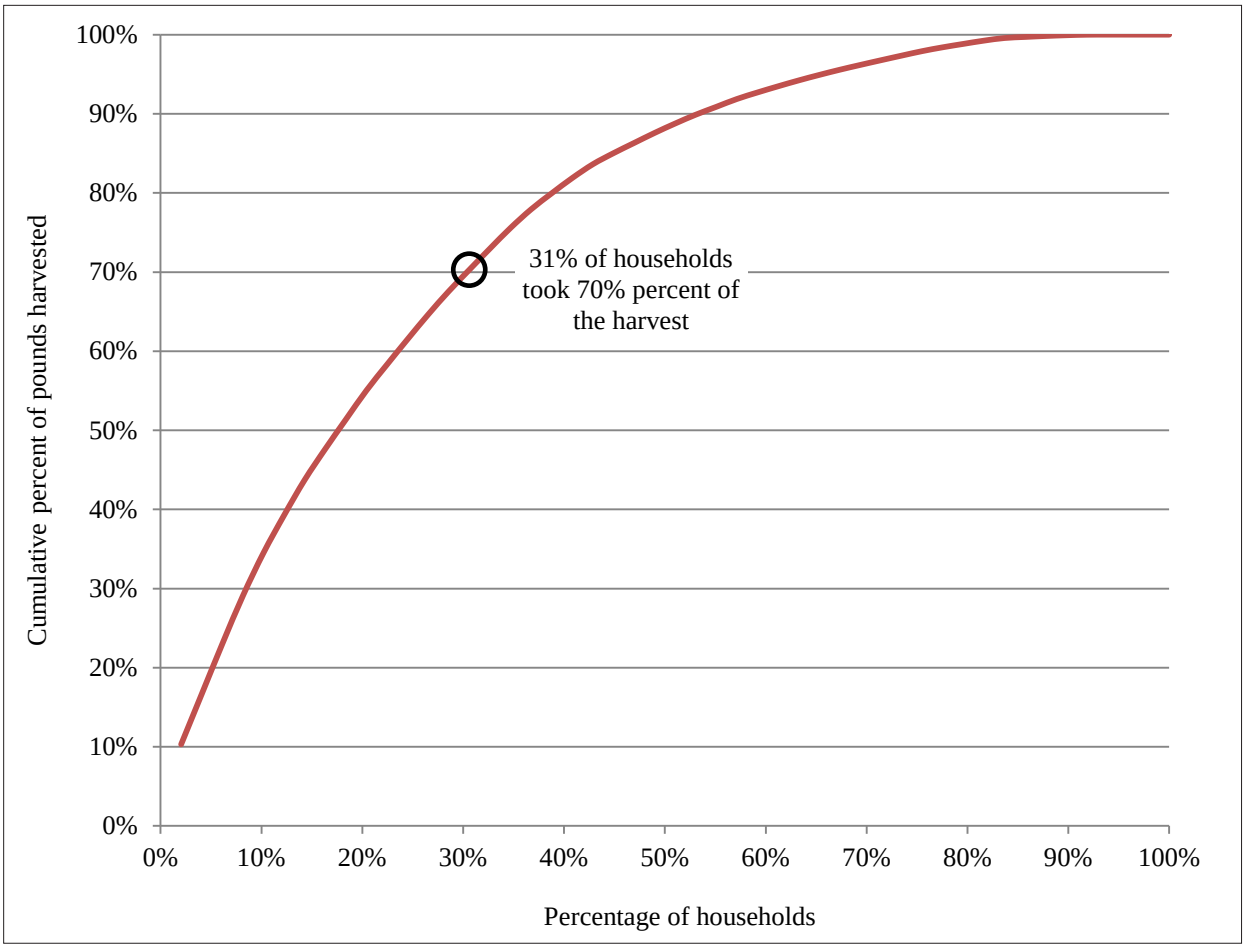

Figure 2-3.–Household specialization, Tyonek, 2013.

Table 2-12.–Estimated use and harvests of fish, game, and vegetation resources, Tyonek, 2013.

Resource	Percentage of households: Use %	Attempt %	Harvest %	Receive %	Give %	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±)
All resources	**100.0**	**100.0**	**100.0**	**85.7**	**77.6**	**24,248.9**	**384.9**	**169.9**				**14.4**
Salmon	**89.8**	**85.7**	**81.6**	**49.0**	**59.2**	**16,765.5**	**266.1**	**117.5**				**17.5**
Chum salmon	8.2	8.2	8.2	0.0	2.0	101.5	1.6	0.7	18.0	ind	0.3	53.9
Coho salmon	65.3	63.3	59.2	32.7	40.8	3,169.4	50.3	22.2	691.6	ind	11.0	20.8
Chinook salmon	85.7	77.6	75.5	40.8	55.1	10,246.9	162.6	71.8	1,096.4	ind	17.4	15.5
Pink salmon	12.2	12.2	12.2	0.0	8.2	150.8	2.4	1.1	66.6	ind	1.1	73.7
Sockeye salmon	46.9	42.9	42.9	22.4	26.5	3,088.3	49.0	21.6	667.7	ind	10.6	55.0
Landlocked salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spawning sockeye salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown salmon	2.0	2.0	2.0	0.0	0.0	8.5	0.1	0.1	1.3	ind	0.0	94.8
Nonsalmon fish	**53.1**	**40.8**	**40.8**	**34.7**	**22.4**	**1,863.2**	**29.6**	**13.1**				**64.3**
Pacific herring	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe/unspecified	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring sac roe	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring spawn on kelp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Eulachon (hooligan, candlefish)	30.6	18.4	18.4	20.4	16.7	1,468.1	23.3	10.3	451.4	gal	7.2	81.9
Unknown smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific (gray) cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown flounder	2.0	2.0	2.0	0.0	0.0	38.6	0.6	0.3	12.9	ind	0.2	94.8
Lingcod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown greenling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pacific halibut	14.3	6.1	4.1	10.2	0.0	25.6	0.4	0.2	25.6	lb	0.4	90.0
Black rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sablefish (black cod)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown shark	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown sole	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Stickleback (needlefish)	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 2-12.–Page 2 of 5.

Resource	Percentage of households: Use %	Attempt %	Harvest %	Receive %	Give %	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±)
Nonsalmon fish, continued												
Wolffish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dolly Varden	8.2	8.2	8.2	0.0	0.0	27.8	0.4	0.2	30.9	ind	0.5	48.3
Arctic grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pike	4.1	2.0	2.0	4.1	0.0	14.4	0.2	0.1	5.1	ind	0.1	94.8
Sheefish	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Longnose sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Rainbow trout	28.6	24.5	24.5	10.2	10.2	230.4	3.7	1.6	164.6	ind	2.6	30.3
Steelhead	2.0	2.0	2.0	0.0	2.0	54.0	0.9	0.4	12.9	ind	0.2	94.8
Unknown trout	2.0	2.0	2.0	0.0	0.0	1.8	0.0	0.0	1.3	ind	0.0	94.8
Unknown whitefishes	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown nonsalmon fish	2.0	2.0	2.0	0.0	0.0	2.6	0.0	0.0	2.6	ind	0.0	94.8
Large land mammals	**73.5**	**61.2**	**12.2**	**67.3**	**24.5**	**3,471.4**	**55.1**	**24.3**				**36.6**
Black bear	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brown bear	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Caribou	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Moose	73.5	59.2	12.2	67.3	24.5	3,471.4	55.1	24.3	7.7	ind	0.1	36.6
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Small land mammals	**12.2**	**10.2**	**6.1**	**6.1**	**4.1**	**139.5**	**2.2**	**1.0**				**53.6**
Beaver	8.2	6.1	4.1	4.1	0.0	77.1	1.2	0.5	5.1	ind	0.1	66.3
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red fox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Snowshoe hare	2.0	2.0	2.0	0.0	0.0	10.3	0.2	0.1	5.1	ind	0.1	94.8
North American river (land) otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Lynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mink	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Porcupine	6.1	6.1	4.1	2.0	4.1	52.1	0.8	0.4	11.6	ind	0.2	84.7

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Table 2-12.–Page 3 of 5.

Resource	Percentage of households: Use %	Attempt %	Harvest %	Receive %	Give %	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±)
Small land mammals, continued												
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red (tree) squirrel	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Least weasel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gray wolf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Wolverine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine mammals	**14.3**	**10.2**	**6.1**	**14.3**	**6.1**	**360.0**	**5.7**	**2.5**				**55.8**
Harbor seal	6.1	8.2	6.1	2.0	6.1	360.0	5.7	2.5	6.4	ind	0.1	55.8
Unknown seal	2.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sea otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Steller sea lion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Beluga whale	10.2	2.0	0.0	10.2	2.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Birds and eggs	**32.7**	**30.6**	**28.6**	**8.2**	**16.3**	**165.9**	**2.6**	**1.2**				**40.4**
Bufflehead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Canvasback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gadwall	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Goldeneye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	8.2	6.1	6.1	4.1	2.0	34.7	0.6	0.2	34.7	ind	0.6	72.9
Common merganser	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red-breasted merganser	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pintail	12.2	10.2	10.2	2.0	6.1	22.6	0.4	0.2	28.3	ind	0.4	52.3
Unknown scaup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown scoter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern shoveler	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Green-winged teal	2.0	2.0	2.0	0.0	2.0	7.7	0.1	0.1	25.7	ind	0.4	94.8
American wigeon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown ducks	4.1	4.1	2.0	2.0	0.0	5.4	0.1	0.0	7.7	ind	0.1	94.8
Canada goose	4.1	4.1	4.1	0.0	2.0	7.7	0.1	0.1	6.4	ind	0.1	77.8
Snow goose	2.0	2.0	2.0	0.0	0.0	7.7	0.1	0.1	2.6	ind	0.0	94.8
White-fronted goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown goose	2.0	4.1	2.0	0.0	2.0	25.7	0.4	0.2	5.1	ind	0.1	94.8
Unknown swan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sandhill crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 2-12.–Page 4 of 5.

Resource	Percentage of households: Use %	Attempt %	Harvest %	Receive %	Give %	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±)
Birds and eggs, continued												
Common snipe	2.0	2.0	2.0	0.0	0.0	1.3	0.0	0.0	12.9	ind	0.2	94.8
Unknown loon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spruce grouse	14.3	16.3	14.3	2.0	6.1	35.1	0.6	0.2	50.1	ind	0.8	39.0
Ruffed grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown grouse	4.1	4.1	4.1	0.0	2.0	4.5	0.1	0.0	9.0	ind	0.1	72.4
Unknown ptarmigan	4.1	4.1	4.1	0.0	4.1	12.6	0.2	0.1	18.0	ind	0.3	82.1
Unknown duck eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown gull eggs	2.0	2.0	2.0	0.0	2.0	0.8	0.0	0.0	2.6	ind	0.0	94.8
Unknown tern eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine invertebrates	**16.3**	**12.2**	**10.2**	**8.2**	**4.1**	**131.9**	**2.1**	**0.9**				**67.7**
Butter clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Freshwater clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Horse clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific littleneck clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pinkneck clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Razor clams	14.3	10.2	8.2	6.1	4.1	117.1	1.9	0.8	39.0	gal	0.6	75.6
Unknown clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown cockles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Dungeness crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown king crab	4.1	2.0	2.0	2.0	0.0	14.8	0.2	0.1	6.4	ind	0.1	94.8
Tanner crab, bairdi	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown Tanner crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown mussels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Octopus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown scallops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Shrimp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0
Vegetation	**89.8**	**89.8**	**83.7**	**46.9**	**44.9**	**1,351.5**	**21.5**	**9.5**				**33.7**
Blueberry	61.2	73.5	59.2	18.4	24.5	617.9	9.8	4.3	154.5	gal	2.5	40.4
Lowbush cranberry	16.3	16.3	14.3	6.1	8.2	63.6	1.0	0.4	15.9	gal	0.3	48.3
Highbush cranberry	49.0	44.9	44.9	14.3	22.4	536.5	8.5	3.8	134.1	gal	2.1	35.4
Crowberry	4.1	4.1	4.1	2.0	0.0	5.5	0.1	0.0	1.4	gal	0.0	89.3

-continued-

Table 2-12.–Page 5 of 5.

Resource	Percentage of households: Use %	Attempt %	Harvest %	Receive %	Give %	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±)
Vegetation, continued												
Currants	14.3	16.3	14.3	2.0	2.0	21.7	0.3	0.2	5.4	gal	0.1	44.2
Raspberry	12.2	12.2	12.2	2.0	6.1	14.7	0.2	0.1	3.7	gal	0.1	67.6
Salmonberry	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Strawberry	12.2	12.2	12.2	4.1	2.0	20.6	0.3	0.1	4.8	gal	0.1	53.5
Twisted stalk berry (watermelon berry)	2.0	2.0	2.0	0.0	0.0	0.4	0.0	0.0	0.1	gal	0.0	94.8
Other wild berry	2.0	2.0	2.0	0.0	0.0	0.5	0.0	0.0	0.1	gal	0.0	94.8
Devil's club	2.0	2.0	2.0	0.0	0.0	2.6	0.0	0.0	2.6	gal	0.0	94.8
Fiddlehead ferns	2.0	2.0	2.0	0.0	0.0	1.3	0.0	0.0	1.3	gal	0.0	94.8
Hudson's Bay (Labrador) tea	14.3	16.3	14.3	2.0	6.1	27.6	0.4	0.2	27.6	gal	0.4	58.9
Wild celery	10.2	10.2	10.2	0.0	4.1	17.4	0.3	0.1	17.4	gal	0.3	46.3
Yarrow	2.0	2.0	2.0	0.0	0.0	1.3	0.0	0.0	1.3	gal	0.0	94.8
Other wild greens	6.1	6.1	6.1	0.0	2.0	20.1	0.3	0.1	20.1	gal	0.3	92.8
Unknown mushrooms	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other wood	79.6	71.4	71.4	30.6	10.4	0.0	0.0	0.0	788.8	cord	12.5	38.4

Source ADF&G Division of Subsistence household surveys, 2014.

Note Where the percentage of households using a resource is greater than the combined receiving and harvesting households indicates use from resources obtained during a previous year.

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

a. Summary rows that include incompatible units of measure have been left blank.

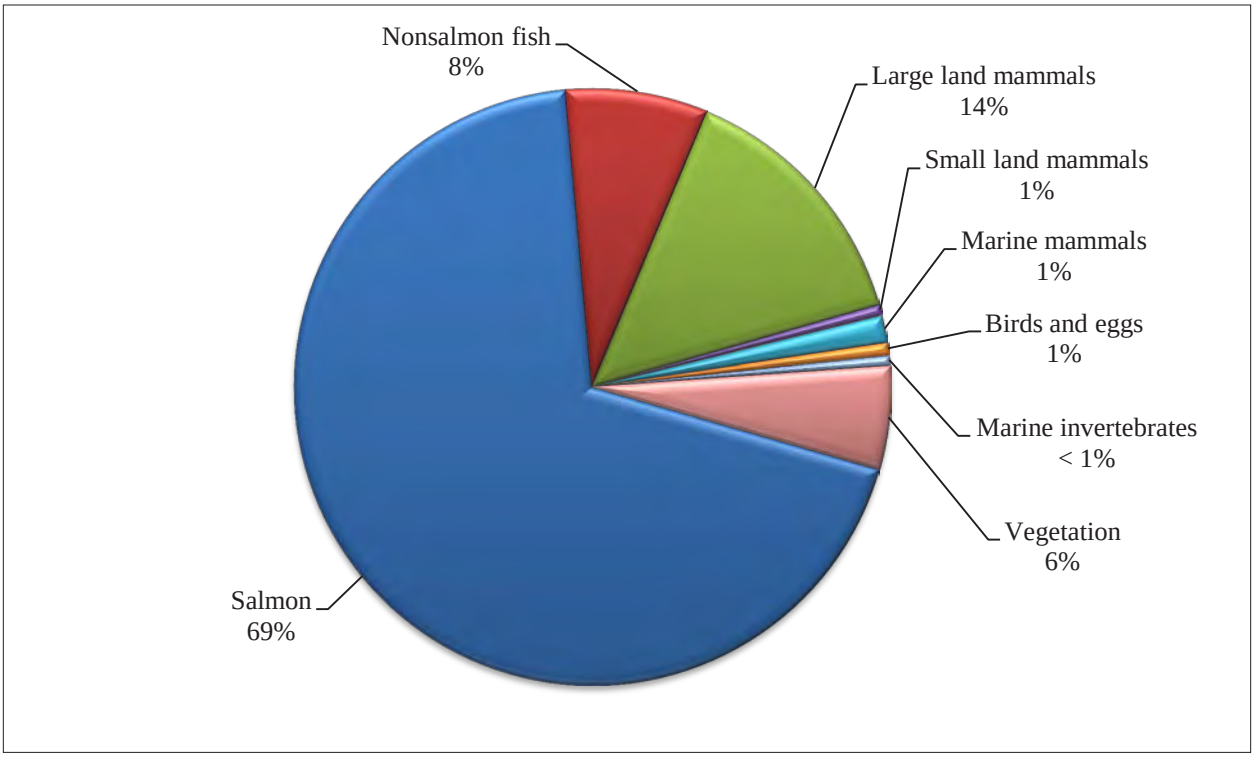


Figure 2-4.–Composition of harvest by resource category in pounds usable weight, Tyonek, 2013.

The harvests of birds and eggs, small land mammals, and marine invertebrates each contributed 1 lb or less per capita (Table 2-12).

Seasonal Round

Tyonek residents harvest wild food resources throughout the year. Like many rural Alaska communities, certain species are targeted in different seasons, and this creates a cyclical harvest pattern. These patterns are defined by seasonal resource availability, laws, regulations, other economic activities, and land access. The annual cycle of resource availability is predictable and allows for the reliable and sustained provision of wild foods for the community.

As in the past, during the study year Tyonek residents began their annual round of resource harvests in the spring as winter ice cleared from local streams and lakes. The rivers and streams usually release their ice burden in April and May, and in May winter ice fishing for rainbow trout comes to an end as lakes thaw. Once breakup occurs, residents shift their fishing efforts to the newly open water of the streams and rivers.

Eulachon, referred to locally as "hooligan," is one of the first fish resources to become available in Cook Inlet waters and in the local rivers (Figure 2-5). Tyonek residents begin eulachon fishing in April, harvesting them with dip nets at the mouth of rivers or collecting them by hand when the fish are washed up on the beaches by strong surf. Eulachon fishing continues into May with the timing of this activity depending on weather and tidal conditions.

By regulation, the spring federal subsistence waterfowl season for Tyonek residents begins April 2 and continues through May 31. Migrating ducks and geese congregate on the Trading Bay mud flats and near the MacArthur River and are hunted as they move through these areas (Figure 2-5).

Salmon setnet fishing for subsistence uses, targeting Chinook (king) salmon, begins on May 15 and occurs on the beaches and at fish camps within the Tyonek Subdistrict. The fishery is open from just south of the

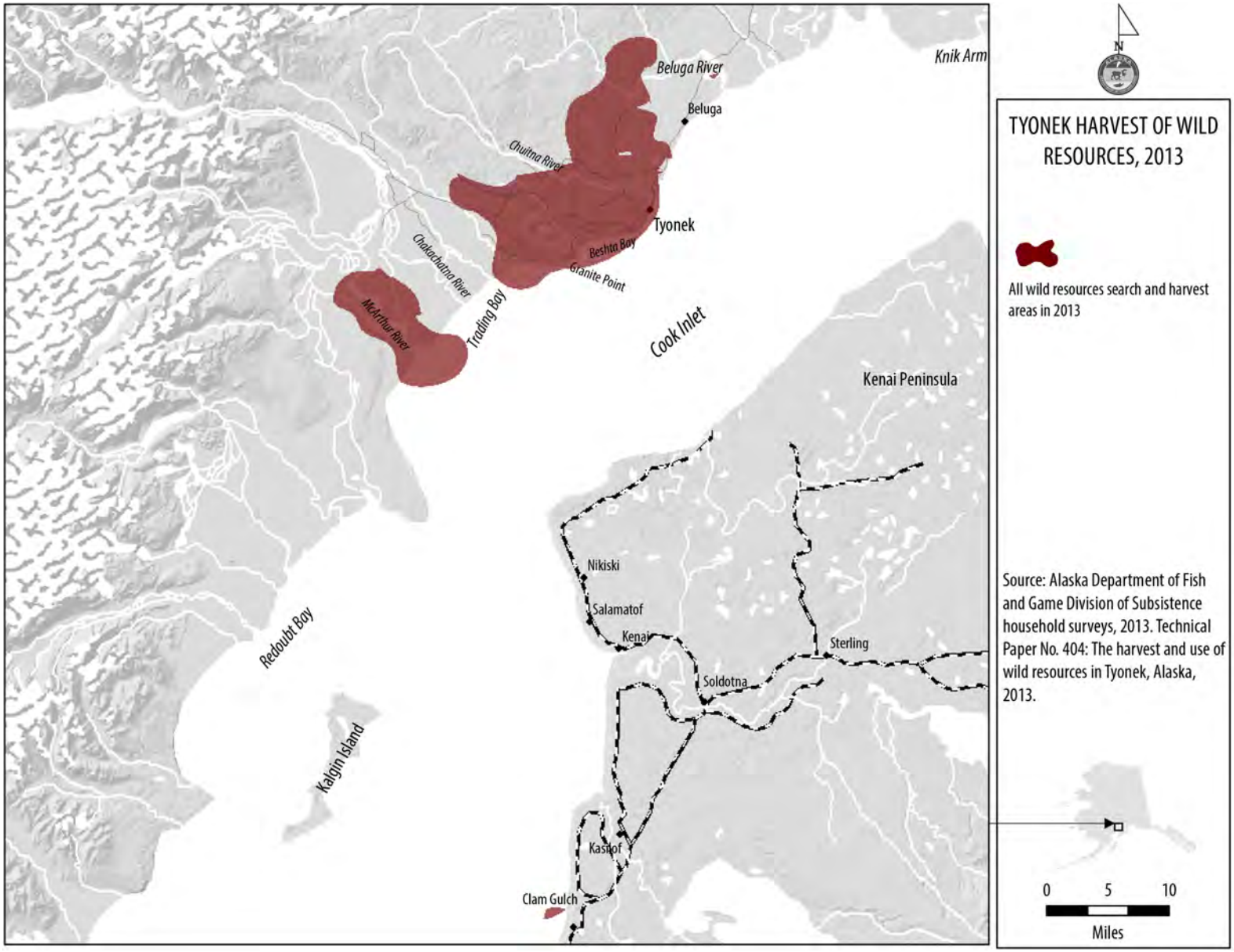


Figure 2-5.–Wild resources search and harvest areas, Tyonek, 2013.

mouth of the Chuitna River to Granite Point, and sites are easily accessible from the community via the beach or the network of roads surrounding Tyonek. In spring, Tyonek residents also pick fresh greens such as fiddlehead ferns and dig for clams.

During summer months, beginning in mid-June and extending through August, Tyonek residents are busy with salmon fishing on beaches near the community and tending their smokehouses. Commercial fishing also begins in the last week in May, targeting sockeye salmon and later coho salmon, and continues throughout the summer on designated open days. In July, Tyonek fishers use a rod and reel to harvest rainbow trout and Dolly Varden in nearby rivers and lakes. Berries begin to ripen at the end of July and most Tyonek households pick blueberries, currants, highbush cranberries, and several other varieties of berries and greens.

In August, moose season is open from August 20 to September 25 for a general hunt in GMU 16B. Tyonek hunters travel the road system north and south of the Chuitna River. They also travel by boat to McArthur River for moose, beaver, and porcupine hunting (Figure 2-5).

Upland game bird seasons for spruce grouse and ptarmigan also open in mid-August. Grouses are the main species taken in early fall, while ptarmigan are taken after freeze-up and throughout the winter months.

The federal subsistence waterfowl season for Tyonek residents reopens from August 1–31. The general waterfowl season opens on September 1 and continues to December 16, but most waterfowl hunting is over by mid- to late October since migrating ducks and geese move through the area before freeze-up occurs. A second moose hunting season occurs for qualified Tier II hunters from December 15 to March 31.

During the winter months, short days and cold temperatures limit the extent of resource harvest activities. Residents take advantage of occasional warm weather to harvest firewood, fish through the ice in local lakes, and hunt moose and ptarmigan.

Following the winter solstice, as the length of the light during the day increases, fishers and their families travel on snowmachines throughout the area to frozen lakes where they fish through the ice for trout and Dolly Varden. Beaver trapping begins in late winter as the amount of daylight increases. Firm snow conditions create easy travel by snowmachine, and beavers become more active. By the end of March, long days and warming weather conditions start a new annual cycle with the arrival of spring.

Use and Harvest Characteristics by Resource Category

All Tyonek households used and attempted to harvest wild resources in 2013, and 100% of households were successful in harvesting at least 1 resource. Table 2-12 also reports the sharing of each resource by percentage of households receiving each resource and the percentage of households giving away each resource. Considering all resources combined, sharing appears to have been an important activity for Tyonek residents; 86% of Tyonek households received at least 1 wild resource in 2013, and 78% of households gave away at least 1 resource.

Large land mammals was the resource category most frequently received by Tyonek households in 2013 (Table 2-12). An estimated 67% of community households received large land mammals (specifically moose) in 2013; this was followed by receipt of salmon (49%) and receipt of vegetation (47%). A smaller percentage of Tyonek household received nonsalmon fish (35%), marine mammals (14%), birds and eggs (8%), marine invertebrates (8%), and small land mammals (6%).

Table 2-13.–Top ranked resources used by households, Tyonek, 2013.

Rank[a]	Resource	Percentage of households using
1.	Chinook salmon	85.7%
2.	Moose	73.5%
3.	Coho salmon	65.3%
4.	Blueberry	61.2%
5.	Highbush cranberry	49.0%
6.	Sockeye salmon	46.9%
7.	Eulachon (hooligan, candlefish)	30.6%
8.	Rainbow trout	28.6%
9.	Lowbush cranberry	16.3%
10.	Pacific halibut	14.3%
10.	Spruce grouse	14.3%
10.	Razor clams	14.3%
10.	Currants	14.3%
10.	Hudson's Bay (Labrador) tea	14.3%

Source ADF&G Division of Subsistence household surveys, 2014.
a. Resources used by the same percentage of households share the lowest rank value instead of having sequential rank values.

Salmon and vegetation were the resource categories most frequently given away by households (59% of households gave away salmon, and 45% gave away vegetation). Twenty-five percent of households gave away large land mammals, and 22% gave away nonsalmon fish. A smaller percentage of households gave away birds and eggs (16%), marine mammals (6%), small land mammals (4%), or marine invertebrates (4%).

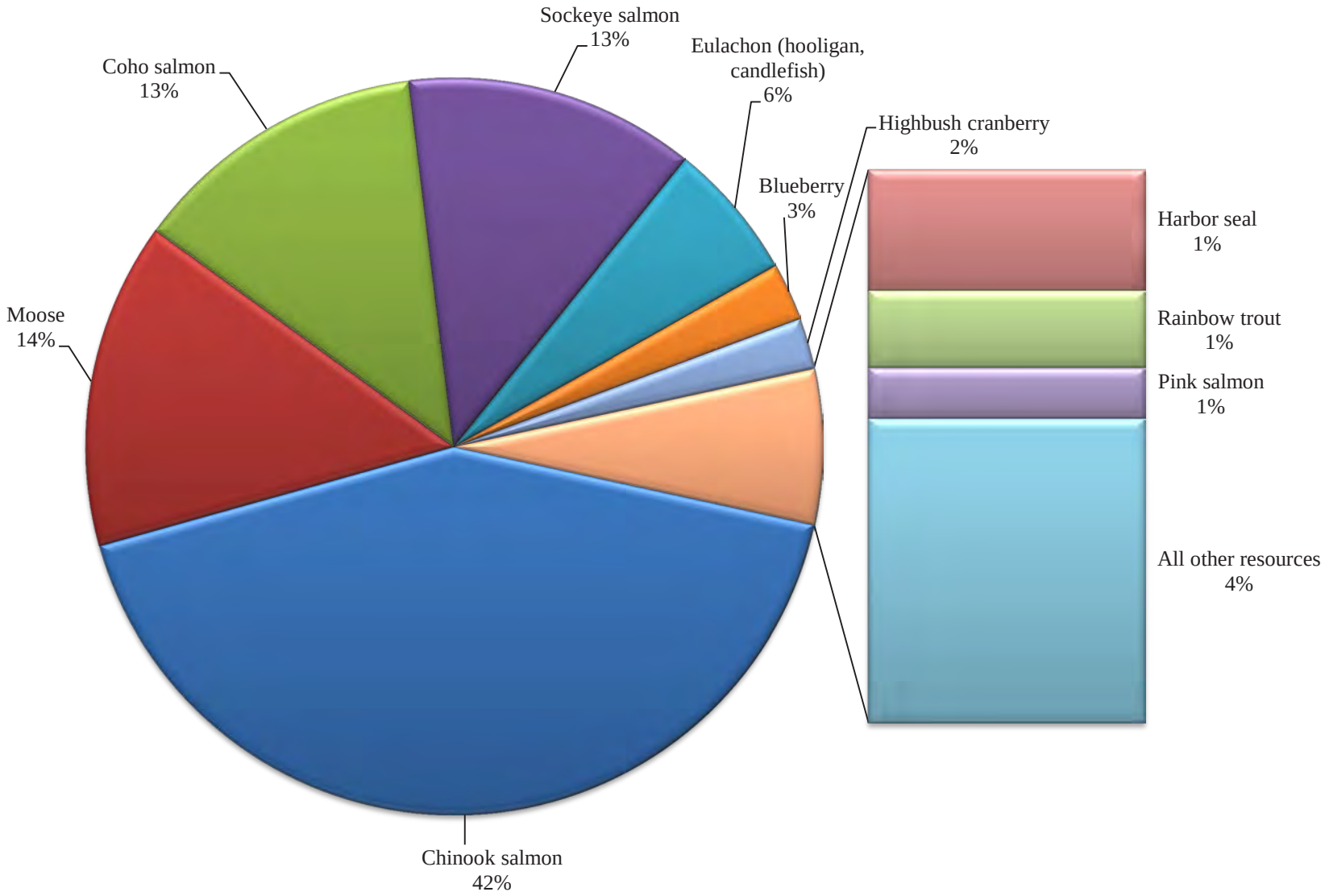
Table 2-13 lists the top resources used by Tyonek households during the 2013 study year. Chinook salmon were used by 86% of households in the community. Use of Chinook salmon was followed closely by use of moose (74% of households) and coho salmon (65%). Four species of berries received a top use rank, including blueberries (61%), highbush cranberries (49%), lowbush cranberries (16%), and currants (14%).

Figure 2-6 depicts the resources with the largest harvests. Importantly, the number of households using a resource is not always directly proportional to the top resources harvested by pounds usable weight. For instance, blueberries contributed about 3% to the overall harvest even though this species was used by 61% of households (Figure 2-6; Table 2-13). This suggests that certain resources are important to households despite being harvested in relatively small quantities. The species that made up the largest percentage of the harvest in pounds usable weight were Chinook salmon (42%), moose (14%), coho salmon (13%) and, sockeye salmon (13%).

Salmon

In 2013, the community of Tyonek harvested a total of 16,766 lb of salmon, or 118 lb per capita out of a total per capita harvest of 170 lb (Table 2-12). Of the total salmon harvest, 61% was Chinook salmon, followed by coho salmon (19%), sockeye salmon (18%), and chum and pink salmon made up the remaining 2% of the total harvest of salmon (Figure 2-7).

Chinook salmon was the most targeted species of salmon by Tyonek residents, and 85% of households used Chinook salmon during the study year; 78% of households fished for Chinook salmon, and 76% of Tyonek households were successful in their Chinook salmon harvest efforts during the study year. In 2013, Tyonek residents harvested 10,247 lb of Chinook salmon, or 72 lb per capita (Table 2-12). The majority (95%) of the Chinook salmon were harvested using subsistence gillnets; the remaining 5% were either removed from commercial catches (4%) or harvested using rod and reel (1%) (Table 2-14).



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

Figure 2-6.–Top species harvested by percentage of total harvest in pounds usable weight, Tyonek, 2013.

