Technical Paper No. 417

Subsistence Harvests in 6 Communities on the Bering Sea, in the Kuskokwim River Drainage, and on the Yukon River, 2013

Edited by

Hiroko Ikuta

David M. Runfola

James J. Simon

and

Marylynne L. Kostick

Contributors: Andrew R. Brenner, Caroline Brown, Hiroko Ikuta, Marylynne L. Kostick, Jeff Park, David M. Runfola, James J. Simon, Lisa J. Slayton, Alida Trainor, and Seth J. Wilson

June 2016

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
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	log_2, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

TECHNICAL PAPER NO. 417

SUBSISTENCE HARVESTS IN 6 COMMUNITIES ON THE BERING SEA, IN THE KUSKOKWIM RIVER DRAINAGE, AND ON THE YUKON RIVER, 2013

Edited by

Hiroko Ikuta, David M. Runfola, and James J. Simon
Alaska Department of Fish and Game, Division of Subsistence, Fairbanks

and

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

Contributors
Andrew R. Brenner, Caroline Brown, Hiroko Ikuta, Jeff Park, David M. Runfola,
James J. Simon, Lisa J. Slayton, Alida Trainor, and Seth J. Wilson
Alaska Department of Fish and Game, Division of Subsistence, Fairbanks

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

June 2016

Development and publication of this manuscript were fully financed by the Donlin Gold LLC.

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.

Hiroko Ikuta, David M. Runfola, and James J. Simon
Alaska Department of Fish and Game Division of Subsistence
1300 College Road, Fairbanks, Alaska 99701-1551 USA

and

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

This document should be cited as:
Ikuta, H., D.M. Runfola, J.J. Simon, and M.L. Kostick, editors. 2016. Subsistence harvests in 6 communities on the Bering Sea, in the Kuskokwim River drainage, and on the Yukon River, 2013. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 417, Fairbanks.

TABLE OF CONTENTS

List of Tables .... **vii**

List of Figures .... **xiv**

List of Plates .... **xxii**

Abstract .... **xxiv**

1. Introduction 1
Hiroko Ikuta, Caroline L. Brown, James J. Simon, David M. Runfola, and Andrew R. Brenner
Background 6
Regulatory Context in the Y-K Delta and Middle Yukon River Regions 7
Salmon 8
Moose 11
Caribou 12
Research Questions 13
Study Objectives 14
Tribal Consultations 14
Rationale and Literature Review 14
Early Studies 15
Recent Comprehensive Subsistence Surveys 15
Migratory Birds 16
Salmon 16
Nonsalmon Fish 17
Large Land Mammals 17
Marine Mammals 17

2. Methods 18
Hiroko Ikuta and Marylynne L. Kostick
General Research Design 18
Survey Instrument 19
Limitations and Assumptions 20
Procedures 20
Data Analysis 23

3. Scammon Bay 25
David Runfola
Community Background 25
Seasonal Round 27
Population Estimates and Demographic Information 30
Summary of Harvest and Use Patterns 33
Individual Participation in the Harvesting and Processing of Wild Resources 33

Harvest and Use of Wild Resources at the Household Level 36
Harvest Quantities and Composition 39
Use and Harvest Characteristics by Resource Category....39
Salmon 47
Nonsalmon Fish 49
Large Land Mammals 57
Small Land Mammals/Furbearers....57
Marine Mammals 60
Birds and Eggs 62
Marine Invertebrates 63
Vegetation 63
Harvest Areas 66
Comparing Harvests and Uses in 2013 with Previous Years 74
Harvest Assessments 74
Harvest Data....85
Income and Cash Employment 86
Food Security 90
Sharing of Wild Resources....93
Household Specialization in Resource Harvesting *93*
Wild Food Networks *95*
Local Comments and Concerns 98
Acknowledgements....100

4. Quinhagak 101
Lisa J. Slayton
Community Background....101
Seasonal Round 103
Population and Demographics 105
Summary of Harvest and Use Patterns 108
Individual Participation in the Harvesting and Processing of Wild Resources 108
Harvest and Use of Wild Resources at the Household Level 110
Harvest Quantities and Composition 111
Use and Harvest Characteristics by Resource Category....119
Salmon 120
Nonsalmon fish 125
Large Land Mammals 131
Small Land Mammals/Furbearers....133
Birds and Eggs 139
Marine Invertebrates 141
Vegetation 141
Harvest Areas 145
Comparing Harvests and Uses in 2013 with Previous Years 156
Harvest Assessments 156

Harvest Data....164
Income and Cash Employment....165
Food Security....168
Sharing of Wild Resources....174
Household Specialization in Resource Harvesting *174*
Wild Food Networks *174*
Local Comments and Concerns....177
Acknowledgements....178

5. Eek....179
Jeff Park
Community Background....179
Seasonal Round....181
Population Estimates and Demographic Information....183
Summary of Harvest and Use Patterns....186
Individual Participation in the Harvesting and Processing of Wild Resources....186
Harvest and Use of Wild Resources at the Household Level....189
Harvest Quantities and Composition....191
Use and Harvest Characteristics by Resource Category....191
Salmon....199
Nonsalmon Fish....202
Large Land Mammals....207
Small Land Mammals/Furbearers....208
Marine Mammals....208
Birds and Eggs....212
Marine Invertebrates....213
Vegetation....213
Harvest Areas....217
Comparing Harvests and Uses in 2013 with Previous Years....222
Harvest Assessments....222
Harvest Data....234
Income and Cash Employment....237
Food Security....240
Sharing of Wild Resources....244
Household Specialization in Resource Harvesting *244*
Wild Food Networks *245*
Local Comments and Concerns....247
Acknowledgements....247

6. Tuntutuliak....248
Seth Wilson
Community Background....248
Seasonal Round....249

Population Estimates and Demographic Information 251
Summary of Harvest and Use Patterns 255
Individual Participation in the Harvesting and Processing of Wild Resources 255
Harvest and Use of Wild Resources at the Household Level 255
Harvest Quantities and Composition 258
Use and Harvest Characteristics by Resource Category 258
Salmon 258
Nonsalmon Fish 269
Large Land Mammals 276
Small Land Mammals/Furbearers 276
Marine Mammals 278
Birds and Eggs 280
Marine Invertebrates 281
Vegetation 281
Harvest Areas 284
Comparing Harvests and Uses in 2013 with Previous Years 284
Harvest Assessments 284
Harvest Data 300
Income and Cash Employment 300
Food Security 302
Sharing of Wild Resources 308
Household Specialization in Resource Harvesting 308
Wild Food Networks 309
Local Comments and Concerns 309
Acknowledgements 311

7. Pilot Station 312
Alida Trainor
Community Background 312
Seasonal Round 315
Summary of Harvest and Use Patterns 317
Individual Participation in the Harvesting and Processing of Wild Resources 317
Harvest and Use of Wild Resources at the Household Level 321
Harvest Quantities and Composition 327
Harvest and Use Characteristics by Resource Category 329
Salmon 331
Nonsalmon Fish 334
Large Land Mammals 342
Small Land Mammals/Furbearers 345
Marine Mammals 348
Birds and Eggs 349
Marine Invertebrates 351
Vegetation 351

Harvest Areas 353
Comparing Harvests and Uses in 2013 with Previous Years 363
Harvest Assessments 363
Harvest Data 367
Income and Cash Employment 372
Food Security 377
Sharing of Wild Resources 380
Household Specialization in Resource Harvesting *380*
Wild Food Networks *380*
Local Comments and Concerns 383
Acknowledgements 383

8. Shageluk 384
Andrew R. Brenner
Community Background 384
Seasonal Round 388
Population Estimates and Demographic Information 389
Summary of Harvest and Use Patterns 393
Individual Participation in the Harvesting and Processing of Wild Resources 393
Harvest and Use of Wild Resources at the Household Level 393
Harvest Quantities and Composition 395
Use and Harvest Characteristics by Resource Category 402
Salmon 404
Nonsalmon Fish 406
Large Land Mammals 409
Small Land Mammals/Furbearers 414
Marine Mammals 414
Birds and Eggs 417
Marine Invertebrates 417
Vegetation 419
Harvest Areas 420
Comparing Harvests and Uses in 2013 with Previous Years 424
Harvest Assessments 424
Harvest Data 439
Salmon *439*
Nonsalmon Fish *442*
Moose *442*
Other Resources *442*
Income and Cash Employment 443
Food Security 445
Sharing of Wild Resources 451
Household Specialization in Resource Harvesting *451*
Wild Food Networks *451*

Local Comments and Concerns 453
Salmon 453
Moose 454
Bison 455
Weather Effects on 2013 Subsistence Harvest 455
Economic concerns 455
Acknowledgements 455

9. Discussion 456
Andrew R. Brenner and David M. Runfola
Subregional Subsistence Patterns 456
Context of Subregional Subsistence Patterns in Western Alaska 456
Coastal Communities 459
Lower Kuskokwim River Communities 462
Yukon River Communities 465
Lower Yukon River 465
Middle Yukon River 467
Conclusions 468

References 470

Appendix A.–Survey Instrument 483

Appendix B.–Ethnographic Interview Protocol 519

Appendix C.–Conversion Factors 526

Appendix D.–Additional Tables 535

LIST OF TABLES

Table

Table 1-1.–Resources used by study communities, 2013. 3
Table 2-1.–Project staff, Donlin Gold Subsistence Research Program, 2014–2016....21
Table 2-2.–Sample achievement, study communities, 2013. 22
Table 3-1.–Population estimates, Scammon Bay, 2010 and 2013. 31
Table 3-2.–Sample achievement, Scammon Bay, 2013. 32
Table 3-3.–Demographic characteristics, Scammon Bay, 2013....33
Table 3-4.–Population profile, Scammon Bay, 2013. 34
Table 3-5.–Birthplaces of household heads, Scammon Bay, 2013. 35
Table 3-6.–Birthplaces of population, Scammon Bay, 2013....35
Table 3-7.–Resource harvest and use characteristics, Scammon Bay, 2013. 38
Table 3-8.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Scammon Bay, 2013....40
Table 3-9.–Top 10 ranked resources used by households, Scammon Bay, 2013. 45
Table 3-10.–Estimated salmon harvests by gear type, Scammon Bay, 2013. 48
Table 3-11.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Scammon Bay, 2013. 50
Table 3-12.–Estimated nonsalmon fish harvests by gear type, Scammon Bay, 2013. 52
Table 3-13.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Scammon Bay, 2013....55
Table 3-14.–Estimated harvests of salmon and nonsalmon fish for consumption by dogs, Scammon Bay, 2013. 57
Table 3-15.–Estimated large land mammal harvests by month and sex, Scammon Bay, 2013. 58
Table 3-16.–Estimated small land mammal harvests by month, Scammon Bay, 2013. 60
Table 3-17.–Estimated marine mammal harvests by month, Scammon Bay, 2013. 62
Table 3-18.–Estimated bird and bird egg harvests by season, Scammon Bay, 2013. 64
Table 3-19.–Use of firewood for home heating, Scammon Bay, 2013. 66
Table 3-20.–Changes in household uses of resources compared to recent years, Scammon Bay, 2013....77
Table 3-21.–Reasons for less household uses of resources compared to recent years, Scammon Bay, 2013....79
Table 3-22.–Reasons for more household uses of resources compared to recent years, Scammon Bay, 2013. 80
Table 3-23.–Reported impact to households that did not get enough of a resource, Scammon Bay, 2013....81

Table 3-24.–Things households reported doing differently as the result of not getting enough of a resource, Scammon Bay, 2013. 83
Table 3-25.–Resources of which households reported needing more, Scammon Bay, 2013. 84
Table 3-26.–Estimated earned and other income, Scammon Bay, 2013. 88
Table 3-27.–Comparison of median income estimates, Scammon Bay, 2013. 88
Table 3-28.–Employment by industry, Scammon Bay, 2013. 89
Table 3-29.–Reported job schedules, Scammon Bay, 2013. 91
Table 3-30.–Employment characteristics, Scammon Bay, 2013. 91
Table 4-2.–Population profile, Quinhagak, 2013. 106
Table 4-1.–Sample achievement, Quinhagak, 2013. 106
Table 4-3.–Population estimates, Quinhagak, 2010 and 2013. 107
Table 4-4.–Demographic characteristics, Quinhagak, 2013. 107
Table 4-5.–Birthplaces of household heads, Quinhagak, 2013. 109
Table 4-6.–Birthplaces of population, Quinhagak, 2013. 109
Table 4-7.–Resource harvest and use characteristics, Quinhagak, 2013. 112
Table 4-8.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Quinhagak, 2013. 113
Table 4-9.–Top 10 ranked resources used by households, Quinhagak, 2013. 120
Table 4-10.–Estimated salmon harvests by gear type, Quinhagak, 2013. 122
Table 4-11.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Quinhagak, 2013. 123
Table 4-12.–Estimated harvests of salmon and nonsalmon fish for consumption by dogs, Quinhagak, 2013. 124
Table 4-13.–Estimated nonsalmon fish harvests by gear type, Quinhagak, 2013 127
Table 4-14.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Quinhagak, 2013. 129
Table 4-15.–Estimated large land mammal harvest by month and sex, Quinhagak, 2013. 133
Table 4-16.–Estimated small land mammal harvests by month, Quinhagak, 2013. 135
Table 4-17.–Estimated marine mammal harvests by month, Quinhagak, 2013. 138
Table 4-18.–Estimated bird and bird egg harvests by season, Quinhagak, 2013. 140
Table 4-19.–Use of firewood for home heating, Quinhagak, 2013. 144
Table 4-20.–Changes in household uses of resources compared to recent years, Quinhagak, 2013. 156
Table 4-21.–Reasons for less household uses of resources compared to recent years, Quinhagak, 2013. 159

Table 4-22.–Reasons for more household uses of resources compared to recent years, Quinhagak, 2013............160
Table 4-23.–Reported impact to households that did not get enough of a resource, Quinhagak, 2013. 161
Table 4-24.–Things households reported doing differently as the result of not getting enough of a resource, Quinhagak, 2013. 162
Table 4-25.–Resources of which households reported needing more, Quinhagak, 2013. 163
Table 4-26.–Estimated earned and other income, Quinhagak, 2013. 167
Table 4-27.–Employment by industry, Quinhagak, 2013. 169
Table 4-28.–Employment characteristics, Quinhagak, 2013. 170
Table 4-29.–Reported job schedules, Quinhagak, 2013............171
Table 4-30.–Comparison of median income estimates, Quinhagak, 2013............171
Table 5-2.–Population estimates, Eek, 2010 and 2013. 184
Table 5-1.–Sample achievement, Eek, 2013. 184
Table 5-3.–Demographic characteristics, Eek, 2013............185
Table 5-4.–Population profile, Eek, 2013. 187
Table 5-5.–Birthplaces of household heads, Eek, 2013 188
Table 5-6.–Birthplaces of population, Eek, 2013. 188
Table 5-7.–Resource harvest and use characteristics, Eek, 2013. 190
Table 5-8.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Eek, 2013. 192
Table 5-9.–Top 10 ranked resources used by households, Eek, 2013............197
Table 5-10.–Estimated salmon harvests by gear type, Eek, 2013. 201
Table 5-11.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Eek, 2013. 201
Table 5-12.–Estimated harvests of salmon and nonsalmon fish for consumption by dogs, Eek, 2013. 202
Table 5-13.–Estimated nonsalmon fish harvests by gear type, Eek, 2013. 204
Table 5-14.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Eek, 2013............205
Table 5-15.–Estimated large land mammal harvests by month and sex, Eek, 2013. 208
Table 5-16.–Estimated small land mammal harvests by month, Eek, 2013. 210
Table 5-17.–Estimated marine mammal harvests by month and sex, Eek, 2013............211
Table 5-18.–Estimated bird and bird egg harvests by season, Eek, 2013. 214
Table 5-19.–Use of firewood for home heating, Eek, 2013. 216
Table 5-20.–Changes in household uses of resources compared to recent years, Eek, 2013. 227
Table 5-21.–Reasons for less household uses of resources compared to recent years, Eek, 2013. .229

Table 5-22.–Reasons for more household uses of resources compared to recent years, Eek, 2013. 230
Table 5-23.–Reported impact to households that did not get enough of a resource, Eek, 2013. 232
Table 5-24.–Things households reported doing differently as the result of not getting enough of a resource, Eek, 2013. 233
Table 5-25.–Resources of which households reported needing more, Eek, 2013. 235
Table 5-26.–Estimated earned and other income, Eek, 2013. 238
Table 5-27.–Comparison of median income estimates, Eek, 2013. 238
Table 5-28.–Employment by industry, Eek, 2013. 239
Table 5-29.–Reported job schedules, Eek, 2013. 240
Table 5-30.–Employment characteristics, Eek, 2013. 241
Table 6-1.–Population estiamtes, Tuntutuliak, 2010 and 2013. 252
Table 6-2.–Sample achievement, Tuntutuliak, 2013. 253
Table 6-3.–Demographic characteristics, Tuntutuliak, 2013. 253
Table 6-4.–Population profile, Tuntutuliak, 2013. 254
Table 6-5.–Birthplaces of household heads, Tuntutuliak, 2013. 255
Table 6-6.–Birthplaces of population, Tuntutuliak, 2013. 255
Table 6-7.–Resource harvest and use characteristics, Tuntutuliak, 2013 257
Table 6-8.–Estimated harvest and use of fish, wildlife, and vegetation resources, Tuntutuliak, 2013. 259
Table 6-9.–Top 10 ranked resources used by households, Tuntutuliak, 2013. 264
Table 6-10.–Estimated harvest of salmon and nonsalmon fish for consumption by dogs, Tuntutuliak, 2013 266
Table 6-11.–Estimated salmon harvests by gear type, Tuntutuliak, 2013 267
Table 6-12.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Tuntutuliak, 2013. 268
Table 6-13.–Estimated harvests of nonsalmon fish by gear type and resource, Tuntutuliak, 2013. 271
Table 6-14.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Tuntutuliak, 2013. 273
Table 6-15.–Estimated large land mammal harvests by month and sex, Tuntutuliak, 2013 277
Table 6-16.–Estimated small land mammal harvests by month, Tuntutuliak, 2013. 278
Table 6-17.–Estimated marine mammal harvests by month, Tuntutuliak, 2013. 280
Table 6-18.–Estimated bird and bird egg harvests by season, Tuntutuliak, 2013 282
Table 6-19.–Use of firewood for home heating, Tuntutuliak, 2013. 284
Table 20.–Changes in household uses of resources compared to recent years, Tuntutuliak, 2013. 293

Table 6-21.–Reasons for less household uses of resources compared to recent years, Tuntutuliak, 2013....295
Table 6-22.–Reasons for more household uses of resources, Tuntutuliak, 2013....296
Table 6-23.–Reported impact to households that did not get enough of a resource, Tuntutuliak, 2013....297
Table 6-24.–Things households reported doing differently as the result of not getting enough of a resource, Tuntutuliak, 2013....298
Table 6-25.–Resources of which households reported needing more, Tuntutuliak, 2013....299
Table 6-26.–Estimated earned and other income, Tuntutuliak, 2013....303
Table 6-27.–Comparison of median income estimates, Tuntutuliak, 2013....303
Table 6-28.–Employment by industry, Tuntutuliak, 2013....304
Table 6-29.–Reported job schedules, Tuntutuliak, 2013....305
Table 6-30.–Employment characteristics, Tuntutuliak, 2013....305
Table 7-1.–Sample achievement, Pilot Station, 2013....317
Table 7-3.–Population profile, Pilot Station, 2013....318
Table 7-2.–Population estimates, Pilot Station, 2010 and 2013....318
Table 7-4.–Demographic characteristics, Pilot Station, 2013....319
Table 7-5.–Birthplaces of household heads, Pilot Station, 2013....320
Table 7-6.–Birthplaces of population, Pilot Station, 2013....320
Table 7-7.–Estimated harvests of fish, wildlife, and vegetation resources, Pilot Station, 2013....322
Table 7-8.–Resource harvest and use characteristics, Pilot Station, 2013....328
Table 7-9.–Top 10 ranked resources used by households, Pilot Station, 2013....330
Table 7-10.–Estimated salmon harvests by gear type, Pilot Station, 2013....333
Table 7-11.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Pilot Station, 2013....335
Table 7-12.–Estimated harvests of salmon and nonsalmon fish for consumption by dogs, Pilot Station, 2013....336
Table 7-13.–Estimated harvests of nonsalmon fish by gear type, Pilot Station, 2013....337
Table 7-14.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Pilot Station, 2013....340
Table 7-15.–Estimated large land mammal harvests by month and sex, Pilot Station, 2013....345
Table 7-16.–Estimated small land mammal harvests by month, Pilot Station, 2013....347
Table 7-17.–Estimated marine mammal harvests by month, Pilot Station, 2013....348
Table 7-18.–Estimated bird and bird egg harvests by season, Pilot Station, 2013....350
Table 7-19.–Use of firewood for home heating, Pilot Station, 2013....352

Table 7-20.–Changes in household uses of resources compared to recent years, Pilot Station, 2013... 363
Table 7-21.–Reasons for less household uses of resources compared to recent years, Pilot Station, 2013...365
Table 7-22.–Reasons for more household uses of resources compared to recent years, Pilot Station, 2013...366
Table 7-23.–Reported impact to households that did not get enough of a resource, Pilot Station, 2013...368
Table 7-24.–Things households reported doing differently as the result of not getting enough of a resource, Pilot Station, 2013. 369
Table 7-25.–Resources of which households reported needing more, Pilot Station, 2013.............370
Table 7-26.–Estimated earned and other income, Pilot Station, 2013. 373
Table 7-27.–Comparison of median income estimates, Pilot Station, 2013. 374
Table 7-28.–Employment by industry, Pilot Station, 2013. 375
Table 7-30.–Reported job schedules, Pilot Station, 2013. 376
Table 7-29.–Employment characteristics, Pilot Station, 2013. 376
Table 8-1.–Population estimates, Shageluk, 2010 and 2013. 390
Table 8-2.–Sample achievement, Shageluk, 2013. 391
Table 8-3.–Demographic characteristics, Shageluk, 2013. 391
Table 8-4.–Population profile, Shageluk, 2013...392
Table 8-5.–Birthplaces of household heads, Shageluk, 2013. 393
Table 8-6.–Birthplaces of population, Shageluk, 2013...393
Table 8-7.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Shageluk, 2013... 396
Table 8-8.–Resource harvest and use characteristics, Shageluk, 2013. 401
Table 8-9.–Top 10 ranked resources used by households, Shageluk, 2013. 403
Table 8-10.–Estimated salmon harvests by gear type, Shageluk, 2013. 405
Table 8-11.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Shageluk, 2013. 407
Table 8-12.–Estimated harvests of salmon and nonsalmon fish for consumption by dogs, Shageluk, 2013...408
Table 8-13.–Estimated harvests of nonsalmon fish by gear type, Shageluk, 2013. 410
Table 8-14.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Shageluk, 2013. 412
Table 8-15.–Estimated large land mammal harvest by month and sex, Shageluk, 2013. 415
Table 8-16.–Estimated small land mammal harvests by month, Shageluk, 2013............................416

Table 8-17.–Estimated bird and bird egg harvests by season, Shageluk, 2013. 418
Table 8-18.–Use of firewood for home heating, Shageluk, 2013. 420
Table 8-19.–Changes in household uses of resources compared to recent years, Shageluk, 2013..430
Table 8-20.–Reasons for less household uses of resources compared to recent years, Shageluk, 2013...433
Table 8-21.–Reasons for more household uses of resources compared to recent years, Shageluk, 2013...434
Table 8-22.–Reported impact to households that did not get enough of a resource, Shageluk, 2013. 436
Table 8-23.–Things households reported doing differently as the result of not getting enough of a resource, Shageluk, 2013. 437
Table 8-24.–Resources of which households reported needing more, Shageluk, 2013..................438
Table 8-25.–Estimated earned and other income, Shageluk, 2013. 444
Table 8-26.–Comparison of median income estimates, Shageluk, 2013. 445
Table 8-27.–Employment by industry, Shageluk, 2013. 446
Table 8-28.–Reported job schedules, Shageluk, 2013. 447
Table 8-29.–Employment characteristics, Shageluk, 2013. 447
Table D-1.–Individual participation in subsistence harvesting and processing activities, Scammon Bay, 2013. 536
Table D-2.–Individual participation in subsistence harvesting and processing activities, Quinhagak, 2013...537
Table D-3.–Individual participation in subsistence harvesting and processing activities, Eek, 2013. 538
Table D-4.–Individual participation in subsistence harvesting and processing activities, Tuntutuliak, 2013...539
Table D-5.–Individual participation in subsistence harvesting and processing activities, Pilot Station, 2013. 540
Table D-6.–Individual participation in subsistence harvesting and processing activities, Shageluk, 2013...541

LIST OF FIGURES

Figure

Figure 1-1.–Study communities of the Donlin Gold Subsistence Research Program, 2013. 2
Figure 3-1.–Historical population estimates, Scammon Bay, 1950–2013. 31
Figure 3-2.–Population profile, Scammon Bay, 2013. 34
Figure 3-3.–Individual participation in subsistence harvesting and processing activities, Scammon Bay, 2013. 35
Figure 3-4.–Percentages of households using, attempting to harvest, or harvesting wild resources, Scammon Bay, 2013. 36
Figure 3-5.–Composition of edible harvest by resource category, Scammon Bay, 2013. 45
Figure 3-6.–Top species harvested in pounds edible weight per capita, Scammon Bay, 2013..........46
Figure 3-7.–Composition of edible salmon harvest, Scammon Bay, 2013..47
Figure 3-8.–Estimated salmon harvests by gear type, Scammon Bay, 2013. 49
Figure 3-9.–Composition of edible nonsalmon fish harvest, Scammon Bay, 2013. 51
Figure 3-10.–Estimated nonsalmon fish harvests by gear type, Scammon Bay, 2013. 54
Figure 3-11.–Composition of edible large land mammal harvest, Scammon Bay, 2013..................58
Figure 3-13.–Estimated small land mammal harvests for fur, Scammon Bay, 2013.........................59
Figure 3-12.–Composition of small land mammal harvest by individual animals harvested, Scammon Bay, 2013. 59
Figure 3-14.–Composition of edible marine mammal harvest, Scammon Bay, 2013. 61
Figure 3-15.–Composition of edible bird and bird egg harvest, Scammon Bay, 2013......................62
Figure 3-16.–Composition of edible marine invertebrate harvest, Scammon Bay, 2013. 65
Figure 3-17.–Composition of edible vegetation harvest by type, Scammon Bay, 2013...................65
Figure 3-18.–Search and harvest areas, all resources, Scammon Bay, 2013. 67
Figure 3-19.–Fishing and harvest areas, salmon, Scammon Bay, 2013. 69
Figure 3-20.–Fishing and harvest areas, burbot, northern pike, sheefish, and whitefishes, Scammon Bay, 2013. 70
Figure 3-21.–Hunting and harvest areas, black bear, caribou, and moose, Scammon Bay, 2013. 71
Figure 3-22.–Hunting and harvest areas, small land mammals, Scammon Bay, 2013......................72
Figure 3-23.–Hunting and harvest areas, seals, walruses, and beluga whales, Scammon Bay, 2013.... 73
Figure 3-24.–Hunting and harvest areas, waterfowl and nonmigratory birds, Scammon Bay, 2013. ... .75
Figure 3-25.–Gathering and harvest areas, berries and greens, Scammon Bay, 2013.......................76

Figure 3-26.–Changes in household uses of resources compared to recent years, Scammon Bay, 2013....78
Figure 3-27.–Percentages of households reporting whether they got enough resources, Scammon Bay, 2013. 78
Figure 3-28.–Estimated numbers of Chinook, chum, and coho salmon harvested, Scammon Bay, 1992–2013....85
Figure 3-29.–Top income sources, Scammon Bay, 2013....87
Figure 3-30.–Responses to questions about food insecure conditions, Scammon Bay, 2013. 92
Figure 3-31.–Food security categories, Scammon Bay, 2013. 92
Figure 3-32.–Mean number of food insecure conditions by month and by household security category, Scammon Bay, 2013....93
Figure 3-33.–Comparison of months when subsistence, store-bought, and any foods did not last, Scammon Bay, 2013. 94
Figure 3-34.–Household harvest specialization, Scammon Bay, 2013....94
Figure 3-35.–Wild food harvesting and processing network, Scammon Bay, 2013....96
Figure 4-1.–Population profile, Quinhagak, 2013. 108
Figure 4-2.–Population history, Quinhagak, 1980–2013....109
Figure 4-3.–Individual participation in subsistence harvesting and processing activities, Quinhagak, 2013....110
Figure 4-4.–Percentages of households using, attempting to harvest, or harvesting wild resources by category, Quinhagak, 2013. 111
Figure 4-5.–Composition of edible harvest by resource category, Quinhagak, 2013....119
Figure 4-6.–Top species harvested in pounds edible weight per capita, Quinhagak, 2013....121
Figure 4-7.–Composition of edible salmon harvest, Quinhagak, 2013. 121
Figure 4-8.–Estimated salmon harvests by gear type, Quinhagak, 2013....124
Figure 4-9.–Composition of edible nonsalmon fish harvest, Quinhagak, 2013....125
Figure 4-10.–Estimated nonsalmon fish harvests by gear type, Quinhagak, 2013....126
Figure 4-11.–Composition of edible large land mammal harvest, Quinhagak, 2013. 131
Figure 4-12.–Estimated small land mammal harvests for fur, Quinhagak, 2013. 133
Figure 4-13.–Composition of small land mammal harvest in individual animals harvested, Quinhagak, 2013....134
Figure 4-14.–Composition of edible marine mammal harvest, Quinhagak, 2013....136
Figure 4-15.–Composition of edible bird and bird egg harvest, Quinhagak, 2013. 139
Figure 4-16.–Composition of edible marine invertebrate harvest, Quinhagak, 2013....142
Figure 4-17.–Composition of edible vegetation harvest by type, Quinhagak, 2013. 142
Figure 4-18.–Search and harvest areas, all resources, Quinhagak, 2013....146

Figure 4-19.–Fishing and harvest areas, salmon, Quinhagak, 2013. 147
Figure 4-20.–Fishing and harvest areas, burbot, northern pike, sheefish, and whitefishes, Quinhagak, 2013. 148
Figure 4-21.–Hunting and harvest areas, caribou and moose, Quinhagak, 2013. 149
Figure 4-22.–Hunting and harvest areas, small land mammals, Quinhagak, 2013. 151
Figure 4-23.–Hunting and harvest areas, beluga whales, seals, and walruses, Quinhagak, 2013. ..152
Figure 4-24.–Hunting and harvest areas, waterfowl and nonmigratory birds, Quinhagak, 2013....154
Figure 4-25.–Gathering and harvest areas, berries and greens, Quinhagak, 2013..........................155
Figure 4-26.–Percentages of households reporting whether they got enough resources, Quinhagak, 2013...157
Figure 4-27.–Household uses of resources compared to recent years, Quinhagak, 2013. 157
Figure 4-28.–Estimated salmon harvests, Quinhagak, 1990–2013..166
Figure 4-29.–Top income sources, Quinhagak, 2013. 168
Figure 4-30.–Responses to questions about food insecure conditions, Quinhagak, 2013. 172
Figure 4-31.–Food security categories, Quinhagak, Alaska, and United States, 2013. 172
Figure 4-32.–Mean number of food insecure conditions by month and by household security category, Quinhagak, 2013. 173
Figure 4-33.–Comparison of months when subsistence, store-bought, and any foods did not last, Quinhagak, 2013. 173
Figure 4-34.–Household harvest specialization, Quinhagak, 2013. 174
Figure 4-35.–Wild food harvesting and processing network, Quinhagak, 2013. 176
Figure 5-1.–Historical population estimates, Eek, 1950–2013..186
Figure 5-2.–Population profile, Eek, 2013. 187
Figure 5-3.–Individual participation in subsistence harvesting and processing activities, Eek, 2013... 188
Figure 5-4.–Percentages of households using, attempting to harvest, or harvesting wild resources, by category, Eek, 2013. 189
Figure 5-5.–Composition of edible harvest by resource category, Eek, 2013. 197
Figure 5-6.–Top species harvested in pounds edible weight per capita, Eek, 2013........................198
Figure 5-7.–Composition of edible salmon harvest, Eek, 2013..199
Figure 5-8.–Estimated salmon harvests by gear type, Eek, 2013. 200
Figure 5-10.–Estimated nonsalmon fish harvests by gear type, Eek, 2013. 203
Figure 5-9.–Composition of edible nonsalmon fish harvest, Eek, 2013. 203
Figure 5-11.–Composition of edible large land mammal harvest, Eek, 2013.................................207
Figure 5-13.–Estimated small land mammal harvests for fur, Eek, 2013.......................................209

Figure 5-12.–Composition of small land mammal harvest in individual animals harvested, Eek, 2013....209
Figure 5-14.–Composition of edible marine mammal harvest, Eek, 2013....211
Figure 5-15.–Composition of edible bird and bird egg harvest, Eek, 2013....212
Figure 5-16.–Composition of edible marine invertebrate harvest, Eek, 2013....215
Figure 5-17.–Composition of edible vegetation harvest by type, Eek, 2013....215
Figure 5-18.–Search and harvest areas, all resources, Eek, 2013....218
Figure 5-19.–Fishing and harvest areas, salmon, Eek, 2013....219
Figure 5-20.–Fishing and harvest areas, burbot, northern pike, sheefish, and whitefishes, Eek, 2013....220
Figure 5-21.–Hunting and harvest areas, caribou and moose, Eek, 2013....221
Figure 5-22.–Hunting and harvest areas, small land mammals, Eek, 2013....223
Figure 5-23.–Hunting and harvest areas, seals and walrus, Eek, 2013....224
Figure 5-24.–Hunting and harvest areas, waterfowl and nonmigratory birds, Eek, 2013....225
Figure 5-25.–Gathering and harvest locations of berries and greens, Eek, 2013....226
Figure 5-26.–Changes in household uses of resources compared to recent years, Eek, 2013....227
Figure 5-27.–Percentages of households reporting whether they got enough reources, Eek, 2013....228
Figure 5-28.–Estimated numbers of Chinook, chum, coho, and sockeye salmon harvested, Eek, 1990–2013....236
Figure 5-29.–Top income sources, Eek, 2013....237
Figure 5-30.–Responses to questions about food insecure conditions, Eek, 2013....242
Figure 5-31.–Food security categories, Eek, 2013....242
Figure 5-32.–Mean number of food insecure conditions by month and household category, Eek, 2013....243
Figure 5-33.–Comparison of months when subsistence, store-bought, and any food did not last, Eek, 2013....243
Figure 5-34.–Household harvest specialization, Eek, 2013....244
Figure 5-35.–Wild food harvesting and processing network, Eek, 2013....246
Figure 6-1.–Historical population estimates, Tuntutuliak, 2013....252
Figure 6-2.–Population profile, Tuntutuliak, 2013....254
Figure 6-3.–Individual participation in subsistence harvesting and processing activities, Tuntutuliak, 2013....256
Figure 6-4.–Percentages of households using, attempting to harvest, or harvesting wild resources, Tuntutuliak, 2013....256
Figure 6-5.–Composition of edible harvest by resource category, Tuntutuliak, 2013....264

Figure 6-6.–Top species harvested in pounds edible weight per capita, Tuntutuliak, 2013. 265
Figure 6-7.–Composition of edible salmon harvest, Tuntutuliak, 2013. 265
Figure 6-8.–Estimated salmon harvests by gear type, Tuntutuliak, 2013. 267
Figure 6-9.–Composition of edible nonsalmon fish harvest, Tuntutuliak, 2013. 269
Figure 6-10.–Estimated nonsalmon fish harvests by gear type, Tuntutuliak, 2013. 270
Figure 6-11.–Composition of edible large land mammal harvest, Tuntutuliak, 2013. 276
Figure 6-12.–Composition of small land mammal harvest in individual animals harvested, Tuntutuliak, 2013. 277
Figure 6-13.–Estimated small land mammal harvests for fur, Tuntutuliak, 2013. 279
Figure 6-14.–Composition of edible marine mammal harvest, Tuntutuliak, 2013. 279
Figure 6-15.–Composition of edible bird and bird egg harvest, Tuntutuliak, 2013. 281
Figure 6-16.–Composition of edible vegetation harvest by type, Tuntutuliak, 2013. 283
Figure 6-17.–Search and harvest areas, all resources, Tuntutuliak, 2013. 285
Figure 6-18.–Fishing and harvest areas, salmon, Tuntutuliak, 2013. 286
Figure 6-19.–Fishing and harvest areas, burbot, northern pike, sheefish, and whitefishes, Tuntutuliak, 2013. 287
Figure 6-20.–Hunting and harvest areas, small land mammals, Tuntutuliak, 2013. 288
Figure 6-21.–Hunting and harvest areas, caribou and moose, Tuntutuliak, 2013. 289
Figure 6-22.–Hunting and harvest areas, seals and walrus, Tuntutuliak, 2013. 290
Figure 6-23.–Hunting and harvest areas, waterfowl and nonmigratory birds, Tuntutuliak, 2013. ..291
Figure 6-24.–Gathering and harvest areas, berries and greens, Tuntutuliak, 2013. 292
Figure 6-25.–Changes in household use of resources compared to recent years, Tuntutuliak, 2013. ... .294
Figure 6-26.–Percentages of households reporting whether they got enough resources, Tuntutulikak, 2013. 294
Figure 6-27.–Estimated numbers of Chinook, chum, sockeye, and coho salmon harvested, Tuntutuliak, 1990 –2013. 301
Figure 6-28.–Top income sources, Tuntutuliak, 2013. 302
Figure 6-29.–Responses to questions about food insecure conditions, Tuntutuliak, 2013. 306
Figure 6-30.–Food security categories, Tuntutuliak, 2013. 306
Figure 6-31.–Mean number of food insecure conditions by month and household category, Tuntutuliak, 2013. 307
Figure 6-32.–Comparison of months when subsistence, store-bought, and any food did not last, Tuntutuliak, 2013. 307
Figure 6-33.–Household harvest specialization, Tuntutuliak, 2013. 308
Figure 6-34.–Wild food harvesting and processing network, Tuntutuliak, 2013. 310

Figure 7-1.–Historical population estimates, Pilot Station, 1970–2013. 319
Figure 7-2.–Population profile, Pilot Station, 2013. 320
Figure 7-3.–Individual participation in subsistence harvesing and processing activities, Pilot Station, 2013. 321
Figure 7-4.–Percentages of households using, attempting to harvest, or harvesting wild resources, Pilot Station, 2013...327
Figure 7-5.–Composition of edible harvest by resource category, Pilot Station, 2013. 329
Figure 7-6.–Top species harvested in pounds edible weight per capita, Pilot Station, 2013. 330
Figure 7-7.–Composition of edible salmon harvest, Pilot Station, 2013. 331
Figure 7-8.–Estimated harvests of salmon by gear type, Pilot Station, 2013. 334
Figure 7-9.–Composition of edible nonsalmon fish harvest, Pilot Station, 2013. 336
Figure 7-10.–Estimated harvests of nonsalmon fish by gear type, Pilot Station, 2013. 339
Figure 7-11.–Composition of edible large land mammal harvest, Pilot Station, 2013. 344
Figure 7-12.–Estimated small land mammal harvests for fur, Pilot Station, 2013. 346
Figure 7-13.–Composition of small land mammal harvest by individual animals harvested, Pilot Station, 2013. 346
Figure 7-14.–Composition of edible marine mammal harvest, Pilot Station, 2013. 348
Figure 7-15.–Composition of edible bird and bird egg harvest by season, Pilot Station, 2013. 349
Figure 7-16.–Composition of edible vegetation harvest, Pilot Station, 2013. 352
Figure 7-17.–Search and harvest areas, all resources, Pilot Station, 2013. 354
Figure 7-18.–Fishing and harvest areas, salmon, Pilot Station, 2013. 355
Figure 7-19.–Fishing and harvest areas, burbot, northen pike, sheefish, and whitefishes, Pilot Station, 2013. 356
Figure 7-20.–Hunting and harvest areas, black bear, caribou, and moose, Pilot Station, 2013.......358
Figure 7-21.–Hunting and harvest areas, small land mammals, Pilot Station, 2013. 359
Figure 7-22.–Hunting and harvest areas, beluga whales and seals, Pilot Station, 2013. 360
Figure 7-23.–Hunting and harvest areas, waterfowl and nonmigratory birds, Pilot Station, 2013. 361
Figure 7-24.–Gathering and harvest areas, berries and greens, Pilot Station, 2013. 362
Figure 7-25.–Percentages of households reporting whether or not they got enough resources, Pilot Station, 2013. 364
Figure 7-26.–Household uses of resources compared to recent years, Pilot Station, 2013. 364
Figure 7-27.–Estimated number of Chinook, summer chum, fall chum, and coho salmon harvested, Pilot Station, 1990–2013...371
Figure 7-28.–Top income sources, Pilot Station, 2013. 374
Figure 7-29.–Responses to questions about food insecure conditions, Pilot Station, 2013............377
Figure 7-30.–Food security categories, Pilot Station, 2013. 378

Figure 7-31.–Mean number of food insecure conditions by month and by household category, Pilot Station, 2013. 379
Figure 7-32.–Comparison of months when subsistence, store-bought, and any food did not last, Pilot Station, 2013...379
Figure 7-33.–Household harvest specialization, Pilot Station, 2013. 380
Figure 7-34.–Wild food harvesting and processing network, Pilot Station, 2013. 382
Figure 8-1.–Historical population estimates, Shageluk, 1950 –2013. 390
Figure 8-2.–Population profile, Shageluk, 2013. 392
Figure 8-3.–Individual participation in subsistence harvesting and processing activities, Shageluk, 2013...394
Figure 8-4.–Percentages of households using, attempting to harvest, or harvesting wild resources, Shageluk, 2013...394
Figure 8-5.–Composition of edible harvest by resource category, Shageluk, 2013. 402
Figure 8-6.–Top species harvested in pounds edible weight per capita, Shageluk, 2013. 403
Figure 8-7.–Composition of edible salmon harvest, Shageluk, 2013. 404
Figure 8-8.–Estimated salmon harvests by gear type, Shageluk, 2013. 405
Figure 8-9.–Composition of edible nonsalmon fish harvest, Shageluk, 2013. 408
Figure 8-10.–Harvests of nonsalmon fish by gear type, Shageluk, 2013. 409
Figure 8-11.–Composition of edible large land mammal harvest, Shageluk, 2013. 414
Figure 8-12.–Composition of small land mammal harvest in individual animals harvested, Shageluk, 2013...415
Figure 8-13.–Estimated small land mammal harvests for fur, Shageluk, 2013. 416
Figure 8-14.–Composition of edible bird and bird egg harvests, Shageluk, 2013..........................417
Figure 8-15.–Composition of edible vegetation harvest by type, Shageluk, 2013. 419
Figure 8-16.–Search and harvest areas, all resources, Shageluk, 2013. 421
Figure 8-17.–Fishing and harvest areas, salmon, Shageluk, 2013. 422
Figure 8-18.–Fishing and harvest areas, burbot, northern pike, sheefish, and whitefishes, Shageluk, 2013...423
Figure 8-19.–Hunting and harvest areas, caribou and moose, Shageluk, 2013. 425
Figure 8-20.–Hunting and harvest locations, small land mammals, Shageluk, 2013. 426
Figure 8-21.–Hunting and harvest areas, waterfowl and nonmigratory birds, Shageluk, 2013. 427
Figure 8-22.–Gathering and harvest areas, berries and greens, Shageluk, 2013. 428
Figure 8-23.–Changes in household uses of resources compared to recent years, Shageluk, 2013. 430
Figure 8-24.–Percentages of households reporting whether they got enough resources, Shageluk, 2013...431

Figure 8-25.–Estimated numbers of Chinook, chum, and coho salmon harvested, 1990–2013......440
Figure 8-26.–Top income sources, Shageluk, 2013. 443
Figure 8-27.–Responses to questions about food insecure conditions, Shageluk, 2013.................448
Figure 8-28.–Food security categories, Shageluk, 2013. 449
Figure 8-29.–Mean number of food insecure conditions by month and by household security category, Shageluk, 2013. 450
Figure 8-30.–Comparison of months when subsistence, store-bought, and any foods did not last, Shageluk, 2013..450
Figure 8-31.–Household harvest specialization, Shageluk, 2013. 451
Figure 8-32.–Wild food harvesting and processing network, Shageluk, 2013. 452
Figure 9-1.–Study communities of the Donlin Gold Subsistence Research Program, 2009–2013. 457
Figure 9-2.–Western Alaska subregions (Schroeder et al. 1987:217). 458
Figure 9-3.–Per capita harvests by category, Scammon Bay and Quinhagak, 2013. 461
Figure 9-4.–Per capita harvests of marine mammals, lower Kuskokwim River and coastal communities, 2010–2013. 463
Figure 9-5.–Per capita harvests by category, Eek, Tuntutuliak, Bethel, and other lower Kuskokwim River communities, 2010–2013. 464
Figure 9-6.–Per capita harvests of salmon species, lower Kuskokwim River communities, 2010–2013..464
Figure 9-7.–Per capita harvests of salmon and nonsalmon fish used for dog food, lower Kuskokwim River communities, 2010–2013. 465
Figure 9-8.–Per capita harvests by category, Pilot Station and other lower Yukon River communities, 2008, 2010, 2011, and 2013. 466
Figure 9-9.–Per capita harvests by category, Shageluk and other middle Yukon River communities, 2010, 2011, and 2013. 467

LIST OF PLATES

Plates

Plate 3-1.–Looking north from the Askinuk Mountains towards Scammon Bay with the subarctic plain of the Yukon-Kuskokwim Delta in the background, February 2013. 25
Plate 4-1.–Quinhagak in April 2014. The school complex can be seen on the far right.................101
Plate 4-2.–Quinhagak children ice fishing on the Kanektok River near the wind farm. 103
Plate 4-3.–(Clockwise from left) Cleaning trout, cutting trout, trout heads and strips, drying trout..... 126
Plate 4-4.–Cutting freshly-harvested seal. 135
Plate 4-5.–Dried marine mammal strips. 136
Plate 4-6.–Making seal oil. 137
Plate 4-7.–Carver Paul Bebee sawing an ivory blank to make jewelry. 138
Plate 4-8.–Carver Paul Bebee making jewelry from mammoth ivory. 139
Plate 4-9.–Murre egg wall art 141
Plate 4-10.–Dried caiggluk (stinkweed) to be processed and used as medicine. 143
Plate 4-12.–Processing Hudson's Bay tea by boiling it in water. 143
Plate 4-11.–Dried Hudson's Bay tea before processing. 143
Plate 4-13.–Paulinee Bebee displaying a current grass basked project and a photograph of herself as a young woman with grass baskets. 144
Plate 4-14.–A photograph of Pauline Bebee as a young woman with 3 grass baskets that she made... 144
Plate 4-15.–A small cargo sled carrying freshly-harvested seal from Kuskokwim Bay.................153
Plate 4-16.–Making frybread dough to supplement subsistence foods...156
Plate 4-17.–Sunset over Kuskokwim Bay. 178
Plate 5-1.–Eek and surrounding landscape. 180
Plate 5-2.–Red meat drying in May, in front of the open water of the bay. 181
Plate 5-3.–Drying racks on the Eek River. 200
Plate 5-4.–Murre eggs and hot dogs. 213
Plate 5-5.–Picking Pallas buttercup (kapuukar) in spring. 216
Plate 6-1.–Aerial view of Tuntutuliak looking south. The blue building on the left is the school. .248
Plate 6-2.–Summer fish camp. 250
Plate 6-3.–Cutting salmon. 266
Plate 6-4.–Spring harvest of cow parsnip. 283
Plate 7-1.–An aerial photo taken in April 2014 shows the colorful houses of Pilot Station and the boreal forest that surrounds the community. 313
Plate 7-2.–Edgar Frances with dance mask at Pilot Station. Steve McCutcheon Collection,

University of Alaska Anchorage Museum. 314
Plate 7-3.–Downtown Pilot Station. Most houses in Pilot Station were colorfully repainted by high school students. 315
Plate 7-4.–Division of Subsistence staff ride with a respondent on the frozen Yukon River in April 2014. By snowmachine, travel to the burbot trap took less than 30 minutes. 342
Plate 7-5.–Pilot Station men clear ice from above a burbot trap and prepare to pull the trap to the surface with corner poles. 343
Plate 7-6.–Live burbot are struck and killed on the ice and then divided among the men. Each catch is widely distributed throughout the community. 343
Plate 8-1.–Photo of Shageluk taken from the hills near town while facing northwest. 385

ABSTRACT

As part of the Donlin Gold Subsistence Research Program, this report summarizes household survey and ethnographic research documenting the 2013 harvests and uses of wild foods in 6 Yukon and Kuskokwim River area communities: Quinhagak, Eek, Tuntutuliak, Shageluk, Pilot Station, and Scammon Bay. Surveys recorded the types and harvest amounts of wild foods that responding households used for subsistence. Salmon, nonsalmon fish, and large land mammals composed the majority of wild food harvests by edible weight in 2013 for all study communities. A portion of subsistence harvests by residents of the communities of Quinhagak, Scammon Bay, Eek, and Tuntutuliak also included marine mammals. Survey results also recorded geographic areas where respondents searched for and harvested wild food resources and the ways in which households used these foods. Community residents searched for and harvested subsistence resources over a large portion of the Yukon-Kuskokwim Delta and coastal Bering Sea, as well as adjacent areas of the Yukon and Kuskokwim river drainages. Many respondents shared resources with other households, both within and outside their communities. In ethnographic interviews, key respondents shared their knowledge and experiences related to their harvests and uses of subsistence foods. Information discussed in ethnographic interviews included patterns of seasonal harvests of wild resources, methods of harvesting and processing subsistence foods, land use patterns, and concerns regarding the health and management of fish and wildlife populations. The results of the 2013 harvest survey and ethnographic research provide information that will assist agencies in understanding the ways in which subsistence resources are used within the study region. Descriptions of community harvest amounts, demographic information, harvest areas, food security, wild food sharing, cash income, and employment all contribute to a broader understanding of natural resource uses and the economy of Western Alaska.

Key words: Bering Sea coast, Chinook salmon, chum salmon, coho salmon, demography, Donlin Creek, Donlin Gold, Eek, employment, food security, furbearers, harvest area, income, Innoko River, Kuskokwim Bay, Kuskokwim River, large land mammals, marine fishes, marine invertebrates, marine mammals, migratory birds, nonsalmon fishes, Pacific salmon, Pilot Station, population estimates, Quinhagak, Scammon Bay, seasonal round, Shageluk, small land mammals, social network analysis, subsistence fishing, subsistence hunting, trapping, Tuntutuliak, Yukon River, vegetation

1. INTRODUCTION

Hiroko Ikuta, Caroline L. Brown, James J. Simon, David M. Runfola, and Andrew R. Brenner

This report summarizes the results of research conducted in 2014 (study year 2013) on the subsistence harvest and uses of wild foods in 6 communities in the Yukon-Kuskokwim (Y-K) Delta and lower-middle Yukon: Quinhagak on Kuskokwim Bay, Eek and Tuntutuliak on the lower Kuskokwim River; Pilot Station and Shageluk on the Yukon River; and Scammon Bay on the Bering Sea coast (Figure 1-1). This is the fourth and final phase of comprehensive subsistence surveys funded by Donlin Gold LLC that Alaska Department of Fish and Game (ADF&G) Division of Subsistence has conducted in the Y-K Delta since 2010. Phase One in 2010 (study year 2009) included 8 Central Kuskokwim River communities: Lower Kalskag, Upper Kalskag, Aniak, Chuathbaluk, Crooked Creek, Red Devil, Sleetmute, and Stony River (Brown et al. 2012); Phase Two in 2011 (study year 2010) included 6 Kuskokwim River communities: Akiak, Kwethluk, Oscarville, and Tuluksak on the lower river and Georgetown and Napaimute on the middle river (Brown et al. 2013). Phase Three in 2012 (study year 2011) included 8 Kuskokwim and Yukon river communities: Napakiak, Napaskiak, McGrath, Takotna, Nikolai, Russian Mission, Anvik, and Grayling (Ikuta et al. 2014).

Residents living in communities in the Yukon-Kuskokwim (Y-K) Delta and lower-middle Yukon River rely substantially on subsistence hunting, fishing, and gathering for nutrition and to support their customary and traditional ways of life. Subsistence harvests of wild foods along the Kuskokwim River drainage and Yukon River are taken from diverse ecosystems and habitats, from the marine environments of the coastal regions to the boreal forests of Interior Alaska. People harvest and use a variety of resources, including, but not limited to, moose, caribou, salmon, whitefishes, northern pike, burbot, geese, ducks, berries, and greens (Table 1-1). Harvest amounts and species harvested vary from community to community and may also fluctuate through time in response to varied circumstances such as species availability, regulations, socioeconomic factors (e.g., cost of fuel), personal tastes, and many others.

Harvest data for the comprehensive subsistence survey projects listed above, except Georgetown and Napaimute[1], are available online at the Community Subsistence Information System (CSIS) website maintained by the ADF&G Division of Subsistence. [2] ADF&G has also produced annual salmon harvest estimates by community, based on fish rack or household surveys, since 1960. Other harvest data, primarily for large game, exist in the hunter-harvest database maintained by ADF&G (WinfoNet).[3] However, because of the remoteness of many communities and of lack of outreach regarding reporting requirements, WinfoNet often fails to capture a significant component of the harvest, especially in rural Alaska (Andersen and Alexander 1992; Schmidt and Chapin 2014).

This study represents a significant contribution to the available data on the harvest and uses of subsistence foods in the Kuskokwim Bay community of Quinhagak, the 2 lower Kuskokwim River communities of Eek and Tuntutuliak, the 2 Yukon River communities of Pilot Station and Shageluk, and the Bering Sea coastal community of Scammon Bay. Community support for this harvest documentation effort was strong: the tribal councils in each of the 6 communities were contacted and approved the research in their respective communities. Indeed, many residents had long been calling for increased data collection to corroborate their own observations of hunting and fishing trends. This harvest documentation program relied on the

---

1. Because all known Georgetown tribal members and all Napaimute community members except 1 individual were permanent residents of other communities during the study year, survey results from Georgetown and Napaimute are not included in the Division of Subsistence Community Subsistence Information System (CSIS).

2. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." http://www.adfg.alaska.gov/sb/CSIS. Hereafter referred to as ADF&G CSIS.

3. WinfoNet is ADF&G Division of Wildlife Conservation's intranet website. The site provides a wide variety of tools to allow users to access, update, and download different kinds of data, including wildlife harvest data.

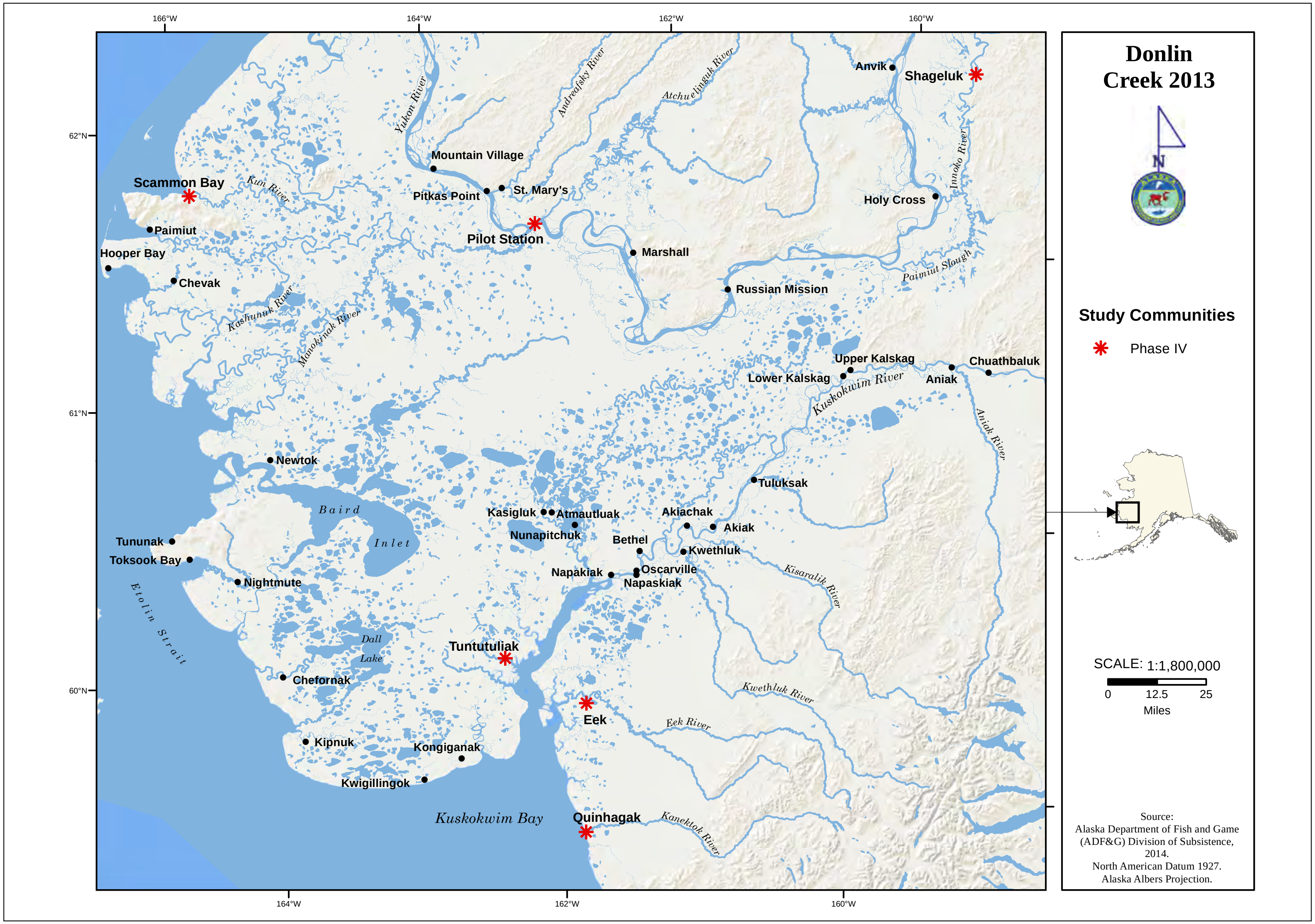


Figure 1-1.–Study communities of the Donlin Gold Subsistence Research Program, 2013.

Table 1-1.–Resources used by study communities, 2013.

Resource	Scientific name
Chum salmon	*Oncorhynchus keta*
Summer chum salmon	*Oncorhynchus keta*
Fall chum salmon	*Oncorhynchus keta*
Unknown chum salmon	*Oncorhynchus keta*
Coho salmon	*Oncorhynchus kisutch*
Chinook salmon	*Oncorhynchus tshawytscha*
Pink salmon	*Oncorhynchus gorbuscha*
Sockeye salmon	*Oncorhynchus nerka*
Unknown salmon	*Oncorhynchus spp.*
Pacific herring	*Clupea pallasi*
Pacific herring roe	*Clupea pallasi*
Smelt	
Eulachon (hooligan, candlefish)	*Thaleichthys pacificus*
Pacific (gray) cod	*Gadus macrocephalus*
Pacific tomcod	*Microgadus proximus*
Saffron cod	*Eleginus gracilis*
Walleye pollock (whiting)	*Theragra chalcogramma*
Flounder	
Pacific halibut	*Hippoglossus stenolepis*
Arctic lamprey	*Lampetra spp.*
Rockfish	
Sculpin	
Stickleback (needlefish)	
Alaska blackfish	*Dallia pectoralis*
Burbot	*Lota lota*
Char	*Salvelinus spp.*
Arctic char	*Salvelinus alpinus*
Brook trout	*Salvelinus fontinalis*
Dolly Varden	*Salvelinus malma*
Lake trout	*Salvelinus namaycush*
Unknown char	*Salvelinus spp.*
Arctic grayling	*Thymallus arcticus*
Northern pike	*Esox lucius*
Sheefish	*Stenodus leucichthys*
Longnose sucker	*Catostomus catostomus*
Rainbow trout	*Oncorhynchus mykiss*
Unknown trout	
Broad whitefish	*Coregonus nasus*
Bering cisco	*Coregonus laurettae*
Least cisco	*Coregonus sardinella*
Unknown cisco	*Coregonus spp.*
Humpback whitefish	*Coregonus pidschian*
Round whitefish	*Prosopium cylindraceum*
Unknown whitefishes	
Bison	*Bison bison*
Black bear	*Ursus americanus*
Brown bear	*Ursus arctos*
Caribou	*Rangifer tarandus*
Moose	*Alces alces*
Muskox	*Ovibos moschatus*
Dall sheep	*Ovis dalli*
Beaver	*Castor canadensis*
Coyote	*Canis latrans*
Arctic fox	*Vulpes lagopus*
Red fox	*Vulpes vulpes*

-continued-

Table 1-1.–Page 2 of 4.

Resource	Scientific name
Snowshoe hare	*Lepus americanus*
Alaska hare	*Lepus othus*
River (land) otter	*Lontra canadensis*
Lynx	*Lynx canadensis*
Marmot	*Marmota spp.*
Marten	*Martes spp.*
Mink	*Neovison vison*
Muskrat	*Ondatra zibethicus*
Porcupine	*Erethizon dorsatum*
Arctic ground (parka) squirrel	*Spermophilus parryii*
Weasel	*Mustela spp.*
Gray wolf	*Canis lupus*
Wolverine	*Gulo gulo*
Reindeer–feral	
Bearded seal	*Erignathus barbatus*
Harbor seal	*Phoca vitulina*
Ribbon seal	*Histriophoca fasciata*
Ringed seal	*Histriophoca fasciata*
Spotted seal	*Phoca largha*
Unknown seal oil	
Unknown seal	
Walrus	*Odobenus rosmarus*
Beluga whale	*Delphinapterus leucas*
Bowhead whale	*Balaena mysticetus*
Unknown marine mammals	
Bufflehead	*Bucephala albeola*
Canvasback	*Aythya valisineria*
Common eider	*Somateria mollissima*
King eider	*Somateria spectabilis*
Spectacled eider	*Somateria fischeri*
Steller's eider	*Polysticta stelleri*
Unknown eider	
Gadwall	*Anas strepera*
Goldeneye	*Bucephala spp.*
Harlequin duck	*Histrionicus histrionticus*
Mallard	*Anas platyrhynchos*
Common merganser	*Mergus merganser*
Red-breasted merganser	*Mergus serrator*
Unknown merganser	*Mergus spp.*
Long-tailed duck	*Clangula hyemalis*
Northern pintail	*Anas acuta*
Scaup	*Aythya spp.*
Black scoter	*Melanitta nigra*
Surf scoter	*Melanitta perspicillata*
White-winged scoter	*Melanitta fusca*
Northern shoveler	*Anas clypeata*
Teal	*Anas spp.*
Green-winged teal	*Anas crecca*
American wigeon	*Anas americana*
Unknown ducks	
Brant	*Branta bernicla*
Cackling goose	*Branta hutchinsii minima*
Canada goose	*Branta canadensis parvipes*

-continued-

Table 1-1.–Page 3 of 4.

Resource	Scientific name
Emperor goose	*Chen canagica*
Snow goose	*Chen caerulescens*
White-fronted goose	*Anser albifrons*
Unknown geese	
Tundra (whistling) swan	*Cygnus columbianus*
Sandhill crane	*Grus canadensis*
Shorebirds	
Whimbrel	*Numenius phaeopus*
Seabirds, loons, grebes	
Loon	*Gavia spp.*
Unknown seabirds	
Grouse	
Spruce grouse	*Falcipennis canadensis*
Sharp-tailed grouse	*Tympanuchus phasianellus*
Ruffed grouse	*Bonasa umbellus*
Ptarmigan	*Lagopus spp.*
Snowy owl	*Bubo scandiacus*
Duck eggs	
Goose eggs	
Swan eggs	*Cygnus spp.*
Crane eggs	*Grus spp.*
Sandhill crane eggs	*Grus canadensis*
Common snipe eggs	*Gallinago gallinago*
Plover eggs	
Whimbrel eggs	*Numenius phaeopus*
Godwit eggs	*Limosa spp.*
Unknown shorebird eggs	
Unknown small shorebird eggs	
Gull eggs	
Loon eggs	*Gavia spp.*
Murre eggs	*Uria spp.*
Tern eggs	
Unknown seabird eggs	
Ptarmigan eggs	*Lagopus spp.*
Unknown eggs	
Clams	
King crab	
Tanner crab	*Chionoecetes spp.*
Unknown crab	
Mussels	*Mytilus spp.*
Shrimp	
Unknown marine invertebrates	
Blueberry	*Vaccinium uliginosum alpinum*
Lowbush cranberry	*Vaccinum vitis-idaea minus*
Highbush cranberry	*Viburnum edule*
Crowberry	*Empetrum nigrum*
Currants	*Ribes spp.*
Cloudberry	*Rubus chamaemorus*
Nagoonberry	*Rubus arcticus spp.*
Raspberry	*Rubus idaeus*
Bearberry	*Uva ursi*
Elderberry	*Sambucus racemosa*
Huckleberry	*Vaccinium parvifolium*
Salmonberry	*Rubus spectabilis*
Strawberry	*Fragaria virginiana*
Other wild berry	

-continued-

Table 1-1.–Page 4 of 4.

Resource	Scientific name
Wild rhubarb	*Polygonum alaskanum*
Eskimo potato	*Hedysarum alpinum*
Other beach greens	
Fiddlehead ferns	
Nettle	*Urtica spp.*
Fireweed	*Epilobium angustifolium*
Stinkweed	*Artemisia tilesii*
Hudson's Bay (Labrador) tea	*Ledum palustre*
Sourdock	*Rumex fenestratus*
Pallas buttercup	*Ranunculus Pallasii*
Spruce tips	*Picea spp.*
Willow leaves	*Salix spp.*
Wild celery	*Angelica lucida*
Beach rye grass	*Lolium spp.*
Wild parsley	*Pastinaca sativa*
Wild rose hips	*Rosa acicularis*
Yarrow	*Achillea spp.*
Spruce tips	*Picea spp.*
Other wild greens	
Unknown mushrooms	
Punk	
Puffballs	
Mousefoods	
Sea chickweed	*Stellaria spp.*
Beach asparagus	*Salicornia virginica*
Unknown vegetation	
Devils club	*Echinopanax horridum*
Sorrel	*Rumex spp.*
Plantain	*Plantago major*
Chaga	*Inonotus I. obliquus*
Wood	

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

public support of the residents of the Y-K Delta and lower-middle Yukon and the cooperating organizations, as well as on the continued financial support of Donlin Gold Limited Liability Corporation.

Background

A variety of political boundaries are found in the Y-K Delta, including areas served by Alaska Native corporations and nonprofit Alaska Native organizations, state fishing and game management areas, and federal subsistence management areas. The study communities of Quinhagak, Eek, Tuntutuliak, Pilot Station, and Scammon Bay in the Y-K Delta are entirely encompassed by ADF&G Game Management Unit (GMU) 18. They are also served by the federal Yukon-Kuskokwim Delta subsistence management area; and they are further represented by Calista Corporation, the regional for-profit Alaska Native Claims Settlement Act (ANCSA) corporation, and the Association of Village Council Presidents (AVCP), a tribal consortium of 56 Alaska Native communities in the Y-K Delta. The lower-middle Yukon River study community of Shageluk is located in GMU 21. Shageluk is located in the federal Western Interior Alaska subsistence management area; it is also represented by Doyon, Limited, the regional for-profit ANCSA corporation, and the Tanana Chiefs Conference, the regional nonprofit Alaska Native organization. Pilot Station, Scammon Bay, and Shageluk are located in the Yukon Fisheries Management Area. The project areas include both state and federal waters used for subsistence fishing.

Central Yup'ik people have historically occupied the lower Kuskokwim and lower Yukon river areas. In the first decades of the 19th century, at the time of early Russian presence in Western Alaska, Central Yup'ik people inhabited the lower Kuskokwim and lower Yukon river areas. Deg Hit'an Athabascan people inhabited the lower-middle Yukon and central Kuskokwim river areas. Members of both of these broad groups maintained larger winter villages as well as seasonal camps, which were usually occupied by a few families (Brown 1983:156; Nelson 1978; Wheeler 1998). Historically, Deg Hit'an Athabascans inhabited the lower-middle Yukon area around Shageluk as well as the central Kuskokwim area. By the early 1900s the cumulative effects of Christian missionary activities and economic development—primarily in commercial fishing, fur trapping, mining, and transportation—ultimately consolidated these settlements roughly into the permanent communities present along the Kuskokwim and Yukon rivers today. Despite their establishment as permanent communities, these early settlements were still characterized by a long-established pattern of seasonal migrations for the purpose of accessing and obtaining various wild resources. Many contemporary residents still follow seasonal patterns of harvest with the use of modern methods and while maintaining a permanent residence in established communities.

Historically, before river-ice breakup, families typically moved to spring camps to hunt and trap small land mammals, fish for various nonsalmon species, hunt caribou and other big game, and hunt migratory birds. With ice breakup on the mainstems and tributaries of the Kuskokwim and Yukon rivers, families moved to summer fish camps, usually along the mainstem rivers, to fish for and process large quantities of salmon as food for both humans and dogs. In early fall, families traveled to fall camps, which were often the same sites as their spring camps, to fish for nonsalmon species and hunt ducks and geese before moving to winter villages to hunt for moose, caribou, and bears; trap small game; and fish under the ice. Coastal Y-K Delta communities shared this historical pattern of seasonal movement between camps; however, a significant portion of their seasonal round included hunting for walrus, seals, and beluga whales in the sea, both on ice and in open water. These seasonal activities continue, usually based out of the permanent communities, but some summer fish camps are still in operation. To this day, the residents of the Y-K Delta continue to rely heavily on hunting, fishing, and gathering to provide for both their nutritional and their cultural needs.

Regulatory Context in the Y-K Delta and Middle Yukon River Regions

The regulation of hunting and fishing for subsistence practices has a unique history in Alaska. Both state and federal laws provide priorities for customary and traditional subsistence hunting and fishing over other consumptive uses, such as commercial fishing. In 1971, ANCSA extinguished aboriginal hunting and fishing rights. However, recognizing the importance of subsistence as well as the lack of legal protection for Alaska's subsistence traditions, both the Alaska State Legislature and the U.S. Congress subsequently adopted laws intended to preserve opportunities for customary and traditional uses of fish and wildlife in Alaska. In 1978, the Alaska State Legislature implemented priorities for subsistence over other consumptive uses of fish and game, including a subsistence fishing priority under AS 16.05.251(b) and a subsistence hunting priority under AS 16.05.255(b). In 1980, the U.S. Congress adopted a similar subsistence priority in the Alaska National Interest Lands Conservation Act (ANILCA), including a rural priority. Between 1985 and 1992, aspects of Alaska's subsistence statutes—primarily those dealing with the definition of a subsistence user and the role of a priority for rural residents in times of shortage—were amended, such that state and federal subsistence laws became incongruent. Since then, the Alaska Board of Fisheries (BOF) and the Alaska Board of Game (BOG) have managed subsistence on state and private lands following procedures outlined in AS 16.05.258 "Subsistence use and allocation of fish and game," while the Federal Subsistence Board (FSB) has managed subsistence on federal public lands (about 60% of the state) for federally-qualified users in some cases, when the FSB has closed federal public lands and waters to nonfederally-qualified subsistence users.

Other federal regulations provide for the subsistence harvests of specific species. In 1972, the Marine Mammal Protection Act provided that "coastal Alaska Natives" could continue to hunt marine mammals for subsistence uses. In 2003, the US Fish and Wildlife Service, following the guidance of the Alaska Migratory Bird Co-Management Council, adopted regulations establishing spring and summer subsistence hunts for migratory birds by permanent residents of communities within eligible subsistence harvest areas. Also in 2003, the North Pacific Fisheries Management Council adopted regulations recognizing subsistence harvests of Pacific halibut by eligible members of Alaska Native tribes and eligible residents of rural Alaska coastal communities.

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

The regulation of subsistence harvests of fish and wildlife in Alaska is administered by the State of Alaska under Title 5 of the Alaska Administrative Code and by the federal government under Title 50, parts 92 and 100, of the Code of Federal Regulations. The federal government designates the Y-K Delta and lower-middle Yukon River as rural subsistence regions (50 CFR §100.22 and 50 CFR §100.23). All federal subsistence regulations apply to these regions and specify that individuals practicing subsistence harvests of fish and wildlife (beavers, coyotes, foxes, hares, lynx, wolves, wolverines, grouses, and ptarmigans) on federal public lands must be permanent rural residents of the area, or in a limited number of cases simply Alaska rural residents from across the state (50 CFR §100.5). State of Alaska regulations cannot require that subsistence harvesters be only rural residents: all Alaskans are eligible to participate in state subsistence hunting, fishing, and trapping opportunities. Customary and traditional use determinations for subsistence resources are administered by Alaska under AS 16.05.258 and by the federal government under 50 CFR §100.24. Because of their relative importance to the study communities, the next sections focus on regulations of 3 major subsistence resources in the Y-K Delta and lower-middle Yukon areas: salmon, moose, and caribou.

Salmon

Residents in the Y-K Delta harvest 5 species of Pacific salmon for subsistence purposes: Chinook salmon *Oncorhynchus tshawytscha*, chum salmon *O. keta*, coho salmon *O. kisutch*, pink salmon *O. gorbuscha*, and sockeye salmon *O. nerka*. Drift gillnetting, set gillnetting, and hook and line fishing are the primary methods used to harvest salmon, although additional gear types are allowed (5 AAC 01.270). Communities in the Y-K Delta are heavily reliant upon the annual returns of salmon not only for basic nutrition, but also for maintenance of cultural identity and cultural values and for economic opportunities for commercial sales (Andrews and Coffing 1986; Andrews 1989:154; Barker and Barker 1993; Brown et al. 2012, 2013; Coffing 1991; Fienup-Riordan 1990:184, 1995:120, 123; Himmelheber 1987; Ikuta et al. 2014, 2013; Oswalt 1963; Pete 1993; Senecal-Albrecht 1998, 1990; Walker and Coffing 1993; Wolfe et al. 1984).

The subsistence salmon fisheries in the Kuskokwim Management Area (Kuskokwim Area) are some of the largest in the state of Alaska in terms of the number of residents who participate and the number of salmon harvested (Brown et al. 2012, 2013; Fall et al. 2014; Ikuta et al. 2014). Since 1994, when ADF&G began acquiring reasonably complete statewide coverage of subsistence harvest survey data, over 50% of Chinook salmon harvested under subsistence regulations have been taken in the Kuskokwim Area, mostly in the Kuskokwim River drainage. Between 2010 and 2014 (study years 2009–2013), the Division of Subsistence conducted comprehensive subsistence harvest and use surveys in 23 Kuskokwim Area communities. The results indicate that, on average, salmon contribute approximately 40% of the total wild resource harvest (in edible pounds) in the lower Kuskokwim River communities,[4] 60% in middle Kuskokwim River communities,[5] and 41% in upper Kuskokwim River communities[6] (Brown et al. 2012, 2013; Fall et al. 2014;

4. Oscarville, Kwethluk, Akiak, and Tuluksak (Brown et al. 2013, study year 2010), Napakiak, and Napaskiak (Ikuta et al. 2014, study year 2011), Bethel (Ikuta, Hiroko et al. *In prep* Bethel subsistence, 2012: wild resource harvests and uses, land use patterns, and subsistence economy in the hub community of the Yukon–Kuskokwim Delta. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 393, Fairbanks), Tuntutuliak and Eek (study year 2013)

5. Kalskag, Upper Kalskag, Aniak, Chuathbaluk, (Brown et al. 2012, study year 2009)

6. Crooked Creek, Red Devil, Sleetmute, and Stony River (Brown et al. 2012, study year 2009) and McGrath, Nikolai, and Takotna (Ikuta et al. 2014, study year 2012).

Ikuta et al. 2014). Although the study year for this report is 2013, this section describes recent regulatory history in order to provide the most current context of low Chinook salmon abundance and its impacts on the subsistence fishers in the Yukon and Kuskokwim regions.

Recent significant declines in Chinook salmon abundance have caused severe hardship for fisheries-dependent communities in the Y-K Delta. In the Kuskokwim River drainage, ADF&G has not provided directed commercial harvest opportunity for Chinook salmon since 1987 and has imposed significant restrictions on the subsistence fishery since 2010. In 2012, a poor Chinook salmon run and 35 days of subsistence fishing closures resulted in harvests of Chinook salmon that were approximately 70% below the previous 10-year average. As a result of historically low Chinook salmon returns in 2012 and their effects on subsistence and commercial salmon fishing in the area, the U.S. Department of Commerce declared a fishery resource disaster for Kuskokwim River Chinook salmon on September 13, 2012 (Blank 2012). Due to relatively unrestricted subsistence salmon fishing in 2013, Chinook salmon harvests increased significantly compared to 2012, but still ranked well below the 10-year average harvest. Additionally, 2013 Chinook salmon escapements at tributary weirs were the lowest on record at all sites (Tiernan and Poetter 2015), and the total escapement of Chinook salmon in the Kuskokwim River was estimated at 40,956 fish (Hamazaki and Liller 2015). This was significantly less than the lower bound of the sustainable escapement goal of 65,000 to 120,000 Chinook salmon (Tiernan and Poetter 2015) .

In the Yukon River drainage, the Chinook salmon run initially failed to produce expected returns in 2000 and has yet to fully rebound to pre-2000 numbers. As a result, the State of Alaska Board of Fisheries designated Chinook salmon as a stock of yield concern in 2000. The federal government declared an economic disaster for Yukon River drainage communities because of the extremely low run of Chinook salmon during the 2009 fishing season, and again in 2012. The department has not provided a directed commercial harvest opportunity for Chinook salmon in the Yukon River since 2008, and it placed restrictions on the subsistence fishery 2008–2009 and 2011–2015. In 2014, the region's salmon fishers experienced the lowest subsistence harvest on record due in part to increased restrictions on subsistence fishing. The efforts of the management agencies and Yukon River residents helped to achieve border passage obligations outlined in the Pacific Salmon Treaty in 2014, which previously had not been met in 5 of the last 11 years (2007, 2008, 2010, 2012, and 2013).

Regulatory authority for Kuskokwim and Yukon drainages salmon management is shared by the Federal Subsistence Board (FSB) and the State of Alaska Board of Fisheries (BOF). On the Kuskokwim River, ADF&G is responsible for implementing regulations in accordance with the Kuskokwim River Salmon Management Plan (5 AAC 07.365) and also has inseason discretionary management authority of salmon in Alaska navigable waters. Waters of the lower Kuskokwim River are largely within or adjacent to federal public lands, namely the Yukon Delta National Wildlife Refuge. As such, the U.S. Fish and Wildlife Service (USFWS) shares inseason subsistence fishing management decision-making with ADF&G. USFWS holds final decision-making authority over management of salmon in these waters only in the event that the federal subsistence program determines that all nonfederally-qualified subsistence uses must be eliminated in order to meet the federal subsistence priority. The Kuskokwim River Salmon Management Working Group (KRSMWG), established in the 1980s and endorsed by the Alaska Board of Fisheries, is composed of knowledgeable stakeholders representing communities throughout the Kuskokwim River drainage, commercial processors, and sport fisheries, as well as an ADF&G management biologist. The working group advises state and federal managers through an established process and is a primary public forum through which management decisions are discussed regarding Kuskokwim River subsistence, commercial, and sport salmon fisheries (Smith and Linderman Jr. 2008:1). On the Yukon River, ADF&G is responsible for implementing regulations in accordance with multiple species- and tributary-specific management plans (5 AAC 05.360, 5 AAC 05.362, 5 AAC 05.365, 5 AAC 05.367, 5 AAC 05.368, 5 AAC 05.369) and also has inseason discretionary management authority over salmon in Alaska navigable waters. The same dual federal-state regulatory structures are in place on the Yukon River as on the Kuskokwim River. However, Yukon River salmon fisheries are also managed in accordance with the Pacific Salmon Treaty. The Yukon River Panel, a board of appointed members from both Alaska and Canada, meets twice a year to negotiate annual aspects of the treaty, such as escapement goals and border passage goals, and to approve funding of scientific research addressing salmon biology and use patterns.

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

Alaska Statute 16.05.258, "Subsistence use and allocation of fish and game," establishes the subsistence use priority (above sport, commercial, and personal uses) when resources are not abundant enough to provide for all consumptive uses while remaining in accordance with principles of sustained yield. Subsistence uses protected by the subsistence priority are those practices identified as customary and traditional practices as determined by the BOF, in the case of fisheries. In 1993, the BOF made positive findings for customary and traditional uses of all salmon species in the entire Kuskokwim Area (5 AAC 01.250)[7] and the Yukon Area (5 AAC 01.200).[8] As part of these findings, the BOF then determined the amount reasonably necessary for subsistence (ANS) in these respective areas as one means to gauge whether regulations provide reasonable opportunities for subsistence uses. Based on historical harvest information, an ANS of 192,000–242,000 individual fish for salmon of all species in the Kuskokwim Area was determined (5 AAC 01.286). For the Yukon Area, the BOF set the ANS at 348,000–503,000 fish for all salmon species.

In 2001, the BOF amended these ANS ranges for both rivers using subsistence harvest data from the years 1990 to 1999. After reviewing various options, the BOF made new customary and traditional use and ANS findings for the Kuskokwim and Yukon areas by species. In January 2013, the board again reconsidered ANS ranges by species for each river system. The current ANS ranges for salmon in the Kuskokwim River drainage, determined by the BOF in 2013, are as follows: 67,200–109,800 Chinook salmon; 41,200–116,400 chum salmon; 32,200–58,700 sockeye salmon; 27,400–57,600 coho salmon; and 500–2,000 pink salmon; in districts 4 and 5 combined: 6,900–17,000 salmon; and in the reminder of the Kuskokwim Area: 12,500–14,400 salmon (5 AAC 01.286).