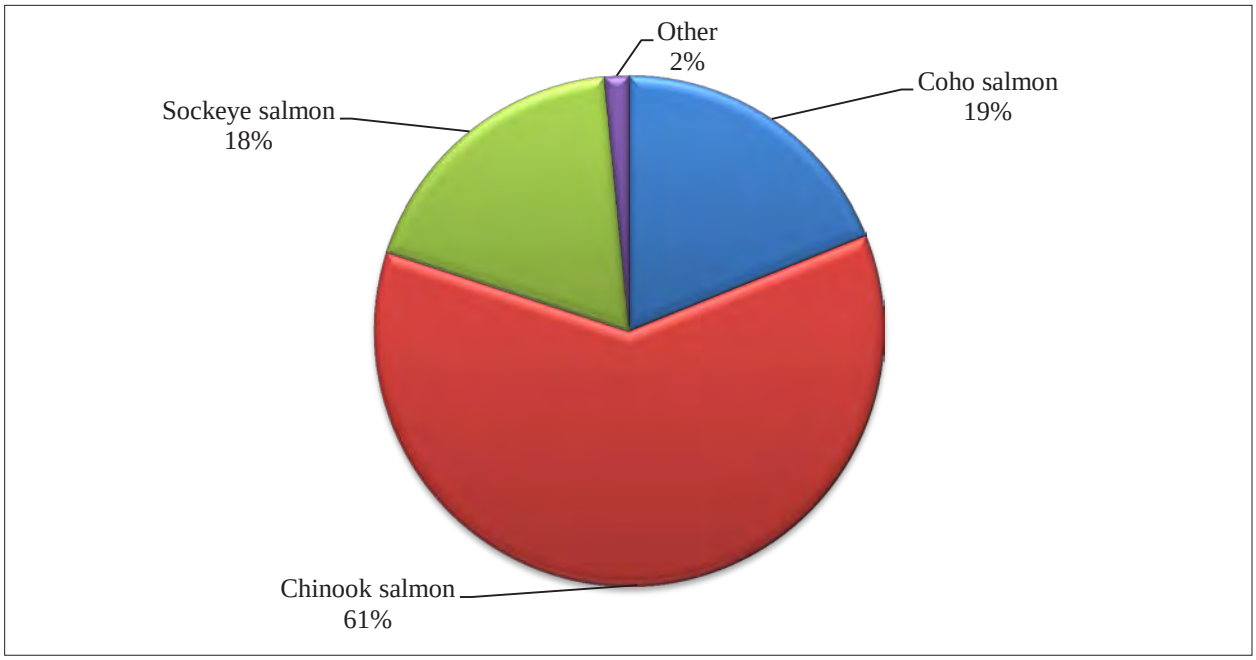


Figure 2-7.–Composition of salmon harvest in pounds usable weight, Tyonek, 2013.

Coho salmon were used by 65% of Tyonek households in 2013. Sixty-three percent of households attempted to harvest coho salmon, with 59% of all Tyonek households successfully harvesting this resource. The total coho salmon harvest in 2013 was 3,169 lb, or 22 lb per capita. The majority (83%) of coho salmon were harvested using subsistence gillnets, and the remaining 17% were either removed from commercial catches (10%) or harvested using rod and reel (7%) (Table 2-14).

Sockeye salmon were used by approximately one-half (47%) of Tyonek households in 2013 and 43% of households attempted to harvest this species; of those 43%, all were successful in harvesting sockeye salmon (Table 2-12). More sockeye salmon were removed from commercial catches (1,853 lb, or 60% of the harvest weight) than harvested using subsistence gillnets (1,164 lb, or 38% of harvest weight) or rod and reel (71 lb, or 2% of harvest weight) (Table 2-14).

Only 12% of Tyonek households used pink salmon and 8% of households used chum salmon (Table 2-12). Of the households that attempted to harvest pink salmon and chum salmon, all were successful.

Sharing of salmon was common in this community in 2013; all 5 species of salmon were reported to be given away. Forty-one percent of households received Chinook salmon, and 55% gave this resource away. Coho salmon were received by 33% of households, and 41% gave coho salmon resources away. Sockeye salmon were given away by 27% of households, and 22% of households received this resource.

Tyonek residents set subsistence gillnets to fish for salmon from their family fish camps along the shoreline of Cook Inlet or from setnet sites close to the community. Areas fished during subsistence and commercial efforts by Tyonek residents for Chinook, coho, and sockeye salmon in the 2013 study year were within a 16-mile stretch of beach near the community. Starting from the west and moving toward the east, the fishing areas encompassed the beach at Granite Point all the way to the mouth of the Chuitna River and up the Chuitna River itself (figures 2-8 through 2-10). Chum salmon and pink salmon were fished for in a smaller area of the beach from Beshta Bay to the mouth of the Chuitna River at several discrete locations (figures 2-11 and 2-12).

Table 2-14.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest, Tyonek, 2013.

Resource	Percentage base	Removed from commercial catch		Subsistence methods											
				Gillnet		Seine		Other		Subsistence gear, any method		Rod and reel		Any method	
		Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**22.6%**	**16.5%**	**74.7%**	**81.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**74.7%**	**81.5%**	**2.7%**	**2.0%**	**100.0%**	**100.0%**
	Total	**22.6%**	**16.5%**	**74.7%**	**81.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**74.7%**	**81.5%**	**2.7%**	**2.0%**	**100.0%**	**100.0%**
Chum salmon	Gear type	0.0%	0.0%	0.9%	0.7%	0.0%	0.0%	0.0%	0.0%	0.9%	0.7%	0.0%	0.0%	0.7%	0.6%
	Resource	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	100.0%	100.0%
	Total	0.0%	0.0%	0.7%	0.6%	0.0%	0.0%	0.0%	0.0%	0.7%	0.6%	0.0%	0.0%	0.7%	0.6%
Coho salmon	Gear type	12.5%	11.9%	30.2%	19.2%	0.0%	0.0%	0.0%	0.0%	30.2%	19.2%	67.8%	61.6%	27.2%	18.9%
	Resource	10.4%	10.4%	82.9%	82.9%	0.0%	0.0%	0.0%	0.0%	82.9%	82.9%	6.6%	6.6%	100.0%	100.0%
	Total	2.8%	2.0%	22.6%	15.7%	0.0%	0.0%	0.0%	0.0%	22.6%	15.7%	1.8%	1.3%	27.2%	18.9%
Chinook salmon	Gear type	8.7%	16.8%	54.8%	71.2%	0.0%	0.0%	0.0%	0.0%	54.8%	71.2%	9.5%	17.6%	43.1%	61.1%
	Resource	4.5%	4.5%	94.9%	94.9%	0.0%	0.0%	0.0%	0.0%	94.9%	94.9%	0.6%	0.6%	100.0%	100.0%
	Total	2.0%	2.8%	40.9%	58.0%	0.0%	0.0%	0.0%	0.0%	40.9%	58.0%	0.3%	0.4%	43.1%	61.1%
Pink salmon	Gear type	9.1%	4.3%	0.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.7%	0.2%	0.0%	0.0%	2.6%	0.9%
	Resource	78.8%	78.8%	21.2%	21.2%	0.0%	0.0%	0.0%	0.0%	21.2%	21.2%	0.0%	0.0%	100.0%	100.0%
	Total	2.1%	0.7%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.6%	0.2%	0.0%	0.0%	2.6%	0.9%
Sockeye salmon	Gear type	69.6%	66.9%	13.3%	8.5%	0.0%	0.0%	0.0%	0.0%	13.3%	8.5%	22.8%	20.9%	26.3%	18.4%
	Resource	60.0%	60.0%	37.7%	37.7%	0.0%	0.0%	0.0%	0.0%	37.7%	37.7%	2.3%	2.3%	100.0%	100.0%
	Total	15.7%	11.0%	9.9%	7.0%	0.0%	0.0%	0.0%	0.0%	9.9%	7.0%	0.6%	0.4%	26.3%	18.4%
Landlocked salmon	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Spawning sockeye salmon	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown salmon	Gear type	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.1%	0.1%
	Resource	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	100.0%	100.0%
	Total	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.1%	0.1%

Source ADF&G Division of Subsistence household surveys, 2014.

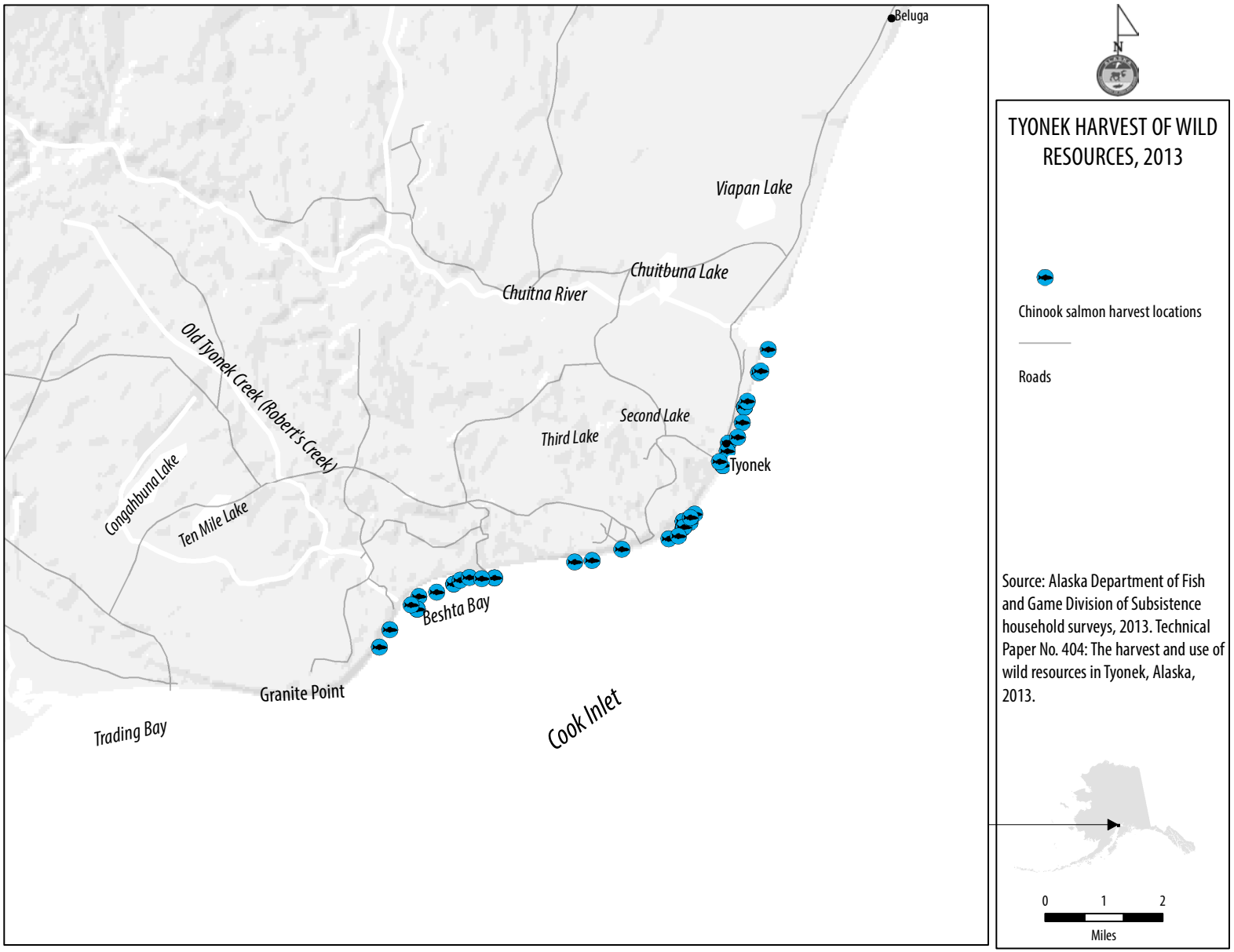


Figure 2-8.–Fishing and harvest locations of Chinook salmon, Tyonek, 2013.

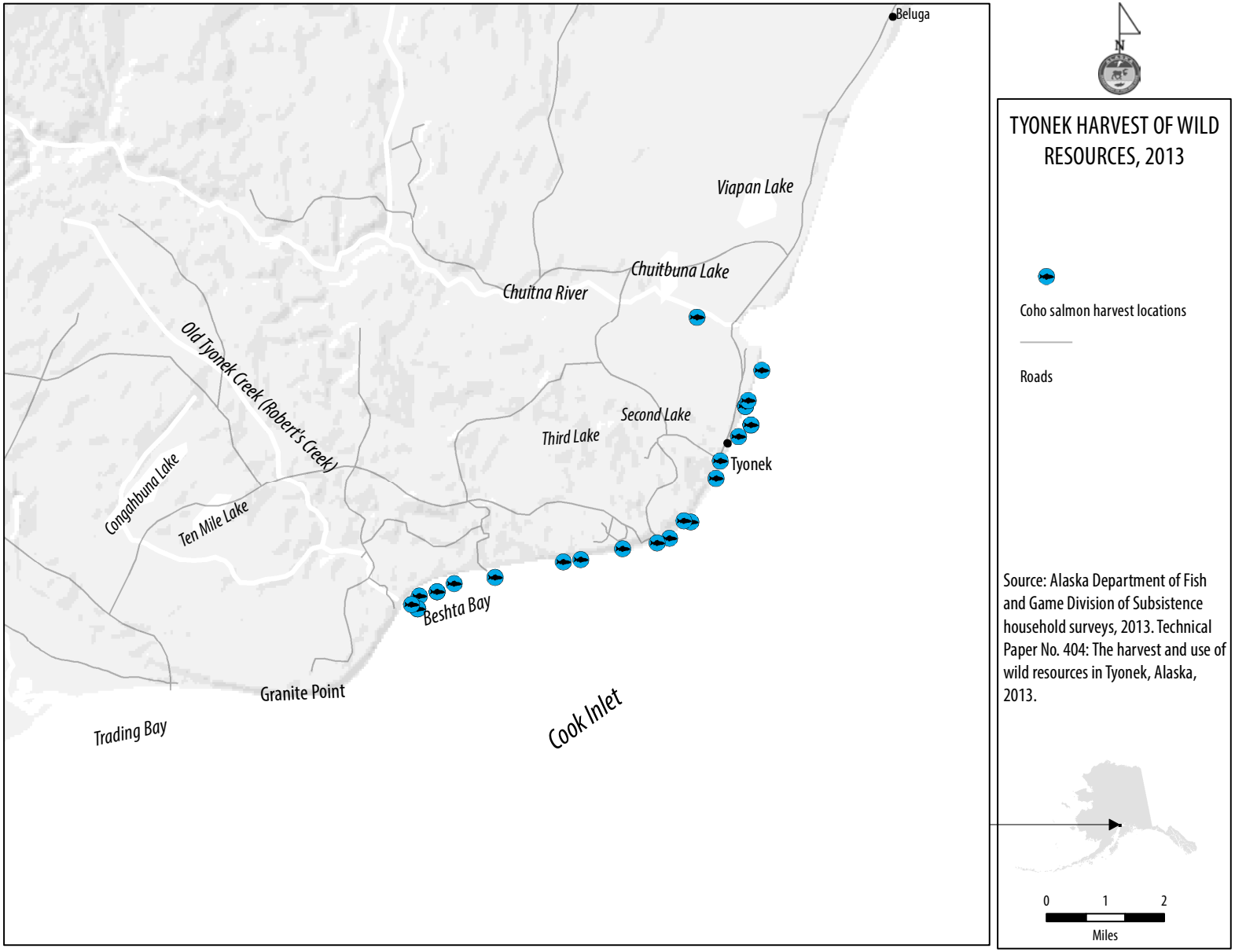


Figure 2-9.–Fishing and harvest locations of coho salmon, Tyonek, 2013.

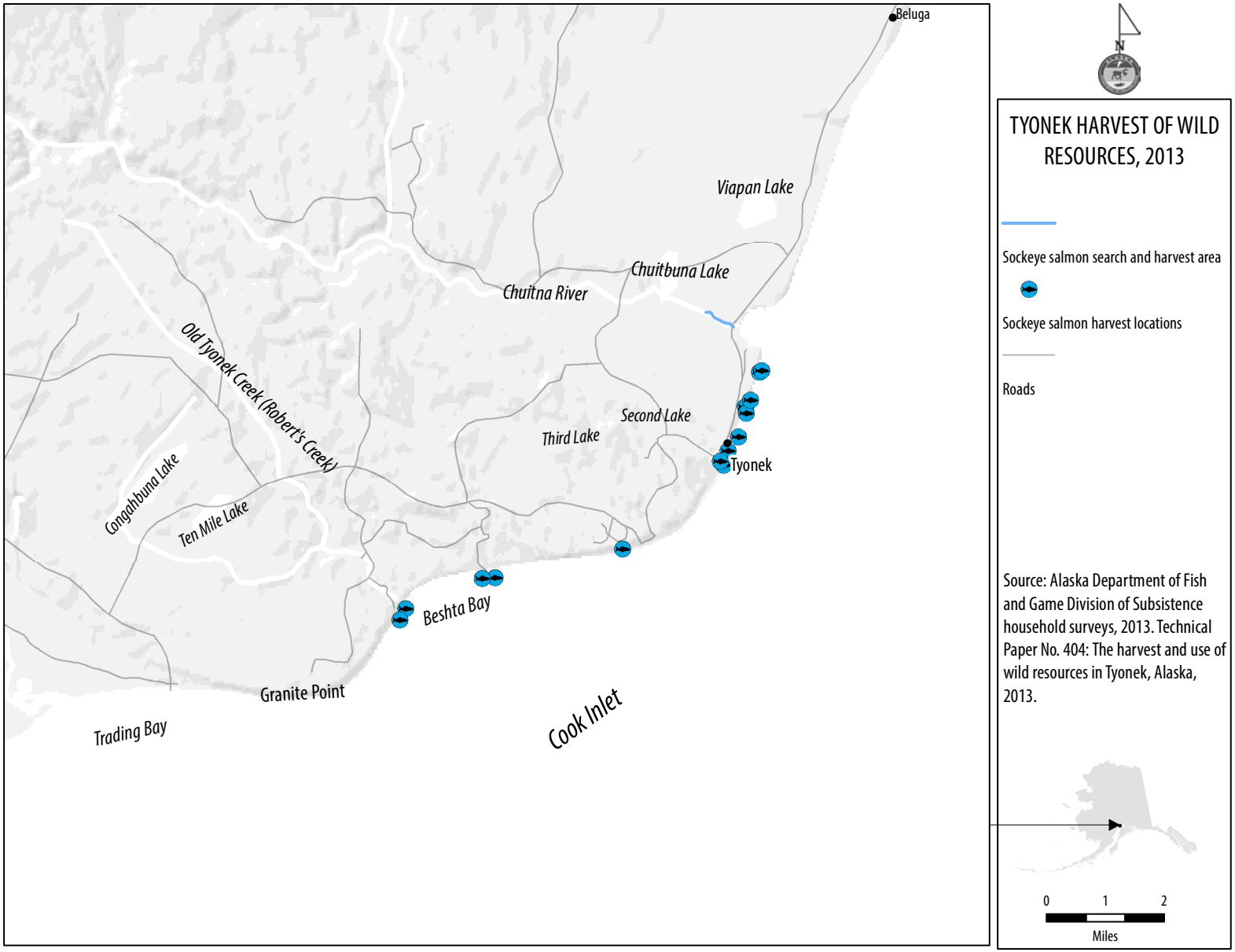


Figure 2-10.–Fishing and harvest locations of sockeye salmon, Tyonek, 2013.

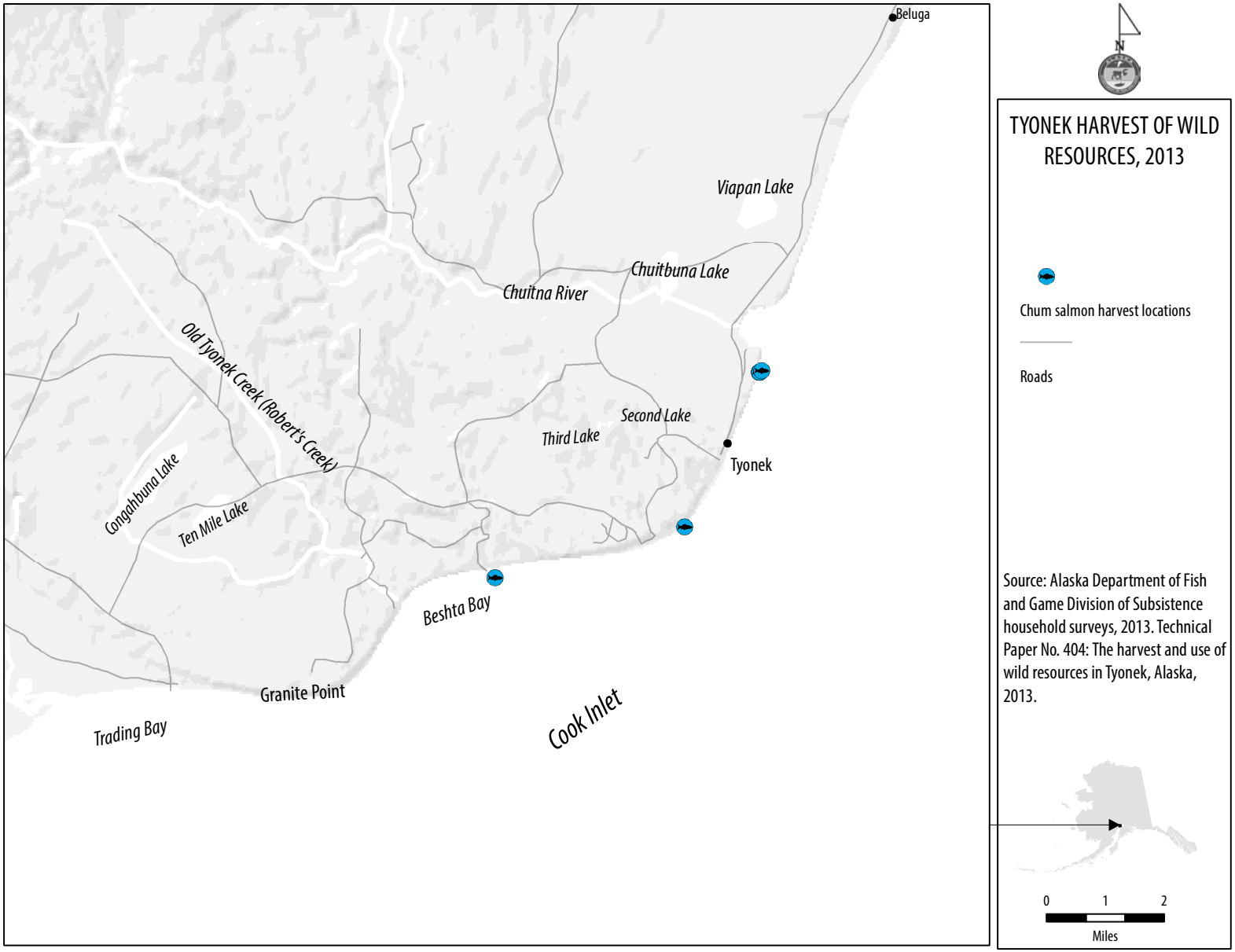


Figure 2-11.–Fishing and harvest locations of chum salmon, Tyonek, 2013.

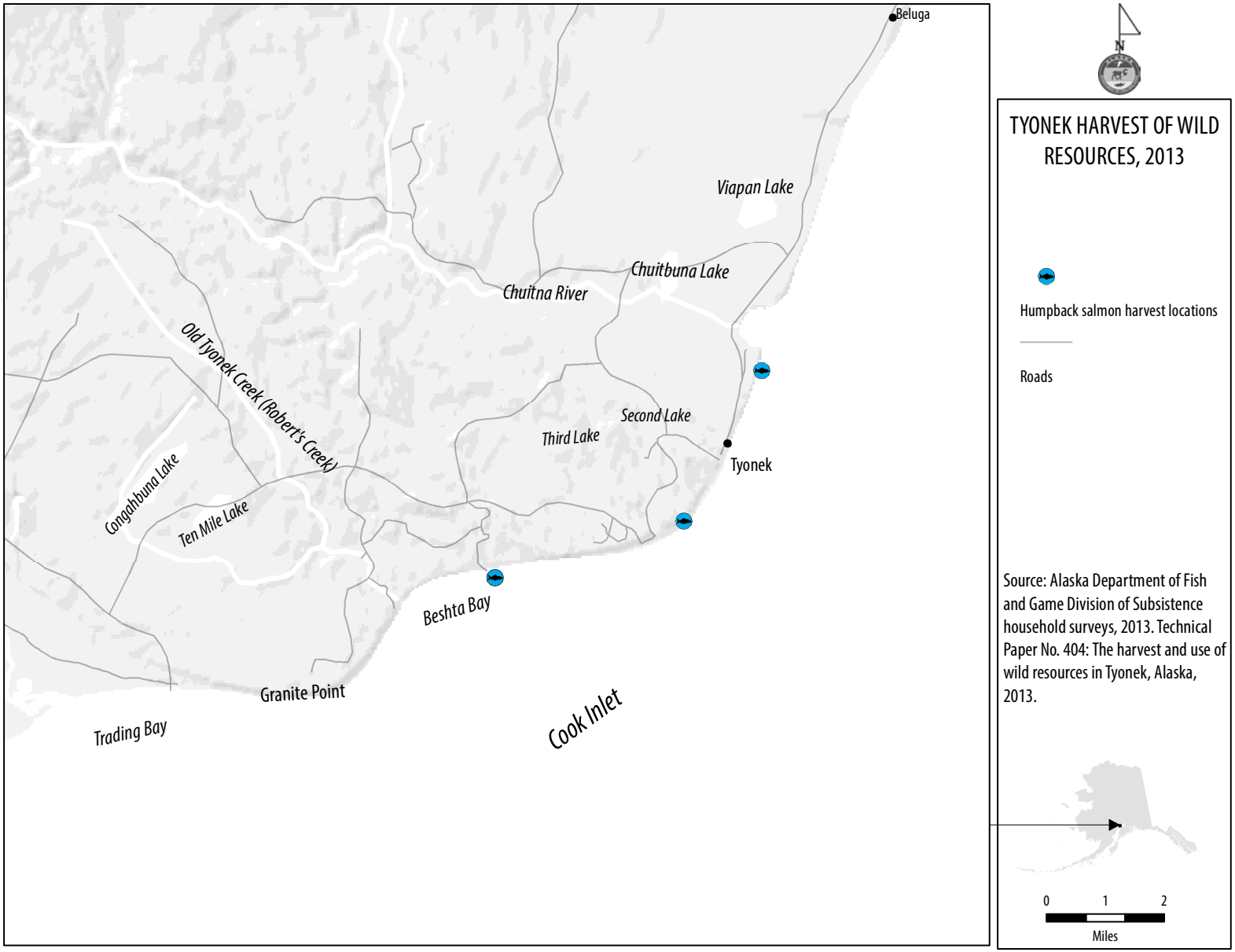


Figure 2-12.–Fishing and harvest locations of pink salmon, Tyonek, 2013.

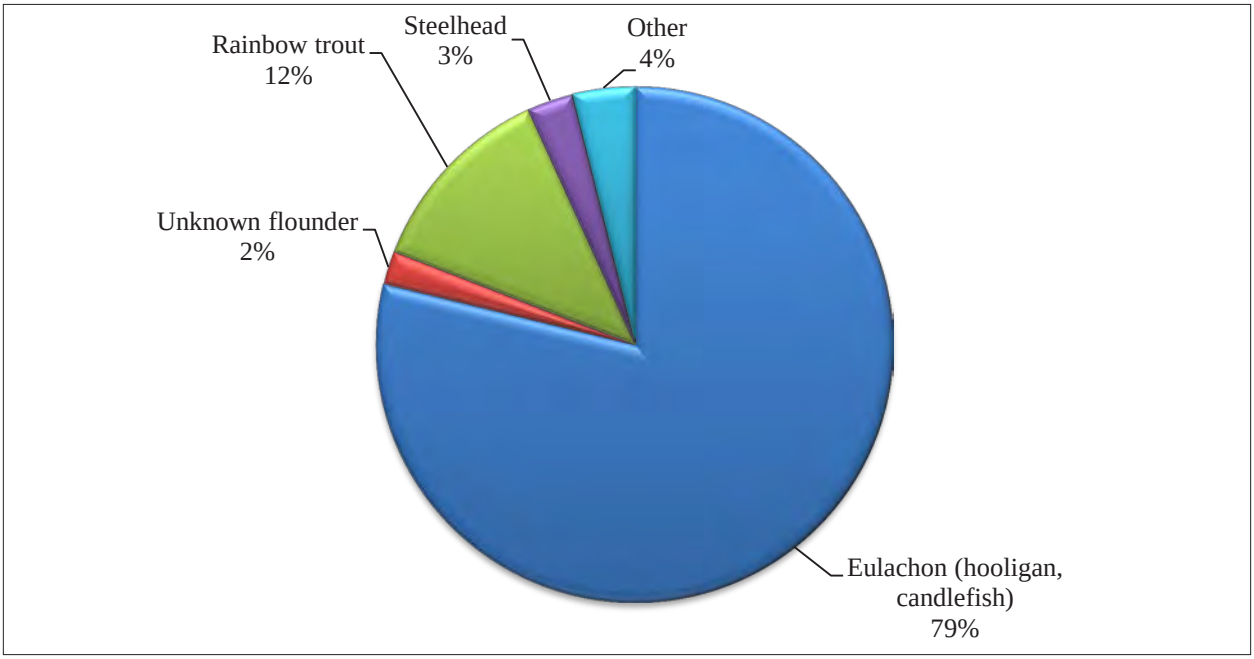


Figure 2-13.–Composition of nonsalmon fish harvest in pounds usable weight, Tyonek, 2013.

Nonsalmon Fish

Nonsalmon fish made up 8% of the overall harvest of wild resources for the community of Tyonek in 2013 (Figure 2-4). A total of approximately 1,863 lb of nonsalmon fish were harvested in Tyonek in 2013, equating to a per capita harvest of 13 lb (Table 2-12). This harvest includes a variety of species, but eulachon composed the majority (79%) of the nonsalmon fish harvest (Figure 2-13). Following the eulachon harvest, rainbow trout composed 12%, steelhead 3%, and flounder 2% of the total nonsalmon fish harvest by Tyonek households in 2013. Making up the remaining 4% of the total nonsalmon fish harvest were: Dolly Varden (1%), Pacific halibut (1%), northern pike (1%), unknown trout (<1%), and unknown nonsalmon fish (<1%) (Table 2-12). Most households fishing for nonsalmon fish were successful, except 2% of households unsuccessfully attempted to harvest stickleback (Table 2-12).

Eulachon are available locally in both the marine waters of Cook Inlet as well as in the mouths of local rivers, and eulachon were used by 31% of households. All households (25% of total households) attempting to harvest rainbow trout were successful; additionally, all households attempting to harvest both steelhead (2%) and unknown species of flounder (2%) were successful. All households attempting to harvest Dolly Varden, northern pike, unknown trout, and unknown salmon species were also successful. Also, 6% of households attempted to harvest Pacific halibut, and 4% were successful.

Nonsalmon fish were harvested using a variety of gear types. The majority of eulachon were harvested using dip nets (88%); the remaining 12% were harvested using gillnets or other methods (such as collecting by hand on the beach) (Table 2-15). Rainbow trout were harvested both by ice fishing (45%) and by rod and reel in the sport fishery (55%). Flounder harvested in the commercial fishery were retained for home use (39 lb total). The total Pacific halibut harvest was an estimated 26 lb, of which 95% was caught with rod and reel, and the remaining 5% was incidental harvest in salmon gillnets.

The majority of the eulachon search and harvest area was within the Beluga River. Tyonek residents also harvested eulachon in set gillnets on the beach near the community (Figure 2-14). The search and harvest areas for Dolly Varden in 2013 included Second Lake, in a small unnamed lake south of Congahbuna Lake that is locally referred to as "Ten Mile Lake" (Kari and Fall 2003), and along the beach near the community (Figure 2-15). Northern pike were harvested in Chuitbuna Lake (Figure 2-16). Pacific halibut were harvested

Table 2-15.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest, Tyonek, 2013.