The BOF chose not to change ANS ranges for Yukon River salmon species in 2013, with the exception of adding an ANS for pink salmon. As such, the current ANS ranges for salmon in the Yukon River drainage are 45,500–66,704 Chinook salmon; 83,500–142,192 summer chum salmon; 89,500–167,900 fall chum salmon, 20,500–51,980 coho salmon, and 2,100–9,700 pink salmon (5 AAC 01.236).

Subsistence harvest of Pacific salmon species in the Kuskokwim River is allowed without a permit (5 AAC 01.280) and with no closed season (5 AAC 01.260) unless otherwise noted for conservation purposes or subsistence fishing closure immediately before, during, and after commercial fishing periods (5 AAC 01.260). Alaska law allows a variety of gear types to be used in the Kuskokwim River for subsistence salmon fishing, including gillnet, beach seine, hook and line attached a rod or pole, handline, and fish wheel (5 AAC 01.270). There are no bag or possession limits for subsistence salmon harvests in the Kuskokwim River, except for a limit of 2 Chinook salmon when subsistence fishing with a hook and line attached to a rod or pole in a portion of the Aniak River drainage (5 AAC 01.295). Federal regulation of all subsistence fish harvests in Alaska federal public lands and waterways are administered under 50 CFR §100.27: "for the Kuskokwim area, subsistence fishing schedules, openings, closings, and methods are the same as those issued for the subsistence taking of fish under Alaska Statutes (AS 16.05.060), unless superseded by a Federal Special Action" (50 CFR §100.27 (4ii)).

---

7. The Kuskokwim Area includes the Kuskokwim River drainage, all waters of Alaska that flow into the Bering Sea between Cape Newenham and the Naskonat Peninsula, and Nunivak and St. Matthew islands. Thirty-eight communities are located within this area.

8. The Yukon Area includes all waters of Alaska between the latitude of Point Romanof and the latitude of the westernmost point of the Naskonat Peninsula, including those waters draining into the Bering Sea.

Subsistence harvest of Pacific salmon species in the Yukon River is allowed without a permit except for a few locations, most of which are accessible by road (5 AAC 01.230). Fishing in the Yukon Area is allowed at any time with the exceptions of those times outlined in 5 AAC 01.210 and 5 AAC 05.360 and unless otherwise noted for conservation purposes. Alaska law allows a variety of gear types to be used in the Yukon River drainage for subsistence salmon fishing and includes specifications regarding the use of gillnets and fish wheels (5 AAC 01.220). There are no federal or state bag possession limits for subsistence salmon harvests in the Yukon River, with the exception of subdistricts 6A and 6B on the Tanana River (5 AAC 01.230 (3)(4)).

By regulation, the subsistence salmon fishing season is open unless a subsistence fishing schedule closure is implemented. If closures to the fishery are necessary, they are implemented by emergency order prior to, during, and after commercial fishing periods, or closures to the fishery are implemented by emergency order for conservation purposes (see 5 AAC 01.260, and 5 AAC 07.365 for the Kuskokwim and 5 AAC 01.310, 5 AAC 05.360, and 5 AAC 05.367 for the Yukon River). In the Kuskokwim River, a subsistence fishing schedule with periodic fishing closures (openings between these closures were often referred to as "windows" or "openers") was implemented from 2001–2006 and has since been discontinued (5 AAC 07.365). In the Yukon River, a windows schedule was implemented by the Board in 2001 and remains in place. Fall et al. (2013) describe these windows by district.

In 2013, the BOF implemented additional regulatory changes for both areas. The State of Alaska adopted sustainable escapement goal ranges for Kuskokwim River Chinook salmon as follows: 65,000–120,000 drainagewide; 4,100–7,500 in the Kwethluk River; 4,800–8,800 in the Kogrukluk River; and 1,800–3,300 in the George River (Elison 2013). The BOF also updated the Kuskokwim River Salmon Management Plan (5 AAC 07.365) to include several major changes: 1) management of the Chinook salmon fishery will be based on preseason and in-season escapement projections; and 2) when the projected escapement of Chinook salmon is within the drainage-wide escapement goal range, harvest opportunity might be limited or liberalized depending on available surplus. If there is limited surplus, a fishing period may open during which Chinook salmon may only be taken by individuals 60 years of age or older. When it is necessary to conserve Chinook salmon, the subsistence fishery may be restricted to gillnets with a mesh size of 4 in or less until sockeye and chum salmon abundance exceeds Chinook salmon abundance.

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

Moose

The history of moose hunting regulations throughout GMU 18 has been dynamic and often restrictive, largely due to variability in the abundance and distribution of the region's moose population. From 1960 through the 2003–2004 regulatory year, hunters were permitted to harvest 1 bull moose under general hunt provisions throughout most of GMU 18.[9] During this period, heavy hunting pressure in the lower Kuskokwim River area limited moose population growth locally (Perry 2012). By 2003, ADF&G, in conjunction with the BOG, identified moose population growth in the lower Kuskokwim River area as a primary management goal. Therefore, beginning in the 2004–2005 regulatory year, and based upon

9. In the lowest Yukon River region, downstream of Mountain Village, the BOG established a moose hunting moratorium from the 1988–1989 regulatory year through the 1993–1994 regulatory year. The purpose of the moratorium was to allow for colonization of moose population into the area.

broad stakeholder support, the BOG established a moratorium on moose hunting in the lower Kuskokwim River drainage roughly extending from the boundary with GMU 19. This moratorium continued until the 2009–2010 regulatory year, when ADF&G administered a registration permit hunt for the same area with a quota of 75 bull moose, which was to be closed by emergency order once hunters reached the quota. In the 2011–2012 regulatory year, ADF&G increased this quota to 100 bull moose; the quota was continued in the 2012–2013 and 2013–2014 regulatory years (Simon et al. 2016:41–45).[10] Although there are other opportunities for residents to harvest moose in GMU 18, including a winter hunt for any moose in the lower Yukon River region, accessing these areas from communities of the lower Kuskokwim River area often requires long-distance travel by snowmachine.

The moose population in the portion of the Yukon River drainage within GMU 18 has increased during the previous 2 decades, resulting in progressively less restrictive hunting opportunities in comparison to regulations of previous years. The most restrictive regulations occurred from the 1988–1989 hunting season through the 1993–1994 hunting season, during which time the department had instituted a moratorium on moose hunting in the lowest Yukon River area (i.e., the portion of the drainage downstream of Mountain Village; Simon et al. 2016:41–45). Moose hunting under state regulations for the area was reinstituted during the 1994–1995 hunting season due to increased moose population densities.[11] From 1995 to the present, the department has lengthened hunting seasons and increased bag limits for the lowest Yukon area (Simon et al. 2016:41–45). During the study year of 2013 in the lowest Yukon River area, hunters were permitted to take 2 moose from August 1 through September 30 or 2 antlerless moose from October 1 through February 28. In the same year in the Yukon River drainage from approximately Russian Mission to Mountain Village, hunters were permitted to take 1 antlered bull during a late summer to early fall season or 1 moose during a winter season.

In GMU 21E, where Shageluk is situated, and GMU 21A (upper Innoko River), state regulations allow residents to harvest 1 antlered bull between September 5–25 on a harvest ticket. Additional federal hunts in GMU 21A are open from August 20 through September 25 and November 1–30 for 1 bull (50 CFR §100.26). Moose populations in Units 21A and 21E appear to be stable (Peirce 2014). The biologists observed high bull to cow ratios and a twinning rate of 37% on the lower Innoko River in Unit 21E, indicating that habitat was not limiting the moose population. In summary, variable moose densities in different parts of Interior Alaska and the Yukon River Delta have led to very different hunt structures.

Caribou

Caribou hunting regulations for GMU 18 varied considerably between 1960 and the 1990s (Simon et al. 2016: 35–40). A registration permit hunt was ended in the 1997–1998 regulatory year, and from then through the 2005–2006 regulatory year, hunters were allowed to harvest 5 caribou per year in GMU 18 south of the Yukon River under general harvest regulations. The caribou bag limit for all of GMU 18 was decreased to 3 caribou per year in the 2006–2007 regulatory year and to 2 caribou per year the following season, where it remained through the 2012–2013 regulatory year. The federal subsistence hunting regulations on federal public lands in GMU 18 are now the same as State of Alaska hunting regulations for the region; however, only federally-qualified subsistence hunters are permitted to hunt caribou under these regulations on federal public lands in GMU 18. Federally-recognized subsistence hunters residing in the lower Kuskokwim River area likely harvest a significant portion of the Mulchatna caribou herd, particularly during winter (Perry 2013). The Mulchatna caribou herd, a portion of which winters south of the Kuskokwim River, is under intensive management to increase its population.

In the 1990s, caribou from the Western Arctic and the Mulchatna herds extended into the Andreafsky Mountains and Nulato Hills and into the lower Kuskokwim River area southwest of the river in the Kilbuck Mountains, respectively, and within hunting range of people from GMU 21E, including Shageluk (Seavoy

10. P. Perry, Area Biologist, personal communication, January 28 and 29, 2016.

11. Alaska Board of Game, November 2003, Record Copy 2, staff comments on Proposals 1 and 2 pertaining to GMU 18 moose on the lower Yukon River and the initiation of the moose hunting moratorium in the lower Kuskokwim River portion of GMU 18.

2011:116–117). By the late 1990s, however, the caribou population significantly declined in the region (Simon 2016). In 2013, under both the state and federal regulations, a hunter can harvest 1 caribou through a harvest ticket between August 10 and September 30 (Simon et al. 2016:35–40).

Research Questions

The principal questions addressed by the Donlin Gold Subsistence Research Program were how much wild foods were harvested for subsistence and how these foods were distributed within and between communities. The answers to these questions provide baseline information about the contemporary subsistence uses of fish, wildlife, and plant resources in Quinhagak on the Kuskokwim Bay, Eek, and Tuntutuliak on the lower Kuskokwim River, Pilot Station and Shageluk in the Yukon River region, and Scammon Bay on the Bering Sea coast. Related questions involved the role of wild foods in the region's economy, the role of cash in subsistence economies, the lands and waters used for subsistence practices in the Kuskokwim and Yukon river drainages, the impacts of competition with other users, the role of nonsubsistence uses of fish and wildlife, the sharing distribution networks for subsistence foods within and between communities, assessments of harvests over time, and the impacts of climate or other environmental changes.

Fish stocks and wildlife populations in the study areas of the Kuskokwim and Yukon river regions, although variable over time, were considered healthy at the time of the study, with the exception of Chinook salmon. As of 2009, both the BOF and the BOG had found that harvestable surpluses of all fish and wildlife species were sufficient to provide the amounts reasonably necessary for subsistence uses and to provide for most other nonsubsistence uses, with the notable exceptions of Chinook salmon throughout the Kuskokwim and Yukon rivers and moose in part of GMU 18.

The management of fish and wildlife resources is complicated by a variety of interrelated factors. Supplies of and demand for fish and wildlife change over time, sometimes dramatically and rapidly. To allocate fish and wildlife sustainably, regulatory bodies need periodic harvest data over time that can account for normal variations in harvests, which for some species can mean decades of research. Matters are further complicated by environmental changes, proposed and occurring resource extraction, and industrial development, all of which could potentially affect renewable natural resources. Large-scale development could also affect social and economic systems by providing increased employment and other income to residents of the regions as well as the potential for increased numbers of people utilizing these areas for hunting, fishing, trapping, gathering, and other activities.

The dynamic environment and economy of rural Alaska has created a need for frequently updated information about subsistence harvests, demographics, employment, and income for the region as a whole, and especially for communities adjacent to proposed developments. In order of increasing scope, research topics have included managing species where demand exceeds supply, sustainably allocating species among competing uses, documenting subsistence economies, assessing and mitigating the effects of development, and monitoring long-term ecological conditions. To improve documentation of Alaska's subsistence economy, policymakers need substantially complete estimates of harvests and better descriptions of subsistence socioeconomic systems. To assess impacts or to monitor long-term changes, investigators need an initial comprehensive survey to collect baseline subsistence harvest, social, and economic data. They also need post-impact surveys to measure changes and assess impacts.

Impact assessment and ecological monitoring are more complex than harvest monitoring because the nature and scope of potential effects and the course of human adaptations are not known in advance. For example, residents of Western Alaska might adapt to persistent and adverse changes in moose populations by increasing subsistence salmon harvests or by purchasing imported foods. The latter adaptation would imply an increased reliance on wage labor or on transfer payments. Fully evaluating the effects of changes in moose populations would require information on moose populations and health, moose harvests, moose harvest locations, the harvests of other species, employment, wages, other types of income, and perhaps household spending patterns. Thus, impact assessment and ecological monitoring require a greater range of data than basic harvest assessment.

Study Objectives

The objectives of this harvest assessment project were to:

- estimate subsistence harvests and uses of wild fish, game, and plant resources in a 12-month study year (2013);
- map areas used for hunting, fishing, and gathering during the study year;
- produce historical use area maps for subsistence hunting, fishing, and gathering;
- collect demographic information about each community, including population size and composition, ethnicity, birthplace, and length of residency in the study community;
- record residents' occupations, industries, months of employment, and amounts and sources of earned and unearned income;
- evaluate trends in subsistence harvests;
- document traditional knowledge observations regarding resources used for subsistence purposes; and
- document local concerns related to subsistence hunting and fishing.

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

Tribal Consultations

A majority of the residents of Western Alaska are Alaska Native people who have maintained the subsistence customs and traditions practiced throughout their ancestors' history. This project intended to build working relationships among state and federal agencies, tribes, communities, nongovernmental organizations, and industries. The ethical conduct of all researchers was guided by the principles of conduct adopted by the Alaska Federation of Natives in 1993 and the Interagency Arctic Research Policy Committee on June 28, 1990. All personnel were directed to work in a manner that developed, rather than jeopardized, relations among the cooperators and between the cooperators and the public.

Rationale and Literature Review

During the past 50 years, ADF&G has used 2 different methods to collect subsistence data in Western Alaska. Both methods—mandatory reporting and voluntary surveys—have had substantial limitations. For big game species such as moose, ADF&G has relied on a system of mandatory harvest reports and permits since statehood. Before hunting, individual hunters must purchase a hunting license and, for selected species, obtain a report or permit that indicates their intent to hunt that species. After hunting, or at the end of the season, hunters are required to mail a postage-paid postcard to ADF&G reporting their efforts and harvest, if any. Andersen and Alexander (1992) found that, on average, this method captured approximately 30% of the moose harvests in Interior Alaska. It has recently been demonstrated that reporting rates in other rural areas of the state are similar to those in the Interior, because the factors that contributed most to these patterns, such as community population size, distance from a road system, presence of a regulatory agent, and community reliance on subsistence foods, are consistent throughout rural Alaska (Schmidt and Chapin 2014).

For comprehensive estimates of subsistence harvests, ADF&G and other researchers have relied on household surveys. However, prior to 2009, these efforts had been minimal in the Y-K Delta and were usually limited to a few years rather than providing longitudinal data sets. Nonetheless, household surveys do collect a wide range of data and are best suited to fulfill the multiple data needs of resource management agencies, regulators, user communities, and industry. Consequently, this program used survey methods.

Reviews of historical harvest data support the policy objective of informing decisions related to amounts reasonably necessary for subsistence uses, with the assumption that a series of harvest data through time should elucidate levels of harvest needed to provide such reasonable opportunities. Historical data are not always available, however, and sometimes harvests are limited by factors other than subsistence demand, so subsistence surveys have also long included a series of harvest assessment questions (e.g., “Did your household get enough salmon last year to meet your needs?”). The following review summarizes the available subsistence harvest literature for Kuskokwim and Yukon river communities.

Early Studies

In the early 1980s, the Division of Subsistence conducted limited research in a number of Western Alaskan communities. Wolfe (1981) conducted a baseline analysis of the subsistence economy and culture in 6 Yukon River delta communities. Although this study included community harvest estimates, sampling methods in this study differed such that comparisons with later studies can only be made with some caution (Wolfe 1981:21–22). The division conducted comprehensive subsistence harvest surveys in Quinhagak in 1982. Harvest information from Quinhagak in 1982 is available online in the CSIS and is also summarized in Wolfe et al. (1984:351–358), although a comprehensive report was not published. The division also documented the subsistence uses of Tuluksak residents including the variety of species used, use areas, seasonality of harvest, and local observations of resource abundance (Andrews and Peterson 1983). This study did not, however, collect quantitative data except for Chinook, sockeye, and chum salmon harvests. In 1983, the Division of Subsistence gathered wild resource harvest and use data as well as ethnographic information in Nunapitchuk for the purpose of documenting subsistence harvest and use patterns and for mapping subsistence harvest and search areas (Andrews 1989). In 1984, the division conducted similar research in Russian Mission (Pete 1991a). In 1986, the division also conducted comprehensive baseline surveys and documented harvest and use patterns, search area maps, and ethnographic data for the residents in Kwethluk (Coffing 1991) and Tununak; information from Tununak was not published in a written report, although harvest information is available online in the CSIS. In the early 1990s, Wheeler (1998) collected baseline estimates of subsistence harvests in the 4 lower-middle Yukon communities of Grayling, Anvik, Shageluk, and Holy Cross. In 1998, Coffing et al. (2001) documented subsistence harvests in Akiachak. In 2008, Holen and Lemons (2010) documented subsistence harvests in Lime Village.

Recent Comprehensive Subsistence Surveys

Since 2009, the Division of Subsistence has conducted comprehensive subsistence surveys in 35 communities in the Kuskokwim River region and lower and middle Yukon areas, including the 4 phases of Donlin projects: the lower Yukon River community of Emmonak in 2009 (Fall et al. 2012); 8 central Kuskokwim River communities including Aniak, Chuathbaluk, Crooked Creek, lower Kalskag, Red Devil, Sleetmute, Stony River, and Upper Kalskag in 2010 (Brown et al. 2012); 5 Yukon River communities including Marshall and Mountain Village on the lower river and Ruby, Galena, and Nulato on the middle river in 2011 (Brown, et al. 2015); 6 Kuskokwim River communities including Akiak, Kwethluk, Oscarville, and Tuluksak on the lower river and Georgetown and Napaimute on the middle river in 2011 (Brown et al. 2013); 8 Kuskokwim and Yukon river communities including Napakiak, Napaskiak, McGrath, Takotna, Nikolai, Russian Mission, Anvik, and Grayling in 2012 (Ikuta et al. 2014); and the lower Kuskokwim River community of Bethel in 2013.[12] The current study provides baseline subsistence harvest data for Quinhagak, Shageluk, Pilot Station, Scammon Bay, Eek, and Tuntutuliak in 2013.

12. Ikuta et al. *In prep.*

The division has conducted or collaborated with other agencies in conducting resource-specific surveys that have documented harvest and use of migratory birds, salmon, nonsalmon fish, and big game. Division researchers have also conducted various ethnographic projects about specific resource or resource categories throughout the Yukon and Kuskokwim river regions.

Migratory Birds

The division's research analyst Liliana Naves collaborated with the Alaska Migratory Bird Co-management Council to conduct migratory bird harvest surveys in the Y-K Delta in 2004–2011 (Naves 2010a–b, 2011, 2012, 2014) and 2013 (Naves 2015). These harvests are reported on the regional level; community-specific data are not available.

Salmon

The division collected ethnographic data of subsistence salmon fishing in the Kuskokwim River communities of Tuntutuliak, Kwethluk, Kalskag, Sleetmute, and Nikolai in 2009 (Ikuta et al. 2013). The major objective of this study was to understand the historical and contemporary social organization of fishing within each community as well as what sociocultural, economic, and environmental factors influenced variations in subsistence salmon harvests of Kuskokwim River salmon. A follow-up study was conducted in the Bethel area in 2012 in response to the very low returns of Chinook salmon that resulted in subsistence fishing closures and restrictions in the Kuskokwim Management Area during the summer of 2012 (Ikuta et al. 2013). A similar project, investigating the socioeconomic effects of the decline in Chinook salmon, was conducted in 5 Yukon River communities—Emmonak, Marshall, Nulato, Beaver, and Eagle—in 2010–2011 (Brown, Godduhn, et al. 2015).

In response to low Chinook salmon abundance in recent years, the Alaska legislature has provided funding for several ongoing Chinook Salmon Research Initiative projects since 2014.[13] Staff designed projects exploring the patterns and trends in salmon fishing to identify variables associated with changing subsistence salmon harvests at the household level. Kuskokwim River communities for these projects include Bethel, Aniak, Sleetmute, Stony River, McGrath, and Nikolai;[14] Yukon River communities include Alakanuk, Beaver, Eagle, Galena, Marshall, and Nulato.[15] The Division also designed research to document observational and experiential knowledge about biological and environmental factors important to the freshwater aspects of Chinook salmon migration and life history. Kuskokwim River communities for these projects include Aniak, Sleetmute, Stony River, McGrath, and Nikolai;[16] Yukon River communities include Alakanuk, Beaver, Eagle, Galena, Marshall, and Nulato.[17] Finally, a pilot project to test methods for inseason collection of subsistence harvest data was implemented on both rivers. On the lower Kuskokwim River, participating communities include Nunapitchuk, Napakiak, Oscarville; middle river communities include Lower Kalskag, Upper Kalskag, Aniak, Chuathbaluk, Napaimute, Crooked Creek, Red Devil, Sleetmute, and Stony River.[18] Yukon River communities for this project include Grayling and Marshall.[19]

13. ADF&G, Juneau. n.d. "Chinook Salmon Research Initiative." Accessed February 19, 2016. http://www.adfg.alaska.gov/index.cfm?adfg=chinookinitiative.main

14. Hiroko Ikuta, Subsistence Resource Specialist III. Patterns and trends in subsistence salmon fishing on the Kuskokwim River, Chinook Salmon Research Initiative project, 2014–2018. Patterns and trends in subsistence salmon fishing in Bethel, Chinook Salmon Research Initiative project, 2015–2018.

15. Caroline Brown, Subsistence Resource Specialist III. Patterns and trends in salmon fishing on the Yukon River, Chinook Salmon Research Initiative project, 2014–2017.

16. Hiroko Ikuta, Subsistence Resource Specialist III. Local and traditional knowledge of freshwater aspects of Chinook salmon life cycle, central and upper Kuskokwim River, Chinook Salmon Research Initiative Project, 2014–2018.

17. Caroline Brown, Subsistence Resource Specialist III. Local and traditional knowledge of freshwater aspects of Chinook salmon life cycle, Yukon River, Chinook Salmon Research Initiative project, 2014–2018.

18. David Runfola, Subsistence Resource Specialist III. Kuskokwim River inseason estimation of Chinook salmon subsistence harvest, Chinook Salmon Research Initiative project, 2014–2017.

19. Caroline Brown, Subsistence Resource Specialist III. Pilot inseason monitoring of subsistence salmon harvests in the Yukon River drainage, Chinook Salmon Research Initiative Project, 2014–2017.

Nonsalmon Fish

Pete (1984, 1991b–c, 1992), Pete and Kreher (1986), and Pete et al. (1987) documented the subsistence herring fishery in the Nelson Island District and northern Kuskokwim Bay. In 2002, Brown et al. (2005) documented traditional ecological knowledge and harvest reports of nonsalmon fish species in Grayling, Anvik, Shageluk, and Holy Cross. In 2001–2003, Krauthoefer et al. (2007) documented the harvest and use of nonsalmon fish harvests in Aniak and Chuathbaluk. In 2012–2013, Ray et al. (2010) documented the harvest and use of nonsalmon fish harvests in Eek, Nunapitchuk, and Tuntutuliak. An ethnographic project to understand whitefish on the upper Kuskokwim River was conducted in Nikolai and Lime Village in 2012–2013 (Van Lanen et al. 2015).

Large Land Mammals

The division has conducted several big game surveys. In 2003–2006, Krauthoefer et al. (2015) conducted large mammal harvest surveys in 8 Central Kuskokwim River communities: Lower Kalskag, Upper Kalskag, Aniak, Chuathbaluk, Crooked Creek, Sleetmute, Red Devil, and Stony River. The division also conducted large land mammal harvest surveys with 473 households in Bethel in 2012 (Runfola et al. 2014) and with 96 households in Nunapitchuk in 2013 (Simon et al. 2016). Other researchers recorded harvests of brown bears for the years 1991–1993 by residents of a number of communities, including Pilot Station, Shageluk, Eek, and Quinhagak, results of which are found in the CSIS. Weekley et al. (2011) conducted big game surveys for the 2009 study year in 9 lower Yukon River communities, including Alakanuk, Chevak, Kotlik, Marshall, Mountain Village, Nunam Iqua, Russian Mission, Saint Mary’s, and Scammon Bay. In 2002–2005, the Division of Subsistence documented harvests of moose, caribou, black bear, brown bear, and gray wolf in the lower-middle Yukon River communities of Grayling, Anvik, Shageluk, and Holy Cross (Brown and Koster 2005, 2015; Brown et al. 2004).

Marine Mammals

Division of Subsistence researchers recorded harvest and use of seals and sea lions by residents of Quinhagak in 1997 and 1998 (Coffing et al. 1998, 1999).

In spite of these extensive efforts, data gaps precluded an understanding of regional subsistence harvest and use patterns in Western Alaska. Information for several communities in the lower and middle Yukon River region was substantially outdated. For multiple coastal communities, comprehensive documentation of subsistence harvest and use patterns had never been attempted. This study was designed specifically to address these limitations, as well as to respond to particular policy objectives and current research directions.

2. METHODS

Hiroko Ikuta and Marylynne L. Kostick

In 2014, comprehensive subsistence surveys conducted in 6 communities asked about all species harvested for subsistence in these areas; the species were further grouped into 6 resource categories (e.g., large land mammals, vegetation, etc.). The research relied on a standard survey instrument developed during a series of studies conducted by the Division of Subsistence beginning in the 1980s. Many survey questions are the same as or similar to questions in prior harvest assessment tools, so recent results can be compared to past results and to results from other communities and regions.

There is a continuing need for harvest estimates for high-demand species, particularly salmon. Several recent poor runs of salmon—especially Chinook salmon—on the Kuskokwim and Yukon rivers have raised significant concern about this important subsistence resource.

General Research Design

The ADF&G Division of Subsistence utilizes a number of quantitative and qualitative social science research methods to fulfill its mission. This study used a combination of harvest surveys (Appendix A) and ethnographic, semi-structured key respondent interviews (Appendix B) to document historical and contemporary subsistence practices.

Ethnographic interviews followed a semi-structured protocol (Appendix B) designed to capture a thorough understanding of broad patterns of local harvest and use for all subsistence resources. The interviews were generally structured around a seasonal round of subsistence activities; respondents were asked about typical patterns of subsistence activities during particular times of the year and were asked to describe any changes in these subsistence activities that had been observed over their lifetimes. Mapping exercises during the interviews recorded locations of historical and contemporary subsistence use areas. Respondents were also asked to discuss any recent concerns in their communities related to subsistence resources, particularly those concerns related to environmental, management, or socio-economic conditions affecting patterns of subsistence harvest and use. Interviews were audiorecorded, individually transcribed, and then analyzed by individual chapter authors.

In addition to interviews, extensive field notes were taken during informal communications with community residents and during harvest surveys when respondents offered information not collected on the survey form. Community members provided further ethnographic information and reviewed researchers' interpretations of ethnographic data during scheduled community review meetings open to all community residents.

Quantitative harvest data were collected through harvest surveys. As characterized by Trotter II and Schensul (1998:702–703),

> Applied projects must be designed to create the highest level of confidence in the research results. To provide this confidence, quantitative social sciences have most commonly favored probabilistic (random) sampling techniques that allow for statistical analysis of the data collected. These techniques work well when the universe from which the sample is to be drawn can be identified and where everyone in a population…has an equal chance of being chosen to express their viewpoint. It does not work for qualitative approaches, where other conditions apply.

Much of the research conducted by the Division of Subsistence is quantitative in nature and involves documenting the amount of fish and wildlife resources harvested by a community of users with the principal unit of analysis being the household. In these cases, probabilistic sampling or census approaches are used to develop estimates of harvests for an entire community or series of communities.

In small communities, sampling designs often strive for a complete census to survey each household regarding subsistence resource harvest and use activities. In larger communities, simple random samples (or stratified random samples) are used to estimate a community's harvest and use patterns. Survey results are expanded to the whole community based upon the patterns identified in the sample of surveyed households. It is essential that the sample of households be representative of the study population.

Confidentiality is maintained through the use of identification codes in place of residents' names or addresses. Households and individuals are assigned numerical codes before surveys begin. The household code sheet is maintained by the principal investigators during survey administration and remains in their custody after the survey is complete. Surveyors have codes only for the households they are assigned to survey. Household code sheets do not accompany surveys when surveys are submitted for data entry and analysis.

Survey Instrument

The primary purpose of the household survey instrument (Appendix A) was to collect information about the harvest and uses of wild, renewable resources. In its simplest form, this type of survey includes a core harvest module that collects, for example, caribou or salmon harvest reports on a single page. By adding more core harvest modules, a single-species survey can evolve into a comprehensive survey while maintaining comparability with single-species efforts. Additional modules can be added to collect demographic, economic, spatial, assessment, or social network data as needed. For this project, researchers collected information from each household about permanent household residents, amounts of wild food harvested, wages earned, and other income received by household members. Researchers also asked questions to assess household food security, to describe networks of food sharing, and to determine whether households were able to harvest sufficient amounts of wild foods.

The demography section included questions about the gender, kin relationships, age, birthplace, education, and ethnicity of each household member. The harvest section asked which wild foods were used and harvested and how much was harvested by the household. The employment section asked respondents to list each job held by each member of the household and, for each job, the months employed, the schedule worked, and the amount earned in the study year. Respondents were asked to estimate household income from other nonemployment sources, such as the Alaska Permanent Fund dividend, Social Security, and public assistance programs. Financial information allows researchers to consider the relationship beween income and subsistence practices in the mixed cash-subsistence economies of the rural study communities in this project, in which residents rely on a combination of cash inputs and subsistence resources to meet household needs. Income information can be better understood in the context of living expenses in the communities. ADF&G staff also asked the respondents to estimate basic living expenses, including housing, utilities, and groceries, as well as equipment used for subsistence activities.

A food security section used a standard national questionnaire to assess whether or not the household had enough food to eat, whether from subsistence sources or from market sources. The protocol used in this survey was a modified version of the 12-month food security scale questionnaire developed by the U.S. Department of Agriculture (USDA). This questionnaire is administered nationwide each year as part of the annual Current Population Survey (CPS). In 2007, approximately 125,000 U.S. households were interviewed, including 1,653 in Alaska (Nord et al. 2008:20). From CPS data, the USDA prepares an annual report on food security in the United States.

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

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

The survey included a series of harvest assessment questions (e.g., "Did your household get enough salmon last year for your needs?"). The section also asked whether households used less, more, or the same amount of particular subsistence foods, and whether they got enough of those foods. In the event that harvests changed or were insufficient, respondents were asked why this occurred.

A network section asked households to document who harvested and processed the resources that the household used, even if household members did not harvest the resources themselves. It also asked household members to document to which households or other communities they gave resources and from which households they received resources. In this way, data analyzed from the network module provide a graphic representation of resource distribution webs by community.

To document the areas used for subsistence, the survey asked households to locate on a map the areas where they searched for and where they actually harvested selected subsistence resources. Maps were available at 3 different scales or extents to accommodate both local and distant searches and harvests.

Limitations and Assumptions

The harvest survey collected information on subsistence activities during a single year. This assumed that respondents could remember their important activities during the previous year. To minimize recall problems, surveys were conducted with household heads on the assumption that household heads were most likely to be aware of all household members' activities. Respondent recall bias was not expected to change significantly from community to community. It was also not expected to affect comparisons of data from this study with other studies employing similar methods.

Some respondents were reluctant to provide information about personal and household incomes, especially earned income. Some community researchers were personally reluctant to ask respondents about income. As a consequence, employment and income data are sometimes missing. However, 280 surveyed households in Quinhagak, Eek, Tuntutuliak, Pilot Station, Shageluk, and Scammon Bay (63% of all households surveyed in the 6 communities) reported income information. An estimated 989 adults were employed in the 6 study communities.

Data for this project were collected for the study year 2013 in winter and spring of 2014. The ADF&G Division of Commercial Fisheries also collected salmon harvest data in its annual postseason survey, conducted in fall 2013 for the summer salmon season. The estimates for salmon harvests resulting from these 2 data collection efforts differed somewhat from community to community and by salmon species. In some cases, the differences were significant. Analysts and principal investigators reviewed the differences to try to understand them. In some cases, the differences were the result of sampling strategies: the Division of Subsistence attempted a census of all households in a community, while the postseason salmon survey used a stratified sample in the same communities. In other cases, especially when compared on the household level, the reasons for the differences were not identifiable.

Standardization in data collection procedures was important because many different people gathered data. One or more principal investigators were present throughout the administration of the surveys and administered surveys themselves with additional help from local surveyors. Standardization and quality control were accomplished through an initial orientation process, daily reviews of surveys as they were completed, and a post-administration review of all surveys. ADF&G staff coded all of the surveys, and coded surveys were reviewed by principal investigators before data entry.

Procedures

The principal investigator in 2014 was Hiroko Ikuta, a Fairbanks-based subsistence resource specialist with the Division of Subsistence. She was assisted in the field by 4 residents of Eek, 5 residents of Pilot Station, 7 residents of Quinhagak, 7 residents of Scammon Bay, 3 residents of Shageluk, and 5 residents of Tuntutuliak, as well as 12 Division of Subsistence employees based in Fairbanks and Bethel (Table 2-1).

Table 2-1.–Project staff, Donlin Gold Subsistence Research Program, 2014–2016.

Task	Name	Organization
Northern Regional Program Manager	James Simon	ADF&G Division of Subsistence
Principal Investigator	Hiroko Ikuta	ADF&G Division of Subsistence
Administrative support	Pam Amundson	ADF&G Division of Subsistence
	Tamsen Coursey-Willis	ADF&G Division of Subsistence
	DeAnne Lincoln	ADF&G Division of Subsistence
Data Management Lead	Marylynne L. Kostick	ADF&G Division of Subsistence
Programmer	Marylynne L. Kostick	ADF&G Division of Subsistence
Data Entry	Theresa Quiner	ADF&G Division of Subsistence
	Barbara Dodson	ADF&G Division of Subsistence
	Zayleen Kalalo	ADF&G Division of Subsistence
	Anita Humphries	ADF&G Division of Subsistence
	Margaret Cunningham	ADF&G Division of Subsistence
	Nicholas Jackson	ADF&G Division of Subsistence
Data Cleaning/Validation	Margaret Cunningham	ADF&G Division of Subsistence
Data Analysis	Marylynne L. Kostick	ADF&G Division of Subsistence
Cartography	Terri Lemons	ADF&G Division of Subsistence
Editorial Review Lead	Rebecca Dunne	ADF&G Division of Subsistence
Production Lead	Rebecca Dunne	ADF&G Division of Subsistence
Field Research Staff	Andrew Brenner (Shageluk lead)	ADF&G Division of Subsistence
	Jason Esler	ADF&G Division of Subsistence
	Michelle Gillette	ADF&G Division of Subsistence
	Anna Godduhn	ADF&G Division of Subsistence
	Odin Miller	ADF&G Division of Subsistence
	Loraine Naaktgeboren	ADF&G Division of Subsistence
	Jeff Park (Eek & Quinhagak lead)	ADF&G Division of Subsistence
	David Runfola (Scammon Bay lead)	ADF&G Division of Subsistence
	Erin Shew	ADF&G Division of Subsistence
	Lisa Slayton	ADF&G Division of Subsistence
	Alida Trainor (Pilot Station lead)	ADF&G Division of Subsistence
	Seth Wilson (Tuntutuliak lead)	ADF&G Division of Subsistence
Local Research Assistant	Elena Alexie	Eek
	Mandy Alexie	Eek
	Karlene Cleveland	Eek
	Oliane Kameroff	Eek
	Alexandra Myers	Pilot Station
	Sharon Myers	Pilot Station
	Darrell Nick	Pilot Station
	Richard Nick	Pilot Station
	Stefen Wassillie	Pilot Station
	Grace Anaver	Quinhagak
	Vera Cleveland	Quinhagak
	Maggie Echuck	Quinhagak
	Marcella Jones	Quinhagak
	Taren Jones	Quinhagak
	Joseph Roberts	Quinhagak
	Kris Sharp	Quinhagak
	Crystal Akerelrea	Scammon Bay
	Jason Akerelrea	Scammon Bay
	June Kaganak	Scammon Bay
	Alice Kaganak	Scammon Bay
	Yvonne Kasayuli	Scammon Bay
	Tashina Long	Scammon Bay
	Evelyn Ulak	Scammon Bay
	Harold Arrow	Shageluk
	Joseph Michael	Shageluk
	Everett Semone	Shageluk
	Carlotta Evan	Tuntutuliak
	April Morgan	Tuntutuliak
	Jeffery Pavila	Tuntutuliak
	Kathleen Simon	Tuntutuliak
	Grace White	Tuntutuliak

Source ADF&G Division of Subsistence, 2015.

Table 2-2.–Sample achievement, study communities, 2013.

Sample information	Community					
	Eek	Pilot Station	Quinhagak	Scammon Bay	Shageluk	Tuntutuliak
Households in community	90	128	162	123	29	104
Sampled households	64	94	109	86	26	67
Percentage of households sampled	71.1%	73.4%	67.3%	69.9%	89.7%	64.4%
Households failed to be contacted	10	12	13	8	3	13
Households declined to be surveyed	16	23	23	29	0	24
Total households attempted to be surveyed	90	129	145	123	29	104
Refusal rate	20.0%	19.7%	17.4%	25.2%	0.0%	26.4%
Sampled population	247	460	493	439	76	266
Estimated population	347.3	626.4	732.7	627.9	84.8	412.9

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

Between November 2013 and May 2014, ADF&G staff traveled to the communities to meet with tribal councils to review survey instruments (both surveys and interview protocols), prepare updated household lists, and obtain community approvals. From January through May 2014, research teams traveled to the communities to implement the surveys. Working with the ADF&G researcher assigned as the lead for each community, the tribal councils of each community selected local surveyors for the research in their community. These community contractors were paid for their time in orientation and survey review and by the number of surveys they completed. In the study communities, an ADF&G employee acted as the community lead for the data collection and conducted an orientation and training session with community assistants. At the end of training, each researcher selected a group of households to survey and made appointments by phone, VHF radio, and in person to conduct surveys. Surveyors worked in teams of 1 community surveyor and 1 ADF&G staff member. Surveys were conducted in person, usually at the respondent's home, at a time selected by the respondent. Community workers administered the surveys in most cases. ADF&G employees conducted all of the mapping.

Either the male or female head of each household answered questions about the household as a whole. Sometimes, both heads of household or other family members would assist the respondent by providing information.

Researchers attempted to survey all occupied households in Scammon Bay, Tuntutuliak, and Shageluk; a 70% sample was attempted in Quinhagak, Eek, and Pilot Station. Across the region, surveys were completed for 446 of 635 households (70%; Table 2-2).

Key respondents for the ethnographic interviews were selected based on a combination of household level harvest survey results and recommendations by other community members using a snowball method. Researchers attempted to interview a representative cross-section of the community with attention to gender, age, and subsistence experience. For all communities, in total, researchers conducted 42 richly informative interviews with 52 key respondents. Most interviews lasted approximately 1 hour. Respondents were given an honorarium for their time and the wealth of information they shared with researchers.

At the conclusion of the survey administration and interviewing process, researchers convened again for project evaluation meetings. They discussed the performance of the instrument, subjectively assessed the quality of the data, and made suggestions to improve the survey process in the future.

After survey data and map data were entered, analyzed, and summarized, ADF&G community leads returned to each community between November 2014 and November 2015 to conduct community review meetings. They provided attendees with summary tables of harvest and income estimates and showed each community a Microsoft PowerPoint[1] presentation summarizing the results, including mapped data. During these visits, community leads conducted follow-up ethnographic interviews as necessary. Any follow-up information was integrated into the overall analysis of harvest and use practices within each community.

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

Data Analysis

Survey responses were coded for data entry following standardized codebook conventions used by the Division of Subsistence. Data were stored within a Microsoft SQL Server at ADF&G in Anchorage. Database structures included rules, constraints, and referential integrity to ensure that data were entered completely and accurately. Data entry screens were available on an internal network. Daily incremental backups of the database occurred, and transaction logs were backed up hourly. Full backups of the database occurred twice weekly. This ensured that no more than 1 hour of data entry would be lost in the unlikely event of a failure. All survey data were entered twice and each set was compared to minimize data entry errors.

Once data were entered and confirmed, information was processed with the use of the Statistical Package for the Social Sciences (SPSS), Version 21. Initial processing included standardized logic checking 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 in units of numbers of animals, gallons, or buckets were converted to pounds usable weight using standard factors (Appendix C).

SPSS was also used 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 situationally. The Division of Subsistence has standardized practices for dealing with missing information, such as minimal value substitution or use of an average 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 is missing, the household survey is treated as a "nonresponse" and not included in community estimates.

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

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

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

where:

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

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

h_i = the total harvest reported in returned surveys,

n_i = the number of returned surveys, and

S_i = the number of households in a community.

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

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

where:

s = sample standard deviation,

n = sample size,

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

N = population size, and

$t_{\alpha/2}$ = student's t statistic for alpha level ($\alpha = 0.95$) with n–1 degrees of freedom.

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

Food security responses were analyzed in SPSS following USDA procedures identified in Bickel et al. (2000) to provide comparability between the Donlin Gold Subsistence Research Program results and USDA results for Alaska and the nation.

Network analysis was done using UCINET (Version 6), and graphical representation of the analysis was done using NetDraw (Version 2.123).

Summaries of results for each community surveyed were added to the Division of Subsistence CSIS. This publicly accessible database includes community-level findings only, not household-level information.

Plate 3-1.–Looking north from the Askinuk Mountains towards Scammon Bay with the subarctic plain of the Yukon-Kuskokwim Delta in the background, February 2013.

3. SCAMMON BAY

David Runfola

In February 2014, 7 ADF&G researchers surveyed a sample of 87 out of 123 households (71%) in Scammon Bay, Alaska. From January through December 2013, residents of Scammon Bay harvested an estimated 262,095 lb (± 12%) of edible weight of wild foods. This estimate represents a mathematical expansion to all households in the community based upon the harvests reported by the households of the sample. The average harvest per household was 2,131 lb, and the average harvest per person was 417 lb. During the study year, Scammon Bay residents reported harvesting 86 different types of wild resources.

This chapter summarizes findings from the household surveys, including demographic characteristics, responses to harvest assessment questions, harvest estimates, employment, income, sharing of wild resources, and food security. Additional tables appear in Appendix D. Results from this survey are available online in the Division of Subsistence Community Subsistence Information System (CSIS). In addition to the comprehensive survey, 14 ethnographic interviews were conducted with 18 key respondents. The ethnographic interviews help to provide context for the quantitative data presented in this chapter. Findings from interviews, historical background information, and comparisons to earlier studies are presented throughout the chapter.

Community Background

The community of Scammon Bay is located in the Yukon-Kuskokwim Delta, Alaska at the mouth of the Kun River, which flows into the Bering Sea at the water body of Scammon Bay (Plate 3-1). At nearly

73,000 square kilometers with approximately 2 lakes per km^2, the Yukon-Kuskokwim Delta is the greatest of Alaska's many lake districts (Arp and Jones 2009). The delta is a subarctic, coastal plain, which includes the Yukon and Kuskokwim river mouths and numerous meandering, low-gradient streams with high silt load from upstream erosion (Arp and Jones 2009; Brabets et al. 2000). The geology of the region consists primarily of deltaic and fluvial sediments that form subarctic tundra, marsh, and tidal flats habitats. These predominant terrestrial features have been formed around a number of volcanic and other igneous formations, such as the Askinuk Mountains, on the northern margin of which the community of Scammon Bay is situated. The region experiences a transitional climate with an annual mean temperature of 27° F (2.8° C) and 15 to 20 inches (38–51 cm) of precipitation per year (Brabets et al. 2000). Sedges, grasses, and dwarf shrub species of willow and birch compose the predominant plant types of the Yukon-Kuskokwim Delta. Other common plant types observed in the region include various forbs and mosses (Viereck and Little Jr. 1972).

Current archaeological evidence indicates that humans populated Beringia possibly as early as 25,000 years BP (Hoffecker et al. 2014). Coastal settlements of the region likely progressed northward and eastward in the Bering Strait region during glacial retreat from 15,000 to 5,000 years BP[1] (Hoffecker and Elias 2003; Pielou 1992; Pringle 2014). Early inhabitants of Beringia have been broadly identified as Paleoindians (Hoffecker and Elias 2003), a group which is considered by anthropologists and archaeologists to be distinct from the ancestors of modern Central Yup'ik[2] residents of the Yukon-Kuskokwim Delta region (Dumond 1977). The ancestors of contemporary Yup'ik people most likely settled coastal areas of the Yukon-Kuskokwim Delta by sometime after 4,500 years BP (VanStone 1984) and possibly as recently as 2,000 years BP (Funk 2010). Archaeological evidence links prehistorical Yup'ik inhabitants to the Norton and Thule tool-making traditions (Dumond 1977, 1984).

Historical Yup'ik settlements in the vicinity of the contemporary community of Scammon Bay included numerous camps that families or family groups inhabited seasonally. As described to her by a number of ethnographic sources, Fienup-Riordan (1986) depicts at least 26 sites within 20 miles of the current location of Scammon Bay that inhabitants utilized seasonally as recently as the early 1900s. Key respondents described families' seasonal use of this area. One explained that "winter camps were…everywhere. My dad had his 8 miles from [Scammon Bay]. Two other families were 10 miles to the east, then [another family] further upriver. There were just family groups that had certain camps all over" (02182014SCM01). Recent ancestors of many contemporary Scammon Bay residents of Yup'ik descent resided semi-permanently at these sites until approximately the 1930s; however, modern residents continue to utilize these sites while hunting, fishing, and gathering berries and other plants.[3]

In approximately the 1930s, area families began moving to the current location of the community primarily in order to avoid seasonal flooding (11072015SCM02; 02182014SCM03; 02162014SCM04). During this same period, area trappers and their families had also been patronizing a trading post less than a mile west of the contemporary village site (11072015SCM02). In 1932, Roman Catholic missionaries established the community's first Christian church (Renner 2005), and Evangelical Covenant missionaries founded another church in the 1940s. The Alaska Territorial Guard Armory was established in 1942 (Marston 1972), and the Bureau of Indian Affairs instituted an elementary school in 1949 (Barnhardt 1985). The contemporary naming of the community as Scammon Bay occurred with the establishment of the U.S. Post Office there in 1951. The community name of Scammon Bay originates from the adjacent body of water, named by William Healey Dall after Capt. Charles M. Scammon, U. S. Revenue Cutter Service, who served as Chief of Marine of the Western Union Telegraph Expedition from 1856–1867 (Orth 1971rep.). The local Yup'ik name for the community is *Marayaaq*, translated into English as "place near the mudflats" (Renner 2005), which historically represented the area between Black River in the north and the Askinuk Mountains at

1. National Climate Data Center, Paleoenvironmental Arctic Sciences. 1999. PALE Paleoenvironmental Atlas of Beringia (map). Accessed January 19, 2016. http://www.ncdc.noaa.gov/paleo/parcs/atlas/beringia/images/movies/lbridge.gif

2. Hereafter *Yup'ik*.

3. Runfola, David M. Traditional knowledge and fish biology: a study of Bering cisco in the Yukon River delta, Alaska. Master's thesis, University of Alaska Fairbanks.

Scammon Bay in the south (Fienup-Riordan 1986). A key respondent described the settling and naming of the community. "They moved over here…[to escape] flooding…When they moved over here the elders got together in the fire bath house, the *qasgiq*, and since there's some mud down there by the stream [to the north] they called it *Marayaaq*" (02162014SCM04). Current residents have family connections to many communities of the Yukon-Kuskokwim Delta region both by ancestry and through marriage. These communities include Hooper Bay, Chevak, Nunam Iqua, Emmonak, Mountain Village, and Kwethluk. Goods and services are provided through the principal transportation network based out of the regional hub community of Bethel.

The City of Scammon Bay was incorporated as a second-class city in 1967.[4] The current elementary and secondary school has been administered by the Lower Yukon School District since 1982 (11072015SCM02). Local governing bodies include the city as well as the Native Village of Scammon Bay Traditional Council. The traditional council is also affiliated with the Association of Village Council Presidents, a regional Alaska Native nongovernmental organization based in Bethel. The local Alaska Native Claims Settlement Act Village Corporation is the Askinuk Corporation, which operates a general merchandise store and fuel depot in the community. The Western Alaska Community Development Quota Program established by the U. S. Magnuson–Stevens Fishery Conservation and Management Act supports a commercial marina in Scammon Bay operated by the nonprofit Coastal Villages Region Fund. The Yukon Kuskokwim Health Corporation operates a health clinic and a water treatment facility. The community also includes a number of small family-owned businesses such as stores and take-out style restaurants.

Seasonal Round

During the spring season in the coastal Bering Sea area of the Yukon-Kuskokwim Delta, residents of Scammon Bay increase their time spent hunting and fishing relative to midwinter. Also in spring, many people frequently fish for saffron cod and rainbow smelt in the Kun River at Scammon Bay. People consume these fish fresh or hang them to dry for later use. Fishers also travel distances of 25 miles or more during March and April to fish under ice for northern pike and burbot. In spring, these fishes aggregate in certain locations throughout the Yukon-Kuskokwim Delta region to feed on forage fishes in preparation for migration to spawning and summer feeding sites. Area fishers generally know the best locations to find northern pike and burbot, and focus harvest efforts there in the spring. Popular northern pike and burbot ice fishing sites include ponds and streams south of Scammon Bay and in the Black River drainage adjacent to the Kusilvak Mountains. Some individuals also travel to an area of lakes approximately 40 to 50 miles southeast of the community to fish through the ice for these species. One key respondent described traveling to this area where there are a number of extinct volcanoes. She explained, "We go [jigging] at the volcanoes for [burbot]" (02172014SCM05). Another key respondent discussed ice fishing for northern pike, which numerous households target in late winter and early spring.

> We generally like to go end of February, all of March. That's when [the northern pike] like to start swimming out and there's a bunch of people that go jigging for them, and this is under the ice. We generally don't setnet for them during the fall or summer months. We mainly [jig for] them during the winter and spring. (02172014SCM06)

Other fishing that occurs throughout spring includes under-ice set gillnets for whitefish harvests. Nets deployed in the Kun River drainage and other streams and ponds in the vicinity of Scammon Bay primarily target humpback whitefish and broad whitefish; however, some fishers will also deploy nets in the Black River, where they can harvest sheefish and least cisco as well. In addition, some fishers set small fish traps primarily to harvest Alaska blackfish[5] under the ice. A Scammon Bay key respondent described the importance of blackfish as a staple food, explaining "They are important because there is plenty of them.

4. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed January 19, 2016. http://commerce.alaska.gov/dcra/DCRAExternal/community

5. Hereafter *blackfish*.

[They are] in all the lakes and sloughs of this area. Where there was plenty of blackfish, that's where [people] made their winter camp" (02182014SCM01).

Hunting occurs during this time of year, as Scammon Bay hunters travel into hills and tundra to harvest ptarmigans—and occasionally Alaska hare, snowshoe hare, and lynx—in early spring. Hunters also travel to open leads in sea ice to hunt seals and walrus. One key respondent explained that hunters will "pull their boats on the ice…to the open water…as soon as things start to break up [in the ocean]" (02182014SCM07). The same key respondent also described that hunters usually target bearded seal "because they got a lot of meat, a lot of oil, and they are the best eating seals" (02182014SCM07). These hunts continue through river-ice breakup and Bering Sea ice-out in late May. Typically, hunters' efforts shift from marine mammals to waterfowl when birds migrate into the area in abundance in late spring just prior to river-ice breakup. When spring migratory waterfowl hunting begins, there is usually residual snow and ice on the tundra and in ponds and streams, permitting hunters to travel long distances by snowmachine to locate and harvest migratory birds. Hunters will target migratory waterfowl after snow and ice have melted, during which time they continue to travel overland by snowmachine and four-wheeler until transitioning to boats following river-ice breakup.

Sea ice-out typically occurs in late May, at which time Scammon Bay residents begin preparing for the late spring and summer fishing season. Pacific herring[6] arrive in the coastal areas near Scammon Bay by mid-May. As recently as the 1990s, many Scammon Bay families typically traveled west of the community along the coast to reside in temporary herring camps just prior to sea ice-out. Here families remained in camp during the herring fishing season where they caught herring and dried them on racks before transporting them home for more permanent storage. One key respondent explained that "Right after school was done for the year, my dad and the men would drag their herring boats out to camp to wait for herring fishing. We would stay there for a couple weeks until we got our herring. Then we'd bring our fish home and get ready to go to Black River for salmon" (11072015SCM02). With larger boats and motors than in previous decades, contemporary fishers generally prefer to base herring fishing operations out of their home community rather than remote camps. Fishers harvest herring with gillnets as well as gather herring roe attached to kelp after these fish have spawned. Following spawning activity, herring roe adheres to small kelp fronds (approximately 4 to 8 inches in length) that are attached to rocks in the tidal zone along the coastline. Roe gatherers wade into rocky areas at low tide and pick the roe-covered kelp by hand. Roe-on-kelp is eaten fresh or frozen for future use. Herring harvested by gillnet are strung along lengths of braided grass and hung to dry for storage and later consumption. Clams and mussels are also harvested along beaches in late spring and summer.

Salmon fishing begins with the arrival of the first Chinook and summer chum salmon. Some fishers set gillnets in the Kun River or in Scammon Bay within a short distance from the community. Others travel to family fish camp sites, some of which are within 5 to 10 miles west of Scammon Bay along the coast. Other fish camps are as far away as 20 miles north along the coast at the mouth of Melatolik[7] Creek, to 40 miles north in the lower portion of Black River. Salmon fishers set gillnets in coastal areas to harvest these fish and process their harvests by cutting, hanging, and drying fish for long-term storage. Some salmon are also smoked, salted, partially dried and frozen, fresh frozen, or eaten fresh. Salmon fishing continues throughout summer months depending on the needs of individual families and fishing groups. Other fishing that occurs in late spring and summer includes hook and line fishing for saffron cod and rainbow smelt in the Kun River adjacent to the community. Fishers also set gillnets for pink salmon, coho salmon, and whitefishes including Bering cisco in the Kun River and Black River drainages. One key respondent described fishing for whitefishes in summer months. He explained, "Every July we go up to the lakes and we start getting those big whitefish and we spend a weekend up there, just camping, setting a net" (02182014SCM01). Also in the summer months, residents use rod and reel to target Pacific halibut[8] in the

6. Hereafter *herring*.

7. Possibly an Anglicized version of the Yup'ik name, *Mernurluuvik*, which translates into English as "a place to rest" (Fienup-Riordan 1986:21–22; Orth 1971rep.:633).

8. Hereafter *halibut*.

Bering Sea within approximately 20 miles of Cape Romanzof. Fishers harvest large quantities of halibut throughout the summer, reducing their activity only late in summer when berry picking and preparations for the moose hunting season begin. Halibut fishing is a relatively recent phenomenon which has become a common practice, as described by one fisher,

> It's fairly new. Within 20 years we started fishing for halibut. I remember the first men [to fish for halibut]. I was very young when they went out with a line and a hook and they were hooking by hand, not with a rod, because they didn't know anything about fishing for halibut at the time. Now we have up to 10 or 20 boats out a day when [the halibut] are swimming out there…When they first started they wanted to see what was out there and they pulled up a lot of cod. Once people figured out where they were getting halibut they progressed…to rod and reel, and they began to figure out their swimming spots. [Halibut] generally like to swim in the muddy areas. (02172014SCM06)

Migratory waterfowl hunting continues into late spring, usually ceasing by the time birds begin nesting. At this time Scammon Bay harvesters gather eggs from nests on the tundra and in ponds. Eggs include those of geese and ducks, as well as tundra swan, Arctic tern, gulls, and various shorebird species. Simultaneous with egg gathering, harvesters begin to gather the first greens of the season. Harvest of greens focuses primarily on early growth of several tundra and beach plant species, often because these are more palatable and nutritious in spring than they are later in the season; however, there are some species of greens that can be harvested later in the growing season and even into the fall months (Keim 1984).

Although much of the summer harvest activity focuses on fishing, Scammon Bay hunters also actively harvest marine mammals during this time of year. Seals are directly targeted by hunters, but also taken opportunistically while people are traveling by boat during other activities. Beluga whales are harvested in late spring and early summer when they move along the coastline, presumably following salmon migrations. Beluga whales are shot by rifle and retrieved by harpoon and floats; however, historically they were also caught with nets. One key respondent explained that "men made nets with big mesh, bigger than for king salmon. They were about 20 feet long. They set the nets where the beluga whales swim. They would tangle in the nets" (02162014SCM04).

By late July and August, families begin to travel by boat, making day trips or longer excursions to harvest large quantities of berries. Marine mammal hunting and fishing also occurs during these trips, but the focus of harvesters is typically to obtain berries. These are transported from the field in buckets, then packed in plastic bags and frozen for future use. Early in the berry-picking season, hunters also harvest ducks and geese during their molting phase. Historically, harvests of molting ducks and geese occurred by "herding birds into [corrals] that men built out of nets and stakes. They scared them into the [corrals] by making noise and beating sticks in the water and the ground" (02172014SCM05).

Immediately following the berry-picking season, hunters prepare for moose hunting. Moose hunts might occur as early as the season opens in early August; however, many hunters wait until late August and early September in order for weather to cool to reduce the chance of meat spoilage. Much of the moose harvest occurs in the Black River drainage; however, some hunters harvest moose within a few miles of the community of Scammon Bay. Many Scammon Bay residents recall a time when very little or no moose would have been consumed by their families. This was noted by one key respondent who shared her memory of her first experience eating moose.

> The first time I ate moose I was about 20 [in the late 1980s]. My dad gave seal [meat] and seal oil to a family in Mountain Village and they gave my dad some moose. My mom cooked the meat and I didn't know what I was eating but I asked my mom, "How come this meat tastes like willows?" and she said that it was because it was moose. We could really taste the food it ate and that made it taste different to me. I had never tasted anything like that before. (11072015SCM02)

The prevalence of moose hunting has increased markedly within the previous 2 or 3 decades. As recently as the 1990s, moose hunters traveled into the vicinity of Holy Cross and Shageluk to hunt moose. As moose populations have increased in the lowest portion of the Yukon River, moose hunting has become a more significant part of the seasonal round of Scammon Bay subsistence activities. One key respondent described this change:

> There's plenty of moose around here. In fact it wasn't always like this. I can remember [about 25 years ago] when I was small my father would go up the Yukon way past Russian Mission and in the Holy Cross area just to moose hunt. Twenty-five years ago, 20 years ago there wasn't as much moose around here as there is now. Now they're running around all summer…We see them all summer, every day. And the main spot to hunt them is Kusilvak [Mountain]. And we can even hunt them in our river [near Scammon Bay]. Twenty years ago they were unheard of around this area. (02172014SCM06)

Hunters begin fall migratory waterfowl harvests, mainly geese and some ducks, as soon as moose hunting activity decreases in late September. Hunters travel by boat or overland to areas within 10 to 20 miles of the community to hunt birds. Typically in October, snow geese will stage in the vicinity of Scammon Bay to feed during their fall migration south. One key respondent explained that this period of staging extends approximately 2 to 4 weeks in the area, during which time hunters harvest large numbers of snow geese (08292015SCM08). Another key respondent described hunting for snow geese as a challenging exercise:

> We usually boat up north [up Melatolik Creek]. The snow geese stay where the ground is soft, really soft. They are the hardest birds to hunt. You gotta work hard for those… We usually pull our boat over the tundra [from] lake to lake. You gotta work hard. If you don't work hard you are not going to catch them. (02182014SCM07)

Harvests of whitefishes and other nonsalmon fishes continue through late fall; some fishers set gillnets in the Black River drainage to harvest Bering cisco and other whitefishes. Fishers continue to harvest saffron cod and rainbow smelt using hand-held jigging gear in the mouth of the Kun River until river ice freeze-up. A key respondent described that fishers will set traps for saffron cod in late summer and early autumn. She recalled, "After berry picking the guys will set their [fish traps] in late August or September for [saffron cod]" (02172014SCM05). Fishing activity continues once ice thickens enough to support a fisher's weight. Fall fishers set blackfish traps in the open water of ponds and maintain them during and following freeze-up. Other fish species harvested with less frequency include sticklebacks and capelin, as described by another key respondent. She stated that, "We would always dipnet for [sticklebacks and capelin] in the fall and catch big piles of them. We eat them raw with seal oil, so fresh that sometimes the [sticklebacks] are still moving in your mouth when you eat them. Some people still catch them like that" (11072015SCM02). In addition, hunters continue to harvest seals through the fall, pausing temporarily for freeze-up and resuming once sea ice is thick enough for travel. Seal and walrus hunts continue through the winter. Some hunters also harvest moose in late fall and through winter until the hunting season closes in spring.

Other midwinter hunting includes foxes, Alaska hare, river otter, and other furbearers, often opportunistically during snowmachine travel. In addition, some hunters travel long distances to hunt caribou in the lower Kuskokwim River region and muskox on Nelson Island. Many households fish continuously through the winter, using jigging gear to harvest saffron cod and rainbow smelt under the ice in the Kun River. Others set gillnets under the ice to catch whitefishes and other nonsalmon fishes. A number of fishers continue from the fall through winter to maintain fish traps under the ice to harvest Alaska blackfish. Occasionally mink are caught in these traps. Their hides are used for handicrafts or sold for cash.

Population Estimates and Demographic Information

Comprehensive household survey results indicate that in 2013 the total estimated Scammon Bay population was 628 persons and 123 households with an estimated total Alaska Native population of 611 persons, or 97% of the total population (Table 3-1). The 2010 U.S. Census enumerated a total population of 474 persons in 96 households with an Alaska Native population of 471 persons (99%). The U.S. Census Bureau American Community Survey (ACS) estimated a 5-year average population of 527 persons and 102 households in Scammon Bay from 2008 through 2012 with a total population of 527 Alaska Native persons. Historical records of decennial census counts for Scammon Bay have shown a consistent increase

Table 3-1.–Population estimates, Scammon Bay, 2010 and 2013.

	Census (2010)	5-year American Community Survey (2008–2012)	This study (2013)
Total population			
Households	96	102	123.0
Population	474	527	627.9
Alaska Native			
Population	471	527	610.7
Percentage	99.4%	100.0%	97.3%

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.

in population since 1950, ranging from 103 persons in 1950 to 474 persons in 2010 (Figure 3-1). Annual population estimates by the Alaska Department of Labor and Workforce Development (ADLWD) since 1984 have shown a similar increase for the community with estimates ranging from 296 persons in 1984 to 535 persons in 2012. Differences between the Division of Subsistence estimated population of 628 persons and estimates from the U.S. Census Bureau decennial census, ACS, and ADLWD are likely due to differences in sampling design, the date of population counts, and potential bias within the methods of expansion from sampled to unsampled households. For example, the U.S. Census Bureau 2010 decennial census count is based upon the number of individuals present in a dwelling on April 15, 2010, whereas the Division of Subsistence population estimate is based upon the number of individuals who resided in a household for at least 3 months during 2013. Researchers suspect that single-person households might have been overrepresented in the group of households that declined to participate in the survey. If so, this would result in a higher average household size for the surveyed group and possibly account for a higher population estimate than reported by other sources.

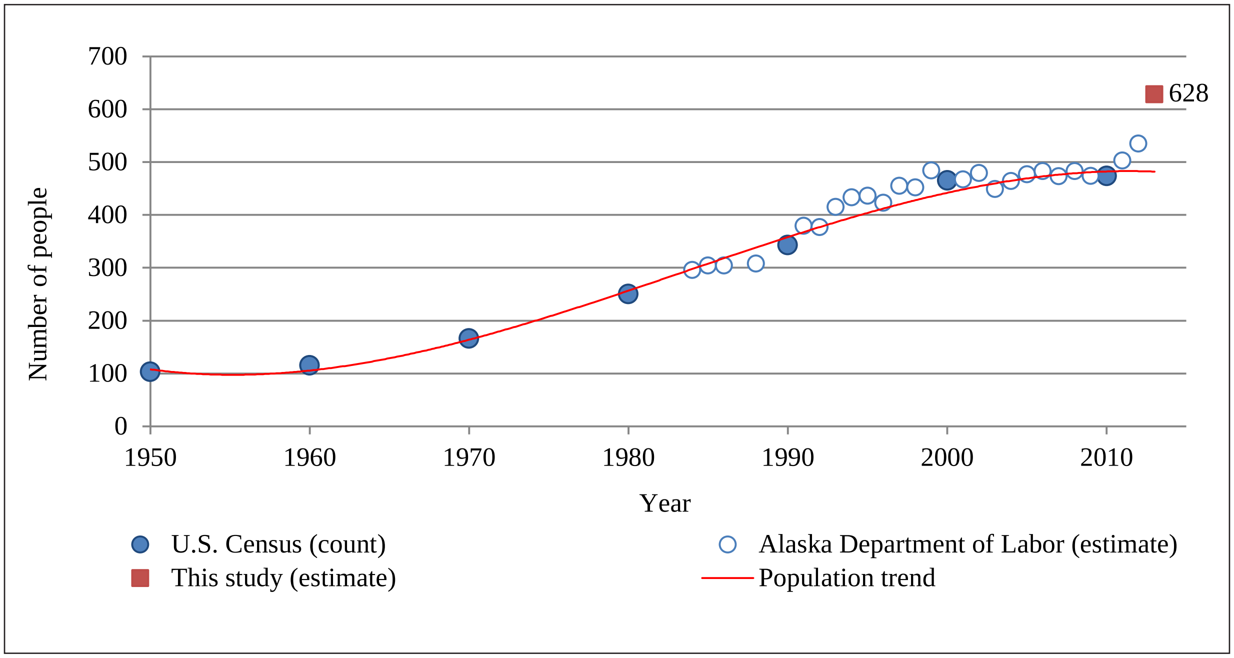


Figure 3-1.–Historical population estimates, Scammon Bay, 1950–2013.

Table 3-2.–Sample achievement, Scammon Bay, 2013.

Sample information	Scammon Bay
Number of dwelling units	128
Survey goal	100%
Households surveyed	86
Households failed to be contacted	8
Households declined to be surveyed	29
Households moved or occupied by nonresident	3
Total households attempted to be surveyed	115
Refusal rate	25.2%
Final estimate of permanent households	123
Percentage of total households surveyed	69.9%
Survey weighting factor	1.4
Sampled population	439
Estimated population	627.9

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

During field operations in Scammon Bay, division staff and local research assistants attempted to survey a census of all households in the community. Researchers completed surveys in 86 households out of a total of 123, or 70% of Scammon Bay households (Table 3-2). Sampled households included 439 persons. Staff contacted residents of 115 households, 29 of whom declined to be interviewed, resulting in a refusal rate of 25%. Based upon responses to the demographic survey questions, staff determined that 3 households were not eligible to be surveyed due to their status as nonresidents in the community during 2013. Division researchers were unable to contact 8 households and estimated that 3 of the uncontacted households were vacant or nonresident during 2013. The mean household size for the community in 2013 is estimated at 5 persons, with a minimum household size of 1 and a maximum of 14 (Table 3-3). The mean age of residents in 2013 is estimated to have been 25 years with a median age of 17 years. The eldest Scammon Bay resident sampled was 83 years of age. The average length of residency for all residents in 2013 was 21 years. Among all heads of household, the average length of residency was 39 years. The greatest length of residency among both the entire population and all heads of household was 83 years. Comprehensive household survey results estimate the total number of Alaska Native households at 119 in Scammon Bay in 2013, or 97% of all households in the community. Of the estimated 2013 population of 628 residents, an estimated 332 persons were male (53%) and 296 persons were female (47%; Table 3-4). Table 3-4 presents estimated population data as distributed among 5-year age cohorts. The largest estimated cohort of males in 2013 was 60 persons from 10 to 14 years of age and the largest cohort of females was 43 persons within the same 5-year age cohort. The greatest cohort of the entire estimated population was 103 persons from 10 to 14 years of age (Table 3-4; Figure 3-2). An estimated 336 persons composed the 4 cohorts from 0 to 19 years of age, or 54% of the estimated population for Scammon Bay in 2013, suggesting that the community's population could experience growth through at least the next generation.

The comprehensive survey instrument also included questions regarding the birthplaces of residents living in sampled households. Birthplace was determined by the community of residence of a person's parents when he or she was born, not the actual community in which they were born. This allows the survey results to avoid possible indications that some individuals were originally residents of a nearby community with a hospital where mothers frequently give birth to their children (e.g., Bethel, Alaska). An estimated 72% of household heads were residents of Scammon Bay when they were born (Table 3-5). Other communities of residence at birth for household heads included several communities throughout the Yukon-Kuskokwim Delta region, including Hooper Bay (5% of household heads' community of residence at birth), Bethel (3%), Alakanuk (1%), Mountain Village (1%), and Nunam Iqua (1%). Approximately 93% of household heads were residents at birth of communities within the area of Alaska that is not connected by highway with Canada and the contiguous 48 states. An estimated 6% of household heads claimed a community of residence at birth that was outside of Alaska but within the U.S. Approximately 83% of all persons were residents of Scammon Bay when they were born (Table 3-6). Other communities of residence at birth

Table 3-3.–Demographic characteristics, Scammon Bay, 2013

Characteristics	Community Scammon Bay
Household size	
Mean	5.1
Minimum	1
Maximum	14
Age	
Mean	24.6
Minimum[a]	0
Maximum	83
Median	17.0
Length of residency	
Total population	
Mean	21.4
Minimum[a]	0
Maximum	83
Heads of household	
Mean	38.6
Minimum[a]	0
Maximum	83
Alaska Native households[b]	
Number	118.7
Percentage	96.5%

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.

for all persons included Hooper Bay (3% of Scammon Bay residents' community of residence at birth), Bethel (2%), Alakanuk (1%), and Emmonak (1%). Approximately 97% of persons were residents at birth of communities within Alaska, and 2% of residents claimed urban Alaska as their place of origin at birth (i.e., Anchorage, Fairbanks, and Seward). An estimated 2.5% of the population claimed a community of residence at birth that was outside of Alaska but within the U.S.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Figure 3-3 depicts the expanded levels of individual participation in the harvest and processing of wild resources by all Scammon Bay residents in 2013.[9] An estimated 69% of individual Scammon Bay residents (432 people) attempted to harvest at least 1 type of wild food resource, and an estimated 57% of residents processed at least 1 type of wild food resource in 2013 (Figure 3-3; Table D-1). Vegetation (including berries, greens, fungi, and firewood) had the highest participation rates by individuals of any category of subsistence resources: 53% of individuals harvested and 34% of individuals processed vegetation for use

9. Percentages are calculated based on valid responses, which excludes from the sample missing data for that category.

Table 3-4.–Population profile, Scammon Bay, 2013.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	47.2	14.2%	14.2%	41.5	14.0%	14.0%	88.7	14.1%	14.1%
5–9	38.6	11.6%	25.9%	27.2	9.2%	23.2%	65.8	10.5%	24.6%
10–14	60.1	18.1%	44.0%	42.9	14.5%	37.7%	103.0	16.4%	41.0%
15–19	45.8	13.8%	57.8%	32.9	11.1%	48.8%	78.7	12.5%	53.5%
20–24	17.2	5.2%	62.9%	22.9	7.7%	56.5%	40.0	6.4%	59.9%
25–29	15.7	4.7%	67.7%	24.3	8.2%	64.7%	40.0	6.4%	66.3%
30–34	17.2	5.2%	72.8%	18.6	6.3%	71.0%	35.8	5.7%	72.0%
35–39	8.6	2.6%	75.4%	8.6	2.9%	73.9%	17.2	2.7%	74.7%
40–44	14.3	4.3%	79.7%	12.9	4.3%	78.3%	27.2	4.3%	79.0%
45–49	10.0	3.0%	82.8%	8.6	2.9%	81.2%	18.6	3.0%	82.0%
50–54	10.0	3.0%	85.8%	12.9	4.3%	85.5%	22.9	3.6%	85.6%
55–59	12.9	3.9%	89.7%	5.7	1.9%	87.4%	18.6	3.0%	88.6%
60–64	5.7	1.7%	91.4%	10.0	3.4%	90.8%	15.7	2.5%	91.1%
65–69	7.2	2.2%	93.5%	2.9	1.0%	91.8%	10.0	1.6%	92.7%
70–74	7.2	2.2%	95.7%	10.0	3.4%	95.2%	17.2	2.7%	95.4%
75–79	5.7	1.7%	97.4%	1.4	0.5%	95.7%	7.2	1.1%	96.6%
80–84	0.0	0.0%	97.4%	4.3	1.4%	97.1%	4.3	0.7%	97.3%
85–89	0.0	0.0%	97.4%	0.0	0.0%	97.1%	0.0	0.0%	97.3%
90–94	0.0	0.0%	97.4%	0.0	0.0%	97.1%	0.0	0.0%	97.3%
95–99	0.0	0.0%	97.4%	0.0	0.0%	97.1%	0.0	0.0%	97.3%
100–104	0.0	0.0%	97.4%	0.0	0.0%	97.1%	0.0	0.0%	97.3%
Missing	8.6	2.6%	100.0%	8.6	2.9%	100.0%	17.2	2.7%	100.0%
Total	**331.8**	**100.0%**	**100.0%**	**296.1**	**100.0%**	**100.0%**	**627.9**	**100.0%**	**100.0%**

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

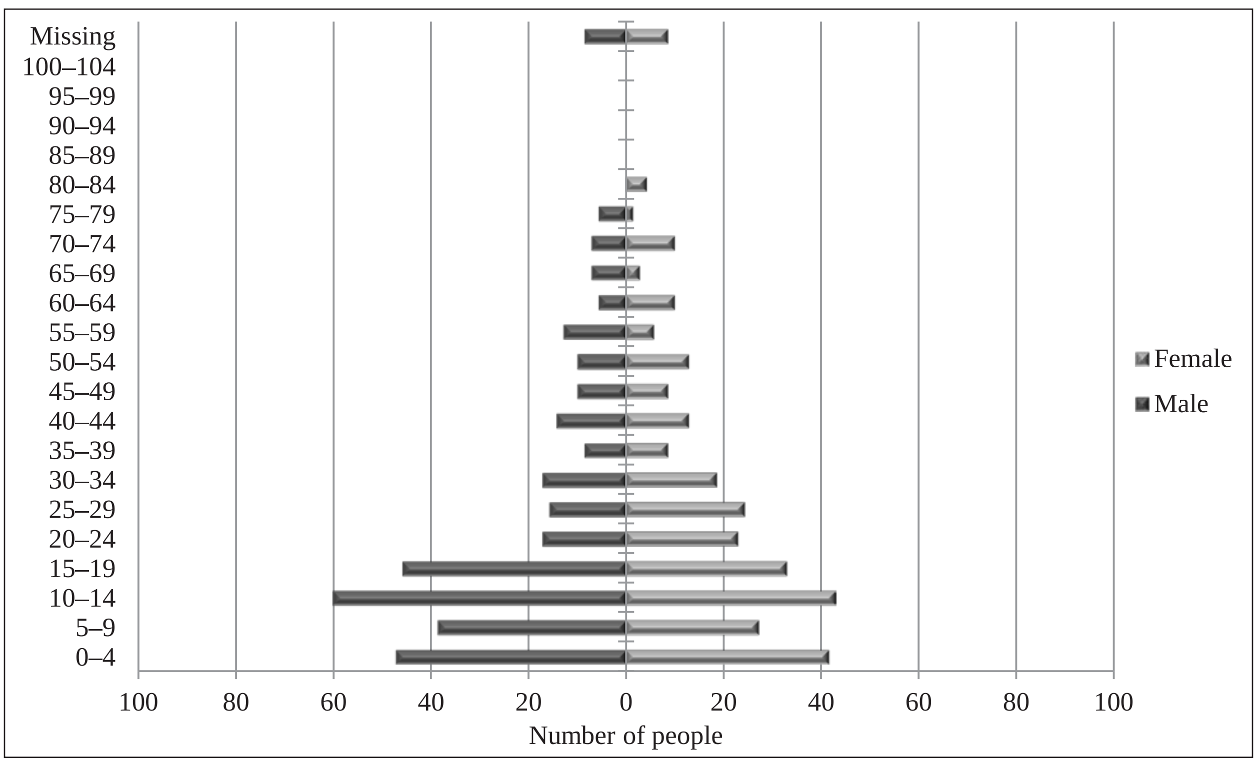


Figure 3-2.–Population profile, Scammon Bay, 2013.

Table 3-5.–Birthplaces of household heads, Scammon Bay, 2013.

Birthplace	Percentage
Alakanuk	1.3%
Balance of Wade Hampton Census Sub-Area	0.7%
Bethel	2.6%
Chevak	0.7%
Emmonak	0.7%
Hooper Bay	5.3%
Iliamna	0.7%
Kasigluk	0.7%
Kipnuk	0.7%
Mountain Village	1.3%
Napaskiak	0.7%
Oscarville	0.7%
Pilot Station	0.7%
Scammon Bay	72.4%
Selawik	0.7%
Nunam Iqua (Sheldon Point)	1.3%
Toksook Bay	0.7%
Chiniliak	0.7%
Numan Iqua (Sheldon Point) & Black R.	0.7%
Missing	1.3%
Other U.S.	5.9%

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 3-6.–Birthplaces of population, Scammon Bay, 2013.

Birthplace	Percentage
Alakanuk	0.9%
Anchorage	1.1%
Balance of Wade Hampton Census Sub-Area	0.2%
Bethel	1.6%
Chevak	0.2%
Emmonak	0.9%
Fairbanks	0.7%
Hooper Bay	3.4%
Iliamna	0.2%
Kasigluk	0.2%
Kipnuk	0.5%
Mountain Village	0.5%
Napaskiak	0.7%
Oscarville	0.2%
Pilot Station	0.2%
Scammon Bay	83.4%
Selawik	0.2%
Seward	0.2%
Nunam Iqua (Sheldon Point)	0.5%
Toksook Bay	0.5%
Chiniliak	0.2%
Numan Iqua (Sheldon Point) & Black R.	0.2%
Missing	0.7%
Other U.S.	2.5%

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.

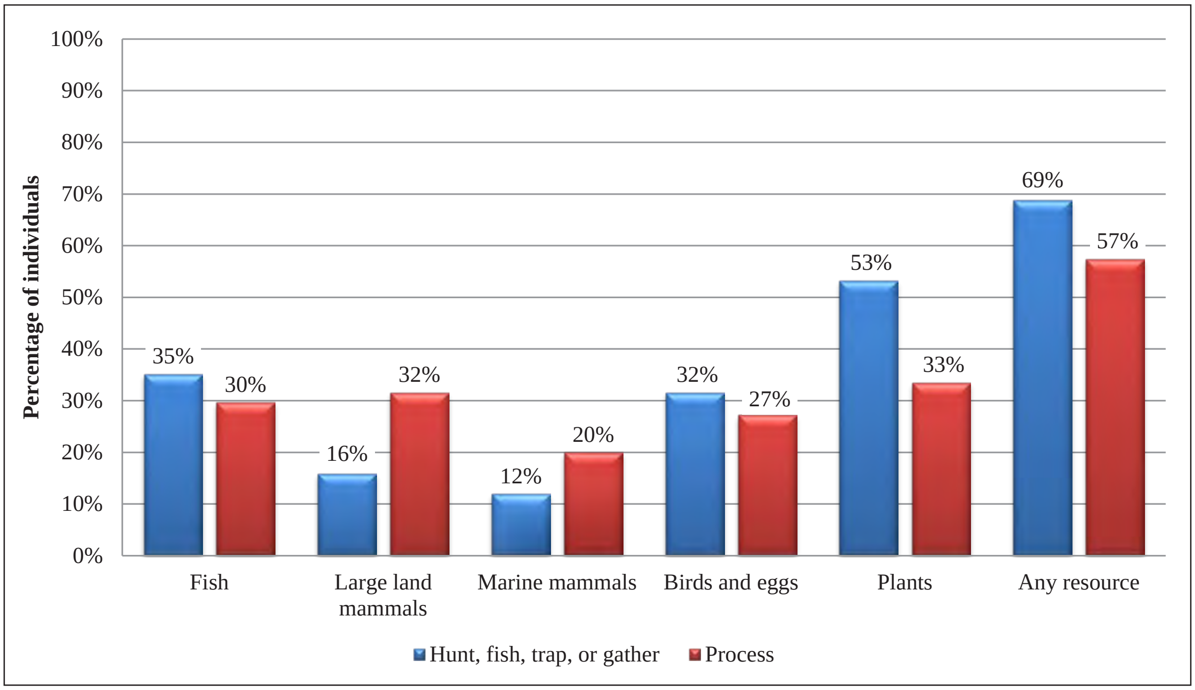


Figure 3-3.–Individual participation in subsistence harvesting and processing activities, Scammon Bay, 2013.

or preservation. Approximately 35% of individuals harvested fish, and 30% processed fish. Similarly, 32% of individuals hunted for birds in 2013, and 28% processed those birds. As compared to other resources, a smaller percentage of people hunted large land mammals (16%) and marine mammals (12%). Many more individuals took part in processing those resources: an estimated 32% of individuals processed large land mammals, and 20% processed marine mammals.

Vegetation typically has the highest participation rates because of its relative accessibility and its high harvest success rate. Most age groups can participate in berry picking and gathering other plants. Relatively fewer individuals hunt for large land mammals and marine mammals for a number of reasons. Hunting for these resources frequently requires travel and time away from the community as well as fairly high skill in the use of a firearm or knowledge of habitats, for example, to hunt and kill a large mammal. The high participation rate in processing large land mammals and marine mammals indicates the amount of time and effort required to dress, butcher, and preserve large quantities of meat.

Harvest and Use of Wild Resources at the Household Level

Figure 3-4 shows by resource category the percentages of households that used wild resources, attempted to harvest, and harvested wild foods. In 2013, 4 resource categories were the most widely used by Scammon Bay households. These included salmon (98% of households used), nonsalmon fishes (98%), large land mammals (98%), and vegetation (97%). Approximately 69% of households in Scammon Bay attempted to harvest salmon, and 66% successfully harvested the resource. Ninety percent of households attempted to harvest nonsalmon fishes, and 88% of households were successful in catching them. This high rate of success suggests that nonsalmon fishes are readily available to fishers, likely due to the proximity and abundance of the resource (Scammon Bay is a coastal community with access to the sea, rivers, and numerous lakes) and

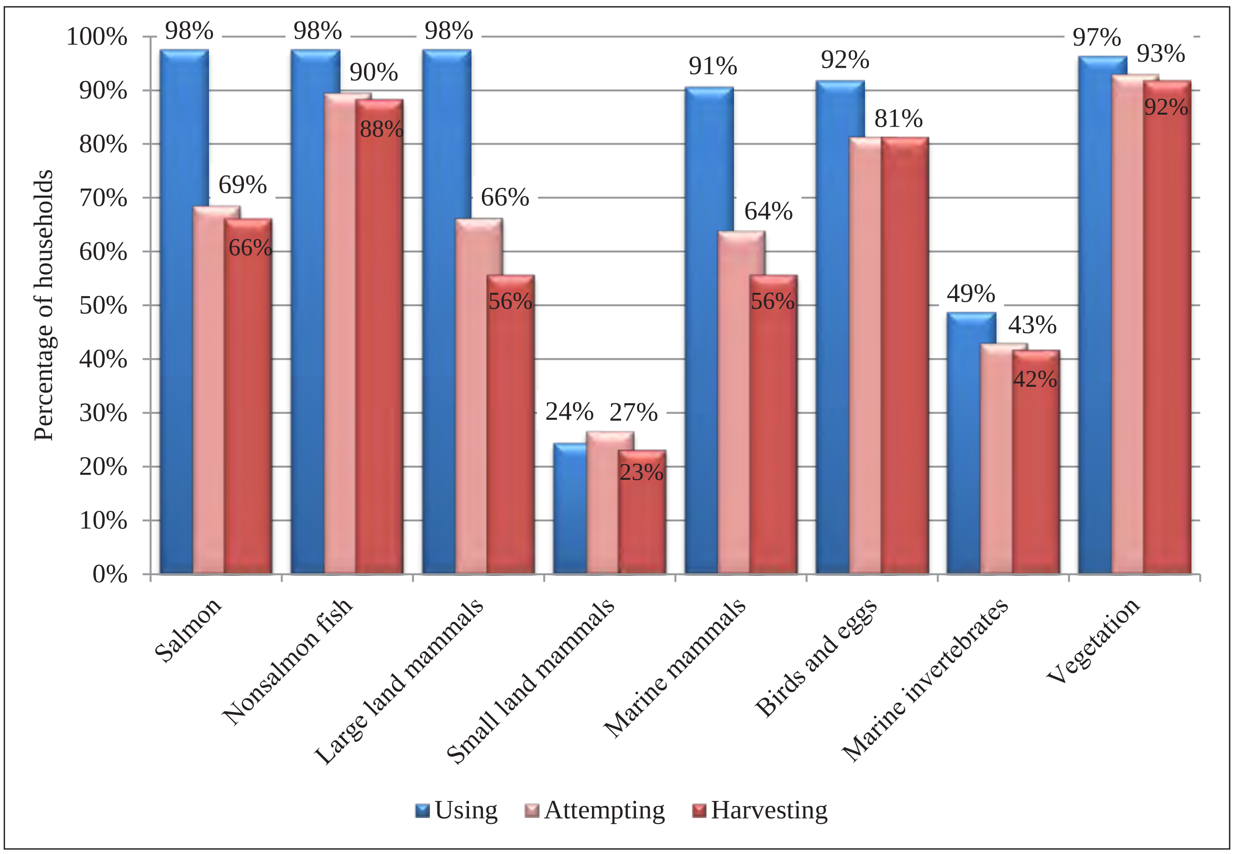


Figure 3-4.–Percentages of households using, attempting to harvest, or harvesting wild resources, Scammon Bay, 2013.

the minimal level of skill required to harvest even small amounts (e.g., using a homemade hook and line tied to a stick to harvest saffron cod and rainbow smelt throughout the year).

An estimated 66% of households hunted moose and other large land mammals, and 56% of hunters were successful. Nearly all households (93%) tried to harvest vegetation and nearly all of those (92% of households) were successful in gathering vegetation. Similar to nonsalmon fishes, berries, greens, and firewood are easily accessible to anyone who attempts to gather them. In comparison to these 4 resource categories, marine mammals as well as birds and eggs were used by a slightly smaller portion of Scammon Bay households in 2013. An estimated 92% of households used birds and eggs, and 91% used marine mammals. Approximately 81% of households attempted to harvest birds and eggs. All of these households were successful, suggesting the ease with which these are obtained, particularly bird eggs. Success rates for marine mammal hunters were somewhat less; 64% of households hunted for marine mammals, and 56% of households actually harvested these animals. As with large land mammals, marine mammal hunting in the Scammon Bay area usually requires access to expensive resources, such as a boat or snowmachine, as well as a relatively high level of skill in both finding the resource and in the use of firearms. These factors may explain the lower success rate. Furthermore, when successful hunters harvest very large animals such as beluga whale and bearded seal, relatively few hunters are needed to supply large amounts of food and blubber for large numbers of people.

Two resource categories with relatively low use by Scammon Bay households were marine invertebrates (49% of households using) and small land mammals (24% of households using). Harvest success rates for both were high: 43% of households attempted to harvest marine invertebrates and 42% harvested these, again suggesting, at least for marine invertebrates, the ease of access to these resources. Twenty-seven percent of households attempted to harvest small land mammals and 23% were successful. It is possible that this high success rate resulted from the activities of a relatively small number of highly skilled hunters and trappers. Species such as Alaska hare, lynx, river otter, and mink are difficult to catch for unskilled individuals who may be less likely to try for such difficult prey. Therefore, participation in harvests of the resource is low. It is also possible that most households simply did not desire to obtain these resources.

For both marine invertebrates and small land mammals, the portion of Scammon Bay households using these species was nearly identical to the percentage harvesting them. Other resource categories indicate a different pattern. Salmon, large land mammals, and marine mammals show marked differences between percentages of households using and percentages of households harvesting. This demonstrates that the absence of resource harvesters in a household does not preclude those individuals from having access to subsistence resources. Rather, Figure 3-4 suggests that subsistence hunters and fishers are likely to share their harvests with households that do not hunt and fish. As in many communities throughout rural Alaska, sharing of subsistence foods is a common practice with a long history in Scammon Bay. One key respondent described a perspective of sharing that he learned from his mother: "One thing I do know about giving something away…is [that] my mom [told] us kids to give, [share] something, give something away…before you keep anything for yourself" (02182014SCM01). Another key respondent described the obligation to provide food for people who are unable to harvest resources for themselves explaining that, "Mainly [we share] with the elders who are not able to hunt, or [people] who don't have a snowmachine [or] boat, because they're dependent on this" (02172014SCM09).

Table 3-7 summarizes resource harvest and use characteristics for Scammon Bay in 2013 at the household level. The average harvest was 2,131 lb usable weight per household and 417 lb per capita. During the study year, community households harvested an average of 22 kinds of resources and used an average of 31 kinds of resources. The maximum number of resources used by any household was 62. In addition, households gave away an average of 10 kinds of resources and received 11 kinds. Overall, at least 137 resources were available for households to harvest in the study area; these included resources that survey respondents identified but were not asked about in the survey instrument.

Table 3-7.–Resource harvest and use characteristics, Scammon Bay, 2013.

Characteristic	
Mean number of resources used per household	**30.7**
Minimum	5
Maximum	62
95% confidence limit (±)	5.6%
Median	30.0
Mean number of resources attempted to harvest per household	**23.6**
Minimum	0
Maximum	65
95% confidence limit (±)	7.4%
Median	22.5
Mean number of resources harvested per household	**22.2**
Minimum	0
Maximum	59
95% confidence limit (±)	7.5%
Median	20.0
Mean number of resources received per household	**10.9**
Minimum	0
Maximum	45
95% confidence limit (±)	9.7%
Median	10.0
Mean number of resources given away per household	**10.2**
Minimum	0
Maximum	52
95% confidence limit (±)	10.7%
Median	8.0
Household harvest (pounds)	
Minimum	0
Maximum	10,351
Mean	2,130.8
Median	1,503.1
Number of resources asked about and identified voluntarily by respondents	137

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

Harvest Quantities and Composition

Table 3-8 reports estimated wild resource harvests and uses by Scammon Bay 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 C for conversion factors[10]). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources harvested, given away, or otherwise used by a household such as resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Purchased foods are not included. Firewood that was gathered or received by Scammon Bay households is included in Table 3-8 as a wild resource use. Any categories or species that show a greater use percentage than harvest percentage reflect the common practice of the sharing of resources among households, which results in a wider distribution of wild foods.

Expanding for unsurveyed households, Scammon Bay's estimated total harvest of edible weight of wild foods between January and December 2013 was 262,090 lb (± 12%) with a per capita harvest of 417 lb (Table 3-8). In terms of edible pounds of each resource category, Scammon Bay residents harvested an estimated 64,788 lb of nonsalmon fish. This was an average of 103 lb per capita and 25% of the total harvest (Figure 3-5; Table 3-8). Amounts of edible pounds of salmon and marine mammals harvested were similar at 53,623 lb and 53,050 lb, respectively, with an average per capita harvest of 85 lb of salmon and 85 lb of marine mammals in 2013. Salmon composed 20% of the total community harvest, and marine mammals made up an additional 20%. The community harvested an estimated total of 51,302 lb of large land mammals, or 82 lb per person. This was also approximately 20% of the total community harvest for 2013. Birds and eggs totaled 25,256 edible pounds harvested, or 10% of total community harvest and 40 lb per capita. Vegetation accounted for approximately 5% of total harvest with an estimated 13,060 lb harvested, or an average of 21 lb per capita. The resource categories with the least amounts of edible pounds harvested included marine invertebrates at 780 lb, or approximately 1 lb per capita, and small land mammals at 230 lb in total, or less than 1 lb per capita. Each of these 2 resource categories composed less than 1% of the total edible pounds harvested by Scammon Bay in 2013. Regardless of edible pounds harvested, the most widely used resource categories (by 98% of households) included nonsalmon fish, salmon, and large land mammals, followed by vegetation (97% of households using), birds and eggs (92%), marine mammals (91%), marine invertebrates (49%), and small land mammals (24%; Figure 3-4; Table 3-8).

Use and Harvest Characteristics by Resource Category

In 2013, an estimated 100% of Scammon Bay households used wild foods and other subsistence resources (Table 3-8). Nearly all households (99%) reported harvesting subsistence resources, 97% reported receiving subsistence resources from other households, and 93% reported giving them away. The wild food resources most commonly received by Scammon Bay households included nonsalmon fish (78% of households), large land mammals (77%), and marine mammals (72%). Approximately 74% of households gave nonsalmon fish to other households, likely due to the high availability of these species in the community. An estimated 58% of Scammon Bay households reported giving large land mammal resources to other households, and 52% of households gave away marine mammal resources. Approximately 69% of households received salmon from others, and 51% of all households gave salmon away. Fifty-nine percent of households reported receiving birds and eggs from others in 2013, and 56% reported giving birds and eggs away. Approximately one-half of all households (49%) claimed to have received berries and plants from others, and slightly more (57% of households) reported giving vegetation away to other households. Relatively small portions of the community reported receiving marine invertebrates (17% of households) and small land mammals (4%). Similarly, small numbers of households claimed to have given away marine invertebrates (17% of households) and small land mammals (11%).

Table 3-9 lists the top 10 ranked resources used by households, and Figure 3-6 shows the species with the highest per capita harvests during the 2013 study year. The principal resources used were derived from a

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

Table 3-8.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Scammon Bay, 2013.

	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence limit (±) harvest
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
All resources	**100.0**	**98.8**	**98.8**	**96.5**	**93.0**	**262,094.5**	**2,130.8**	**417.4**				**11.8**
Salmon	**97.7**	**68.6**	**66.3**	**68.6**	**51.2**	**53,623.2**	**436.0**	**85.4**				**13.5**
Summer chum salmon	90.7	65.1	62.8	40.7	41.9	44,817.5	364.4	71.4	9,679.8	ind	78.7	14.1
Fall chum salmon	10.5	2.3	2.3	8.1	2.3	728.4	5.9	1.2	157.3	ind	1.3	99.5
Unknown chum salmon	4.7	4.7	4.7	0.0	0.0	198.7	1.6	0.3	42.9	ind	0.3	55.2
Coho salmon	22.1	15.1	11.6	12.8	4.7	636.8	5.2	1.0	138.7	ind	1.1	46.0
Chinook salmon	75.6	51.2	44.2	41.9	23.3	4,357.1	35.4	6.9	454.8	ind	3.7	25.1
Pink salmon	30.2	24.4	23.3	9.3	11.6	2,510.1	20.4	4.0	929.7	ind	7.6	34.7
Sockeye salmon	11.6	8.1	8.1	3.5	2.3	374.7	3.0	0.6	84.4	ind	0.7	60.1
Unknown salmon	2.3	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Nonsalmon fish	**97.7**	**89.5**	**88.4**	**77.9**	**74.4**	**64,788.4**	**526.7**	**103.2**				**13.7**
Pacific herring	52.3	34.9	33.7	19.8	24.4	10,136.3	82.4	16.1	1,691.0	gal	13.7	29.6
Pacific herring roe	38.4	25.6	23.3	17.4	11.6	1,377.0	11.2	2.2	250.4	gal	2.0	35.0
Smelt	55.8	41.9	40.7	18.6	19.8	2,580.3	21.0	4.1	430.1	gal	3.5	41.3
Pacific (gray) cod	4.7	4.7	4.7	0.0	0.0	12.9	0.1	0.0	25.7	ind	0.2	54.6
Saffron cod	73.3	70.9	68.6	8.1	26.7	10,679.5	86.8	17.0	12,574.6	ind	102.2	20.4
Walleye pollock (whiting)	4.7	3.5	3.5	1.2	1.2	16.0	0.1	0.0	11.4	ind	0.1	66.1
Flounder	7.0	5.8	5.8	3.5	0.0	67.7	0.6	0.1	61.5	ind	0.5	77.6
Pacific halibut	74.4	44.2	44.2	38.4	37.2	19,784.1	160.8	31.5	19,784.1	lb	160.8	18.4
Arctic lamprey	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Rockfish	1.2	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sculpin	15.1	11.6	11.6	3.5	1.2	46.5	0.4	0.1	93.0	ind	0.8	37.5
Stickleback (needlefish)	14.0	3.5	3.5	11.6	2.3	42.9	0.3	0.1	7.2	ind	0.1	79.7
Alaska blackfish	51.2	20.9	18.6	37.2	16.3	1,139.9	9.3	1.8	1,139.9	lb	9.3	33.2
Burbot	36.0	12.8	12.8	26.7	7.0	303.8	2.5	0.5	126.6	ind	1.0	41.8
Arctic char	1.2	1.2	1.2	0.0	1.2	12.9	0.1	0.0	14.3	ind	0.1	109.0
Dolly Varden	3.5	3.5	3.5	0.0	0.0	32.2	0.3	0.1	35.8	ind	0.3	88.8
Arctic grayling	1.2	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pike	53.5	43.0	43.0	12.8	19.8	6,935.9	56.4	11.0	1,541.3	ind	12.5	24.6
Sheefish	29.1	14.0	14.0	16.3	9.3	1,004.0	8.2	1.6	167.3	ind	1.4	47.3
Rainbow trout	2.3	1.2	1.2	1.2	0.0	2.0	0.0	0.0	1.4	ind	0.0	109.0

-continued-

Table 3-8.–Page 2 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Nonsalmon fish, continued												
Broad whitefish	53.5	34.9	32.6	25.6	18.6	3,149.4	25.6	5.0	787.3	ind	6.4	42.5
Bering cisco	65.1	39.5	38.4	34.9	25.6	3,424.8	27.8	5.5	2,446.3	ind	19.9	27.3
Least cisco	40.7	22.1	20.9	22.1	11.6	596.4	4.8	0.9	584.1	ind	4.7	30.6
Humpback whitefish	57.0	39.5	39.5	29.1	22.1	3,402.5	27.7	5.4	1,134.2	ind	9.2	30.7
Round whitefish	8.1	4.7	4.7	3.5	2.3	41.5	0.3	0.1	83.0	ind	0.7	78.7
Unknown whitefishes	1.2	0.0	0.0	1.2	1.2	0.0	0.0	0.0	0.0	ind	0.0	0.0
Large land mammals	**97.7**	**66.3**	**55.8**	**76.7**	**58.1**	**51,302.4**	**417.1**	**81.7**				**13.5**
Bison	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Black bear	5.8	8.1	4.7	1.2	3.5	572.1	4.7	0.9	5.7	ind	0.0	53.6
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Caribou	20.0	3.5	3.5	16.5	5.9	1,301.5	10.6	2.1	10.0	ind	0.1	63.5
Moose	97.7	66.3	55.8	67.4	55.8	49,428.8	401.9	78.7	91.5	ind	0.7	13.5
Muskox	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Small land mammals	**24.4**	**26.7**	**23.3**	**3.5**	**10.5**	**230.3**	**1.9**	**0.4**				**41.9**
Beaver	3.5	4.7	3.5	0.0	0.0	42.9	0.3	0.1	5.7	ind	0.0	76.7
Coyote	1.2	2.3	1.2	0.0	1.2	0.0	0.0	0.0	1.4	ind	0.0	109.0
Arctic fox	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red fox	9.3	10.5	9.3	0.0	3.5	0.0	0.0	0.0	41.5	ind	0.3	47.4
Snowshoe hare	8.1	10.5	8.1	0.0	3.5	48.6	0.4	0.1	40.0	ind	0.3	54.1
Alaska hare	10.5	12.8	10.5	0.0	7.0	115.8	0.9	0.2	44.3	ind	0.4	50.1
River otter	7.0	10.5	7.0	0.0	3.5	0.0	0.0	0.0	34.3	ind	0.3	61.5
Lynx	4.7	4.7	4.7	1.2	3.5	22.9	0.2	0.0	10.0	ind	0.1	85.9
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	7.0	9.3	5.8	2.3	0.0	0.0	0.0	0.0	31.5	ind	0.3	58.6
Muskrat	4.7	4.7	4.7	0.0	0.0	0.0	0.0	0.0	28.6	ind	0.2	83.4
Porcupine	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	1.4	ind	0.0	109.0
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gray wolf	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Wolverine	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

-continued-

Table 3-8.–Page 3 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Marine mammals	**90.7**	**64.0**	**55.8**	**72.1**	**52.3**	**53,049.5**	**431.3**	**84.5**				**23.2**
Bearded seal	67.4	44.2	37.2	41.9	36.0	11,413.3	92.8	18.2	81.5	ind	0.7	19.0
Ribbon seal	7.0	7.0	4.7	2.3	3.5	636.5	5.2	1.0	7.2	ind	0.1	56.8
Ringed seal	69.8	52.3	46.5	29.1	38.4	10,572.3	86.0	16.8	188.8	ind	1.5	19.8
Spotted seal	40.7	32.6	27.9	17.4	20.9	3,123.6	25.4	5.0	55.8	ind	0.5	23.1
Unknown seal	33.7	11.6	0.0	25.6	8.1	0.0	0.0	0.0				0.0
Walrus	19.8	5.8	3.5	16.3	5.8	3,303.8	26.9	5.3	4.3	ind	0.0	62.2
Beluga whale	65.1	27.9	20.9	52.9	25.6	24,000.0	195.1	38.2	24.0	ind	0.3	36.6
Bowhead whale	8.1	0.0	0.0	8.1	1.2	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown marine mammals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0
Birds and eggs	**91.9**	**81.4**	**81.4**	**59.3**	**55.8**	**25,256.1**	**205.3**	**40.2**				**15.2**
Common eider	11.6	3.5	2.3	9.3	2.3	110.6	0.9	0.2	50.1	ind	0.4	94.6
King eider	17.4	8.1	8.1	10.5	3.5	194.5	1.6	0.3	136.0	ind	1.1	64.8
Spectacled eider	2.3	2.3	2.3	0.0	1.2	24.3	0.2	0.0	10.0	ind	0.1	77.5
Steller's eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gadwall	1.2	1.2	1.2	0.0	1.2	11.4	0.1	0.0	14.3	ind	0.1	109.0
Harlequin duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	43.0	41.9	39.5	4.7	15.1	560.6	4.6	0.9	287.5	ind	2.3	22.5
Red-breasted merganser	1.2	1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Long-tailed duck	8.1	8.1	7.0	1.2	2.4	75.1	0.6	0.1	50.1	ind	0.4	53.8
Northern pintail	41.9	33.7	31.4	11.6	11.6	1,302.2	10.6	2.1	868.2	ind	7.1	38.0
Scaup	9.3	9.3	8.1	2.4	0.0	39.9	0.3	0.1	44.3	ind	0.4	47.2
Black scoter	14.0	12.8	11.6	3.5	7.0	122.3	1.0	0.2	135.9	ind	1.1	40.8
Surf scoter	1.2	2.3	1.2	0.0	0.0	1.3	0.0	0.0	1.4	ind	0.0	109.0
White-winged scoter	1.2	1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern shoveler	11.6	10.5	9.3	2.3	2.3	53.0	0.4	0.1	48.6	ind	0.4	44.5
Teal	34.9	31.4	30.2	5.8	9.3	214.9	1.7	0.3	413.3	ind	3.4	30.4
American wigeon	18.6	17.4	16.3	2.3	8.1	237.9	1.9	0.4	181.6	ind	1.5	37.3
Unknown ducks	2.3	1.2	1.2	1.2	1.2	33.8	0.3	0.1	21.5	ind	0.2	109.0
Brant	46.5	39.5	39.5	9.4	15.3	4,857.1	39.5	7.7	809.5	ind	6.6	20.4
Cackling goose	84.9	70.9	70.9	20.0	38.4	1,821.6	14.8	2.9	1,518.0	ind	12.3	14.4
Emperor goose	21.2	17.6	17.4	4.7	4.7	325.4	2.6	0.5	130.2	ind	1.1	34.4

-continued-

Table 3-8.–Page 4 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Birds and eggs, continued												
Snow goose	25.6	19.8	17.4	9.3	10.5	1,529.4	12.4	2.4	383.3	ind	3.1	40.6
White-fronted goose	72.1	61.6	60.5	15.3	24.7	5,681.5	46.2	9.0	1,340.0	ind	10.9	18.1
Unknown geese	1.2	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tundra (whistling) swan	50.0	38.4	38.4	13.1	9.5	1,170.4	9.5	1.9	104.4	ind	0.8	17.8
Sandhill crane	61.6	46.5	46.5	18.8	18.8	3,652.2	29.7	5.8	434.8	ind	3.5	24.4
Shorebirds	1.2	1.2	1.2	0.0	0.0	0.1	0.0	0.0	1.4	ind	0.0	109.0
Loon	4.7	3.5	3.5	1.2	0.0	23.3	0.2	0.0	4.3	ind	0.0	62.2
Unknown seabirds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ptarmigan	70.9	53.5	53.5	20.0	32.6	1,668.3	13.6	2.7	2,383.3	ind	19.4	21.2
Snowy owl	1.2	1.2	1.2	0.0	0.0	4.3	0.0	0.0	1.4	ind	0.0	109.0
Duck eggs	39.5	31.4	31.4	11.8	11.6	144.2	1.2	0.2	961.1	ind	7.8	23.0
Goose eggs	68.6	52.3	51.2	24.7	22.1	825.5	6.7	1.3	2,751.8	ind	22.4	19.0
Swan eggs	23.3	17.4	17.4	7.0	5.8	98.2	0.8	0.2	155.9	ind	1.3	31.7
Crane eggs	9.3	8.1	8.1	1.2	1.2	24.3	0.2	0.0	38.6	ind	0.3	46.1
Unknown shorebird eggs	14.0	12.8	12.8	2.3	5.8	15.8	0.1	0.0	399.0	ind	3.2	48.9
Gull eggs	40.7	30.2	27.9	12.8	9.4	380.6	3.1	0.6	1,268.6	ind	10.3	28.3
Loon eggs	5.8	5.8	5.8	0.0	3.5	7.5	0.1	0.0	41.5	ind	0.3	77.1
Tern eggs	14.0	14.0	14.0	1.2	5.8	39.0	0.3	0.1	779.5	ind	6.3	72.7
Ptarmigan eggs	1.2	1.2	1.2	0.0	0.0	1.7	0.0	0.0	17.2	ind	0.1	109.0
Unknown eggs	3.5	2.4	2.3	2.4	1.2	3.8	0.0	0.0	17.2	ind	0.1	92.5
Marine invertebrates	**48.8**	**43.0**	**41.9**	**17.4**	**17.4**	**780.1**	**6.3**	**1.2**				**22.0**
Clams	38.4	33.7	33.7	8.1	12.8	588.3	4.8	0.9	183.1	gal	1.5	24.0
King crab	1.2	1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tanner crab	0.0	1.2	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
Mussels	36.0	26.7	26.7	15.1	10.5	149.2	1.2	0.2	99.4	gal	0.8	28.1
Shrimp	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	109.0
Unknown marine invertebrates	4.7	3.5	3.5	1.2	1.2	42.6	0.3	0.1	20.0	gal	0.2	64.5

-continued-

Table 3-8.–Page 5 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Vegetation	**96.5**	**93.0**	**91.9**	**48.8**	**57.0**	**13,064.4**	**106.2**	**20.8**	**3,901.2**	gal	**31.7**	**10.4**
Blueberry	62.8	58.1	58.1	9.3	5.8	618.6	5.0	1.0	154.7	gal	1.3	21.6
Lowbush cranberry	45.3	43.0	43.0	5.9	8.2	710.8	5.8	1.1	177.7	gal	1.4	23.4
Highbush cranberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Crowberry	82.6	77.9	77.9	8.2	20.0	3,129.2	25.4	5.0	782.3	gal	6.4	13.8
Cloudberry	91.9	87.2	87.2	18.6	37.2	7,656.4	62.2	12.2	1,914.1	gal	15.6	9.8
Nagoonberry	29.1	29.1	27.9	1.2	0.0	112.6	0.9	0.2	28.2	gal	0.2	37.5
Bearberry	1.2	1.2	1.2	0.0	0.0	2.9	0.0	0.0	0.7	gal	0.0	109.0
Other wild berry	1.2	1.2	1.2	0.0	1.2	34.3	0.3	0.1	8.6	gal	0.1	109.0
Wild rhubarb	11.6	10.5	10.5	1.2	2.3	41.2	0.3	0.1	40.9	gal	0.3	52.4
Other beach greens	2.3	2.3	2.3	0.0	0.0	20.0	0.2	0.0	20.0	gal	0.2	94.6
Fiddlehead ferns	2.3	2.3	2.3	0.0	0.0	5.9	0.0	0.0	5.9	gal	0.0	105.6
Hudson's Bay (Labrador) tea	54.7	51.2	51.2	8.1	9.3	94.7	0.8	0.2	94.7	gal	0.8	18.9
Sourdock	43.0	41.9	41.9	3.5	9.3	270.6	2.2	0.4	270.6	gal	2.2	26.5
Pallas buttercup	31.4	26.7	26.7	7.0	12.8	156.7	1.3	0.2	156.7	gal	1.3	26.3
Wild celery	10.5	8.1	8.1	2.3	0.0	49.0	0.4	0.1	49.0	gal	0.4	95.5
Wild parsley	8.1	8.1	8.1	0.0	0.0	13.9	0.1	0.0	13.9	gal	0.1	48.0
Other wild greens	25.6	25.6	25.6	1.2	2.4	65.0	0.5	0.1	65.0	gal	0.5	31.7
Unknown mushrooms	2.3	2.3	2.3	0.0	1.2	0.6	0.0	0.0	0.6	gal	0.0	77.1
Fireweed	1.2	1.2	1.2	0.0	1.2	2.9	0.0	0.0	2.9	gal	0.0	109.0
Stinkweed	19.8	18.6	18.6	1.2	1.2	32.6	0.3	0.1	32.6	gal	0.3	37.3
Punk	5.8	2.3	2.3	3.5	3.5	0.0	0.0	0.0	35.8	gal	0.3	78.2
Mousefoods	17.4	17.4	15.1	2.3	8.1	46.3	0.4	0.1	46.3	gal	0.4	48.1
Wood	75.3	65.9	65.9	23.5	18.8	0.0	0.0	0.0				0.0

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

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

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

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

* Resource not asked on survey, but information offered by participant.

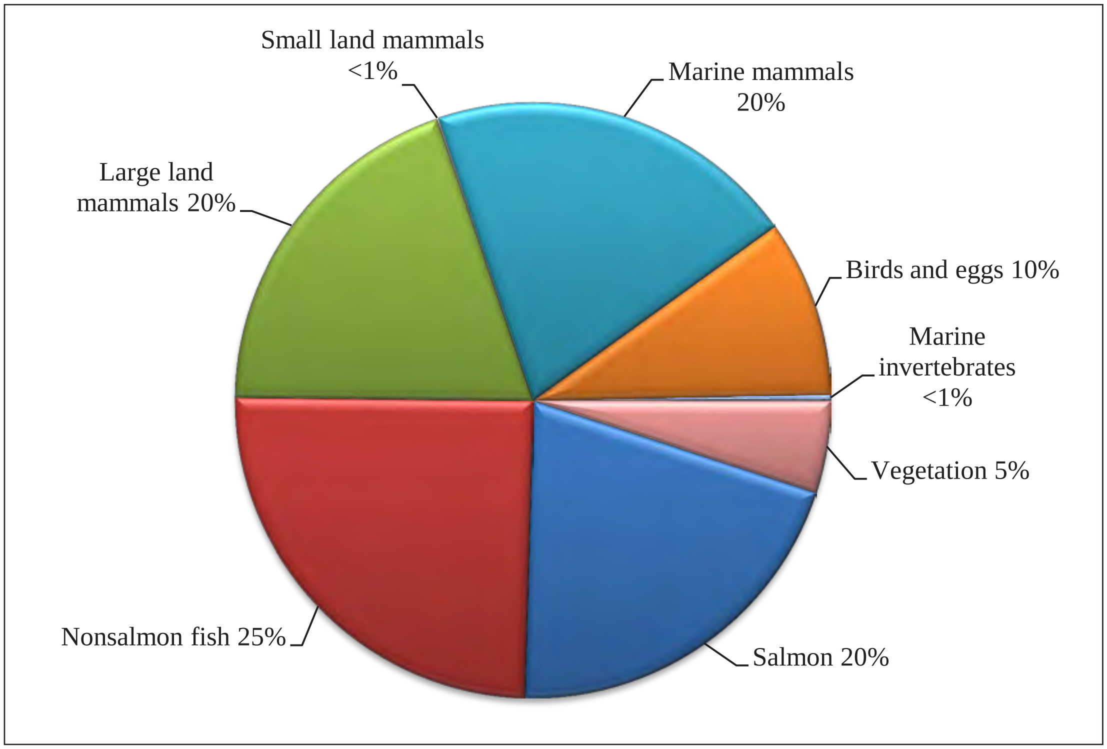


Figure 3-5.–Composition of edible harvest by resource category, Scammon Bay, 2013.

Table 3-9.–Top 10 ranked resources used by households, Scammon Bay, 2013.

Rank[a]	Resource	Percentage of households using
1.	Moose	97.7%
2.	Cloudberry	91.9%
3.	Summer chum salmon	90.7%
4.	Cackling goose	84.9%
5.	Crowberry	82.6%
6.	Chinook salmon	75.6%
7.	Wood	75.3%
7.	Pacific halibut	74.4%
9.	Saffron cod	73.3%
10.	White-fronted goose	72.1%

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.

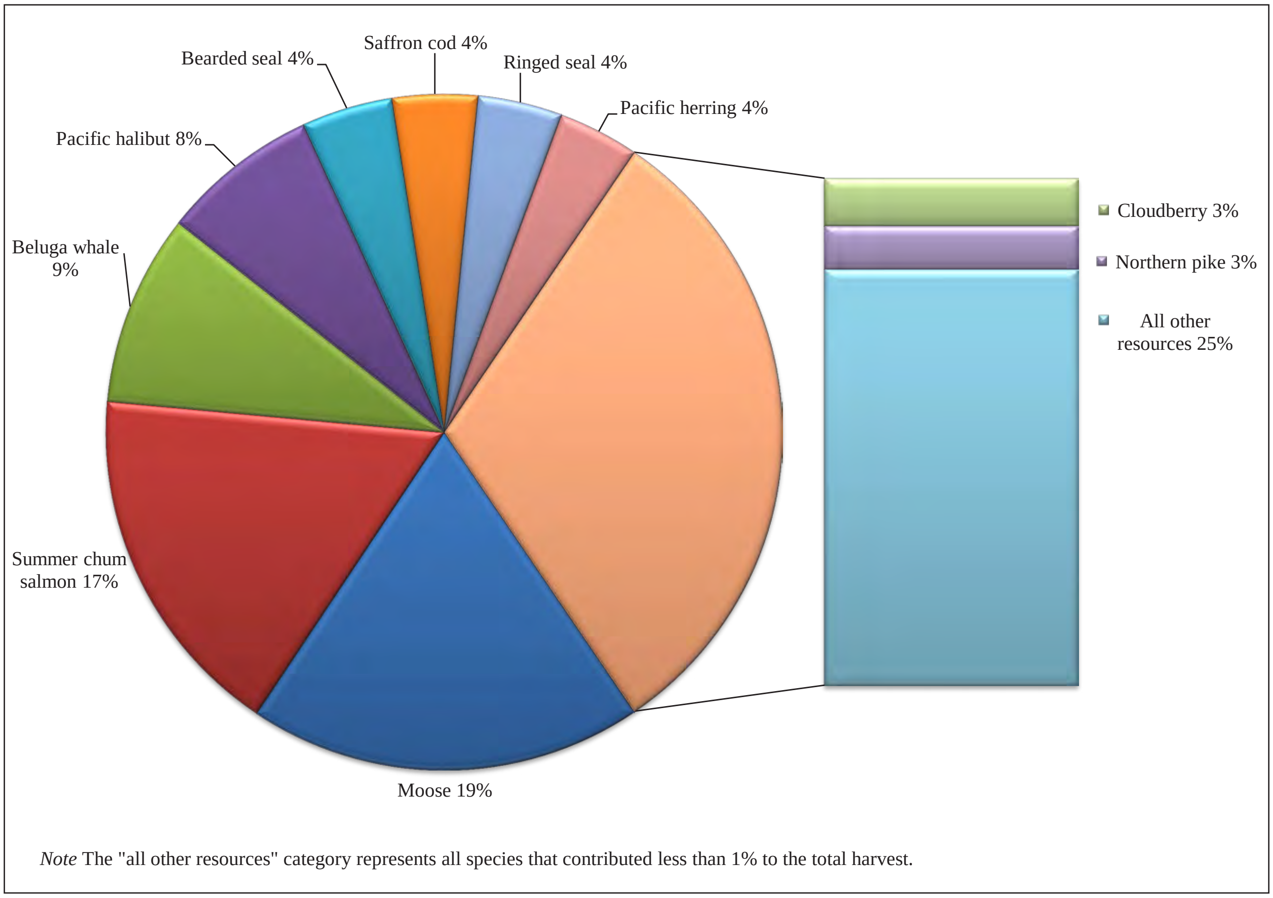


Figure 3-6.–Top species harvested in pounds edible weight per capita, Scammon Bay, 2013.

variety of categories including large land mammals, nonsalmon fish, salmon, vegetation, and birds. Table 3-9 demonstrates that in 2013 no one category or species dominated the foods and other wild resources that Scammon Bay households used, further suggesting the diversity of resources available to residents of this Bering Sea coastal community. Moose was the most commonly used wild food resource: approximately 98% of households reported using this species. Following moose was summer chum salmon: 91% of households used this resource. Similarly, 88% of households reported using cloudberry[11] and approximately 85% reported using cackling goose. A large portion of Scammon Bay households (83%) also reported use of crowberry in 2013. Other important resources used by Scammon Bay households during the study year included Chinook salmon (76% of households used), wood (75%), Pacific halibut (74%), saffron cod (73%), and white-fronted goose (72%).

Figure 3-6 depicts the 10 principal wild food resources harvested by average pounds of edible weight per capita. This figure shows the relative importance of various food sources in terms of weight harvested (and presumably consumed), as opposed to how commonly the resources were claimed to have been used. Therefore, this figure may depict the relative value of each resource as a dietary staple in 2013 better than does Table 3-9. The principal resources by weight harvested include relatively large species (e.g., moose, beluga whale, halibut, bearded seal) as well as resources of great abundance locally (e.g., summer chum salmon, saffron cod, Pacific herring, cloudberry). Although the figure may also suggest other aspects of importance, such as nutritional density, cultural value, or significance to family traditions, it is primarily

11. Residents of the coastal Bering Sea and Yukon-Kuskokwim Delta regions typically refer to cloudberry *Rubus chamaemorus* with the local common name of salmonberry. The reader should not confuse this with the distinct species *Rubus spectabilis* which is also referred to as salmonberry in regions where it is endemic. *Rubus spectabilis* is not endemic to the Yukon-Kuskokwim Delta region. Hereafter *cloudberry*.

intended to represent what was reported to have been harvested by Scammon Bay households in 2013. On average, an estimated total of 417 lb of wild foods were harvested for each resident of the community (Table 3-8). Of this total, 19% of the per capita harvest was composed of moose, and a similar 17% was composed of summer chum salmon (Figure 3-6). Other principal species harvested by weight per capita included beluga whale (9% of the total per capita harvest) and halibut (7%). Bearded seal, saffron cod, ringed seal, and herring each composed 4% of the total harvest by weight per capita, while cloudberry and northern pike each composed 3% of this total. All other wild food resources constituted 26% of the total weight harvested per capita.

Salmon

In 2013, Scammon Bay households harvested 5 species of salmon, including chum—both summer and fall chum—Chinook, pink, coho, and sockeye salmon (Table 3-8). The total weight of all salmon harvested was approximately 53,623 lb, or 85 lb per capita, and 98% of households reported the use of salmon. Approximately 83% of the total harvest of salmon was composed of summer chum salmon; Chinook salmon constituted 8% of the total weight harvested, and pink salmon accounted for 5% of the total (Figure 3-7). Fishers harvested 44,818 lb of summer chum salmon, or 71 lb per capita (Table 3-8). Summer chum salmon was the most commonly used salmon: 91% of households reported using the species. The total estimated weight of summer chum salmon harvested (44,818 lb or 71 lb per capita) was an order of magnitude greater than the weight of the next most harvested species of salmon, Chinook salmon, which totaled 4,357 lb, or 7 lb per capita. Nearly two-thirds of Scammon Bay households reported attempting to harvest summer chum salmon (65% of households), and 63% successfully harvested the species. Despite the relatively small harvest of Chinook salmon by weight, it was still widely used by Scammon Bay households (76% of households reported use). Forty-four percent of households harvested Chinook salmon, and 51% attempted to harvest the species. In addition, 42% of households reported receiving Chinook salmon, and 23% reported giving it away to others. These data indicate the widespread sharing of Chinook salmon within the community and possibly with households outside of Scammon Bay. Fishers harvested a total of 2,510 lb of pink salmon, 728 lb of fall chum salmon, 637 lb of coho salmon, and 375 lb of sockeye salmon.

Set gillnet was the principal gear type used to harvest salmon in 2013; 10,891 salmon (51,229 lb) were taken with this gear type (Table 3-10). A relatively small portion of all salmon were harvested with dip

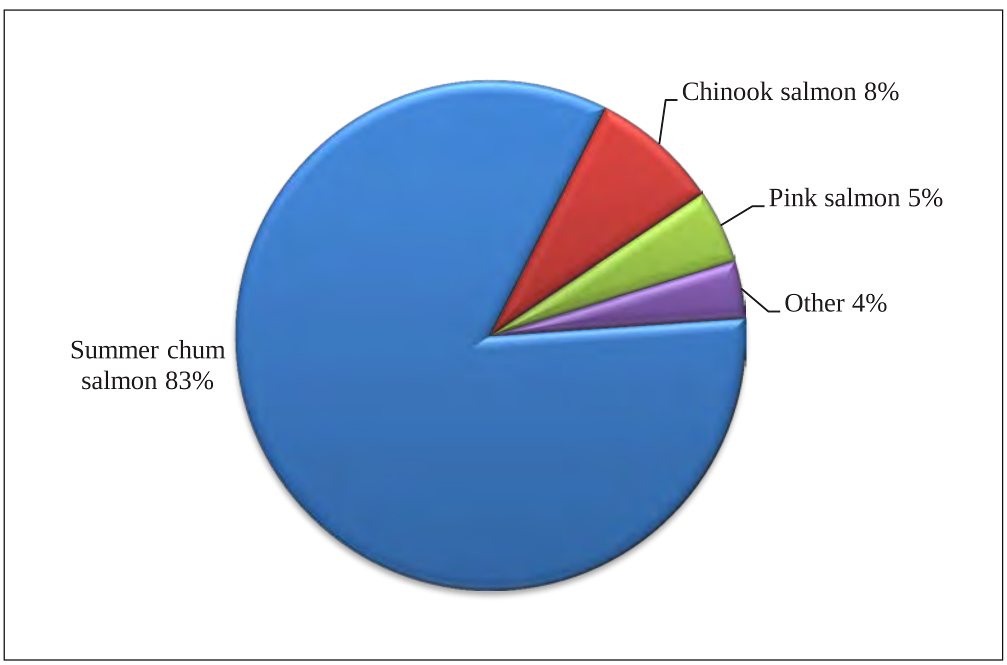


Figure 3-7.–Composition of edible salmon harvest, Scammon Bay, 2013.

Table 3-10.–Estimated salmon harvests by gear type, Scammon Bay, 2013.

			Subsistence methods									
	Removed from commercial catch		Setnet		Driftnet		Fish wheel		Seine net		Dip net	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**168.8**	**580.4**	**10,891.2**	**51,228.6**	**121.6**	**562.9**	**0.0**	**0.0**	**93.0**	**842.8**	**211.7**	**836.5**
Summer chum salmon	0.0	0.0	9,379.5	43,426.9	121.6	562.9	0.0	0.0	42.9	629.1	135.9	629.1
Fall chum salmon	0.0	0.0	157.3	728.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown chum salmon	42.9	198.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coho salmon	0.0	0.0	137.3	630.2	0.0	0.0	0.0	0.0	0.0	6.6	1.4	6.6
Chinook salmon	4.3	41.1	450.5	4,316.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink salmon	114.4	308.9	733.7	1,981.0	0.0	0.0	0.0	0.0	7.2	200.8	74.4	200.8
Sockeye salmon	7.2	31.8	32.9	146.1	0.0	0.0	0.0	0.0	42.9	6.4	0.0	0.0
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

-continued-

Table 3-10.–Continued.

	Subsistence methods									
	By hand		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**1.4**	**6.4**	**0.0**	**0.0**	**11,225.9**	**52,634.3**	**93.0**	**408.5**	**11,487.6**	**53,623.2**
Summer chum salmon	**0.0**	**0.0**	0.0	0.0	9,636.9	44,618.9	42.9	198.7	9,679.8	44,817.5
Fall chum salmon	**0.0**	**0.0**	0.0	0.0	157.3	728.4	0.0	0.0	157.3	728.4
Unknown chum salmon	**0.0**	**0.0**	0.0	0.0	0.0	0.0	0.0	0.0	42.9	198.7
Coho salmon	**0.0**	**0.0**	0.0	0.0	138.7	636.8	0.0	0.0	138.7	636.8
Chinook salmon	**0.0**	**0.0**	0.0	0.0	450.5	4,316.0	0.0	0.0	454.8	4,357.1
Pink salmon	**0.0**	**0.0**	0.0	0.0	808.1	2,181.8	7.2	19.3	929.7	2,510.1
Sockeye salmon	**1.4**	**6.4**	0.0	0.0	34.3	152.4	42.9	190.5	84.4	374.7
Unknown salmon	**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.

Note The harvested number of salmon is represented as individual fish harvested.

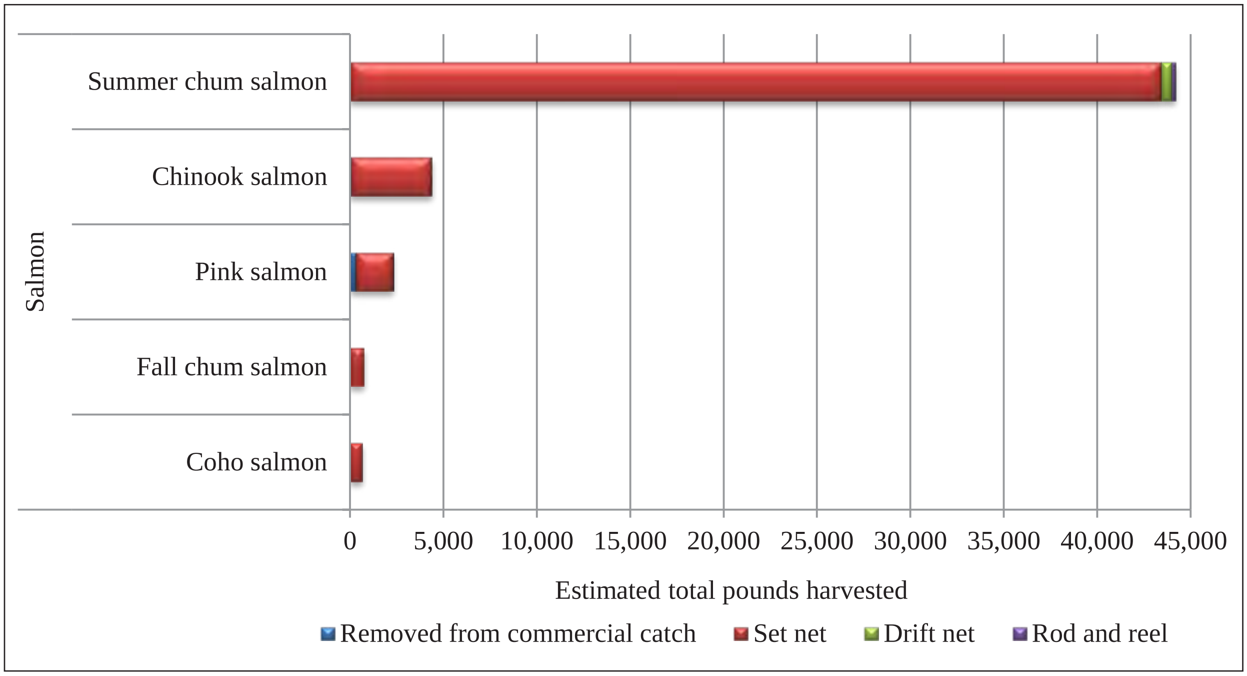


Figure 3-8.–Estimated salmon harvests by gear type, Scammon Bay, 2013.

net (212 salmon or 837 lb), drift gillnet (122 salmon or 563 lb), and rod and reel (93 salmon or 409 lb). An estimated 169 salmon (580 pounds) were removed from commercial harvests for home use. Figure 3-8 depicts the pounds of salmon harvested by gear type and shows that nearly all salmon were harvested using set gillnets. As estimated in pounds of fish, 96% of the salmon harvest—approximately 51,229 lb—was caught using set gillnets (tables 3-8 and 3-11).

Nonsalmon Fish

In 2013, Scammon Bay households harvested several species of nonsalmon fish. The total weight of all nonsalmon fish harvested was approximately 64,788 lb, or 103 lb per capita (Table 3-8). Principal species harvested included 19,784 lb of halibut (32 lb per capita and 30% of the total weight of nonsalmon fish harvests); 10,680 lb of saffron cod (commonly referred to as tomcod[12]; 17 lb per capita and 16% of all nonsalmon fish); 10,136 of herring (16 lb per capita and 16%); and 6,936 lb of northern pike (11 lb per capita and 11%; Table 3-8; Figure 3-9). Scammon Bay households also harvested an estimated 11,619 lb of whitefishes[13], including 3,425 lb of Bering cisco, 3,403 lb of humpback whitefish, and 3,149 lb of broad whitefish, each of which constituted about 5 lb harvested per capita in 2013 (Table 3-8).

Nearly all Scammon Bay households (98%) reported using nonsalmon fish. Halibut and saffron cod were the most commonly used nonsalmon fish, with 74% and 73% of households using each, respectively. Although approximately three-quarters of households reported using halibut, relatively few households (44%) actually harvested this resource. This discrepancy indicates the important role that sharing halibut has in the community—38% reported receiving halibut—as well as the relative difficulty of harvesting this large marine fish species. On the contrary, use and harvest rates of saffron cod are both high and similar to each other. Although 73% of households used saffron cod, an estimated 69% harvested the species. This

---

12. Many residents of the coastal Bering Sea and Yukon-Kuskokwim Delta regions commonly refer to saffron cod *Eleginus gracilis* as “tomcod.” The reader should not confuse this common name with the species Pacific tomcod *Microgradus proximus,* which is also present in the Bering Sea, but generally not harvested by subsistence fishers in the region.

13. The term whitefishes may commonly include a number of closely related species of the genus Coregoninae. Whitefish species in this project include the following: humpback whitefish *Coregonus pidschian,* broad whitefish *C. nasus,* Bering cisco *C. laurettae,* least cisco *C. sardinella,* sheefish (inconnu) *Stenodus leucichthys*, and round whitefish *Prosopium cylindraceum.*

Table 3-11.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Scammon Bay, 2013.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Fish wheel	Seine net	Dip net	By hand	Other method	Subsistence gear, any method	Rod and reel	Any method
Salmon	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**100.0%**	**100.0%**	**0.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**1.1%**	**95.5%**	**1.0%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**	**0.0%**	**98.2%**	**0.8%**	**100.0%**
	Total	**1.1%**	**95.5%**	**1.0%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**	**0.0%**	**98.2%**	**0.8%**	**100.0%**
Summer chum salmon	Gear type	0.0%	84.8%	100.0%	0.0%	0.0%	75.2%	0.0%	0.0%	84.8%	48.6%	83.6%
	Resource	0.0%	96.9%	1.3%	0.0%	0.0%	1.0%	0.0%	0.0%	99.6%	0.4%	100.0%
	Total	0.0%	81.0%	1.0%	0.0%	0.0%	0.8%	0.0%	0.0%	83.2%	0.4%	83.6%
Fall chum salmon	Gear type	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	1.4%
	Resource	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	1.4%
Unknown chum salmon	Gear type	34.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Coho salmon	Gear type	0.0%	1.2%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	1.2%	0.0%	1.2%
	Resource	0.0%	99.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	1.2%
Chinook salmon	Gear type	7.1%	8.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.2%	0.0%	8.1%
	Resource	0.9%	99.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.1%	0.0%	100.0%
	Total	0.1%	8.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.0%	0.0%	8.1%
Pink salmon	Gear type	53.2%	3.9%	0.0%	0.0%	0.0%	24.0%	0.0%	0.0%	4.1%	4.7%	4.7%
	Resource	12.3%	78.9%	0.0%	0.0%	0.0%	5.6%	0.0%	0.0%	86.9%	0.8%	100.0%
	Total	0.6%	3.7%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	4.1%	0.0%	4.7%
Sockeye salmon	Gear type	5.5%	0.3%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.3%	46.6%	0.7%
	Resource	8.5%	39.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	40.7%	50.8%	100.0%
	Total	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.4%	0.7%
Unknown 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%
	Resource	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%

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

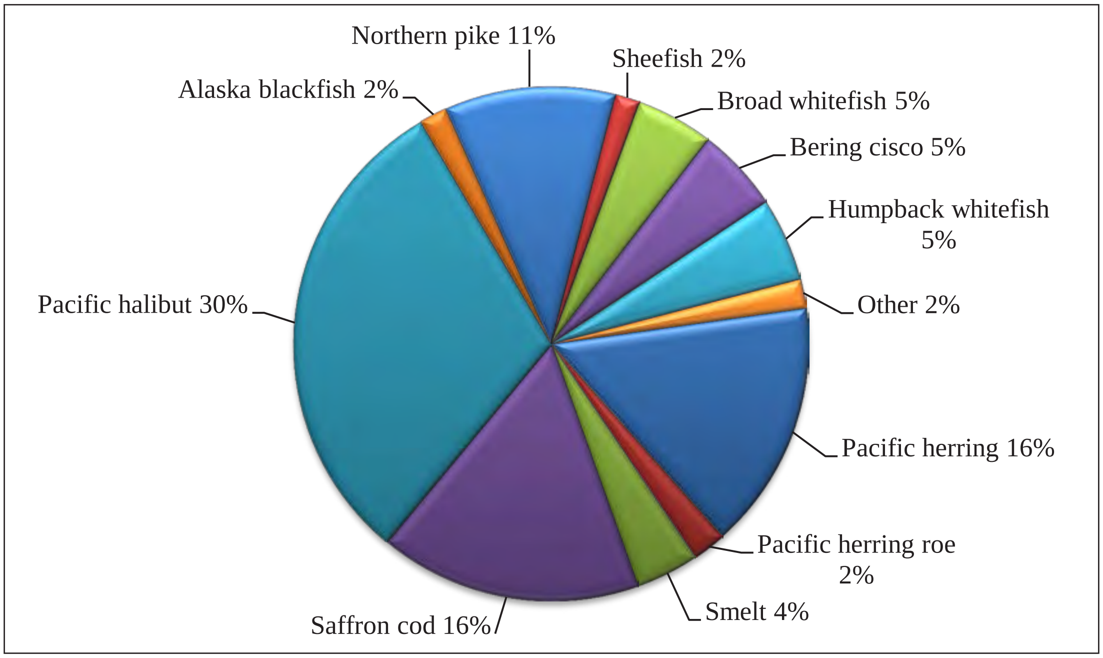


Figure 3-9.–Composition of edible nonsalmon fish harvest, Scammon Bay, 2013.

fish is both common and relatively easy to harvest. It is present year-round in the Kun River mouth and other coastal marine areas very close to the community and is usually harvested by hook and line attached to a short stick in both open water and through the ice. Only 8% of households reported receiving saffron cod from others, further suggesting that most households are capable of harvesting this fish due to its easy accessibility for fishers who attempt to harvest it.

Other important nonsalmon fish species included whitefishes, specifically Bering cisco, humpback whitefish, broad whitefish, least cisco, and sheefish (inconnu). Bering cisco was the most commonly used of these species: 65% of households used this fish. About one-half of all households used humpback whitefish and broad whitefish (57% and 54% using, respectively), 41% reported using least cisco, and 29% used sheefish. An estimated 38% of households harvested Bering cisco, 40% reported harvesting humpback whitefish, 33% broad whitefish, 21% least cisco, and 14% sheefish. Whitefishes were also widely shared; approximately one-third of households reported that they received Bering cisco, humpback whitefish, or broad whitefish. Approximately one-half of all households reported using smelt[14], northern pike, herring, and Alaska blackfish; and smaller portions of the population harvested these species. More than one-third of all households reported using herring roe and burbot in 2013.

Harvest of nonsalmon fish occurred primarily with the use of 3 gear types. These included 23,240 lb of nonsalmon fish taken using set gillnet, 19,326 lb harvested by jigging (including hook and line attached to a pole in open water and through the ice), and 18,302 lb were harvested using rod and reel gear (Table 3-12). Figure 2-10 depicts the weights of nonsalmon fish harvested by gear type, and Table 3-13 shows the percentage of the nonsalmon harvest by gear type in terms of total estimated pounds. Nearly all saffron cod (9,737 lb or 91%) and northern pike (6,679 lb or 92%), as well as essentially all smelt (2,579 lb or 99.8%), were harvested by jigging, both in open water and through the ice (Figure 3-10; tables 3-12 and 3-13). Most herring (8,916 lb or 88%) and whitefishes (11,351 lb or 98%) were harvested by set gillnet, and the majority of halibut were harvested using rod and reel (18,268 lb or 92%). As estimated in edible pounds, 29% of nonsalmon fish harvest was caught by jigging both in open water and through the ice, and 31% was caught

14. The species of smelt harvested by Scammon Bay fishers was likely rainbow smelt *Osmerus mordax*, the most abundant species of smelt present in this region.

Table 3-12.–Estimated nonsalmon fish harvests by gear type, Scammon Bay, 2013.

				Subsistence methods											
		Removed from commercial catch		Setnet		Driftnet		Fish wheel		Jigging		Seine net		Dip net	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**42.9**		**23,239.6**		**1,288.9**		**0.0**		**19,326.3**		**0.0**		**156.6**
Pacific herring	gal	7.2	42.9	1,487.5	8,916.0	196.4	1,177.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe	gal	0.0	0.0	5.7	31.5	0.0	0.0	0.0	0.0	14.3	78.7	0.0	0.0	0.0	0.0
Smelt	gal	0.0	0.0	0.2	1.4	0.0	0.0	0.0	0.0	429.8	2,578.9	0.0	0.0	0.0	0.0
Pacific (gray) cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saffron cod	ind	0.0	0.0	1,109.9	942.6	0.0	0.0	0.0	0.0	11,464.7	9,736.9	0.0	0.0	0.0	0.0
Walleye pollock (whiting)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flounder	ind	0.0	0.0	57.2	62.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	lb	0.0	0.0	1,516.0	1,516.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic lamprey	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rockfish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sculpin	ind	0.0	0.0	22.9	11.4	0.0	0.0	0.0	0.0	70.1	35.0	0.0	0.0	0.0	0.0
Stickleback (needlefish)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.2	17.2	0.0	0.0	0.0	0.0
Burbot	ind	0.0	0.0	56.5	135.6	0.0	0.0	0.0	0.0	70.1	168.2	0.0	0.0	0.0	0.0
Arctic char	ind	0.0	0.0	14.3	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	ind	0.0	0.0	1.4	1.3	0.0	0.0	0.0	0.0	34.3	30.9	0.0	0.0	0.0	0.0
Arctic grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern pike	ind	0.0	0.0	57.2	257.4	0.0	0.0	0.0	0.0	1,484.1	6,678.5	0.0	0.0	0.0	0.0
Sheefish	ind	0.0	0.0	167.3	1,004.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	2.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	0.0	0.0	787.3	3,149.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bering cisco	ind	0.0	0.0	2,360.5	3,304.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	85.8	120.1
Least cisco	ind	0.0	0.0	548.4	559.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.8	36.5
Humpback whitefish	ind	0.0	0.0	1,097.0	3,291.0	37.2	111.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round whitefish	ind	0.0	0.0	83.0	41.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown whitefishes	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

-continued-

Table 3-12.–Continued.

		Subsistence methods											
		Fish trap		By hand		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**1,011.2**		**794.9**		**626.4**		**46,443.9**		**18,301.7**		**64,788.4**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	1,683.9	10,093.4	0.0	0.0	1,691.0	10,136.3
Pacific herring roe	gal	0.0	0.0	144.5	794.9	85.8	472.0	250.4	1,377.0	0.0	0.0	250.4	1,377.0
Smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	430.1	2,580.3	0.0	0.0	430.1	2,580.3
Pacific (gray) cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.7	12.9	25.7	12.9
Saffron cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	12,574.6	10,679.5	0.0	0.0	12,574.6	10,679.5
Walleye pollock (whiting)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.4	16.0	11.4	16.0
Flounder	ind	0.0	0.0	0.0	0.0	0.0	0.0	57.2	62.9	4.3	4.7	61.5	67.7
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	1,516.0	1,516.0	18,268.1	18,268.1	19,784.1	19,784.1
Arctic lamprey	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rockfish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sculpin	ind	0.0	0.0	0.0	0.0	0.0	0.0	93.0	46.5	0.0	0.0	93.0	46.5
Stickleback (needlefish)	ind	7.2	42.9	0.0	0.0	0.0	0.0	7.2	42.9	0.0	0.0	7.2	42.9
Alaska blackfish	lb	968.3	968.3	0.0	0.0	154.5	154.5	1,139.9	1,139.9	0.0	0.0	1,139.9	1,139.9
Burbot	ind	0.0	0.0	0.0	0.0	0.0	0.0	126.6	303.8	0.0	0.0	126.6	303.8
Arctic char	ind	0.0	0.0	0.0	0.0	0.0	0.0	14.3	12.9	0.0	0.0	14.3	12.9
Dolly Varden	ind	0.0	0.0	0.0	0.0	0.0	0.0	35.8	32.2	0.0	0.0	35.8	32.2
Arctic grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern pike	ind	0.0	0.0	0.0	0.0	0.0	0.0	1,541.3	6,935.9	0.0	0.0	1,541.3	6,935.9
Sheefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	167.3	1,004.0	0.0	0.0	167.3	1,004.0
Rainbow trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	1.4	2.0	0.0	0.0	1.4	2.0
Broad whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	787.3	3,149.4	0.0	0.0	787.3	3,149.4
Bering cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	2,446.3	3,424.8	0.0	0.0	2,446.3	3,424.8
Least cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	584.1	596.4	0.0	0.0	584.1	596.4
Humpback whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	1,134.2	3,402.5	0.0	0.0	1,134.2	3,402.5
Round whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	83.0	41.5	0.0	0.0	83.0	41.5
Unknown whitefishes	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

Note The summary row that includes incompatible unites of measure for harvest number has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

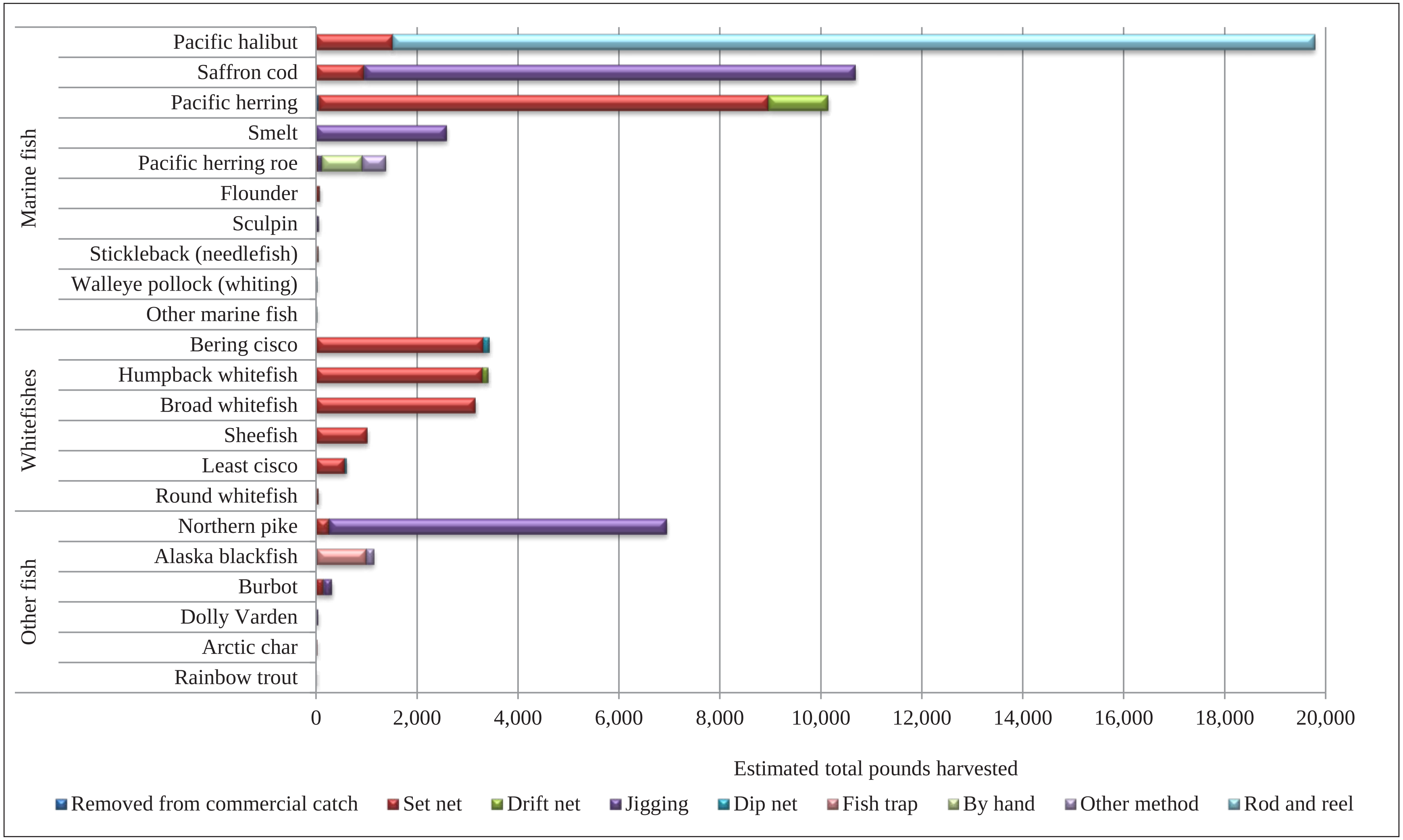


Figure 3-10.–Estimated nonsalmon fish harvests by gear type, Scammon Bay, 2013.

Table 3-13.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Scammon Bay, 2013.

			Subsistence methods											
Resource	Percentage base	Removed from commercial catch	Setnet	Driftnet	Fish wheel	Jigging	Seine net	Dip net	Fish trap	By hand	Other method	Subsistence gear, any method	Rod and reel	Any method
Nonsalmon fish	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**100.0%**	**0.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**0.1%**	**31.0%**	**2.0%**	**0.0%**	**29.2%**	**0.0%**	**0.2%**	**1.1%**	**0.9%**	**0.7%**	**71.7%**	**28.2%**	**100.0%**
	Total	**0.1%**	**31.0%**	**2.0%**	**0.0%**	**29.2%**	**0.0%**	**0.2%**	**1.1%**	**0.9%**	**0.7%**	**71.7%**	**28.2%**	**100.0%**
Pacific herring	Gear type	100.0%	44.3%	91.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.7%	0.0%	15.6%
	Resource	0.4%	88.0%	11.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%	0.0%	100.0%
	Total	0.1%	13.8%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.6%	0.0%	15.6%
Pacific herring roe	Gear type	0.0%	0.2%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	100.0%	75.3%	3.0%	0.0%	2.1%
	Resource	0.0%	2.3%	0.0%	0.0%	5.7%	0.0%	0.0%	0.0%	40.4%	24.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.9%	0.5%	2.1%	0.0%	2.1%
Smelt	Gear type	0.0%	0.0%	0.0%	0.0%	13.6%	0.0%	0.0%	0.0%	0.0%	0.0%	5.6%	0.0%	4.0%
	Resource	0.0%	0.1%	0.0%	0.0%	99.8%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	4.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	0.0%	4.0%
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%	0.1%	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%	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%
Saffron cod	Gear type	0.0%	1.7%	0.0%	0.0%	51.4%	0.0%	0.0%	0.0%	0.0%	0.0%	23.0%	0.0%	16.5%
	Resource	0.0%	3.1%	0.0%	0.0%	91.1%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.5%	0.0%	0.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.5%	0.0%	16.5%
Walleye pollock (whiting)	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	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%	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%
Flounder	Gear type	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
	Resource	0.0%	93.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	93.0%	7.0%	100.0%
	Total	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
Pacific halibut	Gear type	0.0%	7.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.3%	99.8%	30.5%
	Resource	0.0%	7.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.7%	92.3%	100.0%
	Total	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	28.2%	30.5%
Arctic lamprey	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%
	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%
	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%
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%
	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%
	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%
Sculpin	Gear type	0.0%	0.1%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
	Resource	0.0%	24.6%	0.0%	0.0%	75.4%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
Stickleback (needlefish)	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.2%	0.0%	0.0%	0.1%	0.0%	0.1%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	69.9%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
Alaska blackfish	Gear type	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	95.8%	0.0%	24.7%	2.5%	0.0%	1.8%
	Resource	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	59.4%	0.0%	9.5%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.2%	1.8%	0.0%	1.8%
Burbot	Gear type	0.0%	0.3%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.5%
	Resource	0.0%	18.1%	0.0%	0.0%	27.1%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.5%

-continued-

Table 3-13.–Page 2 of 2.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Set net	Drift net	Fish wheel	Jigging	Seine net	Dip net	Fish trap	By hand	Other method	Subsistence gear, any method	Rod and reel	Any method
Arctic char	Gear type	0.0%	0.1%	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%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	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%
Dolly Varden	Gear type	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
	Resource	0.0%	4.0%	0.0%	0.0%	96.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	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%
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%
	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%
	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%
Northern pike	Gear type	0.0%	0.0%	0.0%	0.0%	33.7%	0.0%	0.0%	0.0%	0.0%	0.0%	14.9%	0.0%	10.7%
	Resource	0.0%	0.0%	0.0%	0.0%	92.1%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	9.9%	0.0%	0.0%	0.0%	0.0%	0.0%	10.7%	0.0%	10.7%
Sheefish	Gear type	0.0%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	1.5%
	Resource	0.0%	41.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	1.5%
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%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	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%
Broad whitefish	Gear type	0.0%	14.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.8%	0.0%	4.9%
	Resource	0.0%	91.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	0.0%	4.9%
Bering cisco	Gear type	0.0%	13.8%	0.0%	0.0%	0.0%	0.0%	76.7%	0.0%	0.0%	0.0%	7.4%	0.0%	5.3%
	Resource	0.0%	81.2%	0.0%	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	4.3%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	5.3%	0.0%	5.3%
Least cisco	Gear type	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	23.3%	0.0%	0.0%	0.0%	1.3%	0.0%	0.9%
	Resource	0.0%	69.5%	0.0%	0.0%	0.0%	0.0%	4.3%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.9%
Humpback whitefish	Gear type	0.0%	13.0%	8.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.3%	0.0%	5.3%
	Resource	0.0%	76.9%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	4.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.3%	0.0%	5.3%
Round whitefish	Gear type	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
	Resource	0.0%	98.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	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%
	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%
	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%

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

Table 3-14.–Estimated harvests of salmon and nonsalmon fish for consumption by dogs, Scammon Bay, 2013.

Resource	Amount	Pounds
Nonsalmon fish		
Saffron cod	178.8 ind	151.8 lb
Alaska blackfish	8.6 lb	8.6 lb
Total	**187.4**	**160.4 lb**

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

using set gillnet (Table 3-13). For Alaska blackfish, the most common gear type used was a fish trap, and most herring roe was picked by hand.

Scammon Bay respondents were asked how many fish of each species they fed to their dogs in 2013. Approximately 152 lb of saffron cod and 9 lb of Alaska blackfish were fed to dogs (Table 3-14).

Large Land Mammals

The estimated large land mammal harvest by Scammon Bay residents in 2013 was 51,302 lb (Table 3-8). At 49,429 lb, moose composed 96% of the total large land mammal harvest (Figure 3-11). Scammon Bay hunters took an estimated 92 moose. Moose constituted 79 lb per capita of the 82 lb per capita of large land mammals harvested by the community. The majority of moose (89%) were taken in August (an estimated 29 animals) and September (56 animals; Table 3-15). Among the animals harvested in August, 17 were bulls, 9 were cows, and 3 were of unknown sex to the persons responding during surveys. In September, 46 bull moose and 9 cow moose were harvested, in addition to at least 1 moose for which respondents did not know the sex. Other harvests included 3 cow moose in January, as well as 1 bull moose and 1 cow moose in February. Additionally, there was 1 cow moose for which month of harvest was unknown. Approximately 98% of Scammon Bay households reported using moose in 2013, and 56% of households harvested moose (Table 3-8). Sixty-seven percent of households reported receiving moose and 56% gave moose to another household. The widespread sharing of moose was common in Scammon Bay in 2013 likely due to the fact that 1 hunter's effort to catch a moose results in large quantities of meat that can be distributed among many people.

The remainder of the large land mammal harvest included an additional 10 caribou and 6 black bears, representing 1,302 lb and 572 lb, respectively. An estimated 3 cow caribou were harvested in January, as well as 4 bull caribou and 3 cow caribou in February (Table 3-15). Caribou were also widely shared, as indicated by the fact that 20% of households claimed to have used caribou while only 4% of households were responsible for the total harvest (Table 3-8). One key respondent described traveling approximately 300 miles round trip by snowmachine to the lower Kuskokwim River area to hunt caribou. He explained that the trip is usually accomplished in 3 days: "Travel [to Kwethluk] in one day, hunt caribou the next day, come home the third day" (02182014SCM07). In addition to caribou, an estimated number of 6 black bears were harvested in the months of April, May, July, and September.

Small Land Mammals/Furbearers

Scammon Bay hunters and trappers harvested 239 small land mammals of various species in 2013, which totaled 230 lb (Table 3-8). Of the total number of small land mammals harvested, 19% was represented by Alaska hare, 17% by red fox, and 17% by snowshoe hare (Figure 3-12). Scammon Bay residents used only a portion of the total for food, including an estimated 116 lb of Alaska hare (locally referred to as jackrabbit), 49 lb of snowshoe hare, 43 lb of beaver, and 23 lb of lynx. Animals harvested and fed to dogs were counted as food even though they were not consumed by humans. A number of Alaska hares, snowshoe hares, beavers, and lynx were reported to have been used for fur and food (Figure 3-13). In addition, Scammon Bay households reported using 42 red foxes, 34 river otters, 32 mink, 29 muskrats, 1 porcupine, and 1 coyote for fur only. The majority of furbearers were harvested from January through April,

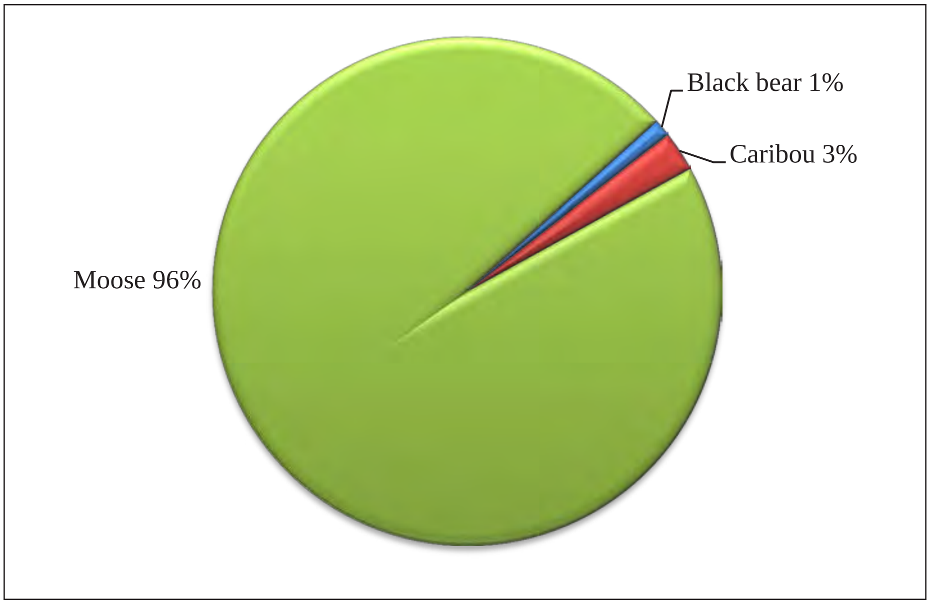


Figure 3-11.–Composition of edible large land mammal harvest, Scammon Bay, 2013.

Table 3-15.–Estimated large land mammal harvests by month and sex, Scammon Bay, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All large land mammals	**5.7**	**10.0**	**0.0**	**1.4**	**1.4**	**0.0**	**1.4**	**28.6**	**57.2**	**0.0**	**0.0**	**0.0**	**1.4**	**107.3**
Bison	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Black bear	0.0	0.0	0.0	1.4	1.4	0.0	1.4	0.0	1.4	0.0	0.0	0.0	0.0	**5.7**
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou	2.9	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**10.0**
Caribou, male	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.3**
Caribou, female	2.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**5.7**
Caribou, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Moose	2.9	2.9	0.0	0.0	0.0	0.0	0.0	28.6	55.8	0.0	0.0	0.0	1.4	**91.5**
Moose, bull	0.0	1.4	0.0	0.0	0.0	0.0	0.0	17.2	45.8	0.0	0.0	0.0	0.0	**64.4**
Moose, cow	2.9	1.4	0.0	0.0	0.0	0.0	0.0	8.6	8.6	0.0	0.0	0.0	1.4	**22.9**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	1.4	0.0	0.0	0.0	0.0	**4.3**
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
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.

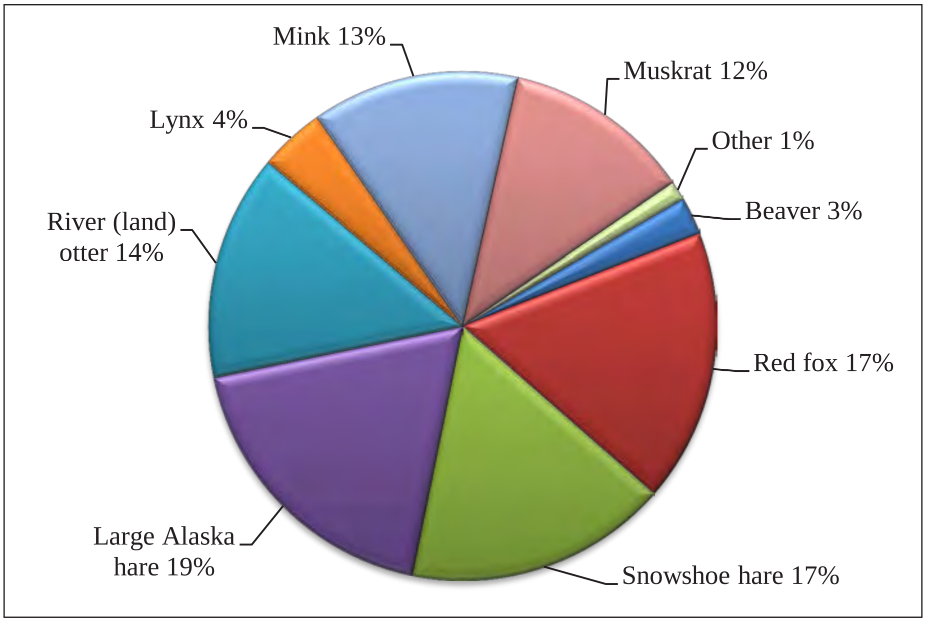


Figure 3-12.–Composition of small land mammal harvest by individual animals harvested, Scammon Bay, 2013.

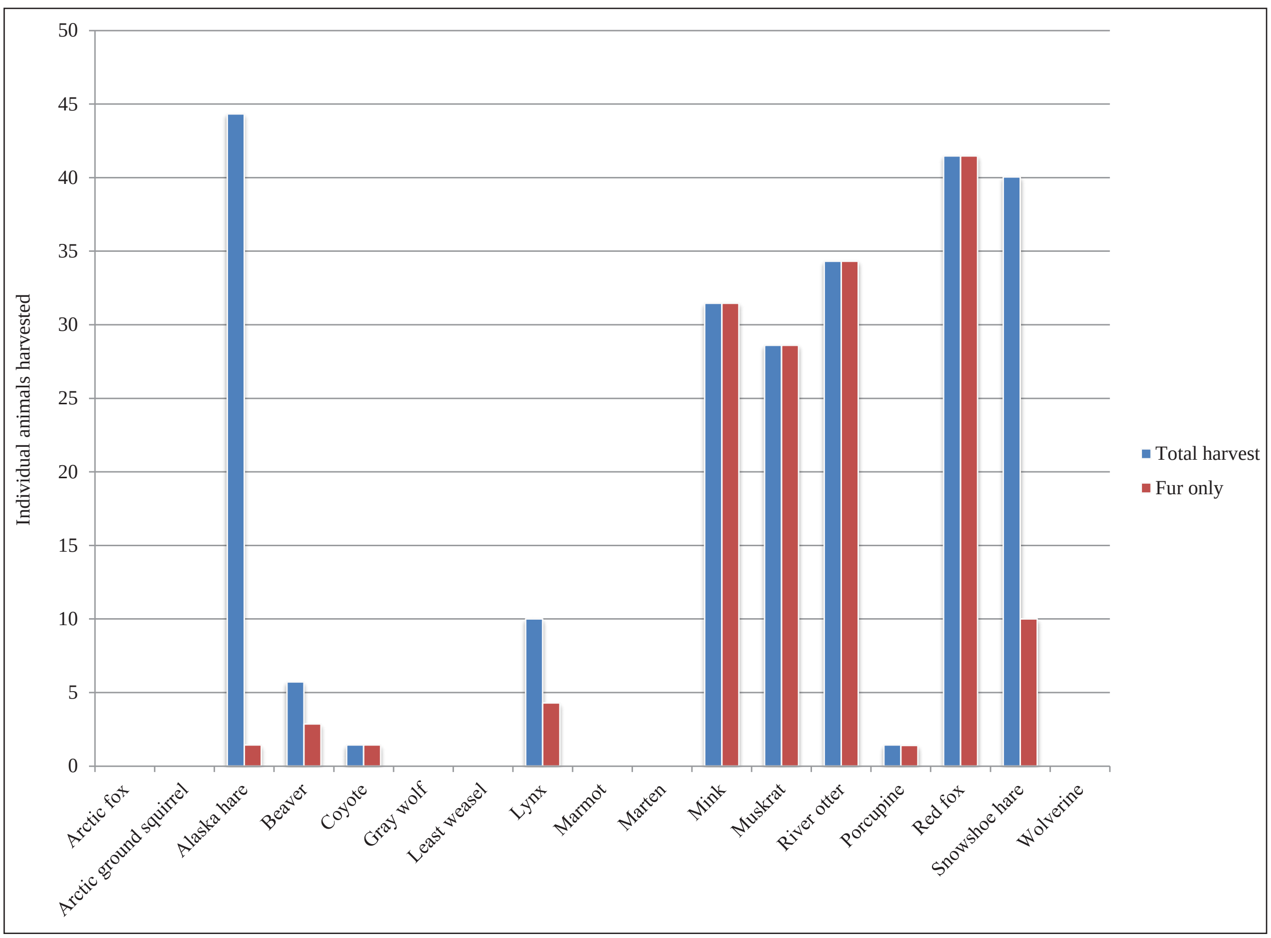


Figure 3-13.–Estimated small land mammal harvests for fur, Scammon Bay, 2013.