Resource	Percentage base	Removed from commercial catch		Subsistence methods															
				Gillnet		Seine		Dip net		Other		Subsistence gear, any method		Ice fishing		Rod and reel		Any method	
		Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Nonsalmon fish	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**1.8%**	**2.1%**	**7.9%**	**8.5%**	**0.0%**	**0.0%**	**56.4%**	**69.6%**	**2.8%**	**4.2%**	**67.1%**	**82.2%**	**10.9%**	**5.7%**	**20.2%**	**10.0%**	**100.0%**	**100.0%**
	Total	**1.8%**	**2.1%**	**7.9%**	**8.5%**	**0.0%**	**0.0%**	**56.4%**	**69.6%**	**2.8%**	**4.2%**	**67.1%**	**82.2%**	**10.9%**	**5.7%**	**20.2%**	**10.0%**	**100.0%**	**100.0%**
Pacific herring	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pacific herring roe/unspecified	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pacific herring sac roe	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pacific herring spawn on kelp	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Eulachon (hooligan, candlefish)	Gear type	0.0%	0.0%	81.6%	93.5%	0.0%	0.0%	100.0%	100.0%	36.0%	30.3%	95.1%	95.8%	0.0%	0.0%	0.0%	0.0%	63.8%	78.8%
	Resource	0.0%	0.0%	10.1%	10.1%	0.0%	0.0%	88.3%	88.3%	1.6%	1.6%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
	Total	0.0%	0.0%	6.4%	8.0%	0.0%	0.0%	56.4%	69.6%	1.0%	1.3%	63.8%	78.8%	0.0%	0.0%	0.0%	0.0%	63.8%	78.8%
Unknown smelt	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pacific (gray) cod	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown cod	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown flounder	Gear type	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	2.1%
	Resource	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
	Total	1.8%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	2.1%
Lingcod	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown greenling	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pacific halibut	Gear type	0.0%	0.0%	2.3%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%	17.0%	13.1%	3.6%	1.4%
	Resource	0.0%	0.0%	5.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	5.0%	0.0%	0.0%	95.0%	95.0%	100.0%	100.0%
	Total	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	3.4%	1.3%	3.6%	1.4%
Black rockfish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	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 rockfish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown rockfish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sablefish (black cod)	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown sculpin	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

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Resource	Percentage base	Removed from commercial catch		Subsistence methods															
				Gillnet		Seine		Di pnet		Other		Subsistence gear, any method		Ice fishing		Rod and reel		Any method	
		Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Unknown sculpin	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown shark	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown sole	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Stickleback (needlefish)	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Wolffish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Alaska blackfish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Burbot	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Arctic char	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Dolly Varden	Gear type	0.0%	0.0%	9.2%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.3%	5.0%	3.3%	15.3%	10.6%	4.4%	1.5%
	Resource	0.0%	0.0%	16.7%	16.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.7%	16.7%	12.5%	12.5%	70.8%	70.8%	100.0%	100.0%
	Total	0.0%	0.0%	0.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.2%	0.5%	0.2%	3.1%	1.1%	4.4%	1.5%
Arctic grayling	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Northern pike	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.6%	7.7%	0.7%	0.8%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.8%	0.7%	0.8%
Sheefish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Longnose sucker	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rainbow trout	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	95.0%	96.7%	64.0%	68.6%	23.3%	12.4%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	44.5%	44.5%	55.5%	55.5%	100.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.4%	5.5%	12.9%	6.9%	23.3%	12.4%
Steelhead	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	64.0%	69.7%	2.7%	3.5%	0.0%	0.0%	0.0%	0.0%	1.8%	2.9%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	2.9%	1.8%	2.9%	0.0%	0.0%	0.0%	0.0%	1.8%	2.9%
Unknown trout	Gear type	0.0%	0.0%	2.3%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%
	Resource	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
	Total	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%
Unknown whitefishes	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown nonsalmon fish	Gear type	0.0%	0.0%	4.6%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%
	Resource	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
	Total	0.0%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%

Source ADF&G Division of Subsistence household surveys, 2014.

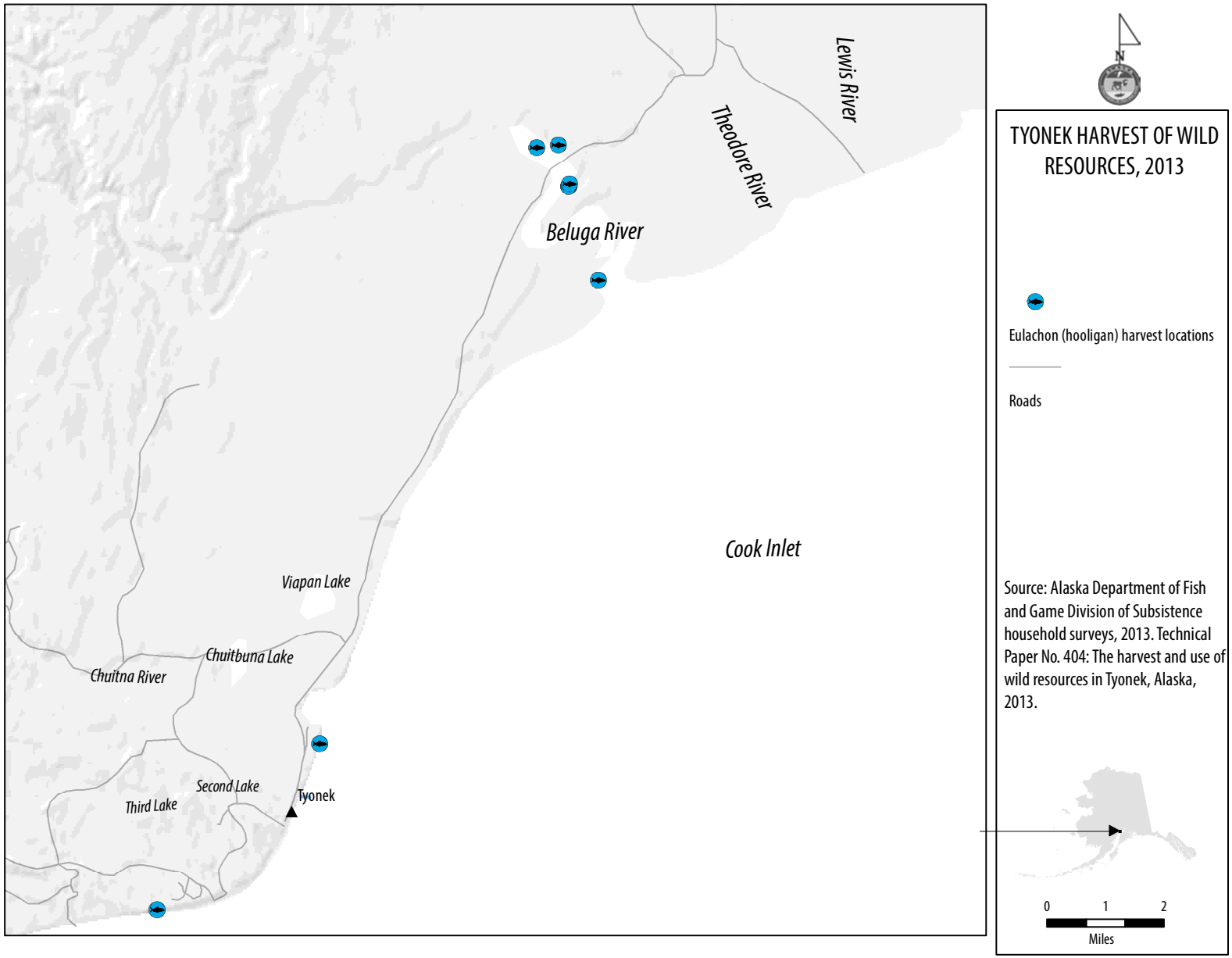

Figure 2-14.–Fishing and harvest locations of eulachon (candlefish), Tyonek, 2013.

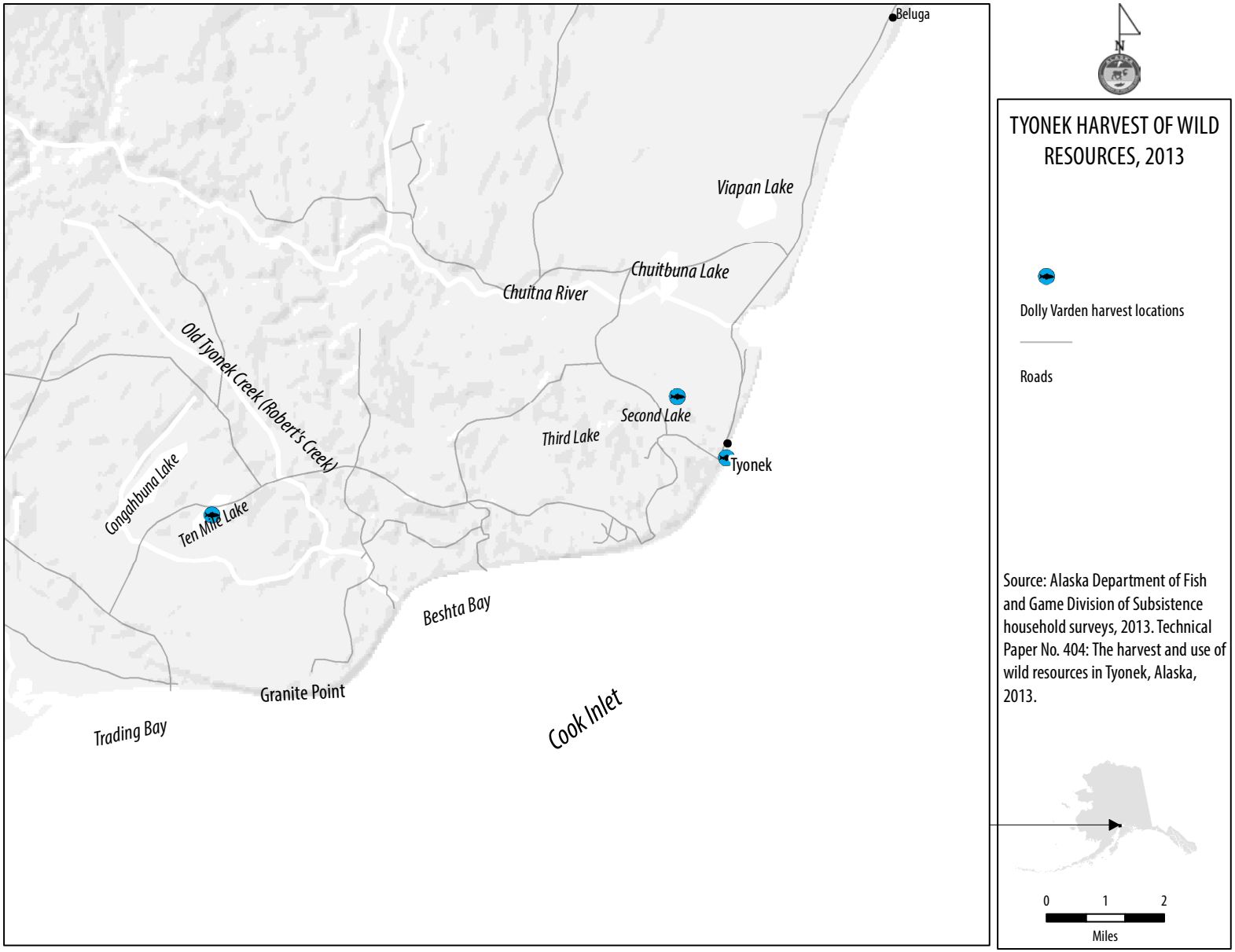

Figure 2-15.–Fishing and harvest locations of Dolly Varden, Tyonek, 2013.

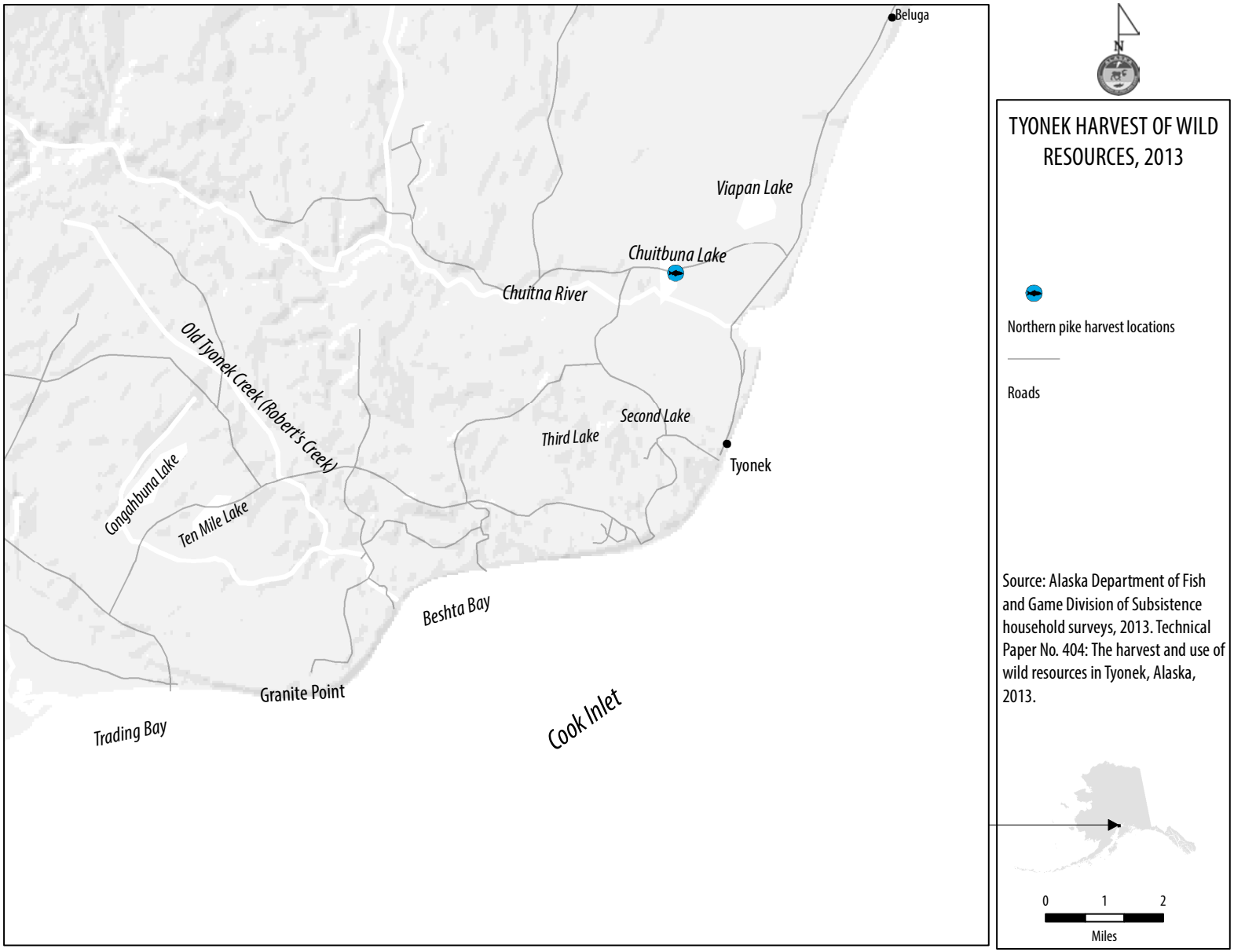

Figure 2-16.–Fishing and harvest locations of northern pike, Tyonek, 2013.

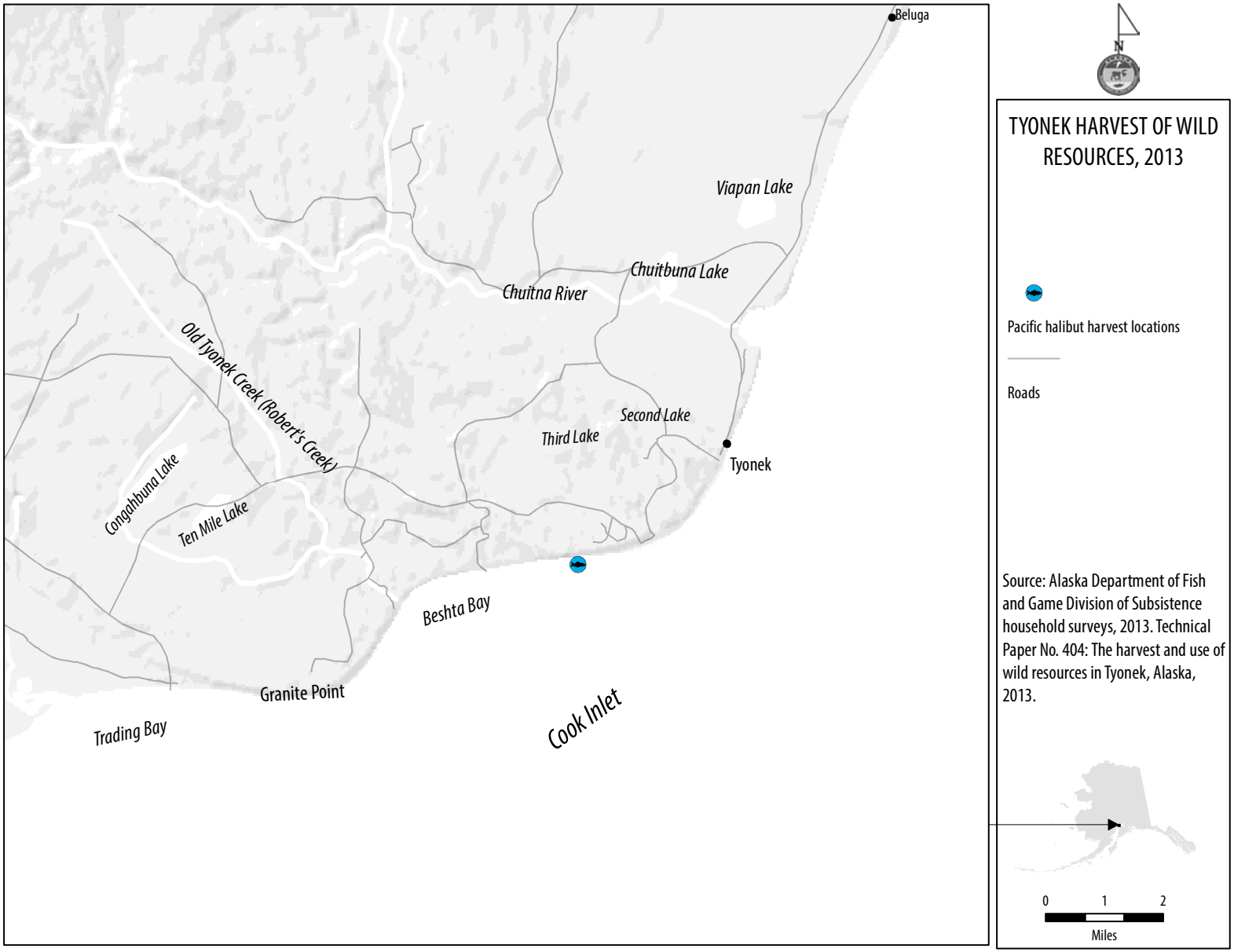

Figure 2-17.–Fishing and harvest locations of Pacific halibut, Tyonek, 2013.

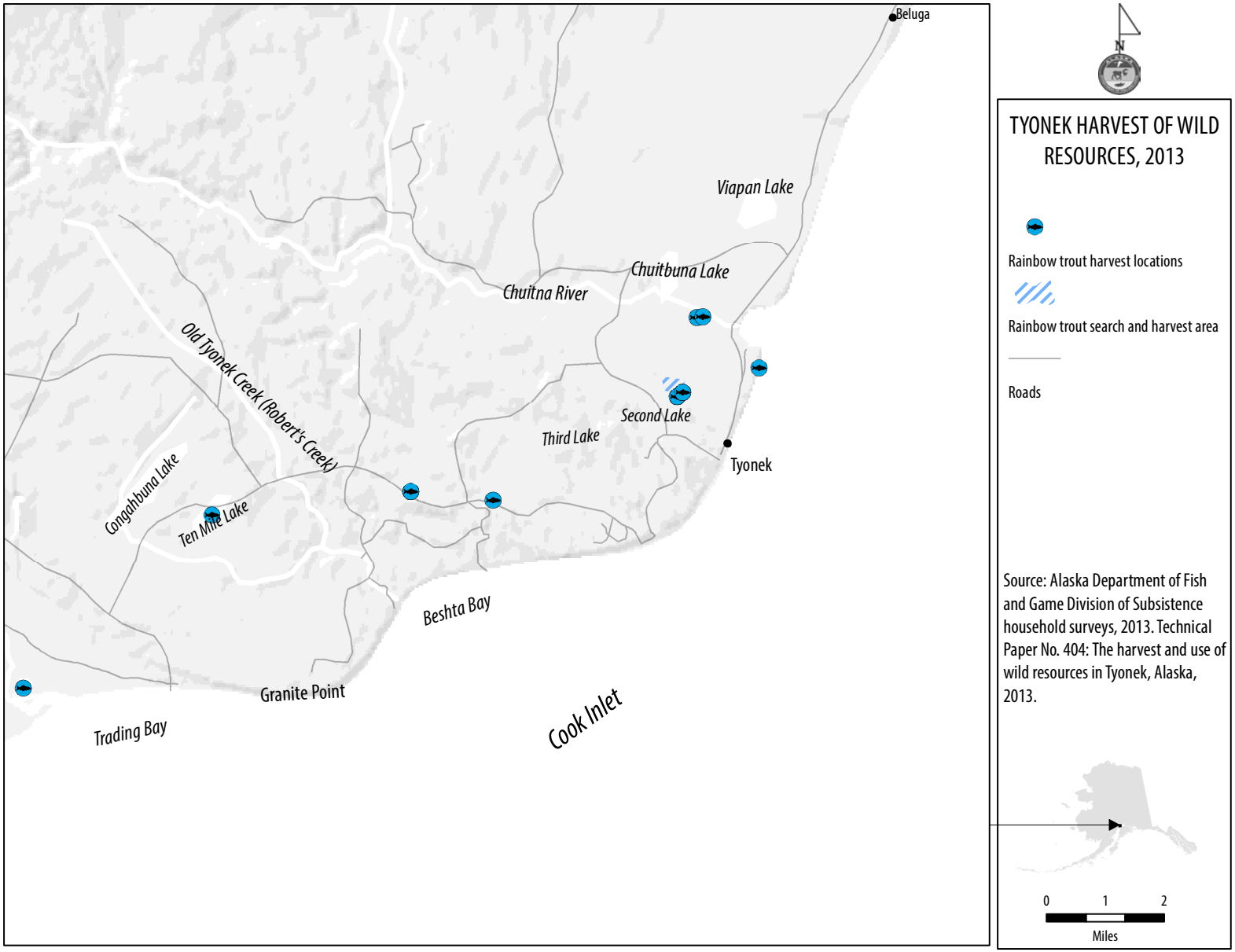

Figure 2-18.–Fishing and harvest locations of rainbow trout, Tyonek, 2013.

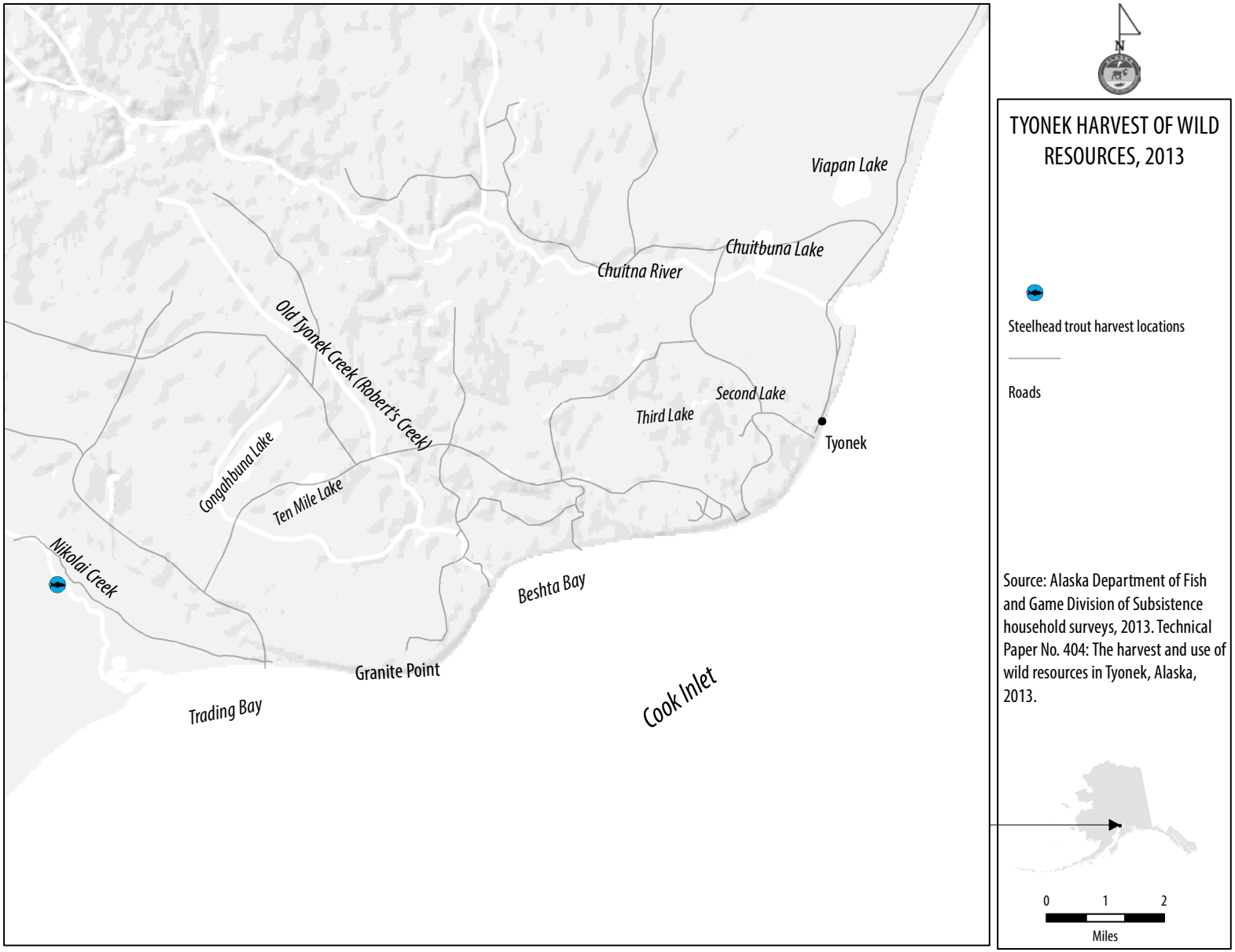

Figure 2-19.–Fishing and harvest locations of steelhead, Tyonek, 2013.

Table 2-16.–Estimated large land mammal harvests by month and sex, Tyonek, 2013.

Resource	Estimated harvest by month													**Total**
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	
All large land mammals	**1.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.3**	**2.6**	**1.3**	**0.0**	**0.0**	**1.3**	**7.7**
Black bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Moose	1.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.6	1.3	0.0	0.0	1.3	**7.7**
Moose, bull	1.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.6	1.3	0.0	0.0	0.0	**6.4**
Moose, cow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	**1.3**
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2014.

in Cook Inlet from the beach near Beshta Bay (Figure 2-17). Rainbow trout were sought in small lakes in and around the community. Rainbow trout were harvested in Second Lake and Ten Mile Lake (Figure 2-18). Steelhead were harvested in Nikolai Creek just a few miles north of Trading Bay (Figure 2-19).

Large Land Mammals

Other than bears, moose are the only large land mammal readily available near Tyonek, and moose made up the entirety of Tyonek's large land mammal harvest in 2013 (Table 2-12). The total moose harvest in 2013 was 3,471 lb, or 24 lb per capita. Approximately 5 bull moose were harvested in the months of August through October, and then 1 bull moose was harvested during the winter Tier II hunt in January (Table 2-16). Additionally there was 1 moose harvest that occurred in an unknown month.

Moose are an important species for subsistence in Tyonek, and in 2013 an estimated 74% of households used moose, which were hunted by 60% of households (Table 2-12). Although a majority of households in the community hunted moose only 12% were successful in 2013. Moose were shared widely throughout the community; 67% of households received this resource, and 25% of households gave it away in 2013. This shows that moose that were received were further distributed to other households. In addition to moose, 2% of households reported receiving and using caribou in 2013, and 4% of households unsuccessfully hunted black bears in 2013.

In 2013 moose search areas were along the roadways near the community and extended north of the Beluga River to the Trading Bay mud flats and along the McArthur River located southwest of Trading Bay. As depicted in Figure 2-20, moose hunting areas shift between the fall season and the winter season. Fall moose hunting areas covered a greater area and included the McArthur River, a traditional hunting area for the community of Tyonek.

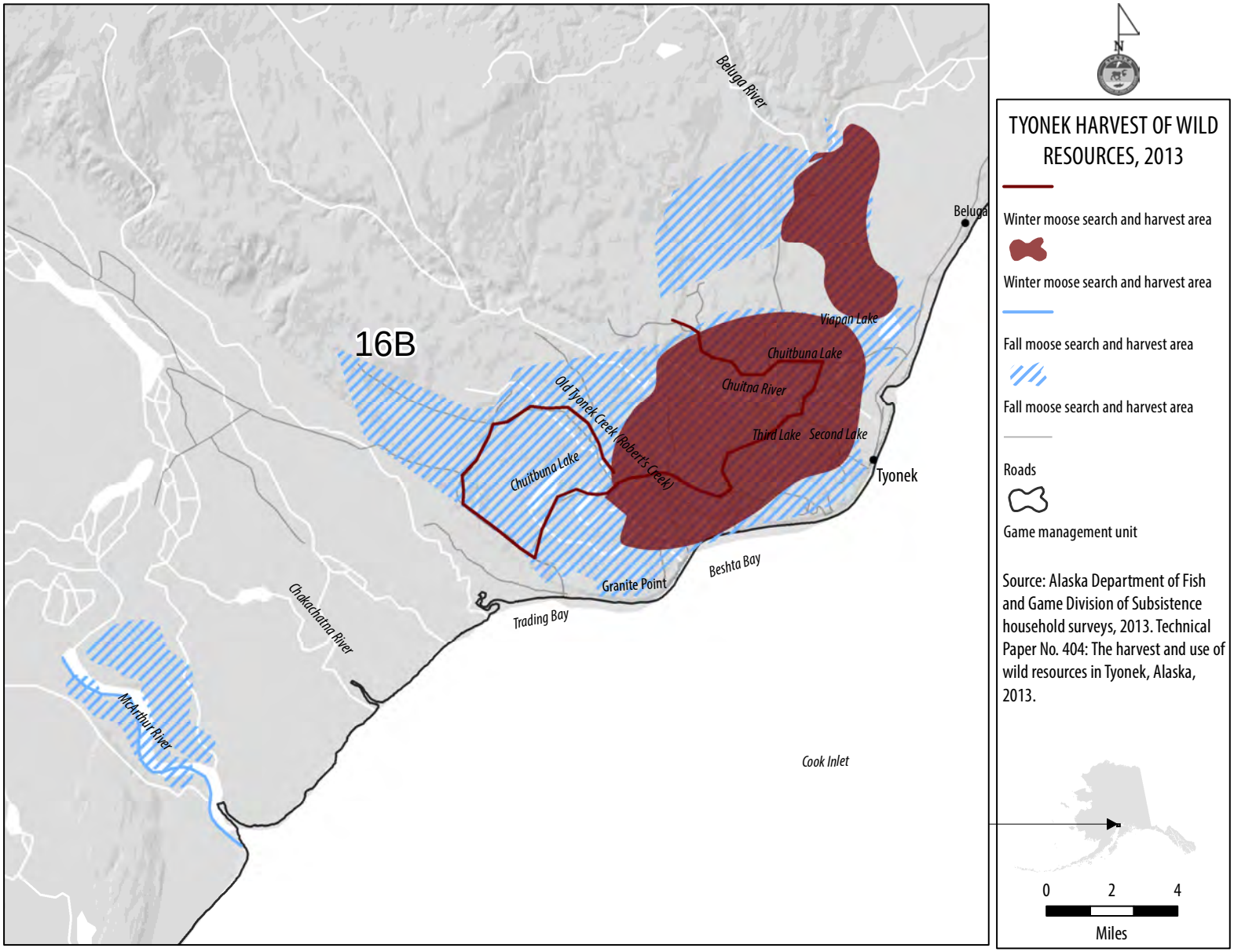

Figure 2-20.–Hunting locations of moose by season, Tyonek, 2013.