Table 3-16.–Estimated small land mammal harvests by month, Scammon Bay, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
All small land mammals	**25.7**	**28.6**	**67.2**	**30.0**	**1.4**	**0.0**	**0.0**	**1.4**	**2.9**	**0.0**	**1.4**	**32.9**	**47.2**	**238.8**
Beaver	0.0	0.0	1.4	1.4	1.4	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	**5.7**
Coyote	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.4**
Arctic fox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Red fox	10.0	8.6	7.2	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	11.4	**41.5**
Snowshoe hare	1.4	5.7	18.6	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**40.0**
Jackrabbit	7.2	7.2	15.7	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	**44.3**
River (land) otter	5.7	0.0	0.0	8.6	0.0	0.0	0.0	1.4	0.0	0.0	1.4	0.0	17.2	**34.3**
Lynx	1.4	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	4.3	**10.0**
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	17.2	14.3	**31.5**
Muskrat	0.0	2.9	24.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	**28.6**
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	**1.4**
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Gray wolf	0.0	0.0	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.

and in December 2013 (Table 3-16). Hunters and trappers took 185 small land mammals in these months. Approximately 7 animals were harvested during the remaining months, and an estimated 47 animals were harvested during months unknown to survey respondents.

Marine Mammals

Scammon Bay households harvested an estimated total of 53,050 lb of marine mammals in 2013, contributing 85 lb per capita to the subsistence harvest (Table 3-8). Ninety-one percent of households reported using marine mammals, and 56% reported harvesting the resource. The majority of the weight of the marine mammal harvest was contributed by 24 beluga whales, resulting in 24,000 total pounds (38 lb per capita). Beluga constituted 45% of the total marine mammal harvest in 2013 (Figure 3-14). Bearded seal and ringed seal also represented substantial portions of the total marine mammal harvest. Scammon Bay hunters harvested an estimated 82 bearded seals and 189 ringed seals (Table 3-8). These constituted 11,413 lb of bearded seal (18 lb per capita or 22% of the total marine mammal harvest by weight) and 10,572 lb of ringed seal (17 lb per capita or 20% of the total marine mammal harvest; Table 3-8; Figure 3-14). In addition, 4 walruses were harvested representing 3,304 lb, as well as 56 spotted seals (3,124 lb). An estimated 7 ribbon seals totaling 637 lb were harvested, all of which was fed to dogs. The ribbon seals were also harvested for the purpose of using the hides, which are highly prized due to their striking appearance and relative rarity in this region.

Ringed seal was the most commonly used marine mammal species; 70% of households reported use (Table 3-8). Bearded seal and beluga whale were also widely used in Scammon Bay: 67% and 65% of households reported use, respectively. Beluga whale was most likely to have been received: 53% of households reported that another household gave this resource to them. Twenty-one percent of households actually harvested beluga whales. Approximately 42% of households reported receiving bearded seal from others. Marine mammal hunting was fairly specialized, particularly in regards to beluga whale, of which 21% of households harvested the entire catch. Approximately 47% of households harvested ringed seal, 37% harvested bearded seal, 33% harvested spotted seal, and 4% harvested walrus. Hunting participation rates are likely relatively low due to the specialized skill and expensive equipment needed to harvest these large animals. In addition, a small number of marine mammal hunters can harvest large amounts of food for many people. In 2013, Scammon Bay hunters also harvested an estimated 7 ribbon seals. Respondents indicated that these are generally not eaten by humans. Rather, as one key respondent described, the hides are prized

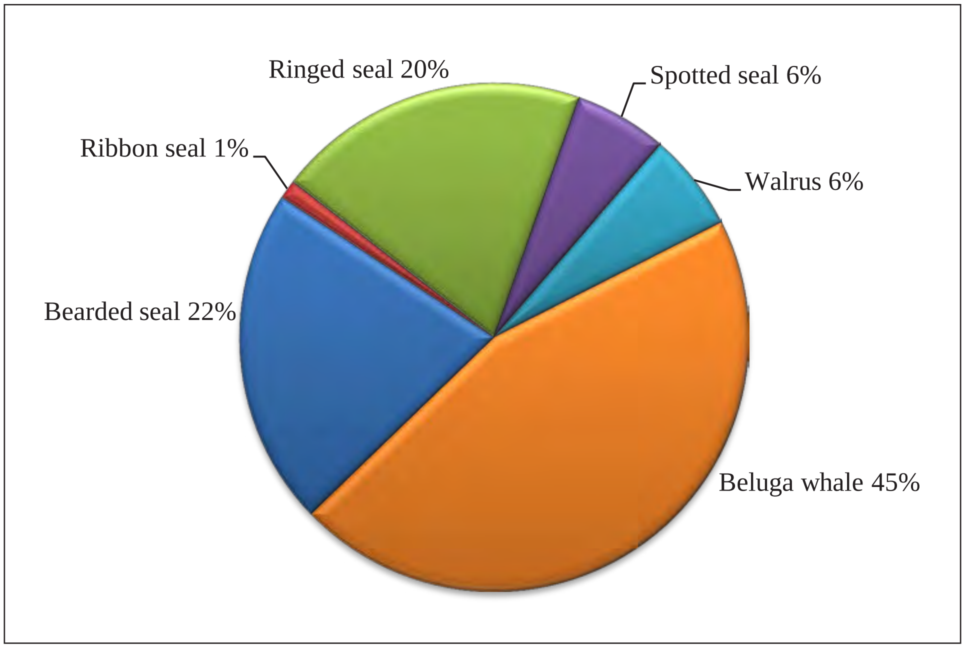


Figure 3-14.–Composition of edible marine mammal harvest, Scammon Bay, 2013.

for use in clothing and the meat is typically fed to dogs (02182014SCM07). He went on to share additional details regarding the use of ribbon seals:

> We saw a whole bunch of those. We caught 6 of them. There were 5 of us in the boat and we caught 6 of them. Mom says she doesn't eat the meat; too much blood. They [have] very bloody meat. So…we never grew up eating them. The skin is very nice though. My mom is going to make me a [ribbon seal hat]… It's very rare that you hear somebody going out and seeing 20 or more of the ribbon seals. But that day there was a lot on the ice. We usually see like 1 or 2 in a day, but we saw so many that day and we caught them. (02182014SCM07)

Seals and seal oil are critical resources in Scammon Bay and are highly prized for many reasons. The meat and oil are used for food, and the oil is used in food processing and preservation. One active seal hunter explained that "Everyone looks for the bearded seal because it has a lot of meat, a lot of oil, and they are one of the best eating seals" (02182014SCM07). Another seal hunter related the importance of seal oil and the practice of using oil from seals harvested in spring specifically in food preservation.

> In spring we go for bearded seals and [ringed seals]. We go for the oil. We catch the seals, take the oil, throw it in buckets. I have to have 10 gallons…or 15 gallons of oil. We save that for the summer so that when our fish are all dried we make poke fish. We take our dry fish from the summer. We cut it all up, put it in buckets. Then we take that springtime seal oil, mix it into the dry fish to preserve the dry fish…It keeps it from drying up, getting moldy, and it's tastier. (02172014SCM09)

An elder female key respondent also described similar preservation methods for plants. "People preserve plants in seal oil, in a seal oil poke. Or we put plants in a bowl, like *mecuqeluggaq* or *kapuukar*[15] or other plants and soak them in seal oil. Then we'll leave them in bowl with the oil. Then they'll sweeten up" (02172014SCM05).

---

15. *Mecuqeluggaq* is sea lovage *Lingusticum scoticum*, a member of the family of plants that includes wild celery and wild parsley. *Kapuukar* is Pallas buttercup *Ranunculus pallasii*, a member of the buttercup family of plants.

Table 3-17.–Estimated marine mammal harvests by month, Scammon Bay, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All marine mammals	**0.0**	**0.0**	**10.0**	**11.4**	**47.3**	**7.4**	**10.7**	**9.7**	**44.9**	**197.1**	**8.6**	**11.4**	**2.9**	**361.5**
Seal	0.0	0.0	10.0	11.4	42.9	0.0	4.3	5.7	42.9	193.1	8.6	11.4	2.9	**333.2**
Bearded seal	0.0	0.0	0.0	1.4	11.4	0.0	4.3	2.9	18.6	40.0	1.4	0.0	1.4	**81.5**
Ribbon seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	5.7	0.0	**7.2**
Ringed seal	0.0	0.0	10.0	10.0	31.5	0.0	0.0	2.9	11.4	108.7	7.2	5.7	1.4	**188.8**
Spotted seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.4	44.3	0.0	0.0	0.0	**55.8**
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**
Walrus	0.0	0.0	0.0	0.0	1.4	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	**4.3**
Whale	0.0	0.0	0.0	0.0	3.0	6.0	5.0	4.0	2.0	4.0	0.0	0.0	0.0	**24.0**
Beluga whale	0.0	0.0	0.0	0.0	3.0	6.0	5.0	4.0	2.0	4.0	0.0	0.0	0.0	**24.0**
Bowhead whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown marine mammals	0.0	0.0	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.

The majority of marine mammals were harvested in October 2013 (Table 3-17). Most of the animals harvested in October were seals, including 109 ringed seals, 44 spotted seals, and 40 ringed seals. May and September were other months of higher harvest; 47 marine mammals were harvested in May and 45 animals in September. Seals were harvested in all months except January, February, and June. Walruses and beluga whales were harvested during May and June, months when sea ice was present. Walrus was also hunted in July, and beluga whale was also hunted in the open-water months of July through October.

Birds and Eggs

In 2013, Scammon Bay households harvested an estimated total of 25,256 lb of birds and eggs, which represented a harvest of 40 lb per capita (Table 3-8). The greatest portion of the harvest was composed of 5 species of goose, which provided 14,215 lb of edible weight. These species included 5,682 lb of white-fronted goose (23% of the total harvest of birds and eggs), 4,857 lb of brant (19%), 1,822 lb of cackling

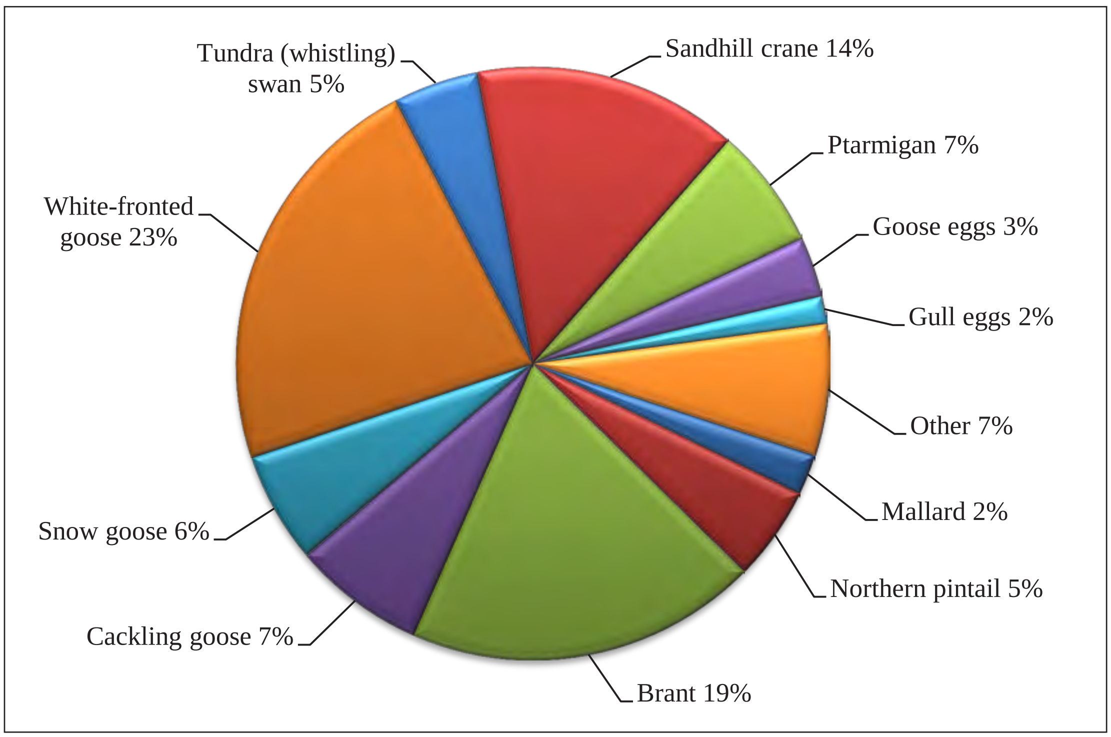


Figure 3-15.–Composition of edible bird and bird egg harvest, Scammon Bay, 2013.

goose (7%), 1,529 lb of snow goose (6%), and 325 lb of emperor goose (1%; Table 3-8; Figure 3-15). As a group, duck harvests totaled an estimated 2,982 lb, including northern pintail at 1,302 lb or 2 lb per capita (5% of the total bird and egg harvest). Hunters also harvested 561 lb of mallard, 238 lb of American wigeon, 215 lb of teal, 195 lb of king eider, and 111 lb of common eider (Table 3-8). Other species that represented substantial portions of the total bird and egg harvest included 3,652 lb of sandhill crane (14% of the total bird and egg harvest), 1,668 lb of ptarmigans (7%), and 1,170 lb of tundra swan (5%; Table 3-8; Figure 3-15). Scammon Bay households also harvested an estimated 1,541 lb of bird eggs, or approximately 6,430 individual bird eggs (Table 3-8). An estimated 3% of the weight of all birds and eggs harvested in 2013 included 2,752 goose eggs (826 lb; Table 3-8; Figure 3-15). In addition, households gathered 1,269 gull eggs (381 lb; Table 3-8). Harvesters also gathered approximately 961 duck eggs, 780 tern eggs, 399 shorebird eggs, and 156 swan eggs.

Although 92% of households claimed to have used at least some birds and eggs, harvest and use of birds varied widely by species among households. As much as 85% of households reported using cackling goose, and 71% harvested the species (Table 3-8). Seventy-two percent of households used white-fronted goose, and 61% harvested it. Approximately 71% of households used ptarmigans, and 54% harvested these birds. An estimated 62% used sandhill crane, and 47% harvested it. Among eggs, goose eggs were the most commonly used (69% of households); about one-half of all households (51%) harvested them. Gull eggs were also widely used (41%). Slightly less than two-thirds (59%) of all households reported that they received at least some birds and eggs; 20% of households received cackling goose or ptarmigans. Harvesting households also commonly gave away these species: 38% of households reported giving away cackling goose, and 33% reported giving away ptarmigans.

Most birds were harvested in spring and fall: 4,600 birds were harvested in spring 2013, and 4,231 were harvested in fall (Table 3-18). The majority of ptarmigans were harvested in spring, which is a common time for people to hunt them as daylight increases and weather warms. Most geese were harvested in fall (2,507 geese) including all snow geese (383 birds). Fewer geese were taken in spring (1,631 geese); however, nearly all brants (748 birds) were harvested in this season. Harvest patterns by season were similar for ducks: most were harvested in fall (1,525 ducks) as opposed to spring (462 ducks). Scammon Bay hunters may be more likely to harvest geese and ducks in fall rather than spring because, as one Scammon Bay key respondent explained, "that's when they're fat" (11072015SCM02). Another key respondent discussed hunters targeting geese that are known to be high in fat in the spring as well. "[In] spring everybody goes for what's fat. We shoot the black brant, the crane, the emperor [goose]. I know that they are the fat birds in spring…Everybody likes the fat birds" (02182014SCM07). In fall, snow goose is a popular species targeted by hunters.

Marine Invertebrates

Harvests of marine invertebrates (shellfish) represented less than one-half of one percent of the total subsistence harvest in Scammon Bay in 2013. Scammon Bay households harvested an estimated total of 780 lb of shellfish (Table 3-8), 75% of which was composed of clams (Figure 3-16). Total harvest of clams was approximately 588 lb or 183 gallons. An estimated 149 lb or 99 gal of mussels were also harvested. Six percent of the shellfish harvest (43 lb or 20 gal) is recorded as unknown marine invertebrates. During household harvest surveys, some respondents described harvesting a worm that is occasionally found on beaches. This organism is known locally in Yup'ik as *ussungluq*, which is a marine worm of the taxonomic class Echiura, sometimes known in English as a spoon worm.

Approximately one-half of Scammon Bay households (49%) described using marine invertebrates in 2013, and a similar portion of households (42%) harvested them. Thirty-eight percent of households reported using clams, and 36% reported using mussels.

Vegetation

Vegetation resources gathered by residents of Scammon Bay represented approximately 5% of the total subsistence harvest in 2013 (Figure 3-5). Household harvests of edible vegetation totaled 13,060 lb (21 lb

Table 3-18.–Estimated bird and bird egg harvests by season, Scammon Bay, 2013.

Resource	Estimated harvest by season: Spring	Summer	Fall	Winter	Season unknown	**Total**
All birds	**11,030.5**	**310.7**	**4,231.1**	**219.9**	**11.4**	**15,803.7**
Common eider	50.1	0.0	0.0	0.0	0.0	**50.1**
King eider	136.0	0.0	0.0	0.0	0.0	**136.0**
Spectacled eider	10.0	0.0	0.0	0.0	0.0	**10.0**
Steller's eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Gadwall	0.0	0.0	14.3	0.0	0.0	**14.3**
Harlequin duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	35.8	7.2	238.8	0.0	5.7	**287.5**
Red-breasted merganser	0.0	0.0	0.0	0.0	0.0	**0.0**
Long-tailed duck	17.2	0.0	32.9	0.0	0.0	**50.1**
Northern pintail	105.8	257.4	502.0	0.0	2.9	**868.2**
Scaup	7.2	0.0	37.2	0.0	0.0	**44.3**
Black scoter	83.0	0.0	52.9	0.0	0.0	**135.9**
Surf scoter	0.0	0.0	1.4	0.0	0.0	**1.4**
White-winged scoter	0.0	0.0	0.0	0.0	0.0	**0.0**
Northern shoveler	4.3	0.0	44.3	0.0	0.0	**48.6**
Teal	12.9	2.9	397.6	0.0	0.0	**413.3**
American wigeon	0.0	0.0	181.6	0.0	0.0	**181.6**
Unknown ducks	0.0	0.0	21.5	0.0	0.0	**21.5**
Brant	748.0	0.0	61.5	0.0	0.0	**809.5**
Cackling goose	369.0	13.0	1,135.9	0.0	0.0	**1,518.0**
Emperor goose	94.4	11.4	24.3	0.0	0.0	**130.2**
Snow goose	0.0	0.0	383.3	0.0	0.0	**383.3**
White-fronted goose	419.6	18.8	901.5	0.0	0.0	**1,340.0**
Unknown geese	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	31.5	0.0	71.5	0.0	1.4	**104.4**
Sandhill crane	400.5	0.0	31.5	1.4	1.4	**434.8**
Shorebirds	0.0	0.0	1.4	0.0	0.0	**1.4**
Loon	4.3	0.0	0.0	0.0	0.0	**4.3**
Unknown seabirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Grouse	0.0	0.0	0.0	0.0	0.0	**0.0**
Ptarmigan	2,070.7	0.0	95.5	217.1	0.0	**2,383.3**
Snowy owl	0.0	0.0	0.0	1.4	0.0	**1.4**
Duck eggs	961.1	0.0	0.0	0.0	0.0	**961.1**
Goose eggs	2,751.8	0.0	0.0	0.0	0.0	**2,751.8**
Swan eggs	155.9	0.0	0.0	0.0	0.0	**155.9**
Crane eggs	38.6	0.0	0.0	0.0	0.0	**38.6**
Unknown shorebird eggs	399.0	0.0	0.0	0.0	0.0	**399.0**
Gull eggs	1,268.6	0.0	0.0	0.0	0.0	**1,268.6**
Loon eggs	41.5	0.0	0.0	0.0	0.0	**41.5**
Tern eggs	779.5	0.0	0.0	0.0	0.0	**779.5**
Ptarmigan eggs	17.2	0.0	0.0	0.0	0.0	**17.2**
Unknown eggs	17.2	0.0	0.0	0.0	0.0	**17.2**

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

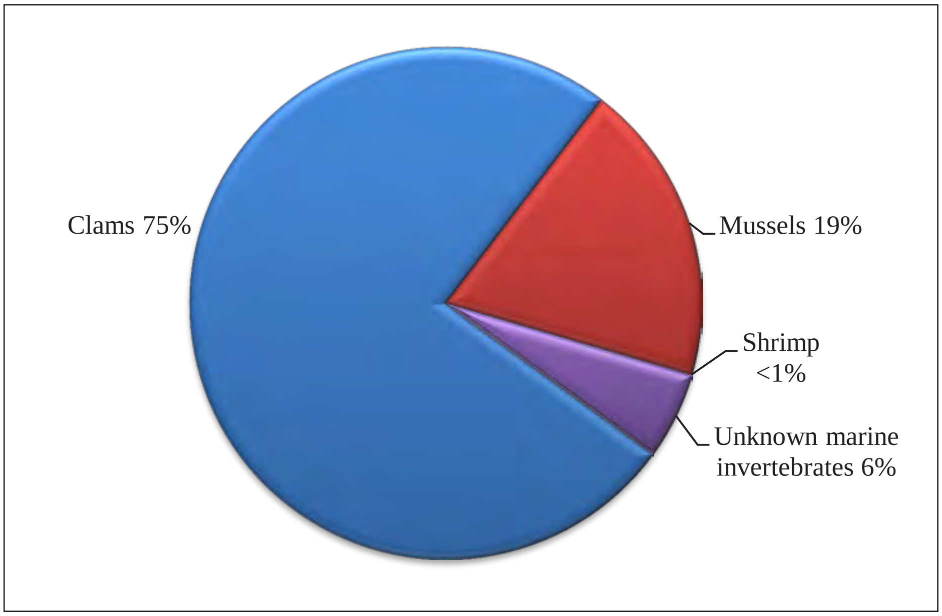


Figure 3-16.–Composition of edible marine invertebrate harvest, Scammon Bay, 2013.

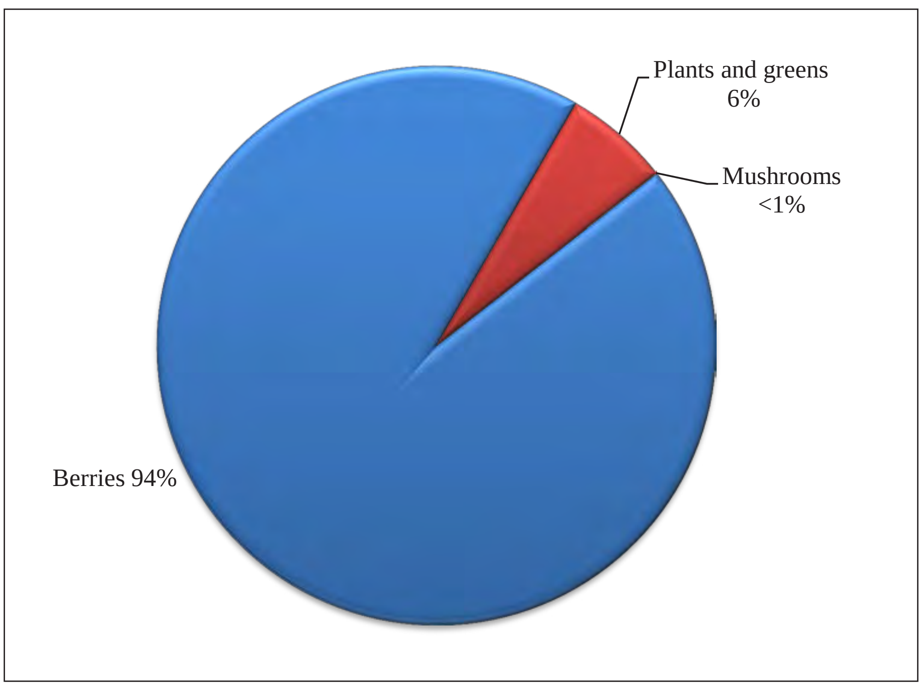


Figure 3-17.–Composition of edible vegetation harvest by type, Scammon Bay, 2013.

Table 3-19.–Use of firewood for home heating, Scammon Bay, 2013.

Community	Household use of wood for home heating as a percentage of sampled households													
	0%		1–25%		26–50%		51–75%		76–99%		100%		Did not respond	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Scammon Bay	22	25.6%	14	16.3%	20	23.3%	13	15.1%	11	12.8%	4	4.7%	2	2.3%

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

per capita; Table 3-8). An estimated 12,261 lb of berries were harvested, representing approximately 94% of the total edible pounds of the vegetation harvest (Table 3-8; Figure 3-17). The 2 principal berry species harvested included cloudberry at 7,652 lb (12 lb per capita) and crowberry (locally known as blackberry) at 3,129 lb (5 lb per capita; Table 2-8). Other species harvested included lowbush cranberry (711 lb), blueberry (619 lb), and nagoonberry (locally known in Yup'ik as *puyuraaraq* or in English as raspberry[16]; 113 lb). In addition to berries, residents gathered 271 lb of sourdock, 157 lb of Pallas buttercup, and 46 lb of mousefoods (plant roots, stems, and seeds of various species that are gathered in fall from rodent food caches and eaten, often mixed into various types of *akutaq* or used in cooking). An estimated 97% of households used vegetation, and 92% reported harvesting plants or firewood. Most households used cloudberry and crowberry, 88% and 83%, respectively. More than one-half of all households reported using blueberry (63%), and 45% used lowbush cranberry. Commonly used greens included Hudson's Bay tea (55% of households using), sourdock (43%), and Pallas buttercup (31%). More than one-half of the community reported sharing vegetation; 49% of households received these resources, and 57% reported giving berries, greens, or wood to other households. Attempted harvest rates and successful harvest rates are identical for almost all plant resources, due to the proximity and ease of harvest that exists for many plants.

In addition to food and medicinal plant harvests, the resource category of vegetation also includes firewood; however, wood is not included in calculations of estimated edible weight of subsistence resources. Approximately 75% of households reported using firewood, and 70% reported harvesting the resource (Table 3-8). Among those that used firewood, 24% received wood from another household, and 19% gave firewood away to someone. Division staff asked survey respondents to estimate the portion of their home heat that was derived from firewood. Twenty-two households (26%) reported that they did not use firewood as a heat source (Table 3-19). Additionally, 14 households (16%) reported that 1–25% of their home heat was derived from firewood in 2013; 20 households (23%) reported having used firewood for 26–50% of their heat; 13 households (15%) reported that 51–75% of heat came from firewood; 11 households (13%) reported that 75–99% of heat came from firewood; and 4 households (5%) reported that all of their home heat was derived from firewood in 2013.

Harvest Areas

Scammon Bay respondents showed researchers areas where members of their household searched for and harvested all resources discussed during surveys. Researchers drew polygons by hand onto paper maps to depict these search and harvest areas. Polygons were recorded digitally from each survey and compiled by all species and resource categories to show the total area used for subsistence harvest activities by respondents in Scammon Bay in 2013. Respondents described using approximately 6,625 square miles of area to search for and harvest all subsistence resources in 2013. The primary focus of harvest effort for all resources occurred in a region extending from Saint Mary's and Pitkas Point west into the Bering Sea, including areas of the lower Yukon River drainage, and the Black, Kun, Kokechik, and Kashunuk rivers (Figure 3-18). Subsistence harvest activities for all resources also included areas in the vicinity of Chevak and Hooper Bay, as well as locations on Nelson Island, around the Ingakslugwat Hills area, Paimiut Slough, and in a portion of the lower drainage of the Kwethluk River.

16. Residents of the Yukon-Kuskokwim Delta region may use the name raspberry when they refer to nagoonberry *Rubus arcticus*. The reader should not confuse this plant with the related species of American red raspberry *Rubus idaeus*, which grows wild throughout forested regions of Alaska and elsewhere, and European raspberry *Rubus idaeus,* variations of which are common cultivars throughout North America.

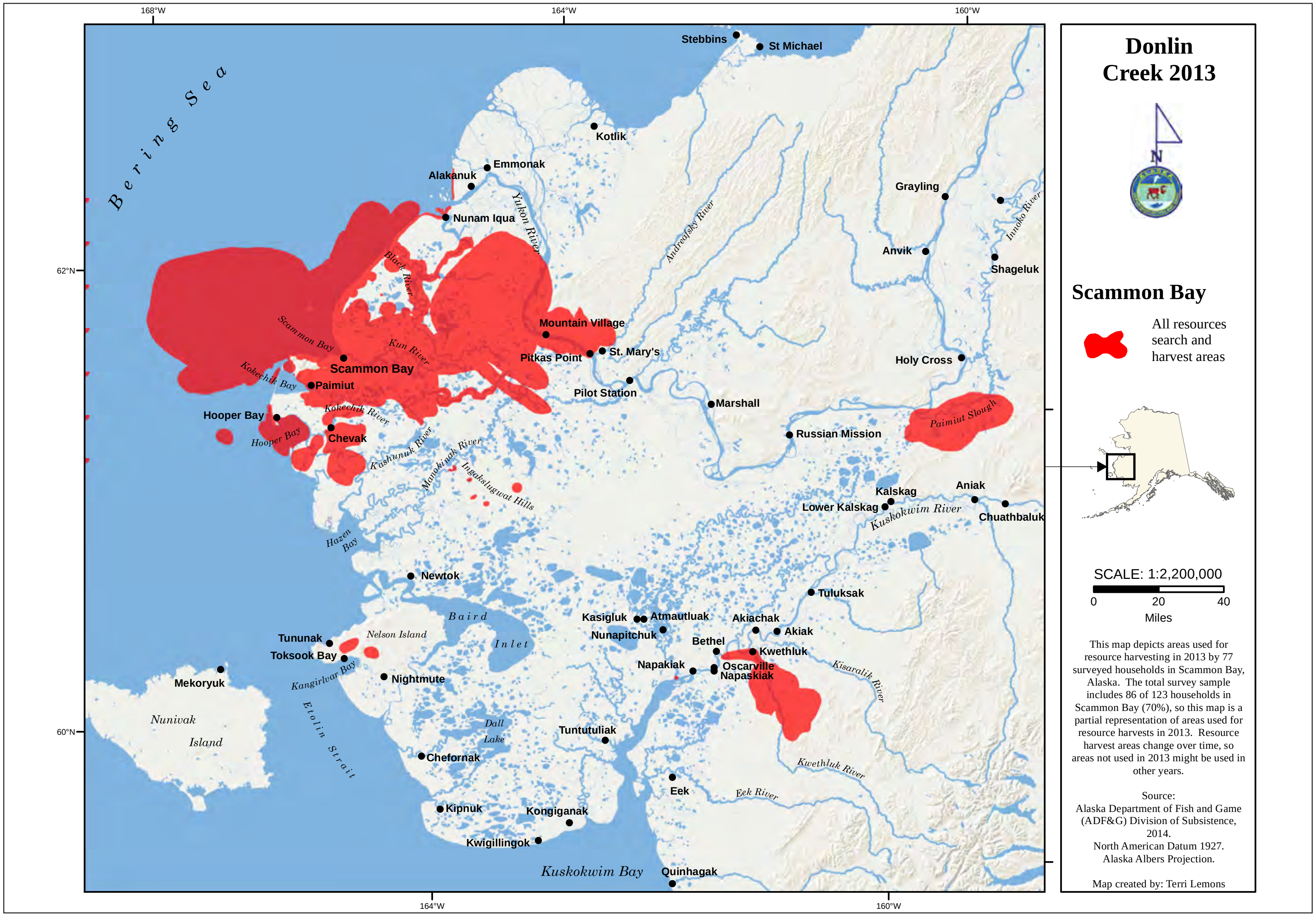


Figure 3-18.–Search and harvest areas, all resources, Scammon Bay, 2013.

Scammon Bay households harvested salmon in the lower 5 miles of the Black River, in an area of the Bering Sea surrounding the mouth of the Black River, and in a strip of ocean along the coast extending approximately 15 miles from the mouth of the Black River southwest toward the mouth of Melatolik Creek (Figure 3-19). Fishers also harvested salmon in the mouth of Melatolik Creek, and in the mouth of the Kipungolak River where it drains into the Black River. Households harvested salmon in locations closer to Scammon Bay including in the Kun River from the mouth of the Kikneak River and other sites downstream to the mouth of the Kun River. Fishers also harvested salmon in an area of the Scammon Bay water body extending from the community approximately 8 miles west along the coast.

Respondents also described where fishers harvested a number of freshwater nonsalmon fish species, including burbot, northern pike, sheefish, and other whitefishes (Subfamily Corigoninae). Scammon Bay fishers harvested burbot in the mouth of the Kun River adjacent to Scammon Bay, in an area in the Kun River drainage approximately 2.5 miles upstream of the community, and on the south side of the Askinuk Mountains in a portion of the Kokechik River drainage (Figure 3-20). Burbot were also harvested in the mouth of the Black River, in the Manokinak River, and in locations adjacent to the Ingakslugwat Hills. Respondents reported harvests of northern pike primarily in 2 areas: a portion of the Black River drainage immediately south and east of the Kusilvak Mountains including ponds within that area, and in ponds on the southeast side of the Askinuk Mountains within the Kokechik River drainage. Northern pike were also harvested in the area of the Ingakslugwat Hills. Fishers harvested sheefish in lower portions of the Black River and in the Bering Sea around the mouth of the Black River, as well as in sites in the lower Kun River drainage within 5 miles of Scammon Bay. Whitefish species other than sheefish were harvested in a section of the Black River from the east side of the Kusilvak Mountains to a location approximately 40 river miles downstream. Fishers also harvested whitefish in the Black River from within a section extending from the Bering Sea coast approximately 8 river miles upstream. Whitefish were harvested in the mouth of Melatolik Creek, in the upper Kashunak River, several locations in the lower Kun River drainage including many adjacent to Scammon Bay, and along the southern coastline of the Scammon Bay water body.

Scammon Bay search and harvest areas for moose, caribou, and black bear were recorded in the survey. In 2013, Scammon Bay hunters searched for and harvested moose in the lowest portion of the Yukon River drainage from Saint Mary’s west into an area immediately south of the Yukon River and into the Black River drainage (Figure 3-21). Hunters also searched for and harvested moose throughout the Black River drainage from the mouth upstream into the Kashunak River and surrounding areas, downstream in the Kashunak River and throughout the Kun River drainage. Hunters searched for and harvested moose in Paimiut Slough and the area immediately south of there. Hunters searched for and harvested caribou in an area of the lower Kwethluk River drainage as well as in a section of the lower Kuskokwim River between Kwethluk and Bethel. Scammon Bay respondents reported hunting black bears in an approximately 20 river-mile section of the Black River as well as in a location in the Kashunak River roughly 25 miles southeast of Scammon Bay.

Scammon Bay respondents reported harvests of several species of small land mammals, including but not limited to beaver, snowshoe hare, Alaska hare, red fox, river otter, and muskrat. These species were harvested throughout the Kun and Tungpuk river drainages downstream to Scammon Bay, as well as the middle section of the Black River (Figure 3-22). Small land mammals were also harvested in an area of the Askinuk Mountains approximately 20 miles east to west and 5 miles north to south, and south into the Kokechik River drainage. Hunters also harvested small land mammals in lower Paimiut Slough.

Scammon Bay hunters searched for and harvested marine mammals in an area of coastal Bering Sea from near Nunam Iqua south into the Hooper Bay water body (Figure 3-23). Various species of seals were hunted throughout the Hooper Bay and Scammon Bay water bodies as well as along the Bering Sea coast north from Scammon Bay to the area around the mouth of the Black River. Seals were hunted in the Bering Sea throughout an area extending approximately 55 miles west from the coast and approximately 40 miles north to south. Seals were also hunted in the Kikneak and Kun River drainages within 10 miles of Scammon Bay. Beluga whales were hunted in a section of the coastal Bering Sea approximately 50 miles from northeast to southwest and roughly 15 miles at its widest point. This area extended throughout the Scammon Bay

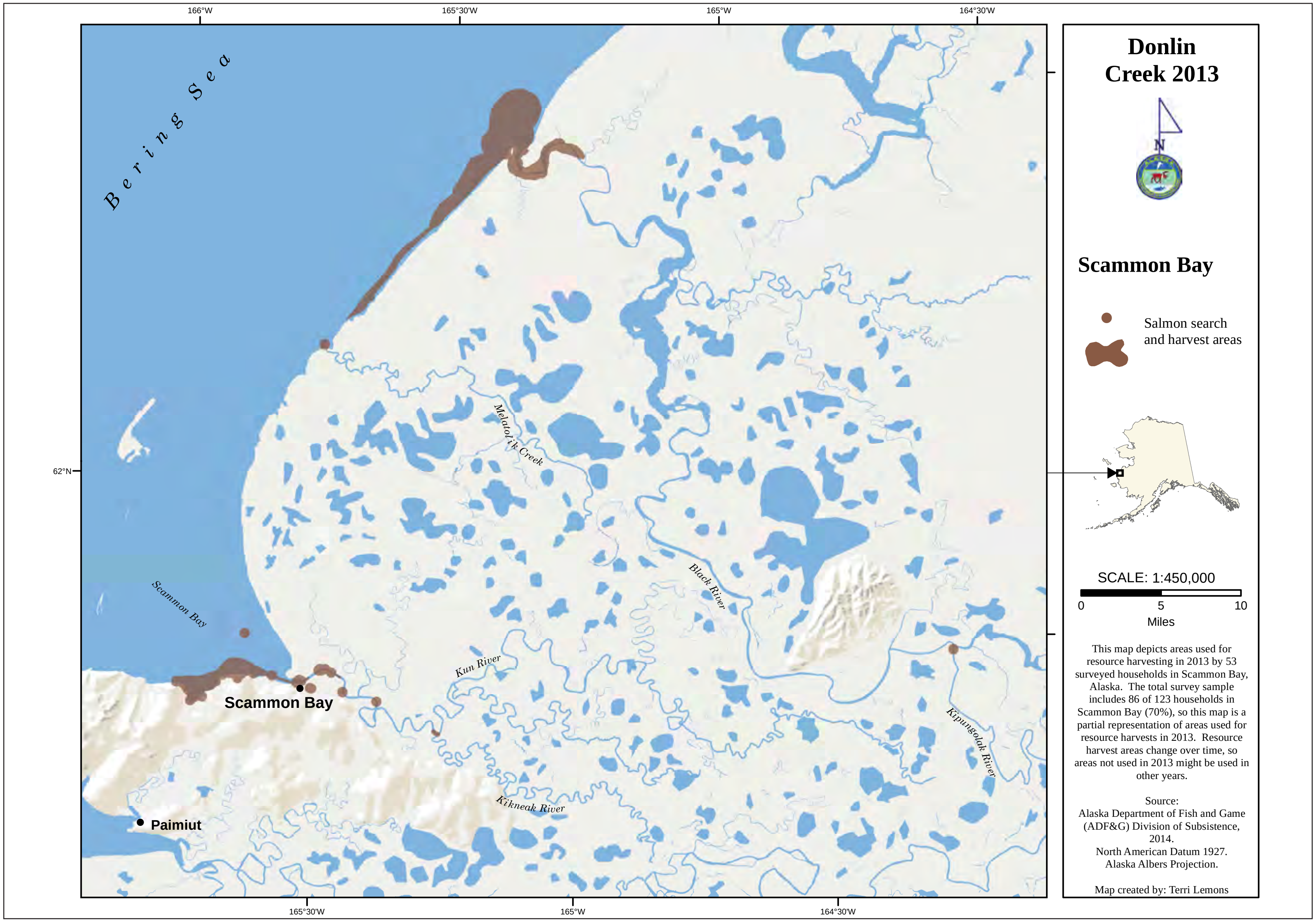


Figure 3-19.–Fishing and harvest areas, salmon, Scammon Bay, 2013.

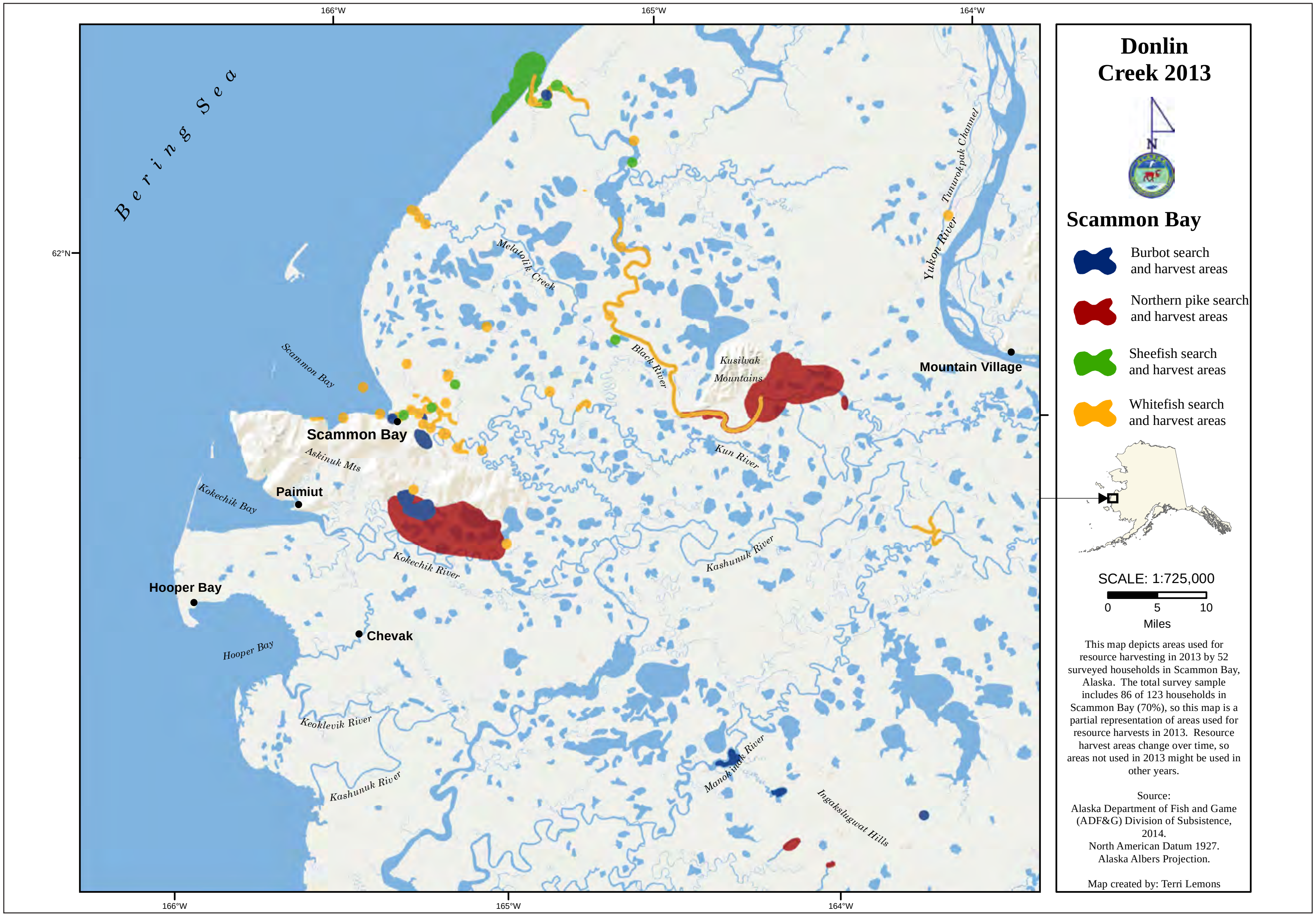


Figure 3-20.–Fishing and harvest areas, burbot, northern pike, sheefish, and whitefishes, Scammon Bay, 2013.

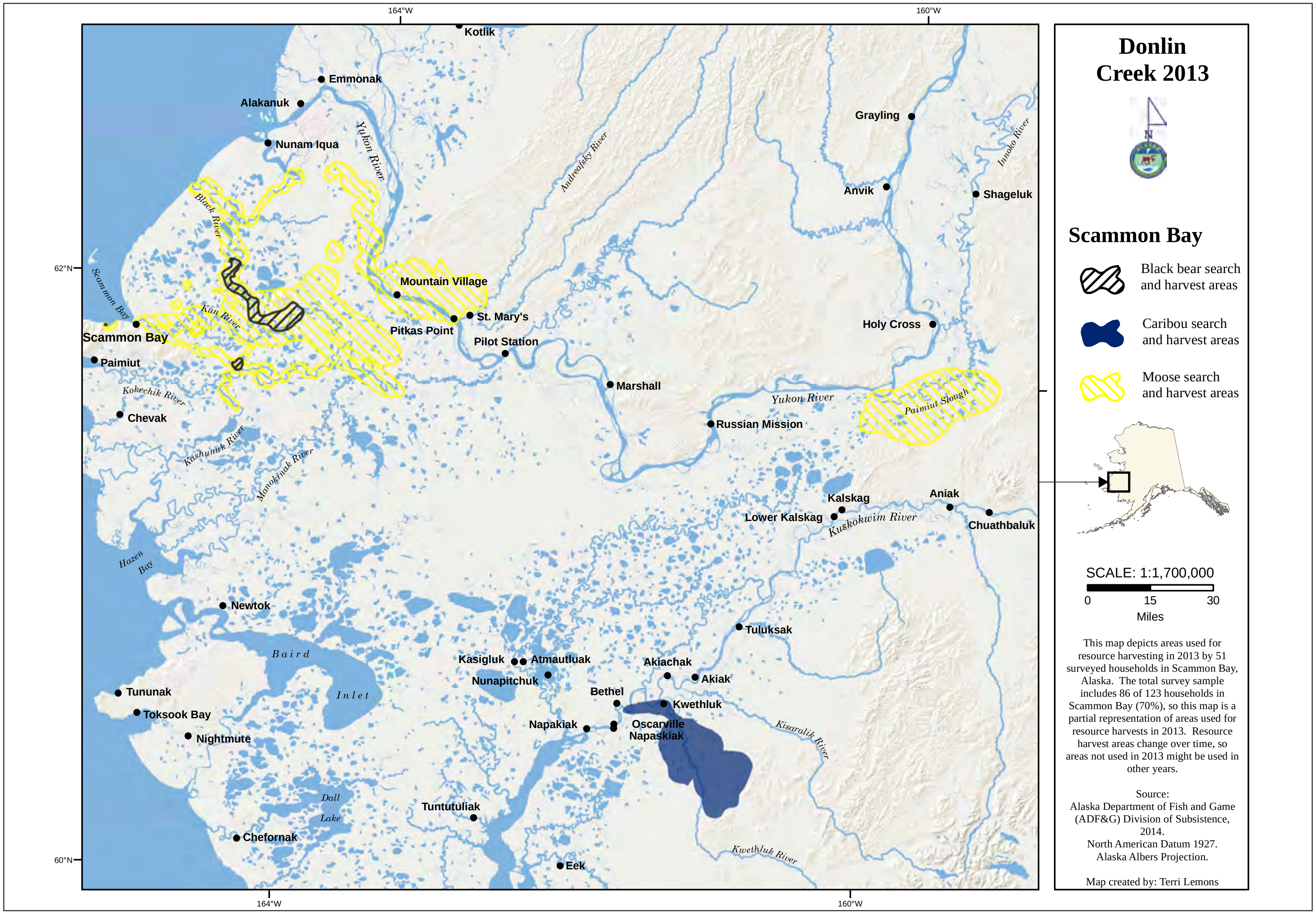


Figure 3-21.–Hunting and harvest areas, black bear, caribou, and moose, Scammon Bay, 2013.

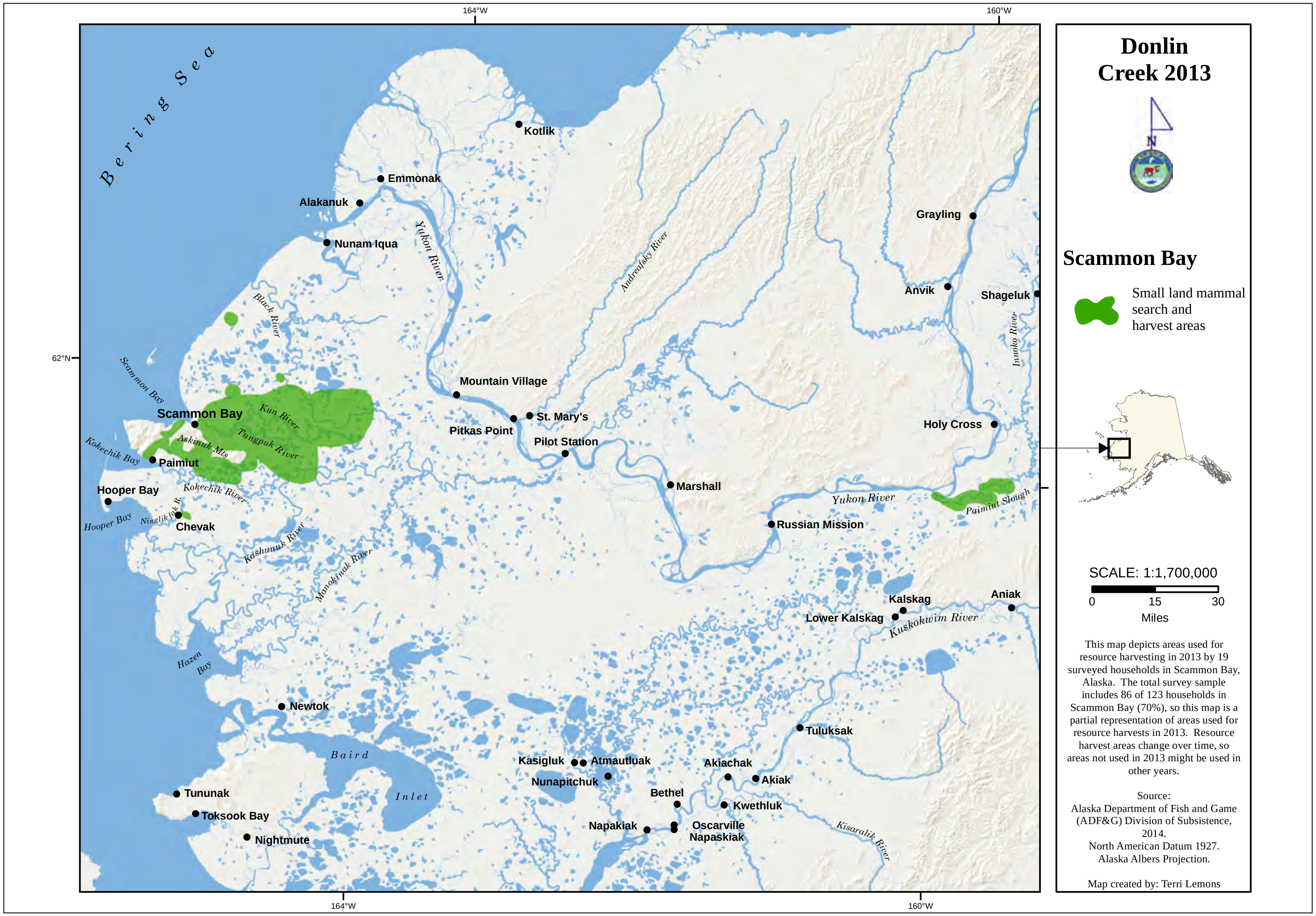


Figure 3-22.–Hunting and harvest areas, small land mammals, Scammon Bay, 2013.

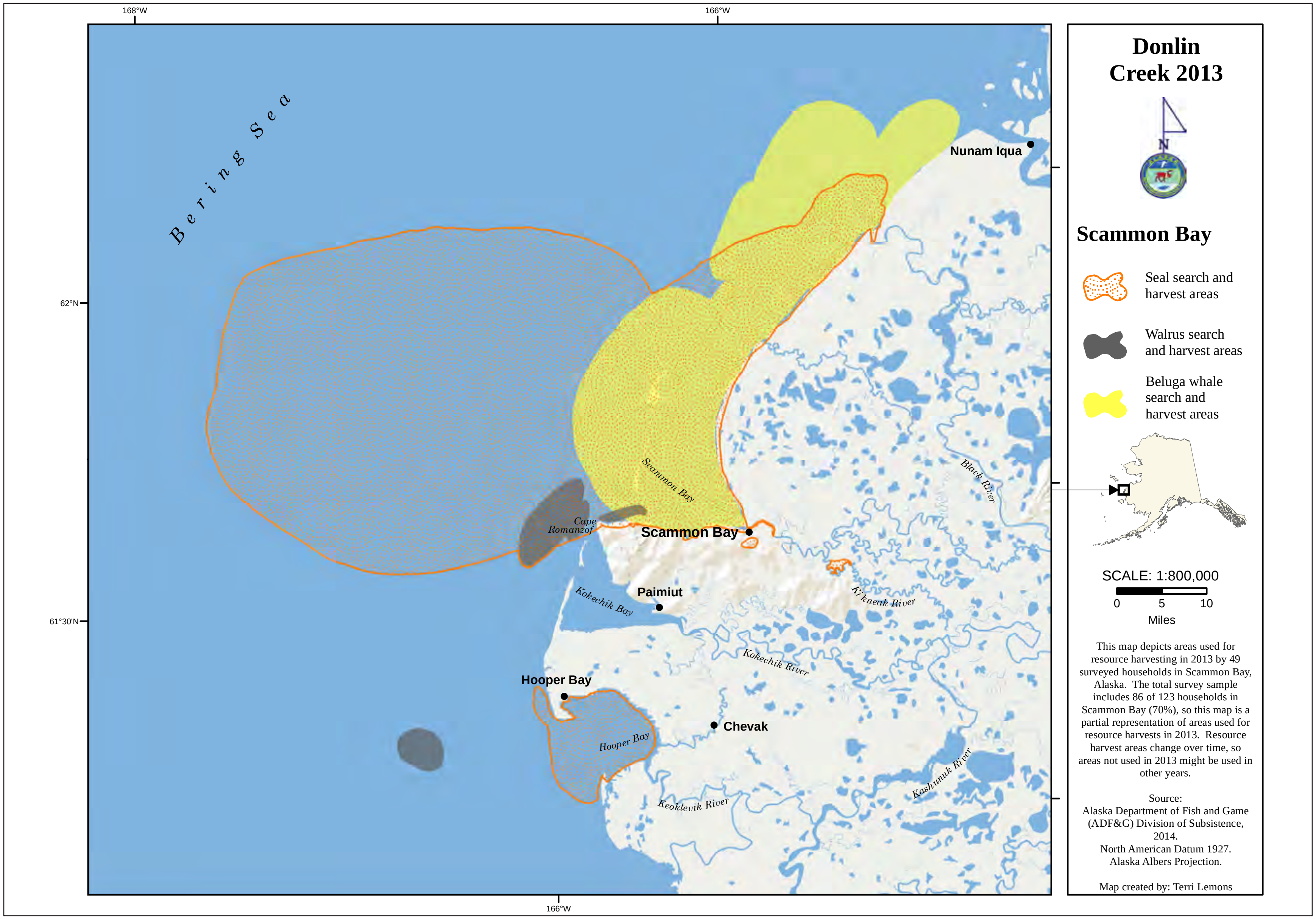


Figure 3-23.–Hunting and harvest areas, seals, walruses, and beluga whales, Scammon Bay, 2013.

water body and north along the coast to the area near Nunam Iqua. Finally, walrus was hunted along the westernmost edge of the southern coast of the Scammon Bay water body and in an area immediately west of Cape Romanzof that was approximately 10 miles northeast to southwest and 8 miles east to west. Walrus was also hunted in an area of the Bering Sea approximately 15 miles southwest of the community of Hooper Bay.

Hunters harvested ducks and geese in an area extending from the Black River in the north into the Askinuk Mountains and further south into the Kokechik River drainage, including portions of the Kashunak River drainage (Figure 3-24). Ducks and geese were also harvested in the Bering Sea in and adjacent to the Hooper Bay water body, an area west of Cape Romanzof 25 miles long and 12 miles wide, and from the Scammon Bay water body along the Bering Sea coast north to the mouth of the Black River. Other geese and duck hunting locations were in an area of the lower Keoklevik River drainage southwest of Chevak and locations to the south of the upper portion of Anakshek Pass. Ptarmigans were hunted in a large area approximately 60 miles east to west by 45 miles north to south at its widest point. This area encompassed portions of the Black, Kun, middle Kashunak, and lower Kokechik river drainages as well as a substantial portion of the Askinuk Mountains. Ptarmigans were also hunted in locations in the lowest section of the Kashunak River drainage.

Scammon Bay respondents reported harvests of berries and greens in the Black, Kun, and Tungpuk river drainages, in tundra areas immediately north of Scammon Bay, and in areas of the Askinuk Mountains south of Scammon Bay (Figure 3-25). Other plant harvest areas included sites on Nelson Island, in the Ninglikfak River drainage near Chevak, around the mouth of the Black River, and in the Anakshek Pass area. Further upstream into the Yukon River area, Scammon Bay households harvested berries and greens at sites adjacent to Mountain Village and in an area of the lower Yukon River approximately 10 to 20 miles downstream of Mountain Village. Finally, some individuals harvested berries and greens in the lower Paimiut Slough drainage.

Comparing Harvests and Uses in 2013 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 2 ways: whether they got more, less, or about the same amount of 8 resource categories in 2013 as in the past 5 years, and whether they got "enough" of each of the 8 resource categories. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different subsistence resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 3-20, Figure 3-26, and Figure 3-27 provide a broad overview of households' assessments of their harvests in 2013. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions.

Nonsalmon fish was the most harvested of all subsistence resource categories used by Scammon Bay households (Table 3-8). Thirty-eight percent of responding households explained that they used the same amount of nonsalmon fish in 2013 as they did in previous years, 39% reported that they used less, and 21% said they used more (Table 3-20; Figure 3-26). When asked why they used less, 29% of respondents reported that weather or other environmental factors resulted in their households using less nonsalmon fish (Table 3-21). Similarly, 26% of households reported that they used less nonsalmon fish due to the fact that the resource was less available. Other stated reasons for using less nonsalmon fish included decreased effort or that the household did not need the resource. For those households that used more nonsalmon fish in the study year, 28% of respondents reported that they received more from others, 22% said they increased their effort, 17% said that nonsalmon fish were more available, and 17% said they were more successful at

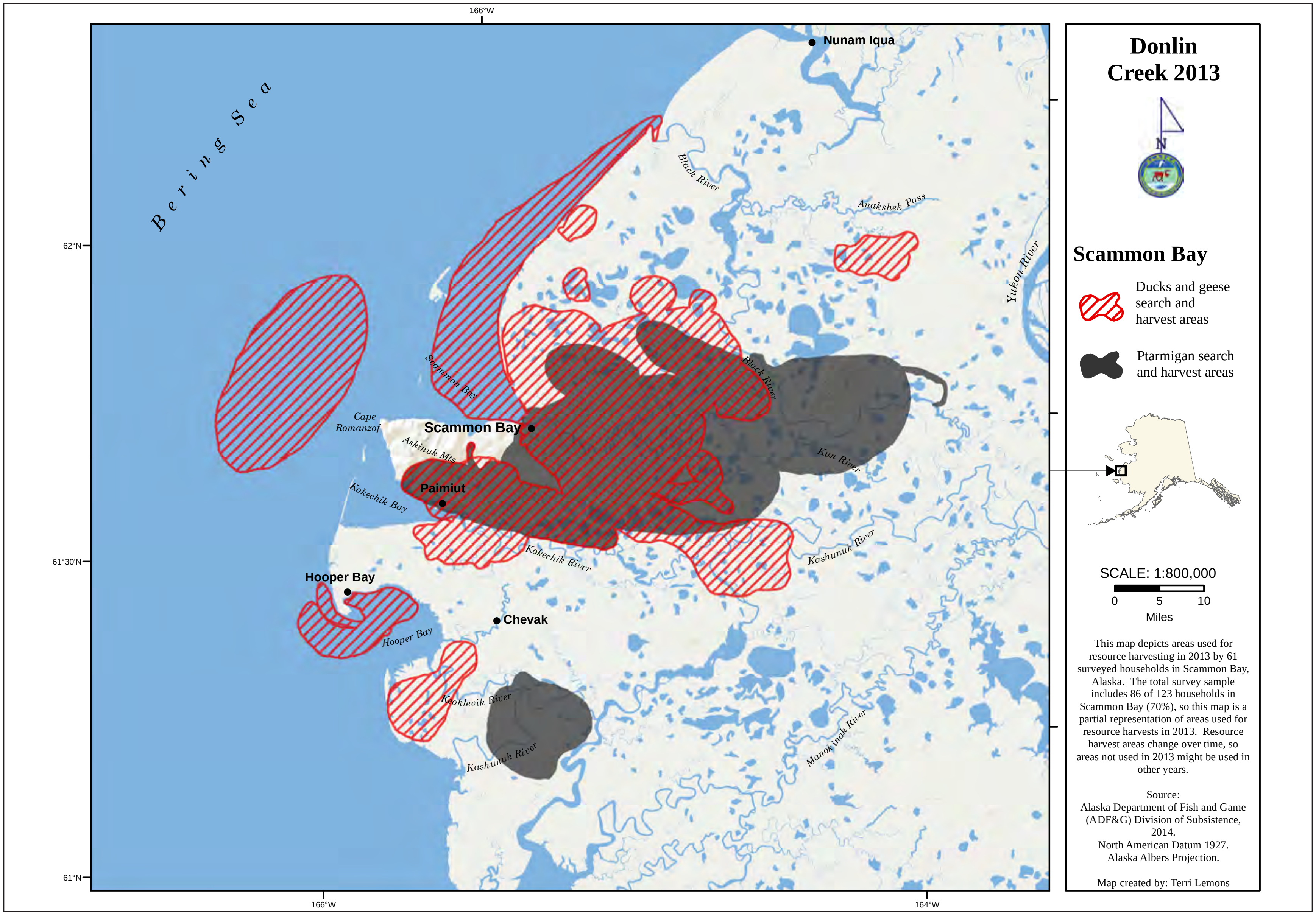


Figure 3-24.–Hunting and harvest areas, waterfowl and nonmigratory birds, Scammon Bay, 2013.

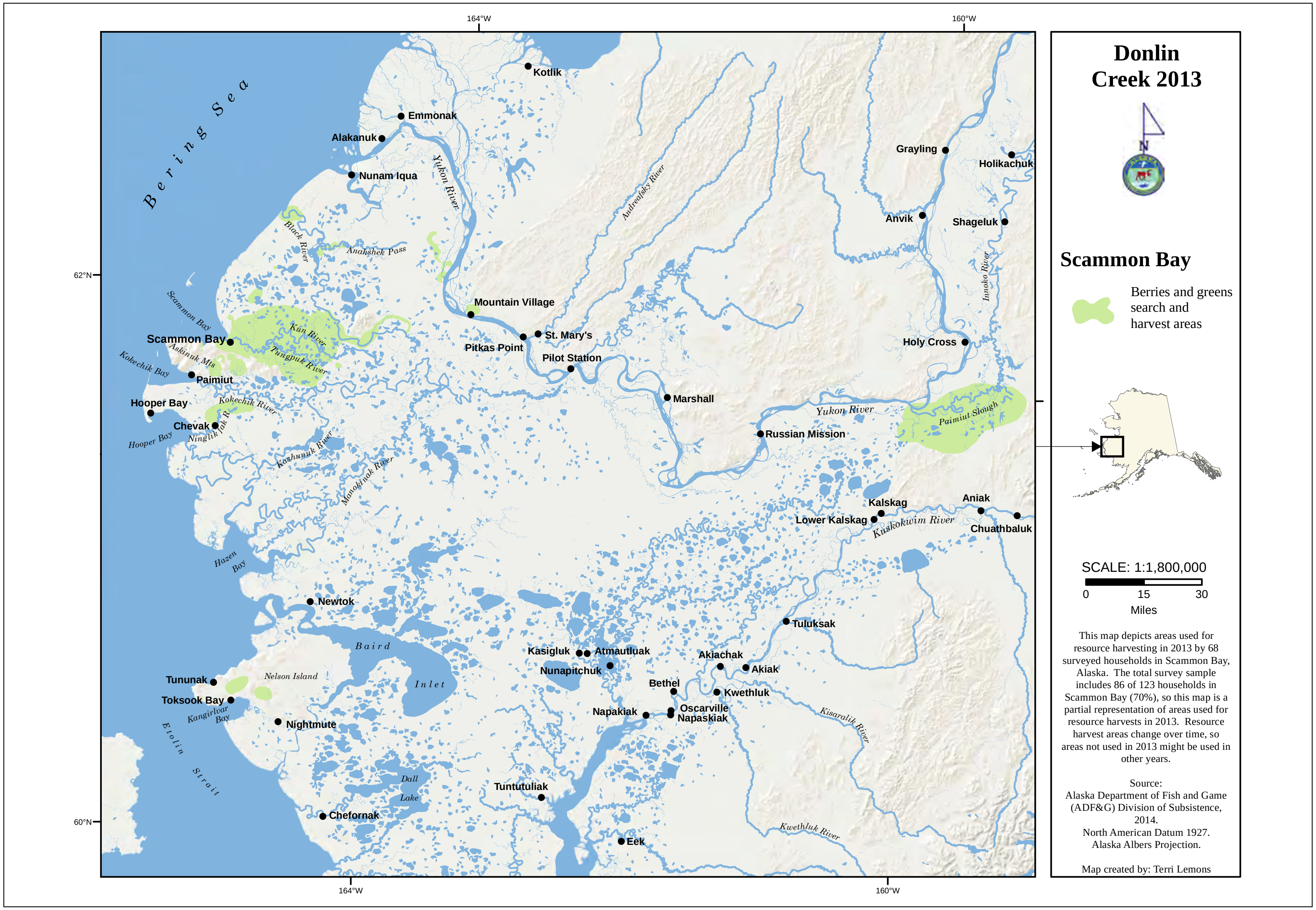


Figure 3-25.–Gathering and harvest areas, berries and greens, Scammon Bay, 2013.

Table 3-20.–Changes in household uses of resources compared to recent years, Scammon Bay, 2013.

			Households reporting use								Households not using	
			Total households		Less		Same		More			
Resource category	Sampled households	Valid responses[a]	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	86	83	83	96.5%	19	22.9%	49	59.0%	15	18.1%	0	0.0%
Chinook salmon	86	80	72	83.7%	51	63.8%	10	12.5%	11	13.8%	8	10.0%
Other salmon	86	86	81	94.2%	24	27.9%	26	30.2%	31	36.0%	5	5.8%
Nonsalmon fish	86	85	83	96.5%	33	38.8%	32	37.6%	18	21.2%	2	2.4%
Land mammals	86	85	82	95.3%	12	14.1%	47	55.3%	23	27.1%	3	3.5%
Marine mammals	86	83	79	91.9%	25	30.1%	43	51.8%	11	13.3%	4	4.8%
Birds and eggs	86	81	78	90.7%	31	38.3%	38	46.9%	9	11.1%	3	3.7%
Marine invertebrates	86	81	45	52.3%	10	12.3%	22	27.2%	13	16.0%	36	44.4%
Vegetation	86	81	80	93.0%	14	17.3%	44	54.3%	22	27.2%	1	1.2%

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

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

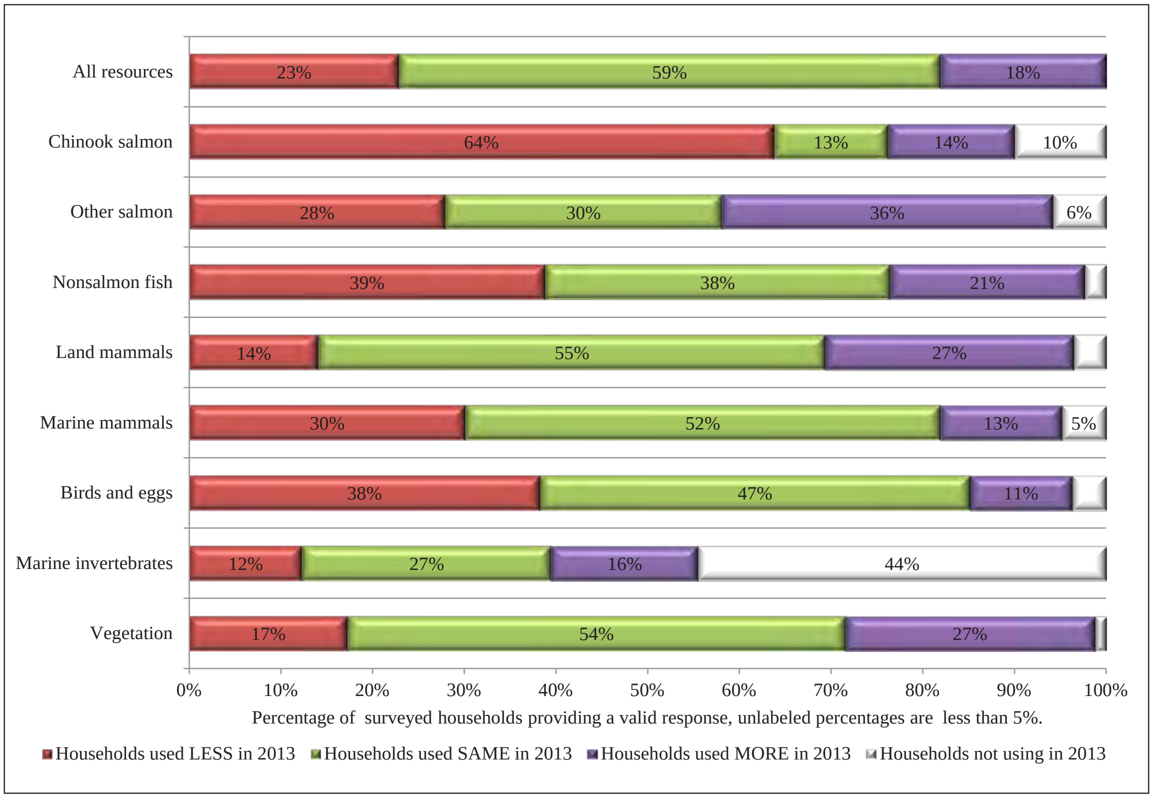


Figure 3-26.–Changes in household uses of resources compared to recent years, Scammon Bay, 2013.

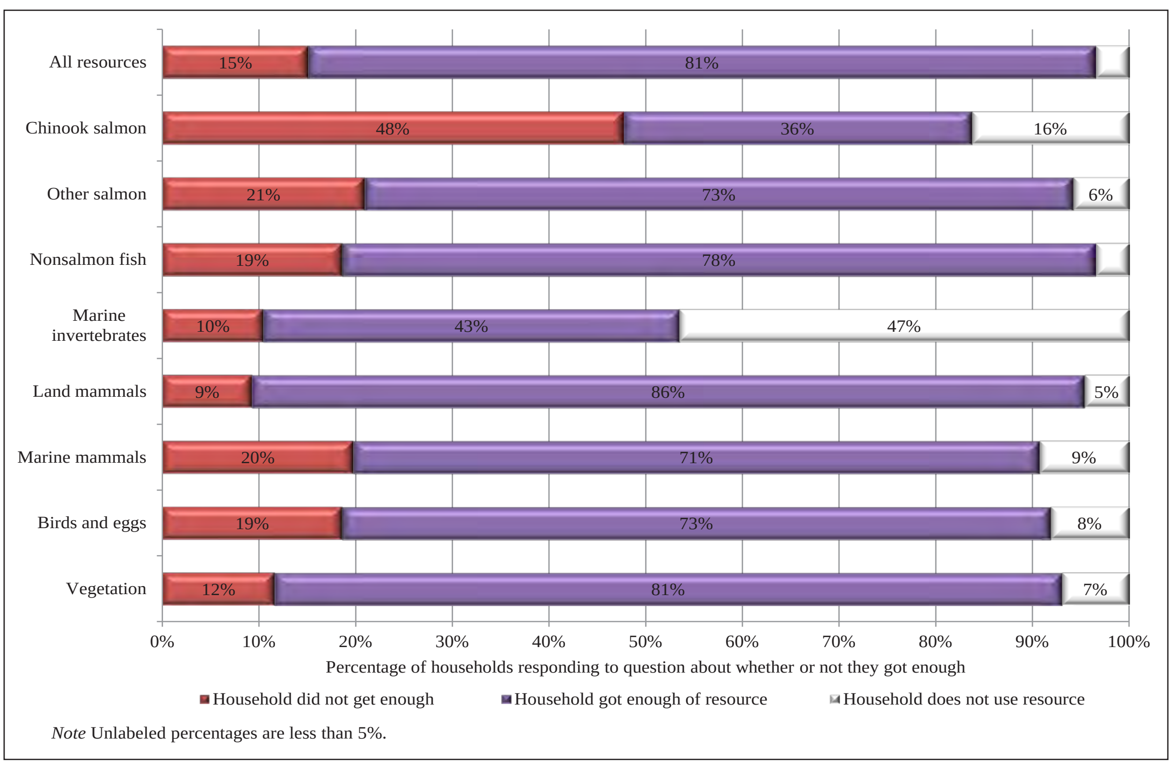


Figure 3-27.–Percentages of households reporting whether they got enough resources, Scammon Bay, 2013.

Table 3-21.–Reasons for less household uses of resources compared to recent years, Scammon Bay, 2013.

Resource category	Valid responses[a]	Households reporting reasons for less use	Family/personal Number	Family/personal Percentage	Resources less available Number	Resources less available Percentage	Too far to travel Number	Too far to travel Percentage	Lack of equipment Number	Lack of equipment Percentage	Less sharing Number	Less sharing Percentage	Lack of effort Number	Lack of effort Percentage	Unsuccessful Number	Unsuccessful Percentage	Weather/environment Number	Weather/environment Percentage	Other reasons Number	Other reasons Percentage
All resources	83	19	3	15.8%	2	11%	0	0.0%	2	11%	1	5%	7	37%	0	0.0%	3	15.8%	0	0.0%
Chinook salmon	80	49	0	0.0%	17	35%	3	6.1%	5	10%	4	8%	4	8%	1	2.0%	1	2.0%	3	6.1%
Other salmon	86	24	2	8.3%	2	8%	0	0.0%	4	17%	3	13%	2	8%	1	4.2%	0	0.0%	4	16.7%
Nonsalmon fish	85	31	2	6.5%	8	26%	0	0.0%	2	6%	2	6%	3	10%	1	3.2%	9	29.0%	3	9.7%
Land mammals	85	12	0	0.0%	0	0%	0	0.0%	1	8%	3	25%	2	17%	1	8.3%	1	8.3%	2	16.7%
Marine mammals	83	24	2	8.3%	1	4%	0	0.0%	2	8%	2	8%	7	29%	5	20.8%	4	16.7%	1	4.2%
Birds and eggs	81	31	3	9.7%	2	6%	0	0.0%	2	6%	5	16%	7	23%	1	3.2%	5	16.1%	2	6.5%
Marine invertebrates	81	10	0	0.0%	1	10%	0	0.0%	2	20%	2	20%	5	50%	0	0.0%	1	10.0%	1	10.0%
Vegetation	81	13	3	23.1%	2	15%	0	0.0%	0	0%	0	0%	6	46%	0	0.0%	0	0.0%	1	7.7%

-continued-

Table 3-21.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Working/no time Number	Working/no time Percentage	Regulations Number	Regulations Percentage	Small/diseased animals Number	Small/diseased animals Percentage	Did not get enough Number	Did not get enough Percentage	Did not need Number	Did not need Percentage	Did not give any away Number	Did not give any away Percentage	Equipment/fuel expense Number	Equipment/fuel expense Percentage	Used other resources Number	Used other resources Percentage	Competition Number	Competition Percentage
All resources	83	19	6	32%	0	0.0%	0	0.0%	1	5.3%	2	10.5%	0	0.0%	2	10.5%	0	0.0%	0	0.0%
Chinook salmon	80	49	7	14%	12	24.5%	0	0.0%	3	6.1%	1	2.0%	0	0.0%	1	2.0%	1	2.0%	0	0.0%
Other salmon	86	24	3	13%	3	12.5%	0	0.0%	1	4.2%	1	4.2%	0	0.0%	1	4.2%	0	0.0%	0	0.0%
Nonsalmon fish	85	31	2	6%	1	3.2%	0	0.0%	2	6.5%	3	9.7%	1	3.2%	0	0.0%	0	0.0%	0	0.0%
Land mammals	85	12	2	17%	1	8.3%	1	8.3%	1	8.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	83	24	2	8%	0	0.0%	0	0.0%	0	0.0%	1	4.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	81	31	2	6%	0	0.0%	0	0.0%	0	0.0%	4	12.9%	0	0.0%	4	12.9%	0	0.0%	0	0.0%
Marine invertebrates	81	10	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	81	13	4	31%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	15.4%	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 3-22.–Reasons for more household uses of resources compared to recent years, Scammon Bay, 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
All resources	83	12	2	16.7%	0	0.0%	0	0.0%	2	16.7%	4	33.3%	3	25.0%	0	0.0%
Chinook salmon	80	10	0	0.0%	0	0.0%	1	10.0%	1	10.0%	1	10.0%	1	10.0%	2	20.0%
Other salmon	86	30	7	23.3%	2	6.7%	2	6.7%	4	13.3%	2	6.7%	1	3.3%	0	0.0%
Nonsalmon fish	85	18	3	16.7%	0	0.0%	0	0.0%	5	27.8%	2	11.1%	4	22.2%	0	0.0%
Land mammals	85	21	2	9.5%	0	0.0%	0	0.0%	7	33.3%	2	9.5%	1	4.8%	0	0.0%
Marine mammals	83	11	1	9.1%	0	0.0%	1	9.1%	3	27.3%	1	9.1%	1	9.1%	0	0.0%
Birds and eggs	81	8	2	25.0%	0	0.0%	0	0.0%	3	37.5%	0	0.0%	3	37.5%	0	0.0%
Marine invertebrates	81	13	1	7.7%	0	0.0%	2	15.4%	1	7.7%	1	7.7%	6	46.2%	0	0.0%
Vegetation	81	21	8	38.1%	0	0.0%	0	0.0%	0	0.0%	5	23.8%	7	33.3%	0	0.0%

-continued-

Table 3-22.–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		Substituted for unavailable resource	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	83	12	0	0.0%	0	0.0%	0	0.0%	2	16.7%	0	0.0%	1	8.3%	1	8.3%	0	0.0%
Chinook salmon	80	10	1	10.0%	0	0.0%	0	0.0%	3	30.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	86	30	4	13.3%	0	0.0%	1	3.3%	4	13.3%	0	0.0%	1	3.3%	2	6.7%	3	10.0%
Nonsalmon fish	85	18	2	11.1%	0	0.0%	0	0.0%	3	16.7%	0	0.0%	0	0.0%	1	5.6%	0	0.0%
Land mammals	85	21	2	9.5%	0	0.0%	0	0.0%	4	19.0%	0	0.0%	1	4.8%	2	9.5%	1	4.8%
Marine mammals	83	11	2	18.2%	0	0.0%	0	0.0%	3	27.3%	0	0.0%	0	0.0%	1	9.1%	0	0.0%
Birds and eggs	81	8	2	25.0%	0	0.0%	0	0.0%	1	12.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	81	13	1	7.7%	0	0.0%	0	0.0%	1	7.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	81	21	2	9.5%	0	0.0%	0	0.0%	1	4.8%	1	4.8%	0	0.0%	2	9.5%	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 3-23.–Reported impact to households that did not get enough of a resource, Scammon Bay, 2013.

		Households not getting enough _______ .				Impact to those not getting enough ______ .									
	Sample	Valid responses[a]		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	86	83	96.5%	13	15.7%	1	7.7%	0	0.0%	6	46.2%	5	38.5%	1	7.7%
Chinook salmon	86	72	83.7%	41	56.9%	0	0.0%	2	4.9%	23	56.1%	11	26.8%	5	12.2%
Other salmon	86	81	94.2%	18	22.2%	0	0.0%	1	5.6%	10	55.6%	5	27.8%	2	11.1%
Nonsalmon fish	86	83	96.5%	16	19.3%	1	6.3%	0	0.0%	10	62.5%	3	18.8%	2	12.5%
Marine invertebrates	86	46	53.5%	9	19.6%	1	11.1%	3	33.3%	3	33.3%	1	11.1%	1	11.1%
Land mammals	86	82	95.3%	8	9.8%	3	37.5%	0	0.0%	4	50.0%	0	0.0%	1	12.5%
Marine mammals	86	78	90.7%	17	21.8%	0	0.0%	3	17.6%	9	52.9%	3	17.6%	2	11.8%
Birds and eggs	86	79	91.9%	16	20.3%	0	0.0%	4	25.0%	11	68.8%	0	0.0%	1	6.3%
Vegetation	86	80	93.0%	10	12.5%	0	0.0%	0	0.0%	10	100.0%	0	0.0%	0	0.0%

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.

harvesting nonsalmon fish (Table 3-22). In Scammon Bay, 19% of respondents (16 households) stated that they did not get enough nonsalmon fish (Table 3-23; Figure 3-27). When these 16 households were asked to evaluate the impact of not getting enough nonsalmon fish, 10 (63%) described the impact as minor, 3 (19%) explained that not getting enough nonsalmon fish had a major effect on their household, and 2 (13%) stated that the impact was severe (Table 3-23). Two households that did not get enough nonsalmon fish adapted by using more store-bought foods (Table 3-24).

Salmon contributed the second highest harvest in edible pounds of subsistence resource categories in Scammon Bay in 2013 (Table 3-8). When asked to compare their use of all salmon other than Chinook, 13% of responding households explained that they used the same amount of salmon other than Chinook in 2013 as they did in previous years, 28% reported that they used less, and 36% said they used more (Table 3-20; Figure 3-26). Survey respondents who stated that their household used less were also asked why they used less. Of these respondents, 17% reported that a lack of equipment resulted in their households using less salmon (Table 3-21). In addition, 13% of households reported that they used less salmon because they did not have time due to their work schedule, and another 13% reported that they were given less salmon than usual by other households. Similarly, 13% of households stated that fishing regulations resulted in their household using less salmon in 2013.[17] Among households that used more salmon in the study year, 23% of respondents said that salmon were more available than in past years, 13% said that they received more from others, and 13% said they were more successful at harvesting salmon (Table 3-22). In Scammon Bay, 22% of respondents (18 households) stated that they did not get enough salmon other than Chinook in 2013 (Table 3-23; Figure 3-27). When these 18 households were asked to evaluate the impact of not getting enough salmon, 1 household (6%) described it as not noticeable, 10 (56%) described the impact as minor, 5 (28%) explained that not getting enough salmon had a major effect on their household, and 2 (11%) stated that the impact was severe (Table 3-23). At least 8 households that did not get enough salmon other than Chinook reported that they chose to do something differently as a result (Table 3-24).

When asked to compare their use of Chinook salmon, 13% of responding households explained that they used the same amount of Chinook in 2013 as they did in previous years, 64% reported that they used less, and 14% said they used more (Table 3-20; Figure 3-26). When asked why they used less, 35% of respondents reported that Chinook salmon was less available, and 25% stated that fishing regulations resulted in their household using less Chinook salmon in 2013 (Table 3-21). Among households that used more Chinook salmon in the study year, 30% of respondents reported that they had more success and 20% said that they received more help (Table 3-22). Forty-eight percent of respondents (41 households) stated that they did not get enough Chinook salmon in 2013 (Table 3-23). When these 41 households were asked to evaluate the impact of not getting enough Chinook salmon, 23 households (56%) described the impact as minor, 11 (27%) explained that not getting enough Chinook salmon had a major effect on their household, and 5 (12%) stated that the impact was severe (Table 3-23). Twenty-one households that did not get enough Chinook salmon reported that they chose to do something differently as a result (Table 3-24).

When asked to assess their harvests of land mammals, marine mammals, and birds and eggs, approximately one-half of Scammon Bay respondents reported that they used the same amount of these resource categories in 2013 as they had in recent years (Table 3-20). Some households reported that they used less of these resources and stated that decreased effort, weather or other environmental conditions, and less sharing of resources largely explained why they used less (Table 3-21). Households that reported using more land mammals, marine mammals, and birds and eggs in 2013 in recent years generally explained that this was due to the fact that they received more of the resources from others or that they had more success harvesting them (Table 3-22).

Survey respondents who stated that their household did not get enough of any resource category were also asked to report the kinds of wild foods they needed in 2013. Forty-four Scammon Bay households stated that they needed at least 1 subsistence resource of which their household did not get enough (Table 3-25).

17. Due to poor Chinook salmon runs in the Yukon River since 2007, restrictions to subsistence fishing opportunities have significantly limited salmon harvests for Yukon River area households, including residents of Scammon Bay (Estensen et al. 2015).

Table 3-24.–Things households reported doing differently as the result of not getting enough of a resource, Scammon Bay, 2013.

Resource category	Valid responses[a]	Bought/bartered		Used more commercial foods		Replaced with other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	10	1	10.0%	6	60.0%	2	20.0%	0	0.0%	0	0.0%
Chinook salmon	21	1	4.8%	2	9.5%	14	66.7%	0	0.0%	4	19.0%
Other salmon	8	1	12.5%	2	25.0%	2	25.0%	0	0.0%	3	37.5%
Nonsalmon fish	4	0	0.0%	2	50.0%	1	25.0%	2	50.0%	0	0.0%
Marine invertebrates	3	0	0.0%	1	33.3%	1	33.3%	0	0.0%	0	0.0%
Land mammals	3	0	0.0%	3	100.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	4	0	0.0%	1	25.0%	2	50.0%	0	0.0%	1	25.0%
Birds and eggs	4	1	25.0%	2	50.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%

-continued-

Table 3-24.–Continued.

Resource category	Valid responses[a]	Increased effort to harvest		Got a job		Obtained food from other sources		Got public assistance		Conserved resource		Other	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	10	1	10.0%	0	0.0%	1	10.0%	0	0.0%	0	0.0%	0	0.0%
Chinook salmon	21	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	4.8%
Other salmon	8	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	12.5%
Nonsalmon fish	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	3	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	25.0%
Vegetation	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	66.7%

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.

Table 3-25.–Resources of which households reported needing more, Scammon Bay, 2013.

Resource	Households needing	Percentage of households[a]
All resources	2	4.5%
Fish	4	9.1%
Salmon	3	6.8%
Chum salmon	7	15.9%
Coho salmon	1	2.3%
Chinook salmon	7	15.9%
Unknown salmon	1	2.3%
Pacific herring	1	2.3%
Smelt	2	4.5%
Pacific tomcod	2	4.5%
Pacific halibut	2	4.5%
Tuna/mackerel	1	2.3%
Alaska blackfish	2	4.5%
Burbot	4	9.1%
Northern pike	2	4.5%
Whitefishes	4	9.1%
Caribou	2	4.5%
Moose	5	11.4%
Marine mammals	1	2.3%
Seal	4	9.1%
Bearded seal	7	15.9%
Harbor seal	2	4.5%
Ringed seal	3	6.8%
Spotted seal	1	2.3%
Walrus	2	4.5%
Whale	2	4.5%
Beluga whale	3	6.8%
Bowhead whale	1	2.3%
Birds and eggs	5	11.4%
Ducks	3	6.8%
Northern pintail	1	2.3%
Geese	5	11.4%
Canada goose	1	2.3%
Emperor goose	1	2.3%
Snow goose	2	4.5%
White-fronted goose	1	2.3%
Swans	1	2.3%
Crane	1	2.3%
Sandhill crane	1	2.3%
Ptarmigan	1	2.3%
Bird eggs	2	4.5%
Swan eggs	1	2.3%
Clams	7	15.9%
Mussels	4	9.1%
Blueberry	4	9.1%
Lowbush cranberry	1	2.3%
Crowberry	4	9.1%
Cloudberry	6	13.6%
Blackberry	1	2.3%
Plants, greens, and	1	2.3%
Other wild greens	1	2.3%
Mousefoods	1	2.3%
Unknown	44	100.0%

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

a. Calculated using only households responding to needing at least one resource (n=44).

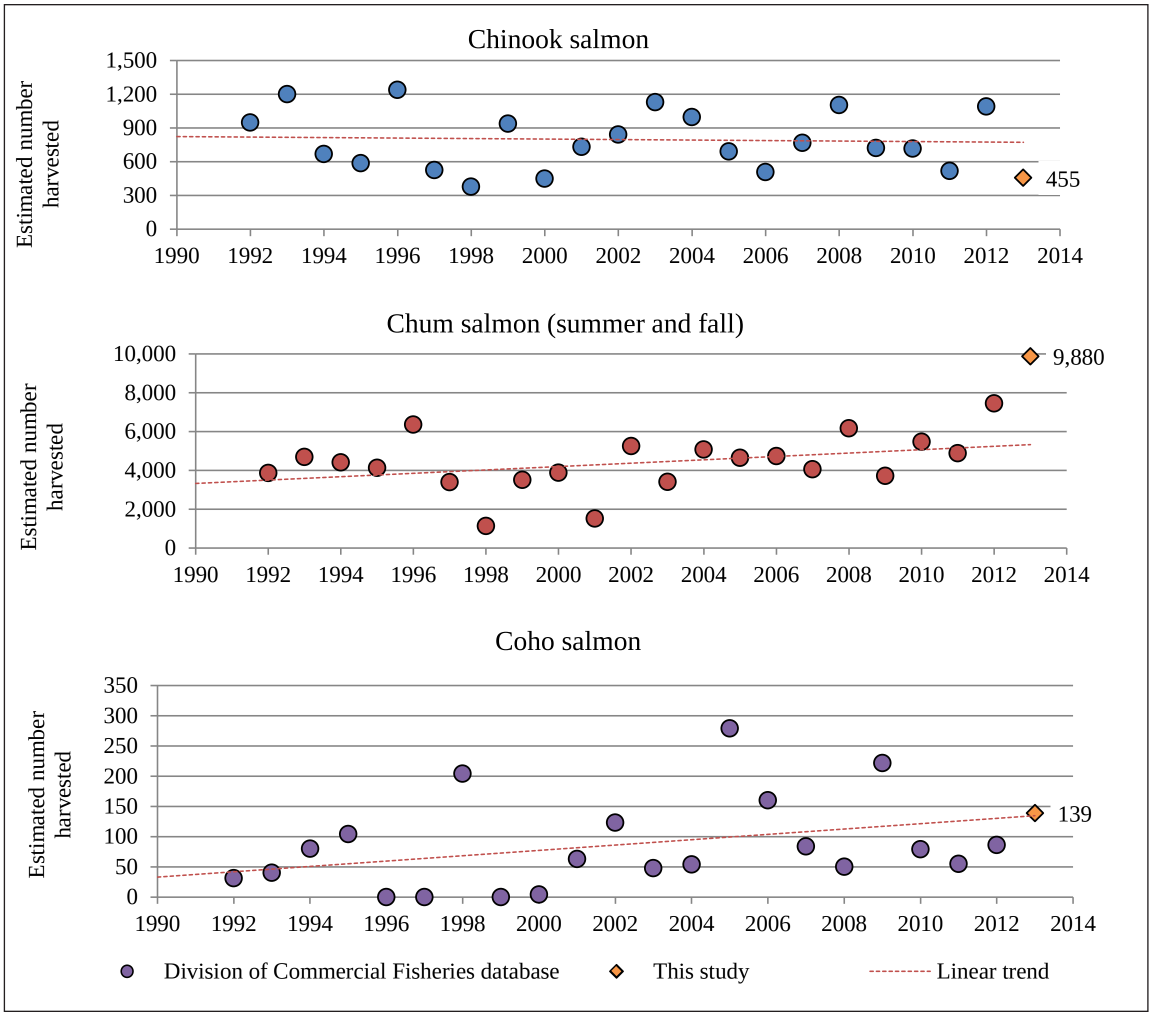


Figure 3-28.–Estimated numbers of Chinook, chum, and coho salmon harvested, Scammon Bay, 1992–2013.

Of these households, 16% stated that they needed more Chinook salmon, 16% needed more chum salmon, and 16% needed more bearded seal. Additionally, 16% said that their household needed clams and 14% said that they needed cloudberries.

Harvest Data

Changes in the harvest of resources by Scammon Bay residents can also be discerned through comparisons with findings from other study years. Data presented in this report represent the only comprehensive subsistence harvest information that Division of Subsistence has recorded for Scammon Bay. Annual harvests of chum (summer and fall), Chinook, and coho salmon for Scammon Bay households are presented in Figure 3-28.[18] Included in Figure 3-28 are data from the ADF&G Division of Commercial Fisheries subsistence salmon harvest surveys conducted from 1992 through 2012 in addition to harvest amounts recorded for 2013 during this study. Harvests of summer and fall chum salmon averaged 4,374 fish between

18. Data presented in Figure 3-28 include total numbers of individual fish harvested as reported in annual postseason harvest surveys and comprehensive household surveys in 2013. These data are not presented in terms of per capita harvest. As discussed in the Population Estimates and Demographic Information section of this chapter, Scammon Bay's population has increased over the time period represented in Figure 3-28. Therefore, a more complete analysis of these data would likely include consideration of per capita harvests of these species.

1992 and 2012, with harvests ranging from a low of 1,135 fish in 1998 to a high of 7,452 fish in 2012. The harvest of chum salmon was 9,880 fish in 2013, more than 2,000 fish greater than the previous and greatest year of harvest. Harvests of Chinook salmon by Scammon Bay residents averaged 797 fish between 1992 and 2012, with harvests ranging from 378 fish in 1998 to 1,238 fish in 1996. In 2013, Scammon Bay households experienced a below-average harvest of 455 Chinook salmon. Lower than average harvests of Chinook salmon coupled with higher than average harvests of chum salmon likely occurred due to management agencies' efforts to conserve Chinook salmon in the Yukon River fishery. In recent years, these conservation efforts have resulted in significant restrictions on subsistence fishing, particularly early in the salmon fishing season when Scammon Bay households have historically targeted Chinook and summer chum salmon. Such changes in community harvest numbers likely reflect individual household responses. For example, as described in the Harvest Assessments section of this chapter, 64% of households reported using less Chinook salmon in 2013 relative to recent years.

In addition to historical salmon harvest information, there are very few harvest data that have been published for residents of Scammon Bay. Weekley et al. (2011) reported large land mammal harvests for 9 lower Yukon River communities, including Scammon Bay, during the period from February 2009 through January 2010. During the 2009–2010 reporting period, 43% of Scammon Bay households reported harvesting moose, and 70% of households reported using moose (Weekley et al. 2011:12). This compares to results from Division of Subsistence comprehensive surveys in which 56% of Scammon Bay households reported harvest of moose in 2013, and 98% of households reported using this resource (Table 3-8). Scammon Bay hunters harvested an estimated 43 moose in 2009–2010, as compared to an estimated harvest of 92 moose in 2013 (Table 3-8; Weekley et al. 2011). Weekley et al. (2011) reported that the majority of moose taken in the 2009–2010 reporting period were harvested in August 2009 (12 bulls harvested) and September 2009 (20 bulls and 5 cows). An additional 6 moose were taken in November and December 2009 and January 2010, 2 cows in each month. In 2009–2010, Scammon Bay hunters harvested moose in portions of GMU 18 adjacent to the lowest section of the Yukon River mouth, as well as in areas north and west of Scammon Bay. In addition to moose, Weekley et al. (2011) reported that 13% of Scammon Bay households used caribou during the reporting period, with no caribou harvest recorded. No harvests or uses of other large land mammal species were reported for Scammon Bay in 2009–2010.

Since 2003, Division of Subsistence researchers have collected harvest data for the National Oceanic and Atmospheric Administration National Marine Fisheries Service's Alaska Subsistence Halibut Program. Much of the harvest data published in division reports is derived from Subsistence Halibut Registration Certificate harvest reports mailed into the division by halibut fishers. Small harvests of halibut were reported by Scammon Bay fishers in 2003–2005. Estimated Scammon Bay halibut harvests were 181 lb in 2003, 79 lb in 2004, and 269 lb in 2005 (Fall et al. 2004, 2005, 2006). These estimates were based upon 1 to 5 returned harvest reports during each year, so they do not reflect the total harvest amounts for the community each year.

Income and Cash Employment

Survey respondents were asked about both earned income (jobs held and wages earned by all household members 16 years and older) and income from sources other than employment. The survey also asked about months worked and work schedules for employed residents in each household. The principal income sources for Scammon Bay in 2013 included employment from local government occupations (34% of all income for the community), employment in service industries (20%), entitlements[19] (17%), and the Alaska Permanent Fund dividend (8%; Figure 3-29). Other important sources of income included Social Security (4%); pension and retirement benefits (2%); unemployment insurance (2%); transportation, communication, and utilities jobs (2%); and federal government jobs (2%).

Table 3-26 shows all reported sources of income by employment occupation and other sources as percentages of total income in 2013. The estimated total of all earned and unearned income was $5,523,939

19. The other income category of Entitlements includes sources such as Temporary Assistance for Needy Families (TANF), adult public assistance, Supplemental Security Income (SSI), and food stamps.

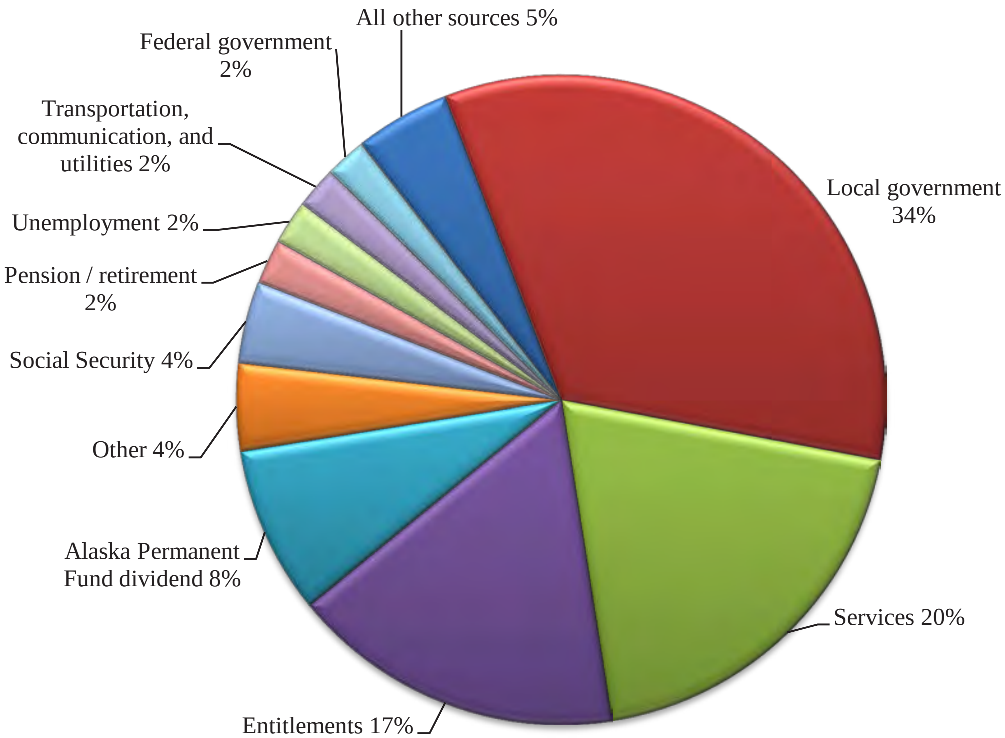


Figure 3-29.–Top income sources, Scammon Bay, 2013.

for all Scammon Bay households in 2013 (Table 3-26). Employment earnings accounted for $3,367,254 of this total. In addition, Scammon Bay households received $2,156,686 of income from sources other than employment. The average total income per household for 2013 was $44,910. This included an average earned income of $27,376 per household (61% of the average total household income) and an average unearned income of $17,534 (39% of the average total household income). Total community income from local government jobs totaled an estimated $1,866,083; 90 people were employed in these jobs in 2013. Service-related jobs resulted in $1,079,030 of wages earned; 74 individuals held these jobs. The remaining jobs produced an estimated $422,140 in 2013 from employment held by 59 people. An estimated 66 households received $738,636 in food stamp benefits[20], and 113 households received a total of $462,046 from the Alaska Permanent Fund dividend[21]. Other important sources of unearned income included 19 households receiving $224,915 of Social Security benefits, 16 households receiving $122,976 in pension or retirement benefits, and 27 households receiving $121,220 from unemployment insurance benefits.

The estimated median household income for Scammon Bay residents in 2013 was $40,353, within a 95% confidence interval of $32,354–$55,649 (Table 3-27). The estimated median household income from this study also falls within the margin of error of the median income of $28,362–$43,638 as estimated by the American Community Survey for 2008–2012 (Table 3-27). In comparison, the 2008–2012 ACS median income for Scammon Bay households was $36,000, while the 2008–2012 ACS median income for all of Alaska households was $69,014 (Table 3-27).

Survey results indicate an estimated total of 244 jobs in Scammon Bay in 2013 (Table 3-28). These jobs were distributed among 187 workers in 104 households. The greatest portion of jobs was found in the

20. Cash benefits for assistance with food purchases that are issued to qualifying households originate from the Supplemental Nutrition Assistance Program (SNAP), a program funded by the U. S. Department of Agriculture and administered by the states. These benefits are commonly referred to as food stamps.

21. The Alaska Permanent Fund Dividend paid $900 to each eligible Alaska resident in 2013.

Table 3-26.–Estimated earned and other income, Scammon Bay, 2013.

Income source	Number of people	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government	90.0	70.5	$1,866,083	$1,173,859 – $2,638,955	$15,171	33.8%
Services	73.5	55.5	$1,079,030	$674,744 – $1,670,911	$8,773	19.5%
Transportation, communication, and utilities	3.0	3.0	$115,812	$24,256 – $318,939	$942	2.1%
Federal government	13.5	10.5	$112,034	$13,086 – $315,977	$911	2.0%
Retail trade	13.5	13.5	$66,703	$13,934 – $180,611	$542	1.2%
Construction	4.5	4.5	$42,756	$1,985 – $111,940	$348	0.8%
Other employment	1.5	1.5	$36,126	$36,566 – $85,863	$294	0.7%
State government	7.5	7.5	$23,170	$26,350 – $91,412	$188	0.4%
Agriculture, forestry, and fishing	10.5	10.5	$21,899	$2,835 – $56,846	$178	0.4%
Manufacturing	3.0	3.0	$2,375	$5,465 – $54,868	$19	0.0%
Finance, insurance, and real estate	1.5	1.5	$1,265	$373 – $8,882	$10	0.0%
Earned income subtotal	**181.5**	**103.5**	**$3,367,254**	**$2,439,975 – $4,279,845**	**$27,376**	**61.0%**
Other income						
Food stamps		65.8	$738,636	$548,976 – $962,856	$6,005	13.4%
Alaska Permanent Fund dividend		113.0	$462,046	$405,471 – $528,757	$3,756	8.4%
Social Security		18.6	$224,915	$103,997 – $387,229	$1,829	4.1%
Pension / retirement		15.7	$122,976	$32,591 – $256,378	$1,000	2.2%
Unemployment		27.2	$121,220	$53,804 – $220,096	$986	2.2%
TANF (Temporary Assistance for Needy Families)		14.3	$88,184	$32,121 – $170,542	$717	1.6%
Foster care		2.9	$68,937	$48,200 – $199,660	$560	1.2%
Supplemental security Income		8.6	$56,809	$16,682 – $114,184	$462	1.0%
Veteran disability		4.3	$52,358	$36,608 – $125,300	$426	0.9%
Native corporation dividend		68.7	$42,810	$29,885 – $58,695	$348	0.8%
Longevity bonus		12.9	$38,496	$14,811 – $69,561	$313	0.7%
Adult public assistance (OAA,		10.0	$32,982	$7,807 – $64,786	$268	0.6%
Child support		5.7	$23,060	$492 – $58,658	$187	0.4%
Heating assistance		35.8	$22,205	$12,534 – $33,369	$181	0.4%
Rental income		3.2	$20,241	$1,013 – $76,143	$165	0.4%
CITGO fuel voucher		21.5	$13,715	$5,687 – $31,119	$112	0.2%
Other		1.4	$12,014	$8,400 – $24,028	$98	0.2%
Meeting honoraria		5.7	$7,652	$1,287 – $23,313	$62	0.1%
Disability		1.4	$7,431	$5,196 – $14,863	$60	0.1%
Workers' compensation / insurance		0.0	$0	$0 – $0	$0	0.0%
Other income subtotal		**116.9**	**$2,156,686**	**1,752,987 – 2,607,009**	**$17,534**	**39.0%**
Community income total			**$5,523,939**	**$4,676,610 – $6,342,764**	**$44,910**	**100.0%**

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

Table 3-27.–Comparison of median income estimates, Scammon Bay, 2013.

Data source	Median[a]	Range[b,c]
2013 Division of Subsistence estimate	$40,353	$32,354–$55,649
2008–2012 ACS (Scammon Bay)	$36,000	$28,362–$43,638
2008–2012 ACS (All Alaska)	$69,014	$68,221–$69,807

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

a. Division of Subsistence 2013 estimate does not include categories of income excluded by the 2008–2012 ACS median estimate, including food stamps, housing assistance, and one-time payments.

b. Range is a 95% confidence interval of the estimated median.

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

Table 3-28.–Employment by industry, Scammon Bay, 2013.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**244.2**	**103.5**	**187.0**	
Federal government	**6.9%**	**10.1%**	**7.4%**	**3.3%**
Executive, administrative, and managerial	0.6%	1.4%	0.8%	1.3%
Engineers, surveyors, and architects	0.6%	1.4%	0.8%	0.0%
Teachers, librarians, and counselors	1.3%	1.4%	0.8%	0.5%
Administrative support occupations, including clerical	1.9%	4.3%	2.5%	1.1%
Service occupations	1.9%	4.3%	2.5%	0.3%
Transportation and material moving occupations	0.6%	1.4%	0.8%	0.0%
State government	**3.1%**	**7.2%**	**4.1%**	**0.7%**
Service occupations	3.1%	7.2%	4.1%	0.7%
Local government, including tribal	**38.8%**	**68.1%**	**49.6%**	**55.4%**
Executive, administrative, and managerial	1.9%	4.3%	2.5%	1.6%
Engineers, surveyors, and architects	0.6%	1.4%	0.8%	0.1%
Teachers, librarians, and counselors	16.3%	33.3%	21.5%	33.2%
Administrative support occupations, including clerical	5.0%	11.6%	6.6%	6.3%
Service occupations	9.4%	17.4%	12.4%	8.9%
Construction and extractive occupations	1.3%	2.9%	1.7%	1.4%
Precision production occupations	1.9%	4.3%	2.5%	2.0%
Handlers, equipment cleaners, helpers, and laborers	4.4%	10.1%	5.8%	0.7%
Agriculture, forestry, and fishing	**4.4%**	**10.1%**	**5.8%**	**0.7%**
Agricultural, forestry, and fishing occupations	4.4%	10.1%	5.8%	0.7%
Construction	**1.9%**	**4.3%**	**2.5%**	**1.3%**
Construction and extractive occupations	0.6%	1.4%	0.8%	0.7%
Handlers, equipment cleaners, helpers, and laborers	1.3%	2.9%	1.7%	0.6%
Manufacturing	**1.3%**	**2.9%**	**1.7%**	**0.1%**
Writers, artists, entertainers, and athletes	1.3%	2.9%	1.7%	0.1%
Transportation, communication, and utilities	**2.5%**	**2.9%**	**1.7%**	**3.4%**
Transportation and material moving occupations	2.5%	2.9%	1.7%	3.4%
Retail trade	**5.6%**	**13.0%**	**7.4%**	**2.0%**
Executive, administrative, and managerial	0.6%	1.4%	0.8%	1.0%
Marketing and sales occupations	3.8%	8.7%	5.0%	0.7%
Administrative support occupations, including clerical	0.6%	1.4%	0.8%	0.3%
Construction and extractive occupations	0.6%	1.4%	0.8%	0.0%
Finance, insurance and real estate	**0.6%**	**1.4%**	**0.8%**	**0.0%**
Handlers, equipment cleaners, helpers, and laborers	0.6%	1.4%	0.8%	0.0%
Services	**34.4%**	**53.6%**	**40.5%**	**32.0%**
Executive, administrative, and managerial	1.3%	2.9%	1.7%	1.8%
Social scientists, social workers, religious workers, and lawyers	0.6%	1.4%	0.8%	1.1%
Teachers, librarians, and counselors	2.5%	5.8%	3.3%	1.5%
Registered nurses, pharmacists, dietitians, therapists, and physicians	0.6%	1.4%	0.8%	1.0%
Health technologists and technicians	1.3%	2.9%	1.7%	3.5%
Technologists and technicians, except health	1.3%	2.9%	1.7%	1.5%
Administrative support occupations, including clerical	5.0%	11.6%	6.6%	6.4%
Service occupations	5.0%	8.7%	5.8%	4.5%
Mechanics and repairers	0.6%	1.4%	0.8%	1.1%
Construction and extractive occupations	6.9%	11.6%	7.4%	7.2%
Transportation and material moving occupations	0.6%	1.4%	0.8%	0.5%
Handlers, equipment cleaners, helpers, and laborers	8.1%	14.5%	10.7%	1.4%
Occupation not indicated	0.6%	1.4%	0.8%	0.6%
Industry not indicated	**0.6%**	**1.4%**	**0.8%**	**1.1%**
Occupation not indicated	0.6%	1.4%	0.8%	1.1%

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

local government sector (39% of all jobs in the community), and the majority of earned income arose from these jobs (55% of total earned income). An estimated 68% of all households included at least one person employed in local government, or 50% of all individuals holding a job. Most of the local government jobs included those in the local public school, grades kindergarten through 12, as well as positions with the City of Scammon Bay and the Scammon Bay Traditional Council. Services resulted in 34% of all jobs and 32% of the total earned income for the community. An estimated 54% of all households included at least 1 person employed in the service industry, or 41% of all employed individuals. An estimated 26% of all jobs included positions in the following industries: federal government (7% of all jobs); retail trade (6%); agriculture, forestry, and fishing (4%); state government (3%); and transportation, communications, and utilities (3%). Employment in these industries provided 10% of all wages earned in Scammon Bay in 2013. Approximately 43% of households included at least 1 person employed in these industries, or 26% of all individuals holding a job.

Of the jobs reported by Scammon Bay respondents, 113 (46% of all jobs) were full-time positions, 70 (29%) were part-time, 53 (22%) were on-call or occasional employment, and 3 (1%) were shift positions (Table 3-29). An estimated 100 employed persons (55% of adults with jobs) held full-time positions, 58 employed persons (31%) worked part time, 44 persons (24%) held on-call positions, and 3 persons (2%) worked shift positions. Approximately 72 employed households (70% of households with at least one job) had at least 1 resident with a full-time position, 41 households (39%) included a resident with a part-time job, and 35 households (33%) included a resident with an on-call position. Out of a total of 339 adults residing in Scammon Bay in 2013, an estimated 187 persons held at least one job (55% of adult residents) (Table 3-30). On average, adults with jobs worked approximately 7.5 months per year. Of all employed adults, an estimated 33% worked year-round, and the average person worked 33 weeks in the year. Of 123 total households, an estimated 104 households included at least 1 resident with a job (84% of all households). The number of jobs held per employed household ranged from 1 to 8 with an average of 2 jobs per household, and an average of 2 adults with jobs in each household with employed residents. On average each household with employed adults experienced 42 person-weeks of employment.

Food Security

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

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

Researchers asked Scammon Bay respondents whether 10 statements regarding food security conditions were ever true for their households during 2013. These 10 food security conditions discussed in the survey and responses from Scammon Bay residents are summarized in Figure 3-30. The first condition listed in the figure indicates lowest level of food insecurity (i.e., "Worried about having enough food") and the last condition indicating the highest level of food insecurity (i.e., "Did not eat for a whole day"). Perhaps most notable among these responses was that 23% of Scammon Bay responding households reported that when considering both subsistence and store-bought sources together, their food did not last and they could not get more. Likely contributing to this condition, 26% of responding households reported that their

Table 3-29.–Reported job schedules, Scammon Bay, 2013.

Schedule	Jobs		Employed persons		Employed households	
	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	113.0	46.3%	100.3	54.5%	72.0	69.6%
Part-time	70.2	28.8%	57.8	31.4%	40.5	39.1%
Shift	3.1	1.3%	3.0	1.7%	3.0	2.9%
On-call (occasional)	53.4	21.9%	44.1	24.0%	34.5	33.3%
Part-time shift	0.0	0.0%	0.0	0.0%	0.0	0.0%
Schedule not reported	4.6	1.9%	4.6	2.5%	3.0	2.9%

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

Table 3-30.–Employment characteristics, Scammon Bay, 2013.

Characteristic	Community
	Scammon Bay
All adults	
Number	339.0
Mean weeks employed	18.0
Employed adults	
Number	187.0
Percentage	55.2%
Jobs	
Number	244.2
Mean	1.3
Minimum	1
Maximum	4
Months employed	
Mean	7.5
Minimum	0
Maximum	12
Percentage employed year-round	32.9%
Mean weeks employed	32.6
Households	
Number	123
Employed	
Number	103.5
Percentage	84.1%
Jobs per employed household	
Mean	2.0
Minimum	1
Maximum	8
Employed adults	
Mean	
Employed households	1.8
Total households	1.5
Minimum	1
Maximum	6
Mean person-weeks of employment	42.0

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

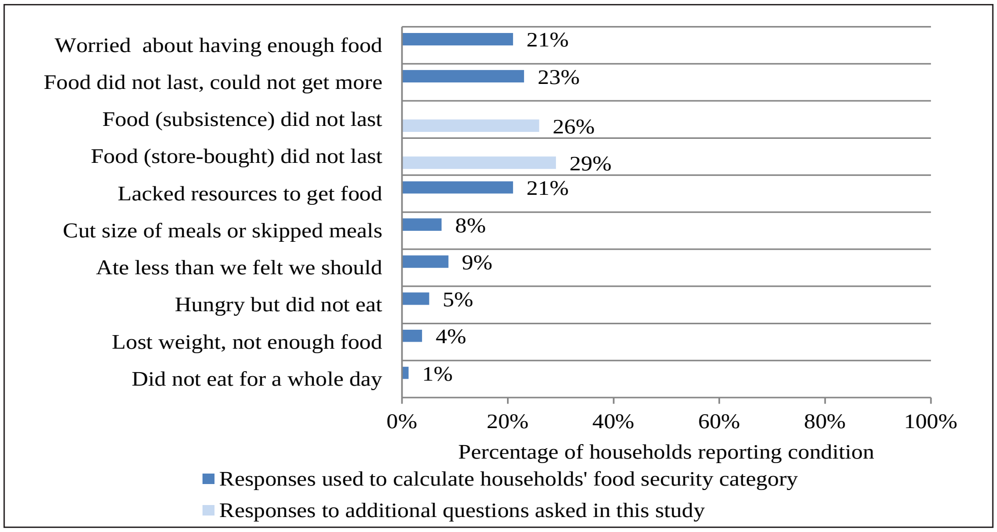


Figure 3-30.–Responses to questions about food insecure conditions, Scammon Bay, 2013.

subsistence foods did not last and 29% reported that their store-bought food did not last. Overall, 21% of responding households reported that they were worried about having enough food, and a similar portion (21%) reported that they lacked the resources to get the food they needed. Resources needed to get food could have represented a number of items, including equipment, fuel, hunting and fishing gear, money needed to obtain these resources, or money needed to purchase food. A smaller number of households also indicated high food insecurity conditions when they affirmed that their households experienced cutting the size of their meals (8% of responding households), eating less than they felt they should (9%), going hungry (5%), losing weight (4%), and not eating for a whole day (1%). Each of these conditions existed due to a lack of food in the household or a lack of resources needed to get food.

During 2013, 85% of Scammon Bay households were classified in the high or marginal food security category (Figure 3-31). Of the remaining households, 11% were categorized as low food security, and 4% as very low food security. In comparison during the years 2011 through 2013, 88% of Alaska households and 86% of U.S. households were classified as having experienced high and marginal food security conditions. Based upon these survey responses, it is apparent that in 2013 Scammon Bay households on average experienced high food security conditions at a rate similar to other households throughout Alaska and the U.S. This was also the case for households reporting low—7% in Alaska and 9% in the U.S.—and very low food security conditions—5% in Alaska and 6% in the U.S.; however, because these percentages are relatively close in value, further analysis would be necessary to determine whether there existed a statistically significant difference between reported food insecurity conditions in Scammon Bay as compared to households elsewhere in Alaska and the nation.

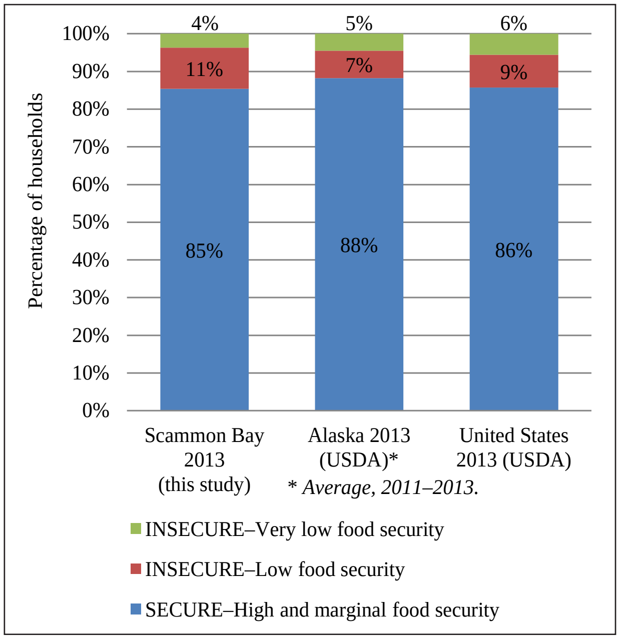


Figure 3-31.–Food security categories, Scammon Bay, 2013.

For each of the food insecurity conditions that were true for their households, respondents were also asked to state during which months these conditions

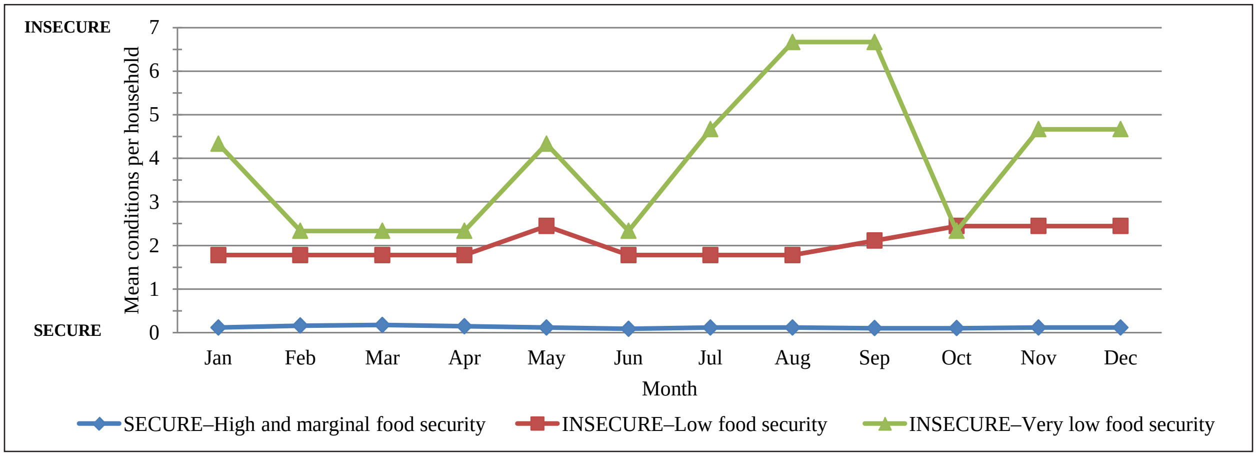


Figure 3-32.–Mean number of food insecure conditions by month and by household security category, Scammon Bay, 2013.

existed. Figure 3-32 portrays the mean number of food insecure conditions reported per household by food security category each month in 2013. Households experiencing high and marginal food security reported essentially no instances of food insecure conditions throughout the year. Households in the low food security category experienced on average 1.8 to 2.4 food insecurity conditions each month, with little or no difference among months. Households reporting very low food security conditions indicated an experience that was much more variable throughout the year as compared to other households. The highest levels of food insecurity conditions for these households occurred in August and September, possibly due to limitations in the supply of salmon as a result of restrictions on salmon fishing. These conditions decreased in October, possibly due to the large supply of moose in the community following the fall hunting season. Other months during which households reported the highest food insecurity conditions included January, November, and December, 2013, as well as May and July. Higher food insecurity in colder months could be related to depletion of summer food stores, lack of transportation such as a snowmachine, and increased household spending on utilities such as heating fuel and electricity, as well as gasoline used to harvest firewood.

Figure 3-33 shows the months during which households experienced foods not lasting. Responses referred to subsistence foods, store-bought foods, and both subsistence and store-bought foods together. More households reported that subsistence foods did not last in the months of January through May, as well as during September. Store-bought foods were more likely not to have lasted throughout the year for households experiencing low and very low food security conditions, with that rate at its highest in November and December of 2013.

Sharing of Wild Resources

Household Specialization in Resource Harvesting

Previous studies (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 3-34, in the 2013 study year in Scammon Bay, about 69% of wild resources as estimated in usable pounds were harvested by 33% 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 Scammon Bay and the other study communities.

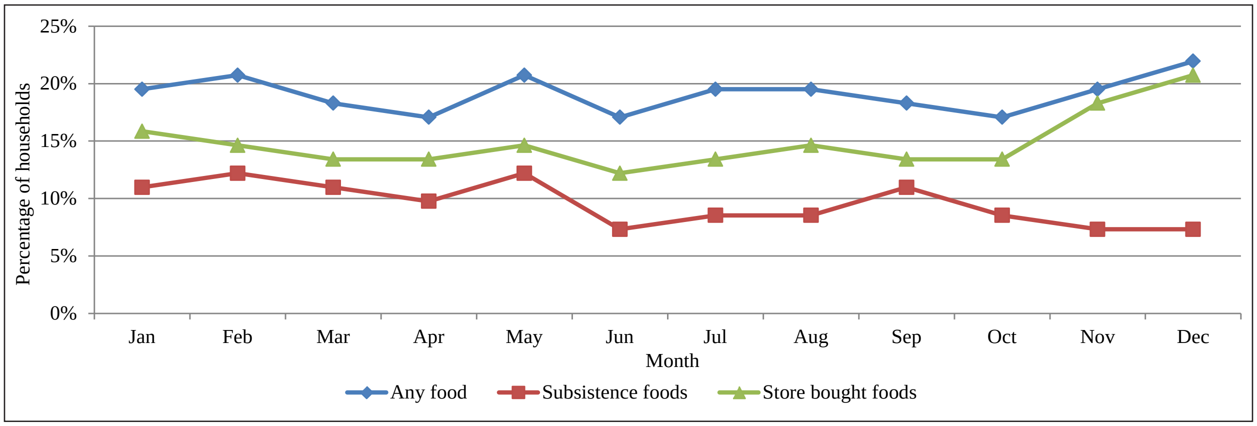


Figure 3-33.–Comparison of months when subsistence, store-bought, and any foods did not last, Scammon Bay, 2013.

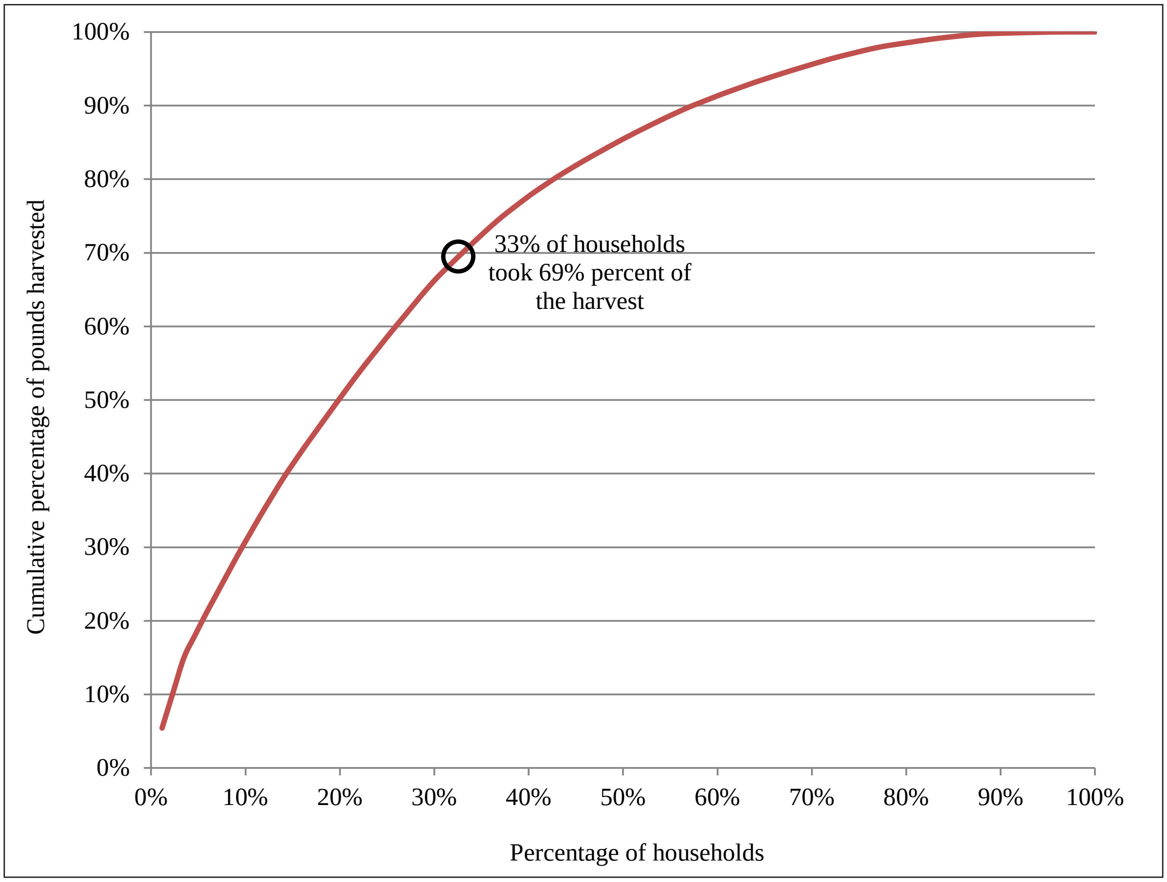


Figure 3-34.–Household harvest specialization, Scammon Bay, 2013.

Wild Food Networks

While subsistence harvest surveys collect information based on individual households, in reality, a portion of the production (harvest and processing) of subsistence foods is achieved by households within a community that work cooperatively. This cooperation is often organized based on kinship; however, partnerships will also occur among peers, friends, or elder mentors and their young apprentices. The organization of the contemporary mixed market–subsistence economies that are predominant in rural Alaska communities has been documented ethnographically by numerous researchers.

Cooperation in the production of foods does not completely characterize the nature of the sharing of wild foods and processing time in Alaska communities. Subsistence foods are widely distributed among households within a community through sharing, barter, and trade (Charnley 1984; Kari 1983; Lonner 1980; Magdanz and Wolfe 1988; Magdanz 1988; Magdanz et al. 2007; Moncrieff 2007; Pete 1991; Schroeder et al. 1987; Stickney 1984; Wolfe et al. 1993).

Figure 3-35 shows the flow of wild foods into surveyed households from other Scammon Bay households and communities in Alaska. Symbol shapes depict the type of household; colors show the age of heads of household, and size indicates the amount of its subsistence harvest in 2013 by edible weight. Arrows show the direction of food from one household to another, with the width of lines showing the number of resources. The position of a household relative to the center of the figure shows the number of sharing connections it had with other households in Scammon Bay, with the centermost households depicting the largest number of connections. The figure is a partial representation of sharing, trade, and barter in 2013 because it only documents the food flows into the 86 surveyed households.[22]

Previous studies have found a positive association between the ages of household heads and the amount of subsistence foods harvested. Household characteristics associated with higher food production include those households with multiple working-age males, involvement with commercial fishing, and higher wage incomes. Characteristics common to lower producing households included female household heads, age of elders, non-Native household heads, and single-person households (Magdanz et al. 2009; Wolfe et al. 2010). Household "developmental cycles" (i.e., the relative age or "maturity" of household heads and number of productive household members) have also been associated with harvests.

Responses to survey questions about sharing of subsistence resources among households indicated that the average Scammon Bay household experienced approximately 7 instances of inputs of wild foods from sharing, including sharing of wild foods and processing effort. While 2 households described no instances of sharing in 2013, the greatest degree of sharing reported was 44 instances by at least one household. The households depicted in proximity to the center of Figure 3-35 show a variety of characteristics; however, the majority of them were headed by couples, including 1 moderately high harvesting household headed by a couple under the age of 40 years. Other households situated toward the center of the figure were moderate to low harvesting couples of all age classes. Some centrally-located households were not headed by couples, including at least 2 headed by single females: one 40 to 59 years of age, and another 59 years of age or older. One low harvesting household headed by a single male 40 to 59 years of age is also centrally located. This indicates that low to moderately harvesting households had many sharing connections with other households, perhaps as a result of their need for resources as perceived by other households. It is also possible that some of these households shared their resources with others, despite their relatively low wild food production.

The highest harvesting household, headed by a couple under the age of 40 years, is situated relatively close to the center, suggesting that this household shared resources with many other households. Other high harvesting households are situated away from the center of the figure; the majority of these were headed by couples aged 40 to 59 years, and a small number were headed by young couples. Although previous research suggests that the highest harvesting households with the largest number of sharing ties tend to be headed by middle-aged couples, there are certainly exceptions to this theory. A typical household headed by

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

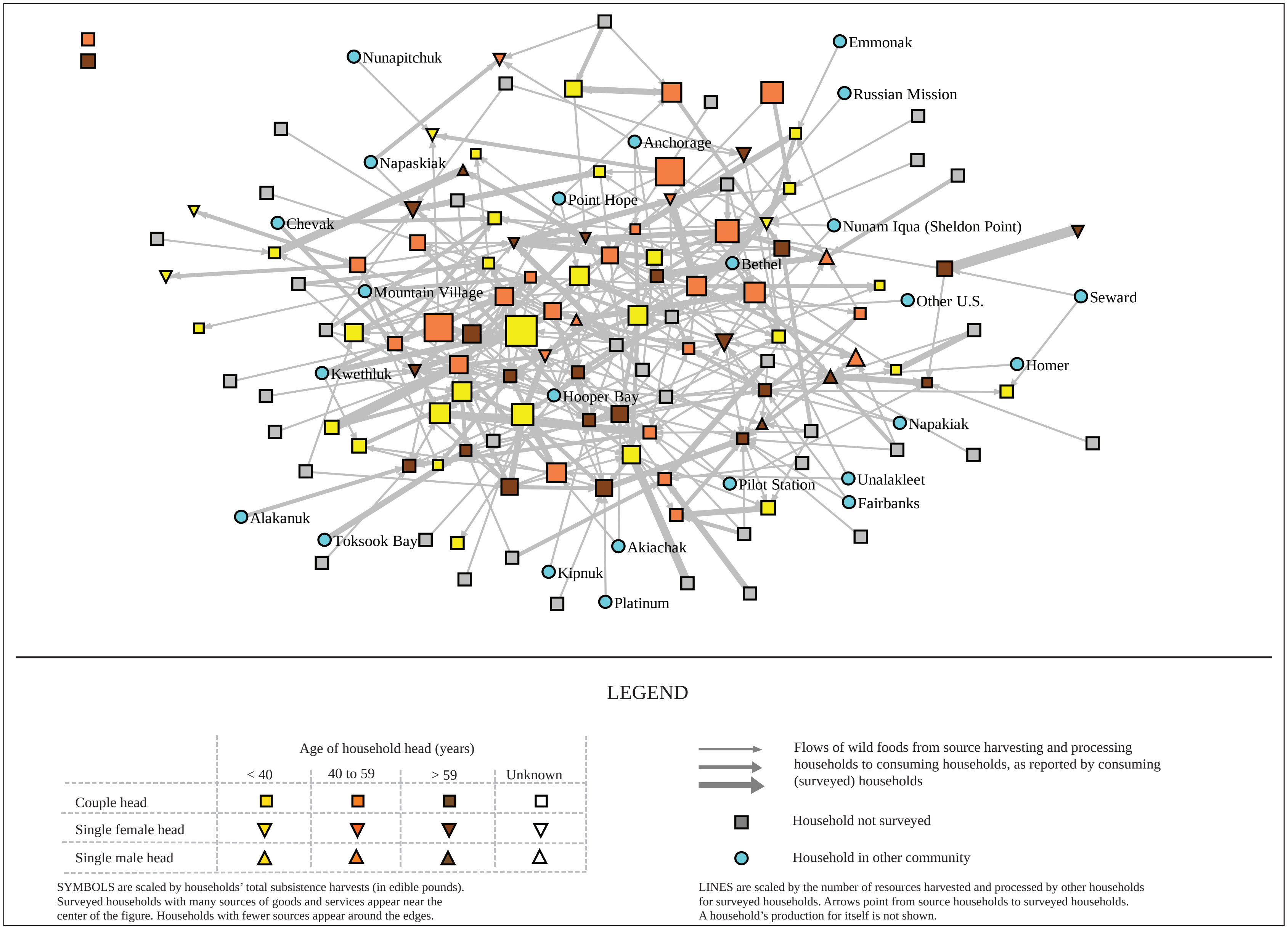


Figure 3-35.–Wild food harvesting and processing network, Scammon Bay, 2013.

a young couple may be described as inexperienced and relatively lacking in cash and equipment; however, in Scammon Bay there are a small number of households headed by young couples with lifelong experience and advanced skills and abilities in hunting, fishing, and gathering, thus potentially explaining their high harvest amounts.

Despite these apparent patterns depicted in the figure, it also shows that the middle-aged and elder households tend to be slightly more concentrated around the center than do young households. Many young households are located at the margin of the figure, likely due to their low harvest levels as well as their recent entry into the subsistence and cash economies of Scammon Bay. Also located at the periphery are a number of outside communities with which Scammon Bay households had sharing connections in 2013. Most of these communities are located in the Yukon-Kuskokwim Delta region; however, households also shared with relatives and friends in urban communities such as Anchorage, Fairbanks, Seward, and Homer. Communities closer to the center included Hooper Bay, Bethel, and Mountain Village: nearby communities with which many Scammon Bay households have kinship ties. Multiple family connections to these 3 Yukon-Kuskokwim Delta communities would explain their proximity to the center of the figure; however, the Iñupiaq communities of Point Hope and Unalakleet are also present in the figure, showing that a number of households reported ties to distant communities well outside of the typical social and cultural circle of most Scammon Bay households. Bethel was the outside community with the highest degree of sharing with Scammon Bay: respondents reported 28 instances of sharing with households in Bethel. Scammon Bay respondents also reported 17 instances of sharing with Hooper Bay households, 16 with Kwethluk households, and 11 with Mountain Village households. Communities with a moderate degree of sharing with Scammon Bay in 2013 were Chevak, Toksook Bay, Point Hope, Anchorage, Napaskiak, Nunam Iqua, and Pilot Station.

In addition to the specific sharing patterns depicted in Figure 3-35, key respondents described the importance of sharing in general terms for residents of the community. One key respondent described the practice of distributing Chinook salmon to many households when the first one of the season is caught. She stated that, "When the king salmon first comes…we always cut it up and give everyone in the family their share" (02172014SCM05). Another key respondent also discussed the extensive amount of sharing of moose and caribou. He explained, "I always give [caribou and moose] to my mom. I give to my in-laws too. We have to give" (02182014SCM07). This sentiment was widely shared not only in regard to specific resources or seasons, but in regard to all resources in general. Another key respondent described the general practice of sharing when he said, "If you got too much you share it with your relatives. They don't want for anything. We don't throw food away…When we have too much we share it. We give half of it to our relatives" (02162014SCM04). This practice of sharing is regarded as an essential part of the daily lives of hunters, fishers, and their families. Key respondents expressed this obligation as central to their life experiences. Another key respondent related these experiences of sharing food as important life lessons in his youth that directly affected his ability to be a successful hunter and fisherman. He explained,

> I'm thankful that I was taught by my mother to take care of the elderly. That's where my knowledge came from. Just by continuously visiting the elders and feeding them… But I would share with elders [when I was young] and I used to expect something in return. And when I [left] with nothing I'd be kind of sad. And my mom would say, "Don't worry. It will come back [to you]." So as I got older, as I continued hunting… [the animals] were always available, just easy because [we shared]. And I'd catch…more than what our house would need. We'd take enough for our household and I'd take the rest and spread it out…We don't hunt for ourselves. We think of the widows and people who don't have snowmachines or boats or motors. Those are the people who we try to help and feed. (02172014SCM09)

This key respondent's reflections clearly demonstrate the integration of sharing with activities of hunting, fishing, and gathering, and how community members use wild food resources as a means of support for each other.

Local Comments and Concerns

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

Thirty-three respondents out of a sample of 87 households provided some comment at the completion of their surveys. The majority of comments from surveys discussed concerns regarding the status of salmon stocks and salmon fishing. These respondents primarily discussed subsistence salmon fishing restrictions during the Chinook salmon fishing season. Fourteen respondents stated their desire for ADF&G to provide additional opportunities for subsistence fishermen to harvest Chinook salmon. One respondent specifically asked that fishery managers schedule subsistence salmon fishing openings in the Coastal District of the Yukon River around the slack tides when set gillnets are effective in catching salmon. Around the tidal extremes along the coast, set gillnets are unable to catch salmon due to the depth of the water and the high tidal flow rates (02052016SCM10). Another respondent also expressed his concern as a commercial fisherman that legal commercial gear types had shifted from larger mesh gillnets to smaller mesh gillnets and dipnets, and that this was an expensive burden for commercial fishers to bear. A small number of respondents also described general concerns regarding the decreasing abundance of salmon stocks, and related this decline to global climate change, perceived unsatisfactory salmon fishery management, and excessive bycatch in at-sea trawler fisheries.

Several survey respondents shared comments regarding the mine that Donlin Gold, LLC has proposed for development in the Kuskokwim River drainage near the community of Crooked Creek. Five respondents expressed concern that this gold mine could potentially cause damage to subsistence resources of the region and negatively affect hunting and fishing activities in the area. Two respondents felt that development of the mine would benefit community residents by increasing employment opportunities in the region and by raising profits for Calista, Inc.[23], the Alaska Native Regional Corporation that holds mineral rights to land that has been proposed for mining operations by Donlin Gold, LLC. Additional survey comments included concerns over the high cost of living for Scammon Bay residents and its prohibitive effect on access to subsistence resources, opinions that harvest surveys and ethnographic research are beneficial for the community and will assist with resource management, and that sharing subsistence resources is a common practice and an essential part of life in Scammon Bay and the economy of the region.

The majority of key respondent interviews included discussions related to the principal species of subsistence harvest as well as the methods and seasons of harvest. In addition, interview subjects often described family histories as they related to subsistence activities. Some key respondents expressed concerns regarding changes in resource availability and limited access to salmon as an effect of fishery management. One key respondent shared an alternative point of view regarding the possibility of over-harvest due to changes in technology and population.

> One thing that I have noticed over the years is with technology we have become more efficient. It used to take a whole summer for us to gather enough salmon to sustain us for the winter. Now we can do that in a few days. [We've got] longer nets, better nets, and monofilament so fish can't see the nets at all…When I was younger it took a week to get a hundred chums. Now we can get that in a tide, less than a tide. The other thing is, the more people we have, the bigger the population, the more access [we have] to resources. I think we are putting a lot of strain on the resource, and we are doing it more efficiently. (02182014SCM01)

Other comments discussed by Scammon Bay key respondents regarded the importance of sharing knowledge and experience with young people and children. Many key respondents spoke fondly of teaching youth

23. Many residents of Scammon Bay are corporate shareholders of Calista, Inc.

about family and community traditions related to hunting, fishing, and gathering wild foods. One key respondent expressed his desire to teach young people about moose hunting and the importance of teaching proper hunting behavior.

> There's a lot of kids in this village that don't have the privilege that [some other] kids have. I bring my boys out since they were able to go. And I've taught them how to hunt, and what to do, and what not to do. You know I went moose-hunting with, um, 13 and 12 year-old boys. Those were my boys. That was my hunting party. I did all the carrying. The experience is priceless. You teach them how to hunt, how to shoot, how to cut, how to be organized. You have to be really organized when you're moose-hunting. You can't just cut up the meat and let it get all dirty. Just keep it clean and keep track of your trash. That's what I was taught growing up—to always keep track of your trash. Because whatever nature gives, you can't treat it disrespectfully. (02172014SCM09)

Another key respondent related a story that demonstrated what he learned from his father about being aware of your needs before killing an animal.

> Once when I was young my friend [asked me to go walrus hunting]. I went home and started getting my stuff ready and my dad asked me, "Where are you going?" I told him, "I'm going walrus hunting." He just said, "Ah, okay." Then I was heading out the door and my dad stops me. He goes, "If you are not gonna bring the whole walrus home, don't shoot one." And I didn't think anything about it, you know…I just went and got there and I saw a walrus on the ice. And we had a small, 16-foot boat. And I saw the walrus and I started talking to myself, "There is no way I'm gonna bring that whole thing in, that whole walrus home." And we didn't shoot it. That's the true meaning of subsistence. You only get what you need, and what you're gonna bring home. You don't [waste] anything. (02182014SCM01)

Several survey respondents and ethnographic interview subjects also described the struggle to maintain wild food harvests despite significant challenges that face residents of rural Alaska communities and the effects that these challenges might have on their ability to get the food they need.

> As long as the resource is there…I think subsistence will continue. But not to the degree that it has been practiced. I'm already seeing changes. I think a lot of [this is due to] the price of fuel and all the rules and regulations now that we have to live by. I think people in Scammon Bay are very good, law-abiding citizens. We'd rather conserve than not have something for kids, my son, to practice…If I don't get a moose—I didn't shoot a moose this year, my boy did last fall. But if he didn't get a moose last fall, we'd be living off the store. We would be stretching our money. We would really have to stretch it. So, subsistence is important. It'll always be important. I think it'll always be practiced, but not to the same degree that my dad used to, and not even to the same degree that I'm using it now. (02182014SCM01)

Information recorded by Division of Subsistence surveys and interviews in Scammon Bay indicates that most residents of the community are currently actively engaged in the harvest and use of many wild food resources available throughout the Yukon-Kuskokwim Delta region and its Bering Sea coast. As demonstrated by Scammon Bay key respondents, the harvest of wild foods represents an essential aspect of the sustenance and cultural heritage of the community. However, residents also expressed their concern that environmental changes and more restrictive resource management decisions might hinder their ability to access the wild foods that they need for subsistence.

Acknowledgements

The Division of Subsistence would like to acknowledge the contributions of all of the residents of Scammon Bay who participated in our surveys and ethnographic interviews. We could not have achieved our research goals without their generous cooperation. We would also like to express our sincere gratitude to the Scammon Bay Traditional Council. The project's success directly depended upon the traditional council's approval of our research prior to arrival in their community, as well as their support and assistance during fieldwork. The division would also like to thank the staff of the traditional council whose considerable time and assistance division researchers needed to accomplish their work. In particular we would like to express our gratitude for the help of Brandon Aguchak, Scammon Bay Traditional Council Tribal Administrator. We also acknowledge the dedication and reliability of the diligent local research assistants who guided division staff and conducted all harvest surveys with them in the field. These local research assistants were Crystal Akerelrea, Jason Akerelrea, Alice Kaganak, June Kaganak, Yvonne Kasayuli, Tashiana Long, and Evelyn Ulak. The Blessed Sacrament Roman Catholic Parish and Rev. Gregg Wood, S.J. graciously provided lodging for division staff in the field.

Plate 4-1.–Quinhagak in April 2014. The school complex can be seen on the far right.

4. QUINHAGAK

Lisa J. Slayton

In April 2014, ADF&G researchers conducted a subsistence survey with 109 of 162 households (67%) in the Yup'ik community of Quinhagak (*Kuinerraq*). This chapter summarizes findings from the household surveys including demographic characteristics, harvest estimates, responses to harvest assessment questions, and income and employment estimates, as well as food security results for 2013. Results from this survey are available online in the Division of Subsistence Community Subsistence Information System (CSIS).[1] Seven ethnographic interviews with Quinhagak respondents provide context for the data presented in this chapter.

In addition to other relevant literature, this chapter will utilize and build on an ADF&G Division of Subsistence baseline survey (Wolfe et al. 1984), a traditional ecological knowledge (TEK) study of contemporary ecosystems and fish populations in the Kuskokwim Bay region (La Vine et al. 2007), and the 2013 monograph on Quinhagak history and oral traditions (Rearden and Fienup-Riordan 2013).

Community Background

Quinhagak, whose Central Yup'ik name *Kuinerraq* (shortened from *Kuingnerraq*) means "newly-formed river," is a long-established Alaska Native site predating historic contact (Rearden and Fienup-Riordan 2013). Quinhagak is located at the mouth of the Kanektok (*Qanirtuuq*) River on the south shore of Kuskokwim Bay, less than 1 mile from the Bering Sea coast.[2] It lies within the Togiak National Wildlife Refuge 71 miles southwest of Bethel, the regional hub.

Quinhagak is located in a marine climate. Summer temperatures average 41˚F to 57˚F, and winter temperatures average 6˚F to 24˚F.[3] Extremes in temperatures have been recorded from 82˚F to -34˚F. Precipitation averages 22 inches a year with 43 inches of snowfall. When ADF&G researchers visited in April 2014, the weather was mild, the rivers were still mostly frozen (thick enough to safely jig for fish under the ice), and small patches of snow were visible on the tundra behind the community (Plate 4-1).

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

2. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed November 12, 2015. http://commerce.alaska.gov/dcra/DCRAExternal/community. Hereafter referred to as ADCCED n.d.

3. ADCCED n.d.

Yup'ik people have lived in the vicinity of modern-day Quinhagak and along the Kanektok and Arolik rivers for millennia (Rearden and Fienup-Riordan 2013). During an archaeological survey of southwestern Alaska in the early 1980s, numerous prehistoric sites such as lookouts, hunting camps, and stone fences for driving caribou toward harvest areas along the upper Kanektok River and around Kagati Lake (the source for the Kanektok River) were discovered. Analysis of artifacts from these sites indicates thousands of years of human use (Ackerman 1985).

The origin of the community of Quinhagak has been dated to around AD 1000.[4] Recent and ongoing archaeological excavations at *Nunalleq* ("Old Village"), 4 miles south of Quinhagak near the mouth of the Arolik River (and along an old channel of the Arolik River), have produced thousands of artifacts dating back 700 years. This previously frozen and recently thawed site contains the remains of several sod houses and a large *qasgi* (men's house or community house; Rearden and Fienup-Riordan 2013). During the 2010 excavation season, archaeologists uncovered the charred remains of burned homes (timbers) which were radiocarbon dated to around AD 1650. Several projectile points (i.e., arrow points) were recovered from the burnt roof level, as well.[5] These new discoveries may substantiate the long-known local oral history of the destruction (i.e., burning) of a village near the Arolik ("ashes") River by Kinak warriors during the Bow and Arrow Wars in the mid-17th century, prior to Euroamerican contact (Rearden and Fienup-Riordan 2013).

Information about past subsistence activities has also come to light during the Nunalleq excavations. Stable isotope analysis on human hair samples found at the site shows that the occupants of the community consumed salmon and caribou year-round, similar to their contemporary descendants in Quinhagak and the surrounding area (Britton et al. 2013). Excavation of this site is an ongoing collaborative effort between archaeologists and Quinhagak residents (particularly students from the local school); it could potentially lead to evidence of even earlier human occupation and additional information about the lifeways and subsistence pursuits of the past occupants.

Although Quinhagak (recorded as "Koingak") was first recorded by Admiral Gavril Sarichev, a Russian navigator and hydrographer, on a costal map in 1826, it was known to Russian explorers a few years earlier. Petr Korsakovskiy, a Russian explorer for the Russian-American Company, gave a brief description of both the location of the community and the appearance and material culture of its inhabitants in his travel journal of southwest Alaska in 1818 (Korsakovskiy and Vasilev 1988:46–47). He describes their clothing as being made of caribou, beaver, fox, marten, and wolf skins; and he writes that their weapons, which included knives, spears, bows, and arrows, were made primarily of wood with some iron and copper. Korsakovskiy further reported: "They make their seines and fish lines from the sinews of bearded seals and beluga. They make their pots out of clay and their dishes of wood" (Korsakovskiy and Vasilev 1988:72). This brief description is the earliest by a Russian explorer of the Kusquqvagmiuts of the Kuskokwim area in general.

In 1893, Moravian missionaries from the Bethel mission established the first church in Quinhagak. By the following year, a new church building had been built, a community garden established, and a school constructed (Rearden and Fienup-Riordan 2013). By the turn of the 20th century, Quinhagak was thriving and continuing to grow. The mission opened a small store in 1904, and a post office was established in 1905.[6]

Between 1906 and 1909, the federal government imported 2,000 reindeer to Quinhagak in order to both provide food in times of scarcity and to involve the Quinhagak people in commerce by selling reindeer skins and meat (Rearden and Fienup-Riordan 2013; Wolfe et al. 1984). However, by the mid-1940s, most of the herd had dispersed or been killed by predators as local interest in herding waned. By 1950, reindeer herding had effectively ended in the area (Rearden and Fienup-Riordan 2013).

In the mid-1950s, some Quinhagak residents began small-scale commercial salmon fishing at the mouths of the Kanektok and Arolik rivers (Rearden and Fienup-Riordan 2013). When a commercial market for

4. ADCCED n.d.

5. Knecht, R., K. Britton, C. Hillerdal, A. Jorge, E. McManus, V. Forbes, M. Raghavan, E. Willerslev, R.S. Davis, and W. Jones. In press. *"Nunalleq": A well-preserved early Yu'pik Eskimo village site in the Yukon-Kuskokwim Delta.* Antiquity.

6. ADCCED n.d.

Plate 4-2.–Quinhagak children ice fishing on the Kanektok River near the wind farm.

chum salmon was established in 1969, commercial catches of Kuskokwim River salmon surpassed subsistence catches for the first time.

The community of Quinhagak was incorporated in 1975. Municipal facilities, utilities, and services include a water treatment plant, city dock, water haul, trash and sewer haul, and landfill. The community is not accessible by road. However, a state-owned gravel airstrip enables air transportation, passenger mail, and cargo service, and a harbor and dock serves the biannual barge deliveries of heavy goods. Bethel, the regional hub, is a 45-minute flight from the community. In addition, float planes land on the Kanektok River, and boats, all-terrain vehicles, snowmachines, dog teams, and some trucks and cars are used for local transportation. Major winter trails are marked to Eek (39 miles) and Goodnews (39 miles). Quinhagak has a post office, clinic, store, a wind farm with 3 working windmills (Plate 4-2), and the Kuinerramiut Elitnaurviat School, which serves students in grades kindergarten through 12. The community is managed by the City of Quinhagak and the Native Village of Kwinhagak.[7]

Seasonal Round

> There's always a season. There's a cycle. There's a cycle for the berries, and then when the berries are done, there's a cycle for birds that are just coming out. We've got to do that then. Then the caribous are coming. There's a cycle, a cycle, it does not stop. The cycle of life. Our hunting, our gathering, and just our subsistence way of life. (041514KWN1)

Situated between the Kanektok and Arolik rivers and fronted by the sand and gravel beaches and the mudflats of the Kuskokwim Bay, Quinhagak has a variety of marine and freshwater resources available for residents to harvest. Five species of salmon—Chinook, chum, coho, sockeye, and pink salmon—occur throughout the area's waterways. In addition, a variety of nonsalmon fish including rainbow trout, Dolly Varden, lake trout, Arctic char, Arctic grayling, burbot, northern pike, Alaska blackfish, and smelts are available. Least cisco, round whitefish, and pygmy whitefish are present as well. Other whitefish species, including sheefish, are less prevalent. Residents also have access to marine fish species such as Pacific halibut, Pacific herring, yellowfin sole, starry flounder, and 3 types of cod: Pacific tomcod, Pacific cod, and saffron cod (Rearden and Fienup-Riordan 2013). Marine mammals such as seasonally migrating walrus, ringed seal, spotted seal, bearded seal, and the less-frequent ribbon seal and beluga whale are available. Sea lions are present farther down the coast towards Goodnews Bay. To the east and south of Quinhagak, a coastal plain of lowland, lake-dotted tundra consisting primarily of mosses, sedges, lichens, grasses, and berries stretches toward the rugged Ahklun Mountains (20–30 miles distant) and provides an abundance of terrestrial subsistence resources. Willows, cottonwood, and alders are found on the coastal plain. Mixed spruce, birch, and aspen forests are found closer to the mountains behind the community. Subsistence resources in the upriver

7. ADCCED n.d.

areas include moose, bears, beavers, foxes, hares, river otters, mink, ptarmigans, lynx, and wolves. In the more mountainous areas, there are marmots, feral reindeer, caribou, porcupines, and Arctic ground (parka) squirrels. Cranes, swans, ducks, geese, and other migratory waterfowl pass through the area during the spring and fall. Several bird species summer along the coast (Wolfe et al. 1984).

Rearden and Fienup-Riordan (2013) describe the seasonal round for Quinhagak residents in the mid-1900s. During that time, people traveled between spring, summer, and winter camps. In spring, subsistence activities focused on hunting for birds, trapping muskrats, and ocean hunting for bearded and ringed seals. Beluga whale was also available at this time of the year if the weather and ice conditions were right. At the end of April, families moved to the mountains to their squirrel camps to hunt Arctic ground squirrels (locally known as parka squirrels) and caribou. At the end of May, families moved back to their summer fish camps along the Kanektok River to prepare for the salmon runs, which lasted all summer. In the fall, starting in late August, families primarily fished for nonsalmon fish species and picked berries. In September and October, men would hunt the upper Kanektok River for bears, caribou, birds, beavers, and moose. In winter, men hunted and trapped small game and fur-bearing mammals such as foxes, mink, and river otters. Trapping these animals for their fur provided much-needed cash income and remained productive into the 1930s.Throughout the winter and into spring, people jigged for trout species and other nonsalmon fish species. Fishing and wood gathering occurred year-round. By the mid-1950s, residents had begun commercial salmon fishing at the mouths of the Kanektok and Arolik rivers in late spring (Rearden and Fienup-Riordan 2013). Commercial fishing shifted activities more toward the coast and provided a means to obtain cash for the purchase of subsistence hunting and fishing gear.

The contemporary seasonal round generally follows the same seasonal pattern as in the distant and recent past in regards to the types of resources available and the general times of the year of their availability. However, residence patterns and technological advancements in gear have changed the ways in which people conduct their subsistence activities. According to La Vine et al. (2007:27),

> The annual subsistence harvest of fish in the area has followed an unchanging pattern of harvest sequencing since the 1920s. Harvest technology, preservation, and processing methods, and harvest quantities have changed, but in general, most fish species eaten 80 years ago are still harvested and eaten today.

Quinhagak residents no longer move their entire households between seasonal camps following the seasonal movements of resources as they did in prehistoric times, or even to the degree that they did 20 years ago. People today reside in the community year-round, with short stays at their fish camps during the summer months and short trips to the mountains to search for land mammals. In addition, squirrel camps are still used to some extent, although not as much as they were in the past. Historically, the Arctic ground (parka) squirrel was a very important furbearer: its fur was a major trade item. Families established squirrel camps in the foothills and mountain valleys specifically for the search and harvest of "parka squirrels." Women prized the skins for making parkas, which were considered "valuable prestige items" (Wolfe et al. 1984:320). Advances in gear, such as boats with motors and snowmachines, have greatly increased the ability of residents to remain in their permanent homes rather than move throughout the landscape for extended lengths of time in search of resources. As one 2013 study respondent below notes, even major changes can occur within 1 generation:

> Camping out is something that people used to do in the past, yeah, in the 90s. Yeah, that was my generation. You would go out camping for 5 to 7 days at a time. Yeah, they don't do that very often. Yeah, the trend nowadays is uh, young guy gets on his snowmachine, maybe 12-ish [around 12:00 pm], yeah, he's out covering a lot of miles and he's back just after dark. (041514KWN3)

Despite no longer traveling between seasonal camps, Quinhagak residents continue to engage in subsistence activities on a year-round basis, as is demonstrated in the following case study of one Quinhagak resident. One active subsistence harvester and commercial fisherman described his annual seasonal round as beginning in the spring. In March and April 2013, he was searching for and harvesting seals, walruses, trouts, smelts, and ptarmigans. He stated, “We get trout before breakup. But afterwards, we don’t usually gather [harvest] trout until July. But smelt, the smelt hit, the big run hit on June, so we don’t quit gathering smelt with dip nets until mid-June” (041415KWN5). This respondent also described other springtime subsistence activities. He stated that he usually harvests around 300 ptarmigans as they travel down from the mountains in spring. When the migrating waterfowl appear, he searches for and harvests this resource in conjunction with gathering greens. He noted, “So yeah, birds—they are on their way here, I can see some now, so birds, and that’s when we go to lakes and collect those greens [Pallas buttercups]” (041415KWN5). In spring, he targets white-fronted goose, king eider, scoters, swans, and cranes. Near the end of May, he gathers bird eggs. The majority of eggs he gathered in 2013 were gull, goose, duck, and swan eggs. During the first week of June, he fishes for Pacific halibut before the salmon arrive. Between fishing for halibut and salmon, he harvests Pacific herring. He stated, “Yeah, usually my dad will [harvest herring with a net], me and my dad will go out and, the herring we get, we—my dad just takes the eggs. Yeah, he just takes the eggs and we save the, what we didn’t eat for halibut [bait] (041415KWN5).

Although subsistence fishers harvest salmon from all the various summer salmon runs (Chinook, chum, sockeye and then coho salmon), this respondent fishes commercially, but retains his incidental catch for subsistence uses.

> I commercial fished all summer [in 2012], so during July we start getting a lot of bycatch [incidental harvest], and instead of throwing it out, I bring mine home, and I also get my cousins and friends to give me theirs, so they won’t throw them out. So, on average, per day, I probably bring home about 40 char. (041415KWN5)

In regards to salmon, he said, “Yeah, yeah, I fish for my family to make dry fish, but I usually rod and reel for the big kings for the freezer. That’s usually easier to get big kings that way” (041415KWN5). Also in July, he and his family began to pick berries, in particular cloudberries (locally known as salmonberries). During the first week of August, his attention turned to the harvest of coho salmon (locally known as silver salmon). After fishing for coho salmon, he went to Warehouse Creek and to Eek Lake to fish for sheefish and other whitefishes from the middle of August to early September, when he also began his search for bearded seals. He stated, “They start coming up into the creeks, I think they, I’m not sure if they go, the elders say they [seals] go up and eat berries. But, there is a lot of fish in the creek, so they are coming. It’s a lot easier to get them in creeks than it is in the ocean” (041415KWN5). September is also the start of the fall migration of waterfowl, and like other residents in Quinhagak, the respondent tried to harvest enough birds to put some in the freezer for winter. He said that fall is also the only time that ribbon seals are seen along the coast near Quinhagak, although he noted that these are fewer in number than in the past. Moose and caribou hunting also began in September: “We get plenty of moose. We try to get 2 of them for my house. So me and my dad usually, we try to get 2 of them. And as many caribou [from the Mulchatna caribou herd] as we can get” (041415KWN5). In November, he targeted nonsalmon fish along with ptarmigans, caribou, and small land mammals. During late winter, he continued to search for and harvest small land mammals and caribou. The respondent harvested marine mammals throughout the fall and winter.

Population and Demographics

Table 4-1 provides the sample achievement for the community of Quinhagak. Expanding for unsurveyed households, Quinhagak’s estimated population was 733 people and included 372 women and 361 men (tables 4-1 and 4-2). Based on self-identification, an estimated 727 (99%) were Alaska Native (Table 4-3). Household size ranged from 1 to 11 people, with an average of 5 people per household (Table 4-4). The average age was 28 years, and the oldest person was 88 years old. Figure 4-1 shows that although Quinhagak has a good mix of age groups, younger community members are more prevalent.

Survey respondents who were heads of households were asked to identify their birthplaces (where their parents were living when the respondent was born), and the majority (82%) reported that their birthplace was Quinhagak (Table 4-5). Other heads of households reported Eek (3%), Kwethluk (2%), and other nearby coastal or near-coastal communities. Two percent (2%) reported other U.S. locations, and less than 1% reported that Bethel was their place of birth. The places of birth for the entire population were similar

Table 4-1.–Sample achievement, Quinhagak, 2013.

Sample information	Quinhagak
Number of dwelling units	165
Survey goal	70%
Households surveyed	109
Households failed to be contacted	13
Households declined to be surveyed	23
Households moved or occupied by nonresident	4
Total households attempted to be surveyed	132
Refusal rate	17.4%
Final estimate of permanent households	162
Percentage of total households surveyed	67.3%
Survey weighting factor	1.5
Sampled population	493
Estimated population	732.7

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

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

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	32.7	9.1%	9.1%	37.2	10.0%	10.0%	69.9	9.5%	9.5%
5–9	43.1	11.9%	21.0%	41.6	11.2%	21.2%	84.7	11.6%	21.1%
10–14	32.7	9.1%	30.0%	53.5	14.4%	35.6%	86.2	11.8%	32.9%
15–19	31.2	8.6%	38.7%	26.8	7.2%	42.8%	58.0	7.9%	40.8%
20–24	29.7	8.2%	46.9%	37.2	10.0%	52.8%	66.9	9.1%	49.9%
25–29	28.2	7.8%	54.7%	22.3	6.0%	58.8%	50.5	6.9%	56.8%
30–34	14.9	4.1%	58.8%	22.3	6.0%	64.8%	37.2	5.1%	61.9%
35–39	29.7	8.2%	67.1%	16.3	4.4%	69.2%	46.1	6.3%	68.2%
40–44	16.3	4.5%	71.6%	16.3	4.4%	73.6%	32.7	4.5%	72.6%
45–49	20.8	5.8%	77.4%	19.3	5.2%	78.8%	40.1	5.5%	78.1%
50–54	19.3	5.3%	82.7%	14.9	4.0%	82.8%	34.2	4.7%	82.8%
55–59	14.9	4.1%	86.8%	17.8	4.8%	87.6%	32.7	4.5%	87.2%
60–64	13.4	3.7%	90.5%	11.9	3.2%	90.8%	25.3	3.4%	90.7%
65–69	4.5	1.2%	91.8%	7.4	2.0%	92.8%	11.9	1.6%	92.3%
70–74	4.5	1.2%	93.0%	8.9	2.4%	95.2%	13.4	1.8%	94.1%
75–79	5.9	1.6%	94.7%	1.5	0.4%	95.6%	7.4	1.0%	95.1%
80–84	1.5	0.4%	95.1%	1.5	0.4%	96.0%	3.0	0.4%	95.5%
85–89	1.5	0.4%	95.5%	1.5	0.4%	96.4%	3.0	0.4%	95.9%
90–94	0.0	0.0%	95.5%	0.0	0.0%	96.4%	0.0	0.0%	95.9%
95–99	0.0	0.0%	95.5%	0.0	0.0%	96.4%	0.0	0.0%	95.9%
100–104	0.0	0.0%	95.5%	0.0	0.0%	96.4%	0.0	0.0%	95.9%
Missing	16.3	4.5%	100.0%	13.4	3.6%	100.0%	29.7	4.1%	100.0%
Total	**361.2**	**100.0%**	**100.0%**	**371.6**	**100.0%**	**100.0%**	**732.7**	**100.0%**	**100.0%**

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

Table 4-3.–Population estimates, Quinhagak, 2010 and 2013.

	Census (2010)	5-year American Community Survey (2007–2011)	This study (2013)
Total population			
Households	165	162	162.0
Population	669	635	732.7
Alaska Native			
Population	650	629	726.8
Percentage	97.2%	99.1%	99.2%

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.

Table 4-4.–Demographic characteristics, Quinhagak, 2013.

Characteristics	Community: Quinhagak
Household size	
Mean	4.5
Minimum	1
Maximum	11
Age	
Mean	28.2
Minimum[a]	0
Maximum	88
Median	23.0
Length of residency	
Total population	
Mean	25.4
Minimum[a]	0
Maximum	86
Heads of household	
Mean	43.2
Minimum[a]	1
Maximum	86
Alaska Native households[b]	
Number	162.0
Percentage	100.0%

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.