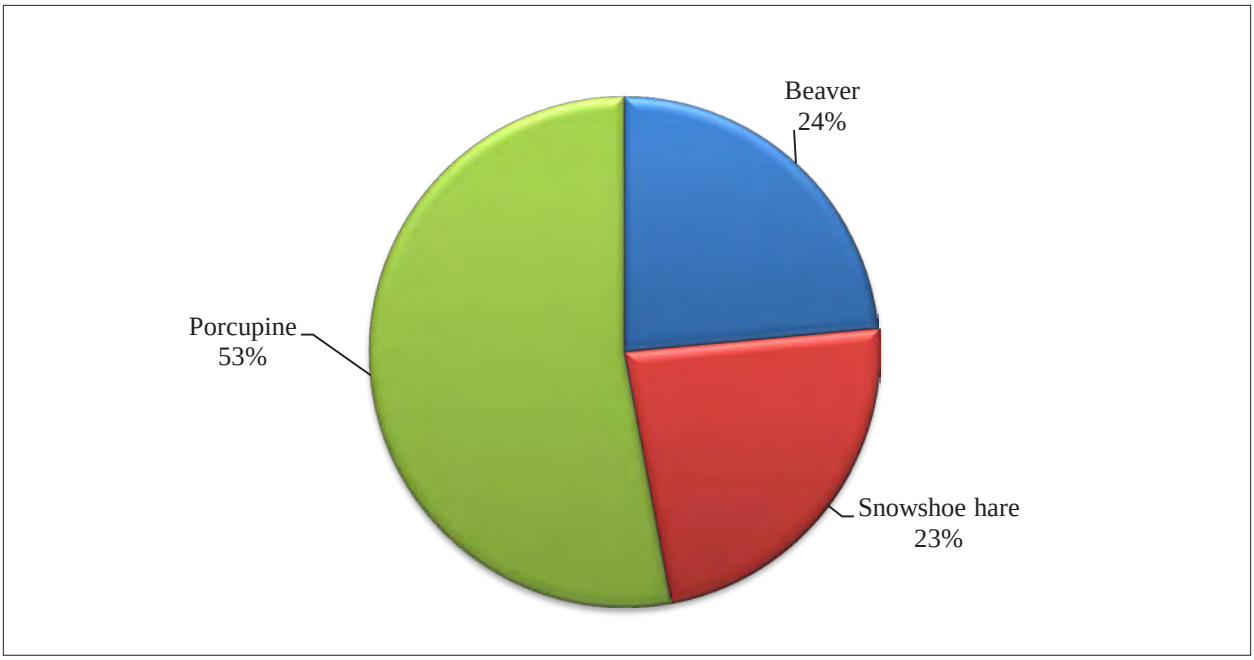

Figure 2-21.–Composition of small land mammal/furbearer harvest by individual animals harvested, Tyonek, 2013.

Small Land Mammals/Furbearers

Small land mammals were not frequently used or harvested by Tyonek households in 2013—12% of households used small land mammals (Table 2-12). Beavers, snowshoe hares, and porcupines were the only 3 species used. Porcupines made up 53% of the total small land mammal harvest by number of individual animals harvested, followed by beavers (24%) and snowshoe hares (23%) (Figure 2-21). Overall 6% of households attempted to harvest beavers and porcupines, but overall only 4% were successful. All households (2% of households) attempting to harvest snowshoe hares were successful. Approximately 12 porcupines, 5 beavers, and 5 snowshoe hares were harvested during the study year—a total harvest equating to 140 lb, or 1 lb per capita. All of these animals were harvested between August and November (Table 2-17).

The search and harvest areas for small land mammals occurred close to the community. The area along the road south of Second and Third lakes had the highest concentration of small land mammal and furbearer search and harvest areas (Figure 2-22).

Table 2-17.–Estimated small land mammal/furbearer harvests by month, Tyonek, 2013.

Resource	Estimated harvest by month													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All small land mammals	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**12.9**	**0.0**	**3.9**	**5.1**	**0.0**	**0.0**	**21.9**
Beaver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	2.6	0.0	0.0	0.0	**5.1**
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Red fox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Snowshoe hare	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	**5.1**
North american river (land) otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Lynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Marten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Mink	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.3	0.0	1.3	0.0	0.0	0.0	**11.6**
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Red (tree) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Least weasel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Gray wolf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Wolverine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2014.

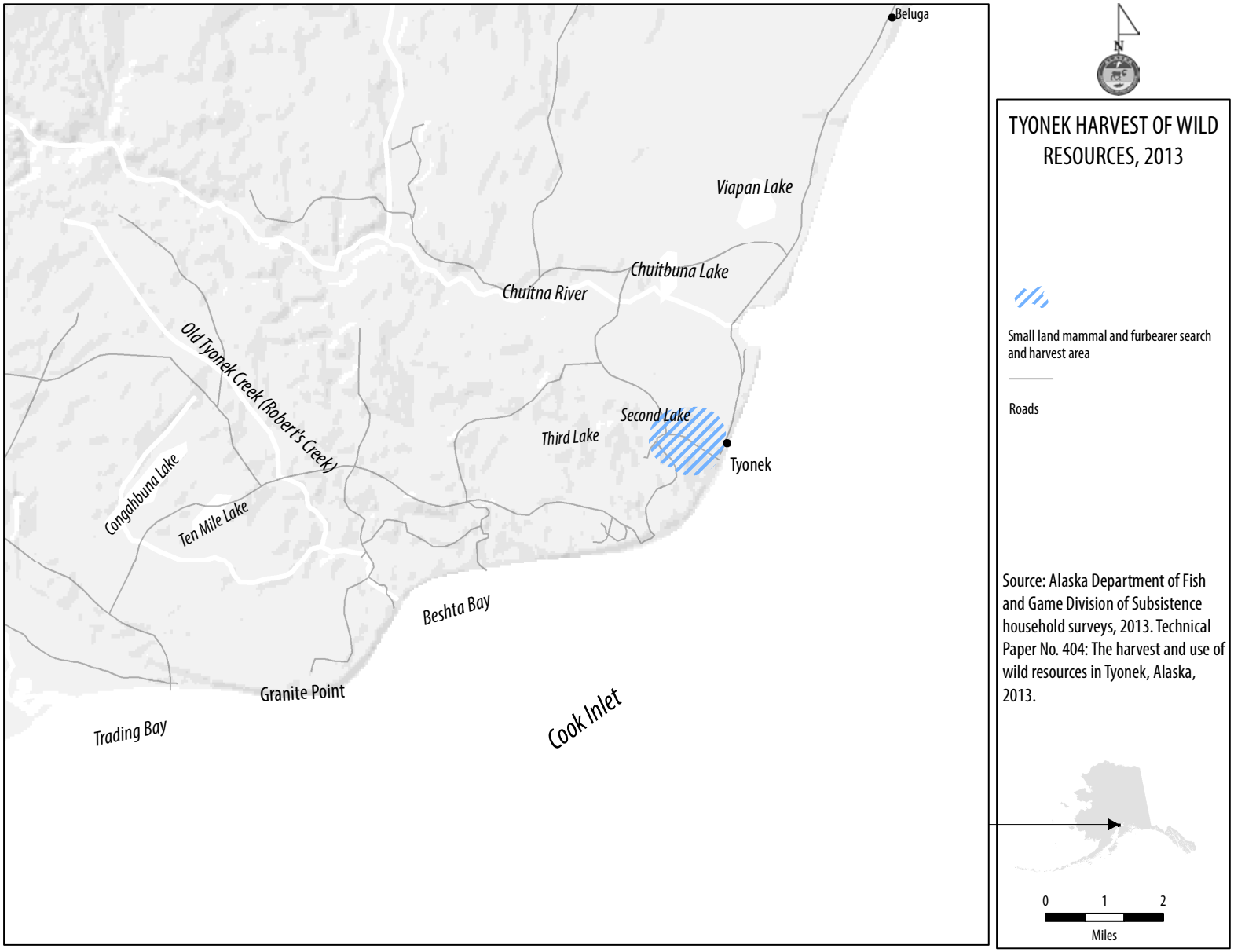

Figure 2-22.–Hunting and trapping locations of small land mammals/furbearers, Tyonek, 2013.

Table 2-18.–Estimated marine mammal harvests by month, Tyonek, 2013.

Resource	Estimated harvest by month													Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	
All marine mammals	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.3**	**2.6**	**0.0**	**2.6**	**0.0**	**0.0**	**0.0**	**0.0**	**6.4**
Harbor seal	0.0	0.0	0.0	0.0	0.0	1.3	2.6	0.0	2.6	0.0	0.0	0.0	0.0	**6.4**
Harbor seal, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Harbor seal, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Harbor seal, unknown sex	0.0	0.0	0.0	0.0	0.0	1.3	2.6	0.0	2.6	0.0	0.0	0.0	0.0	**6.4**
Unknown seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Sea otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Steller sea lion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Steller sea lion, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Steller sea lion, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Steller sea lion, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Beluga whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2014.

Marine Mammals

A total of 360 lb, or 2.5 lb per capita, of marine mammals were harvested by Tyonek community members in 2013 (Table 2-12). Marine mammals were used by 14% of Tyonek households in 2013. Harbor seals made up 100% of the marine mammal harvest, and all harbor seals were harvested between June and September (Table 2-18). Harbor seals were harvested and used by 6% of households. A small portion of Tyonek residents (2%) attempted to harvest beluga whales outside Cook Inlet, but no households hunted beluga whales locally in Cook Inlet due to conservation concerns for this genetically isolated stock. Although Tyonek residents actively hunted in the past, in 2008 Cook Inlet beluga whales were determined to be a distinct population segment and listed under the Endangered Species Act of 1973 (Shelden et al. 2015:1). No beluga hunting has been allowed in Cook Inlet since 2006.[4] Beluga whale resources were received from other areas of Alaska, and 10% of households received and used beluga whales in 2013 (Table 2-12).

Seals were harvested in several areas near the community of Tyonek (Figure 2-23). The search areas were encompassed by an area stretching approximately 20 miles along the Cook Inlet coast—from the McArthur Flats north to the Beluga River. Seals were searched for or harvested in the Trading Bay area as well as from the beach adjacent to the Tyonek.

4. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Regional Office. "Cook Inlet Beluga Whales: Management and Recovery of Cook Inlet Beluga Whales," http://alaskafisheries.noaa.gov/protectedresources/whales/beluga/management.htm (accessed April 2015).

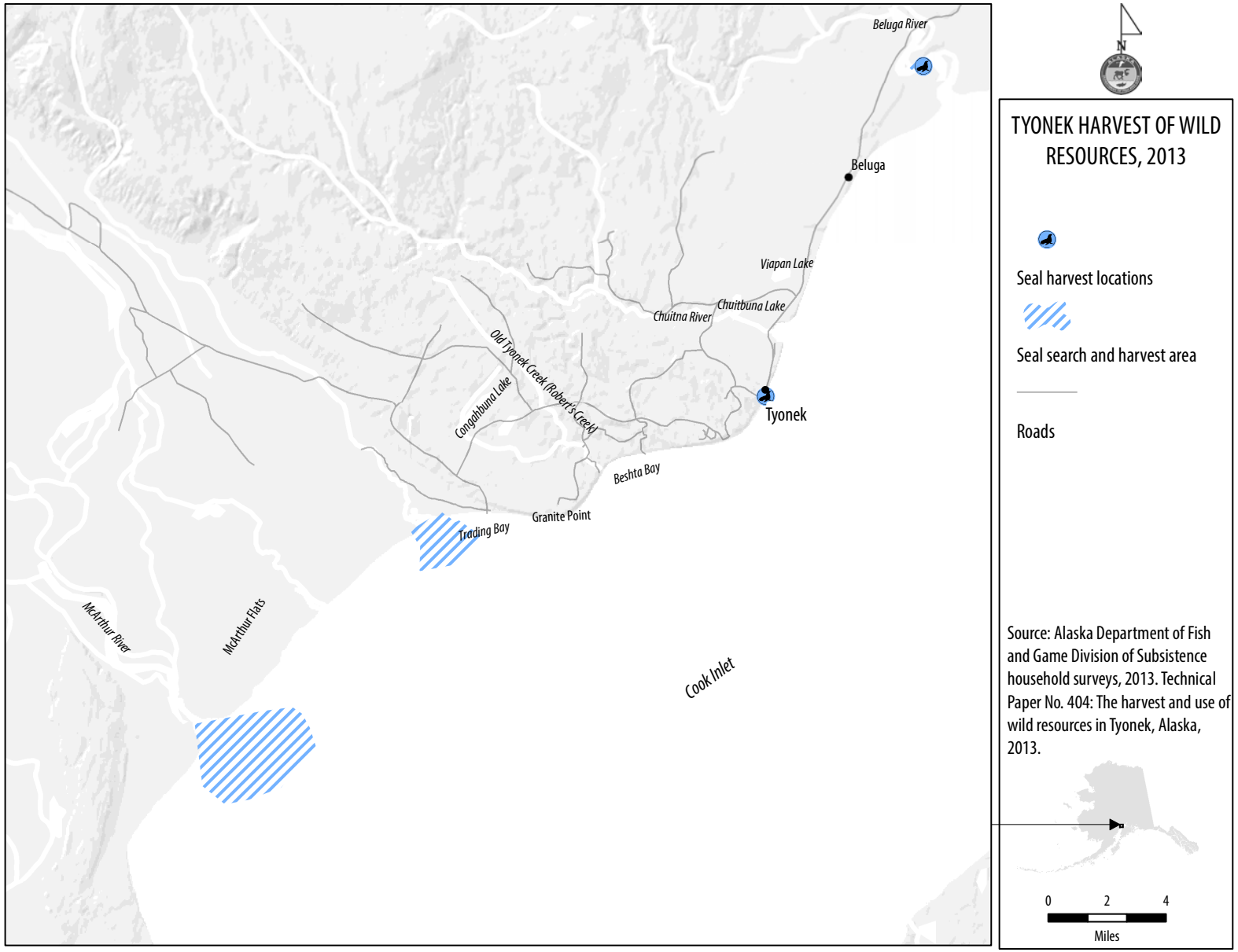

Figure 2-23.–Hunting and harvest locations of harbor seals, Tyonek, 2013.

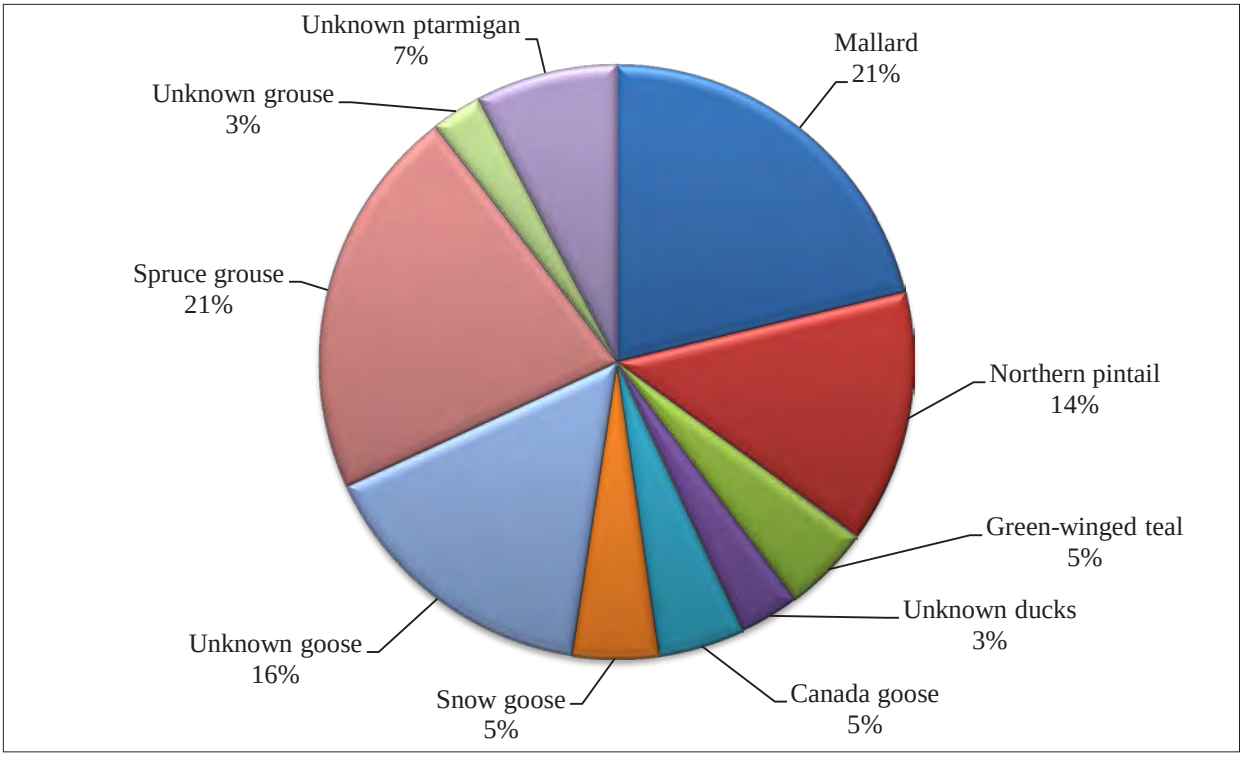

Figure 2-24.–Composition of bird harvest in pounds usable weight, Tyonek, 2013.

Birds and Eggs

Birds and eggs as a category were used by 33% of Tyonek households in 2013 with a total harvest of 166 lb, or 1.2 lb per capita (Table 2-12). The species of migratory waterfowl that were used in 2013 included mallard, northern pintail, green-winged teal, Canada goose, snow goose, common snipe, and unknown species of geese and ducks. The species of upland game birds used by Tyonek households in 2013 included spruce grouse, ptarmigan, and unknown grouse species. The only eggs harvested and used were unknown gull eggs; 2% of Tyonek households harvested and used gull eggs from unspecified kinds of gulls in 2013.

In terms of harvest by usable weight, mallards made up 21% the total bird and bird egg harvest (Figure 2-24); 8% of households used mallards, and 6% of households harvested this species (Table 2-12). Northern pintails made up 14% of the total bird and bird egg harvest in 2013 (Figure 2-24). Northern pintails were used by 12% of Tyonek households and harvested by 10%. Canada geese and unknown ducks were each used by 4% of Tyonek households in 2013 (Table 2-12).

Spruce grouse made up 21% of the bird and bird egg harvest in 2013, and 14% of households used and harvested spruce grouse (Figure 2-24; Table 2-12). Four percent of households used both unknown grouse and ptarmigan, and all households that attempted to harvest these species were successful.

The majority of birds (129) were harvested during the fall months; 21 birds were harvested in winter, 27 in summer, and 22 in spring (Table 2-19). For spruce grouse, the timing of harvests was predominantly during the summer (22 birds) and fall (26 birds).

Bird eggs were gathered on the beach located along the west side of the mouth of the Chuitna River (Figure 2-25). Primary search and harvest areas for upland game birds were near the center of the community and along the Tyonek road system. Tyonek residents searched for upland game birds as far north as the Beluga River. Primary hunting areas for migratory waterfowl included the beach near Granite Point, the mud flats in Trading Bay, and the area just north of the mouth of the McArthur River. Some migratory waterfowl were sought to the east of the community on the beach at the mouth of the Chuitna River.

Table 2-19.–Estimated bird harvests by season, Tyonek, 2013.

	Estimated harvest by season					
Resource	Winter	Summer	Spring	Fall	Season unknown	**Total**
All birds	**20.6**	**27.0**	**21.9**	**128.6**	**2.6**	**200.6**
Bufflehead	0.0	0.0	0.0	0.0	0.0	**0.0**
Canvasback	0.0	0.0	0.0	0.0	0.0	**0.0**
Gadwall	0.0	0.0	0.0	0.0	0.0	**0.0**
Goldeneye	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	0.0	0.0	7.7	27.0	0.0	**34.7**
Common merganser	0.0	0.0	0.0	0.0	0.0	**0.0**
Red-breasted merganser	0.0	0.0	0.0	0.0	0.0	**0.0**
Northern pintail	0.0	5.1	1.3	21.9	0.0	**28.3**
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown scoter	0.0	0.0	0.0	0.0	0.0	**0.0**
Northern shoveler	0.0	0.0	0.0	0.0	0.0	**0.0**
Green-winged teal	0.0	0.0	0.0	25.7	0.0	**25.7**
American wigeon	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown ducks	0.0	0.0	7.7	0.0	0.0	**7.7**
Canada goose	0.0	0.0	0.0	6.4	0.0	**6.4**
Snow goose	0.0	0.0	0.0	2.6	0.0	**2.6**
Canada/cackling goose	0.0	0.0	0.0	0.0	0.0	**0.0**
White-fronted goose	0.0	0.0	5.1	0.0	0.0	**5.1**
Unknown swan	0.0	0.0	0.0	0.0	0.0	**0.0**
Sandhill crane	0.0	0.0	0.0	0.0	0.0	**0.0**
Common snipe	0.0	0.0	0.0	12.9	0.0	**12.9**
Unknown loon	0.0	0.0	0.0	0.0	0.0	**0.0**
Spruce grouse	2.6	21.9	0.0	25.7	0.0	**50.1**
Unknown shorebirds–large	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown grouse	2.6	0.0	0.0	6.4	0.0	**9.0**
Unknown ptarmigan	15.4	0.0	0.0	0.0	2.6	**18.0**

Source ADF&G Division of Subsistence household surveys, 2014.

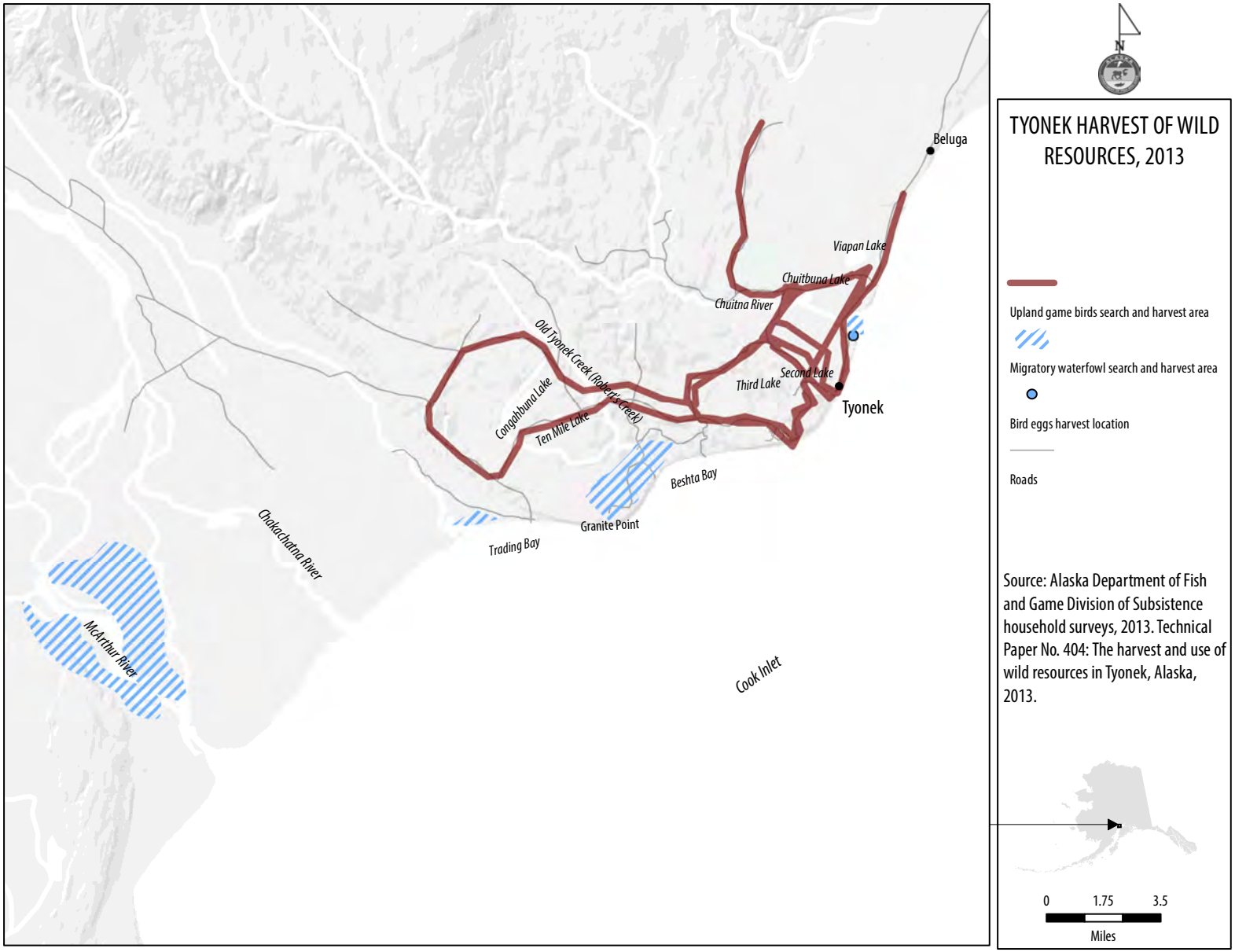

Figure 2-25.–Hunting and harvest locations of upland game birds, migratory waterfowl, and bird eggs, Tyonek, 2013.

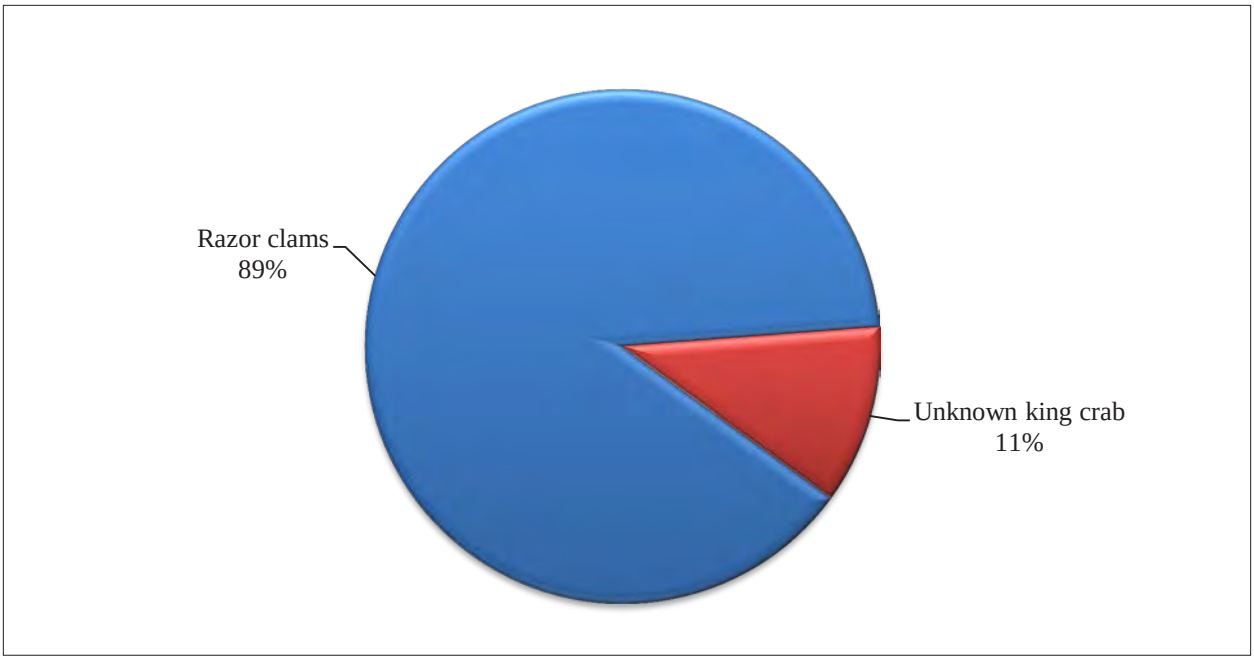

Figure 2-26.–Composition of marine invertebrates harvest in pounds usable weight, Tyonek, 2013.

Marine Invertebrates

Marine invertebrates were used by 16% of Tyonek households in 2013 (Table 2-12). The total harvest was 132 lb, or just less than 1 lb per capita. In 2013, razor clams made up 89% of the total marine invertebrate harvest while king crab made up the remaining 11% of the total marine invertebrate harvest (Figure 2-26). Razor clams were harvested by 8% of households, and king crabs were harvested by 2% of Tyonek households in 2013. Razor clams were used by 14% of households; king crabs were used by 4% of households; and Tanner crabs were used by 2% of households. All Tanner crabs that were used in 2013 were received. Tyonek residents traveled south in search of marine invertebrates in 2013. The beaches, including near Clam Gulch, were the major spots Tyonek residents used to search for and harvest marine invertebrates during the 2013 study year (Figure 2-27).

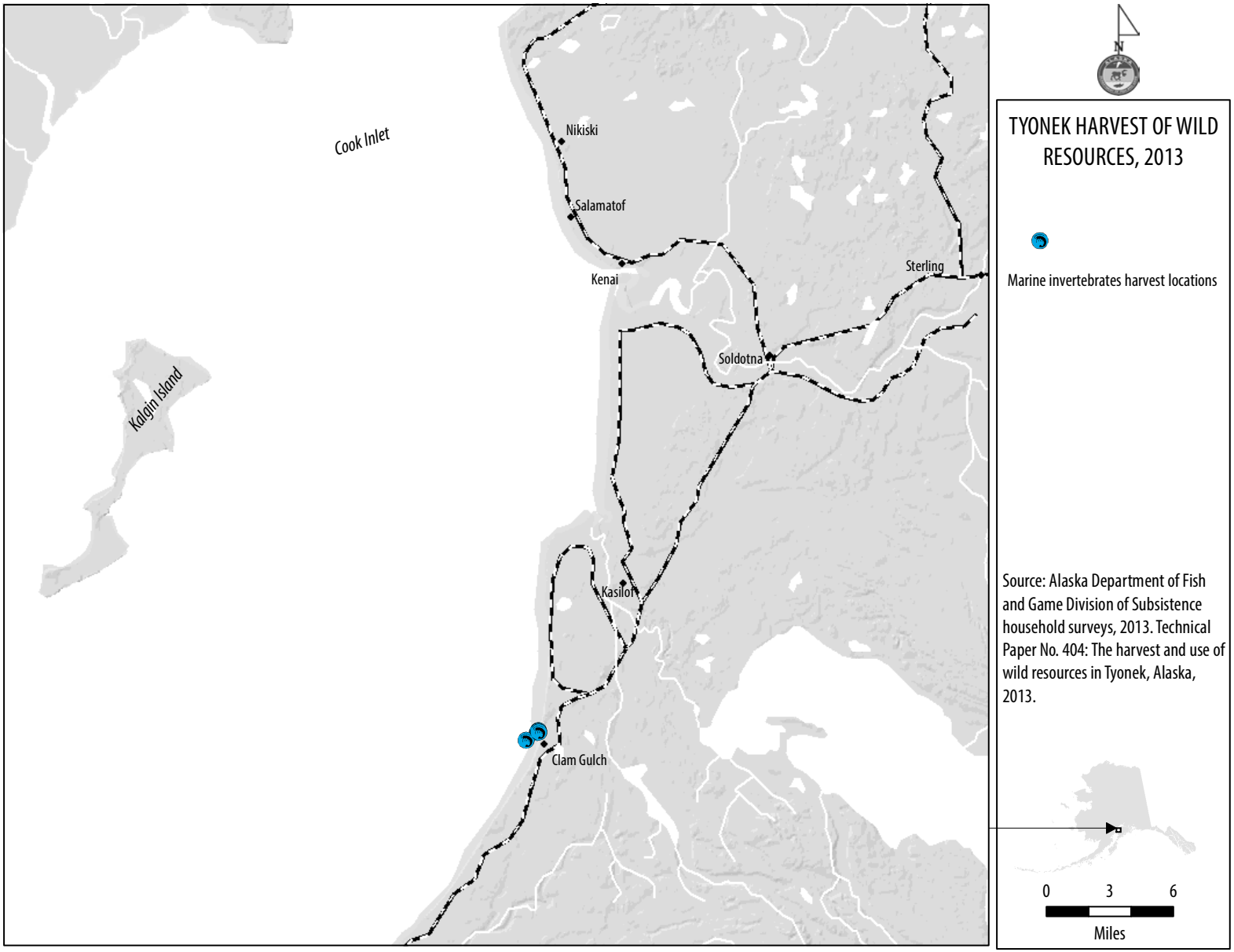

Figure 2-27.–Fishing and harvest locations of marine invertebrates, Tyonek, 2013.

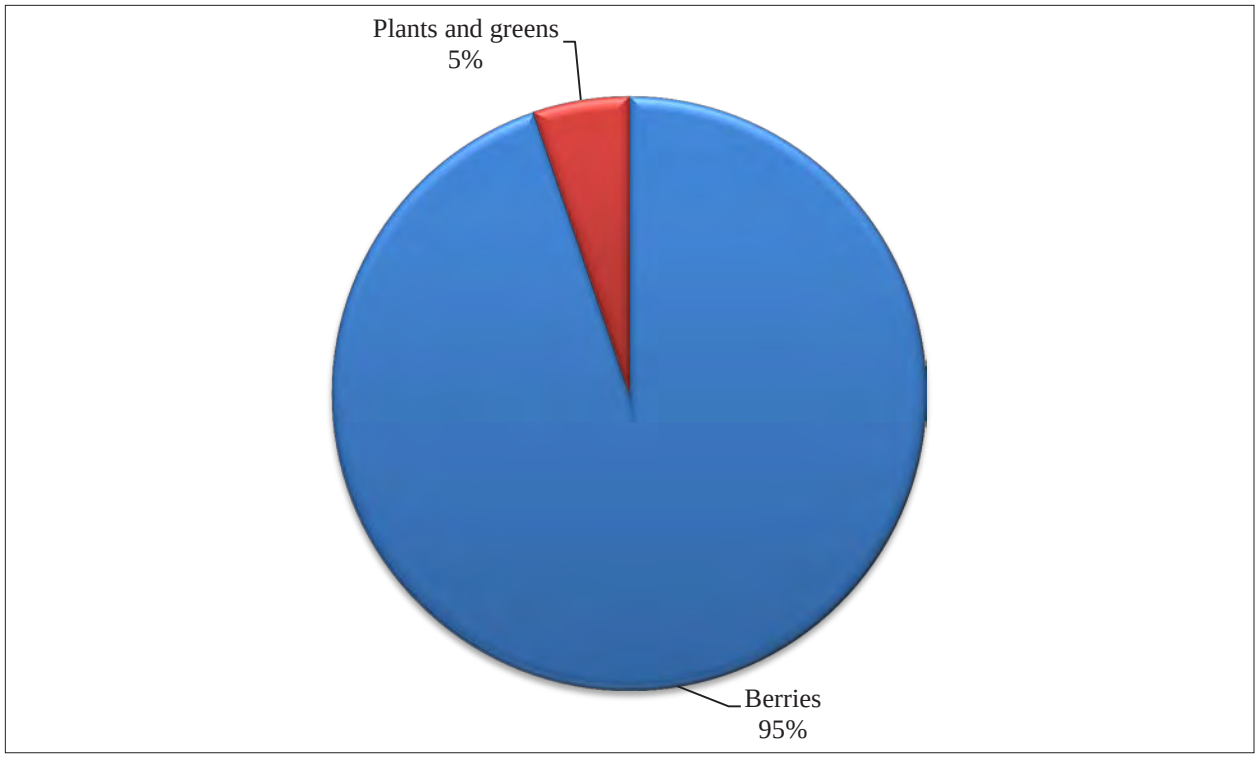

Figure 2-28.–Composition of vegetation harvest by type and pounds usable weight, Tyonek, 2013.

Vegetation

Vegetation was used by 90% of Tyonek households in 2013 (Table 2-12). A total of 1,352 lb of edible plants and berries were harvested by Tyonek residents, or 10 lb per capita. The vast majority of the vegetation harvest was composed of berries (95%) (Figure 2-28). Plants and greens made up the remaining 5% of the harvest for this resource category.

Eight specified species of berries were reportedly used by Tyonek households during the study year (Table 2-12). Blueberries were the most used (61%) and harvested (59%) berry by Tyonek households while the next most used type was highbush cranberries (49% of households used highbush cranberries and 45% harvested this berry). Lowbush cranberries were used by 16% of households and harvested by 14% of households. Currants were used and harvested by 14% of households, and 12% of households used and harvested both wild strawberries and raspberries. During the study year, a small portion of Tyonek households (4%) used and harvested crowberries, and 2% used and harvested both twisted stalk berries (watermelon berries) and other unspecified kinds of wild berries.

The per capita harvest of blueberries and highbush cranberries was 4 lb for each species. The per capita harvest of all other kinds of berries was less than one-half pound each. Sharing of berries and berry products was less common than demonstrated in other resource categories in Tyonek; 25% of households gave away blueberries, while 18% received this resource; 22% of households gave away highbush cranberries, and 14% received highbush cranberries. For the remaining types of harvested berries, all of which had low per capita harvests, fewer than 10% of households gave away or received each berry type, if any sharing occurred at all.

Plants were harvested, used, and shared far less frequently than berries in 2013; 14% of households harvested and used Hudson's Bay (Labrador) tea, and 10% harvested and used wild celery. Hudson's Bay (Labrador) tea was given away by 6% of households, and 4% of households gave away wild celery. Only 2% of Tyonek households received Hudson's Bay (Labrador) tea.

Table 2-20.–Reported use of firewood for home heating, Tyonek, 2013.

Percent of home heating from wood	Households responding to use of wood for home heating	
	Number	Percentage
0%	2	5.6%
1–25%	2	5.6%
26–50%	0	0.0%
51–75%	11	30.6%
76–99%	21	58.3%
100%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2014.

This study also collected information on the harvest of wood, but the harvest amount is not included in estimated usable harvest weight calculations. In Table 2-12, "other wood" includes all wood harvested for firewood, handicrafts, smokehouses, and other purposes; 80% of Tyonek households used wood in 2013 and 71% harvested wood. In terms of sharing, 10% of households gave away other wood while 31% received other wood. A total estimated 789 cords of wood were harvested by the community as a whole. This estimate of harvested wood does not include wood that was purchased or harvested commercially.

Wood is considered an important resource and is part of the seasonal round of harvest of wild resources by Tyonek residents (Table 2-20). During the study year, 58% of Tyonek households reported that a majority (76–99%) of their home heating source came from firewood, while another 31% said that more than one-half (51–75%) of their home heat came from firewood.

Vegetation was harvested from several areas near Tyonek. Both plants and berries were harvested within the immediate area near the community and along the Chuitna River. Berries were sought in areas farther from the community. Tyonek residents went as far west as Trading Bay to gather berries in 2013, often harvesting along the roadways or near lakes. The farthest east Tyonek residents traveled for berries was to Viapan Lake—just west of the Chuitna River (Figure 2-29). Firewood was harvested near the community and also along the Tyonek roadways; in particular the roads north of Congahbuna Lake were used as access points leading to firewood harvesting areas (Figure 2-30). Tyonek residents also harvested wood near the split of the Chuitna River where Lone Creek branches away from the river.

Comparing Harvests and Uses in 2013 with Previous Years

Harvest Assessments

For 10 resource categories and for all resources combined, survey respondents were asked to assess whether their use and harvests in the 2013 study year were less, more, or about the same as other recent years. "Other recent years" was defined as about the last 5 years. Table 2-21 reports the number of valid responses for each category, the number of households that did not respond, and the number of households that did not use a resource category or all resources combined. In Table 2-21, response percentages are based on the number of valid responses for each category to contextualize these assessments within the set of community households that typically use each category.

Figure 2-31 depicts responses to the "less, same, more" assessment question. Households that said they did not ordinarily "use" something are not included within the results. This results in fewer responses for less commonly used categories, such as bird eggs or small land mammals, and manifests in the chart as a very short bar compared to categories such as large land mammals, salmon, and vegetation, which are ordinarily used by most households. Some households did not respond to the question.

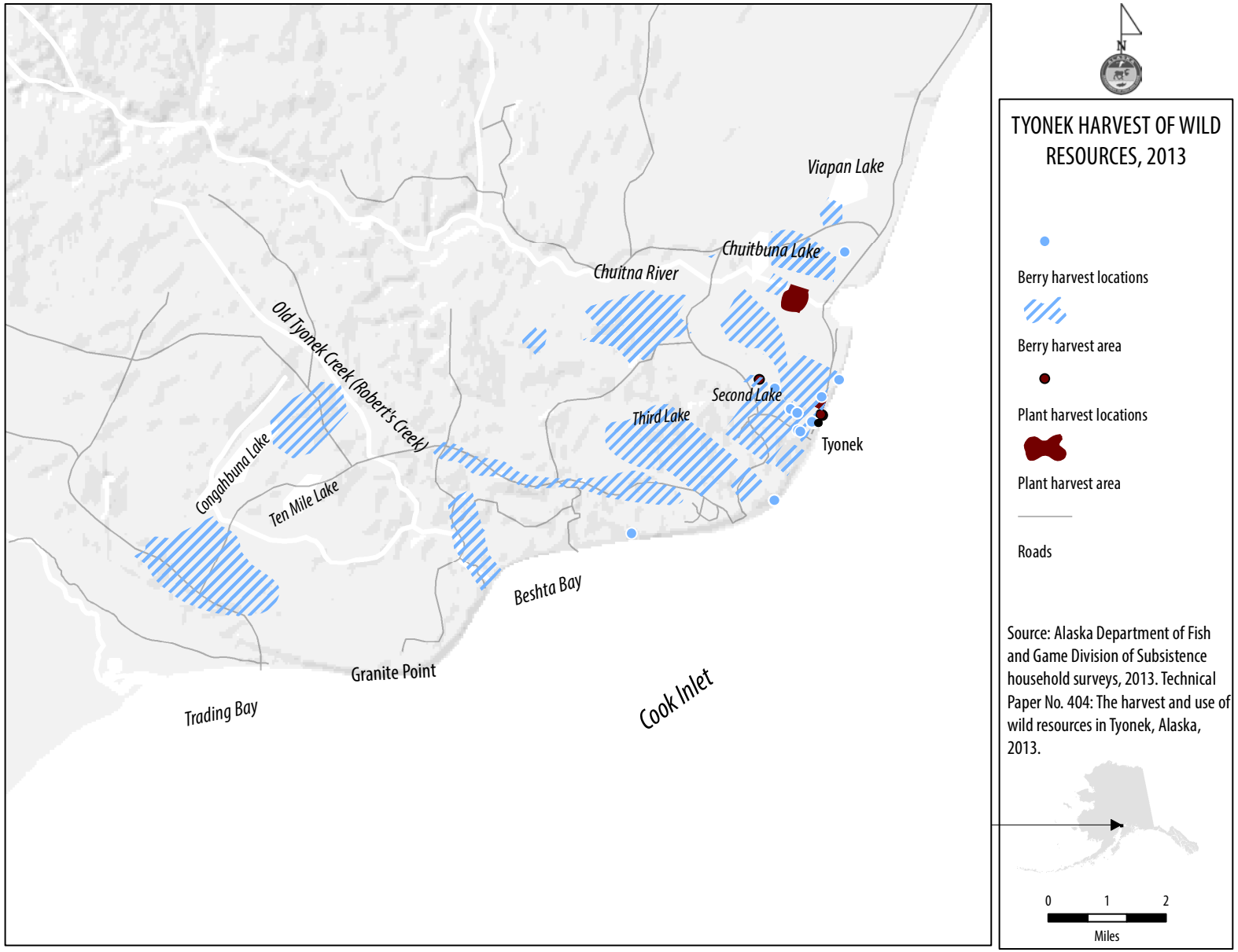

Figure 2-29.–Gathering and harvest locations of berries and plants, greens, and mushrooms, Tyonek, 2013.

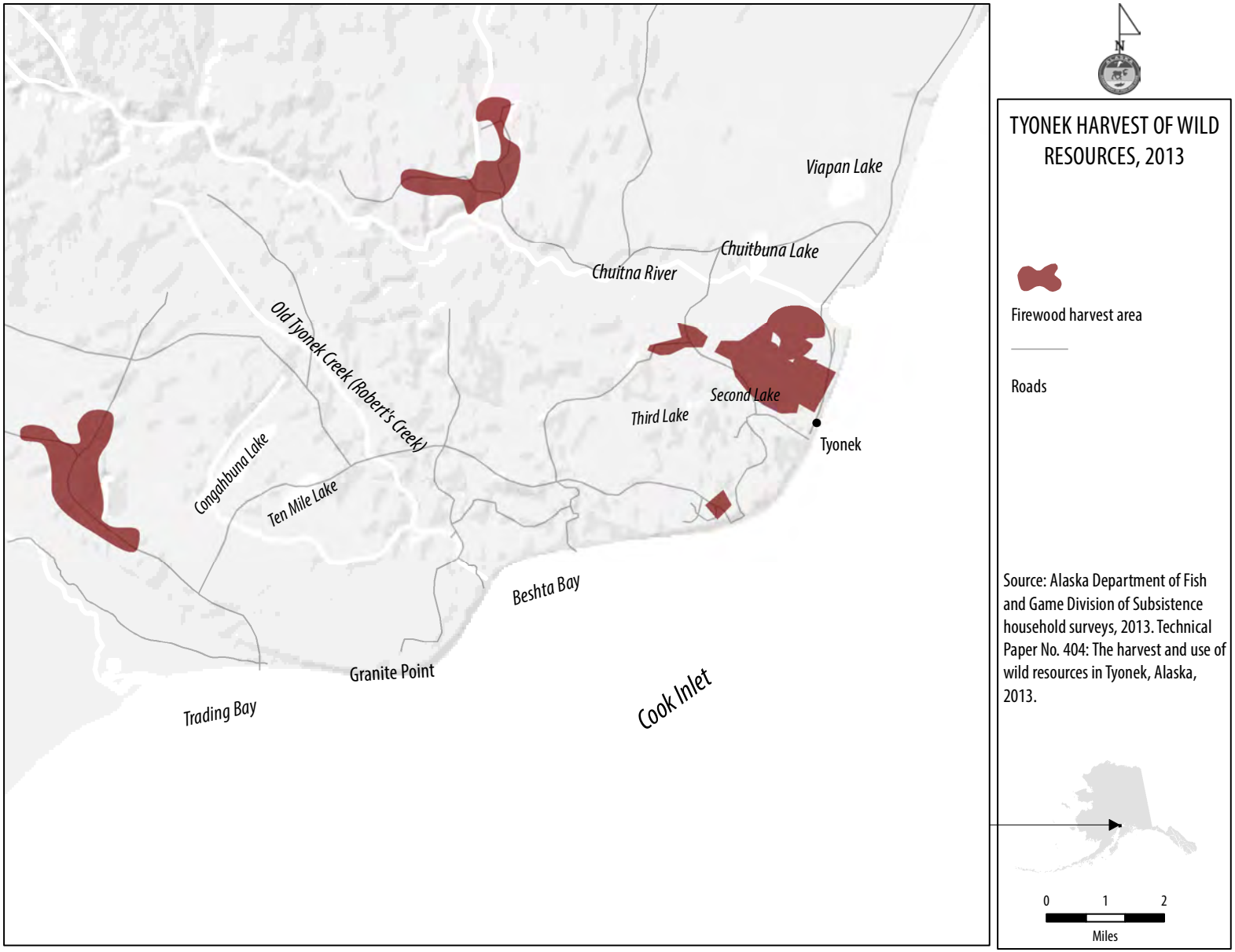

Figure 2-30.–Harvest locations of firewood, Tyonek, 2013.

Table 2-21.–Changes in household use of resources compared to recent years, Tyonek, 2013.

Resource category	Sampled households	Valid responses[a]	Households reporting use: Total households Number	Total households Percentage	Less Number	Less Percentage	Same Number	Same Percentage	More Number	More Percentage	Households not using Number	Households not using Percentage
Any resource	49	49	47	95.9%	44	89.8%	30	61.2%	18	36.7%	47	95.9%
All resources	**49**	**48**	**47**	**95.9%**	**33**	**68.8%**	**12**	**25.0%**	**2**	**4.2%**	**1**	**2.1%**
Salmon	49	48	47	95.9%	33	68.8%	7	14.6%	7	14.6%	1	2.1%
Nonsalmon fish	49	42	22	44.9%	14	33.3%	6	14.3%	2	4.8%	20	47.6%
Large land mammals	49	47	42	85.7%	35	74.5%	5	10.6%	2	4.3%	5	10.6%
Small land mammals	49	49	7	14.3%	6	12.2%	1	2.0%	0	0.0%	42	85.7%
Marine mammals	49	48	11	22.4%	5	10.4%	4	8.3%	2	4.2%	37	77.1%
Migratory waterfowl	49	41	13	26.5%	10	24.4%	2	4.9%	1	2.4%	28	68.3%
Other birds	49	47	17	34.7%	10	21.3%	5	10.6%	2	4.3%	30	63.8%
Bird eggs	49	48	2	4.1%	1	2.1%	0	0.0%	1	2.1%	46	95.8%
Marine invertebrates	49	47	12	24.5%	9	19.1%	2	4.3%	1	2.1%	35	74.5%
Vegetation	49	48	43	87.8%	25	52.1%	14	29.2%	4	8.3%	5	10.4%

Source ADF&G Division of Subsistence household surveys, 2014.

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

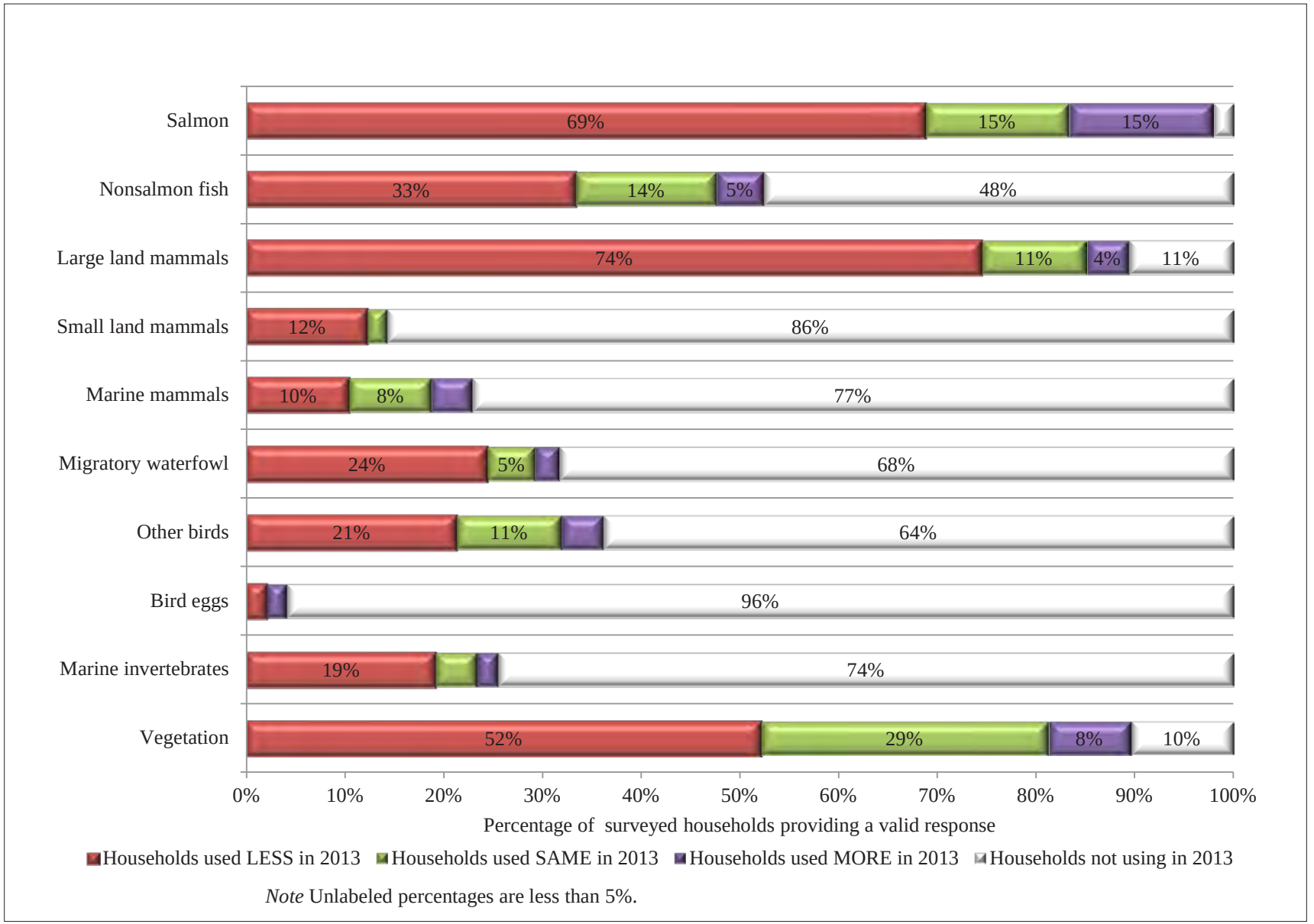

Figure 2-31.–Changes in household use of resources compared to recent years, Tyonek, 2013.

Taking all the resource categories into consideration, most households, 69%, said they used less subsistence resources in general over the previous 12 months compared to recent years (Table 2-21). A smaller number, 25% of households, said they used about the same amount, and only 4% said they used more.

Table 2-22 and Table 2-23 depict, by resource category, the reasons Tyonek respondents gave for less or more use, respectively. This was an open-ended question, and respondents could provide more than 1 reason for each resource category. Project staff grouped the responses into categories, such as regulations hindering residents from harvesting resources, sharing of harvests, effects of weather on animals and subsistence activities, changes in the animal populations, personal reasons such as work and health, and other outside effects on residents' opportunities to engage in hunting, fishing, and gathering activities.

The top reasons reported by Tyonek residents for using less of all wild resources was "less resources available" followed by "working/no time" and due to "weather/environmental factors" in 2013 (Table 2-22). The principal reason given by community residents for using more of all resources was that they "received more" resources in 2013 (Table 2-23).

The resource category having the greatest percentage of households that used the resources and indicated less use in 2013 was large land mammals (74% of households indicated less use) (Table 2-21). Valid responses from households indicated that large game resources were less available, especially moose—during both the fall and winter hunts—and that harvesting efforts were unsuccessful (Table 2-22). Following large game, 69% of households that use salmon indicated less use of salmon in 2013 (Table 2-21). The top 3 reasons given for less use of salmon were that resources were less available, family/personal reasons, and that regulations factored into not being able to get enough salmon resources in 2013 (Table 2-22). The Chinook salmon run has declined in abundance in recent years (ADF&G Chinook Salmon Research Team 2013). In addition, the subsistence fishery is open 3 days a week during the Chinook salmon run, and residents reported they sometimes would miss the major runs as they came by since the fishery was closed that day.

The percentage of households reporting more use of a resource category in 2013 was significantly lower than households reporting less use of a resource category. For example 69% of households reported they used less salmon in 2013, while 15% of households reported more salmon use. Salmon was the resource category having the greatest percentage of households that indicated more use in 2013 (Figure 2-31).

The impact to households from not getting enough wild resources is reported in Table 2-24. The impact of not getting enough large land mammals was noted as minor by 6 households, major by 16 households, and severe by 10 households out of 32 households reporting that they did not get enough large land mammals. For salmon, the impact was noted as minor by 6 households, major by 16 households, and severe by 9 households out of a total of 31 households that did not get enough. For all resources, 66% of households (out of 47) said that they did not get enough resources in 2013, and of those respondents 16% said that the impact from not getting enough resources was minor, while 42% said it was major, and 42% said it was severe.

Table 2-22.–Reasons for less household use of resources compared to recent years, Tyonek, 2013.

Resource category	Valid responses[a]	Households reporting reasons for less use	Family/ personal		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful		Weather/ environment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	49	44	6	13.6%	36	82%	1	2.3%	8	18%	5	11%	15	34%	13	29.5%	10	22.7%
All resources	**48**	**31**	**3**	**9.7%**	**14**	**45%**	**0**	**0.0%**	**6**	**19%**	**0**	**0%**	**1**	**3%**	**1**	**3.2%**	**7**	**22.6%**
Salmon	48	32	5	15.6%	18	56%	0	0.0%	0	0%	1	3%	1	3%	2	6.3%	2	6.3%
Nonsalmon fish	42	14	0	0.0%	4	29%	0	0.0%	0	0%	0	0%	6	43%	0	0.0%	0	0.0%
Large land mammals	47	35	2	5.7%	12	34%	0	0.0%	2	6%	4	11%	4	11%	11	31.4%	3	8.6%
Small land mammals	49	6	0	0.0%	1	17%	0	0.0%	1	17%	1	17%	2	33%	2	33.3%	0	0.0%
Marine mammals	48	5	0	0.0%	1	20%	0	0.0%	1	20%	0	0%	0	0%	0	0.0%	0	0.0%
Migratory waterfowl	41	10	1	10.0%	1	10%	1	10.0%	2	20%	0	0%	2	20%	1	10.0%	1	10.0%
Other birds	47	10	0	0.0%	3	30%	0	0.0%	2	20%	0	0%	3	30%	2	20.0%	0	0.0%
Bird eggs	48	1	0	0.0%	0	0%	0	0.0%	1	100%	0	0%	0	0%	0	0.0%	0	0.0%
Marine invertebrates	47	9	0	0.0%	1	11%	0	0.0%	1	11%	0	0%	3	33%	0	0.0%	0	0.0%
Vegetation	48	25	0	0.0%	15	60%	0	0.0%	2	8%	0	0%	2	8%	2	8.0%	8	32.0%

-continued-

Table 2-22.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Other reasons		Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Equipment/ fuel expense		Used other resources	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	49	44	0	0%	13	29.5%	11	25.0%	3	6.8%	7	15.9%	0	0.0%	2	4.5%	0	0.0%
All resources	**48**	**31**	**0**	**0%**	**8**	**25.8%**	**3**	**9.7%**	**0**	**0.0%**	**1**	**3.2%**	**0**	**0.0%**	**1**	**3.2%**	**0**	**0.0%**
Salmon	48	32	0	0%	2	6.3%	4	12.5%	0	0.0%	2	6.3%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	42	14	0	0%	0	0.0%	2	14.3%	0	0.0%	2	14.3%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	47	35	0	0%	1	2.9%	1	2.9%	0	0.0%	1	2.9%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	49	6	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	48	5	0	0%	0	0.0%	5	100.0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%	0	0.0%
Migratory waterfowl	41	10	0	0%	1	10.0%	0	0.0%	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other birds	47	10	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Bird eggs	48	1	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	47	9	0	0%	1	11.1%	1	11.1%	2	22.2%	1	11.1%	0	0.0%	1	11.1%	0	0.0%
Vegetation	48	25	0	0%	3	12.0%	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, 2014.

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

Table 2-23.–Reasons for more household use of resources compared to recent years, Tyonek, 2013.

Resource category	Valid responses[a]	Households reporting reasons for more use	Increased availability		Used other resources		Favorable weather		Received more		Needed more		Increased effort		Had more help	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	49	17	2	11.8%	0	0.0%	2	11.8%	5	29.4%	2	11.8%	4	23.5%	0	0.0%
All resources	**48**	**1**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**	**1**	**100.0%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
Salmon	48	7	0	0.0%	0	0.0%	0	0.0%	1	14.3%	0	0.0%	2	28.6%	0	0.0%
Nonsalmon fish	42	2	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	47	2	0	0.0%	0	0.0%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	49	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	48	1	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Migratory waterfowl	41	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Other birds	47	2	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%
Bird eggs	48	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%
Marine invertebrates	47	1	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	48	4	2	50.0%	0	0.0%	1	25.0%	1	25.0%	1	25.0%	0	0.0%	0	0.0%

-continued-

Table 2-23.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for more use	Other		Regulations		Traveled farther		More success		Needed less		Store-bought expense		Got/ fixed equipment	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	49	17	0	0.0%	0	0.0%	1	5.9%	5	29.4%	0	0.0%	0	0.0%	0	0.0%
All resources	**48**	**1**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
Salmon	48	7	0	0.0%	0	0.0%	0	0.0%	4	57.1%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	42	2	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	47	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Small land mammals	49	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	48	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Migratory waterfowl	41	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other birds	47	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Bird eggs	48	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	47	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	48	4	0	0.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2014.

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

Table 2-24.–Reported impact to households reporting that they did not get enough of a type of resource, Tyonek, 2013.

		Households not getting enough _____ .				Impact to those not getting enough _____ .									
	Sampled	Valid responses[a]		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	**49**	**47**	**95.9%**	**31**	**66.0%**	**0**	**0.0%**	**0**	**0.0%**	**5**	**16.1%**	**13**	**41.9%**	**13**	**41.9%**
Salmon	49	46	93.9%	31	67.4%	0	0.0%	0	0.0%	6	19.4%	16	51.6%	9	29.0%
Nonsalmon fish	49	22	44.9%	12	54.5%	1	8.3%	0	0.0%	2	16.7%	3	25.0%	6	50.0%
Marine invertebrates	49	12	24.5%	10	83.3%	0	0.0%	0	0.0%	2	20.0%	3	30.0%	5	50.0%
Large land mammals	49	40	81.6%	32	80.0%	0	0.0%	0	0.0%	6	18.8%	16	50.0%	10	31.3%
Marine mammals	49	11	22.4%	8	72.7%	1	12.5%	0	0.0%	5	62.5%	0	0.0%	2	25.0%
Small land mammals	49	7	14.3%	6	85.7%	0	0.0%	0	0.0%	1	16.7%	4	66.7%	1	16.7%
Migratory waterfowl	49	14	28.6%	11	78.6%	1	9.1%	0	0.0%	3	27.3%	6	54.5%	1	9.1%
Other birds	49	17	34.7%	12	70.6%	2	16.7%	0	0.0%	2	16.7%	4	33.3%	4	33.3%
Bird eggs	49	1	2.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Vegetation	49	43	87.8%	26	60.5%	0	0.0%	0	0.0%	9	34.6%	10	38.5%	7	26.9%

Source ADF&G Division of Subsistence household surveys, 2014.

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

Harvest Data

Changes in the harvest of resources by Tyonek residents can also be discerned through comparisons with findings from other study years. Comprehensive subsistence harvest surveys were conducted in Tyonek in 1983–1984 (Fall et al. 1984), 2005–2006 (Stanek et al. 2007), and 2013. Several other studies of specific resources such as salmon, furbearers, marine mammals, migratory birds, and moose add to the base of knowledge for those resources (Braund and Behnke 1980; Foster 1982a–b; Stanek and Foster 1980; Stanek et al. 1982; Stickney 1980).

In 1983–1984, Tyonek households harvested 260 lb of wild resources per capita and in 2005–2006 an estimated 217 lb were harvested compared to 170 lb in this study year; Figure 2-32 compares estimated harvests in pounds per capita for the 3 study years by resource category. Most of the difference between the 1983–1984, 2005–2006, and 2013 harvests stems from lower harvests of salmon (187 lb per capita in 1983–1984; 151 lb per capita in 2005–2006, and 118 lb per capita in 2013) and large land mammals (55 lb per capita in 1983–1984; 40 lb per capita in 2005–2006, and 24 lb per capita in 2013). Tyonek residents also had lower harvests of marine invertebrates and marine mammals in 2013 than in the 2005–2006 and 1983–1984 study years. The small land mammal harvest was the same in 2013 as the earlier studies (1 lb per capita). However the per capita harvests of nonsalmon fish and vegetation were slightly higher in 2013 than in the earlier study periods.

ADF&G also monitors annual subsistence harvests of salmon in the Tyonek Subdistrict through a permit and reporting system. Table 2-25 presents harvest data for all permit holders in this fishery, regardless of community of residence for permit holders, from 1981 through 2013. In 2013, 82 permits were issued for the Tyonek Subdistrict subsistence salmon fishery, including 59 permits issued to Tyonek residents (72%). Residents of Tyonek accounted for 71% of the reported harvest total (842 salmon), including 78% of the reported Chinook salmon harvest (636 Chinook salmon) (Table 2-26).