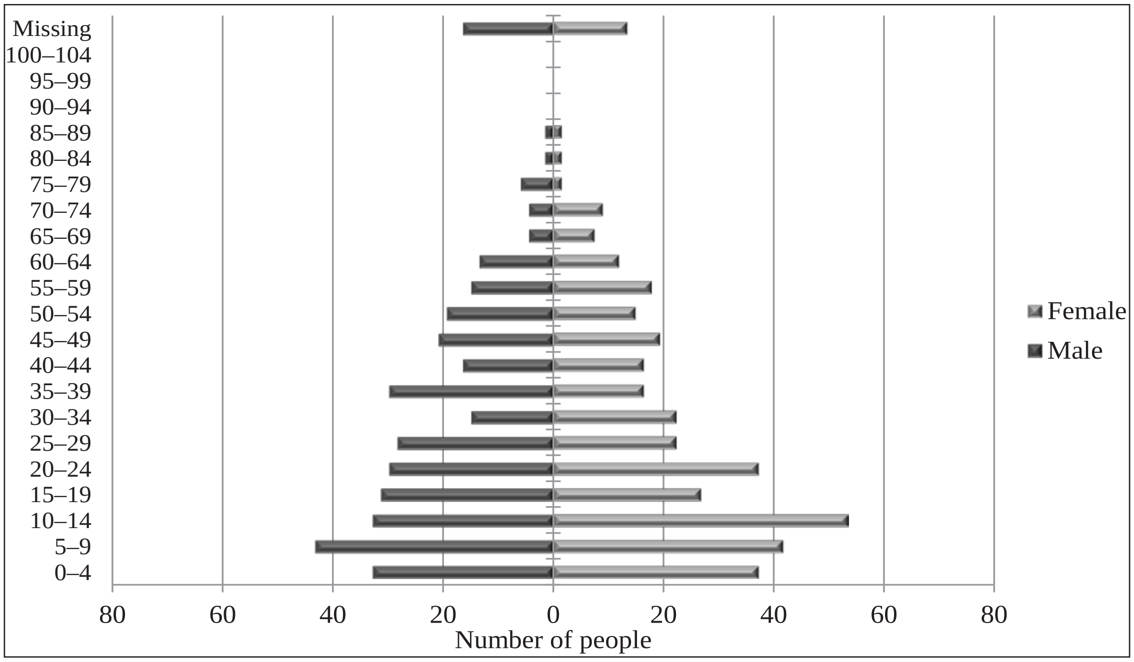


Figure 4-1.–Population profile, Quinhagak, 2013.

(Table 4-6). Eighty-nine (89%) percent reported that their birthplace was Quinhagak, 2% said Eek, and 1% said Kwethluk. Less than 1% reported other communities in Alaska or other U.S. locations as their place of birth.

The first U.S. Census taken in Quinhagak in 1880 recorded a population of 83 (Rearden and Fienup-Riordan 2013). The 2010 United States Census recorded a population of 669 (650 Alaska Natives) for Quinhagak, and the 5-year American Community Survey (ACS) for 2008–2012 estimated 635 (629 Alaska Natives; Table 4-3). The Alaska Department of Labor reported a population of 690 for 2013.[8] However, the results of this study estimate the current population to be 733. Quinhagak's population has grown steadily over the past 30 years (Figure 4-2). According to LaVine et al. (2007) Quinhagak has historically been one of the largest communities along the Kuskokwim Bay.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Table D-2, found in Appendix D of this report, and Figure 4-3 show the expanded levels of individual participation in the harvest and processing of wild resources by all Quinhagak residents in 2013.[9] Overall, 54% of people attempted to harvest resources, and 45% participated in processing wild foods. More people participated in processing than in hunting both land mammals and marine mammals (30% and 19%, respectively, processed; 15% and 11% hunted). The processing of large mammals such as moose or walrus is very labor intensive and typically requires a family or group effort to fully process and store these types of resources. Two resource categories, fish and plants, show a different pattern. For these categories, there was less participation in processing than in fishing or gathering. Fish were processed by 42% (45% of people fished), and plants such as berries and greens were gathered by 63% (48% processed). Picking berries and greens is an activity in which both young children and the elderly can participate, making it a popular activity for many families. Processing the plants and berries however, can be done by as few as 1

8. Alaska Department of Labor and Workforce Development (ADLWD), Research and Analysis Section, Juneau, n.d. "Population Estimates." Accessed January 27, 2016. http://laborstats.alaska.gov/pop/popest.htm

9. Percentages are calculated based on valid responses, which excludes from the sample missing data for that category.

Table 4-5.–Birthplaces of household heads, Quinhagak, 2013.

Birthplace	Percentage
Bethel	0.6%
Eek	2.8%
Emmonak	0.6%
Goodnews Bay	1.1%
Hooper Bay	0.6%
Kasigluk	0.6%
Kipnuk	1.1%
Kwethluk	2.3%
Kwigillingok	0.6%
Manokotak	1.1%
Nunapitchuk	0.6%
Quinhagak	81.9%
Scammon Bay	0.6%
Togiak	0.6%
Tuntutuliak	1.1%
Missing	1.7%
Other U.S.	2.3%

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 4-6.–Birthplaces of population, Quinhagak, 2013.

Birthplace	Percentage
Bethel	0.4%
Clarks Point	0.2%
Eek	2.2%
Emmonak	0.2%
Goodnews Bay	0.4%
Hooper Bay	0.8%
Kasigluk	0.4%
Kipnuk	0.4%
Kwethluk	1.0%
Kwigillingok	0.2%
Lake Minchumina	0.2%
Manokotak	0.4%
Napakiak	0.6%
Nunapitchuk	0.6%
Quinhagak	88.8%
Scammon Bay	0.2%
Togiak	0.4%
Tuntutuliak	0.6%
Upper Kalskag	0.2%
Other U.S.	0.8%
Missing	0.8%

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.

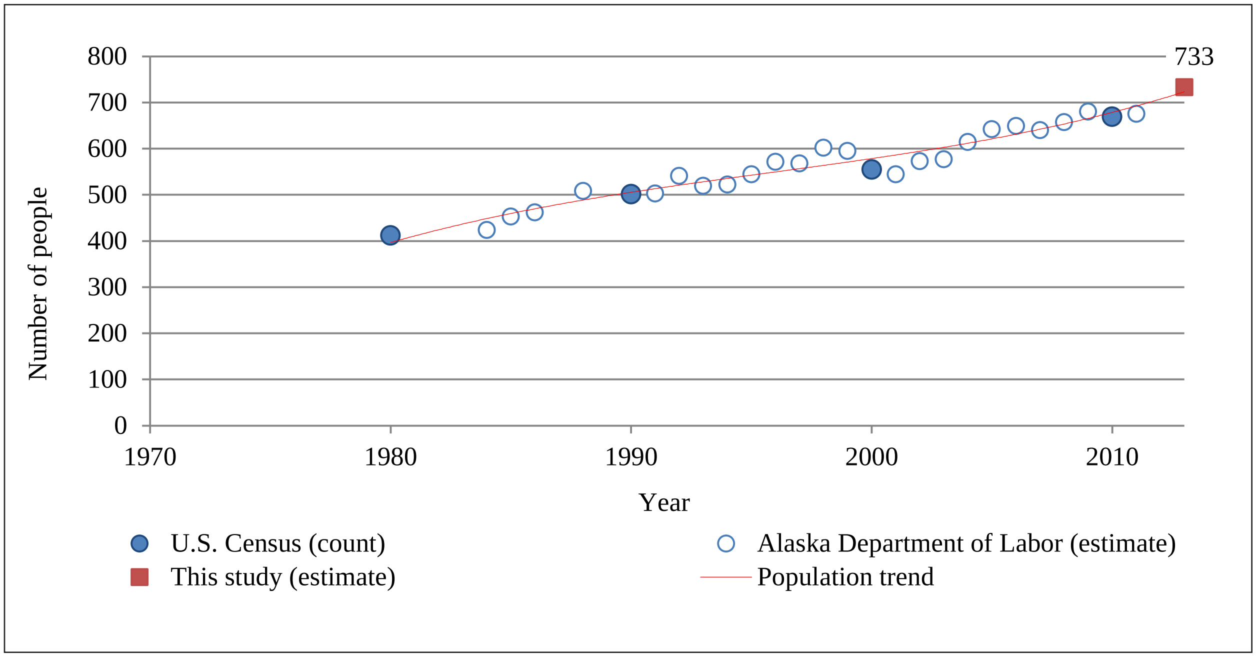


Figure 4-2.–Population history, Quinhagak, 1980–2013.

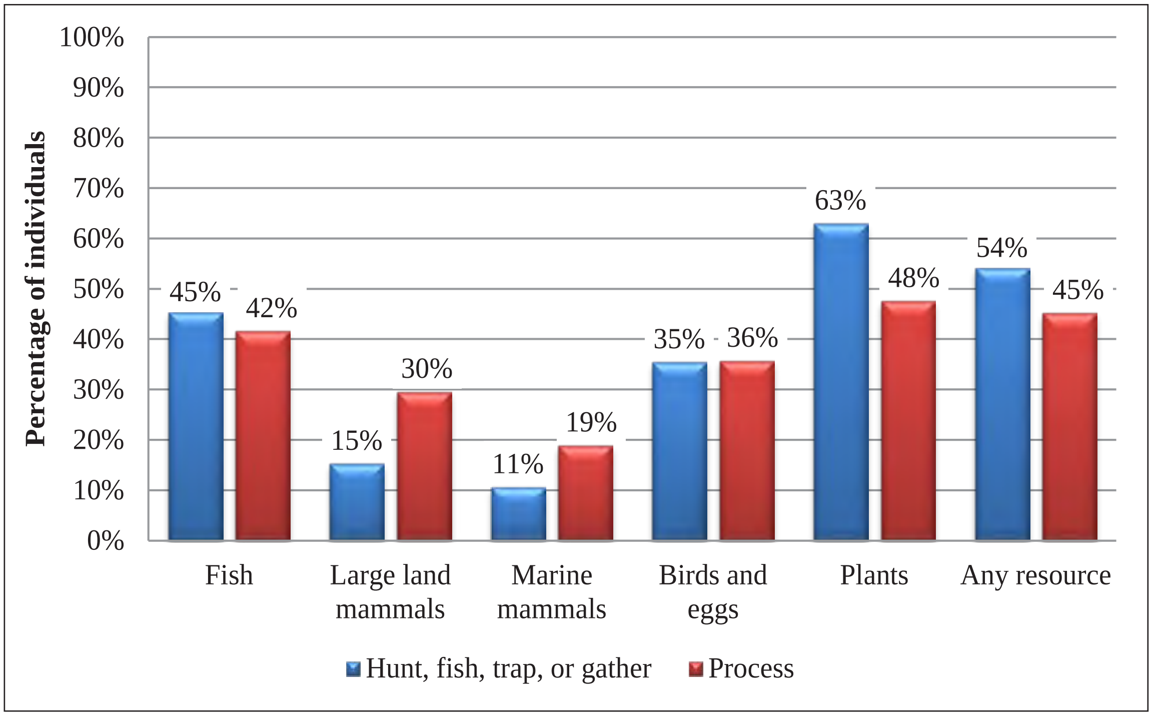


Figure 4-3.–Individual participation in subsistence harvesting and processing activities, Quinhagak, 2013.

or 2 people depending on the amount of vegetation that needs to be processed. Birds and eggs were hunted (36%) and processed (36%) equally.

Harvest and Use of Wild Resources at the Household Level

Figure 4-4 shows by resource category the percentages of households that used wild resources, attempted to harvest, and harvested wild resources. Vegetation (95% of households) and salmon (95%) were the most widely used resource categories, followed by nonsalmon fish (94%), birds and eggs (93%), large land mammals (83%), marine mammals (77%), and small land mammals (29%). A small percentage (13%) used marine invertebrates. The vegetation category also had the highest percentage of households attempting to harvest and harvesting of all categories. Wood is included in this category and is gathered year-round for home heating and smokehouse use. Additionally, Quinhagak residents seek out spring greens and fall berries for consumption, and they gather grasses for basket making. These factors may account for the high rate of use in this category.

The categories that show the most disparity between using, attempting to harvest, and actually harvesting were the large land mammals and marine mammals categories. Both of these categories show a high percentage of usage but a low percentage of harvest during the study year, which indicates a high degree of sharing. The salmon category also had a higher percentage of households using than harvesting, but to a lesser degree.

Table 4-7 summarizes resource harvest and use characteristics for Quinhagak in 2013 at the household level. The average harvest was 1,333 lb usable weight per household, 295 lb per capita. During the study year, community households harvested an average of 17 kinds of resources and used an average of 25 kinds of resources. In addition, households gave away an average of 7 kinds of resources. Overall, at least 109 resources were available for households to harvest in the study area; these included animals and plants that survey respondents identified, but that were not included in the survey instrument.

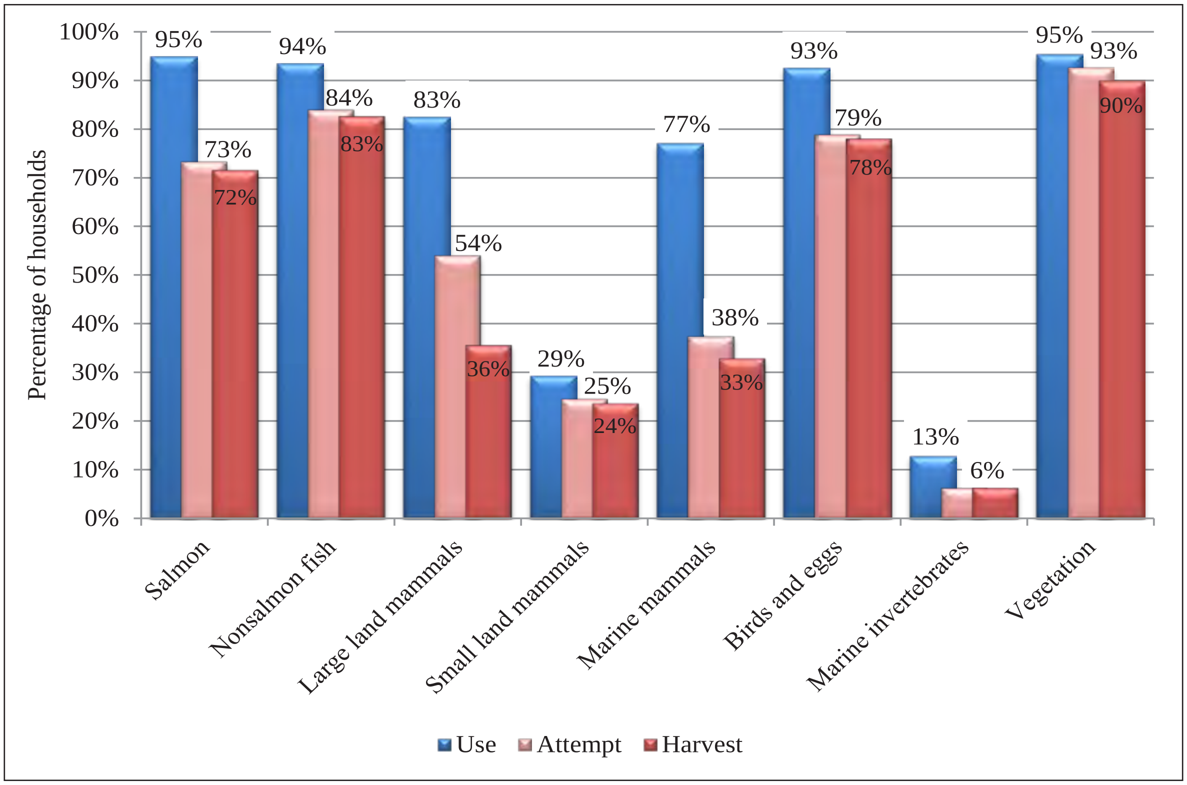


Figure 4-4.–Percentages of households using, attempting to harvest, or harvesting wild resources by category, Quinhagak, 2013.

Harvest Quantities and Composition

Table 4-8 reports estimated wild resource harvests and uses by Quinhagak 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 C for conversion factors[10]). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources taken, given away, or used by a household, and resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Purchased foods are not included, but resources such as firewood are included because they are an important part of the subsistence way of life. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

The total local community harvest in pounds usable weight for all resources combined was 215,950 lb (or 295 lb per capita). Figure 4-5 shows the composition in percentages of the total harvest by weight. Salmon was the largest category, contributing 35% of the total edible weight. This category accounted for 75,351 lb (or 103 lb per capita) of edible weight (Table 4-8). The next largest contributing category was large land mammal category at 18% (Figure 4-5). Quinhagak hunters harvested a total of 38,702 lb (53 lb per capita) of large land mammals in 2013 (Table 4-8). Fishers harvested 33,072 lb (45 lb per capita) of nonsalmon fish species or 15% of the total harvest (Figure 4-5; Table 4-8). The category of birds and eggs made up 11% of the harvest, with 22,360 lb (31 lb per capita).The next category was marine mammals at 10% or 22,268 total pounds (30 lb per capita). Despite having the highest use and participation in harvest (95% using and 93% attempting harvest), the total edible pounds of vegetation only accounted for 10% of the community harvest

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

Table 4-7.–Resource harvest and use characteristics, Quinhagak, 2013.

Characteristic	
Mean number of resources used per household	**24.6**
Minimum	2
Maximum	58
95% confidence limit (±)	5.3%
Median	23.0
Mean number of resources attempted to harvest per household	**18.7**
Minimum	0
Maximum	57
95% confidence limit (±)	6.7%
Median	18.0
Mean number of resources harvested per household	**17.4**
Minimum	0
Maximum	57
95% confidence limit (±)	6.9%
Median	18.0
Mean number of resources received per household	**8.9**
Minimum	0
Maximum	42
95% confidence limit (±)	10.3%
Median	6.0
Mean number of resources given away per household	**6.8**
Minimum	0
Maximum	31
95% confidence limit (±)	10.8%
Median	5.0
Household harvest (pounds)	
Minimum	0
Maximum	9,394
Mean	1,333.0
Median	981.7
Number of resources asked about and identified voluntarily by respondents	145

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

Table 4-8.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Quinhagak, 2013.

	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence limit (±) harvest
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
All resources	**100.0**	**98.2**	**98.2**	**94.5**	**78.0**	**215,949.8**	**1,333.0**	**294.7**				**13.2**
Salmon	**94.5**	**73.4**	**71.6**	**49.5**	**49.5**	**75,350.6**	**465.1**	**102.8**				**13.1**
Chum salmon	69.7	50.5	49.5	30.3	29.4	12,128.3	74.9	16.6	2,470.1	ind	15.2	17.7
Coho salmon	71.6	54.1	52.3	22.0	23.9	8,527.3	52.6	11.6	1,857.8	ind	11.5	16.6
Chinook salmon	87.2	67.0	63.3	44.0	40.4	41,781.8	257.9	57.0	3,801.8	ind	23.5	14.5
Pink salmon	11.0	6.4	6.4	6.4	3.7	220.7	1.4	0.3	81.7	ind	0.5	66.4
Sockeye salmon	77.1	55.0	53.2	31.2	29.4	12,692.5	78.3	17.3	2,538.5	ind	15.7	18.4
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Nonsalmon fish	**93.6**	**83.5**	**82.6**	**81.7**	**46.8**	**33,071.6**	**204.1**	**45.1**				**19.7**
Pacific herring	13.8	7.3	7.3	6.4	1.8	2,318.5	14.3	3.2	386.4	gal	2.4	52.3
Pacific herring roe	19.3	3.7	3.7	15.6	1.8	127.1	0.8	0.2	23.1	gal	0.1	61.1
Smelt	72.5	61.5	59.6	20.2	24.8	7,543.0	46.6	10.3	1,257.2	gal	7.8	34.8
Pacific (gray) cod	0.9	0.9	0.9	0.0	0.9	3.7	0.0	0.0	7.4	ind	0.0	113.4
Saffron cod	9.2	9.2	9.2	0.0	2.8	325.5	2.0	0.4	395.3	ind	2.4	52.0
Walleye pollock (whiting)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Flounder	1.8	1.8	1.8	0.0	0.9	13.1	0.1	0.0	11.9	ind	0.1	82.3
Pacific halibut	68.8	15.6	15.6	60.6	6.4	7,606.4	47.0	10.4	7,420.5	lb	45.8	40.6
Arctic lamprey	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sculpin	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Alaska blackfish	14.7	5.5	5.5	11.0	1.8	437.0	2.7	0.6	437.0	lb	2.7	57.5
Burbot	11.9	3.7	3.7	9.2	0.9	481.5	3.0	0.7	200.6	ind	1.2	69.7
Arctic char	1.8	1.8	1.8	0.9	0.9	160.5	1.0	0.2	178.3	ind	1.1	96.2
Dolly Varden	61.5	53.2	51.4	22.0	22.9	4,938.0	30.5	6.7	5,486.7	ind	33.9	23.6
Unknown char	1.8	0.9	0.9	0.9	0.9	22.3	0.1	0.0	14.9	ind	0.1	113.4
Arctic grayling	28.4	23.9	23.9	5.5	7.3	367.1	2.3	0.5	367.1	ind	2.3	49.2
Northern pike	23.9	7.3	7.3	18.3	2.8	1,734.4	10.7	2.4	385.4	ind	2.4	44.1

-continued-

Table 4-8.–Page 2 of 6.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Nonsalmon fish, continued												
Sheefish	7.3	3.7	3.7	3.7	2.8	258.6	1.6	0.4	43.1	ind	0.3	70.8
Rainbow trout	36.7	27.5	26.6	11.0	10.1	1,575.1	9.7	2.1	1,125.1	ind	6.9	47.9
Unknown trout	1.8	0.9	0.9	0.9	0.0	445.9	2.8	0.6	148.6	ind	0.9	113.4
Broad whitefish	19.3	7.3	7.3	13.8	3.7	1,337.6	8.3	1.8	334.4	ind	2.1	50.3
Bering cisco	35.8	29.4	27.5	13.8	11.9	2,130.7	13.2	2.9	1,521.9	ind	9.4	29.1
Least cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown cisco	0.9	0.9	0.9	0.0	0.0	10.4	0.1	0.0	14.9	ind	0.1	113.4
Humpback whitefish	17.4	9.2	9.2	11.0	3.7	1,212.8	7.5	1.7	404.3	ind	2.5	45.8
Round whitefish	2.8	1.8	1.8	0.9	0.9	20.1	0.1	0.0	40.1	ind	0.2	105.2
Unknown whitefishes	1.8	0.9	0.9	1.8	0.0	2.2	0.0	0.0	7.4	ind	0.0	113.4
Large land mammals	**82.6**	**54.1**	**35.8**	**65.1**	**31.2**	**38,701.7**	**238.9**	**52.8**				**21.8**
Bison	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Black bear	0.9	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Caribou	65.1	40.7	29.4	43.1	23.1	16,229.7	100.2	22.2	124.8	ind	0.8	21.0
Moose	70.4	45.4	19.3	52.3	20.4	22,471.9	138.7	30.7	41.6	ind	0.3	27.2
Muskox	0.9	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Small land mammals	**29.4**	**24.8**	**23.9**	**7.3**	**10.1**	**1,713.3**	**10.6**	**2.3**				**43.3**
Beaver	18.3	12.8	11.9	5.5	7.3	1,337.6	8.3	1.8	110.0	ind	0.7	46.9
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	5.5	4.6	4.6	0.9	0.9	0.0	0.0	0.0	38.6	ind	0.2	62.8
Small Alaska hare	6.4	6.4	4.6	0.9	0.0	29.7	0.2	0.0	14.9	ind	0.1	52.3
Snowshoe hare	8.3	6.4	5.5	2.8	1.8	148.6	0.9	0.2	75.0	ind	0.5	91.4
River (land) otter	5.5	4.6	4.6	0.9	1.8	53.5	0.3	0.1	65.4	ind	0.4	96.2
Lynx	4.6	3.7	3.7	0.9	0.9	11.9	0.1	0.0	16.3	ind	0.1	113.4
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	4.6	3.7	3.7	0.9	0.9	0.0	0.0	0.0	11.9	ind	0.1	74.5
Muskrat	4.6	4.6	4.6	0.0	0.9	5.6	0.0	0.0	11.9	ind	0.1	67.5
Porcupine	7.3	6.4	6.4	0.9	1.8	104.0	0.6	0.1	20.8	ind	0.1	51.6

-continued-

Table 4-8.–Page 3 of 6.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Small land mammals, continued												
Arctic ground (parka) squirrel	0.9	0.9	0.9	0.0	0.0	22.3	0.1	0.0	44.6	ind	0.3	113.4
Least weasel	0.9	0.9	0.9	0.0	0.9	0.0	0.0	0.0	14.9	ind	0.1	113.4
Gray wolf	2.8	1.8	1.8	0.9	0.0	0.0	0.0	0.0	4.5	ind	0.0	84.2
Wolverine	4.6	3.7	3.7	0.9	1.8	0.0	0.0	0.0	14.9	ind	0.1	61.4
Marine mammals	**77.1**	**37.6**	**33.0**	**59.6**	**25.7**	**22,267.6**	**137.5**	**30.4**				**33.9**
Bearded seal	22.2	20.2	10.1	12.0	6.4	4,369.5	27.0	6.0	31.2	ind	0.2	40.2
Harbor seal	0.9	0.9	0.9	0.0	0.9	166.5	1.0	0.2	3.0	ind	0.0	113.4
Ribbon seal	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ringed seal	25.0	22.0	12.8	13.0	8.3	3,911.8	24.1	5.3	69.9	ind	0.4	51.5
Spotted seal	45.9	30.3	24.8	22.9	15.6	6,242.2	38.5	8.5	111.5	ind	0.7	28.4
Unknown seal oil	32.1	0.9	0.0	32.1	0.9	0.0	0.0	0.0				0.0
Unknown seal	0.9	0.0	0.0	0.9	0.0	0.0	0.0	0.0				0.0
Walrus	19.3	9.2	2.8	15.6	4.6	4,577.6	28.3	6.2	5.9	ind	0.0	68.9
Beluga whale	17.4	5.5	4.6	13.8	3.7	3,000.0	18.5	4.1	3.0	ind	0.0	97.3
Bowhead whale	6.4	0.0	0.0	6.4	0.9	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown marine mammals	0.9	0.0	0.0	0.9	0.0	0.0	0.0	0.0				0.0
Birds and eggs	**92.7**	**78.9**	**78.0**	**49.5**	**46.8**	**22,359.5**	**138.0**	**30.5**				**16.8**
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	2.8	2.8	2.8	0.0	0.9	33.9	0.2	0.0	17.8	ind	0.1	95.2
King eider	1.8	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Steller's eider	0.9	0.9	0.9	0.0	0.0	1.5	0.0	0.0	1.5	ind	0.0	113.4
Unknown eider	5.5	4.6	4.6	0.9	1.8	170.8	1.1	0.2	77.3	ind	0.5	59.5
Goldeneye	6.4	6.4	6.4	0.0	2.8	123.6	0.8	0.2	80.3	ind	0.5	51.3
Harlequin duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	36.7	28.4	28.4	10.2	8.4	727.4	4.5	1.0	373.0	ind	2.3	23.4
Unknown merganser	4.6	3.7	3.7	0.9	0.9	83.3	0.5	0.1	87.7	ind	0.5	66.1
Long-tailed duck	1.8	1.8	1.8	0.0	0.0	29.0	0.2	0.0	19.3	ind	0.1	90.8
Northern pintail	39.4	32.1	32.1	9.2	9.3	644.3	4.0	0.9	429.5	ind	2.7	22.1
Scaup	7.3	6.4	6.4	0.9	2.8	66.9	0.4	0.1	74.3	ind	0.5	72.1
Black scoter	10.1	9.2	9.2	0.9	2.8	176.6	1.1	0.2	196.2	ind	1.2	43.1
Surf scoter	1.8	1.8	1.8	0.0	0.0	26.8	0.2	0.0	29.7	ind	0.2	89.4

-continued-

Table 4-8.–Page 4 of 6.

Resource	Percentage of households: Using	Percentage of households: Attempting harvest	Percentage of households: Harvesting	Percentage of households: Receiving	Percentage of households: Giving away	Harvest weight (lb): Total	Harvest weight (lb): Mean per household	Harvest weight (lb): Per capita	Harvest amount[a]: Total	Harvest amount[a]: Unit	Harvest amount[a]: Mean per household	95% confidence limit (±) harvest
Birds and eggs, continued												
White-winged scoter	2.8	1.8	1.8	1.8	0.9	105.5	0.7	0.1	46.1	ind	0.3	109.7
Northern shoveler	6.4	5.5	5.5	0.9	0.9	90.7	0.6	0.1	83.2	ind	0.5	72.9
Teal	3.7	1.8	1.8	1.8	0.0	5.4	0.0	0.0	10.4	ind	0.1	80.6
American wigeon	1.8	1.8	1.8	0.0	0.9	29.2	0.2	0.0	22.3	ind	0.1	84.2
Unknown ducks	4.6	1.8	1.8	2.8	0.0	14.2	0.1	0.0	17.8	ind	0.1	84.2
Brant	12.8	9.2	8.3	4.6	4.6	713.4	4.4	1.0	118.9	ind	0.7	47.2
Canada goose	68.8	50.5	50.5	22.9	20.2	1,105.8	6.8	1.5	921.5	ind	5.7	15.1
Emperor goose	8.3	6.4	5.5	2.8	3.7	89.2	0.6	0.1	35.7	ind	0.2	62.0
Snow goose	9.2	9.2	6.4	3.7	2.8	266.9	1.6	0.4	66.9	ind	0.4	49.9
White-fronted goose	69.7	56.0	56.0	18.3	18.3	7,969.1	49.2	10.9	1,879.5	ind	11.6	20.3
Unknown geese	2.8	0.9	0.0	2.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tundra (whistling) swan	52.3	40.4	38.5	18.5	19.4	3,048.9	18.8	4.2	272.0	ind	1.7	22.0
Sandhill crane	34.9	29.4	27.5	9.3	11.1	1,585.5	9.8	2.2	188.8	ind	1.2	29.4
Shorebirds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Seabirds, loons, grebes	0.9	0.9	0.9	0.0	0.0	161.7	1.0	0.2	29.7	ind	0.2	113.4
Loon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ptarmigan	71.6	54.1	52.3	25.0	24.1	2,571.5	15.9	3.5	3,673.5	ind	22.7	17.1
Duck eggs	18.3	16.5	13.8	2.8	3.7	102.6	0.6	0.1	683.7	ind	4.2	40.9
Goose eggs	17.4	15.6	12.8	4.6	6.5	310.8	1.9	0.4	1,035.9	ind	6.4	39.3
Swan eggs	10.1	9.2	6.4	2.8	1.8	64.6	0.4	0.1	102.6	ind	0.6	51.8
Crane eggs	3.7	3.7	2.8	0.0	1.8	19.7	0.1	0.0	31.2	ind	0.2	84.2
Common snipe eggs	0.9	0.9	0.9	0.0	0.0	0.6	0.0	0.0	11.9	ind	0.1	113.4
Plover eggs	0.9	0.9	0.9	0.0	0.0	2.3	0.0	0.0	32.7	ind	0.2	113.4
Whimbrel eggs	0.9	0.9	0.9	0.0	0.0	0.1	0.0	0.0	3.0	ind	0.0	113.4
Godwit eggs	0.9	0.9	0.9	0.0	0.0	14.9	0.1	0.0	29.7	ind	0.2	113.4
Unknown shorebird eggs	9.2	10.1	7.3	0.0	1.8	7.0	0.0	0.0	215.5	ind	1.3	56.7
Unknown small shorebird eggs	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0	37.2	ind	0.2	113.4
Gull eggs	27.5	27.5	23.9	3.7	8.3	690.7	4.3	0.9	2,302.2	ind	14.2	31.6
Loon eggs	4.6	5.5	4.6	0.0	0.9	6.7	0.0	0.0	37.2	ind	0.2	65.0
Murre eggs	15.6	5.5	5.5	10.1	4.6	1,081.2	6.7	1.5	4,914.7	ind	30.3	52.2

-continued-

Table 4-8.–Page 5 of 6.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Tern eggs	9.2	9.2	7.3	0.9	1.8	24.4	0.2	0.0	487.5	ind	3.0	83.8
Unknown seabird eggs	4.6	1.8	1.8	2.8	0.9	26.8	0.2	0.0	89.2	ind	0.6	79.8
Ptarmigan eggs	8.3	5.5	5.5	2.8	0.9	26.8	0.2	0.0	267.5	ind	1.7	59.1
Unknown eggs	9.2	4.6	4.6	4.6	0.9	139.6	0.9	0.2	634.6	ind	3.9	77.2
Marine invertebrates	**12.8**	**6.4**	**6.4**	**8.3**	**3.7**	**282.6**	**1.7**	**0.4**				**55.4**
Clams	11.9	5.5	5.5	8.3	3.7	277.9	1.7	0.4	88.2	gal	0.5	56.3
King crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tanner crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
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
Mussels	0.9	0.9	0.9	0.0	0.0	4.5	0.0	0.0	3.0	gal	0.0	113.4
Shrimp	0.9	0.9	0.9	0.0	0.0	0.2	0.0	0.0	0.1	gal	0.0	113.4
Unknown marine invertebrates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Vegetation	**95.4**	**92.7**	**89.9**	**48.6**	**51.4**	**22,203.1**	**137.1**	**30.3**				**9.3**
Blueberry	50.5	47.7	47.7	2.8	9.3	1,306.4	8.1	1.8	326.6	gal	2.0	23.7
Lowbush cranberry	63.3	56.0	56.0	12.0	16.0	1,807.7	11.2	2.5	451.9	gal	2.8	15.5
Highbush cranberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Crowberry	85.3	75.2	74.3	22.9	28.0	7,927.4	48.9	10.8	1,981.9	gal	12.2	13.1
Cloudberry	90.8	85.3	85.3	13.9	30.8	7,918.3	48.9	10.8	1,979.6	gal	12.2	9.1
Nagoonberry	67.9	63.3	63.3	6.4	13.9	981.5	6.1	1.3	245.4	gal	1.5	18.4
Wild rhubarb	2.8	2.8	2.8	0.0	0.0	52.5	0.3	0.1	52.5	gal	0.3	97.9
Other beach greens	46.8	42.2	42.2	6.4	10.1	515.0	3.2	0.7	515.0	gal	3.2	21.8
Fiddlehead ferns	14.7	11.9	11.9	3.7	2.8	36.0	0.2	0.0	36.0	gal	0.2	54.2
Hudson's Bay (Labrador) tea	33.9	31.2	31.2	3.7	9.2	79.1	0.5	0.1	79.1	gal	0.5	28.6
Sourdock	42.2	39.4	39.4	6.4	12.8	578.9	3.6	0.8	578.9	gal	3.6	27.1
Pallas buttercup	45.0	38.5	38.5	10.1	12.8	647.9	4.0	0.9	647.9	gal	4.0	29.0
Wild celery	9.2	9.2	9.2	0.0	0.0	30.9	0.2	0.0	30.9	gal	0.2	45.4
Beach rye grass	0.9	0.9	0.9	0.0	0.9	14.9	0.1	0.0	14.9	gal	0.1	113.4

-continued-

Table 4-8.–Page 6 of 6.

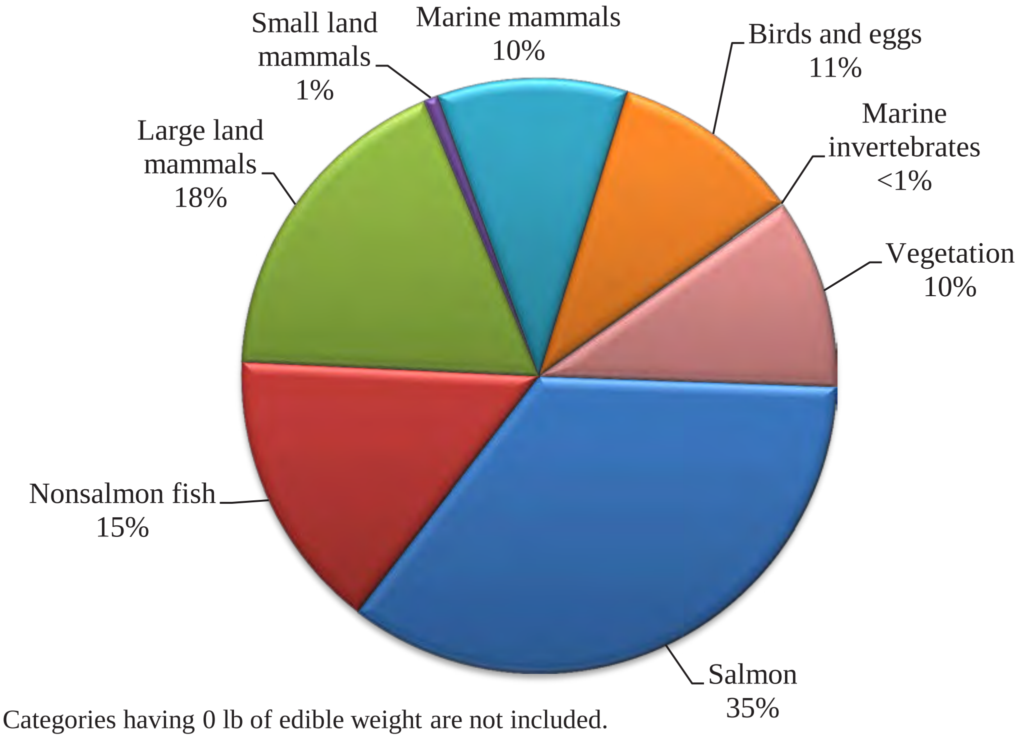
Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Vegetation, continued												
Wild parsley	9.2	8.3	8.3	0.9	0.9	28.8	0.2	0.0	28.8	gal	0.2	45.4
Wild rose hips	0.9	0.9	0.9	0.0	0.0	11.9	0.1	0.0	3.0	gal	0.0	113.4
Other wild greens	8.3	5.5	5.5	2.8	0.0	54.0	0.3	0.1	54.0	gal	0.3	79.9
Unknown mushrooms	0.9	0.9	0.9	0.9	0.9	4.5	0.0	0.0	4.5	gal	0.0	113.4
Stinkweed	28.4	25.7	25.7	6.4	8.3	200.4	1.2	0.3	200.4	gal	1.2	35.2
Punk	11.0	10.1	6.4	0.9	1.9	0.0	0.0	0.0	117.0	gal	0.7	77.8
Mousefoods	5.5	8.3	4.6	0.0	0.0	7.1	0.0	0.0	7.1	gal	0.0	59.3
Wood	61.5	57.8	57.8	12.8	12.8	0.0	0.0	0.0				0.0

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

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

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

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



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

Figure 4-5.–Composition of edible harvest by resource category, Quinhagak, 2013.

by weight (figures 4-4 and 4-5). Quinhagak residents harvested 22,203 lb (30 lb per capita) of vegetation in 2013. Small land mammals added 1% and marine invertebrates added less than 1% each to the total edible weight harvested by the community.

Use and Harvest Characteristics by Resource Category

Sharing is a major component of subsistence activities in Quinhagak. In 2013 households gave away an average of 7 kinds of resources, and they received an average of 9 kinds of resources (Table 4-7). A majority of households (78%) gave wild foods of any type to others, while almost all (95%) said that they received wild foods (Table 4-8). In regards to salmon, 50% of households gave away salmon, and the same percentage (50%) received salmon from others. Nearly one-half of households (47%) reported giving away nonsalmon fish, while a much larger percentage (82%) reported receiving the resource. Large land mammals were given away by 31% of households and received by 65%. Of the small land mammals, 10% gave some away, and 7% received some. Marine mammals were given away by 26% of households, while a much larger percentage (60%) received. Similar to salmon, birds and eggs were given away and received almost equally, with 47% giving and 50% receiving. For marine invertebrates such as clams, crabs, and mussels, 4% gave away, and 8% received. The sharing of vegetation, like salmon and birds and eggs, was nearly equal, with 51% of households giving away and 49% receiving.

The resources most commonly given away were nonsalmon fish species (47%), large land mammals (31%), and marine mammals (26%). Large land mammal and marine mammal hunting are usually conducted by young and middle-aged, able-bodied residents, due to the physical demands and challenges of the activity. This smaller subgroup of the population then distributes these resources (mostly through sharing) to those that cannot harvest these particular resources for themselves.

Table 4-9 lists the top 10 ranked resources used by households in Quinhagak during the 2013 study year. The resources in this top 10 list are diverse. Cloudberry (used by 91% of households) ranks first, and Chinook salmon (87%) ranks second. The third highest percentage of use was crowberry at 85%. Sockeye salmon was fourth at 77%. Smelts were number 5 at 73%. Both coho salmon and ptarmigans were used by

Table 4-9.–Top 10 ranked resources used by households, Quinhagak, 2013.

Rank[a]	Resource	Percentage of households using
1.	Cloudberry	90.8%
2.	Chinook salmon	87.2%
3.	Crowberry	85.3%
4.	Sockeye salmon	77.1%
5.	Smelt	72.5%
6.	Coho salmon	71.6%
6.	Ptarmigan	71.6%
8.	Chum salmon	69.7%
8.	Moose	70.4%
8.	White-fronted goose	69.7%

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.

72% of households. Moose was used by 70% of households. Chum salmon and white-fronted goose were both used by 70% of households.

Figure 4-6 shows the species with the highest per capita harvests in 2013. Salmon dominated the top 10 by pounds of edible weight per capita, which demonstrates the importance of salmon to the community of Quinhagak. Four salmon species are included in the figure: Chinook, sockeye, chum, and coho salmon. The highest percentage was Chinook salmon at 19%. The second highest percentage was moose at 10%, followed by caribou at 7%. Sockeye salmon (6%), chum salmon (5%), and coho salmon (4%) were next. Rounding out the top 10, Quinhagak households harvested white-fronted geese, crowberries, cloudberries, each of which contributed 4% to the pounds edible weight per capita, and Pacific halibut, which accounted for 3%.

Salmon

Subsistence-caught salmon made the largest contribution to the annual diet of Quinhagak residents in 2013. During the study year 2013, Quinhagak households harvested all of the salmon types available to them: Chinook salmon, chum salmon, sockeye salmon, coho salmon, and pink salmon. As noted earlier, salmon composed 35% of the total weight of wild food harvested by the community (75,351 lb or 103 lb per capita; Figure 4-5; Table 4-8). Chinook salmon made up 56% of the edible salmon harvest, followed by sockeye salmon at 17% and chum salmon at 16% (Figure 4-7). Coho salmon made up 11% of the salmon harvest, and pink salmon made up less than 1%. Chinook salmon (3,802 individual fish) was the most harvested of the salmon species (by 63% of Quinhagak households), the most used (by 87%), and the most given away (by 40%; Table 4-8). The mean harvest weight of Chinook salmon was 258 lb per household (57 lb per capita). The least harvested (by only 6% of households) salmon species was pink salmon. Pink salmon was also the least used (11%) and the least shared (4%). Only 82 pink salmon (average 1 lb per household, less than 1 lb per capita) were harvested by Quinhagak households in 2013.

Quinhagak fishers caught an estimated 10,750 salmon (75,351 lb or 103 lb per capita) using set gillnets (setnets), drift gillnets (driftnets), and rod and reel (tables 4-8 and 4-10). An estimated 498 salmon (3,548 lb) were removed from commercial harvests for home use. Figure 4-8 is a visual representation of the number of salmon harvested by gear type. In Quinhagak, drift gillnets are the primary gear type used to harvest salmon. In 2013, 81% of all salmon was harvested with drift gillnets, which were used to harvest all types of salmon available (Table 4-11). Chinook salmon made up 60% of the salmon harvested by drift gillnets. Overall, 3,340 (36,702 lb) Chinook salmon were harvested in driftnets (Table 4-10). Quinhagak

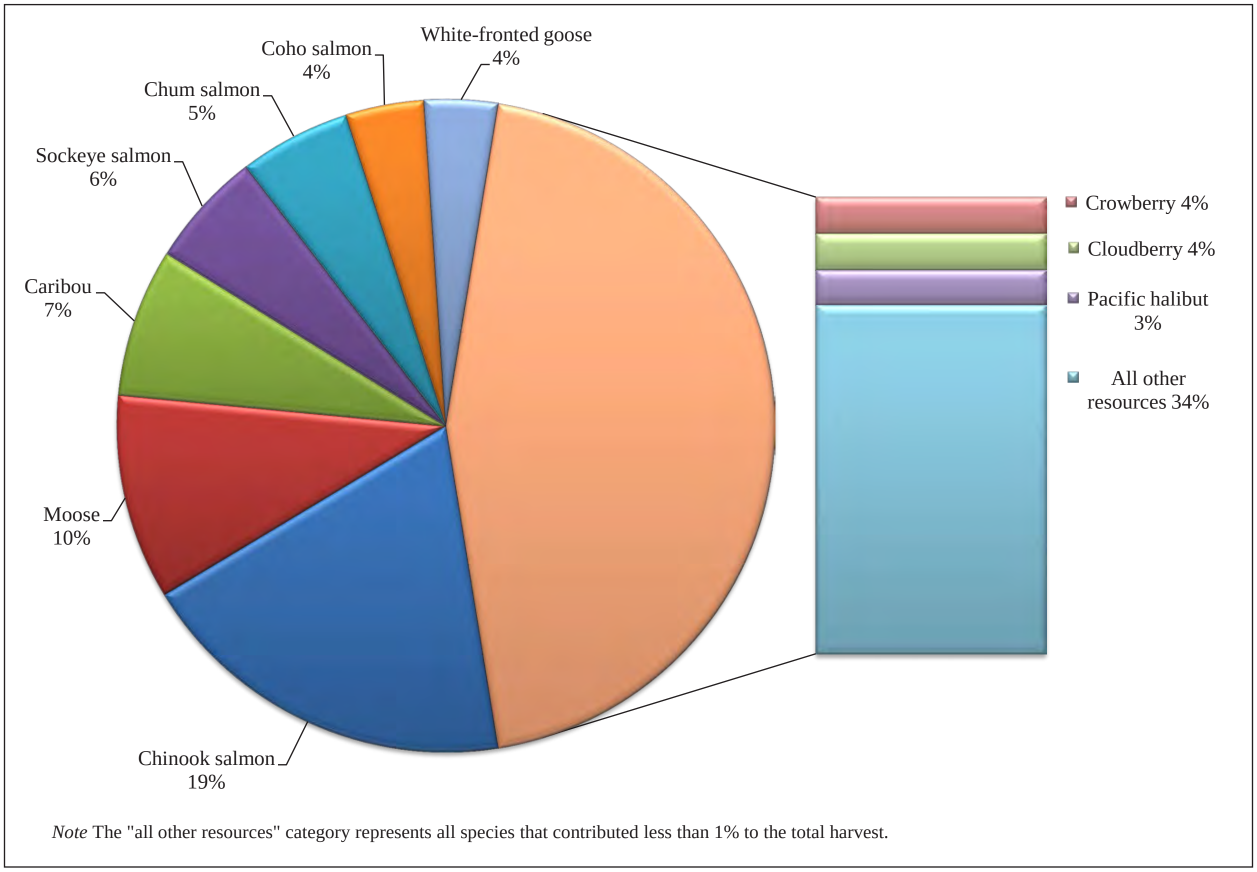


Figure 4-6.–Top species harvested in pounds edible weight per capita, Quinhagak, 2013.

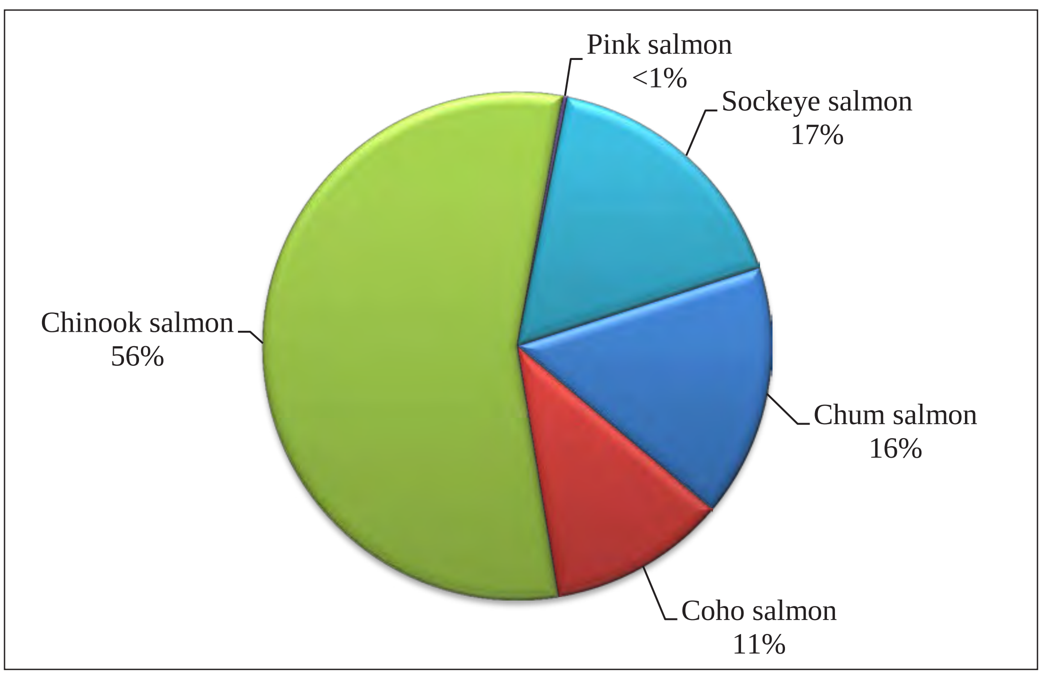


Figure 4-7.–Composition of edible salmon harvest, Quinhagak, 2013.

Table 4-10.–Estimated salmon harvests by gear type, Quinhagak, 2013.

	Removed from commercial catch		Subsistence methods							
			Setnet		Driftnet		Fish wheel		Seine net	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**497.9**	**3,548.2**	**506.8**	**3,013.1**	**8,354.1**	**61,132.1**	**0.0**	**0.0**	**0.0**	**0.0**
Chum salmon	118.9	583.8	225.9	1,109.2	1,967.8	9,661.8	0.0	0.0	0.0	0.0
Coho salmon	62.4	286.5	40.1	184.2	1,052.3	4,829.9	0.0	0.0	0.0	0.0
Chinook salmon	182.8	2,009.1	105.5	1,159.7	3,339.6	36,702.0	0.0	0.0	0.0	0.0
Pink salmon	0.0	0.0	50.5	136.4	14.9	40.1	0.0	0.0	0.0	0.0
Sockeye salmon	133.8	668.8	84.7	423.6	1,979.7	9,898.3	0.0	0.0	0.0	0.0
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

-continued-

Table 4-10.–Continued.

	Subsistence methods									
	By hand		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**0.0**	**0.0**	**0.0**	**0.0**	**8,861.0**	**64,145.2**	**1,391.1**	**7,657.2**	**10,750.0**	**75,350.6**
Chum salmon	0.0	0.0	0.0	0.0	2,193.7	10,771.0	157.5	773.5	2,470.1	12,128.3
Coho salmon	0.0	0.0	0.0	0.0	1,092.4	5,014.0	703.0	3,226.7	1,857.8	8,527.3
Chinook salmon	0.0	0.0	0.0	0.0	3,445.1	37,861.7	173.9	1,911.1	3,801.8	41,781.8
Pink salmon	0.0	0.0	0.0	0.0	65.4	176.6	16.3	44.1	81.7	220.7
Sockeye salmon	0.0	0.0	0.0	0.0	2,064.4	10,321.9	340.3	1,701.7	2,538.5	12,692.5
Unknown salmon	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.
Note The harvested number of salmon is represented as individual fish harvested.

fishers harvested 1,980 (9,898 lb) sockeye salmon using driftnets. Sockeye salmon and chum salmon each made up 16% of the salmon harvested using drift gillnets (Table 4-11). Quinhagak residents harvested 1,968 (9,662 lb) chum salmon and 1,052 (4,830 lb) coho salmon using drift gillnets (Table 4-10). Pink salmon is the only salmon type that was harvested in greater quantities using a set gillnet (51 individuals, or 136 lb) than by using a drift gillnet (15 individuals, or 40 lb). Rod and reel gear was used to harvest all available salmon types, a total of 1,391 salmon. Coho salmon was harvested in greater numbers using rod and reel gear (703 individuals or 3,227 lb) than the other types of salmon available.

During the study year 2013, the only type of salmon used for dog food was chum salmon. Quinhagak households fed 72 chum salmon (350 lb) to their dogs (Table 4-12). La Vine et al. (2007) reports that fishing for dog teams was a large part of the annual subsistence harvest until around the late 1960s and early 1970s, when snowmachine use for travel became more common, and the use of dog teams (and thus the amount of fish needed for feed) decreased. One respondent remembers,

> The most—maybe, the more interesting one is when we used to, um, hunt and gather, with a dog team. So, I was fortunate enough to live that part…There was a lot of dog teams here. My stepdad had one—my grandpa had one. We shared it with, you know, my uncles. And we head out with these huge dogs—and back then, they were huge dogs—you know, big muscly dogs, not the, skimpy, race-running dogs that don't even look like what we used to use. So, there's a lot of respect for those dogs because, you know, they're the main transportation and sometimes my grandpa would tell me that they'd go all the way to Tikchuk Lakes from here to go hunting. And that's really far. (041114KWN2)

Although salmon fishing gear types and the amount of fish used for dog food have changed over the years, fishing for salmon continues to be an integral part of life for the residents of Quinhagak.

Table 4-11.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Quinhagak, 2013.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Fish wheel	Seine net	Other method	Subsistence gear, any method	Rod and reel	Any method
Salmon	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**4.7%**	**4.0%**	**81.1%**	**0.0%**	**0.0%**	**0.0%**	**85.1%**	**10.2%**	**100.0%**
	Total	**4.7%**	**4.0%**	**81.1%**	**0.0%**	**0.0%**	**0.0%**	**85.1%**	**10.2%**	**100.0%**
Chum salmon	Gear type	16.5%	36.8%	15.8%	0.0%	0.0%	0.0%	16.8%	10.1%	16.1%
	Resource	4.8%	9.1%	79.7%	0.0%	0.0%	0.0%	88.8%	6.4%	100.0%
	Total	0.8%	1.5%	12.8%	0.0%	0.0%	0.0%	14.3%	1.0%	16.1%
Coho salmon	Gear type	8.1%	6.1%	7.9%	0.0%	0.0%	0.0%	7.8%	42.1%	11.3%
	Resource	3.4%	2.2%	56.6%	0.0%	0.0%	0.0%	58.8%	37.8%	100.0%
	Total	0.4%	0.2%	6.4%	0.0%	0.0%	0.0%	6.7%	4.3%	11.3%
Chinook salmon	Gear type	56.6%	38.5%	60.0%	0.0%	0.0%	0.0%	59.0%	25.0%	55.4%
	Resource	4.8%	2.8%	87.8%	0.0%	0.0%	0.0%	90.6%	4.6%	100.0%
	Total	2.7%	1.5%	48.7%	0.0%	0.0%	0.0%	50.2%	2.5%	55.4%
Pink salmon	Gear type	0.0%	4.5%	0.1%	0.0%	0.0%	0.0%	0.3%	0.6%	0.3%
	Resource	0.0%	61.8%	18.2%	0.0%	0.0%	0.0%	80.0%	20.0%	100.0%
	Total	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.2%	0.1%	0.3%
Sockeye salmon	Gear type	18.8%	14.1%	16.2%	0.0%	0.0%	0.0%	16.1%	22.2%	16.8%
	Resource	5.3%	3.3%	78.0%	0.0%	0.0%	0.0%	81.3%	13.4%	100.0%
	Total	0.9%	0.6%	13.1%	0.0%	0.0%	0.0%	13.7%	2.3%	16.8%
Unknown salmon	Gear type	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%
	Total	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.

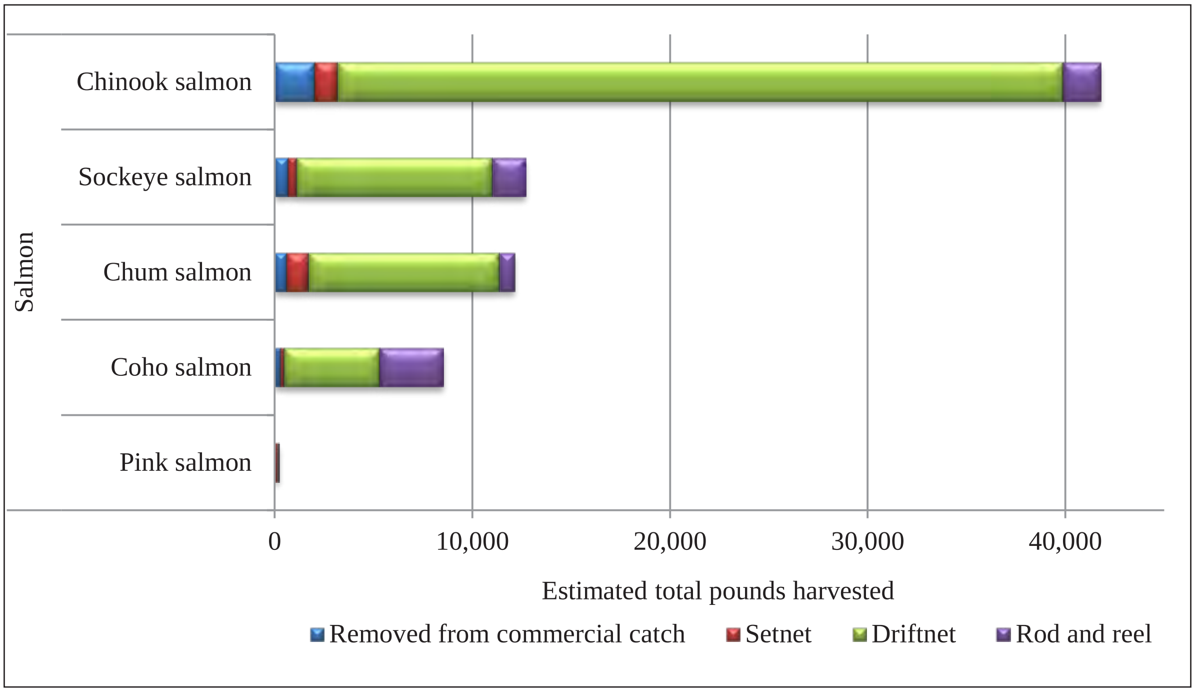


Figure 4-8.–Estimated salmon harvests by gear type, Quinhagak, 2013.

Table 4-12.–Estimated harvests of salmon and nonsalmon fish for consumption by dogs, Quinhagak, 2013.

Resource	Amount	Pounds
Salmon		
Chum salmon	71.3 ind	350.3 lb
Nonsalmon fish		
Smelt	10.3 gal	61.7 lb
Saffron cod	8.9 ind	7.3 lb
Total	**90.5 ind**	**419.3 lb**

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

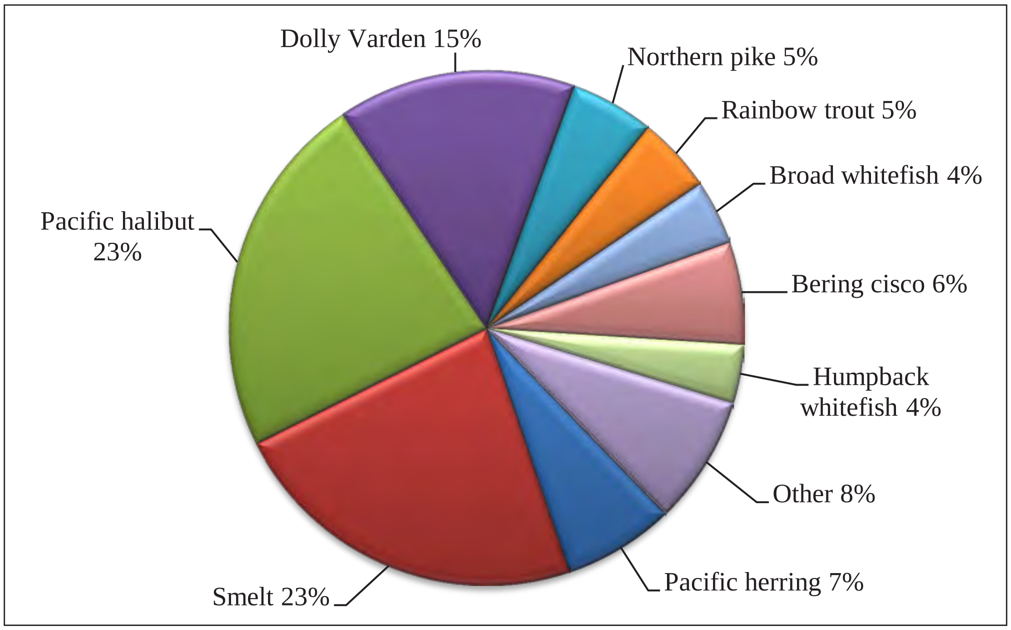


Figure 4-9.–Composition of edible nonsalmon fish harvest, Quinhagak, 2013.

Nonsalmon fish

During the study year 2013, Quinhagak households harvested at least 18 different types of nonsalmon fish for a community total of 33,072 lb. Although nonsalmon fish contributed less than salmon in terms of estimated weight (33,072 lb versus 75,351 lb, respectively), the category accounted for a notable portion of Quinhagak's total harvest (Figure 4-5; Table 3-8). Per capita, Quinhagak residents harvested 45 lb of nonsalmon fish in 2013 (Table 4-8). Ninety-four percent (94%) of households reported using nonsalmon fish, and 83% reported harvesting it. Smelts and Dolly Varden were by far the most commonly harvested nonsalmon fish (60% and 51% respectively). Smelts accounted for nearly one-quarter of the nonsalmon harvest, or 10 lb per capita (Figure 4-9). Dolly Varden, known as "trout" to most Quinhagak residents, provided 7 lb per capita, or 15% of the nonsalmon fish harvest (Plate 4-3; Figure 4-9). Pacific halibut also provided 10 lb per capita, but was harvested by only 16% of households. Even with the low percentage of households harvesting Pacific halibut, it was used by 69% of households and received by 61% (the most received nonsalmon fish), demonstrating the prevalence and importance of sharing within the community. Smelts were used by 73% of households and received by 20% of households, and Dolly Varden was used by 62% of households and received by 22%. Of the whitefish species, Bering cisco was the most used (36%), the most harvested (28%), and the most received (14%).

Figure 4-10 is a visual representation of the number of nonsalmon fish harvested by gear type in 2013. In total, 603 (549 lb) nonsalmon fish were removed from commercial harvests for home use (Table 4-13). The primary gear types used for harvesting nonsalmon fish were jigging gear (36%), rod and reel (25%), drift gillnets (22%), set gillnets (9%), dip nets (3%), and fish traps (1%; Table 4-14). In addition, herring roe (49 lb) was reported as having been harvested by hand, and 55 lb of nonsalmon fish were harvested by other methods not stated (Table 4-13).

Dolly Varden and Bering cisco were harvested using the largest number of gear types. Respondents reported harvesting 1,925 (1,732 lb) Dolly Varden using a driftnet, 1,902 (1,712 lb) using jigging gear, 569 (512 lb) with rod and reel, and 535 (482 lb) using set gill nets. Bering cisco were harvested using jigging gear (800 fish, or 1,119 lb), drift gillnets (339 for 474 lb), set gillnets (253 for 354 lb), and rod and reel (131, or 183 lb).

Table 4-12 shows the types and amount of nonsalmon fish used for dog food. In 2013, 62 lb of smelts and 7 lb of saffron cod were used as dog food.

Plate 4-3.–(Clockwise from left) Cleaning trout, cutting trout, trout heads and strips, drying trout.

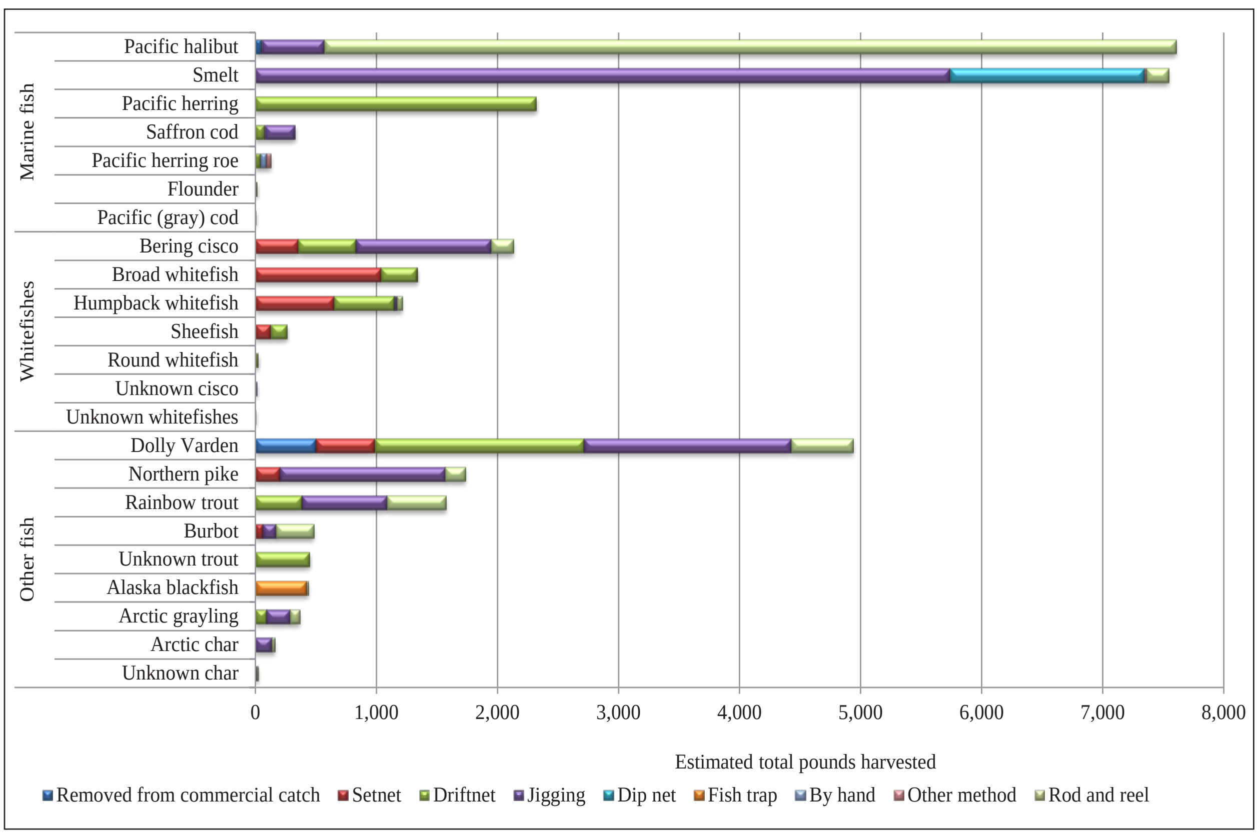


Figure 4-10.–Estimated nonsalmon fish harvests by gear type, Quinhagak, 2013.

Table 4-13.–Estimated nonsalmon fish harvests by gear type, Quinhagak, 2013.

				Subsistence methods											
		Removed from commercial catch		Setnet		Driftnet		Fish wheel		Jigging		Seine net		Dip
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]
Nonsalmon fish			**549.0**		**2,911.2**		**6,519.5**		**0.0**		**11,882.5**		**0.0**	
Pacific herring	gal	0.0	0.0	0.0	0.0	386.4	2,318.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe	gal	0.0	0.0	0.0	0.0	7.4	40.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	955.9	5,735.4	0.0	0.0	267.6
Pacific (gray) cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saffron cod	ind	0.0	0.0	0.0	0.0	89.2	73.4	0.0	0.0	306.2	252.1	0.0	0.0	0.0
Walleye pollock (whiting)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flounder	ind	0.0	0.0	4.5	4.9	7.4	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	lb	47.6	48.8	0.0	0.0	0.0	0.0	0.0	0.0	504.1	516.8	0.0	0.0	0.0
Arctic lamprey	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sculpin	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stickleback (needlefish)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	ind	0.0	0.0	26.0	62.4	0.0	0.0	0.0	0.0	44.6	107.0	0.0	0.0	0.0
Arctic char	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	148.6	133.8	0.0	0.0	0.0
Dolly Varden	ind	555.9	500.3	535.0	481.5	1,924.7	1,732.2	0.0	0.0	1,901.9	1,711.7	0.0	0.0	0.0
Unknown char	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	11.1	0.0	0.0	0.0
Arctic grayling	ind	0.0	0.0	0.0	0.0	92.1	92.1	0.0	0.0	193.2	193.2	0.0	0.0	0.0
Northern pike	ind	0.0	0.0	44.6	200.6	0.0	0.0	0.0	0.0	303.7	1,366.6	0.0	0.0	0.0
Sheefish	ind	0.0	0.0	20.8	124.8	22.3	133.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow trout	ind	0.0	0.0	0.0	0.0	275.0	384.9	0.0	0.0	500.9	701.2	0.0	0.0	0.0
Unknown trout	ind	0.0	0.0	0.0	0.0	148.6	445.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	0.0	0.0	258.6	1,034.4	74.3	297.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bering cisco	ind	0.0	0.0	252.7	353.7	338.9	474.4	0.0	0.0	799.6	1,119.4	0.0	0.0	0.0
Least cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.9	10.4	0.0	0.0	0.0
Humpback whitefish	ind	0.0	0.0	215.5	646.5	166.5	499.4	0.0	0.0	7.4	22.3	0.0	0.0	0.0
Round whitefish	ind	0.0	0.0	0.0	0.0	37.2	18.6	0.0	0.0	3.0	1.5	0.0	0.0	0.0
Unknown whitefishes	ind	0.0	0.0	7.4	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

-continued-

Table 4-13.–Continued.

		Subsistence methods											
		Fish trap		By hand		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**419.1**		**49.0**		**55.0**		**23,442.3**		**9,080.3**		**33,071.6**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	386.4	2,318.5	0.0	0.0	386.4	2,318.5
Pacific herring roe	gal	0.0	0.0	8.9	49.0	6.8	37.2	23.1	127.1	0.0	0.0	23.1	127.1
Smelt	gal	0.0	0.0	0.0	0.0	3.0	17.8	1,226.5	7,359.1	30.7	183.9	1,257.2	7,543.0
Pacific (gray) cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	3.7	7.4	3.7
Saffron cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	395.3	325.5	0.0	0.0	395.3	325.5
Walleye pollock (whiting)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flounder	ind	0.0	0.0	0.0	0.0	0.0	0.0	11.9	13.1	0.0	0.0	11.9	13.1
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	504.1	516.8	6,868.8	7,040.9	7,420.5	7,606.4
Arctic lamprey	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sculpin	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stickleback (needlefish)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	lb	419.1	419.1	0.0	0.0	0.0	0.0	419.1	419.1	17.8	17.8	437.0	437.0
Burbot	ind	0.0	0.0	0.0	0.0	0.0	0.0	70.6	169.4	130.0	312.1	200.6	481.5
Arctic char	ind	0.0	0.0	0.0	0.0	0.0	0.0	148.6	133.8	29.7	26.8	178.3	160.5
Dolly Varden	ind	0.0	0.0	0.0	0.0	0.0	0.0	4,361.6	3,925.5	569.2	512.3	5,486.7	4,938.0
Unknown char	ind	0.0	0.0	0.0	0.0	0.0	0.0	7.4	11.1	7.4	11.1	14.9	22.3
Arctic grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	285.4	285.4	81.7	81.7	367.1	367.1
Northern pike	ind	0.0	0.0	0.0	0.0	0.0	0.0	348.3	1,567.2	37.2	167.2	385.4	1,734.4
Sheefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	43.1	258.6	0.0	0.0	43.1	258.6
Rainbow trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	775.8	1,086.1	349.3	489.0	1,125.1	1,575.1
Unknown trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	148.6	445.9	0.0	0.0	148.6	445.9
Broad whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	332.9	1,331.7	1.5	5.9	334.4	1,337.6
Bering cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	1,391.1	1,947.6	130.8	183.1	1,521.9	2,130.7
Least cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	14.9	10.4	0.0	0.0	14.9	10.4
Humpback whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	389.4	1,168.2	14.9	44.6	404.3	1,212.8
Round whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	40.1	20.1	0.0	0.0	40.1	20.1
Unknown whitefishes	ind	0.0	0.0	0.0	0.0	0.0	0.0	7.4	2.2	0.0	0.0	7.4	2.2

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

Note The summary row that includes incompatible units of measure for harvest numbers has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

Table 4-14.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Quinhagak, 2013.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Fish wheel	Jigging	Seine net	Dip net	Fish trap	By hand	Other method	Subsistence gear, any method	Rod and reel	Any method
Nonsalmon fish	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**100.0%**	**0.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**2.7%**	**8.9%**	**21.6%**	**0.0%**	**36.0%**	**0.0%**	**2.8%**	**0.7%**	**0.1%**	**0.1%**	**72.0%**	**25.2%**	**100.0%**
	Total	**2.7%**	**8.9%**	**21.6%**	**0.0%**	**36.0%**	**0.0%**	**2.8%**	**0.7%**	**0.1%**	**0.1%**	**72.0%**	**25.2%**	**100.0%**
Pacific herring	Gear type	0.0%	0.0%	28.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.4%	0.0%	6.1%
	Resource	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	6.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.1%	0.0%	6.1%
Pacific herring roe	Gear type	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	67.6%	0.5%	0.0%	0.3%
	Resource	0.0%	0.0%	32.2%	0.0%	0.0%	0.0%	0.0%	0.0%	26.0%	19.7%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.3%	0.0%	0.3%
Smelt	Gear type	0.0%	0.0%	0.0%	0.0%	41.7%	0.0%	100.0%	0.0%	0.0%	32.4%	26.7%	1.9%	19.8%
	Resource	0.0%	0.0%	0.0%	0.0%	76.0%	0.0%	14.3%	0.0%	0.0%	0.2%	97.6%	2.4%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	15.0%	0.0%	2.8%	0.0%	0.0%	0.0%	19.3%	0.5%	19.8%
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%
	Resource	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	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Saffron cod	Gear type	0.0%	0.0%	0.9%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	0.9%
	Resource	0.0%	0.0%	22.6%	0.0%	77.4%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.2%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.9%
Walleye pollock (whiting)	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%
	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%
	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%
Flounder	Gear type	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	37.5%	62.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	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%
Pacific halibut	Gear type	4.6%	0.0%	0.0%	0.0%	3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	73.1%	19.9%
	Resource	0.6%	0.0%	0.0%	0.0%	6.8%	0.0%	0.0%	0.0%	0.0%	0.0%	6.8%	92.6%	100.0%
	Total	0.1%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	18.4%	19.9%
Arctic lamprey	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%
	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%
	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%
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%
	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%
	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%
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%
	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%
	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%
Alaska blackfish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	1.5%	0.2%	1.1%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	64.5%	0.0%	0.0%	95.9%	4.1%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	1.1%	0.0%	1.1%
Burbot	Gear type	0.0%	1.8%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	3.2%	1.3%
	Resource	0.0%	13.0%	0.0%	0.0%	22.2%	0.0%	0.0%	0.0%	0.0%	0.0%	35.2%	64.8%	100.0%
	Total	0.0%	0.2%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.8%	1.3%

-continued-

Table 4-14.–Page 2 of 2.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Fish wheel	Jigging	Seine net	Dip net	Fish trap	By hand	Other method	Subsistence gear, any method	Rod and reel	Any method
Arctic char	Gear type	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.3%	0.4%
	Resource	0.0%	0.0%	0.0%	0.0%	83.3%	0.0%	0.0%	0.0%	0.0%	0.0%	83.3%	16.7%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%	0.4%
Dolly Varden	Gear type	47.6%	14.2%	21.0%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	14.3%	5.3%	12.9%
	Resource	10.1%	9.8%	35.1%	0.0%	34.7%	0.0%	0.0%	0.0%	0.0%	0.0%	79.5%	10.4%	100.0%
	Total	1.3%	1.3%	4.5%	0.0%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	10.3%	1.3%	12.9%
Unknown char	Gear type	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
	Resource	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	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%	0.1%
Arctic grayling	Gear type	0.0%	0.0%	1.1%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.8%	1.0%
	Resource	0.0%	0.0%	25.1%	0.0%	52.6%	0.0%	0.0%	0.0%	0.0%	0.0%	77.7%	22.3%	100.0%
	Total	0.0%	0.0%	0.2%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.2%	1.0%
Northern pike	Gear type	0.0%	5.9%	0.0%	0.0%	9.9%	0.0%	0.0%	0.0%	0.0%	0.0%	5.7%	1.7%	4.5%
	Resource	0.0%	11.6%	0.0%	0.0%	78.8%	0.0%	0.0%	0.0%	0.0%	0.0%	90.4%	9.6%	100.0%
	Total	0.0%	0.5%	0.0%	0.0%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	4.1%	0.4%	4.5%
Sheefish	Gear type	0.0%	3.7%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.7%
	Resource	0.0%	48.3%	51.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.7%
Rainbow trout	Gear type	0.0%	0.0%	4.7%	0.0%	5.1%	0.0%	0.0%	0.0%	0.0%	0.0%	3.9%	5.1%	4.1%
	Resource	0.0%	0.0%	24.4%	0.0%	44.5%	0.0%	0.0%	0.0%	0.0%	0.0%	69.0%	31.0%	100.0%
	Total	0.0%	0.0%	1.0%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	1.3%	4.1%
Unknown trout	Gear type	0.0%	0.0%	5.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	1.2%
	Resource	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	1.2%
Broad whitefish	Gear type	0.0%	30.5%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.8%	0.1%	3.5%
	Resource	0.0%	77.3%	22.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%	0.4%	100.0%
	Total	0.0%	2.7%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%	0.0%	3.5%
Bering cisco	Gear type	0.0%	10.4%	5.7%	0.0%	8.1%	0.0%	0.0%	0.0%	0.0%	0.0%	7.1%	1.9%	5.6%
	Resource	0.0%	16.6%	22.3%	0.0%	52.5%	0.0%	0.0%	0.0%	0.0%	0.0%	91.4%	8.6%	100.0%
	Total	0.0%	0.9%	1.2%	0.0%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	5.1%	0.5%	5.6%
Least cisco	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%
	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%
	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%
Unknown cisco	Gear type	0.0%	0.0%	0.0%	0.0%	0.1%	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%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	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%
Humpback whitefish	Gear type	0.0%	19.1%	6.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	4.2%	0.5%	3.2%
	Resource	0.0%	53.3%	41.2%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	96.3%	3.7%	100.0%
	Total	0.0%	1.7%	1.3%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%	0.1%	3.2%
Round whitefish	Gear type	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
	Resource	0.0%	0.0%	92.6%	0.0%	7.4%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
Unknown whitefishes	Gear type	0.0%	0.1%	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%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	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%

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

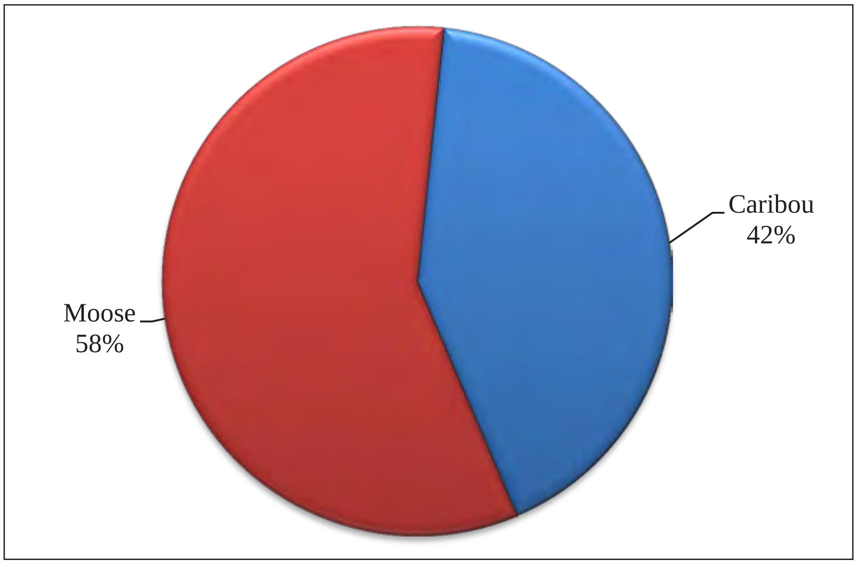


Figure 4-11.–Composition of edible large land mammal harvest, Quinhagak, 2013.

Large Land Mammals

Large land mammals, particularly moose and caribou, contributed substantially to the diets of Quinhagak's residents. Overall, 83% of Quinhagak's residents used large land mammals, and 36% harvested the resource (Table 4-8). Although moose (received by 52% of households) and caribou (received by 43% of households) were the only large land mammals harvested, 1% of households also reported receiving black bear meat, and 1% reported receiving muskox meat. Because there was no reported harvest of these 2 species, this meat was likely received through gift giving or sharing with people from other communities or from unsurveyed households within Quinhagak.

Of the 38,702 lb (53 lb per capita) of large land mammals harvested by Quinhagak residents in 2013, 58% came from moose (22,472 lb total or 31 lb per capita; Table 4-8; Figure 4-11). Caribou provided 42% of the total large land mammal meat (16,230 lb or 22 lb per capita).