Since 1981, the average annual subsistence salmon harvest for Tyonek residents in this fishery is 1,501 salmon, including 1,221 Chinook salmon (Table 2-25). The recent 5-year (2008 through 2012) average is 1,154 salmon, including 818 Chinook. The harvest per permit over time has declined for both Chinook salmon and all salmon. The historical average harvest of Chinook salmon per permit is 21 fish, and the most recent 5-year average is 12 salmon. The historical average of all salmon harvested per permit is 26 salmon, and the most recent 5-year average is 16 salmon. Fishers note that they have harvested fewer fish for the same number of days fishing compared to the past.

Current and Historical Harvest Areas

It is possible to compare historical spatial harvest data with the 2013 study year mapping data to identify changes in the search and harvest areas for wild food resources over time. Spatial data were collected as part of the 1983–1984[5], 2005–2006, and 2013 study years.

Figure 2-33 represents all wild resource search and harvest areas from the past 3 comprehensive surveys conducted in Tyonek. The map data depict Tyonek residents' harvest and use areas over a 30-year span. Comparing the historical and contemporary map data demonstrates the continuity in Tyonek residents' search and harvest areas over the past 3 decades. The harvest locations of salmon and nonsalmon fish have remained constant over time. Similarly, search and harvest areas for birds, plants, berries, and wood encompass the same geographic area in all 3 study years. However, there are some differences between harvests in 2013 and the 2 earlier studies. Mapping data for 1978–1984 and 2005–2006 collected in 2 previous studies show that Tyonek residents traveled farther south in Cook Inlet than they did in the 2013 study year. The historical map data indicate that residents were searching for and harvesting marine mammals near Redoubt Bay and marine invertebrates near Tuxedni Bay during these previous years. Tuxedni Bay was once a popular location for harvesting razor clams, and residents would take extended trips to the area to harvest this resource (Stanek et al. 2006:61); however, residents note that there are fewer clams in the area currently, and it is not worth the effort and expense to travel this distance. In 2013 the farthest west

5. Note that the mapping data for the 1983–1984 study year present search and harvest locations for 1978–1984.

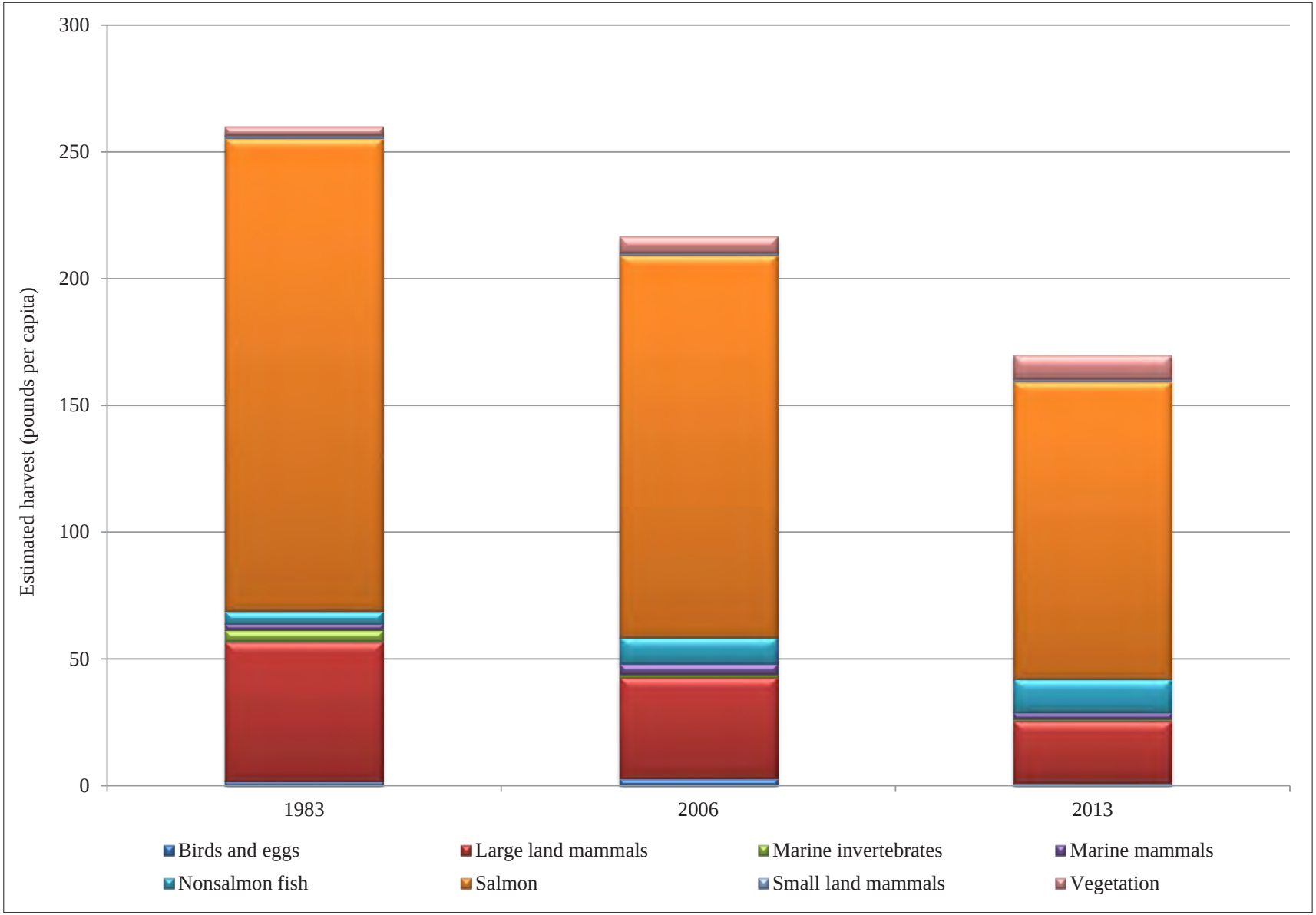

Figure 2-32.–Estimated harvests by pounds per capita and by resource category, Tyonek, 1983–1984, 2005–2006, and 2013.

Table 2-25.–Historical subsistence salmon harvests, permit return data, Tyonek Subdistrict, 1981–2013.

	Permits		Reported salmon harvests						Harvest per permit	
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	**Total**	Chinook	**Total**
1981	70	NA	2,002	269	64	32	15	**2,382**	29	**34**
1982	69	NA	1,590	310	113	4	14	**2,031**	23	**29**
1983	75	NA	2,665	187	59	6	0	**2,917**	36	**39**
1984	75	NA	2,200	266	79	23	3	**2,571**	29	**34**
1985	76	NA	1,472	164	91	10	0	**1,737**	19	**23**
1986	65	NA	1,676	203	223	46	50	**2,198**	26	**34**
1987	64	61	1,610	166	149	24	10	**1,959**	26	**32**
1988	47	42	1,587	91	253	12	8	**1,951**	38	**46**
1989	49	47	1,250	85	115	1	0	**1,451**	27	**31**
1990	42	37	781	66	352	12	20	**1,231**	21	**33**
1991	57	54	902	20	58	0	0	**980**	17	**18**
1992	57	44	907	75	234	19	7	**1,242**	21	**28**
1993	62	54	1,370	57	77	17	19	**1,540**	25	**29**
1994	58	49	770	85	101	22	0	**978**	16	**20**
1995	70	55	1,317	45	153	15	0	**1,530**	24	**28**
1996	73	49	1,039	68	137	7	21	**1,272**	21	**26**
1997	70	42	639	101	137	8	0	**885**	15	**21**
1998	74	49	1,027	163	64	2	1	**1,257**	21	**26**
1999	77	54	1,230	144	94	11	32	**1,511**	23	**28**
2000	60	59	1,157	63	87	0	6	**1,313**	20	**22**
2001	84	58	976	172	49	6	4	**1,207**	17	**21**
2002	101	71	1,080	209	115	4	9	**1,417**	15	**20**
2003	87	74	1,183	111	44	10	7	**1,355**	16	**18**
2004	97	75	1,345	93	130	0	0	**1,568**	18	**21**
2005	78	66	982	61	139	2	0	**1,184**	15	**18**
2006	82	55	943	20	14	1	0	**978**	17	**18**
2007	84	67	1,281	200	123	2	3	**1,609**	19	**24**
2008	94	77	1,178	121	194	9	13	**1,515**	15	**20**
2009	89	69	636	184	258	2	1	**1,081**	9	**16**
2010	105	77	843	212	167	2	2	**1,226**	11	**16**
2011	114	63	595	154	26	7	7	**789**	9	**13**
2012	89	69	840	176	138	2	4	**1,160**	12	**17**
2013	82	48	813	172	181	0	19	**1,185**	17	**25**
5-year average (2008–2012)	98	71	818	169	157	4	5	**1,154**	12	**16**
10-year average (2003–2012)	92	69	983	133	123	4	4	**1,247**	14	**18**
Historical average (1981–2012)	75	58	1,221	136	126	10	8	**1,501**	21	**26**

Source ADF&G Division of Subsistence, ASFDB 2014 (ADF&G 2015).

Note "NA" indicates that information regarding the number of permits returned in 1981–1986 does exist; however, it was not available at the time this report was written.

Table 2-26.–Subsistence salmon harvests by community of residence, permit return data, Tyonek Subdistrict, 2013.

	Permits		Reported salmon harvests					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	**Total**
Alexander Creek	1	1	0	0	0	0	0	**0**
Anchorage	14	8	95	69	58	0	4	**226**
Beluga	1	0	0	0	0	0	0	**0**
Big Lake	1	1	0	4	1	0	0	**5**
Chugiak	1	0	0	0	0	0	0	**0**
Eagle River	2	2	21	0	0	0	0	**21**
Glennallen	1	0	0	0	0	0	0	**0**
Kenai	1	1	57	10	0	0	0	**67**
Palmer	1	1	4	15	4	0	1	**24**
Tyonek	59	34	636	74	118	0	14	**842**
Total	**82**	**48**	**813**	**172**	**181**	**0**	**19**	**1,185**

Source ADF&G Division of Subsistence, Alaska Subsistence Fisheries Database (ASFDB) 2014.

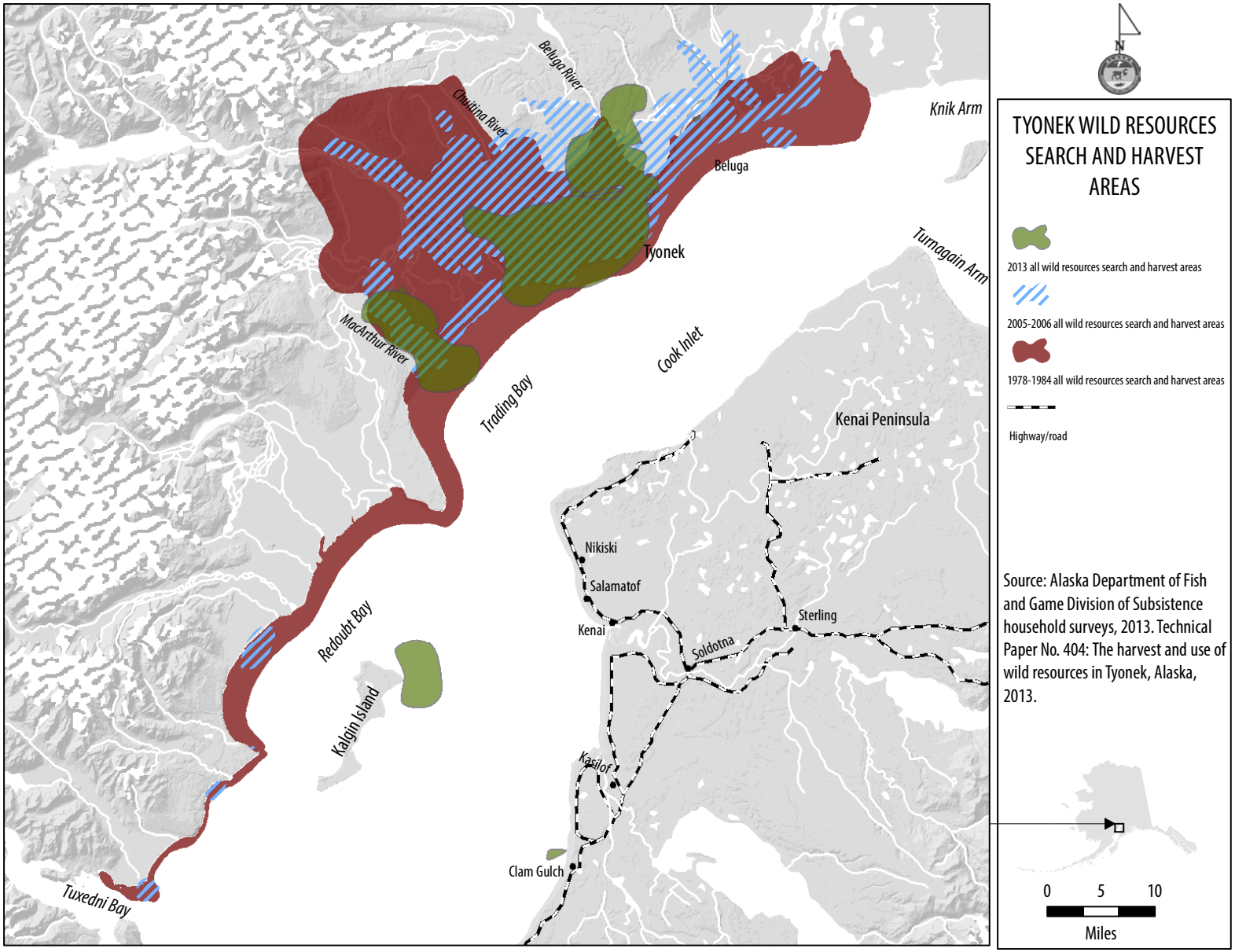

Figure 2-33.–Search and harvest locations of all wild resources, Tyonek, 1978–1984, 2005–2006, and 2013.

Tyonek residents traveled for hunting marine mammals was the McArthur River flats. Another difference between the previous years' mapping data and this study year was that in 2013 the majority of Tyonek residents did not attempt to harvest bears, small land mammals/furbearers, or beluga whales—resulting in smaller search areas for these categories (Table 2-12; Figure 2-33).

Local Comments and Concerns

Following is a summary of local observations of wild resource populations and trends that were recorded during the surveys. Some households did not offer any additional information during the survey interviews, so not all households are represented in the summary. In addition, respondents expressed their concerns about wild resources during the community review meeting of preliminary data. These concerns have been included in the summary.

Nonsalmon Fish

Northern pike have recently been harvested for the first time in lakes close to the community such as at First and Second lakes and Chuitbuna Lake. Several respondents were concerned that the northern pike would spread farther into other local streams and lakes. Tyonek residents expressed concern about the new presence of northern pike in salmon spawning areas and the potential effects northern pike may have on the ecosystem as a whole.

Salmon

Tyonek residents are concerned about the health of the populations of all 5 species of Pacific salmon. Residents noted that they were concerned about salmon harvests in marine fisheries and especially the bycatch volume of Chinook salmon, and effects of pollution and climate change on salmon. Many Tyonek households mentioned more "jack" Chinook salmon (immature, non-spawning male salmon) were returning in 2013 than in previous years, and numerous respondents reported a significant decrease in overall Chinook salmon returns. Several households attributed these changes to heavy rain and flood events occurring in local streams and rivers. Many respondents commented that they had to take time off of work to fish longer into the season in order to retain enough Chinook salmon for their household's needs. Residents are encouraged by recent efforts of the Tyonek Tribal Conservation District to restore and rehabilitate salmon spawning streams in the area.

Large Land Mammals

Winter moose populations were reported to be on the decline in 2013. Many residents stated that they had not seen a moose around Tyonek in many months. Low abundance of moose during the winter is a concern for residents since they rely on the Tier II hunt to meet their moose harvesting goals for the year. Tyonek residents harvested only 1 moose in the winter hunt although there was considerable effort expended for the hunt by local residents. Several survey respondents expressed concern that the Tier II hunt would be closed in the winter due to a low winter moose population and this would further affect their overall moose harvest.

Chuitna Coal Project

Many survey respondents expressed concern about the Chuitna Coal Project—a proposed coal mine located 12 miles from the community within the Chuitna River watershed. Residents expressed concern for the future of subsistence and commercial fishing in Tyonek as a result of the proposed mine project due to the proposed plans to alter the flow of the Chuitna River. The Chuitna River is an important Chinook and coho salmon spawning stream for the subsistence fishery and sport fishery using rod and reel gear. The primary concern about the proposed coal development focused on the potential for pollution as a consequence of mine development. The potential effect on beluga whales and salmon was particularly concerning to

survey respondents. One resident stated that coal dust might be blown into the water and nearby lands and negatively affect people, animals, and plants. This resident was worried that the dust would make the people of Tyonek sick because it would be on the plants and animals they harvest for subsistence.

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REFERENCES

ADF&G Chinook Salmon Research Team. 2013. *Chinook salmon stock assessment and research plan, 2013.* Alaska Department of Fish and Game, Special Publication No. 13-01: Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/SP13-01.pdf

Alaska Department of Labor and Workforce Development. 2015. *Alaska population estimates by borough, census area, city, and census designated place (CDP), 2010–2014*. http://laborstats.alaska.gov/pop/popest.htm

Braund, S.R. and S.R. Behnke. 1980. *Lower Cook Inlet petroleum development scenarios sociocultural systems analysis*. Alaska OCS Socioeconomic Studies Program, Technical Report No. 47. Prepared for the Bureau of Land Management, Alaska Outer Continental Shelf Office: Anchorage.

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

Fall, J.A., D.J. Foster, and R.T. Stanek. 1984. *The use of fish and wildlife resources in Tyonek, Alaska. Tubughna Ch'adach' Elnen Ghuhdilt'a*. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 105: Anchorage. http://www.adfg.alaska.gov/techpap/tp105.pdf

Foster, D.J. 1982a. *Tyonek moose utilization 1981*. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 26. http://www.adfg.alaska.gov/techpap/tp026.pdf

1982b. *The utilization of king salmon and the annual round of resource uses in Tyonek, Alaska*. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 27. http://www.adfg.alaska.gov/techpap/tp027.pdf

Holen, D. 2014. *Fishing for community and culture: the value of fisheries in rural Alaska*. Polar Record 50(4), pages 403–413.

Kari, J. and J.A. Fall. 2003. *Shem Pete's Alaska: the territory of the upper Cook Inlet Dena'ina*. University of Alaska Press: Fairbanks.

De Laguna, F. 1934. *The archaeology of Cook inlet, Alaska*. University of Pennsylvania Press: Philadelphia.

Shelden, K.E.W., C.L. Sims, L. Vate Brattstrom, K.T. Goetz, and R.C. Hobbs. 2015. *Aerial surveys of beluga whales (Delphinapterus leucas) in Cook Inlet, Alaska, June 2014*. Alaska Fisheries Science Center Processed Report 2015-03, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service: Seattle, WA. http://www.afsc.noaa.gov/Publications/ProcRpt/PR2015-03.pdf

Stanek, R.T., J. Fall, and D. Foster. 1982. *Subsistence shellfish use in three Cook Inlet villages, 1981: A preliminary report.* Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 34. http://www.adfg.alaska.gov/techpap/tp034.pdf

Stanek, R.T., J.A. Fall, and D.L. Holen. 2006. *West Cook Inlet ethnographic overview and assessment for Lake Clark National Park and Preserve*. Lake Clark National Park and Preserve, Anchorage, and the Alaska Department of Fish and Game Division of Subsistence: Juneau.

Stanek, R.T. and D.J. Foster. 1980. *Tyonek king salmon subsistence fishery: 1980 activities report.* Alaska Department of Fish and Game, Division of Subsistence. http://www.adfg.alaska.gov/techpap/tp033.pdf

Stanek, R.T., D.L. Holen, and C. Wassillie. 2007. *Harvest and uses of wild resources in Tyonek and Beluga, Alaska, 2005-2006*. Alaska Department of Fish and Game, Division of Subsistence. http://www.adfg.alaska.gov/techpap/TP321.pdf (Accessed December 10, 2012)

Stickney, A.A. 1980. *Report on the survey conducted in Tyonek 1980*. Alaska Department of Fish and Game, Division of Subsistence. http://www.adfg.alaska.gov/techpap/tp035.pdf (Accessed December 11, 2012)

U.S. Census Bureau. 2011. *2010 census*. U.S. Census Bureau: Washington, D.C. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

Wolfe, R.J. 1987. *The super-household: specialization in subsistence economies*. Paper presented at the 14th annual meeting of the Alaska Anthropological Association, March 1987, Anchorage, Alaska. Alaska Department of Fish and Game Division of Subsistence: Juneau.

Wolfe, R.J., C.L. Scott, W.E. Simeone, C.J. Utermohle, and M.C. Pete. 2010. *The "super-household" in Alaska Native subsistence economies*. Final Report to the National Science Foundation, Project ARC 0352611.

APPENDIX A–SURVEY INSTRUMENT

COMPREHENSIVE HARVEST SURVEY

TYONEK, ALASKA

January to December, 2013

This survey is used to estimate wild harvests and to describe community economies. We will publish a summary report, and send it to all households in your community. We share the community 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 resources, and to implement federal and state subsistence priorities.

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

HOUSEHOLD ID:		
COMMUNITY ID:	TYONEK	355
RESPONDENT ID:		
INTERVIEWER:		
INTERVIEW DATE:		
START TIME:		
STOP TIME:		
DATA CODED BY:		
DATA ENTERED BY:		
SUPERVISOR:		

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HDR
2525 C STREET, SUITE 305
ANCHORAGE, AK 99503

907-644-2117

HOUSEHOLD MEMBERS

HOUSEHOLD ID

Between JANUARY and DECEMBER, 2013…
…who lived in your household?

ID#	IS THIS PERSON ANSWERING QUESTIONS *ON THIS SURVEY?* (circle)	MALE OR FEMALE? (circle)	ALASKA NATIVE? (circle)	IN WHAT YEAR WAS THIS PERSON BORN? (year)	WHERE WERE PARENTS LIVING WHEN THIS PERSON WAS BORN? (ak city or state)	HOW IS THIS PERSON RELATED TO HOUSEHOLD HEAD 1? (relation)	HOW MANY YEARS HAS THIS PERSON LIVED IN TYONEK? (number)
HEAD 1	Y N	M F	Y N				YRS
01							
Enter spouse or partner next. If household has a SINGLE HEAD, leave HEAD 2 blank.							
HEAD 2	Y N	M F	Y N				YRS
02							
Enter children (oldest to youngest), grandchildren, grandparents, brothers, sisters, or anyone else living full-time in this household.							
03	Y N	M F	Y N				YRS
04	Y N	M F	Y N				YRS
05	Y N	M F	Y N				YRS
06	Y N	M F	Y N				YRS
07	Y N	M F	Y N				YRS
08	Y N	M F	Y N				YRS
09	Y N	M F	Y N				YRS
10	Y N	M F	Y N				YRS
11	Y N	M F	Y N				YRS
12	Y N	M F	Y N				YRS
13	Y N	M F	Y N				YRS
14	Y N	M F	Y N				YRS
15	Y N	M F	Y N				YRS

PERMANENT HH MEMBERS: 01 **TYONEK: 355**

HOUSEHOLD MEMBER PARTICIPATION

HOUSEHOLD ID

Between JANUARY and DECEMBER, 2013…
…did this person...

PERSON	Fish		Large Land Mammals		Small Land Mammals Furbearers		Birds & Eggs		Plants/Berries/Wood	
ID# FROM	Fish	Process	Hunt	Process	Hunt/Trap	Process	Hunt/Gather	Process	Gather	Process
Page 2	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*
Head 1	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Head 2	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
03	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
04	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
05	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
06	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
07	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
08	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
09	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
10	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
11	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
12	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
13	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
14	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
15	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N

PERMANENT HH MEMBERS: 01 **TYONEK: 355**

HARVESTS: COMMERCIAL SALMON FISHING

HOUSEHOLD ID

Do members of your household USUALLY participate in COMMERCIAL SALMON FISHING ?..... Y N

Between JANUARY and DECEMBER, 2013…

…Did members of your household participate in commercial salmon fishing?..... Y N

IF NO, go to the next harvest page.

If YES, continue on this page…

Please estimate the number of salmon ALL MEMBERS OF YOUR HOUSEHOLD REMOVED FROM COMMERCIAL HARVEST FOR PERSONAL USE OR SHARING in 2013. INCLUDE the fish you gave away, ate fresh, fed to dogs, lost to spoilage, caught as incidental catch while fishing for another species, or got by helping others. If harvested with others, report ONLY YOUR SHARE of the catch.

	IN 2013 DID MEMBERS OF YOUR HH…		IN 2013, HOW MANY _____ WERE REMOVED FOR YOUR OWN USE?	IN 2013, HOW MANY _____ DID YOU REMOVE FROM THE CATCH & GIVE AWAY TO CREW OR OTHERS?		ID NUMBER FROM PAGE 2	
	COMMERCIAL FISH FOR _____?	CATCH AS INCIDENTAL CATCH _____?		CREW	OTHERS	PERMIT HOLDER	CREW
	(circle)	*(circle)*	*(number)*	*(number)*		*(number)*	*(number)*
CHINOOK (KING) SALMON	Y N	Y N	IND	IND	IND		
113000001							
CHUM (DOG) SALMON	Y N	Y N	IND	IND	IND		
111000001							
COHO (SILVER) SALMON	Y N	Y N	IND	IND	IND		
112000001							
PINK (HUMPIES) SALMON	Y N	Y N	IND	IND	IND		
114000001							
SOCKEYE (RED) SALMON	Y N	Y N	IND	IND	IND		
115000001							
UNKNOWN SALMON	Y N	Y N	IND	IND	IND		
119000001							

HARVESTS: COMMERCIAL NON-SALMON FISHING

HOUSEHOLD ID

Do members of your household USUALLY participate in COMMERCIAL NON-SALMON FISHING ?..... Y N

Between JANUARY and DECEMBER, 2013…

…Did members of your household participate in commercial non-salmon fishing?..... Y N

IF NO, go to the next harvest page.

If YES, continue on this page…

Please estimate the number of commercially harvested non-salmon fish ALL MEMBERS OF YOUR HOUSEHOLD REMOVED FROM COMMERCIAL HARVEST FOR PERSONAL USE OR SHARING in 2013. INCLUDE the fish you gave away, ate fresh, fed to dogs, lost to spoilage, caught as incidental catch while fishing for another species, or got by helping others. If harvested with others, report ONLY YOUR SHARE of the catch.

	IN 2013 DID MEMBERS OF YOUR HH…		IN 2013, HOW MANY _____ WERE REMOVED FOR YOUR OWN USE?	IN 2013, HOW MANY _____ DID YOU REMOVE FROM THE CATCH & GIVE AWAY TO CREW OR OTHERS?		ID NUMBER FROM PAGE 2	
	COMMERCIAL FISH FOR _____?	CATCH AS INCIDENTAL CATCH _____?		CREW	OTHERS	PERMIT HOLDER	CREW
	(circle)	*(circle)*	*(number)*	*(number)*		*(number)*	*(number)*
HALIBUT	Y N	Y N	LBS	LBS	LBS		
121800001							
FLOUNDER	Y N	Y N	IND	IND	IND		
121499001							
HERRING	Y N	Y N	GAL	GAL	GAL		
120200001							
HERRING SPAWN ON KELP	Y N	Y N	GAL	GAL	GAL		
120306001							
HERRING SAC ROE	Y N	Y N	IND	IND	IND		
120304001							
LINGCOD	Y N	Y N	IND	IND	IND		
121606001							
PACIFIC (GRAY) COD	Y N	Y N	IND	IND	IND		
121008001							
SABLEFISH (BLACK COD)	Y N	Y N	IND	IND	IND		
122800001							
SOLE	Y N	Y N	IND	IND	IND		
123600001							
BLACK ROCKFISH	Y N	Y N	IND	IND	IND		
122602001							
RED ROCKFISH	Y N	Y N	IND	IND	IND		
122604001							
GREENLING	Y N	Y N	IND	IND	IND		
121600001							

CONTINUED FROM PREVIOUS PAGE .....

Please estimate the number of commercially harvested non-salmon fish ALL MEMBERS OF YOUR HOUSEHOLD REMOVED FROM COMMERCIAL HARVEST FOR PERSONAL USE OR SHARING in 2013. INCLUDE the fish you gave away, ate fresh, fed to dogs, lost to spoilage, caught as incidental catch while fishing for another species, or got by helping others. If harvested with others, report ONLY YOUR SHARE of the catch.

	IN 2013 DID MEMBERS OF YOUR HH…		IN 2013, HOW MANY _____ WERE REMOVED FOR YOUR OWN USE?	IN 2013, HOW MANY _____ DID YOU REMOVE FROM THE CATCH & GIVE AWAY TO CREW OR OTHERS?		ID NUMBER FROM PAGE 2	
	COMMERCIAL FISH FOR _____?	CATCH AS INCIDENTAL CATCH _____?		CREW	OTHERS	PERMIT HOLDER	CREW
	(circle)	*(circle)*	*(number)*	*(number)*		*(number)*	*(number)*
WOLF EEL (WOLFFISH)	Y N	Y N	IND	IND	IND		
124200001							
SHARK	Y N	Y N	IND	IND	IND		
123200001							
DOLLY VARDEN	Y N	Y N	IND	IND	IND		
125006001							
	Y N	Y N					
	Y N	Y N					
	Y N	Y N					
	Y N	Y N					

HARVESTS: COMMERCIAL MARINE INVERTEBRATE HARVEST

HOUSEHOLD ID

Do members of your household USUALLY participate in COMMERCIAL MARINE INVERTEBRATE HARVEST ?..... Y N

Between JANUARY and DECEMBER, 2013…

…Did members of your household participate in commercial marine invertebrate harvest?..... Y N

IF NO, go to the next harvest page.

If YES, continue on this page…

Please estimate the commercially harvested marine invertebrates ALL MEMBERS OF YOUR HOUSEHOLD REMOVED FROM COMMERCIAL HARVEST in 2013. INCLUDE the marine invertebrates you gave away, ate fresh, fed to dogs, lost to spoilage, caught as incidental catch while fishing for another species, or got by helping others. If harvested with others, report ONLY YOUR SHARE of the catch.

	IN 2013 DID MEMBERS OF YOUR HH…		IN 2013, HOW MANY _____ WERE REMOVED FOR YOUR OWN USE?	IN 2013, HOW MANY _____ DID YOU REMOVE FROM THE CATCH & GIVE AWAY TO CREW OR OTHERS?		ID NUMBER FROM PAGE 2	
	COMMERCIAL FISH FOR _____?	CATCH AS INCIDENTAL CATCH _____?		CREW	OTHERS	PERMIT HOLDER	CREW
	(circle)	*(circle)*	*(number)*	*(number)*		*(number)*	*(number)*
RAZOR CLAMS	Y N	Y N	LBS	LBS	LBS		
500612001							
PACIFIC LITTLENECK CLAMS *(Steamers)*	Y N	Y N	LBS	LBS	LBS		
500608001							
DUNGENESS CRAB	Y N	Y N	GAL	GAL	GAL		
501004001							
KING CRAB	Y N	Y N	GAL	GAL	GAL		
501008001							
TANNER CRAB	Y N	Y N	IND	IND	IND		
501012001							
OCTOPUS	Y N	Y N					
502200001							
SHRIMP	Y N	Y N					
503400001							
SCALLOPS	Y N	Y N					
502600001							
	Y N	Y N					
	Y N	Y N					
	Y N	Y N					
	Y N	Y N					
	Y N	Y N					

COMMERCIAL MARINE INVERTEBRATE HARVEST: 03 **TYONEK: 355**

HARVESTS: SALMON (NON-COMMERCIAL)

HOUSEHOLD ID

Do members of your household USUALLY harvest SALMON ?..... Y N

Between JANUARY and DECEMBER, 2013…

…Did members of your household USE or TRY TO HARVEST salmon?..... Y N

IF NO to both questions, go to the next harvest page.

If YES, continue on this page…

Please estimate how many salmon ALL MEMBERS OF YOUR HOUSEHOLD HARVESTED in 2013, including with a rod and reel. INCLUDE salmon you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with others, report ONLY YOUR SHARE of the catch. Do not include fish caught and released.

	IN 2013 DID MEMBERS OF YOUR HH…					IN 2013, HOW MANY _____ DID YOUR HOUSEHOLD…				
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?	…HARVEST WITH A SET NET?	…HARVEST WITH A OR SEINE?	…HARVEST WITH ROD AND REEL?	…HARVEST WITH OTHER GEAR?	UNITS
	(circle)					*(number taken by each gear type)*			*Amount / Type*	*(ind, lbs)*
CHINOOK (KING) SALMON	Y N	Y N	Y N	Y N	Y N				/	IND
113000000										
SOCKEYE (RED) SALMON	Y N	Y N	Y N	Y N	Y N				/	IND
115000000										
COHO (SILVER) SALMON	Y N	Y N	Y N	Y N	Y N				/	IND
112000000										
PINK (HUMPIES) SALMON	Y N	Y N	Y N	Y N	Y N				/	IND
114000000										
CHUM (DOG) SALMON	Y N	Y N	Y N	Y N	Y N				/	IND
111000000										
SPAWNING SOCKEYE	Y N	Y N	Y N	Y N	Y N				/	IND
117050000										
LANDLOCKED SALMON *Kokanee*	Y N	Y N	Y N	Y N	Y N				/	IND
116000000										
UNKNOWN SALMON	Y N	Y N	Y N	Y N	Y N				/	IND
119000000										

These columns should include all the harvests: salmon HARVESTED by members of this household in 2013.

ASSESSMENTS: SALMON

Between JANUARY and DECEMBER, 2013…

To conclude our salmon section, I am going to ask a few general questions about salmon.

Last year…

…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

Last year…

…did your household GET ENOUGH salmon?..... Y N

If NO…

What KIND of salmon did you need?..... _____

How would you describe the impact to your household of not getting enough salmon last year?..... ...minor? (1) ...major? (2) severe? (3)

SALMON :04 **TYONEK: 355**

HARVESTS: OTHER FISH (NON-COMMERCIAL)

HOUSEHOLD ID

Do members of your household USUALLY harvest OTHER FISH ?.....Y N

Between JANUARY and DECEMBER, 2013…

…Did members of your household USE or TRY TO HARVEST other fish?.....Y N

IF NO to both questions, go to the next harvest page.

If YES, continue on this page…

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD HARVESTED in 2013, including with a rod and reel. INCLUDE other fish you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with others, report ONLY YOUR SHARE of the catch. Do not include fish caught and released

	IN 2013 DID MEMBERS OF YOUR HH…					IN 2013, HOW MANY _____ DID YOUR HOUSEHOLD…					
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?	…HARVEST WITH A SET NET?	…HARVEST WITH DIPNET?	…HARVEST WITH ROD AND REEL?	…HARVEST ICE FISHING?	…HARVEST WITH OTHER GEAR?	UNITS
	(circle)					*(number taken by each gear type)*				*Amount / Type*	*(ind, lbs)*
RAINBOW TROUT	Y N	Y N	Y N	Y N	Y N					/	IND
126204000											
DOLLY VARDEN	Y N	Y N	Y N	Y N	Y N					/	IND
125006000											
UNKNOWN TROUT	Y N	Y N	Y N	Y N	Y N					/	IND
126299000											
GRAYLING	Y N	Y N	Y N	Y N	Y N					/	IND
125200000											
NORTHERN PIKE	Y N	Y N	Y N	Y N	Y N					/	IND
125500000											
EULACHON *(Hooligan, Candlefish)*	Y N	Y N	Y N	Y N	Y N					/	IND
120404000											
BLACKFISH	Y N	Y N	Y N	Y N	Y N					/	IND
124600000											
SUCKER	Y N	Y N	Y N	Y N	Y N					/	IND
126000000											
ARCTIC CHAR	Y N	Y N	Y N	Y N	Y N					/	IND
125002000											
WHITEFISH	Y N	Y N	Y N	Y N	Y N					/	IND
126400000											
STICKLEBACK (NEEDLEFISH)	Y N	Y N	Y N	Y N	Y N					/	GAL
123800000											
BURBOT	Y N	Y N	Y N	Y N	Y N					/	GAL
124800000											
HERRING	Y N	Y N	Y N	Y N	Y N					/	GAL
120200000											
	Y N	Y N	Y N	Y N	Y N						

These columns should include all the harvests: other fish HARVESTED by members of this household in 2013.

Continue on next page

HARVESTS: OTHER FISH (NON-COMMERCIAL) HOUSEHOLD ID

…continued

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD HARVESTED in 2013 , including with a rod and reel. INCLUDE other fish you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with others, report ONLY YOUR SHARE of the catch. Do not include fish caught and released.

	IN 2013 DID MEMBERS OF YOUR HH…					IN 2013, HOW MANY _____ DID YOUR HOUSEHOLD…					
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?	…HARVEST WITH GILL NET	…HARVEST WITH SEINE	…HARVEST WITH DIP NET	…HARVEST WITH ROD AND REEL	…HARVEST WITH OTHER GEAR?	UNITS
	(circle)					*(number taken by each gear type)*				*Amount / Type*	*(ind, lbs)*
HALIBUT	Y N	Y N	Y N	Y N	Y N					/	LBS
121800000											
ROCKFISH	Y N	Y N	Y N	Y N	Y N					/	IND
122600000											
SCULPIN	Y N	Y N	Y N	Y N	Y N					/	IND
123000000											
LINGCOD	Y N	Y N	Y N	Y N	Y N					/	IND
121606000											
COD (SPECIFY)	Y N	Y N	Y N	Y N	Y N					/	IND
121000000											
OTHER SMELT	Y N	Y N	Y N	Y N	Y N					/	GAL
120400000											
HERRING SPAWN ON KELP	Y N	Y N	Y N	Y N	Y N					/	GAL
120306000											
	Y N	Y N	Y N	Y N	Y N					/	
	Y N	Y N	Y N	Y N	Y N					/	

These columns should include all the harvests: other fish HARVESTED by members of this household in 2013.

OTHER FISH

Between JANUARY and DECEMBER, 2013…

To conclude our other fish section, I am going to ask a few general questions about other fish.

Last year…

…did your household use LESS, SAME, or MORE other fish than in recent years?..... X - S M

X = do not use

If LESS or MORE…

WHY was your use different?..... _____ 1

_____ 2

Last year…

…did your household GET ENOUGH other fish?..... Y N

If NO…

What KIND of other fish did you need?..... _____

How would you describe the impact to your household of not getting enough other fish last year?..... …minor? (1) …major? (2) severe ?

HARVESTS: MARINE INVERTEBRATES/SHELLFISH

HOUSEHOLD ID

Do members of your household USUALLY harvest MARINE INVERTEBRATES/SHELLFISH ?.....Y N

Between JANUARY and DECEMBER, 2013…

…Did members of your household USE or TRY TO HARVEST marine invertebrates/shellfish ?.....Y N

IF NO to both questions, go to the next harvest page.

If YES, continue on this page…

Please estimate how many marine invertebrates/shellfish ALL MEMBERS OF YOUR HOUSEHOLD HARVESTED in 2013. INCLUDE marine invertebrates/shellfish you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with others, report ONLY YOUR SHARE of the catch.

	IN 2013 DID MEMBERS OF YOUR HH…					IN 2013, HOW MANY _____ DID YOUR HOUSEHOLD HARVEST?	UNITS
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?		
	(circle)					*(number taken)*	*(ind, lbs,gal)*
RAZOR CLAMS	Y N	Y N	Y N	Y N	Y N		GAL
500612000							
COCKLES	Y N	Y N	Y N	Y N	Y N		GAL
500800000							
BUTTER CLAMS	Y N	Y N	Y N	Y N	Y N		GAL
500602000							
FRESHWATER CLAMS	Y N	Y N	Y N	Y N	Y N		GAL
500604000							
LITTLENECK CLAMS (STEAMERS)	Y N	Y N	Y N	Y N	Y N		GAL
500608000							
PINKNEK (SURF) CLAMS	Y N	Y N	Y N	Y N	Y N		GAL
500610000							
HORSE CLAMS (GAPER)	Y N	Y N	Y N	Y N	Y N		GAL
500606000							
MUSSELS	Y N	Y N	Y N	Y N	Y N		GAL
502000000							
UNKNOWN CLAMS	Y N	Y N	Y N	Y N	Y N		GAL
500699000							
SCALLOPS	Y N	Y N	Y N	Y N	Y N		GAL
502600000							
	Y N	Y N	Y N	Y N	Y N		IND
	Y N	Y N	Y N	Y N	Y N		IND

HARVESTS: MARINE INVERTEBRATES/SHELLFISH

HOUSEHOLD ID

CONTINUED FROM PREVIOUS PAGE ….

If YES, continue on this page…

Please estimate how many marine invertebrates/shellfish ALL MEMBERS OF YOUR HOUSEHOLD HARVESTED in 2013. INCLUDE marine invertebrates/shellfish you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with others, report ONLY YOUR SHARE of the catch.

	IN 2013 DID MEMBERS OF YOUR HH…					IN 2013, HOW MANY _____ DID YOUR HOUSEHOLD HARVEST?	UNITS
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?		
	(circle)					*(number taken)*	*(ind, lbs,gal)*
DUNGENESS CRAB	Y N	Y N	Y N	Y N	Y N		IND
501004000							
KING CRAB	Y N	Y N	Y N	Y N	Y N		IND
501008000							
TANNER CRAB, BAIRDI *Snow Crab*	Y N	Y N	Y N	Y N	Y N		
501012020							
UNKNOWN CRAB	Y N	Y N	Y N	Y N	Y N		
501099000							
	Y N	Y N	Y N	Y N	Y N		

These columns should include all the harvests: marine invertebrates/shellfish HARVESTED by members of this household in 2013.

MARINE INVERTEBRATES/SHELLFISH

Between JANUARY and DECEMBER, 2013…

To conclude our marine invertebrates/shellfish section, I am going to ask a few general questions about marine invertebrates/shellfish.

Last year…

…did your household use LESS, SAME, or MORE marine invertebrates/shellfish than in recent years?..... X L S M

X = do not use

If LESS or MORE…

WHY was your use different?..... _____ 1

_____ 2

Last year…

…did your household GET ENOUGH marine invertebrates/shellfish?..... Y N

If NO…

What KIND of marine invertebrates/shellfish did you need?..... _____

How would you describe the impact to your household of not getting enough marine invertebrates/shellfish last year?..... ...minor? (1) ...major? (2) severe? (3)

MARINE INVERTEBRATES/SHELLFISH: 08 **TYONEK: 355**

HARVESTS: LARGE LAND MAMMALS

HOUSEHOLD ID

Do members of your household USUALLY hunt for LARGE LAND MAMMALS?.....Y N

Between JANUARY and DECEMBER, 2013…

…Did members of your household USE or TRY TO HARVEST large land mammals?.....Y N

IF NO to both questions, go to the next harvest page.

If YES, continue on this page…

Please estimate how many large land mammals ALL MEMBERS OF YOUR HOUSEHOLD HARVESTED in 2013. INCLUDE large land mammals you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with others, report ONLY YOUR SHARE of the catch.

CIRCLE THE HARVEST AMOUNT THAT IS A POTLATCH MOOSE.	IN 2013 DID MEMBERS OF YOUR HH… USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?	SEX	IN 2013, HOW MANY _____ DID MEMBERS OF YOUR HOUSEHOLD HARVEST? JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	AMOUNT USED FOR HIDE ONLY	UNITS
	(circle)						*(enter number by sex and month of take)*														*(ind)*
MOOSE	Y N	Y N	Y N	Y N	Y N	M															IND
						F															
211800000						?															
211800001						M															
211800002						F															
211800009						?															
CARIBOU	Y N	Y N	Y N	Y N	Y N	M															IND
						F															
211000000						?															
211000001						M															
211000002						F															
211000009						?															
BLACK BEAR	Y N	Y N	Y N	Y N	Y N																IND
210600000																					
BROWN BEAR	Y N	Y N	Y N	Y N	Y N																IND
210800000																					
DALL SHEEP	Y N	Y N	Y N	Y N	Y N																IND
212200000																					
	Y N	Y N	Y N	Y N	Y N																IND
	Y N	Y N	Y N	Y N	Y N																IND

LARGE LAND MAMMALS 210000000

Between JANUARY and DECEMBER, 2013…

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

Last year…

…did your household use LESS, SAME, or MORE large land mammals than in recent years?..... X L S M

X = do not use

If LESS or MORE…

WHY was your use different?..... _____ 1

_____ 2

Last year…

…did your household GET ENOUGH large land mammals?..... Y N

If NO…

What KIND of large land mammals did you need?..... _____

How would you describe the impact to your household of not getting enough large land mammals last year?..... ...minor? (1) ...major? (2) severe? (3)

LARGE LAND MAMMALS: 10 **TYONEK: 355**

HARVESTS: SMALL LAND MAMMALS OR FURBEARERS

USEHOLD ID

Do members of your household USUALLY hunt or trap for SMALL LAND MAMMALS OR FURBEARERS for subsistence?..... Y N

Between JANUARY and DECEMBER, 2013…
…Did members of your household USE or TRY TO HARVEST small land mammals or furbearers?..... Y N

IF NO to both questions, go to the next harvest page.

If YES, continue on this page…

Please estimate how many small land mammals or furbearers ALL MEMBERS OF YOUR HOUSEHOLD HARVESTED in 2013. INCLUDE small land mammals or furbearers you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting or trapping with others, report ONLY YOUR SHARE of the catch.

	IN 2013 DID MEMBERS OF YOUR HH…					IN 2013, HOW MANY _____ DID MEMBERS OF YOUR HOUSEHOLD HARVEST?												HOW MANY _____ WERE USED FOR FUR ONLY?	UNITS
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN		
	(circle)					*(enter number by month of take)*														*(ind)*
BEAVER	Y N	Y N	Y N	Y N	Y N															IND
220200000																				
RED FOX	Y N	Y N	Y N	Y N	Y N															IND
220804000																				
LAND OTTER	Y N	Y N	Y N	Y N	Y N															IND
221200000																				
SNOWSHOE HARE	Y N	Y N	Y N	Y N	Y N															IND
221004000																				
COYOTE	Y N	Y N	Y N	Y N	Y N															IND
220400000																				
LYNX	Y N	Y N	Y N	Y N	Y N															IND
221600000																				
MARMOT	Y N	Y N	Y N	Y N	Y N															IND
221800000																				
MARTEN	Y N	Y N	Y N	Y N	Y N															IND
222000000																				
MINK	Y N	Y N	Y N	Y N	Y N															IND
222200000																				
MUSKRAT	Y N	Y N	Y N	Y N	Y N															IND
222400000																				
PORCUPINE	Y N	Y N	Y N	Y N	Y N															IND
222600000																				
	Y N	Y N	Y N	Y N	Y N															IND

Continue on next page

HARVESTS: SMALL LAND MAMMALS OR FURBEARERS

HOUSEHOLD ID

....continued

Please estimate how many small land mammals or furbearers ALL MEMBERS OF YOUR HOUSEHOLD HARVESTED in 2013. INCLUDE small land mammals or furbearers you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting or trapping with others, report ONLY YOUR SHARE of the catch.

	IN 2013 DID MEMBERS OF YOUR HH...					IN 2013, HOW MANY _____ DID MEMBERS OF YOUR HOUSEHOLD HARVEST?												HOW MANY _____ WERE USED FOR FUR ONLY?	UNITS
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	
	(circle)					*(enter number by month of take)*													*(ind)*
WEASEL	Y N	Y N	Y N	Y N	Y N														IND
223000000																			
WOLF	Y N	Y N	Y N	Y N	Y N														IND
223200000																			
WOLVERINE	Y N	Y N	Y N	Y N	Y N														IND
223400000																			
TREE SQUIRREL *Red*	Y N	Y N	Y N	Y N	Y N														IND
222804000																			
PARKA SQUIRREL (GROUND)	Y N	Y N	Y N	Y N	Y N														IND
222802000																			
	Y N	Y N	Y N	Y N	Y N														IND
	Y N	Y N	Y N	Y N	Y N														IND
	Y N	Y N	Y N	Y N	Y N														IND
	Y N	Y N	Y N	Y N	Y N														IND

Did you sell any furs? *If yes, remember to include income on Other Income page* ..... Y N

SMALL LAND MAMMALS OR FURBEARERS

Between JANUARY and DECEMBER, 2013...

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

Last year...

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

If NO...

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

How would you describe the impact to your household of not getting enough small land mammals or furbearers last year?..... ...minor? (1) ...major? (2) severe? (3)

SMALL LAND MAMMALS: 14 **TYONEK: 355**

HARVESTS: MARINE MAMMALS

HOUSEHOLD ID

Do members of your household USUALLY hunt for MARINE MAMMALS for subsistence?..... Y N

Between JANUARY and DECEMBER, 2013…
…Did members of your household USE or TRY TO HARVEST marine mammals?..... Y N

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

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

	IN 2013 DID MEMBERS OF YOUR HH…					IN 2013, HOW MANY _____ DID MEMBERS OF YOUR HOUSEHOLD HARVEST?													WERE LESS, SAME, OR MORE _____ AVAILABLE IN 2013, THAN IN RECENT YEARS?
	USE?	TRY TO HARVEST?	RECEIVE?	GIVE AWAY?	SEX	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS	
	(circle)					*(enter number by sex and month of take)*													*(ind)*	*(circle)*
HARBOR SEAL	Y N	Y N	Y N	Y N	M														IND	L S M ?
					F															
300806000					?															
300806001					M															
300806002					F															
300806009					?															
STELLER SEA LION	Y N	Y N	Y N	Y N	M														IND	L S M ?
					F															
301200000					?															
301200001					M															
301200002					F															
301200009					?															
BELUGA WHALE	Y N	Y N	Y N	Y N															IND	L S M ?
301602000																				
SEA OTTER	Y N	Y N	Y N	Y N															IND	L S M ?
301000000																				
UNKNOWN SEAL	Y N	Y N	Y N	Y N															IND	L S M ?
300899000																				
	Y N	Y N	Y N	Y N															IND	L S M ?
	Y N	Y N	Y N	Y N															IND	L S M ?
																				" ? " means "I don't know"

MARINE MAMMALS

Between JANUARY and DECEMBER, 2013…

To conclude our marine mammals section, I am going to ask a few general questions about .
Last year…
…did your household use LESS, SAME, or MORE marine mammals than in recent years?..... X L S M
If LESS or MORE… *X = do not use*
WHY was your use different?..... _____ 1
_____ 2

Last year…
…did your household GET ENOUGH marine mammals?..... Y N
If NO…
What KIND of marine mammals did you need?..... _____

How would you describe the impact to your household
of not getting enough steller sea lion, female last year?..... ...minor? (1) ...major? (2) ...severe? (3)

MARINE MAMMALS: 12 **TYONEK: 355**

HARVESTS: MIGRATORY WATERFOWL

HOUSEHOLD ID

Do members of your household USUALLY hunt for MIGRATORY WATERFOWL?.....Y N

Between JANUARY and DECEMBER, 2013...
Did members of your household USE or TRY TO HARVEST migratory waterfowl?.....Y N

IF NO to both questions, go to the next harvest page.

If YES, continue on this page...

Please estimate how many migratory waterfowl ALL MEMBERS OF YOUR HOUSEHOLD HARVESTED in 2013. INCLUDE migratory waterfowl you gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with others, report ONLY YOUR SHARE of the catch.

	IN 2013 DID MEMBERS OF YOUR HH...					IN 2013, HOW MANY _____ DID MEMBERS OF YOUR HOUSEHOLD ?						
						Spring			Summer		Fall	
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	UNKNOWN
	(circle)												
GOLDENEYE 410210000	Y N	Y N	Y N	Y N	Y N								
BUFFLEHEAD *(Butterball)* 410202000	Y N	Y N	Y N	Y N	Y N								
MALLARD 410214000	Y N	Y N	Y N	Y N	Y N								
PINTAIL 410220000	Y N	Y N	Y N	Y N	Y N								
AMERICAN WIGEON 410236020	Y N	Y N	Y N	Y N	Y N								
SHOVELER 410230000	Y N	Y N	Y N	Y N	Y N								
GREEN WINGED TEAL 410232060	Y N	Y N	Y N	Y N	Y N								
SCAUP 410226000	Y N	Y N	Y N	Y N	Y N								
CANVASBACK 410204000	Y N	Y N	Y N	Y N	Y N								
COMMON MERGANSER 410216020	Y N	Y N	Y N	Y N	Y N								
RED-BREASTED MERGANSER 410216040	Y N	Y N	Y N	Y N	Y N								
SCOTER 410228000	Y N	Y N	Y N	Y N	Y N								
GADWALL 410208000	Y N	Y N	Y N	Y N	Y N								

Continue on next page.

HARVESTS: MIGRATORY WATERFOWL

...continued

	IN 2013 DID MEMBERS OF YOUR HH…					IN 2013, HOW MANY _____ DID MEMBERS OF YOUR HOUSEHOLD ?							
						Spring			Summer		Fall		
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	UNKNOWN
	(circle)												
WHITE-FRONTED GEESE	Y N	Y N	Y N	Y N	Y N								
410410000													
SNOW GEESE	Y N	Y N	Y N	Y N	Y N								
410408000													
CANADA GEESE	Y N	Y N	Y N	Y N	Y N								
410404000													
UNKNOWN GEESE	Y N	Y N	Y N	Y N	Y N								
410499000													
SWAN (SPECIFY)	Y N	Y N	Y N	Y N	Y N								
410699000													
SANDHILL CRANE	Y N	Y N	Y N	Y N	Y N								
410802000													
LOONS	Y N	Y N	Y N	Y N	Y N								
411216000													
COMMON SNIPE	Y N	Y N	Y N	Y N	Y N								
411002000													
	Y N	Y N	Y N	Y N	Y N								

MIGRATORY WATERFOWL

Between JANUARY and DECEMBER, 2013…

To conclude our migratory waterfowl section, I am going to ask a few general questions about migratory waterfowl.

Last year…

…did your household use LESS, SAME, or MORE migratory waterfowl than in recent years?..... X L S M

X = do not use

If LESS or MORE…

WHY was your use different?..... _____ 1

_____ 2

Last year…

…did your household GET ENOUGH migratory waterfowl?..... Y N

If NO…

What KIND of migratory waterfowl did you need?..... _____

How would you describe the impact to your household of not getting enough migratory waterfowl last year?..... ...minor? (1) ...major? (2) severe? (3)

MIGRATORY WATERFOWL: 15 **TYONEK: 355**

HARVESTS: OTHER BIRDS

HOUSEHOLD ID

Do members of your household USUALLY hunt for OTHER BIRDS?.....Y N

Between JANUARY and DECEMBER, 2013…
…Did members of your household USE or TRY TO HARVEST other birds?.....Y N

IF NO to both questions, go to the next harvest page.

If YES, continue on this page…

Please estimate how many other birds ALL MEMBERS OF YOUR HOUSEHOLD HARVESTED in 2013. INCLUDE other birds you gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with others, report ONLY YOUR SHARE of the catch.

	IN 2013 DID MEMBERS OF YOUR HH…					IN 2013, HOW MANY _____ DID MEMBERS OF YOUR HOUSEHOLD HARVEST?												
						Winter			Spring			Summer		Fall		Winter		
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN
	(circle)																	
SPRUCE GROUSE	Y N	Y N	Y N	Y N	Y N													
421802020																		
RUFFED GROUSE	Y N	Y N	Y N	Y N	Y N													
421802060																		
UNKNOWN GROUSE	Y N	Y N	Y N	Y N	Y N													
421802990																		
PTARMIGAN	Y N	Y N	Y N	Y N	Y N													
421804000																		
	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													

OTHER BIRDS

Between JANUARY and DECEMBER, 2013…

To conclude our other birds section, I am going to ask a few general questions about other birds.

Last year…
…did your household use LESS, SAME, or MORE other birds 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 other birds?..... Y N

If NO…

What KIND of other birds did you need?..... _____

How would you describe the impact to your household
of not getting enough other birds last year?..... ...minor? (1) ...major? (2) severe? (3)

OTHER BIRDS: 15 **TYONEK: 355**

HARVESTS: BIRD EGGS

HOUSEHOLD ID

Do members of your household USUALLY look for BIRD EGGS?.....Y N

Between JANUARY and DECEMBER, 2013…
…Did members of your household USE or TRY TO GATHER bird eggs?.....Y N

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

Please estimate how many bird eggs ALL MEMBERS OF YOUR HOUSEHOLD GATHERED in 2013. INCLUDE bird eggs you gave away, ate fresh, lost to spoilage, or got by helping others. If looking with others, report ONLY YOUR SHARE of the eggs.

	IN 2013 DID MEMBERS OF YOUR HH…					IN 2011, HOW MANY _____ DID MEMBERS OF YOUR HOUSEHOLD HARVEST?	UNITS/NOTES
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?		
	(circle)					*(number)*	*(each, gallons, buckets, etc.)*
DUCK EGGS	Y N	Y N	Y N	Y N	Y N		
430200000							
GULL EGGS	Y N	Y N	Y N	Y N	Y N		
431212000							
TERN EGGS	Y N	Y N	Y N	Y N	Y N		
431226000							
UNKNOWN EGGS	Y N	Y N	Y N	Y N	Y N		
439900000							
	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		

EGGS

Between JANUARY and DECEMBER, 2013…

To conclude our eggs section, I am going to ask a few general questions about resource name.

Last year…
…did your household use LESS, SAME, or MORE eggs 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 eggs?..... Y N
If NO…
What KIND of eggs did you need?..... _____

How would you describe the impact to your household
of not getting enough eggs last year?..... ...minor? (1) ...major? (2) severe? (3)

BIRD EGGS: 15 **TYONEK: 355**

HARVESTS: PLANTS AND BERRIES INCLUDING WOOD

HOUSEHOLD ID

Do members of your household USUALLY harvest PLANTS AND BERRIES INCLUDING WOOD?..... Y N

Between JANUARY and DECEMBER, 2013…
…Did members of your household USE or TRY TO HARVEST plants and berries including wood?..... Y N

IF NO to both questions, go to the next harvest page.

If YES, continue on this page…

Please estimate how many plants and berries including wood ALL MEMBERS OF YOUR HOUSEHOLD HARVESTING in 2013. INCLUDE plants and berries including wood you gave away, ate fresh, lost to spoilage, or got by helping others. If harvesting with others, report ONLY YOUR SHARE of the harvest.

	IN 2013 DID MEMBERS OF YOUR HH…					IN 2013, HOW MANY _____ DID MEMBERS OF YOUR HOUSEHOLD HARVEST?	UNITS/NOTES
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?		
	(circle)					(number)	(each, gallons, buckets, etc.)
BLUEBERRY	Y N	Y N	Y N	Y N	Y N		
601002000							
LOW BUSH CRANBERRY	Y N	Y N	Y N	Y N	Y N		
601004000							
HIGH BUSH CRANBERRY	Y N	Y N	Y N	Y N	Y N		
601006000							
RASPBERRY	Y N	Y N	Y N	Y N	Y N		
601020000							
OTHER BERRIES *(List)*	Y N	Y N	Y N	Y N	Y N		
601000000							
HUDSON BAY TEA *Labrador Tea*	Y N	Y N	Y N	Y N	Y N		
602018000							
MUSHROOMS	Y N	Y N	Y N	Y N	Y N		
602040000							
OTHER PLANTS *(List)*	Y N	Y N	Y N	Y N	Y N		
602000002							
WOOD *Firewood*	Y N	Y N	Y N	Y N	Y N		
604000000							
WOOD *(Specify Use)*	Y N	Y N	Y N	Y N	Y N		
604000002							
	Y N	Y N	Y N	Y N	Y N		
	Y N	Y N	Y N	Y N	Y N		

PLANTS AND BERRIES

Between JANUARY and DECEMBER, 2013…

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

Last year…
…did your household use LESS, SAME, or MORE plants and berries than in recent years?..... X L S M

X = do not use

If LESS or MORE…
WHY was your use different?..... _____ 1
_____ 2

Last year…
…did your household GET ENOUGH plants and berries?..... Y N

If NO…
What KIND of plants and berries did you need?..... _____

How would you describe the impact to your household of not getting enough plants and berries last year?..... …minor? (1) …major? (2) severe? (3)

PLANTS AND BERRIES: 17 **TYONEK: 355**

ASSESMENTS

HOUSEHOLD ID

OVERALL HARVEST

To conclude our harvest section, I am going to ask a few general questions about ALL WILD RESOURCES. Think about your entire harvest last year.

Last year…

…overall did your household use LESS, SAME, or MORE wild resources than in recent years? ..... X L S M

X = do not use

If LESS or MORE…

WHY was your use different?..... _____ 1

_____ 2

Last year…

…did your household GET ENOUGH wild resources? ..... Y N

If NO…

What KIND of wild did you need?..... _____

Overall why do you think you did not get enough wild resources?..... _____ 1

_____ 2

How would you describe the impact to your household of not getting enough wild resources last year?..... ...not noticable? (0) ...minor? (1) ...major? (2) severe? (3)

USE OF WOOD FOR HOME HEATING

Please estimate the percentage of your households heating needs in 2013 that came from firewood.

(circle one)

0%	1-25%	26-50%	51-75%	76-99%	*100%*
(0)	(1)	(2)	(3)	(4)	*(5)*

USE OF TRANSPORTATION FOR SUBSISTENCE ACTIVITIES

During 2013, did members of your household use the following when harvesting or attempting to harveset wild foods?

	Used?	Own?	Borrow?	Lease?
boat	Y N	Y N	Y N	Y N
snowmachine	Y N	Y N	Y N	Y N
4-wheeler/ORV	Y N	Y N	Y N	Y N
airplane	Y N	Y N	Y N	Y N

HEALTH IMPACT ASSESSMENTS

In a normal week, how many times a day on average are wild foods such as salmon, non-salmon fish, moose, caribou, birds, etc. served in your household? .....

(circle ONE response)

NONE Don't use (0)	LESS than once a day (1)	About ONCE a day (2)	2 OR 3 times a day (3)	3 OR MORE times a day (4)

If this household does NOT USEwild foods, go to the next page.

Otherwise, continue below…

Please list the TOP FIVE MOST IMPORTANT WILD FOODS members of your household eat on a regular basis. Include wild foods that may not be available now, but are important at other times of the year. Please list most important foods first.

(Not necessary to fill out every line)

	Wild Food 1	*Wild Food 2*	*Wild Food 3*	*Wild Food 4*	*Wild Food 5*
TOP FIVE WILD FOODS					

If your household CANNOT GET WILD FOODS, what foods do members of your household eat instead? These can be general categories or more specific items you purchase or grow. Please list most important alternative foods first. These can be general categories or more specific items you purchase, grow, or are grown locally.

(Not necessary to fill out every line)

	Other Food	*Other Food*	*Other Food*	*Other Food*	*Other Food*
OTHER FOODS (1 TO 5)					
OTHER FOODS (6 TO 10)					

ASSESSMENTS: 66 **TYONEK: 355**

JOBS FOR EACH PERSON IN THE HOUSEHOLD, 16 YEARS OLD AND OLDER :EHOLD ID

Between JANUARY and DECEMBER, 2013…

…Did any members of your household earn money from a JOB or from SELF EMPLOYMENT?..... Y N

For each member of this household born before 1998, please list EACH JOB held between JANUARY and DECEMBER, 2013.
For household members who did not have a job, write: "RETIRED," "UNEMPLOYED," "STUDENT," "HOMEMAKER," etc.
There should be at least ONE ROW for each member of this household born BEFORE 1998.

We ask about jobs and income because we are trying to understand all parts of the community economy. Many people use wages from jobs to support subsistence activities. If one person has more than one job, list each job on a separate line. (One person may have several lines.)

REMEMBER COMMERCIAL FISHING & TRAPPING AND ANY HANDICRAFTS IF APPLICABLE.