The following is an example of how one young hunter views her hunt for moose as not just a simple quest for food, but also as a cultural and spiritual integration of what her elders have taught her concerning hunting, processing, and sharing. In answer to a researcher's question concerning large land mammal hunting and traditional beliefs, this respondent described in detail her 2013 search, harvest and sharing of moose in the shortened and edited quotation below:

> It depends on species or the kind of hunt. But I think moose is the most powerful, [because] it's the biggest animal we hunt and it's the hardest animal to hunt. So, there's a lot of that, that inner prayer going on, before-during-after. And of course, it's also how you handle the animal. So it doesn't just end when you get the animal. You still have to respect it by taking care of it in time and not letting anything spoil and making sure you give [to] elder[s] and widows. My moose was on Nuqluk Creek. It was in a valley, and we packed [it] about a mile and a half.
>
> What my grandma asked to do, begging's not the right word, but asking the animal to come to you is what I did all the time in my head, and when I was alone, right before I got the moose, I sat for like maybe, hour and a half, until it got kinda dark and I figured, it was two and a half miles back to the camp. But while I sat there for those hour and a half, I was calling—I was doing female calls, with just my own voice, [because] I forgot my caller. And it worked. So it got dark [and] I start leaving and I was so sad because I figured that's probably our last chance. And then I kept looking back—looking back,

and one of my last look-backs is when I saw the moose come, and it was in the exact spot where I was sitting and calling him. So, that was exciting. And I thought, uh, it's most [likely] a bear. I looked through the binocs: it was a young bull. So, I don't know, some adrenaline hit me and I was running like, [the movie] Fast Runner (*laughter*). I remember looking around and seeing how fast I was running—I couldn't believe it (*chuckling*). Yeah. I just remember thinking I can't miss this one. We got pretty close, it even started trotting away, but I called it again and it came back. And then it just stood there not moving…and it did really feel like he was giving himself to me. And I don't know how he didn't smell me because they have the biggest noses ever. And the wind was going, and you know, he was downwind from me. So, he was staring at me, smelling me, just sitting there. It was weird; I think he was totally giving himself to me. When it fell into the trees, I thought, he ran off. Apparently he had just fallen into the trees [where there was a] big ditch all the way across…I can't be down here by myself; the grass was taller than me; I was in a ditch, in the dark. And, the whole time the moose was right next to me and I didn't even know it. So I went home [to camp] and they met me halfway and walked me back. And I said I might have shot a [moose]—I mean I might have killed a moose. It was the hardest night ever to try to sleep. Not knowing if that moose was there or if the bears got it, or if it ran off somewhere and died. Did I do everything right? Playing the whole scenario in my head over and over all night—I didn't sleep all night. So we woke up and checked it [and] he was there! I skin him. I skin all the legs and every piece. And then I slit the throat and I take out the tongue. And then I dig through the gut-pile and I take all the fat because all the elders love [that] fat surrounding the guts. And then I take the heart, the liver, the kidneys, and the arteries. I love the arteries. You can eat them raw or you could just cook them any old way. I had 'em raw in the field, you know like when we first open up a moose or a caribou. I can't really work with Western knives; I always cut myself when I do. I only know the *uluaq*. And then I took off all the meat from the neck, so that we don't have to carry the neck. But I couldn't leave the head even though there was 3 of us in a 16-foot boat, with all our gear and a moose. I still took the head (*chuckling*). Some people sacrifice and leave it, and when they do, they point it to the east, [toward the] sunrise; it's another form of ritual for respecting the animal. I have my usual elders I always give to anyway, for everything. I can never keep everything that I gather and hunt; I feel bad if I do. So, I have my regular elders I think of, and then my grandma usually picks more people. I kept a little, mainly scrap-stuff and organs and some bone-marrow. (041114KWN2)

In this retelling of her moose hunt, from the actual hunt through the field processing and to the ultimate sharing of the meat, this respondent shows us that there is much more to the pursuit of subsistence foods than just the actual harvest. She follows the advice of her elders, shows respect for the animal, learns new information to pass on, and adds 1 moose to the community's subsistence harvest for the year.

Table 4-15 shows the 2013 estimated large land mammal harvests by month and sex. No large land mammals were harvested during the months of May through August. For moose, September was the most intense harvest period for Quinhagak residents. Of a total of 42 moose, 36 were harvested during this month. Two moose were harvested in the month of February. The month or months in which 4 moose were harvested were unknown. Of the moose harvested in September, 31 were bull (male) moose, 5 were unknown, and no cow (female) moose were reported. Quinhagak hunters did harvest 2 cow moose in February. As with moose, caribou were harvested in every month except for the months of May through August. Of a total of 125 caribou harvested by Quinhagak residents, the greatest number were harvested in the winter and spring months of February (37) and March (28). The next highest harvest occurred in the fall month of September (22). The exact month of harvest of 9 caribou was unknown. Sixty-eight males were harvested in the months of January through April and September through December; the highest amounts were harvested in February (19), March (18) and September (13). Twenty-five female caribou were harvested in the months of February, March, September, November, and December; the highest harvest occurred in March (9).

Table 4-15.–Estimated large land mammal harvest by month and sex, Quinhagak, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
All large land mammals	**7.4**	**38.6**	**28.2**	**3.0**	**0.0**	**0.0**	**0.0**	**0.0**	**58.0**	**4.5**	**7.4**	**5.9**	**13.4**	**166.5**
Bison	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Black bear	0.0	0.0	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	7.4	37.2	28.2	3.0	0.0	0.0	0.0	0.0	22.3	4.5	7.4	5.9	8.9	**124.8**
Caribou, male	1.5	19.3	17.8	3.0	0.0	0.0	0.0	0.0	13.4	4.5	3.0	1.5	4.5	**68.4**
Caribou, female	0.0	4.5	8.9	0.0	0.0	0.0	0.0	0.0	3.0	0.0	4.5	4.5	0.0	**25.3**
Caribou, unknown sex	5.9	13.4	1.5	0.0	0.0	0.0	0.0	0.0	5.9	0.0	0.0	0.0	4.5	**31.2**
Moose	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	35.7	0.0	0.0	0.0	4.5	**41.6**
Moose, bull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.2	0.0	0.0	0.0	1.5	**32.7**
Moose, cow	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.5**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0	3.0	**7.4**
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
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.

Small Land Mammals/Furbearers

In 2013, Quinhagak residents harvested 13 different types of small land mammals. Nearly all of Quinhagak households that attempted to harvest small land mammals (25%) were successful (24%; Table 4-8). Twenty-nine percent (29%) of households used small land mammals, and 7% reported receiving this resource from others. Of the 444 individual small land mammals harvested in 2013, 162 were used only for their fur and were not consumed for food (Figure 4-12). In an effort to accurately estimate the edible pounds harvested by residents, Table 4-8 assigns a zero value to species that are not typically eaten. Red fox, mink, least weasel, gray wolf, and wolverine were not eaten by Quinhagak respondents and therefore have zero edible pounds attributed to them. A total of 1,713 lb (2 lb per capita) of edible meat came from small land mammals.

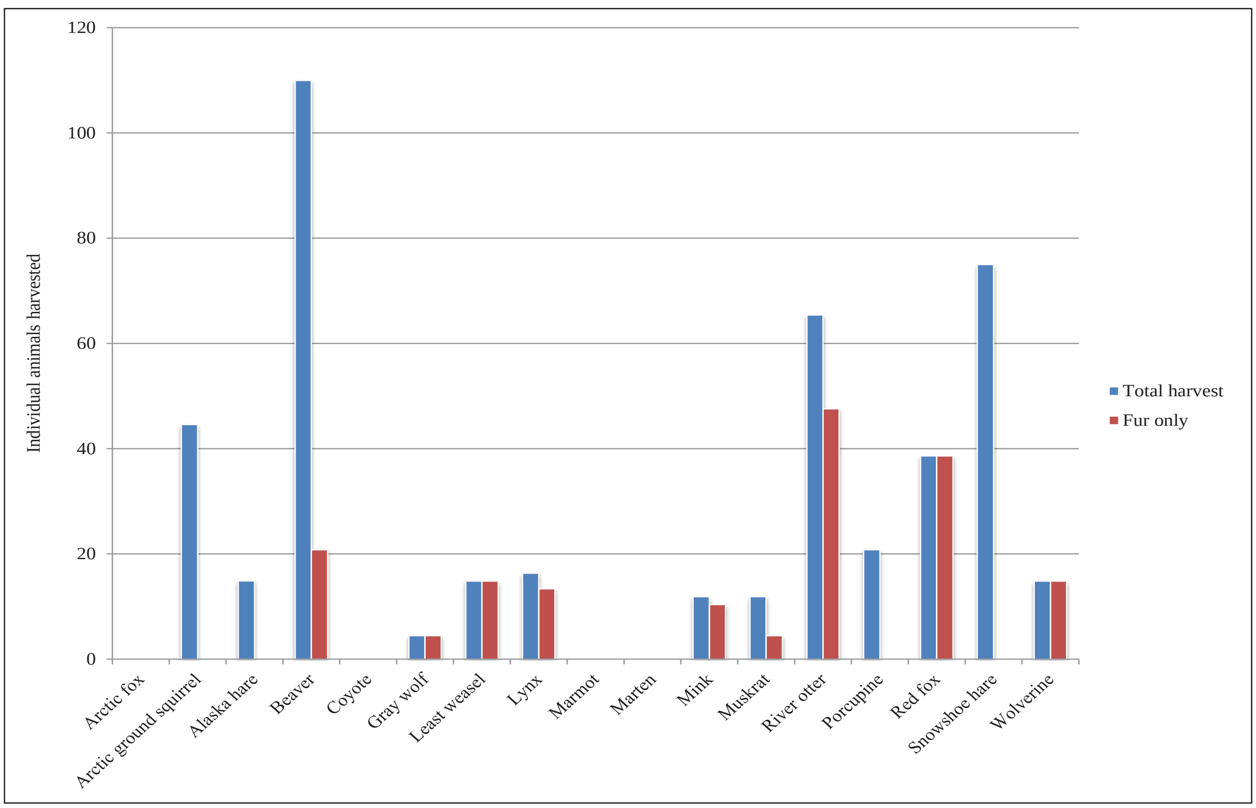


Figure 4-12.–Estimated small land mammal harvests for fur, Quinhagak, 2013.

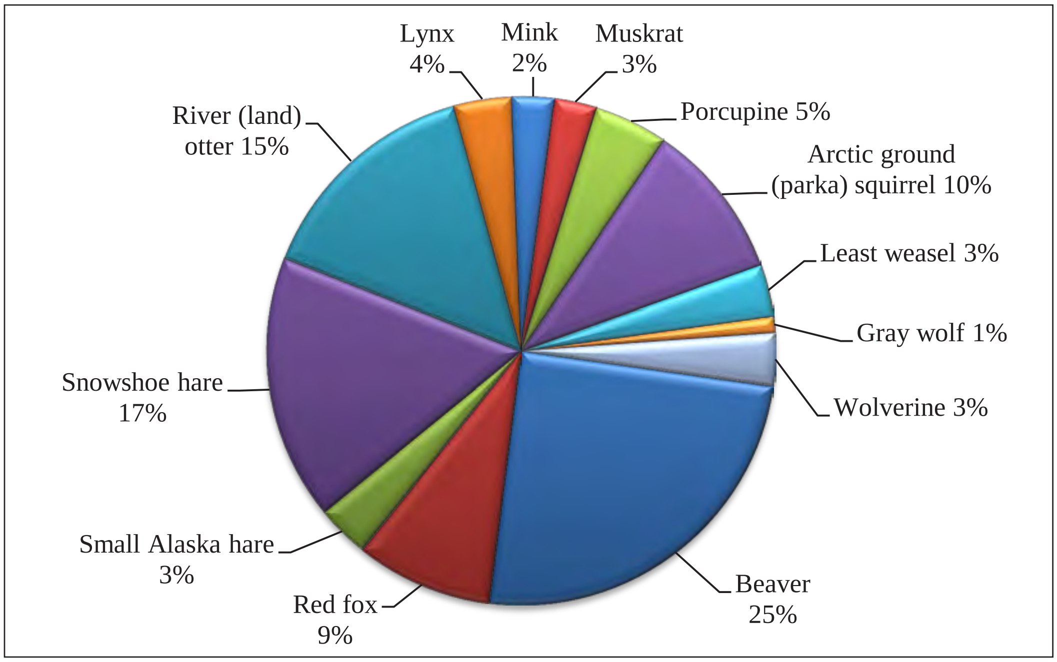


Figure 4-13.–Composition of small land mammal harvest in individual animals harvested, Quinhagak, 2013.

Figure 4-13 shows the composition of small land mammal harvest in 2013 by number of animals harvested. Beaver made up 25% of harvest, followed by snowshoe hare (17%), river (land) otter (15%), and Arctic ground (parka) squirrel (10%). Beaver was most harvested (by 12% of households) and most used (18%) small land mammal by the community (Table 4-8).

Survey respondents reported harvesting at least 1 type of small land mammal in every month of the year (Table 4-16). Beaver was harvested in all months except September and December, and the majority was harvested in the months of February (22) and January (18). The majority of snowshoe hare was harvested in the winter or spring, primarily in the months of February and March (28). In 2013, Arctic ground (parka) squirrels were harvested exclusively in April (45). In the past, according to respondents, squirrel hunting mostly occurred in the fall from family squirrel camps. One respondent noted that, "they would go up there [to squirrel camps] in the fall time. And, then when they, when they had enough, I mean, they would come down when it's winter, 'cause they, they'll just ride their dogs down in winter" (041514KWN1). Although people no longer hunt squirrels for their fur to the same extent as in the past, as late as the mid-1980s, a bundle of 45 untanned skins, enough to make 1 parka, sold for $150 (Rearden and Fienup-Riordan 2013).

Marine Mammals

Quinhagak residents harvested approximately 22,268 lb (30 lb per capita) of food from marine mammals in 2013 (Table 4-8; Plate 4-4). Seventy-seven households reported using some type of marine mammal. Of the 38% of households who reported searching for marine mammals, 33% were successful. Nearly two-thirds (60%) of household respondents received some type of marine mammal from others. Sharing of marine mammals is a very common practice in Quinhagak (Plate 4-5).

Spotted seal provided the most edible pounds of all marine mammals (6,242 lb, or 9 lb per capita), and it accounted for 28% of the total marine mammal harvest by weight (Table 4-8; Figure 4-14). Spotted seal was also the most used (46%), the most harvested (25%), and the most received (23%) marine mammal in 2013. Bearded seal contributed 4,370 lb (6 lb per capita) to the community and composed 20% of the marine mammal harvest by edible weight. Ringed seal contributed (3,912 lb, or 5 lb per capita) to the Quinhagak diet. Oil derived from seals was used by 32% of households and received by 32% of households (Plate

Table 4-16.–Estimated small land mammal harvests by month, Quinhagak, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
All small land mammals	**49.1**	**86.3**	**49.2**	**75.9**	**22.4**	**1.5**	**4.5**	**14.9**	**3.0**	**17.9**	**84.8**	**23.8**	**10.4**	**443.6**
Beaver	17.8	22.3	3.0	16.3	5.9	1.5	4.5	14.9	0.0	10.4	10.4	0.0	3.0	**110.0**
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Red fox	0.0	7.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.8	8.9	3.0	**38.6**
Alaska hare	4.5	1.5	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	**14.9**
Snowshoe hare	9.0	13.5	13.5	9.0	7.5	0.0	0.0	0.0	0.0	7.5	7.5	7.5	0.0	**75.0**
River (land) otter	7.4	14.9	0.0	0.0	7.4	0.0	0.0	0.0	3.0	0.0	32.7	0.0	0.0	**65.4**
Lynx	1.5	1.5	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	1.5	**16.3**
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	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	1.5	0.0	**11.9**
Muskrat	0.0	3.0	3.0	4.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**11.9**
Porcupine	0.0	7.4	11.9	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**20.8**
Arctic ground (parka) squirrel	0.0	0.0	0.0	44.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**44.6**
Least weasel	0.0	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	0.0	0.0	**14.9**
Gray wolf	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	**4.5**
Wolverine	3.0	4.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	4.5	0.0	**14.9**

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

Plate 4-4.–Cutting freshly-harvested seal.

Plate 4-5.–Dried marine mammal strips.

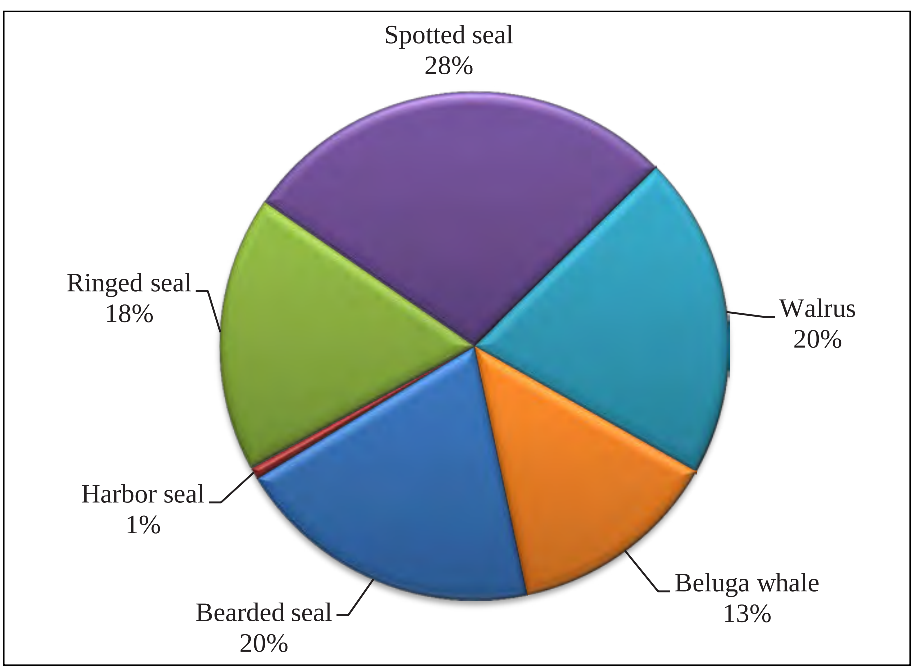


Figure 4-14.–Composition of edible marine mammal harvest, Quinhagak, 2013.

Plate 4-6.–Making seal oil.

4-6). One respondent describes how he hunted for seals using his 15-foot Lund boat with a 40-horsepower jet motor,

> …Yeah, we do that—ride around all day for seals…We just look for 'em. They're everywhere. Popping here and there [laughs]. [I use] 24, 30 gallons [of gas]. Sometimes even 12. Not much. Sometimes, when we wanna go close [to shore], we get by on only 12 gallons. There's tons [of seals] out there [in the Kuskokwim Bay]…not too far. Ten miles, 12 miles, 15, somewhere around there…They're always in the water. But right now [April] they're always in the ice. Ice and…sandbars. Resting, sleeping. We try [to] sneak up. We always try to sneak up on 'em, you know—go really slow, 'til I get really close and, shoot 'em. I just idle it [the boat]. You know…just start going and—we check the wind first and go with the wind 'til we're, which way's better…Then we try to get close enough to shoot 'em. (041614KWN7)

Quinhagak hunters also harvested walrus (estimated 4,578 lb or 6 lb per capita) and beluga whale (3,000 lb or 4 lb per capita; Table 4-8). Only 6% of Quinhagak respondents attempted to harvest beluga whale, and only 5% were successful. Seventeen percent of residents used beluga, and 14% of respondents received this resource. There was no attempt to harvest bowhead whale in 2013, because Quinhagak is not a bowhead whaling community, but 6% of respondents reported receiving some bowhead, most likely *muktuk*. Because there was no reported Quinhagak harvest of this particular marine resource, it had to have been acquired from outside the community through sharing networks.

The majority of marine mammals were harvested in the months of April, May, and September (in that order; Table 4-17). The only month in which any type of marine mammal was not hunted or harvested was January. Spotted seals were harvested in the months of April through September, the majority in April (52) and May (39). Bearded seals were harvested in the months of March through May, October, and September; the highest number was harvested in April (10). Most ringed seals were harvested in April (62). Respondents also harvested 3 harbor seals in April. Quinhagak households harvested 3 walrus in April and 3 in May. Of the 3 beluga whales that were harvested by the community, 1 was harvested in February, 1 in November, and 1 in December.

Ivory obtained from marine mammals, such as walrus tusks, and also "found" ivory from ancient large land mammals, such as mammoth tusks, are often used to create sellable art and crafts. Plates 4-7 and 4-8 show master carver Paul Bebee at his home work station making art and jewelry from ivory.

Table 4-17.–Estimated marine mammal harvests by month, Quinhagak, 2013.

Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
	Estimated harvest by month													
All marine mammals	**0.0**	**1.0**	**5.9**	**130.8**	**52.0**	**8.9**	**1.5**	**5.9**	**13.4**	**3.0**	**1.0**	**1.0**	**0.0**	**224.5**
Seal	0.0	0.0	5.9	127.8	49.0	8.9	1.5	5.9	13.4	3.0	0.0	0.0	0.0	**215.5**
Bearded seal	0.0	0.0	3.0	10.4	8.9	0.0	0.0	0.0	7.4	1.5	0.0	0.0	0.0	**31.2**
Harbor seal	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**3.0**
Ribbon seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Ringed seal	0.0	0.0	3.0	62.4	1.5	0.0	0.0	1.5	0.0	1.5	0.0	0.0	0.0	**69.9**
Spotted seal	0.0	0.0	0.0	52.0	38.6	8.9	1.5	4.5	5.9	0.0	0.0	0.0	0.0	**111.5**
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**
Walrus	0.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**5.9**
Whale	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	**3.1**
Beluga whale	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	**3.1**
Bowhead whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown marine mammals	0.0	0.0	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.

Plate 4-7.–Carver Paul Bebee sawing an ivory blank to make jewelry.

Plate 4-8.–Carver Paul Bebee making jewelry from mammoth ivory.

Birds and Eggs

Quinhagak is located in an excellent area in which to harvest a variety of migratory birds and bird eggs. In 2013, Quinhagak residents used at least 23 different types of birds and over 13 different types of eggs (Table 4-8). Ninety-three percent of Quinhagak residents used birds and eggs, obtained either by harvesting (78%) or by receiving (50%). Overall, birds and eggs contributed 22,360 lb (31 lb per capita) of subsistence food to the community. Figure 4-15 shows the composition of bird and egg harvest. The highest harvested birds by edible weight were white-fronted geese (36%), tundra (whistling) swans (14%), and ptarmigans (11%). Both white-fronted goose and ptarmigans are within the top 10 resources used by Quinhagak residents (Table 4-9).

With the exception of ptarmigans, Quinhagak residents harvested and used only migratory birds, which are available both in the spring and in the fall. Table 4-18 reports the harvest of birds and eggs by season. In 2013, the majority of birds was harvested in the spring (5,587). Of this total, 1,539 were white-fronted geese and 1,265 were ptarmigans. Canada geese (758), northern pintails (397), and mallards (305) were also harvested in abundance in springtime. Hunters harvested many fewer birds in the fall (720). White-fronted geese (341) and Canada geese (164) were the most harvested birds during the fall. Ptarmigans (2,394) were harvested in winter and spring, providing a much-needed source of meat during the lean late winter and early spring months.

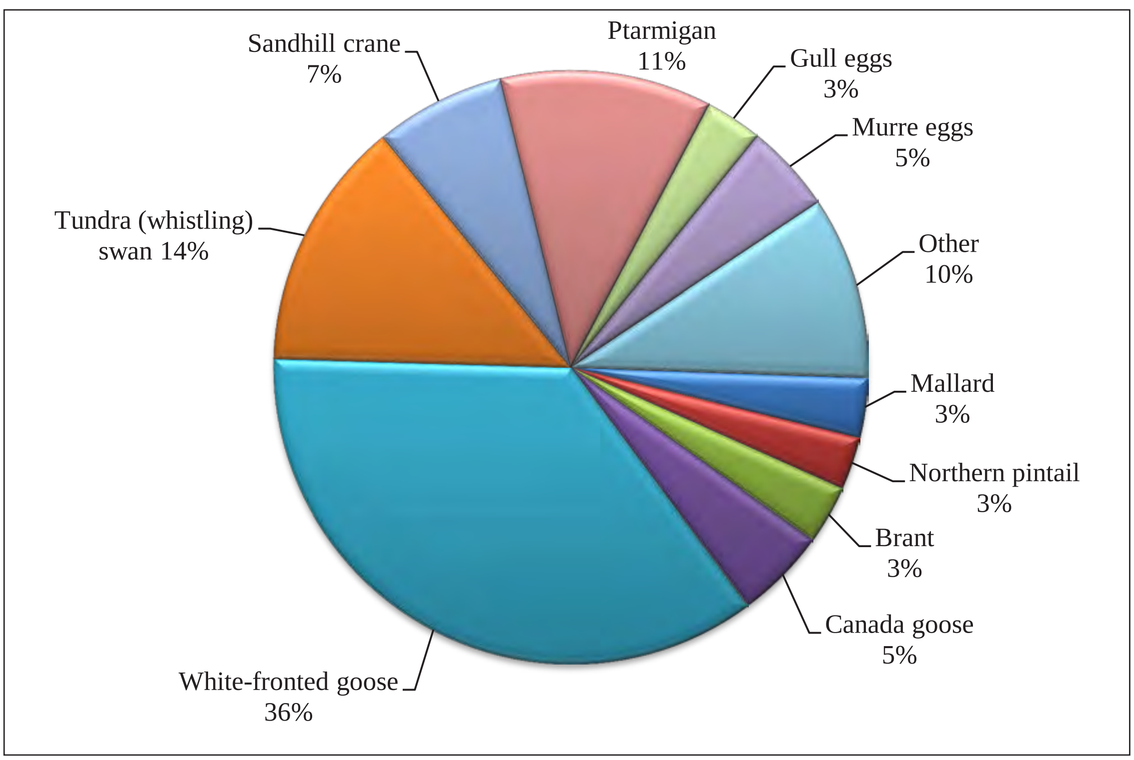


Figure 4-15.–Composition of edible bird and bird egg harvest, Quinhagak, 2013.

Table 4-18.–Estimated bird and bird egg harvests by season, Quinhagak, 2013.

	Estimated harvest by season					
Resource	Winter	Spring	Summer	Fall	Season unknown	**Total**
All birds	**2,413.3**	**16,503.4**	**5.9**	**719.5**	**26.9**	**19,669.0**
Bufflehead	0.0	0.0	0.0	0.0	0.0	**0.0**
Canvasback	0.0	17.8	0.0	0.0	0.0	**17.8**
King eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Steller's eider	0.0	1.5	0.0	0.0	0.0	**1.5**
Unknown eider	0.0	77.3	0.0	0.0	0.0	**77.3**
Goldeneye	0.0	65.4	0.0	14.9	0.0	**80.3**
Harlequin duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	0.0	304.7	0.0	56.5	11.9	**373.0**
Unknown merganser	19.3	68.4	0.0	0.0	0.0	**87.7**
Long-tailed duck	0.0	19.3	0.0	0.0	0.0	**19.3**
Northern pintail	0.0	396.8	0.0	32.7	0.0	**429.5**
Scaup	0.0	66.9	0.0	7.4	0.0	**74.3**
Black scoter	0.0	196.2	0.0	0.0	0.0	**196.2**
Surf scoter	0.0	29.7	0.0	0.0	0.0	**29.7**
White-winged scoter	0.0	46.1	0.0	0.0	0.0	**46.1**
Northern shoveler	0.0	83.2	0.0	0.0	0.0	**83.2**
Teal	0.0	4.5	5.9	0.0	0.0	**10.4**
American wigeon	0.0	22.3	0.0	0.0	0.0	**22.3**
Unknown duck	0.0	17.8	0.0	0.0	0.0	**17.8**
Brant	0.0	92.1	0.0	26.8	0.0	**118.9**
Canada goose	0.0	758.0	0.0	163.5	0.0	**921.5**
Emperor goose	0.0	35.7	0.0	0.0	0.0	**35.7**
Snow goose	0.0	29.7	0.0	37.2	0.0	**66.9**
White-fronted goose	0.0	1,539.0	0.0	340.5	0.0	**1,879.5**
Unknown goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	0.0	243.7	0.0	28.2	0.0	**272.0**
Sandhill crane	0.0	176.9	0.0	11.9	0.0	**188.8**
Shorebirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Seabirds, loons, grebes	0.0	29.7	0.0	0.0	0.0	**29.7**
Loon	0.0	0.0	0.0	0.0	0.0	**0.0**
Grouse	0.0	0.0	0.0	0.0	0.0	**0.0**
Ptarmigan	2,394.0	1,264.5	0.0	0.0	15.0	**3,673.5**
Duck eggs	0.0	683.7	0.0	0.0	0.0	**683.7**
Goose eggs	0.0	1,035.9	0.0	0.0	0.0	**1,035.9**
Swan eggs	0.0	102.6	0.0	0.0	0.0	**102.6**
Crane eggs	0.0	31.2	0.0	0.0	0.0	**31.2**
Common snipe eggs	0.0	11.9	0.0	0.0	0.0	**11.9**
Plover eggs	0.0	32.7	0.0	0.0	0.0	**32.7**
Whimbrel eggs	0.0	3.0	0.0	0.0	0.0	**3.0**
Godwit eggs	0.0	29.7	0.0	0.0	0.0	**29.7**
Unknown shorebird eggs	0.0	215.5	0.0	0.0	0.0	**215.5**
Unknown small shorebird eggs	0.0	37.2	0.0	0.0	0.0	**37.2**
Gull eggs	0.0	2,302.2	0.0	0.0	0.0	**2,302.2**
Loon eggs	0.0	37.2	0.0	0.0	0.0	**37.2**
Murre eggs	0.0	4,914.7	0.0	0.0	0.0	**4,914.7**
Tern eggs	0.0	487.5	0.0	0.0	0.0	**487.5**
Unknown seabird eggs	0.0	89.2	0.0	0.0	0.0	**89.2**
Ptarmigan eggs	0.0	267.5	0.0	0.0	0.0	**267.5**
Unknown eggs	0.0	634.6	0.0	0.0	0.0	**634.6**

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

Plate 4-9.–Murre egg wall art

Quinhagak residents gathered approximately 14,590 bird eggs in 2013, mostly murre eggs (4,915 individual eggs). Eggs contributed 2,519 lb (3 lb per capita) to the diet of residents (Table 4-8). Murre eggs made up 5% of all bird and egg harvests by edible weight (Figure 4-15). They were used by 16% of households, harvested by 6%, and received by 10%. Murre eggs were also used as material for making art and crafts (Plate 4-9). Gull eggs (2,302 eggs), which made up 3% of the bird and egg harvest, contributed 691 lb (1 lb per capita) to the community larder (Table 4-8; Figure 4-15). 28% of households reported using gull eggs, 24% reported harvesting them, and 4% reported receiving gull eggs (Table 4-8). All goose eggs combined totaled 1,036 eggs for 311 lb (4 lb per capita) to the community harvest. All duck eggs combined (684) contributed 103 lb, or 1 lb per capita. Respondents also reported harvesting eggs of swans, cranes, snipes, plovers, whimbrel, godwit, loons, terns, and ptarmigans in 2013.

All eggs were harvested in the spring when birds are nesting in the area (Table 4-18).

Marine Invertebrates

With the exception of clams, the harvest and use of marine invertebrates by Quinhagak residents in 2013 was minimal when compared to the harvest and use of other resources (Table 4-8). In addition to clams, households used only 2 other types of this resource: mussels and shrimp. Twelve percent of respondents reported using clams, 6% reported harvesting and 8% reported receiving clams; the total community harvest was 278 lb, or 0.4 lb per capita. The specific type of clams used is unknown. Less than 1% of households reported using, attempting to harvest, and harvesting mussels or shrimp, and no household reported receiving mussels or shrimp. Clams made up 98% of the total marine invertebrate category, mussels made up 2%, and shrimp made up less than 1% (Figure 4-16).

Vegetation

The vegetation category included berries, plants and greens, mushrooms, and wood. Wood is not measured in usable pounds, but it is a common subsistence resource used for smoking fish, drying other meats, craftwork, and home heating. Figure 4-17 shows the composition of the edible vegetation category. Berries made up 90% of the total vegetation harvest by weight, followed by plants and greens (10%) and mushrooms (1%).

Quinhagak households used 5 types of berries in 2013 (Table 4-8). Cloudberries (locally known as salmonberries), were the most used (by 91% of households) and the most harvested (85%). They contributed 7,918 lb (11 lb per capita) to the community from a total of 1,980 gallons, and they were the most shared type of berry. Thirty-one percent of households gave away cloudberries in 2013. Crowberries (locally known as blackberries) were the next most used (85%) and harvested (74%) of the berry types. Crowberries were received by more households (23%) than were cloudberries (14%). Crowberries contributed 7,927 lb (11 lb per capita) to the diet of Quinhagak residents. Nagoonberries were used by 68% of households. Of the 63% who attempted harvest of nagoonberries, all were successful (63%). Sixty-three percent of Quinhagak households used lowbush cranberries in 2013. Similar to nagoonberries, the same percentage of those who attempted harvest (56%) were successful at harvesting (56%). Blueberries were the least used (51%) of the berry types. Forty-eight percent (48%) of households were successful at harvesting blueberries.

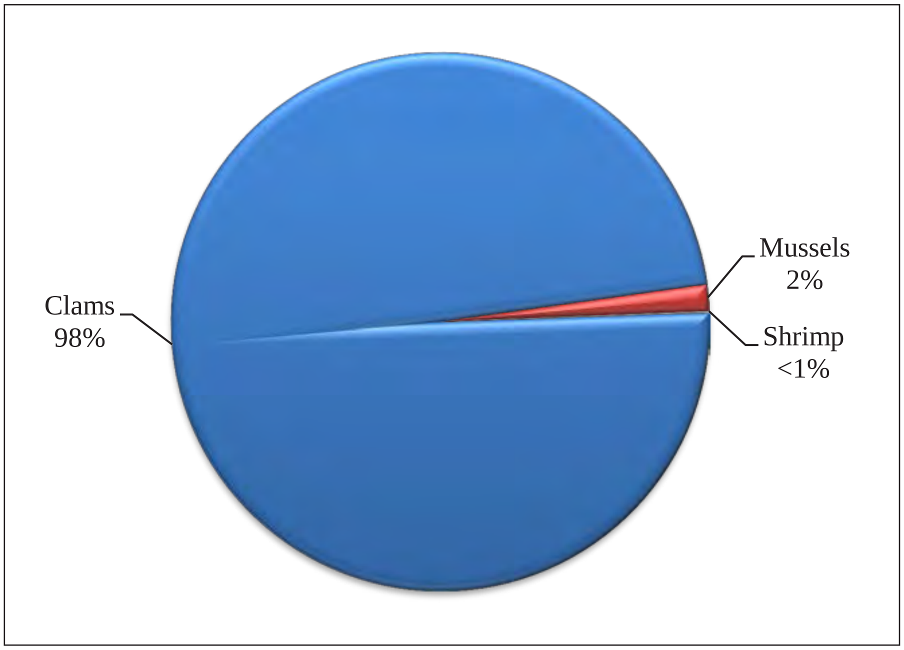


Figure 4-16.–Composition of edible marine invertebrate harvest, Quinhagak, 2013.

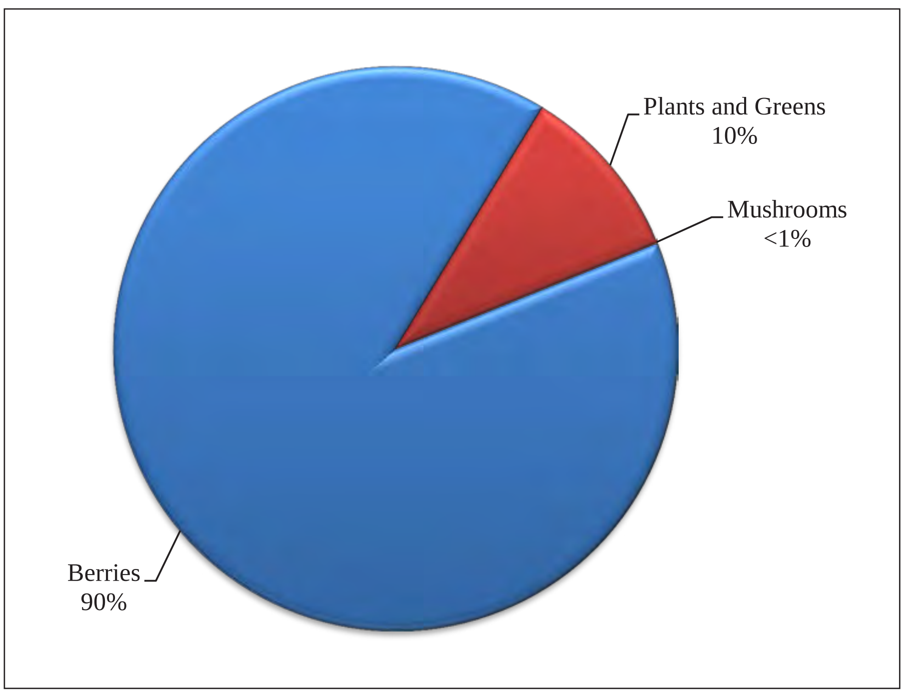


Figure 4-17.–Composition of edible vegetation harvest by type, Quinhagak, 2013.

Plate 4-10.–Dried caiggluk (stinkweed) to be processed and used as medicine.

Several types of plants and greens were used as food and for medicinal purposes by Quinhagak residents in 2013 (Plate 4-10).Within the vegetation category, various beach greens that are used by Quinhagak households are listed under the general term "other beach greens." This unspecified resource was used by 47% of households and harvested by 42% of households (Table 4-8). Beach greens contributed 515 lb (less than 1 lb per capita) to the community in 2013. Of specified plants and greens, Pallas buttercup, sourdock, Hudson's Bay (Labrador) tea, and stinkweed topped the list of most used (45%, 42%, 34%, and 28% respectively; Table 4-8; plates 4-11 and 4-12). An elder respondent noted, "…There's some stuff—greens, plants—out in the tundra that are edible…I told my kids to gather some greens when they're here. They're good—better than store-bought…yeah, 'cause they're not sprayed with that pest [pesticides]" (041614KWN4).

The most harvested plants and greens (excluding beach greens) were Pallas buttercup and sourdock, each harvested by 39% of households (Table 4-8). Pallas buttercup contributed 648 lb (less than 1 lb per capita) to the community, and sourdock contributed 579 lb (less than 1 lb per capita). A small mushroom harvest (5 lb) was used by less than 1% of households. Quinhagak residents also harvest a variety of grasses for use in traditional basket making and other crafts (plates 4-13 and 4-14).

The nonedible plant harvest included wood and punk (a fungus growth found on birch trees). The smoke from burning punk is often used as a mosquito repellent, and the burned ashes are sometimes mixed with tobacco and either chewed or smoked. Punk was used by 11% of households, harvested by 6%, and received by less than 1% of households (Table 4-8). Various types of wood (including driftwood) were used by 62% of Quinhagak households in 2013. All of those households that attempted to harvest wood (58%) were successful. Thirteen percent (13%) of respondents reported receiving wood, and 13% reported giving wood to others. The survey asked respondents to estimate how much of their home heating came from wood. Forty-two percent of respondents said that they did not use wood to heat their homes (Table 4-19). Only 3% said that 100% of their home heating came from wood. Nineteen percent of respondents reported that 26% to 50% of their home heating needs were met by wood.

Plate 4-11.–Dried Hudson's Bay tea before processing.

Plate 4-12.–Processing Hudson's Bay tea by boiling it in water.

Plate 4-13.–Paulinee Bebee displaying a current grass basked project and a photograph of herself as a young woman with grass baskets.

Plate 4-14.–A photograph of Pauline Bebee as a young woman with 3 grass baskets that she made.

Table 4-19.–Use of firewood for home heating, Quinhagak, 2013.

	Household use of wood for home heating as a percentage of sampled households													
	0%		1–25%		26–50%		51–75%		76–99%		100%		Did not respond	
Community	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Quinhagak	46	42.2%	20	18.3%	21	19.3%	10	9.2%	7	6.4%	3	2.8%	2	1.8%

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

Harvest Areas

As part of the survey, Quinhagak respondents were asked to mark on a map the areas in which they harvested or searched for subsistence resources. Maps were produced for 7 resource categories: salmon, nonsalmon fish, large land mammals, small land mammals, marine mammals, birds and eggs, and berries and greens. Additionally, a comprehensive map depicting the harvest and search areas for all resource categories combined was produced (Figure 4-18).

In 2013, Quinhagak respondents reported using approximately 8,495 square miles for subsistence search and harvest areas. Figure 4-18 shows that residents traveled extensively in the Yukon-Kuskokwim Delta region, utilizing areas within Kuskokwim Bay, Goodnews Bay, Hooper Bay, areas around the lower Yukon and Kuskokwim rivers, and the Kanektok, Arolik, Goodnews, and Kwethluk rivers. In addition to the immediate area of Quinhagak and the Kuskokwim Bay communities of Kongiganak and Kwigillingok, Quinhagak residents utilized areas near communities as far north as Emmonak to as far south as Twin Hills and Togiak. Residents also used areas near the Kuskokwim River communities of Eek, Napakiak, Bethel, and Kwethluk, and the Goodnews Bay communities of Platinum and Goodnews Bay. Search and harvest areas near the Johnson River (a tributary of the Kuskokwim River) included the communities of Nunapitchuk, Kasigluk, and Atmautluak. One respondent stated, “So Quinhagak [residents] goes all over the place, just to do subsistence life. The farthest I’ve gone is to the Yukon, Napaimute area, to go moose hunting” (041514KWN1).

Residents travel to such distant areas as the Igushik River, Eek, and the Johnson River area on the Kuskokwim not only because these are good areas for particular types of resources, but also to participate in subsistence activities with other family members and friends who live in the communities close to these areas.

The search and harvest areas for salmon, with the exception of a few outlying areas, were centered on the Kuskokwim Bay and the Kanektok and Arolik rivers (Figure 4-19). Additional areas included Goodnews Bay and the mouth of the Goodnews River, the mouth of the Eek River, the Kuskokwim River just below the mouth of the Johnson River, the Kuskokwim River near the community of Bethel, and the Hooper Bay area near the community of Hooper Bay.

In 2013, the search and harvest areas for nonsalmon fish occurred in a variety of locations according to species. Figure 4-20 depicts the search and harvest areas for burbot, northern pike, sheefish, and whitefish species. Quinhagak residents searched for and harvested burbot primarily in Eek Lake and a section of Eek River near the community of Eek. Northern pike was searched for and harvested in 3 major locations: the Kuskokwim River just downriver of the Johnson River and at the mouth of the Johnson River, along the Eek River from its mouth to just upriver of the community of Eek, and along the middle section of the Igushik River southeast of the communities of Togiak and Twin Hills. Sheefish search and harvest was concentrated in Eek Lake and the large wetland area southwest of Eek Lake; some search and harvest also occurred on the Eenayarak River and within the associated wetlands area.

Quinhagak residents searched for and harvested whitefishes in 4 major areas. The most extensive of these areas were the Kanektok River from near the headwaters to its mouth at Quinhagak and the Arolik River from near its headwaters to its mouth just south of Quinhagak. These 2 rivers are critical traditional whitefish harvest locations for residents. Respondents also reported searching for and harvesting whitefishes on the Kuskokwim River just downriver of the mouth of the Johnson River and near the community of Goodnews Bay. Whitefish species were also searched for and harvested a few miles up the Goodnews River from its mouth at Goodnews Bay.

The search for large land mammals (i.e., caribou and moose) by Quinhagak residents in 2013 consisted of a variety of locations (Figure 4-21). Although the search and harvest area for caribou was concentrated in the Quinhagak area and nearby mountains, the search and harvest for moose occurred in areas as far north as the Yukon River and as far south as the Goodnews Bay area. Overlap of search and harvest areas for both caribou and moose occurred near Quinhagak and the Kanektok and Arolik rivers and in the nearby mountains. In addition, residents searched for and harvested caribou from the Quinhagak area north to the Eek River area, both near the coast and inland. Concerning caribou, 1 respondent noted,

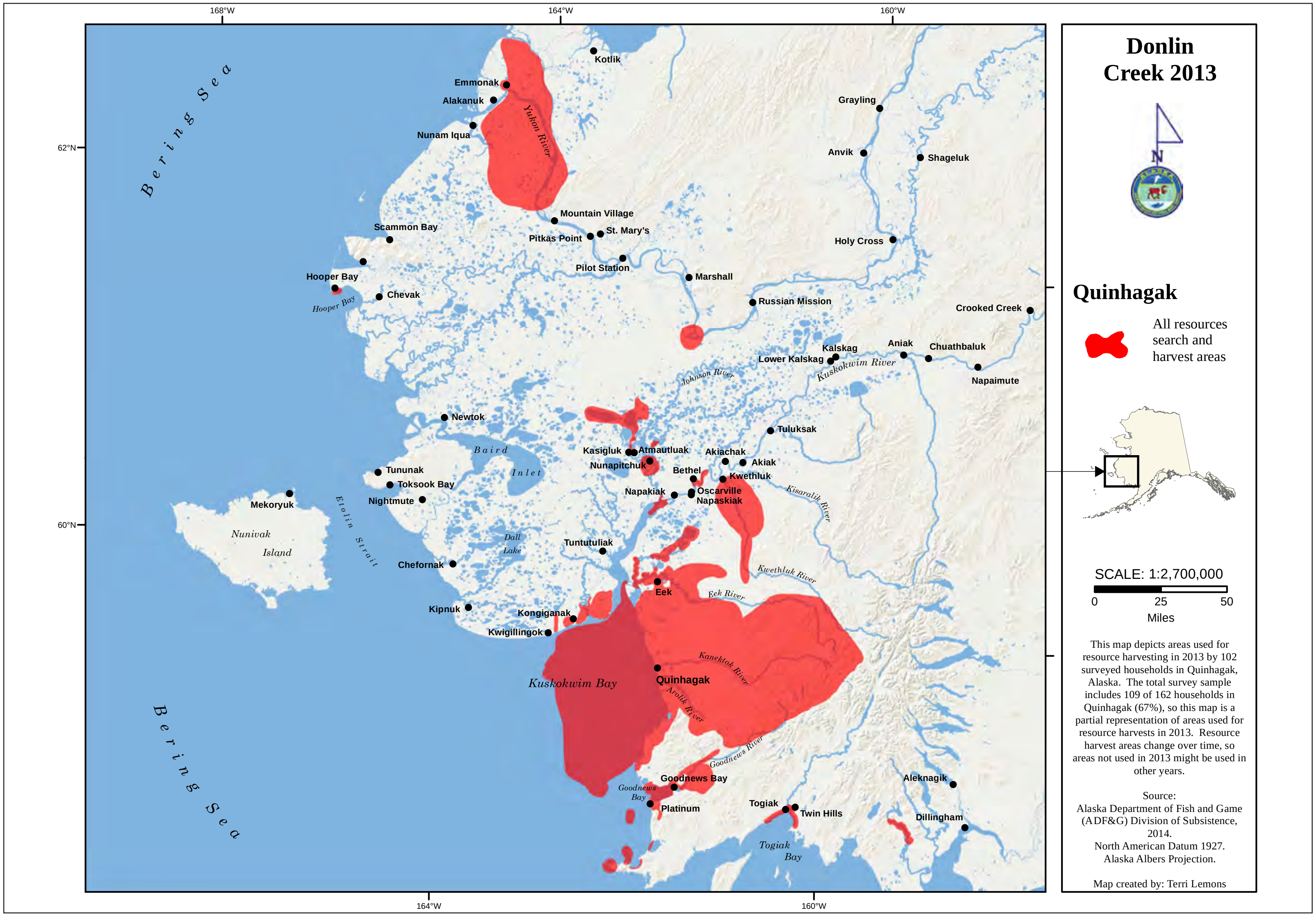


Figure 4-18.–Search and harvest areas, all resources, Quinhagak, 2013.

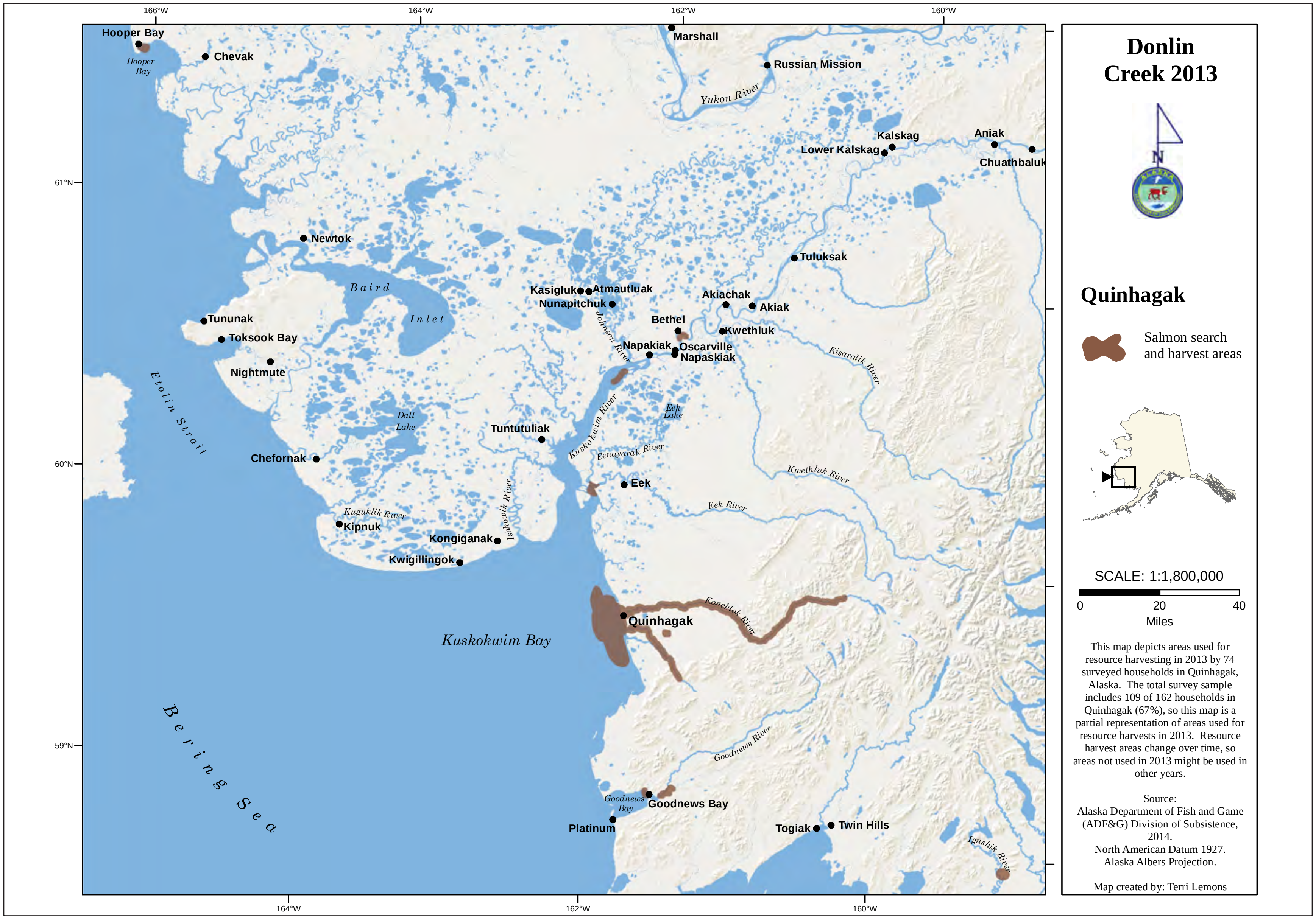


Figure 4-19.–Fishing and harvest areas, salmon, Quinhagak, 2013.

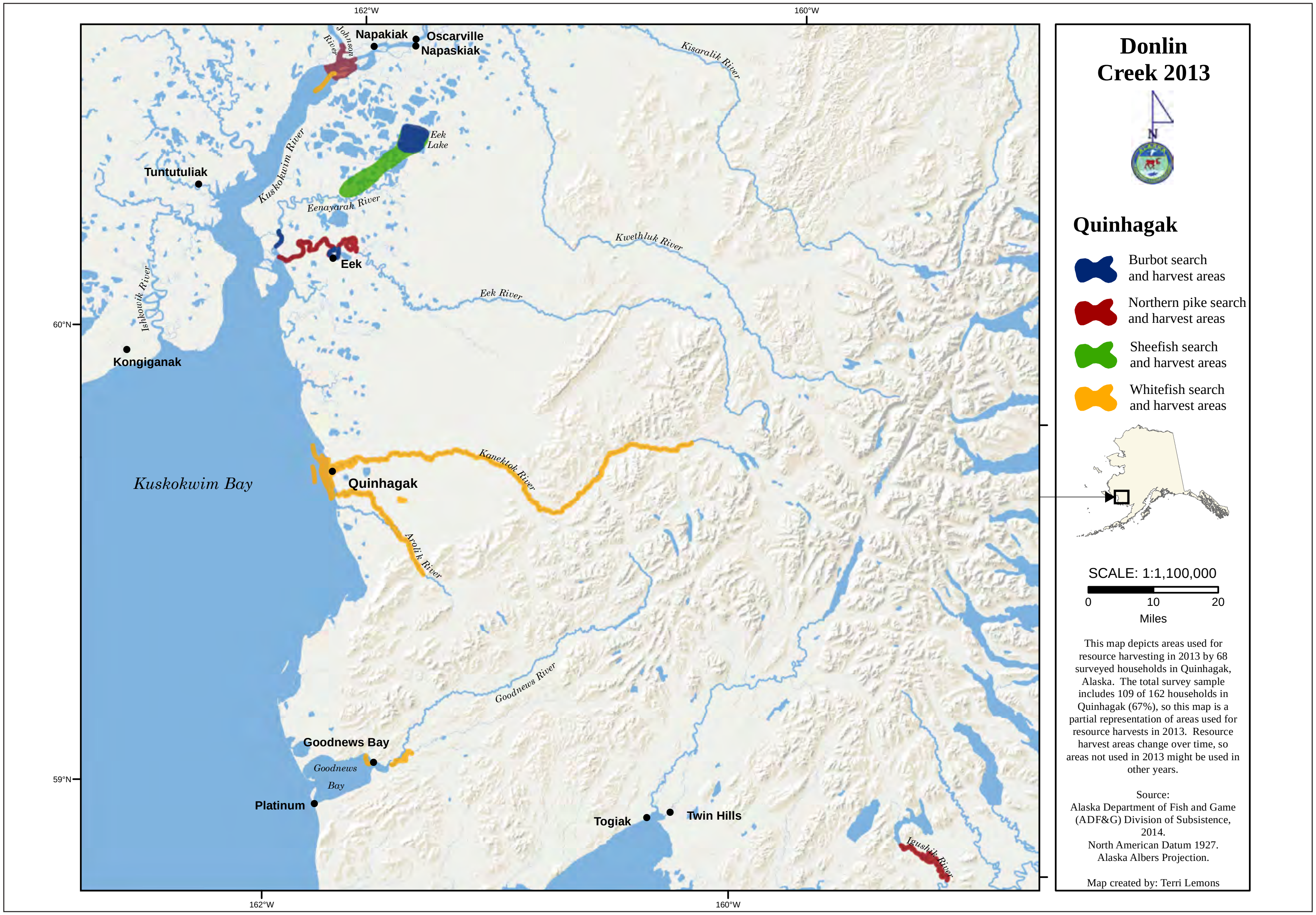


Figure 4-20.–Fishing and harvest areas, burbot, northern pike, sheefish, and whitefishes, Quinhagak, 2013.

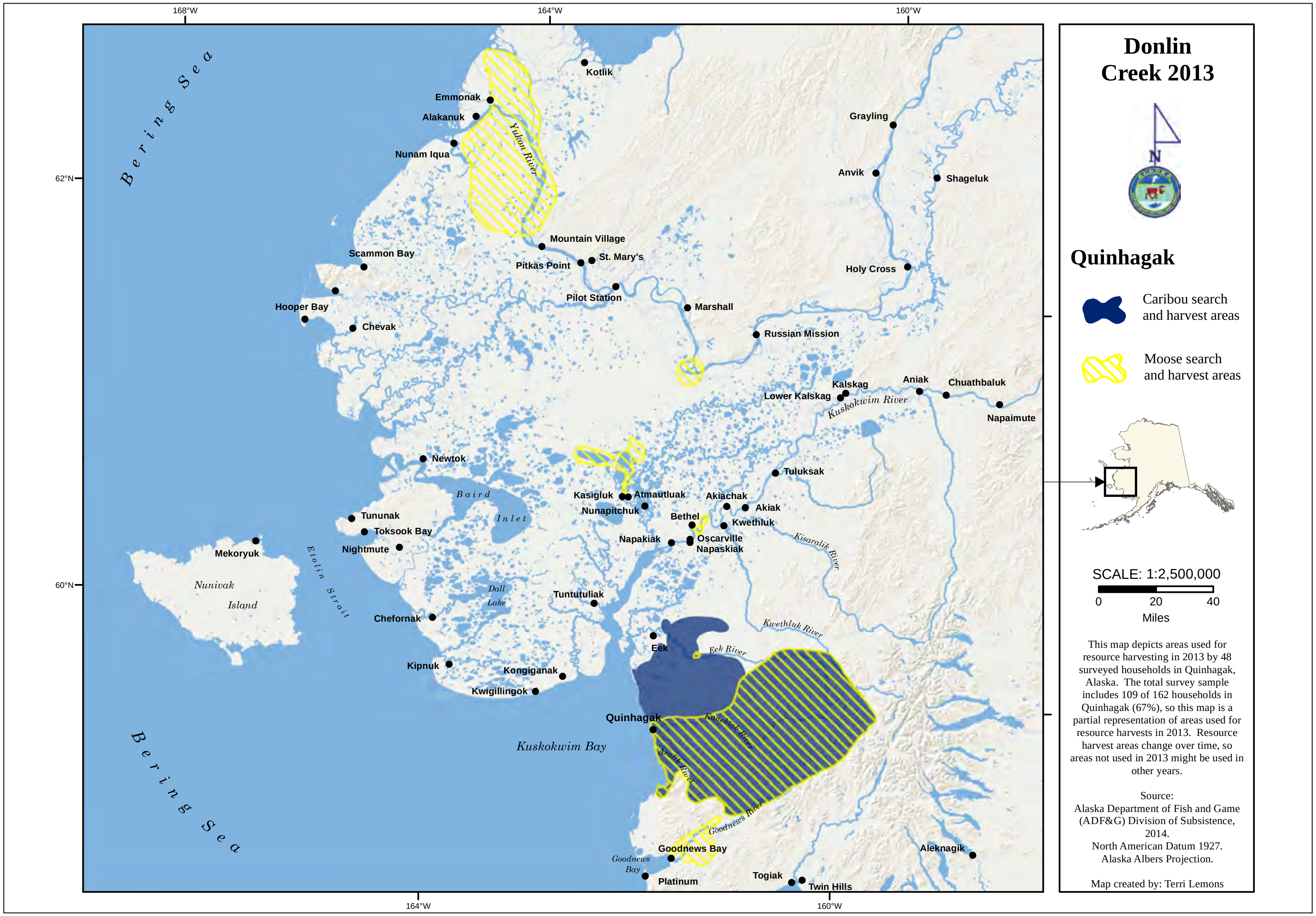


Figure 4-21.–Hunting and harvest areas, caribou and moose, Quinhagak, 2013.

> Yeah, caribou…Some people prefer caribou more than…moose. Maybe because they're more abundant. Or, they're easier to catch. But I prefer moose than caribou. We do hunt them, and there's abundance. There was one year back in what, early 2000s, where there was so much caribou it was not even funny. I mean, you couldn't have gone out there, you could literally see the tundra moving. There were thousands of tundra [caribou], the tundra was just packed full of caribou. Just looking out the window you can see them. Everywhere, I mean, there were massively everywhere. [There were] thousands of them. It was just ridiculous. One, I don't know what was going on, the caribou that year, they were just right there. But…nowadays…this year, they were catching them near Quinhagak…on the north mouth of Arolik. In the Bessie Creek area…People hunted them all over around here, didn't see anything. Up on the Kanektok River they didn't see anything. There was a small herd up on the Warehouse Creek area, on the trail going up to uh, Kisaralik. There were some around there that one person caught a couple of them. (041514KWN1)

In addition to the overlap area with caribou, respondents reported searching for and harvesting moose near the community of Goodnews Bay and the Goodnews River, a section of the Yukon River between the communities of Marshall and Russian Mission, a large area on both sides of the Yukon River from just downriver of Mountain Village to the lower river communities of Emmonak, Alakanuk, and Nunam Iqua, including an area north of Emmonak. Residents also used another moose search and harvest area along the Kuskokwim River near and a few miles upriver from the community of Bethel. In addition, Quinhagak hunters searched for and harvested moose in the large lake area just north of the communities of Kasigluk and Atmautluak.

The search and harvest of small land mammals by Quinhagak residents in 2013 occurred in 2 primary areas (Figure 4-22). The largest of these was a broad area of land near Quinhagak encompassing the entire lengths of both the Kanektok and Arolik Rivers, portions of the upper Goodnews River including its headwaters, and portions of the middle and upper Eek River including its headwaters. Quinhagak residents utilized nearly all of the mountainous and tundra areas located between the Eek River and the Goodnews River for the search and harvest of small land mammals. The smaller of the 2 areas was near the communities of Kasigluk and Atmautluak and in the extensive lake system north of these communities. One respondent said, "Snowshoe hares, they were abundant near the mountains, especially on the Arolik [River] side. You know, right on the, even Jacksmith Bay area, there were some around here" (041514KWN1).

In 2013, Quinhagak residents hunted and harvested marine mammals in 2 primary locations: Kuskokwim Bay and Goodnews Bay (Figure 4-23). Beluga whales and walrus were searched for and harvested exclusively in Kuskokwim Bay. Seals, on the other hand, were searched for and harvested in both Goodnews Bay and Kuskokwim Bay, overlapping in the Kuskokwim Bay with areas also used for the search and harvest of beluga whales and walrus. Seals were the only marine mammal searched for and harvested in Goodnews Bay and in a stretch of the Kuskokwim River extending several miles upriver from its mouth. Quinhagak residents utilized the greatest amount of area for the search and harvest of seals, as compared to other marine mammals (Plate 4-15). The area used for hunting walrus constituted the smallest area used for search and harvest of marine mammals in 2013.

Figure 4-24 shows the areas of search and harvest by residents of Quinhagak in 2013 for waterfowl and for ptarmigans and grouses. There was no reported harvest of grouses for the community in 2013, therefore the gray colored sections on the map indicate the search and harvest areas for ptarmigans only.

The search and harvest area for ducks and geese was more extensive and diverse than that for ptarmigans in 2013. Ducks and geese were searched for and harvested as far north as a portion of the Eek River northeast of the community of Eek to as far south as Chagvan Bay. Quinhagak residents searched for and harvested ducks and geese primarily along the coast of the Kuskokwim Bay both north and south of the community for several miles, and also for a few miles inland, near lakes, ponds, and other water sources on the tundra. In addition, residents searched for and harvested ducks and geese across the Kuskokwim Bay around the community of Kongiganak and near the mouth of the Ishkowik River. Ducks and geese were

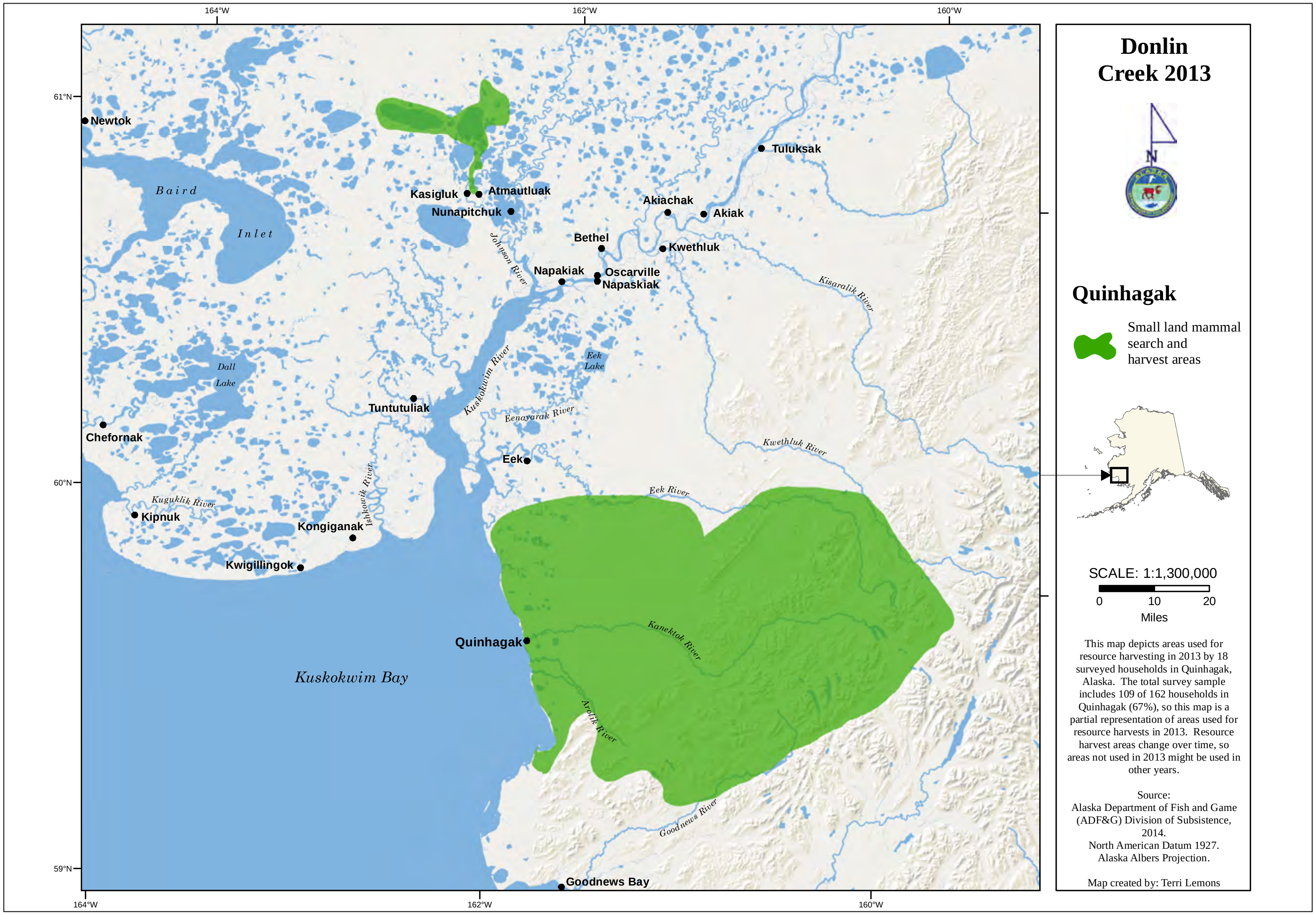


Figure 4-22.–Hunting and harvest areas, small land mammals, Quinhagak, 2013.

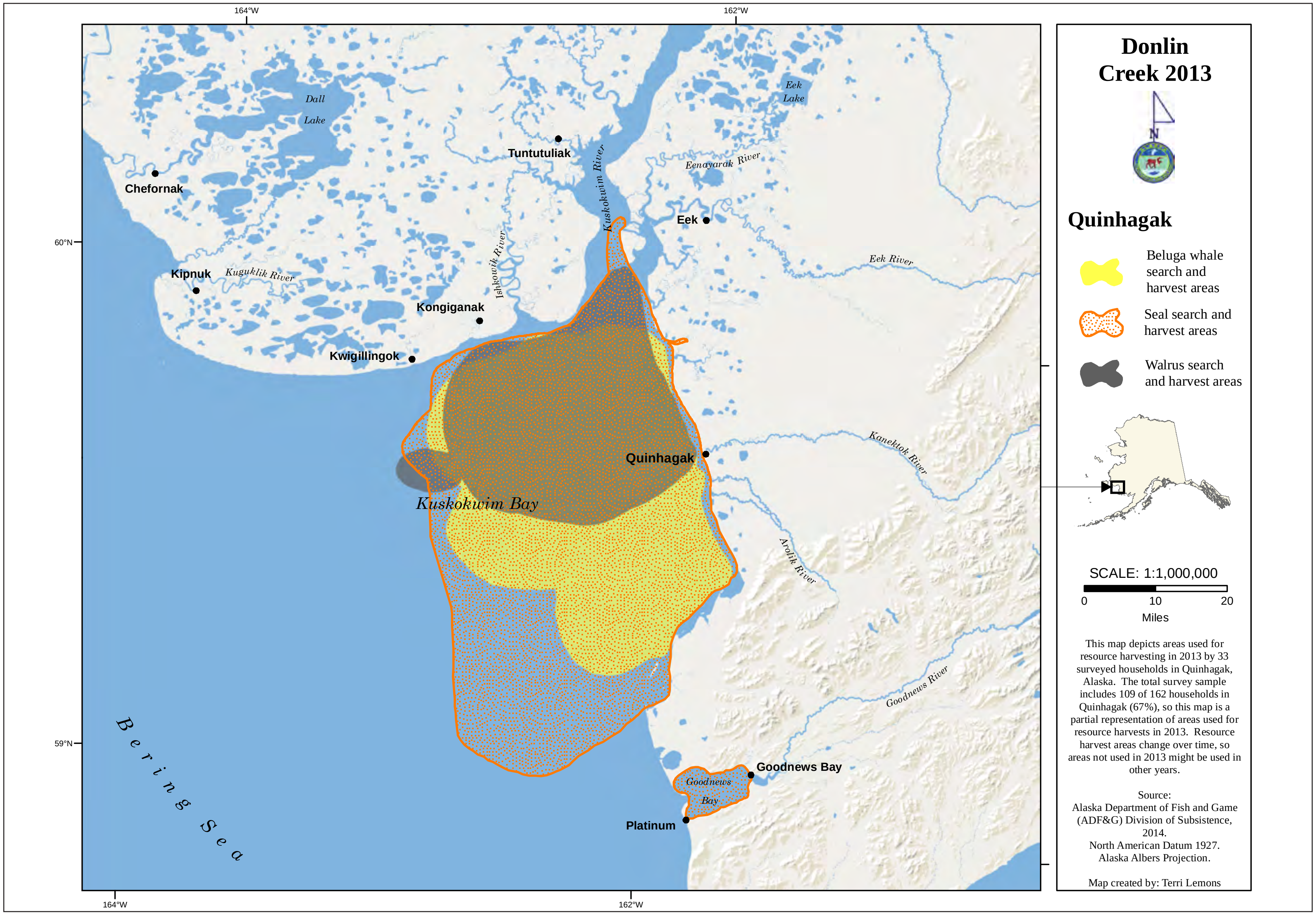


Figure 4-23.–Hunting and harvest areas, beluga whales, seals, and walruses, Quinhagak, 2013.

Plate 4-15.–A small cargo sled carrying freshly-harvested seal from Kuskokwim Bay.

also hunted and harvested in Goodnews Bay, near the community of Platinum, and in Kuskokwim Bay. Several respondents stated that they often harvested ducks and geese while they were on the Kuskokwim Bay pursuing other subsistence resources. Ptarmigans search and harvest areas overlapped with those of ducks and geese along the coast north and south of Quinhagak. Residents also utilized inland areas. One area extended for several miles up the Kanektok River from its mouth. Another area extended in a linear fashion for several miles overland between the Kanektok and Arolik rivers following the base of a mountain range. Many respondents reported harvesting ptarmigans opportunistically while searching for other subsistence resources. This last area may represent an opportunistic harvest of ptarmigans while working a trapline or searching for other subsistence resources in the foothills.

Quinhagak residents utilized several locations in their search and harvest of berries and greens. Figure 4-25 represents the search and harvest areas for these resources in 2013. One of the areas most used was a section of land stretching from Quinhagak approximately 40 miles north along the coast and approximately 10 miles inland from the coast. This included the area around the community of Eek and on both sides of the Eek River near that community. One elder respondent said, “For…salmonberries we used to camp up…Warehouse Creek, maybe 4 or 3 days…but nowadays…we always go [in] one day” (041614KWN4). Respondents also reported using several other areas north of Quinhagak including a small section on both sides of the Kwethluk River, the entire circumference of Eek Lake, and locations in the wetlands south of Eek Lake near the Eenayarak River. In addition, residents used locations near the headwaters of the Johnson River and the wetland areas near the communities of Nunapitchuk and Atmautluak.

Another large area that respondents reported using to gather berries and greens was located along both sides of the Kanektok River for almost its entire length. Quinhagak residents also searched for and harvested berries and greens south along the coast for approximately 60 miles. Other locations south of Quinhagak included the north side of Goodnews Bay, around the community of Goodnews Bay, and the area around and south of the community of Platinum. The same elder respondent stated, “I went to Platinum for blackberries…yeah, when you go there…you don’t look for berries. They’re all over. You don’t have to hunt for ‘em…just sit down and pick-pick-pick” (041614KWM4). A small section of the middle Igushik River southeast of Quinhagak was also used for the search and harvest of berries and greens in 2013.

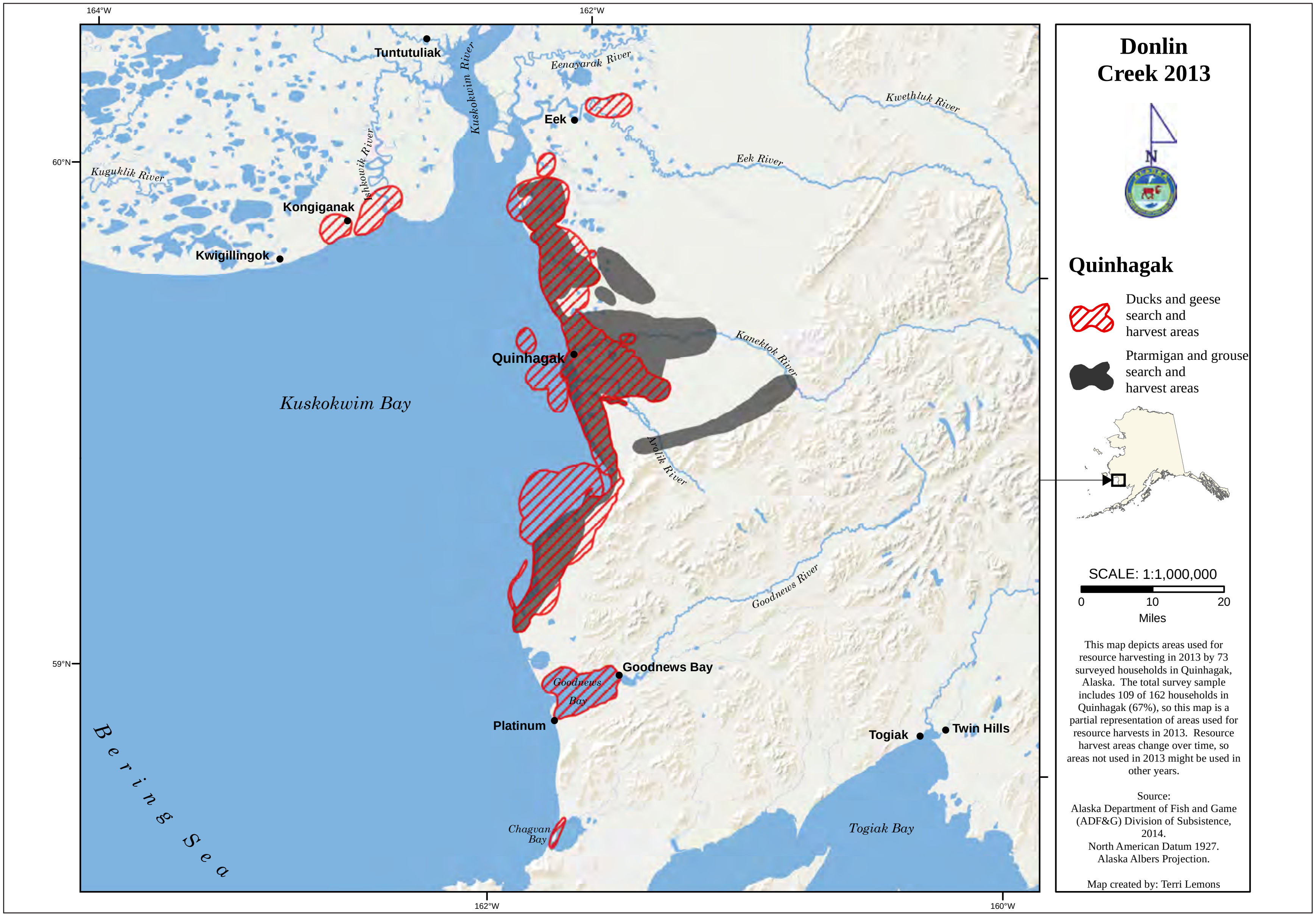


Figure 4-24.–Hunting and harvest areas, waterfowl and nonmigratory birds, Quinhagak, 2013.

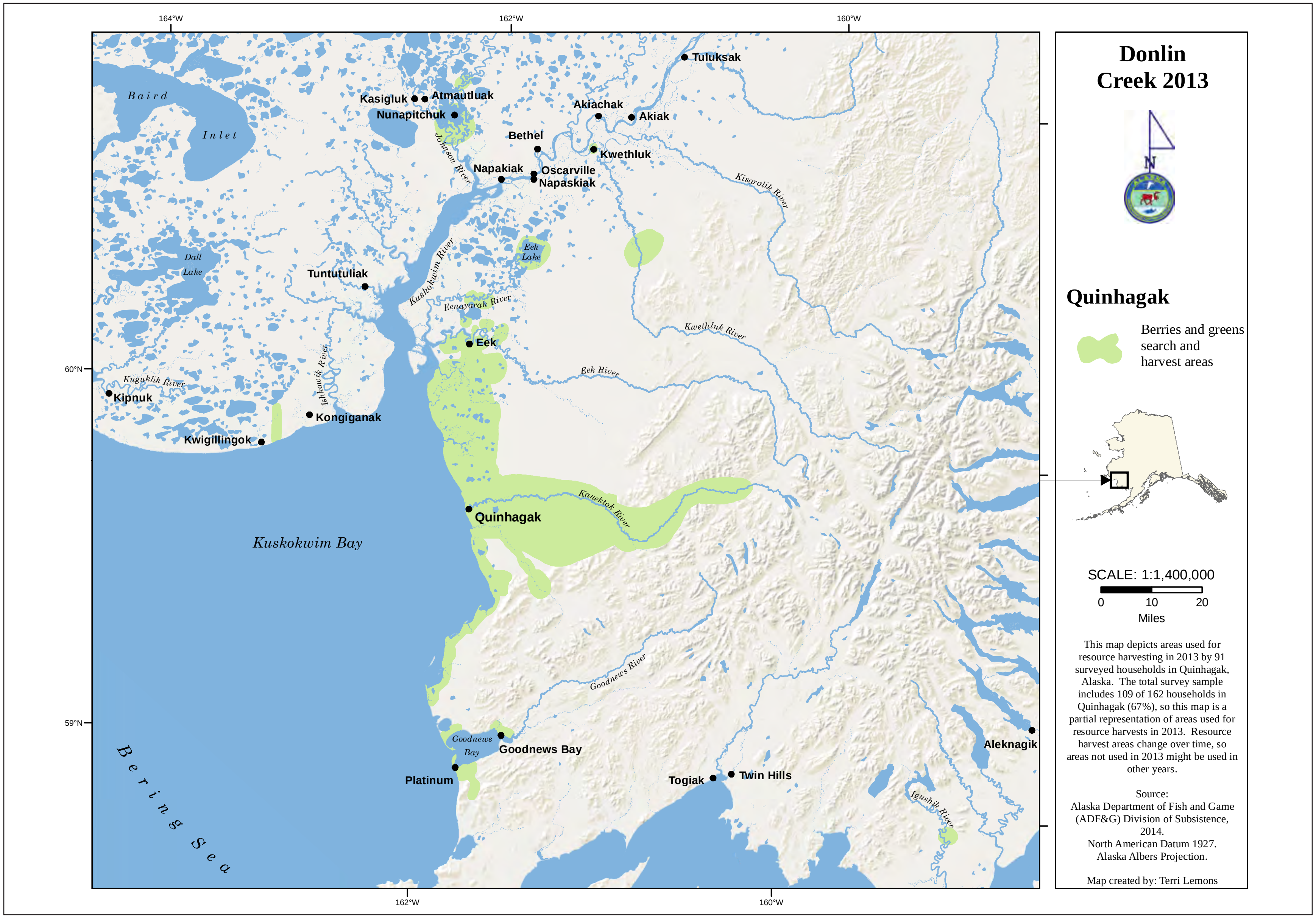


Figure 4-25.–Gathering and harvest areas, berries and greens, Quinhagak, 2013.

Plate 4-16.–Making frybread dough to supplement subsistence foods.

Comparing Harvests and Uses in 2013 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their 2013 harvest in 2 ways: whether they got more, less, or about the same amount of the 7 resource categories as in the past 5 years, and whether they got "enough" of each of the 7 categories. Households were also asked to provide reasons if their use was different or if they were unable to get enough of any resource. If they did not get enough of a certain resource, they were then asked to evaluate the severity of the impact to their household as a result of not getting enough of the resource. Additionally, respondents were asked whether they did anything differently (i.e., switch to a different subsistence resource or supplement with store-bought food) because they did not get enough (Plate 4-16).

Viewed together, Table 4-20, Figure 4-26, and Figure 4-27 provide a broad overview of Quinhagak households' assessments of their 2013 subsistence harvests. Some households did not respond to the assessment questions, because they did not use all resource categories. Also, some households did not answer the questions even though they did use a resource category.

Figure 4-26 shows the percentages of households that reported whether they got enough of each subsistence resource category. More than one-half (68%) reported getting enough of all subsistence foods in 2013. In terms of resource categories, 77% of households reported that they got enough salmon or nonsalmon fish; these percentages were higher than any other resource category. The fish resource categories were followed

Table 4-20.–Changes in household uses of resources compared to recent years, Quinhagak, 2013.