WORK SCHEDULE…

	WHO HAD THIS JOB?	WHAT KIND OF WORK DID HE/SHE DO IN THIS JOB?	FOR WHOM DID HE/SHE WORK IN THIS JOB?	JOB LOCATION?	IN 2013, WHAT MONTHS DID HE OR SHE WORK IN THIS JOB?	FULL TIME	PART TIME	SHIFT - FULL TIME	ON-CALL, VARIES	SHIFT - PART TIME	IN 2013, HOW MUCH DID HE/SHE EARN IN THIS JOB?
	person	*job title*	*employer, SIC*	*community*	*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		SOC				SCHEDULE					
2ND JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
2 6 910100000		SOC				SCHEDULE					
3RD JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
3 6 910100000		SOC				SCHEDULE					
4TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
4 6 910100000		SOC				SCHEDULE					
5TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
5 6 910100000		SOC				SCHEDULE					
6TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
6 6 910100000		SOC				SCHEDULE					
7TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
7 6 910100000		SOC				SCHEDULE					
8TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
8 6 910100000		SOC				SCHEDULE					
9TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
9 6 910100000		SOC				SCHEDULE					
10TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
10 6 910100000		SOC				SCHEDULE					
11TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
11 6 910100000		SOC				SCHEDULE					
12TH JOB					J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / YR
12 6 910100000		SOC				SCHEDULE					

If a person is SELF-EMPLOYED (selling carvings, crafts, bread, etc), list that as a separate job. Enter "sewer," "carver," "baker," etc. as JOB TITLE. Work schedule usually will be "ON CALL." For gross income from self employment ("profit"), enter revenue MINUS expenses.

If a person is UNEMPLOYED, specify retired, unemployed, disabled, student, or homemaker as the JOB TITLE.

TRAPPING for barter or sale IS a job.
COMMERCIAL FISHING is recorded as "ON-CALL, VARIES" for work schedule.

WORK SCHEDULE
1 - Fulltime (35+ hours/week)
2 - Parttime (<35 hours/week)
3 - Shift (2 wks on/2 off, etc.)
4 - Irregular, on call

GROSS INCOME is the same as TAXABLE INCOME on a W-2 form.

EMPLOYMENT: 23 **TYONEK: 355**

OTHER INCOME

THIS PAGE IS ONLY FOR INCOME THAT IS NOT EARNED FROM WORKING

HOUSEHOLD ID

Between JANUARY and DECEMBER, 2013…

…Did any members of your household receive a dividend from the Permanent Fund or a Native Corporation?..... Y N

IF NO, go to the next section on this page.

If YES, continue below…

		Did anyone in your household receive income from ____ in 2013?	TOTAL amount all members of your household received from ____ in 2013.
		circle one	*dollars*
DIVIDENDS	ALASKA PERMANENT FUND DIVIDEND	Y N	$ /YR
	32		
	NATIVE CORPORATION DIVIDENDS	Y N	$ /YR
	13		

Alaska PFD IN 2013
1 PFD = $900
2 PFDs = $1,800
3 PFDs = $2,700
4 PFDs = $3,600
5 PFDs = $4,500
6 PFDs = $5,400
7 PFDs = $6,300
8 PFDs = $7,200
9 PFDs = $8,100
10 PFDs = $9,000
11 PFDs = $9,900
12 PFDs = $10,800

Regional Corporations	*Dividend*
CIRI	*$ 34.99*

Village Corporation(s)	*Dividend*

Between JANUARY and DECEMBER, 2013…

…Did any members of your household receive OTHER income such as SENIOR BENEFITS or UNEMPLOYMENT?..... Y N

IF NO, go to the next page.

If YES, continue below…

		Received? *circle one*	Total Amount? *dollars*
EMPLOYMENT RELATED	UNEMPLOYMENT	Y N	$ /YR
	12		
	WORKERS' COMP	Y N	$ /YR
	8		
	SOCIAL SECURITY	Y N	$ /YR
	7		
	PENSION & RETIREMENT	Y N	$ /YR
	5		
	DISABILITY	Y N	$ /YR
	31		
	VETERANS ASSISTANCE	Y N	$ /YR
	35		
ENTITLEMENTS	FOOD STAMPS (QUEST CARD)	Y N	$ /YR
	11		
	ADULT PUBLIC ASSISTANCE	Y N	$ /YR
	3		
	SUPPLEMENTAL SECURITY INCOME (SSI)	Y N	$ /YR
	10		
STATE BENEFI	ENERGY ASSISTANCE	Y N	$ /YR
	9		
	ALASKA SENIOR BENEFITS (LONGEVITY)	Y N	$ /YR
	6		

		Received? *circle one*	Total Amount? *dollars*
FAMILY & CHILD	TANF *(say"Tanif," used to be AFDC)*	Y N	$ /YR
	2		
	CHILD SUPPORT	Y N	$ /YR
	15		
	FOSTER CARE	Y N	$ /YR
	41		
OTHER	FUEL VOUCHERS	Y N	$ /YR
	MEETING HONORARIA *(not per diem*)*	Y N	$ /YR
	OTHER *(describe)*	Y N	$ /YR
	OTHER *(describe)*	Y N	$ /YR

** per diem covers travel expenses, and is not counted as income.*

Scratch paper for calculations

for _____ weeks =
for _____ months =

for _____ weeks =
for _____ months =

Senior benefits of $125 per month for 12 months = $1,500 per elder
Senior benefits of $175 per month for 12 months = $2,100 per elder
Senior benefits of $250 per month for 12 months = $3,000 per elder

OTHER INCOME: 24 **TYONEK: 355**

COMMENTS

HOUSEHOLD ID

DO YOU HAVE ANY QUESTIONS, COMMENTS, OR CONCERNS?

INTERVIEW SUMMARY:

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

COMMENTS: 30 **TYONEK: 355**

APPENDIX B–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 3 qt of smelt, the quantity would be multiplied by the appropriate conversion factor (in this case 1.5) to show a harvest of 4.5 lb of smelt.

Resource name	Reported units	Conversion factor
Chum salmon	Individual	5.6388
Chum salmon [CF retention]	Individual	5.6388
Coho salmon	Individual	4.5825
Coho salmon [CF retention]	Individual	4.5825
Chinook salmon	Individual	9.3456
Chinook salmon [CF retention]	Individual	9.3456
Pink salmon	Individual	2.2630
Pink salmon [CF retention]	Individual	2.2630
Sockeye salmon	Individual	4.6250
Sockeye salmon	Pounds	1.0000
Sockeye salmon	Pints	0.6250
Sockeye salmon [CF retention]	Individual	4.6250
Landlocked salmon	Individual	1.0000
Spawning sockeye salmon	Individual	2.1800
Unknown salmon	Individual	6.5960
Unknown salmon [CF retention]	Individual	6.5960
Pacific herring	Individual	0.4000
Pacific herring	Gallons	6.0000
Pacific herring	Quarts	1.5000
Pacific herring [CF retention]	Individual	6.0000
Pacific herring [CF retention]	Gallons	6.0000
Pacific herring roe/unspecified	Gallons	7.0000
Pacific herring sac roe	Gallons	7.0000
Pacific herring sac roe [CF retention]	Individual	0.1750
Pacific herring sac roe [CF retention]	Gallons	7.0000
Pacific herring spawn on kelp	Gallons	7.0000
Pacific herring spawn on kelp [CF retention]	Individual	7.0000
Pacific herring spawn on kelp [CF retention]	Gallons	7.0000
Pacific herring roe on hemlock branches	Gallons	7.0000
Smelt	Gallons	3.2500
Smelt [CF retention]	Individual	0.2500
Smelt [CF retention]	Gallons	3.2500
Eulachon (hooligan, candlefish)	Individual	0.2500
Eulachon (hooligan, candlefish)	Pounds	1.0000
Eulachon (hooligan, candlefish)	Gallons	3.2500
Eulachon (hooligan, candlefish)	Quarts	1.2500
Unknown smelt	Gallons	3.2500
Unknown smelt [CF retention]	Individual	0.2500
Sea bass	Individual	1.0000
Cod	Individual	3.2000
Pacific (gray) cod	Individual	4.0000
Pacific (gray) cod	Pounds	1.0000
Pacific (gray) cod [CF retention]	Individual	4.0000
Pacific tomcod	Individual	0.5000
Pacific tomcod [CF retention]	Individual	0.5000

-continued-

Resource name	Reported units	Conversion factor
Walleye pollock (whiting)	Individual	1.4000
Unknown cod	Individual	3.0600
Flounder	Individual	3.0000
Starry flounder	Individual	3.0000
Starry flounder [CF retention]	Individual	3.0000
Unknown flounder	Individual	3.0000
Unknown flounder [CF retention]	Individual	3.0000
Lingcod	Individual	2.4000
Lingcod	Pounds	1.0000
Lingcod [CF retention]	Individual	4.0000
Lingcod [CF retention]	Gallons	6.6000
Unknown greenling [CF retention]	Individual	1.0000
Pacific halibut	Individual	18.9000
Pacific halibut	Pounds	1.0000
Pacific halibut [CF retention]	Individual	45.0000
Pacific halibut [CF retention]	Pounds	1.0000
Arctic lamprey	Individual	0.6000
Arctic lamprey [CF retention]	Individual	0.6000
Arctic lamprey [CF retention]	Gallons	6.0000
Rockfish	Individual	4.0000
Rockfish	Pounds	1.0000
Rockfish [CF retention]	Individual	4.0000
Rockfish [CF retention]	Pounds	1.0000
Black rockfish	Individual	1.5000
Black rockfish	Pounds	1.0000
Black rockfish [CF retention]	Individual	1.5000
Red rockfish	Pounds	1.0000
Red rockfish [CF retention]	Individual	4.0000
Yelloweye rockfish	Individual	2.6423
Yelloweye rockfish	Pounds	1.0000
Copper rockfish	Individual	1.4800
Unknown rockfish	Individual	4.0000
Unknown rockfish	Pounds	1.0000
Unknown rockfish [CF retention]	Individual	4.0000
Sablefish (black cod)	Individual	3.1000
Sablefish (black cod) [CF retention]	Individual	3.1000
Sculpin	Individual	0.5000
Sculpin [CF retention]	Individual	0.5000
Unknown sculpin	Individual	0.5000
Unknown sculpin [CF retention]	Individual	0.5000
Salmon shark	Individual	9.0000
Unknown shark [CF retention]	Individual	9.0000
Unknown sole [CF retention]	Individual	1.0000
Stickleback (needlefish)	Gallons	6.0000
Wolffish [CF retention]	Individual	0.5000
Alaska blackfish	Gallons	6.0000
Burbot	Individual	2.4000
Arctic char	Individual	0.7000
Brook trout	Individual	1.4000

-continued-

Resource name	Reported units	Conversion factor
Dolly Varden	Individual	0.9000
Dolly Varden [CF retention]	Individual	1.4000
Lake trout	Individual	2.0000
Arctic grayling	Individual	0.7000
Northern pike	Individual	2.8000
Northern pike	Individual	2.8000
Sheefish	Individual	5.5000
Longnose sucker	Individual	0.7000
Trout	Individual	1.4000
Cutthroat trout	Individual	1.4000
Rainbow trout	Individual	1.4000
Steelhead	Individual	4.2000
Unknown trout	Individual	1.4000
Whitefishes	Individual	1.7500
Broad whitefish	Individual	4.0000
Least cisco	Individual	0.4000
Humpback whitefish	Individual	1.7500
Humpback whitefish	5 gallon buckets	1.7500
Round whitefish	Individual	1.0000
Unknown whitefishes	Individual	1.7500
Unknown nonsalmon fish	Individual	1.0000
Bison	Individual	450.0000
Black bear	Individual	58.0000
Brown bear	Individual	141.0000
Caribou	Individual	130.0000
Deer	Individual	42.5000
Mountain goat	Individual	72.5000
Moose	Individual	450.0000
Dall sheep	Individual	65.0000
Beaver	Individual	15.0000
Coyote	Individual	0.0000
Arctic fox	Individual	0.0000
Red fox	Individual	0.0000
Red fox–cross phase	Individual	0.0000
Red fox–red phase	Individual	0.0000
Snowshoe hare	Individual	2.0000
North American river (land) otter	Individual	0.0000
Lynx	Individual	4.0000
Marmot	Individual	0.0000
Marten	Individual	0.0000
Mink	Individual	0.0000
Muskrat	Individual	1.8000
Porcupine	Individual	4.5000
Arctic ground (parka) squirrel	Individual	0.5000
Red (tree) squirrel	Individual	0.5000
Unknown squirrel	Individual	0.5000
Least weasel	Individual	0.0000
Gray wolf	Individual	0.0000
Wolverine	Individual	0.0000

-continued-

Resource name	Reported units	Conversion factor
Harbor seal	Individual	56.0000
Unknown seal	Individual	56.0000
Bufflehead	Individual	0.4000
Canvasback	Individual	1.1000
King eider	Individual	2.6700
Spectacled eider	Individual	2.4300
Gadwall	Individual	0.8000
Goldeneye	Individual	0.8000
Mallard	Individual	1.0000
Merganser	Individual	0.9000
Common merganser	Individual	0.9000
Red-breasted merganser	Individual	0.9000
Unknown merganser	Individual	0.9000
Long-tailed duck	Individual	0.8000
Northern pintail	Individual	0.8000
Scaup	Individual	0.9000
Unknown scaup	Individual	0.9000
Black scoter	Individual	0.9000
Surf scoter	Individual	0.9000
White-winged scoter	Individual	0.9000
Unknown scoter	Individual	0.9000
Northern shoveler	Individual	0.6000
Green-winged teal	Individual	0.3000
Wigeon	Individual	0.7000
American wigeon	Individual	0.7000
Unknown wigeon	Individual	0.7000
Unknown ducks	Individual	0.7000
Brant	Individual	1.2000
Cackling goose	Individual	1.2000
Canada goose	Individual	1.2000
Unknown Canada/cackling goose	Individual	1.2000
Emperor goose	Individual	2.5000
Snow goose	Individual	3.0000
White-fronted goose	Individual	2.4000
Unknown goose	Individual	5.0000
Tundra (whistling) swan	Individual	6.0000
Unknown swan	Individual	6.0000
Sandhill crane	Individual	8.4000
Common snipe	Individual	0.1000
Unknown loon	Individual	3.0000
Murre	Individual	1.6500
Grouse	Individual	0.7000
Spruce grouse	Individual	0.7000
Sharp-tailed grouse	Individual	0.7000
Ruffed grouse	Individual	0.7000
Unknown grouse	Individual	0.5000
Ptarmigan	Individual	0.5000
Unknown ptarmigan	Individual	0.7000
Duck eggs	Individual	0.1500

-continued-

Resource name	Reported units	Conversion factor
Unknown duck eggs	Individual	0.1500
Goose eggs	Individual	0.2500
Unknown goose eggs	Individual	0.2500
Gull eggs	Individual	0.3000
Unknown gull eggs	Individual	0.3000
Unknown tern eggs	Individual	0.6000
Unknown eggs	Individual	0.2200
Chitons (bidarkis, gumboots)	Gallons	3.9100
Unknown chitons	Gallons	3.9100
Clams	Gallons	3.0000
Butter clams	Individual	0.1000
Butter clams	Gallons	3.0000
Freshwater clams	Individual	0.1500
Freshwater clams	Gallons	3.0000
Horse clams	Gallons	4.4500
Pacific littleneck clams (steamers)	Gallons	3.0000
Pacific littleneck clams (steamers) [CF retention]	Pounds	1.0000
Pinkneck clams	Gallons	3.0000
Razor clams	Individual	0.2500
Razor clams	Gallons	3.0000
Razor clams	Quarts	0.7500
Razor clams [CF retention]	Pounds	1.0000
Unknown clams	Gallons	3.0000
Cockles	Individual	0.1300
Cockles	Gallons	3.0000
Unknown cockles	Gallons	3.0000
Dungeness crab	Individual	0.7000
Dungeness crab	Pounds	1.0000
Dungeness crab [CF retention]	Individual	0.7000
Dungeness crab [CF retention]	Pounds	1.0000
King crab	Individual	2.3000
King crab	Pounds	1.0000
Unknown king crab	Individual	2.3000
Unknown king crab	Pounds	1.0000
Unknown king crab [CF retention]	Individual	2.3000
Tanner crab	Individual	1.6000
Tanner crab	Pounds	1.0000
Tanner crab	Gallons	1.6000
Tanner crab [CF retention]	Individual	1.6000
Tanner crab [CF retention]	Pounds	1.0000
Tanner crab, bairdi	Individual	1.6000
Unknown tanner crab	Gallons	1.6000
Unknown tanner crab [CF retention]	Individual	1.6000
Unknown crab	Individual	2.3000
Mussels	Gallons	1.5000
Unknown mussels	Gallons	1.5000
Octopus	Individual	4.0000
Octopus [CF retention]	Individual	4.0000

-continued-

Resource name	Reported units	Conversion factor
Oyster	Individual	0.1800
Unknown oyster	Individual	0.1800
Unknown scallops	Gallons	1.6400
Unknown scallops [CF retention]	Pounds	1.0000
Shrimp	Individual	0.0100
Shrimp	Pounds	1.0000
Shrimp	Gallons	2.0000
Shrimp [CF retention]	Individual	0.0425
Shrimp [CF retention]	Pounds	1.0000
Shrimp [CF retention]	Gallons	2.0000
Squid	Gallons	8.0000
Squid [CF retention]	Individual	4.0000
Squid [CF retention]	Gallons	8.0000
Unknown marine invertebrates	Gallons	3.7910
Berries	Gallons	4.0000
Berries	Quarts	1.0000
Berries	5 gallon buckets	20.0000
Berries	Gallons	4.0000
Berries	Quarts	1.0000
Berries	Half-pints	0.2500
Blueberry	Pounds	1.0000
Blueberry	5 gallon buckets	20.0000
Blueberry	Gallons	4.0000
Blueberry	Quarts	1.0000
Blueberry	Plastic shopping bag	10.0000
Blueberry	Pints	0.5000
Blueberry	Half-pints	0.2500
Lowbush cranberry	Pounds	1.0000
Lowbush cranberry	5 gallon buckets	20.0000
Lowbush cranberry	Gallons	4.0000
Lowbush cranberry	Quarts	1.0000
Lowbush cranberry	Pints	0.5000
Lowbush cranberry	Half-pints	0.2500
Highbush cranberry	Pounds	1.0000
Highbush cranberry	5 gallon buckets	20.0000
Highbush cranberry	Gallons	4.0000
Highbush cranberry	Quarts	1.0000
Highbush cranberry	Pints	0.5000
Highbush cranberry	Half-pints	0.2500
Crowberry	Gallons	4.0000
Crowberry	Quarts	1.0000
Crowberry	Pints	0.5000
Crowberry	Half-pints	0.2500
Elderberry	Gallons	6.0000
Currants	Pounds	1.0000
Currants	Gallons	4.0000
Currants	Quarts	1.0000
Currants	Half-pints	0.2500
Huckleberry	Quarts	1.5000

-continued-

Resource name	Reported units	Conversion factor
Huckleberry	Half-pints	0.3750
Cloudberry	Gallons	4.0000
Cloudberry	Half-pints	0.2500
Nagoonberry	Gallons	4.0000
Nagoonberry	Quarts	1.0000
Nagoonberry	Half-pints	0.2500
Raspberry	Individual	0.0077
Raspberry	Pounds	1.0000
Raspberry	5 gallon buckets	20.0000
Raspberry	Gallons	4.0000
Raspberry	Quarts	1.0000
Raspberry	Pints	0.5000
Raspberry	Half-pints	0.2500
Salmonberry	Pounds	1.0000
Salmonberry	Gallons	4.0000
Salmonberry	Quarts	1.0000
Salmonberry	Pints	0.5000
Salmonberry	Half-pints	0.2500
Soapberry	Quarts	1.0000
Strawberry	Gallons	4.0000
Strawberry	Quarts	1.5000
Strawberry	Pints	0.5000
Strawberry	Half-pints	0.2500
Blackberry	Gallons	4.0000
Twisted stalk berry (watermelon berry)	Gallons	4.0000
Twisted stalk berry (watermelon berry)	Half-pints	0.1250
Serviceberry	Half-pints	0.2500
Other wild berry	Gallons	4.0000
Other wild berry	Quarts	1.0000
Other wild berry	Pints	0.5000
Other wild berry	Half-pints	0.2500
Plants, greens, and mushrooms	Individual	1.0000
Plants, greens, and mushrooms	Pounds	1.0000
Plants, greens, and mushrooms	Gallons	1.0000
Plants, greens, and mushrooms	Quarts	0.2500
Plants, greens, and mushrooms	Pints	0.3723
Plants, greens, and mushrooms	Half-pints	0.0625
Wild rhubarb	Pounds	1.0000
Wild rhubarb	Gallons	1.0000
Wild rhubarb	Pints	0.1250
Eskimo potato	Gallons	4.0000
Eskimo potato	Quarts	1.0000
Eskimo potato	Half-pints	0.2500
Devils club	Gallons	1.0000
Devils club	Half-pints	0.0625
Fiddlehead ferns	Gallons	1.0000
Hudson's Bay (Labrador) tea	Pounds	1.0000
Hudson's Bay (Labrador) tea	Gallons	1.0000
Hudson's Bay (Labrador) tea	Quarts	0.2500

-continued-

Resource name	Reported units	Conversion factor
Hudson's Bay (Labrador) tea	Plastic shopping bag	1.0000
Hudson's Bay (Labrador) tea	Pints	0.1250
Hudson's Bay (Labrador) tea	Half-pints	0.0625
Mint	Quarts	0.2500
Dandelion greens	Gallons	1.0000
Dandelion greens	Half-pints	0.0625
Sourdock	Gallons	1.0000
Spruce tips	Gallons	1.0000
Spruce tips	Quarts	0.2500
Wild celery	Gallons	1.0000
Wild rose hips	Individual	0.0050
Wild rose hips	Gallons	4.0000
Wild rose hips	Quarts	1.0000
Wild rose hips	Pints	0.5000
Wild rose hips	Half-pints	0.2500
Yarrow	Gallons	1.0000
Yarrow	Quarts	0.2500
Other wild greens	Pounds	1.0000
Other wild greens	Gallons	1.0000
Other wild greens	Quarts	0.2500
Other wild greens	Plastic shopping bag	2.5000
Other wild greens	Pints	0.1250
Other wild greens	Half-pints	0.0625
Unknown mushrooms	Individual	0.0500
Unknown mushrooms	Pounds	1.0000
Unknown mushrooms	Gallons	1.0000
Unknown mushrooms	Quarts	0.2500
Unknown mushrooms	Plastic shopping bag	2.5000
Unknown mushrooms	Pints	0.1250
Unknown mushrooms	Half-pints	0.0625
Fireweed	Pounds	1.0000
Fireweed	Gallons	1.0000
Fireweed	Quarts	0.2500
Fireweed	Cords	957.5065
Fireweed	Pints	0.1250
Fireweed	Half-pints	0.0625
Plantain	Gallons	1.0000
Plantain	Quarts	0.2500
Plantain	Half-pints	0.0625
Stinkweed	Pounds	1.0000
Stinkweed	Gallons	1.0000
Stinkweed	Plastic shopping bag	2.5000
Stinkweed	Half-pints	0.0625
Unknown greens from land	Gallons	1.0000
Unknown greens from land	Quarts	0.2500
Bladder wrack	Gallons	4.0000
Wood	Cords	0.0000

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

APPENDIX C–ADDITIONAL TABLE

Appendix C Table.–Comparison of selected findings, Tyonek, 2013.

	Tyonek
Demography	
Population	142.7
Percentage of population that is Alaska Native	95.5%
Percentage of household heads born in Alaska	92.5%
Average length of residency of household heads (year)	41.2
Cash economy	
Average number of months employed	8.2
Percentage of employed adults working year-round	35.8%
Percentage of income from sources other than employment	27.2%
Average household income[a]	$36,727
Per capita income[a]	$16,213
Resource harvest and use	
Per capita harvest, pounds usable weight	169.9
Average household harvest, pounds usable weight	384.9
Number of resources used by 50% or more households	5.0
Average number of resources used per household	8.0
Average number of resources attempted to be harvested per household	7.4
Average number of resources harvested per household	6.3
Average number of resources received per household	3.4
Average number of resources given away per household	3.2
Percentage of total harvest taken by top 25% ranked households	61.5%
Percentage of households that harvested 70% of harvest	30.6%
Per capita harvest by lowest ranked 50% of households	21.1
Percentage of total harvest taken by lowest ranked 50% of harvesting households	12.4%
Average number of resources used by lowest ranked 50% of households	6.8
Average number of resources used by top 25% ranked households	10.1

Source ADF&G Division of Subsistence household surveys, 2014.

a. Includes income from sources other than employment.

APPENDIX D–PROJECT SUMMARY

Summary Findings: Harvest and Use of Wild Resources in Tyonek, Alaska, 2013

Project

The following is a brief overview of research conducted by the Alaska Department of Fish and Game (ADF&G) to provide comprehensive harvest and use data for fish, wildlife, and wild plant resources in Tyonek, Alaska (see Figure 1). The study period covers January 1 through December 31, 2013. Funding for this project was provided by Alaska LNG. The purpose of the project was to provide updated harvest and use data of wild resources for a feasibility study for the potential Alaska LNG pipeline project. The potential development required updated baseline information about the full range of wild resource harvests, uses, and areas of harvest, as well as demographic and economic information to understand the role of these harvests in the economy and way of life of community residents in the project area.

Methods

The primary data gathering method was a systematic household survey. The surveys were conducted face-to-face and mostly in residents' homes and at the the tribal hall. The goal was to survey all Tyonek households. The Division of Subsistence established an estimate of 63 eligible households to be surveyed. Of the 63 qualifying households found in 2013, 49 were successfully surveyed. Harvest mapping was also conducted for each household to document search areas and harvest locations of wild resources, including harvest amount, month of harvest, and how harvesters accessed the resource. Additionally, to understand long-term trends in the area and local knowledge of resources, key respondent interviews were conducted.

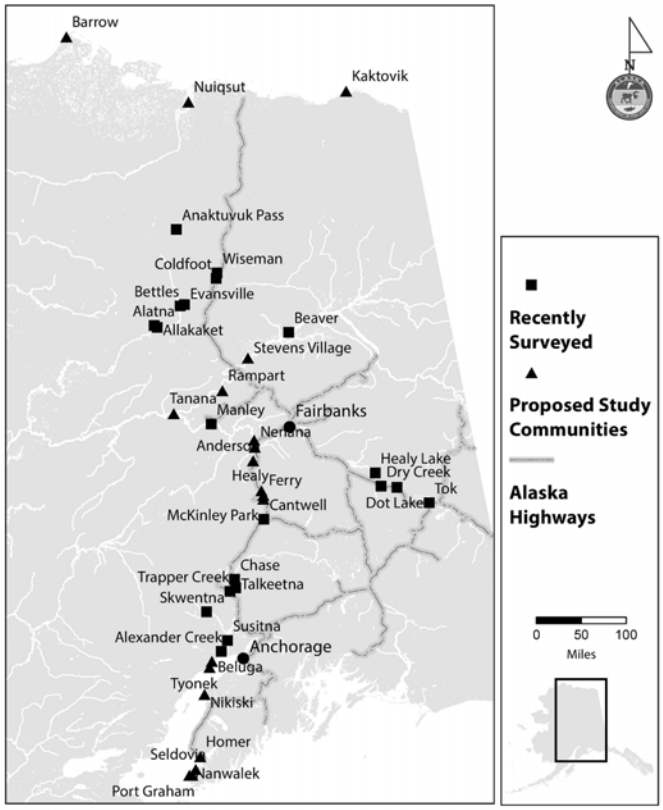

Figure 1

Findings

This study found an estimated population for Tyonek in 2013 of 143 individuals, represented by 63 households. According to survey results, all households in Tyonek used and attempted to harvest wild resources in 2013, and 100% of households were successful in harvesting at least 1 resource. The total wild resource harvest by Tyonek residents was 24,249 lb in 2013.

Figure 2 shows the composition of harvest by resource category in pounds usable weight for Tyonek in 2013. The composition of the harvest is represented by salmon (69% of the total harvest), followed by large land mammals (14%), nonsalmon fish (8%), and vegetation (6%); additionally, each contributing 1% or less of the total harvest were birds and eggs, small land mammals, marine mammals, and marine invertebrates. Chinook salmon was the most targeted species of salmon by Tyonek residents, and moose was the most targeted species of the large land mammals.

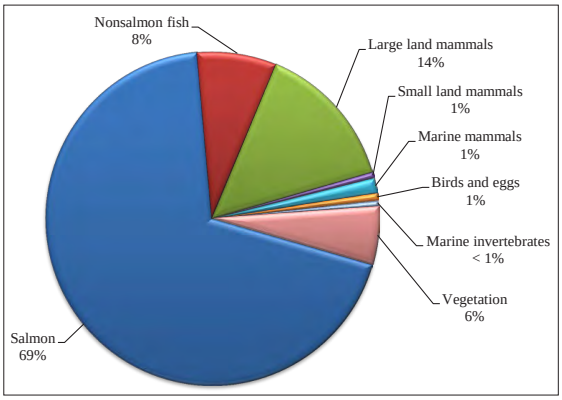

Figure 2

Figure 3 illustrates the wild resources search and harvest areas used by Tyonek residents in 2013. These search and harvest areas are fairly localized to the community.

For the complete study findings see the technical paper listed below that is available to download from the ADF&G website. Technical papers for other recent studies for Southcentral Alaska communities are also available from this searchable database.

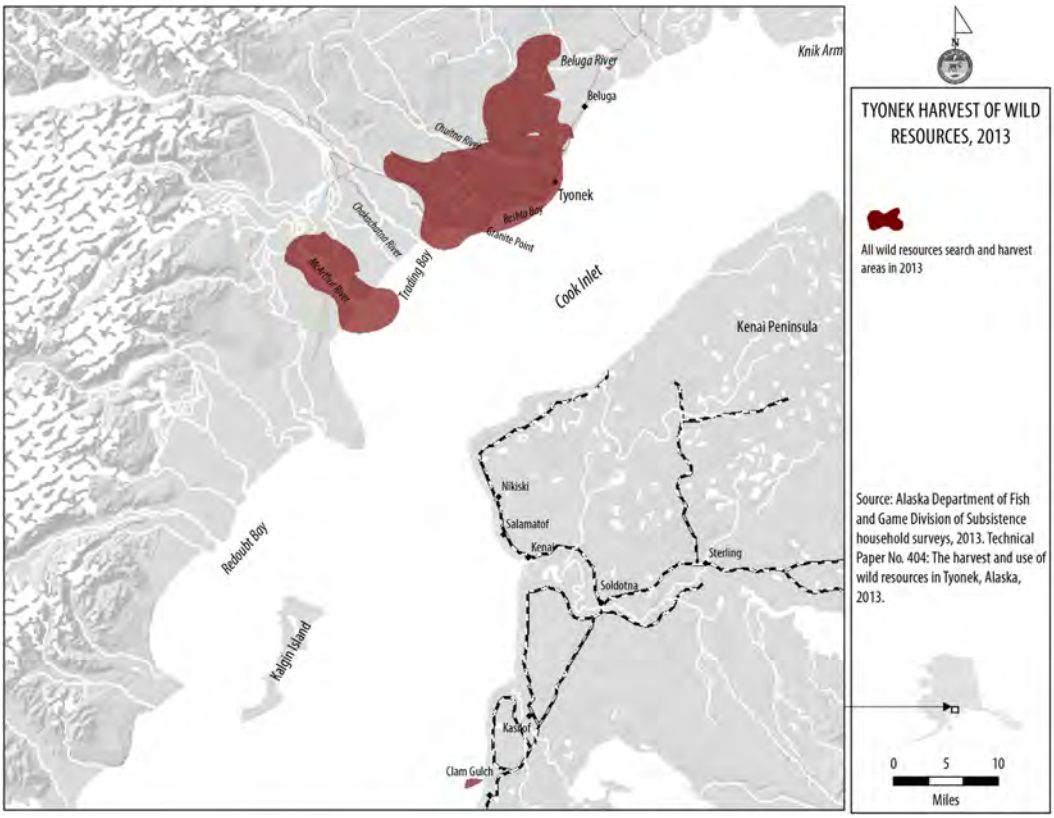

Figure 3

Jones, B., D. Holen, and D. S. Koster. 2015. *The Harvest and Use of Wild Resources in Tyonek, Alaska, 2013.* Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 404. Anchorage.
Available at: http://www.adfg.alaska.gov/sf/publications/

DIVISION OF SUBSISTENCE