			Households reporting use								Households not using	
	Sampled	Valid	Total households		Less		Same		More			
Resource category	households	responses[a]	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	109	100	100	91.7%	38	38.0%	49	49.0%	13	13.0%	0	0.0%
Chinook salmon	109	107	103	94.5%	53	49.5%	36	33.6%	14	13.1%	4	3.7%
Other salmon	109	106	100	91.7%	31	29.2%	55	51.9%	14	13.2%	6	5.7%
Nonsalmon fish	109	104	100	91.7%	32	30.8%	52	50.0%	16	15.4%	4	3.8%
Land mammals	109	100	92	84.4%	43	43.0%	39	39.0%	10	10.0%	8	8.0%
Marine mammals	109	100	85	78.0%	29	29.0%	47	47.0%	9	9.0%	15	15.0%
Birds and eggs	109	103	96	88.1%	33	32.0%	57	55.3%	6	5.8%	7	6.8%
Marine invertebrates	109	107	16	14.7%	4	3.7%	4	3.7%	8	7.5%	91	85.0%
Vegetation	109	99	97	89.0%	20	20.2%	48	48.5%	29	29.3%	2	2.0%

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

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

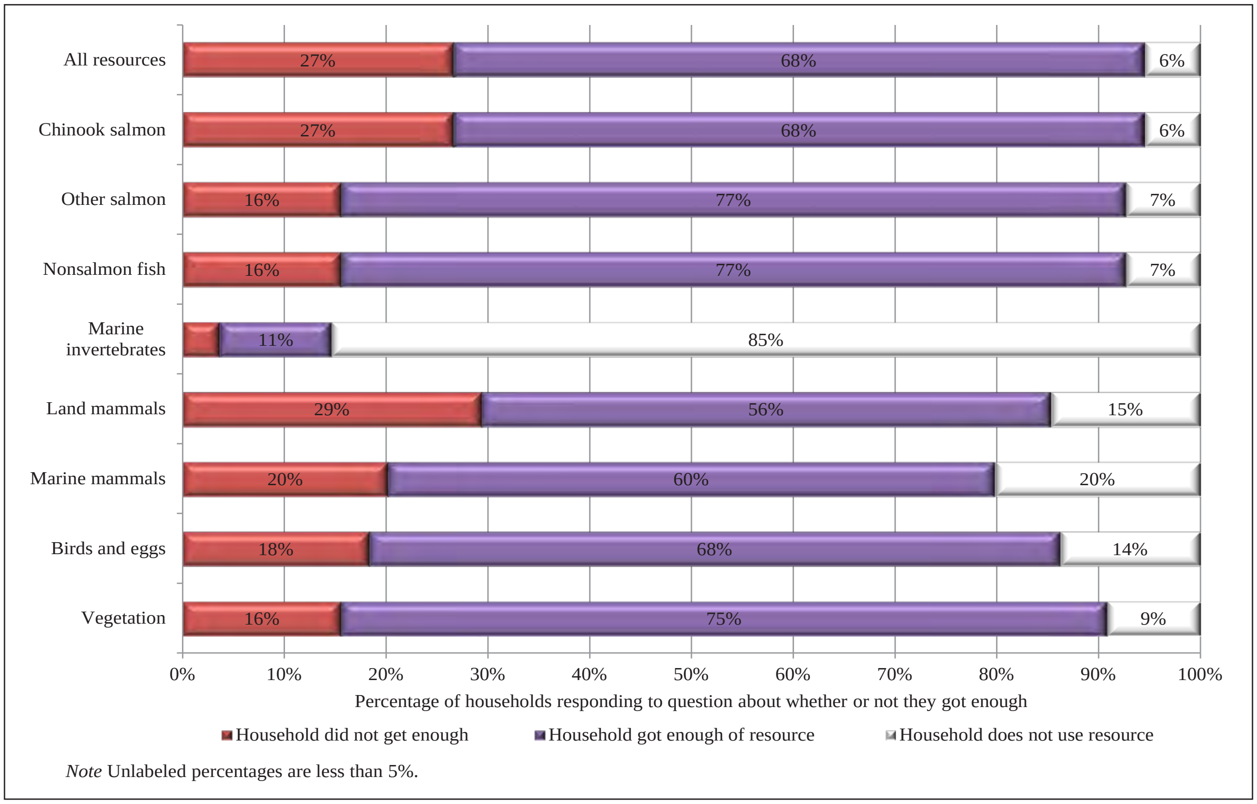


Figure 4-26.–Percentages of households reporting whether they got enough resources, Quinhagak, 2013.

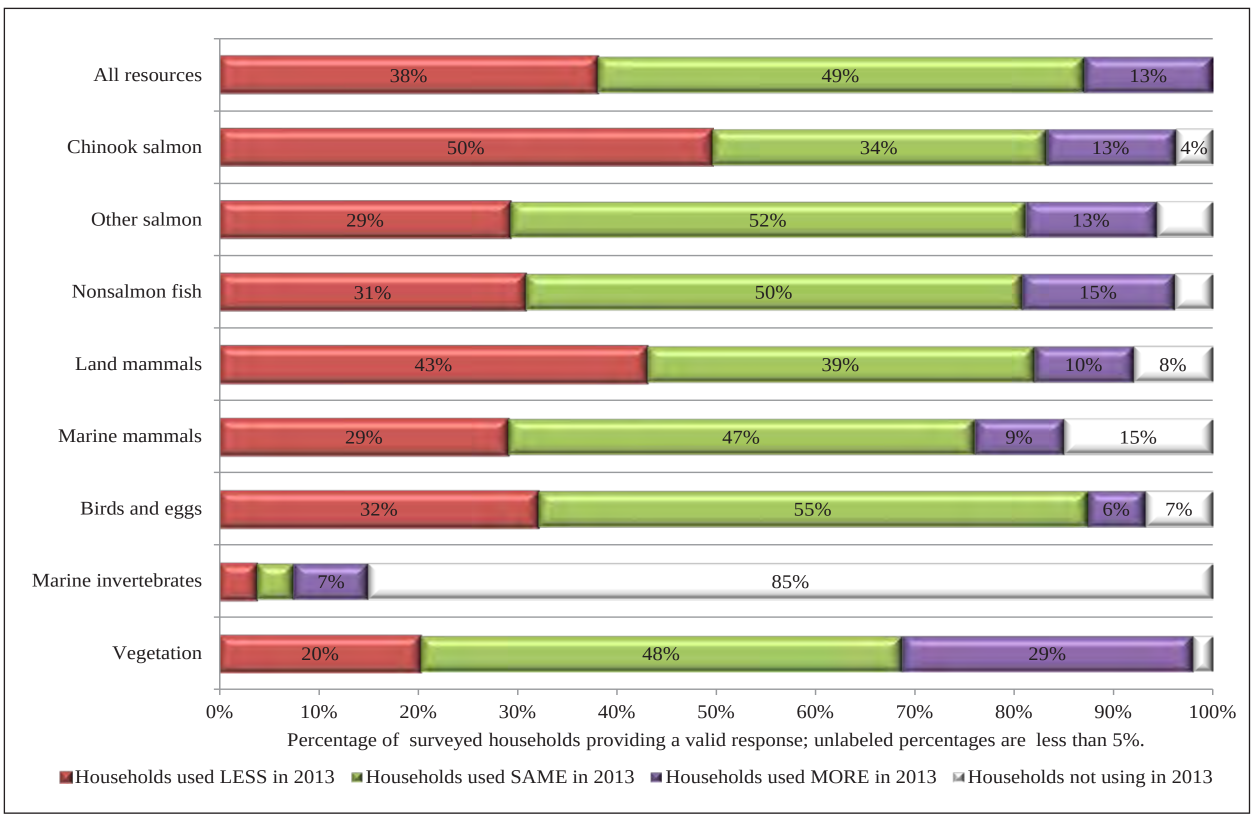


Figure 4-27.–Household uses of resources compared to recent years, Quinhagak, 2013.

closely by vegetation. Seventy-five percent of households reported getting enough vegetation in 2013. Over one-half (56%) reported getting enough land mammals. Of the 7 categories of subsistence resources, the land mammal category had the highest percentage of unmet needs in 2013.

As shown by Figure 4-27, 52% of households said that they used about the same amount of salmon as in recent years. However, 50% said that they used less Chinook salmon than in recent years. Fifty percent (50%) reported getting about the same amount of nonsalmon fish as in recent years. Forty-eight percent reported getting about the same amount of vegetation. Forty-three percent (43%) reported getting less land mammals than in recent years.

Table 4-21 shows the reasons provided by households for using less of a particular resource category as compared to recent years. Households reporting that they used less land mammals cited family or personal reasons (21%), unsuccessful hunts (21%), and less sharing (16%) as their main reasons for using less land mammals in 2013. Of those households that used less salmon, 21% said there was less resource availability, and 18% cited lack of equipment. In addition, 7% said that restrictive regulations were the reason for using less salmon in 2013. Other reasons included less effort and less time for subsistence activities due to wage employment. For Chinook salmon, 32% cited lack of resource, and 11% cited regulations as the main reasons that they used less of this resource. Of those households that reported using less marine mammals (29%), 23% reported less sharing as the main reason for less use in 2013.

Table 4-22 shows the reasons that Quinhagak households used more of a subsistence resource in comparison to recent years. Vegetation showed an increase in use (29%) by the highest percentage of households (Figure 4-27). Households reported that the increase in use of vegetation was due primarily to increased availability (32%) and increased effort (32%; Table 4-22).

Survey respondents who answered that they did not get enough of a certain resource were further asked to assess the resulting impact of not having enough of that resource on their household. Respondents were asked to rate the impact as not noticeable, minor, major, or severe. For all resource categories combined, 10% of responding households said that the impact was severe, and 7% said that it was not noticeable (Table 4-23). The same percentage (38%) reported a minor impact as reported a major impact to their households. Nineteen percent (19%) of households reported a severe impact to their household because they did not get enough land mammals, a greater percentage than for any other resource. Marine mammals closely followed with 18% of households reporting a severe impact. Over one-half (53%) of households reported that not having enough salmon had a major impact on their household. Thirty-five percent reported that the impact of not having enough nonsalmon fish had a major impact on their household. Households not having enough land mammals (31%) and marine mammals (27%) also experienced major impacts.

Respondents who reported not getting enough of a resource were asked to explain what, if anything, they did differently to compensate (Table 4-24). Seven households said that they had to replace Chinook salmon with more commercial foods. Three households said that they switched to a different subsistence resource to compensate for a lack of enough Chinook salmon. Seventeen households said that they did not get enough land mammals and reported that they had to use more commercial foods to compensate. Three households replaced land mammals with other subsistence foods. Using more commercial food (which requires cash to purchase) was the major adaptive strategy for lack of any subsistence resource.

Survey respondents also reported the types of subsistence foods of which they needed more in 2013 (Table 4-25). In regards to large land mammals, 24 Quinhagak households said that they needed more caribou, and 19 households said that they needed more moose. Four households said that they needed land mammals, and another 4 households specified that they needed large land mammals. One household reported that they needed more feral reindeer. For vegetation, berries topped the list of most needed, specifically crowberries (8 households) and cloudberries (4 households). Two households said that they needed more vegetation in general and 11 households stated that they needed more berries. Three households said that they needed more plants and greens, and 1 household said that they needed more beach greens.

In regards to fish, 20 households reported needing more salmon in 2013. Of these, 6 households reported that they needed more salmon in general. Coho salmon was the most needed (5 households) salmon species.

Table 4-21.–Reasons for less household uses of resources compared to recent years, Quinhagak, 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		Other reasons	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	100	35	9	25.7%	9	26%	1	2.9%	9	26%	1	3%	3	9%	2	5.7%	4	11.4%	2	5.7%
Chinook salmon	107	47	4	8.5%	15	32%	0	0.0%	4	9%	5	11%	5	11%	1	2.1%	3	6.4%	4	8.5%
Other salmon	106	28	2	7.1%	6	21%	0	0.0%	5	18%	2	7%	4	14%	0	0.0%	1	3.6%	3	10.7%
Nonsalmon fish	104	26	4	15.4%	5	19%	1	3.8%	3	12%	2	8%	8	31%	0	0.0%	5	19.2%	1	3.8%
Land mammals	100	38	8	21.1%	2	5%	4	10.5%	1	3%	6	16%	4	11%	8	21.1%	1	2.6%	2	5.3%
Marine mammals	100	22	3	13.6%	0	0%	0	0.0%	2	9%	5	23%	4	18%	4	18.2%	0	0.0%	2	9.1%
Birds and eggs	103	29	5	17.2%	5	17%	0	0.0%	5	17%	2	7%	11	38%	1	3.4%	1	3.4%	0	0.0%
Marine invertebrates	107	4	0	0.0%	1	25%	0	0.0%	1	25%	0	0%	2	50%	0	0.0%	0	0.0%	0	0.0%
Vegetation	99	18	2	11.1%	3	17%	0	0.0%	5	28%	0	0%	3	17%	0	0.0%	0	0.0%	3	16.7%

-continued-

Table 4-21.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Did not give any away		Equipment/ fuel expense		Used other resources		Competition	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	100	35	7	20%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	5.7%	1	2.9%	0	0.0%
Chinook salmon	107	47	4	9%	5	10.6%	0	0.0%	1	2.1%	3	6.4%	0	0.0%	0	0.0%	0	0.0%	2	4.3%
Other salmon	106	28	3	11%	2	7.1%	0	0.0%	2	7.1%	1	3.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	104	26	0	0%	1	3.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	3.8%
Land mammals	100	38	3	8%	0	0.0%	1	2.6%	2	5.3%	2	5.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	100	22	3	14%	0	0.0%	0	0.0%	0	0.0%	1	4.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	103	29	2	7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	6.9%	0	0.0%	0	0.0%
Marine invertebrates	107	4	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	99	18	7	39%	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.

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

Table 4-22.–Reasons for more household uses of resources compared to recent years, Quinhagak, 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
All resources	100	12	5	41.7%	1	8.3%	0	0.0%	0	0.0%	0	0.0%	2	16.7%	1	8.3%
Chinook salmon	107	11	1	9.1%	0	0.0%	2	18.2%	2	18.2%	0	0.0%	3	27.3%	1	9.1%
Other salmon	106	9	3	33.3%	0	0.0%	3	33.3%	0	0.0%	1	11.1%	1	11.1%	0	0.0%
Nonsalmon fish	104	15	1	6.7%	0	0.0%	2	13.3%	1	6.7%	2	13.3%	7	46.7%	2	13.3%
Land mammals	100	9	2	22.2%	0	0.0%	0	0.0%	4	44.4%	0	0.0%	1	11.1%	0	0.0%
Marine mammals	100	9	0	0.0%	0	0.0%	1	11.1%	3	33.3%	0	0.0%	3	33.3%	0	0.0%
Birds and eggs	103	5	0	0.0%	0	0.0%	1	20.0%	1	20.0%	0	0.0%	1	20.0%	0	0.0%
Marine invertebrates	107	8	0	0.0%	0	0.0%	0	0.0%	4	50.0%	1	12.5%	3	37.5%	0	0.0%
Vegetation	99	25	8	32.0%	0	0.0%	4	16.0%	0	0.0%	0	0.0%	8	32.0%	3	12.0%

-continued-

Table 4-22.–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		Substituted for unavailable resource	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	100	12	1	8.3%	0	0.0%	0	0.0%	1	8.3%	0	0.0%	0	0.0%	1	8.3%	0	0.0%
Chinook salmon	107	11	1	9.1%	0	0.0%	0	0.0%	2	18.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	106	9	2	22.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	104	15	0	0.0%	0	0.0%	0	0.0%	1	6.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	100	9	0	0.0%	0	0.0%	0	0.0%	2	22.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	100	9	0	0.0%	0	0.0%	0	0.0%	3	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	103	5	1	20.0%	0	0.0%	2	40.0%	1	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	107	8	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	99	25	2	8.0%	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.

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

Table 4-23.–Reported impact to households that did not get enough of a resource, Quinhagak, 2013.

		Households not getting enough _______ .				Impact to those not getting enough ______ .										
	Sample	Valid responses[a]		Did not get enough		No response		Not noticeable		Minor		Major		Severe		
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	
All resources	109	103	94.5%	29	28.2%	2	6.9%	2	6.9%	11	37.9%	11	37.9%	3	10.3%	
Chinook salmon	109	103	94.5%	29	28.2%	2	6.9%	1	3.4%	13	44.8%	11	37.9%	2	6.9%	
Other salmon	109	101	92.7%	17	16.8%	2	11.8%	0	0.0%	4	23.5%	9	52.9%	2	11.8%	
Nonsalmon fish	109	101	92.7%	17	16.8%	1	5.9%	1	5.9%	8	47.1%	6	35.3%	1	5.9%	
Marine invertebrates	109	16	14.7%	4	25.0%	0	0.0%	1	25.0%	3	75.0%	0	0.0%	0	0.0%	
Land mammals	109	93	85.3%	32	34.4%	0	0.0%	0	0.0%	16	50.0%	10	31.3%	6	18.8%	
Marine mammals	109	87	79.8%	22	25.3%	2	9.1%	3	13.6%	7	31.8%	6	27.3%	4	18.2%	
Birds and eggs	109	94	86.2%	20	21.3%	2	10.0%	5	25.0%	6	30.0%	4	20.0%	3	15.0%	
Vegetation	109	99	90.8%	17	17.2%	2	11.8%	1	5.9%	11	64.7%	3	17.6%	0	0.0%	

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

a. Includes households that did not respond to the question and households that never used the resource.

Table 4-24.–Things households reported doing differently as the result of not getting enough of a resource, Quinhagak, 2013.

Resource category	Valid responses[a]	Bought/bartered		Used more commercial foods		Replaced with other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	20	0	0.0%	17	85.0%	1	5.0%	1	5.0%	1	5.0%
Chinook salmon	10	0	0.0%	7	70.0%	3	30.0%	0	0.0%	1	10.0%
Other salmon	11	0	0.0%	6	54.5%	1	9.1%	0	0.0%	2	18.2%
Nonsalmon fish	8	0	0.0%	5	62.5%	1	12.5%	0	0.0%	0	0.0%
Marine invertebrates	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Land mammals	22	0	0.0%	17	77.3%	3	13.6%	0	0.0%	0	0.0%
Marine mammals	10	0	0.0%	3	30.0%	0	0.0%	1	10.0%	1	10.0%
Birds and eggs	7	0	0.0%	5	71.4%	0	0.0%	0	0.0%	0	0.0%
Vegetation	8	0	0.0%	4	50.0%	1	12.5%	0	0.0%	1	12.5%

-continued-

Table 4-24.–Continued.

Resource category	Valid responses[a]	Increased effort to harvest		Got a job		Obtained food from other sources		Got public assistance		Conserved resource		Other	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	20	0	0.0%	0	0.0%	1	5.0%	0	0.0%	0	0.0%	2	10.0%
Chinook salmon	10	0	0.0%	0	0.0%	0	0.0%	1	10.0%	0	0.0%	0	0.0%
Other salmon	11	1	9.1%	0	0.0%	1	9.1%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	8	0	0.0%	0	0.0%	2	25.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	22	1	4.5%	1	4.5%	1	4.5%	0	0.0%	0	0.0%	1	4.5%
Marine mammals	10	1	10.0%	0	0.0%	2	20.0%	0	0.0%	1	10.0%	1	10.0%
Birds and eggs	7	0	0.0%	0	0.0%	2	28.6%	0	0.0%	0	0.0%	0	0.0%
Vegetation	8	1	12.5%	0	0.0%	1	12.5%	0	0.0%	0	0.0%	0	0.0%

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.

Table 4-25.–Resources of which households reported needing more, Quinhagak, 2013.

Resource	Households needing	Percentage of households[a]
All resources	3	5.3%
Fish	9	15.8%
Salmon	6	10.5%
Chum salmon	1	1.8%
Coho salmon	5	8.8%
Chinook salmon	4	7.0%
Sockeye salmon	4	7.0%
Nonsalmon fish	3	5.3%
Smelt	2	3.5%
Pacific halibut	3	5.3%
Alaska blackfish	1	1.8%
Dolly Varden	4	7.0%
Rainbow trout	1	1.8%
Whitefishes	3	5.3%
Land mammals	4	7.0%
Large land mammals	4	7.0%
Caribou	24	42.1%
Moose	19	33.3%
Beaver	2	3.5%
River (land) otter	1	1.8%
Gray wolf	1	1.8%
Reindeer–feral	1	1.8%
Marine mammals	3	5.3%
Seal	7	12.3%
Bearded seal	3	5.3%
Harbor seal	1	1.8%
Ringed seal	1	1.8%
Spotted seal	3	5.3%
Unknown seal oil	2	3.5%
Walrus	2	3.5%
Beluga whale	2	3.5%
Birds and eggs	5	8.8%
Migratory birds	2	3.5%
Northern pintail	1	1.8%
Geese	3	5.3%
White-fronted goose	3	5.3%
Swans	2	3.5%
Tundra (whistling) swan	2	3.5%
Crane	1	1.8%
Sandhill crane	1	1.8%
Ptarmigan	2	3.5%
Bird eggs	2	3.5%
Duck eggs	2	3.5%
Clams	2	3.5%
Butter clams	1	1.8%
Mussels	1	1.8%
Vegetation	2	3.5%
Berries	11	19.3%
Crowberry	8	14.0%
Cloudberry	4	7.0%
Nagoonberry	2	3.5%
Salmonberry	2	3.5%
Plants, greens, and	3	5.3%
Beach greens	1	1.8%
Wood	1	1.8%
Unknown	31	54.4%

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

a. Calculated using only households responding to needing at least one resource (n=57).

Seventeen households reported needing more nonsalmon fish. In regards to small land mammals, 2 households said that they needed more beaver in 2013, 1 household needed river (land) otter, and 1 household needed gray wolf. Twenty-four households said that they needed more marine mammals, including 2 households that said that they needed more seal oil. Seals of any type were needed by 7 households. In total, 15 households reported needing some species of seal. Two households said they needed more walrus, and 2 households said they needed more beluga whale.

Of all bird types available, 22 households said that they needed more in 2013. Migratory bird species were needed the most. Only 2 households said that they needed more ptarmigans. Regarding eggs, 2 households said they needed more bird eggs and 2 households said that they needed more duck eggs.

Harvest Data

Comparisons between results from this study and previous research can help describe subsistence changes over time. Although an ADF&G baseline subsistence study (Wolfe et al. 1984) conducted in 1982 included subsistence data for Quinhagak, it did not record specific information concerning the harvest of all species available, especially in the migratory bird, nonsalmon fish, and vegetation resource categories. Additionally, La Vine et al. (2007) documents traditional knowledge of 6 Yup'ik elders from the communities of Quinhagak and Goodnews Bay, summarizing observations of the distribution and abundance of local freshwater and anadromous fish species over 88 years (1916–2004). Thus, this 2013 study is the first fully comprehensive subsistence harvest survey ever conducted for Quinhagak.

There are notable differences between this comprehensive subsistence survey and the earlier 1982 baseline study (Wolfe et al. 1984), which are separated by approximately 30 years. In contrast to community harvest estimates developed from an attempted census of Quinhagak households in this study (see Methods), the earlier study described harvests for a sample of 12 households that were nonrandomly selected as representative of a range of household types. Researchers made no attempt to expand harvests to the community level (Wolfe et al. 1984:22–24, 351–353). Nevertheless, comparisons between community averages from this comprehensive study and sample household averages from the 1982 baseline study may indicate general differences or similarities in broad subsistence patterns for Quinhagak residents between 1982 and 2013. Such comparisons are limited by the major differences in sampling methods and as such should be viewed only as generalizations and with caution.

In terms of overall per capita harvests wild resources, many fewer pounds were harvested (298 lb) in 2013 than among the sampled Quinhagak households in 1982 (756 lb; Table 4-8; Wolfe et al. 1984). This difference likely reflects differences in harvest levels for multiple resources rather than a dramatic difference in harvest of 1 or a few particular resources. For example, results from the 12 surveyed households from the 1982 study year suggest that Quinhagak residents did not attempt to harvest as much Pacific cod, Alaska blackfish, or Pacific herring in 2013 as they did 30 years ago. According to La Vine et al. (2007:36), Quinhagak residents agreed that Alaska blackfish around the community were smaller now than in the past, and that their numbers were declining as of 2006, which may explain some of the differences in harvests between the 2 quantitative studies. One notable difference in the harvest of large land mammals between the study years involves the harvest of brown bears. Wolfe et al. (1984:322) states that "several brown bear are taken each year by Quinhagak hunters." In contrast, brown bears were neither hunted nor harvested in 2013 by surveyed households (Table 4-8). Small land mammals, especially furbearers, were searched for and harvested to a greater extent in 1982 than in 2013. Over the years, trapping has decreased due in part to the decline in the value of furs. This 2013 study found that although the Arctic ground squirrel is still valued for making parkas, the search and harvest for these small mammals has decreased. Squirrel camps are now used mostly as bases from which to search for other types of subsistence foods and also as places where families connect with their cultural traditions and pass those traditions on to their children. One respondent noted,

> Squirrel hunting is one thing that's kinda dying out. …If anyone does it now, it's mainly still elder couples going to Platinum for the squirrel hunting season. In the past, when I was a kid, I remember there [would] be families camping in the mountains, just squirrel hunting. I don't think many people do that now. (041114KWN2)

In contrast to such apparent reductions, harvest percentages for some resources were similar between the 2 study years. For example, the the contribution of moose and caribou to the total subsistence harvest in 2013 (17%) is higher than, but similar to, the 12% of the harvest contributed by these species among sampled households in 1982 (Table 4-8; Wolfe et al. 1984:353).

The traditional ecological knowledge study conducted by LaVine et al. (2007) noted that the greatest change to subsistence practices observed by study respondents and harvests in the Kuskokwim Bay area over time (1916–2004) was in technology (i.e., means of travel, fishing and hunting gear, and processing tools). The report also noted that due to improved technology (i.e., boats and motors, snowmachines, and freezers) there has been a decrease in use of seasonal camps in favor of searching for subsistence resources from a home base. Additionally, the study notes a reduction in the harvest of some species due to decreased need (e.g., there is no longer a need for certain types of fish for dog food), and an increase in harvest of other species due to improved harvest methods (e.g., rifles and nylon nets).

Figure 4-28 shows the harvest in numbers of fish of 4 salmon species between 1990 and 2013. Data for this figure was gathered by ADF&G during annual postseason surveys. The results of this study are represented by an orange diamond on the figure. The methodological differences between the 2 studies are important to consider when comparing this study year to prior years.

The highest harvest years varied slightly among salmon species. The highest harvest year for Chinook salmon was in 2006, with a harvest of 5,163 individual salmon. This was also the highest harvest year for sockeye salmon (3,128). The highest harvest year for chum and coho salmon was 1990 (the earliest year shown on the figure) with harvests of 3,161 and 3,799 individual salmon, respectively.

Linear trend lines on Figure 4-28 show overall harvest trends through the years. After the highest harvest of Chinook salmon in 2006, the harvest declined steadily until the 2013 harvest (this study, 3,802) which is only slightly lower than the 1990 harvest of 3,881. Between 1990 and 2013, the trendline for Chinook salmon shows a slight decline. The sockeye salmon harvest between 1990 and 2013 shows a pattern of steep declines and gentle ascents, almost a wave-like pattern through the years. The trendline for sockeye salmon shows a slight increase in overall harvest over the 23-year span. After the high harvest year of 1990, chum salmon, showing a more erratic harvest pattern from year to year, maintained a steady trendline over the long term. The 2013 harvest of 2,470 individual chum salmon is only 691 fewer salmon than the harvest year of 1990. Coho salmon had the sharpest decline in the linear trend over time than any of the other salmon types harvested by Quinhagak residents. In recent years, the harvest of coho has continued to decline since 2008, when the harvest was 2,217.

Fluctuations in the subsistence harvest of the various salmon types can be attributed to several factors including, but not limited to, the abundance of the resource, harvest effort, weather and climate conditions, regulations, outside competition for the resource (i.e., sport fishers and commercial trawlers), and household economics.

Income and Cash Employment

Survey respondents were asked about both earned income (jobs held and wages earned by all household members 16 and older) and other income (Alaska Permanent Fund dividend, Social Security, public assistance, etc.). In 2013, the total community income from both earned and received funds was $6,358,254, and the average household income was $39,248 (Table 4-26). Of the total community income, $4,514,601 (71%) was from wage employment and $1,843,654 (29%) was from other sources. Figure 4-29 shows the top income sources for residents of Quinhagak. Local government provided 43% ($2,767,011) of the community total, more income than any other source (Table 4-26; Figure 4-29). Forty-two percent of jobs were in the local government sector (Table 4-27). The services industry, including health care and social services, followed with $622,559: 10% of the total community income and 19% of all jobs (tables 4-26 and 4-27; Figure 4-29). The next major source of income was the Alaska Permanent Fund dividend, which added $604,198. Seasonal forestry and commercial fishing occupations contributed $549,665 (9%) to the community income. Twenty-two percent of jobs held by employed residents were in these occupations.

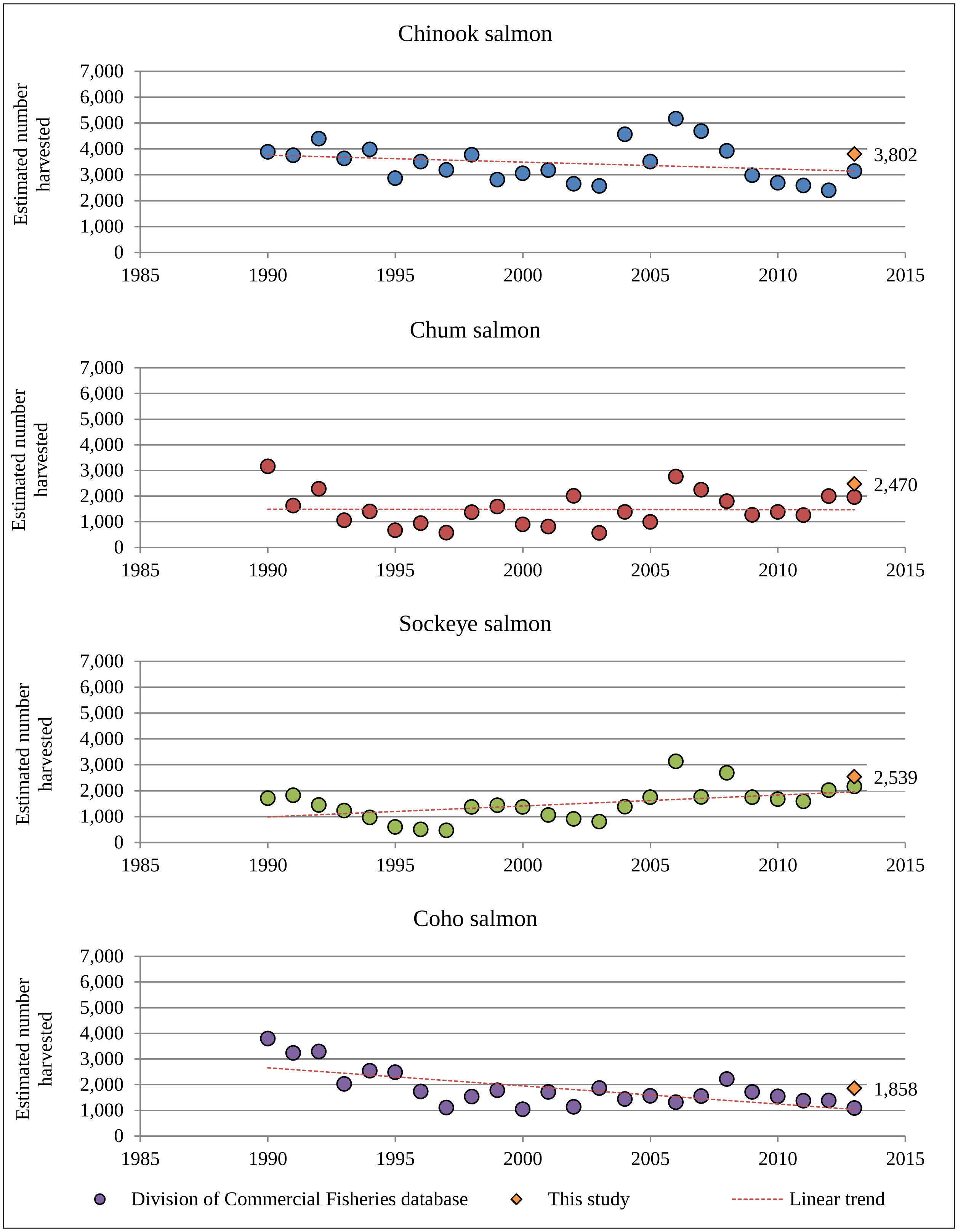


Figure 4-28.–Estimated salmon harvests, Quinhagak, 1990–2013.

Table 4-26.–Estimated earned and other income, Quinhagak, 2013.

Income source	Number of people	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government	122.7	97.5	$2,767,011	$2,006,779 – $3,765,087	$17,080	43.5%
Services	59.8	42.5	$622,559	$416,200 – $1,012,064	$3,843	9.8%
Agriculture, forestry, and fishing	69.2	59.8	$549,665	$344,006 – $819,769	$3,393	8.6%
Retail trade	23.6	22.0	$210,096	$91,409 – $394,426	$1,297	3.3%
Transportation, communication, and utilities	9.4	9.4	$154,572	$60,326 – $313,751	$954	2.4%
Federal government	7.9	7.9	$95,635	$18,977 – $278,042	$590	1.5%
Construction	7.9	6.3	$60,273	$4,564 – $145,752	$372	0.9%
Other employment	4.7	4.7	$47,703	$485 – $158,852	$294	0.8%
State government	1.6	1.6	$5,727	$5,343 – $11,636	$35	0.1%
Manufacturing	4.7	4.7	$1,360	$146 – $3,370	$8	0.0%
Earned income subtotal	**264.2**	**147.8**	**$4,514,601**	**$3,660,831 – $5,669,833**	**$27,868**	**71.0%**
Other income						
Alaska Permanent Fund dividend		153.1	$604,198	$529,960 – $678,839	$3,730	9.5%
Food stamps		65.7	$456,092	$309,535 – $634,675	$2,815	7.2%
Unemployment		55.0	$226,290	$139,028 – $332,434	$1,397	3.6%
Social Security		25.3	$177,951	$77,643 – $301,474	$1,098	2.8%
Pension / retirement		16.6	$108,042	$37,631 – $213,209	$667	1.7%
Native corporation dividend		114.7	$67,293	$49,382 – $89,237	$415	1.1%
Adult public assistance (OAA, APD)		19.6	$38,759	$9,078 – $87,026	$239	0.6%
TANF (Temporary Assistance for Needy Families)		10.7	$37,229	$3,176 – $103,334	$230	0.6%
Supplemental Security Income		12.2	$22,507	$1,538 – $78,743	$139	0.4%
Longevity bonus		13.7	$21,243	$6,897 – $40,200	$131	0.3%
Heating assistance		53.8	$19,576	$11,198 – $29,996	$121	0.3%
CITGO fuel voucher		33.0	$13,424	$6,673 – $23,360	$83	0.2%
Other		4.7	$12,415	$177 – $44,100	$77	0.2%
Meeting honoraria		7.7	$10,087	$892 – $28,426	$62	0.2%
Winnings		2.9	$8,567	$264 – $33,000	$53	0.1%
Disability		7.7	$7,039	$553 – $25,675	$43	0.1%
Foster care		1.8	$5,850	$3,936 – $17,714	$36	0.1%
Veteran disability		3.3	$4,288	$2,885 – $16,836	$26	0.1%
Child support		9.2	$2,804	$515 – $8,253	$17	0.0%
Workers' compensation / insurance		0.0	$0	$0 – $0	$0	0.0%
Other income subtotal		**159.3**	**$1,843,654**	**$1,539,410 – $2,168,094**	**$11,381**	**29.0%**
Community income total			**$6,358,254**	**$5,479,232 – $7,513,710**	**$39,248**	**100.0%**

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

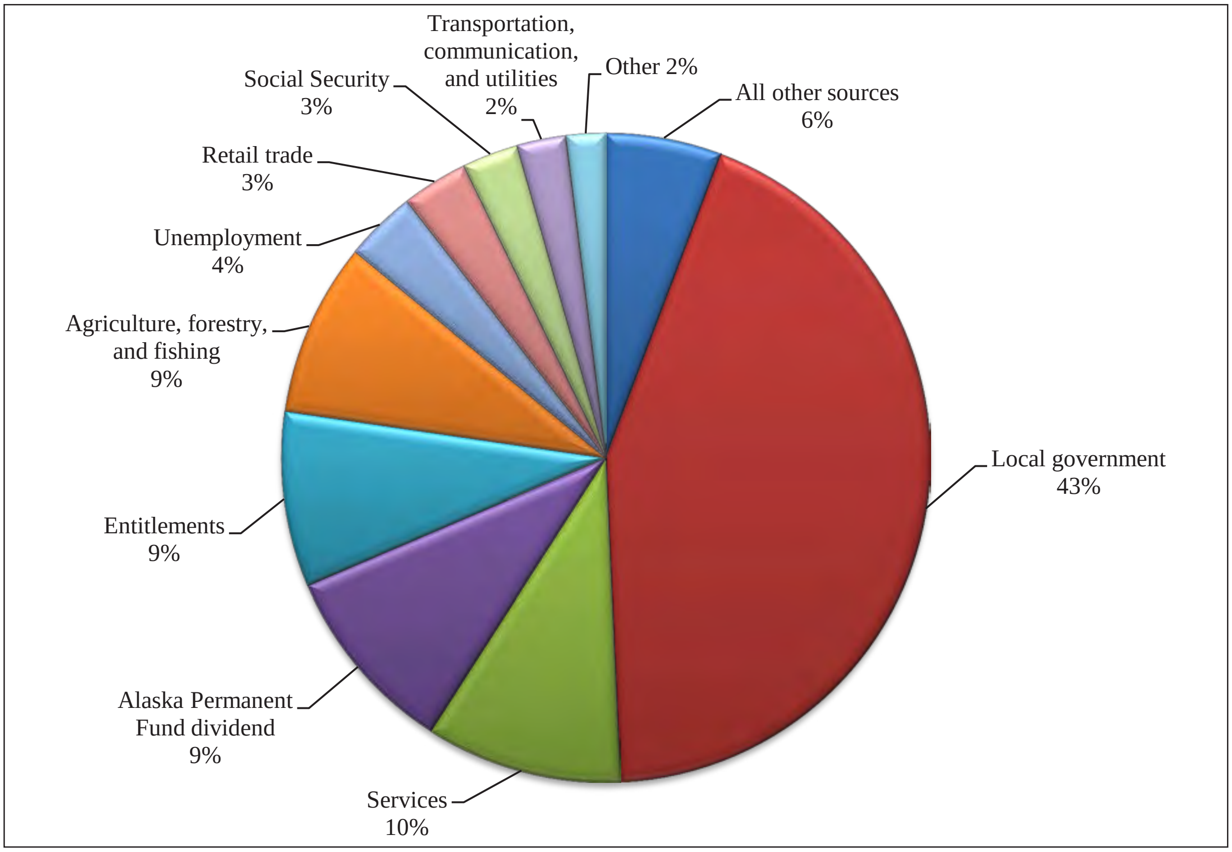


Figure 4-29.–Top income sources, Quinhagak, 2013.

An estimated 275 (61%) adults in Quinhagak held at least 1 job in 2013 (Table 4-28). Of the jobs reported by residents, 49% were full time, 18% were part time (fewer than 35 hours per week), and 28% were on-call positions (occasional work when needed; Table 4-29). On average, employed adults worked 31 weeks out of the year; 36% worked year-round (Table 4-28). The mean number of jobs per employed households was 2, with a minimum of 1 and a maximum of 6. According to the American Community Survey estimate for 2008–2012, the median household income generated from all jobs in Quinhagak was $35,208 (Table 4-30). This estimate is slightly higher than the ADF&G estimate of $31,097 for 2013. The median household income for Alaska households was $69,014, according to ACS estimates.

The largest contributor to the other income total was the Alaska Permanent Fund dividend at $604,198 (10%), followed by food stamps at $456,092 (7%; Table 4-26). A variety of entitlements including unemployment and Social Security benefits also contributed to the community income. Researchers noted a lack of local job opportunities during their visit.

Food Security

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

Table 4-27.–Employment by industry, Quinhagak, 2013.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**330.3**	**147.8**	**274.7**	
Federal government	**2.5%**	**5.3%**	**3.0%**	**2.1%**
Teachers, librarians, and counselors	0.5%	1.1%	0.6%	0.4%
Marketing and sales occupations	0.5%	1.1%	0.6%	1.3%
Service occupations	1.5%	3.2%	1.8%	0.4%
State government	**0.5%**	**1.1%**	**0.6%**	**0.1%**
Handlers, equipment cleaners, helpers, and laborers	0.5%	1.1%	0.6%	0.1%
Local government, including tribal	**41.2%**	**66.0%**	**46.4%**	**61.3%**
Executive, administrative, and managerial	5.4%	11.7%	6.5%	6.7%
Social scientists, social workers, religious workers, and	1.5%	3.2%	1.8%	0.8%
Teachers, librarians, and counselors	5.9%	11.7%	7.1%	19.9%
Health technologists and technicians	0.5%	1.1%	0.6%	1.0%
Technologists and technicians, except health	0.5%	1.1%	0.6%	0.7%
Marketing and sales occupations	0.5%	1.1%	0.6%	1.4%
Administrative support occupations, including clerical	3.9%	8.5%	4.8%	5.8%
Service occupations	9.8%	19.1%	11.9%	9.8%
Mechanics and repairers	0.5%	1.1%	0.6%	0.3%
Construction and extractive occupations	3.4%	7.4%	4.2%	4.7%
Precision production occupations	2.0%	4.3%	2.4%	1.2%
Transportation and material moving occupations	0.5%	1.1%	0.6%	1.0%
Handlers, equipment cleaners, helpers, and laborers	5.9%	12.8%	7.1%	6.7%
Occupation not indicated	1.0%	2.1%	1.2%	1.1%
Agriculture, forestry, and fishing	**21.6%**	**40.4%**	**26.2%**	**12.2%**
Service occupations	0.5%	1.1%	0.6%	0.1%
Agricultural, forestry, and fishing occupations	21.1%	40.4%	25.6%	12.0%
Construction	**2.5%**	**4.3%**	**3.0%**	**1.3%**
Construction and extractive occupations	1.5%	3.2%	1.8%	1.2%
Handlers, equipment cleaners, helpers, and laborers	1.0%	1.1%	1.2%	0.1%
Manufacturing	**1.5%**	**3.2%**	**1.8%**	**0.0%**
Writers, artists, entertainers, and athletes	1.5%	3.2%	1.8%	0.0%
Transportation, communication, and utilities	**2.9%**	**6.4%**	**3.6%**	**3.4%**
Precision production occupations	1.0%	2.1%	1.2%	0.7%
Transportation and material moving occupations	2.0%	4.3%	2.4%	2.8%
Retail trade	**7.4%**	**14.9%**	**8.9%**	**4.7%**
Executive, administrative, and managerial	2.0%	4.3%	2.4%	2.1%
Marketing and sales occupations	3.4%	6.4%	4.2%	1.3%
Service occupations	0.5%	1.1%	0.6%	0.5%
Handlers, equipment cleaners, helpers, and laborers	1.5%	3.2%	1.8%	0.8%
Services	**18.6%**	**28.7%**	**22.6%**	**13.8%**
Social scientists, social workers, religious workers, and	1.0%	2.1%	1.2%	0.5%
Teachers, librarians, and counselors	1.0%	2.1%	1.2%	0.7%
Health technologists and technicians	1.0%	2.1%	1.2%	1.8%
Technologists and technicians, except health	0.5%	1.1%	0.6%	0.0%
Marketing and sales occupations	1.0%	2.1%	1.2%	0.4%
Administrative support occupations, including clerical	1.0%	2.1%	1.2%	1.3%
Service occupations	3.4%	7.4%	4.2%	1.8%
Construction and extractive occupations	1.0%	2.1%	1.2%	2.4%
Precision production occupations	0.5%	1.1%	0.6%	0.3%
Handlers, equipment cleaners, helpers, and laborers	7.4%	9.6%	8.9%	3.9%
Occupation not indicated	1.0%	2.1%	1.2%	0.6%
Industry not indicated	**1.5%**	**3.2%**	**1.8%**	**1.1%**
Service occupations	0.5%	1.1%	0.6%	0.2%
Construction and extractive occupations	0.5%	1.1%	0.6%	0.0%
Handlers, equipment cleaners, helpers, and laborers	0.5%	1.1%	0.6%	0.9%

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

Table 4-28.–Employment characteristics, Quinhagak, 2013.

Characteristic	Community Quinhagak
All adults	
Number	450.3
Mean weeks employed	18.9
Employed adults	
Number	274.7
Percentage	61.0%
Jobs	
Number	330.3
Mean	1.2
Minimum	1
Maximum	3
Months employed	
Mean	7.2
Minimum	0
Maximum	12
Percentage employed year-round	36.2%
Mean weeks employed	31.0
Households	
Number	162
Employed	
Number	147.8
Percentage	91.3%
Jobs per employed household	
Mean	2.0
Minimum	1
Maximum	6
Employed adults	
Mean	
Employed households	1.9
Total households	1.7
Minimum	1
Maximum	5
Mean person-weeks of employment	39.6

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

Table 4-29.–Reported job schedules, Quinhagak, 2013.

	Jobs		Employed persons		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	161.9	49.0%	148.7	54.8%	107.0	72.3%
Part-time	59.9	18.1%	51.7	19.0%	36.2	24.5%
Shift	4.9	1.5%	4.8	1.8%	4.7	3.2%
On-call (occasional)	92.3	27.9%	80.8	29.8%	59.8	40.4%
Part-time shift	0.0	0.0%	0.0	0.0%	0.0	0.0%
Schedule not reported	11.3	3.4%	11.3	4.2%	7.9	5.3%

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

Table 4-30.–Comparison of median income estimates, Quinhagak, 2013.

Data source	Median[a]	Range[b,c]
2013 Division of Subsistence estimate	$31,097	$27,450–$40,193
2008–2012 ACS (Quinhagak)	$35,208	$28,421–$41,995
2008-2012 ACS (All Alaska)	$69,014	$68,221–$69,807

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

a. Division of Subsistence 2013 estimate does not include categories of income excluded by the 2008–2012 ACS median estimate including food stamps, housing assistance, and one-time payments.

b. Range is a 95% confidence interval of the estimated median.

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

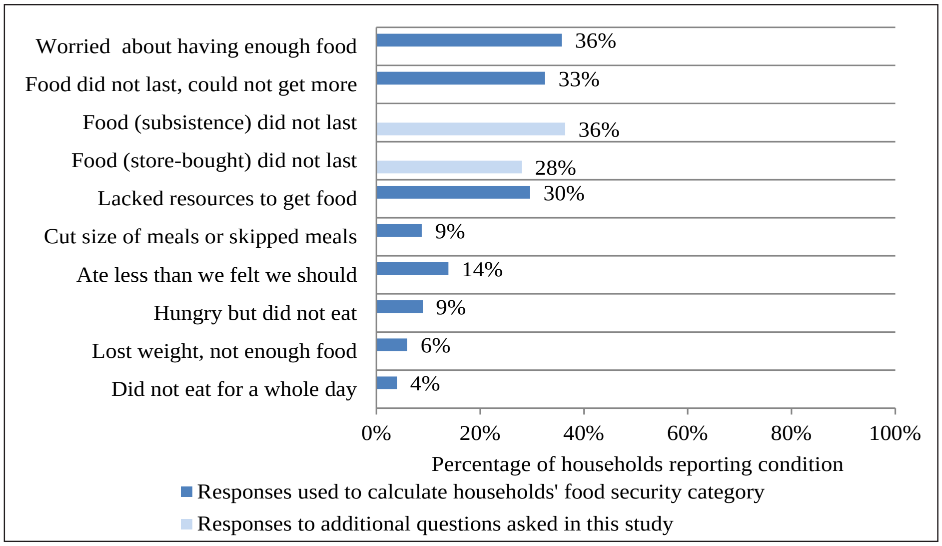


Figure 4-30.–Responses to questions about food insecure conditions, Quinhagak, 2013.

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

Responses to core questions from Quinhagak residents are summarized in Figure 4-30. This figure shows that anxiety over having enough food to eat affected 36% of households. A similar percentage of households (33%) ran out of food at least once during the year, and 30% of households reported that they did not have what they needed to hunt, gather, or buy food. Food security results for Quinhagak, the state of Alaska, and the United States are summarized in Figure 4-31. Eighty-one percent (81%) of households in Quinhagak were classified as high and marginal food security in 2013, while Alaska and the rest of the United States had 88% and 86% respectively. Six percent (6%) of Quinhagak households were characterized as very low food security, the same percentage as the nation and only 1% higher than the state of Alaska. In the low food security category, however, the difference is greater. Twice as many Quinhagak households as Alaska households were categorized as low food security (7% and 14%, respectively).

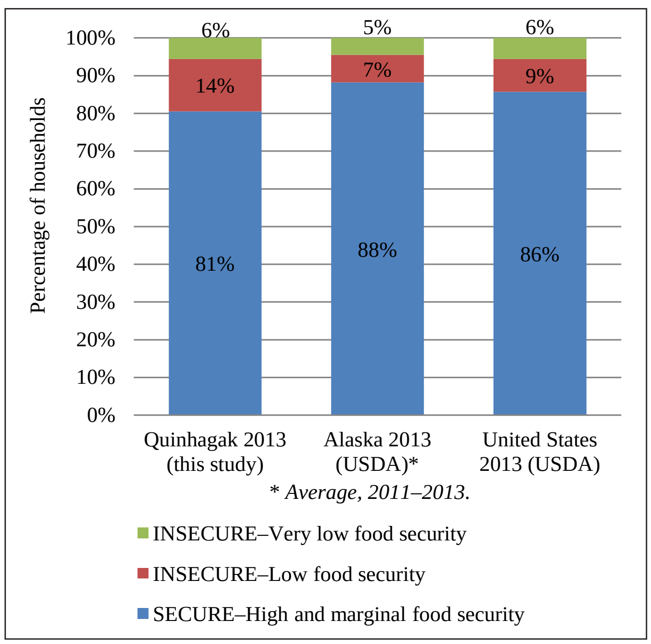


Figure 4-31.–Food security categories, Quinhagak, Alaska, and United States, 2013.

Figure 4-32 portrays the mean number of food insecure conditions per household by food security category by month. Households with high or marginal food security (shown in blue) reported an average of less than one food insecure condition per month. Households with low food security (red) reported between 1 and 2 food

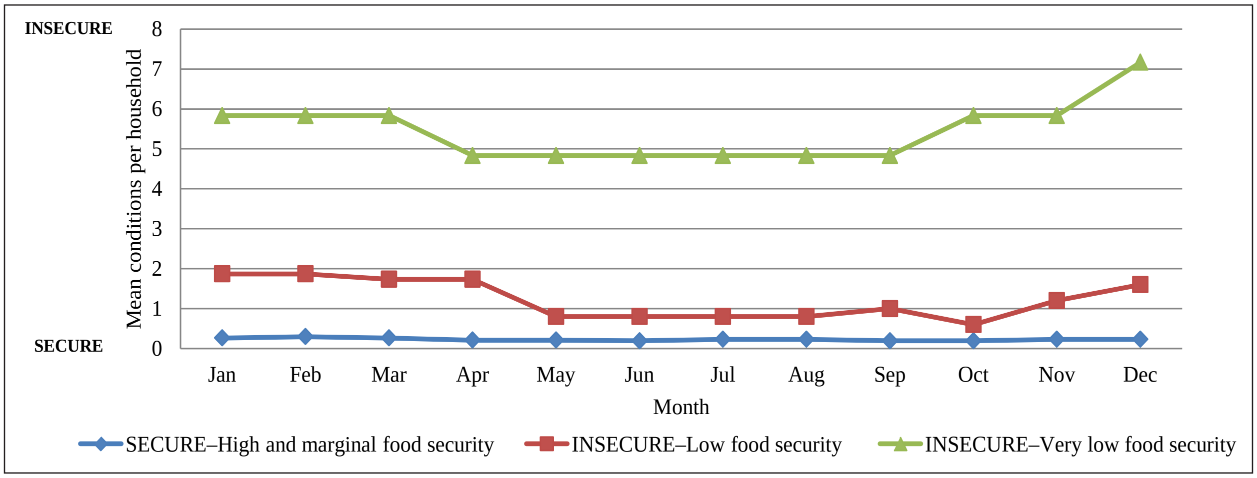


Figure 4-32.–Mean number of food insecure conditions by month and by household security category, Quinhagak, 2013.

insecure conditions per month throughout the year, with the highest levels in the late winter and early spring months of January through April. October had the fewest food insecure conditions for households in the low food security category. Households with very low food security (green) showed a similar pattern. These households averaged a minimum of 5 conditions in the months of April through September and a maximum of 7 conditions in December.

The seasonal availability of subsistence foods may account for these fluctuations. Figure 4-33 shows the months during which households reported that their food did not last. Subsistence foods (shown in red) followed the same fluctuations throughout the year as the mean number of food insecure conditions for households with low and very low food security (figures 4-32 and 4-33). Households ran out of food at higher rates in late winter and early spring than they did in summer months. Fifteen percent of Quinhagak households reported running out of subsistence food in April, more than any other month. That percentage fell sharply in October to a low of 7%. Store-bought food ran out for more households in the fall and winter months. This may reflect a lack of cash due to the lack of year-round employment.

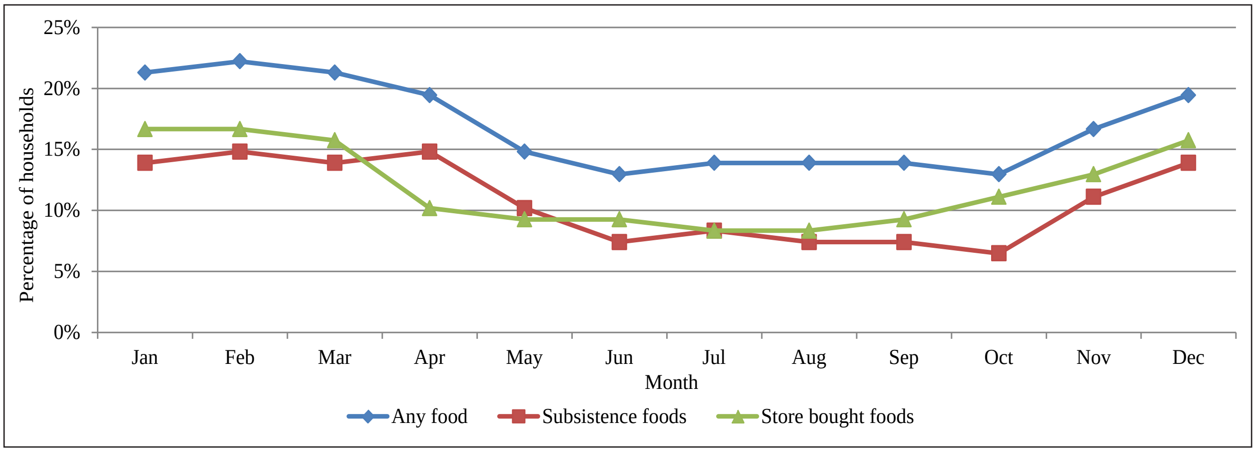


Figure 4-33.–Comparison of months when subsistence, store-bought, and any foods did not last, Quinhagak, 2013.

Sharing of Wild Resources

> We're sharing people. I hope that never stops. Even though I lost my husband over 30 years ago, I still eat fresh birds, fresh seals, 'cause people share their birds with me. Now I have grandsons that do the hunting. (041614KWN4)

Household Specialization in Resource Harvesting

Previous studies (Wolfe 1987; Wolfe et al. 2010) have shown that in most rural Alaska communities, a relatively small portion of households produce most of the community's subsistence harvest, which they share with other households. Wolfe et al. (2010) found that of 3,265 households in 66 rural Alaska communities, only 33% of the households accounted for 76% of subsistence harvests. Factors that influenced levels of subsistence harvests included larger households with a pool of adult labor, higher wage income, involvement in commerical fishing, and the location of the community. Figure 4-34 shows that for the community of Quinhagak in 2013, 30% of households accounted for the production of 70% of the total harvest. This is consistent with the "30-70 rule" of community harvest of subsistence foods discussed above.

Wild Food Networks

Although subsistence harvest surveys collect information based on individual households, in reality, much of the production (harvest and processing) of subsistence foods is achieved by households within a community that work cooperatively. This cooperation is often organized based on kinship in the manner of traditional communities. The organization of the contemporary mixed market–subsistence economies that are predominant in rural Alaska communities has been documented ethnographically by numerous researchers.

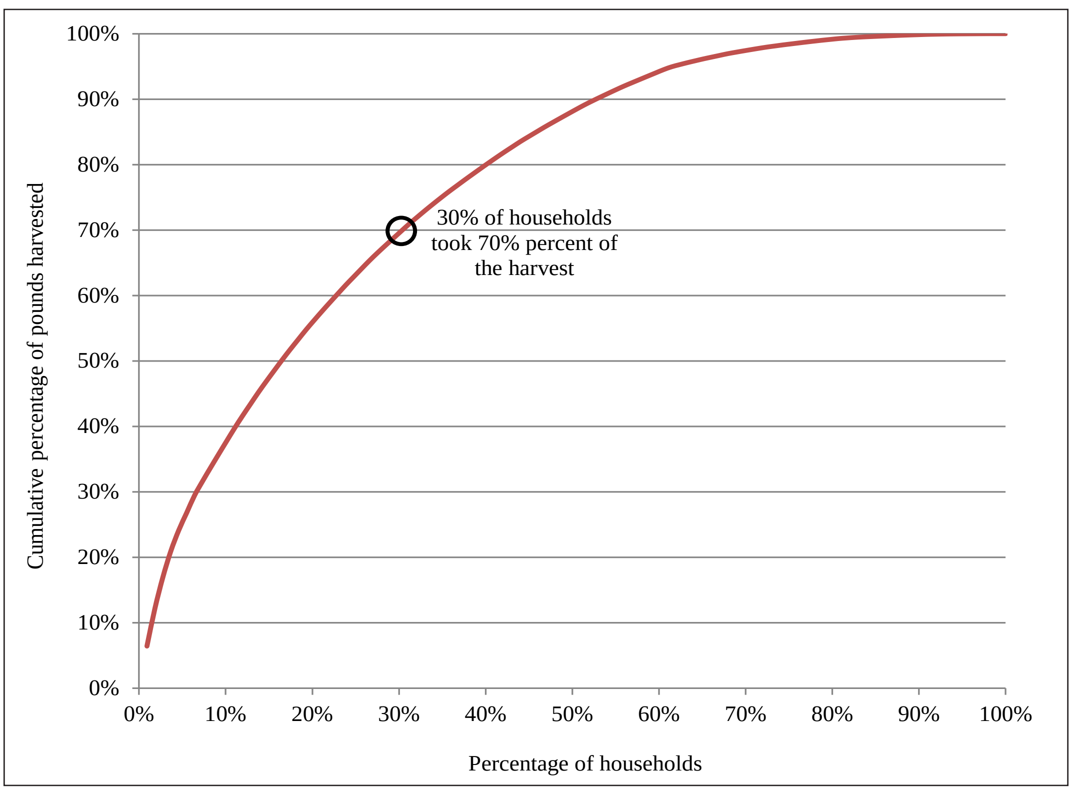


Figure 4-34.–Household harvest specialization, Quinhagak, 2013.

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

Figure 4-35 shows the flow of wild foods into surveyed households from other Quinhagak households and communities in Alaska. Symbol shapes depict the types of household, colors show the ages of heads of household, and sizes indicate the amount of households' subsistence harvests in 2013 by edible weight. Arrows show the direction of food from one household to another, and the weight of lines shows the number of resources. The position of a household relative to the center of the figure shows how tied it was to other households in Quinhagak. The figure is a partial representation of sharing, trade, and barter in 2013, because it only documents the food flows into the 109 surveyed households.[11]

Previous studies have found a positive association between the ages of household heads and the amount of subsistence foods harvested. Household characteristics associated with higher food production include those households with multiple working-age males, involvement with commercial fishing, and higher wage incomes. Characteristics common to lower producing households included female household heads, age of elders, non-Native household heads, and single-person households (Magdanz et al. 2009; Wolfe et al. 2010). Household "developmental cycles" (i.e., the relative age or "maturity" of household heads and number of productive household members) have also been associated with harvests.

Figure 4-35 shows a variety of household heads with varying demographics including age, sex, and marital status. Two heavy harvesting households appear near the center of the diagram: a single male under the age of 40, represented by a large upward yellow triangle, and a household headed by a couple between 40 and 59 years of age, represented by a large orange square. The literature described above suggests that heavy harvesting households are typically led by middle-aged couples, but the young, single male demonstrates diversity in high harvesting households. The proximity to the center of both the young single male and the middle-aged couple demonstrates that high harvesting households in Quinhagak are heavily connected within the food distribution network. Also in the center of the diagram are households led by single females of all ages, represented by yellow, orange, and brown downward triangles. The harvest by these households is much smaller in comparison to others shown in the network, but their proximity to the center illustrates that they may receive wild foods from many other households.

The Quinhagak network diagram shows complex relationships with numerous communities throughout Alaska. In total, surveyed households reported receiving food from 32 other communities around the state. Many of the communities are located in the Kuskokwim delta region including neighboring Eek, Goodnews Bay, Kongiganak, and Kwigilingok. A variety of Kuskokwim River communities also appear on the network. Survey respondents identified Bethel, Oscarville, Napakiak and Tuntuntuliak as sources of wild foods. Anchorage and Bethel, two hub communities, appear near the center of the diagram suggesting that residents maintain strong relationships with friends and family in larger communities.

For all surveyed households combined, Quinhagak survey participants cumulatively described 1154 instances of sharing or processing wild foods with another household in 2013. The average surveyed household received wild food or help processing wild food 6 times in 2013. One household reported receiving wild food 55 times in 2013, more than any other household. Of the 109 surveyed households in Quinhagak, only 2 are unconnected to any other household on the network diagram (Table 4-1; Figure 4-35). One household headed by a single female and one headed by a single male, both between the ages of 40 and 59, appear near the top left corner of the diagram. These households did not report receiving food from anyone in 2013. Sharing is strongly related to interpersonal and kinship connections, and it is possible that these 2 households were not fully integrated into the community at the time of the survey. Teachers, health aids, or other individuals new to Quinhagak will likely receive less wild foods than others who have been there longer.

---

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

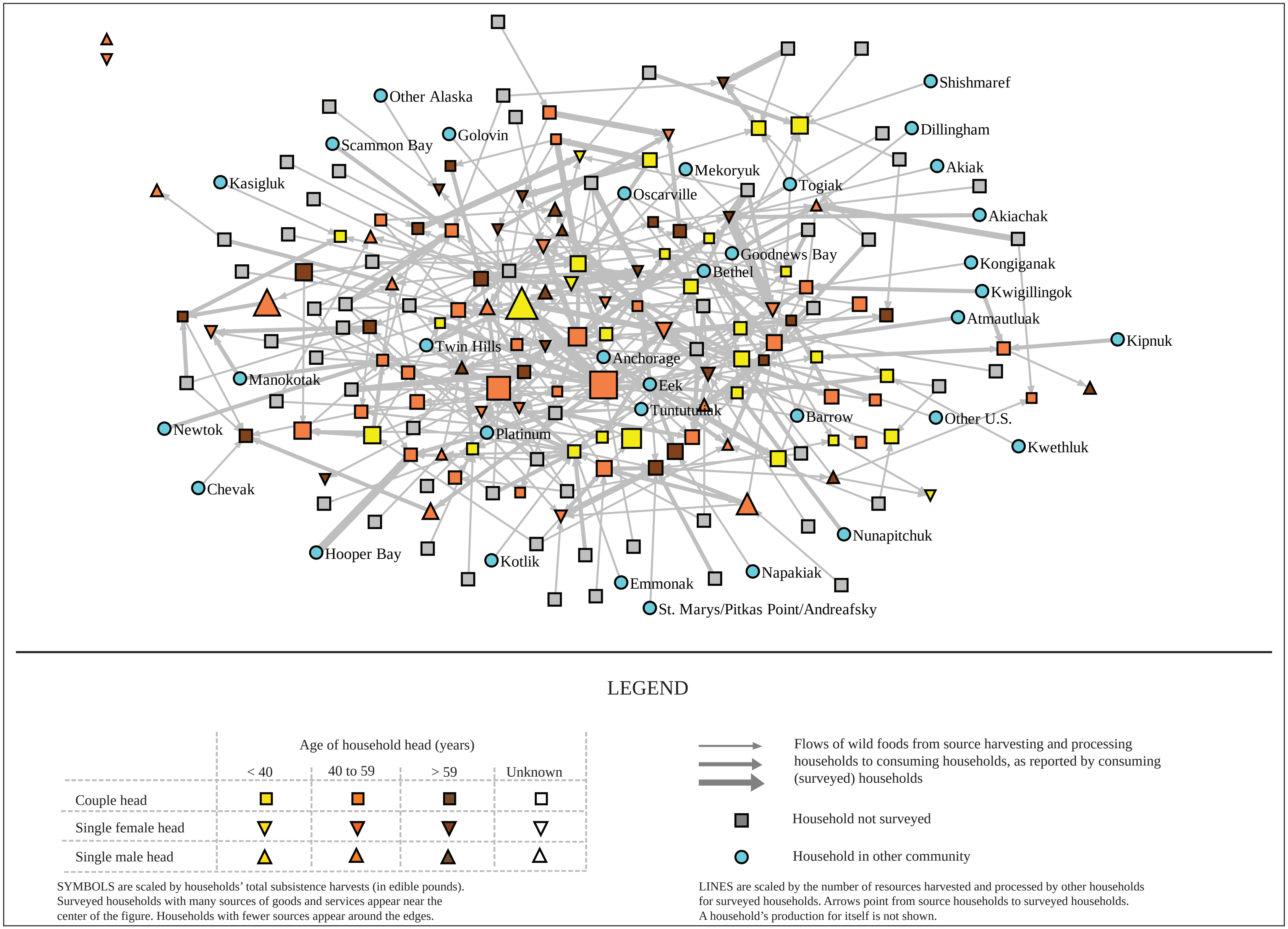


Figure 4-35.–Wild food harvesting and processing network, Quinhagak, 2013.

Local Comments and Concerns

As early as the 1960s, non-Native sport fishers had discovered the world-class sport-fishing opportunities that the Kanektok River provided (Rearden and Fienup-Riordan 2013). In addition to salmon in the lower river, sport fishers targeted Arctic graying, Dolly Varden, and trophy rainbow trout on the upper and middle portions of the river. Commercial fishing guides offered rafting trips from the headwaters downstream to the mouth. In the 1980s, sport fishing by non-Native sport fishers increased exponentially due to an increase in the number of guides and the expansion of existing guide operations (Rearden and Fienup-Riordan 2013). Many conflicts between Quinhagak residents and non-Native sport fishers erupted at this time. Although most sport fishers viewed their practice of "catch and release" as sound management of the resource, local residents saw it as "playing with fish," a disrespectful practice toward the fish, which were viewed as having awareness. To Quinhagak subsistence fishers, hooking a fish in the mouth and then placing it back in the water (after much handling while taking pictures) was senseless abuse, not sport (Rearden and Fienup-Riordan 2013). These conflicts continue to exist in contemporary Quinhagak. For more information on the subject of Quinhagak's history of conflict with sport fishers, see Rearden and Fienup-Riordan (2013) and Wolfe (2006, 1989). Wolfe (1989) gives a comprehensive summary of the conflicts between subsistence users and sport fishers during the 1980s, and also of the outcome of Board of Fisheries deliberations concerning the issue. No resolution has occurred.

Interview respondents expressed their concerns about sport fishing:

"Well, here's one thing I do support. Yeah. I wouldn't…want the sport fishermen to be targeting our kings while we're making sacrifices to allow for escapement" (041514KWN3).

"Yeah, yeah the, those sport fishermens trespass [on] a lot of lands up there [Kanetok River]. Land allotments. That's one of the bad thing[s]" (041614KWN4).

One elder respondent said,

> And there's one thing that I don't like about the regulations for last year. Like they didn't open up the commercial fishing until July 15…and before that, we didn't do much…subsistence either, 'cause we respect the, that, uh, regulation. They did, they didn't close…for subsistence, but some of us didn't feel right. To go out and get some while our…commercial fishermens are restricted…we let a lotta kings, kings go up [the Kanektok River]. Our commercial fishermen and us subsistence. But, there were lots of sport fishing up there, catching them [kings]. Why not if they, if, if they're closing down commercial, why not include the sport fishing too up there? (041614KWN4)

Subsistence users feel that they are being unfairly treated in respect to their fishing opportunities. They argue that it is unfair to let sport fishermen have access to king salmon fishing while subsistence fishers are told (through regulations) to stop fishing for Chinook salmon.

Quinhagak residents remain deeply committed to their traditional use of and respect for wild resources. They continue to rely heavily on these resources not only for subsistence, but also for the cohesiveness of their community and the continuation of long established Yup'ik traditions which are passed on from generation to generation, hopefully for years to come.

Plate 4-17.–Sunset over Kuskokwim Bay.

Acknowledgements

The author would like to express thanks to all residents of Quinhagak for their interest and participation in this ADF&G comprehensive subsistence study. Special thanks to Quinhagak elders and subsistence harvesters and processors who contributed their time and experience with our researchers as key respondents. Additionally, members of the Native Village of Kwinhagak council and Tribal Administrator are recognized for their help in facilitating this study. Special thanks to Jacqueline Cleveland, Native Village of Kwinhagak's Director of Natural Resources at the time for her support and expertise. Finally, the author would like to thank the local researchers who scheduled and administered surveys and shared their knowledge of and perspectives on the community of Quinhagak, a truly subsistence-based, traditional yet modern community situated on Alaska's Kuskokwim Bay (Plate 4-17).

5. EEK

Jeff Park

In May 2014, ADF&G researchers surveyed 64 of 90 households (71%) in Eek, Alaska. Expanding for 26 unsurveyed households, Eek's estimated total harvest of wild foods between January and December 2013 was 84,775 lb (± 13%). The average harvest per household was 942 lb; the average harvest per person was 244 lb.

Fish provided over one-half of the total edible pounds of wild food harvested in 2013, with salmon accounting for 29% and a variety of nonsalmon fish, including northern pike, burbot, and humpback whitefish making up 25% of the total subsistence harvest. The single most-harvested resource was Chinook salmon, which accounted for 10% of the total harvest. Other resources harvested in large quantities included moose, caribou, white-fronted goose, cloudberry, and bearded seal.

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

In addition to the comprehensive survey, 6 ethnographic interviews were conducted with 7 people. Respondents included both elders who held a lifetime of knowledge about living off the land and members of younger generations who were among the most currently active hunters, fishers, and gatherers in the community. These ethnographic interviews provided an opportunity to identify valuable information that may not be captured by the survey, including details about the seasonal round, recent changes in subsistence harvesting and processing practices, and insights on how the study year may have differed from a typical year.

Community Background

Eek is a Central Yup'ik Eskimo community in the Yukon-Kuskokwim Delta in southwest Alaska. It is located on the Eek River, which originates in the Kuskokwim Mountains 165 miles to the east and is the southernmost tributary of the Kuskokwim River (Alt [*n.d.*]; Dorsey 2011). Eek is surrounded by flat, lowland tundra dominated by lakes and wetlands (Plate 5-1). Flora is primarily lichens, mosses, shrubs, and grasses, because tree growth is limited by the permanently frozen soil. Boreal forests are found along rivers and streams in the lowlands and become more prevalent as the elevation increases nearer to the mountains.

The area surrounding the lower Kuskokwim River and its tributaries is believed to have been occupied since at least AD 600 (Dorsey 2011). People established villages, which served as home bases from which residents traveled to take advantage of seasonal opportunities to harvest food throughout the region. In 1878, the U.S. Signal Service first documented the village that is now known as Eek, which was then located on Eek Point at the mouth of the Eek River. By the early 1900s, the village was known as Eek, and in the 1920s it was moved to its present location, approximately 18 miles up the Eek River. By the 1930s, Eek had a Moravian church, a school, and a Northern Commercial Company store. The population grew as families from surrounding remote camps were attracted by the school and services available in Eek. Many families moved to Eek from the nearby village of Apokak, which was located at the mouth of the Apokak Slough and was abandoned due to flooding by 1935 (Dorsey 2011; Orth 1971rep.). The name Eek is a simplified form of the Central Yup'ik Eskimo name *Ekvicuaq* (formerly spelled *Iqfijouaq*). The name Ekvicuaq originates from the term *ekvik*, meaning river bank or bluff (Jacobson 2012). One key respondent

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

Plate 5-1.–Eek and surrounding landscape.

who was interviewed for this project described the origin of the name: "Ekvicuaq is here [pointing at map]. It's called the little bluff or little hill. That's how Ekvicuaq got its name" (051114EEK5).

Eek is a second-class city in the Bethel census area; it was incorporated in 1970.[2] It is 40 air miles south of the regional hub community Bethel and 420 miles west of Anchorage.[3] Eek residents travel throughout the region by boat in the summer and snowmachine in the winter. Eek has a small, state-owned airport with a single gravel runway that is utilized by several small airlines for passenger and freight services. Access to Alaska's road system requires a plane ride to Anchorage with a stop in Bethel.

Eek has a post office, a washeteria, a community hall, and a small dock that allows barges to deliver supplies and fuel.[4] The Yukon-Kuskokwim Health Corporation operates the Eek Clinic, which provides primary and preventative health care. The Eek School is part of the Lower Kuskokwim School District and offers pre-kindergarten through 12th grade education. The City of Eek operates a water treatment system and a landfill, and the Eek village corporation, Iqfijouaq Company, owns a small grocery store. Electricity is generated by an on-site diesel fueled power plant operated by the nonprofit Alaska Village Electric Cooperative. Public safety is provided by a Village Public Safety Officer and a Volunteer Fire Department in Eek, as well as the Alaska State Trooper post in Bethel.

2. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed January 5, 2016. http://commerce.alaska.gov/dcra/DCRAExternal/community. Hereafter referred to as ADCCED n.d.
3. Google earth V 7.1.5.1557. (April 9, 2013). Eek Alaska. 60 12' 58.69"N, 162 00' 48.47"W, Eye alt 56 meters. DigitalGlobe 2015, Landsat 2015. Accessed January 5, 2016. http://www.earth.google.com
4. ADCCED n.d.

Plate 5-2.–Red meat drying in May, in front of the open water of the bay.

Seasonal Round

Living off the land follows a seasonal cycle, and opportunities to hunt, fish, gather, and preserve food are presented throughout the year. Late winter and early spring is a transition from the relatively dormant midwinter months to breakup. Some subsistence resources that are available throughout the winter are primarily targeted at this time to take advantage of the warmer weather and longer days as breakup approaches.

April is a popular time for Eek residents to jig through the river ice for northern pike, Arctic grayling, and small numbers of burbot (Ray et al. 2010). Residents also search for nearby flocks of ptarmigans via snowmachine in April. Many seal and walrus hunters wait until the warmer weather of March, April and May to tow their boats to the bay with their snowmachines. Seal hunting in late winter is safer than in the colder months, and the temperatures provide a better opportunity to preserve the seal oil than the warmer weather of summer hunting: "...rendering the oil is one of the reasons we try to get them in springtime, 'cause it's colder. I mean it, not at the point of freezing, but it's just cold enough to keep the oil longer before we put it away" (051114EEK6).

By May, the snow is melting and the rivers are breaking up (Plate 5-2). At this time, many families take the opportunity to pull drifting logs from the rivers to use for firewood. Some Eek residents also gather young edible plants from the tundra, such as sourdock and Pallas buttercup, soon after breakup. Migratory waterfowl arrive in the region in May as well. Eek hunters harvest a wide variety of ducks, geese, and other migratory birds on day trips to nearby lakes and sloughs where the birds are known to gather. Also, some residents begin to gather eggs soon after the birds arrive to the region. One key respondent and egg-gathering expert reported that egg gathering begins consistently in the middle of May: "…from experience, every year, it's been around…May 20th. That's when they start really laying their eggs" (050914EEK7). He also reported that most subsistence harvesters continue to gather eggs until the chick embryos begin to take shape in mid- to late June: "…end of June would be too late for most people. Not for me. I gather my eggs continuously until they start hatching" (050914EEK7).

The Chinook salmon run is typically at its peak by early June. Many families consider Chinook salmon to be the most desirable salmon species, not just because they are large and have a high oil content, but also because of the time of year they arrive: "…the first and second week of June is the best time to cut fish because it's nice and sunny out, and they, the fish dry up really fast, get a hard layer on it so the bugs can't get to them" (051114EEK5). The chum and sockeye salmon runs begin a week or 2 after the Chinook run. Set and drift gillnet fishing for these 3 salmon species continues into July. Also, whitefishes can be caught throughout the summer using a rod and reel: "That's just, sitting in 1 spot doing that…you bait the hook and then you just toss it and you just sit there and wait" (050914EEK7). However, some residents wait until early fall to harvest whitefishes because the fish are fatter then (Ray et al. 2010).

July marks the beginning of another opportunity for seal hunting, which continues until freeze-up: "…we usually wait 'til August to start hunting seal again. That's when the bearded seals come in, and that's what we prefer, is the bearded seal" (051114EEK5). The coho salmon run peaks in August, a time when preserving fish by drying is typically not an option:

> [Coho salmon fishing] usually starts the first week of August, is when they're running strong…we usually put a lot away in the freezer for the winter, and then we jar a few…it's raining usually in like August and September when they're running strong, and it's just really hard to keep them from molding. (051114EEK5)

August is berry picking season. Cloudberries, blueberries, lowbush cranberries, and crowberries are harvested and frozen to be used for making *akutaq* (also known as Eskimo ice cream) throughout the winter. Bearded seal hunting and coho salmon fishing continue into September, when the focus turns to moose hunting. Moose season begins on September 1 and commonly involves a camping trip up the Eek River and a variety of associated subsistence activities such as berry picking, opportunistic harvests of beaver and other small land mammals, and rod and reel fishing for Dolly Varden, Arctic grayling, and sheefish. One respondent reported: "We target [sheefish] when we go upriver for cooking over the fire. They're usually pretty easy to catch. They get pretty big" (051114EEK5).

September provides a second opportunity to harvest migratory waterfowl and is also a popular time to fish for a variety of nonsalmon fish. Burbot (locally known as lush) are targeted by jigging from boats prior to freeze-up: "August, September, October. Those lush fish…if you throw your hook, one after another, you keep catching those. So much lush" (050914EEK1). Fishers set nets for broad and humpback whitefish as well as Bering cisco because they have higher fat content at this time of year (Ray et al. 2010). These whitefish species are often frozen and eaten raw or used for akutaq throughout the winter: "The whitefish from the lakes are used for frozen fish. And we, they put those away under the ground and eat them wintertime. Eat them frozen raw" (051014EEK4).

One key respondent reported that beluga whales were once harvested in the fall as they moved from the bay up into the rivers; however, today there are far fewer belugas seen in the area:

> We used to get a lot of beluga when I was growing up, and I think it was like 10, 15 years ago we just stopped seeing them. You see few here and there. We used to wait until fall time to hunt beluga…they just jam up the river just bunch of them, hundreds of them. (051114EEK5)

Winter is the ideal time for many subsistence activities because it allows for the efficiency of snowmachine travel. With adequate snow cover, subsistence users may access vast areas that are not easily accessed at other times of year. Eek residents set Alaska blackfish traps in small tundra lakes and streams, set whitefish nets under the ice in rivers, and catch sheefish by jigging through the ice (Ray et al. 2010). Snowmachine travel also allows opportunities to maintain extensive furbearer trap lines and to make one day or overnight hunting trips for moose and caribou.

Most Eek residents only harvest caribou during the winter months. Key respondents indicated that caribou hunting is only cost effective when snow conditions allow for hunting by snowmachine. Residents take day trips to the east of Eek to take advantage of the proximity of the Mulchatna caribou herd at that time of year.

> People that don't have as much money, that was their time to go out and harvest their caribou, cause they wouldn't have to buy so much gas. I guess it was for everybody. It's a lot easier and you could go out, come back have your meat put away by the end of the day. (051114EEK5)

Moose hunting takes place largely in September, though a few moose are taken in December. Key respondents indicated that, depending on their hunting success in the fall, they may travel by snowmachine to the lower Yukon River area of GMU 18 to harvest a moose if snow conditions allow for safe travel. Although it is over 200 miles round trip, this hunting trip is an economical one because it is easily done in a weekend, and hunter success is very likely. This hunt is also desirable to some residents because it allows for the harvesting of cow moose:

> [If] we only get one moose during the fall hunt, and then I split it with my whole family so it doesn't usually last that long, so we have to go to the Yukon to get more meat. That's usually January, February most of the time, and we target, since cows are allowed, cows. The meat between the cow and the bull are different, and the cow's a lot more tender and less gamey, so we target the cow when we go to the Yukon. (051114EEK5)

Winter also provides an opportunity for the hunting and trapping of most furbearers, like river otter, mink, lynx, and wolverine. Though some Eek residents maintain trap lines, their capacity to do so varies from year to year depending on snow conditions and the ability to efficiently travel by snowmachine. In addition to trapping, much of the furbearer harvest is done by hunting: "…we hunt and trap. If we see one while we're trapping, then we're going after it…it's opportunistic, I mean nowadays you have to come home with something with the high price of gas" (051114EEK5).

Finally, winter seal hunters may make trips beginning in January if ice conditions allow. However, the cold of midwinter makes seal hunting particularly challenging:

> I hunt for [spotted seals] during January and February. When it's really cold I bring my canoe down to the bay and just sit there and wait for them…it's too cold out for the motors and usually with metal boats water freezes a lot faster on it and it just gets too heavy. With a canoe it's so light that I can drag it anywhere during that time, so I won't have to worry about it freezing up. (051114EEK5)

March and April marks the end of some winter harvesting opportunities. Furbearer trapping season is over, and melting snow makes it difficult to travel over the tundra to hunt for caribou. People once again begin to turn their attention to the many harvesting opportunities that spring provides.

Population Estimates and Demographic Information

Two hundred forty-seven people lived in the 64 surveyed Eek households during the study year (Table 5-1). Expanding for the 26 unsurveyed households brings the total estimated Eek population in 2013 to 347, with 338 (98%) self-reported Alaska Natives (tables 5-1 and 5-2). Surveyed households had an average of 4 permanent residents (Table 5-3). The largest household surveyed had 9 occupants. The average age of Eek residents was 29, and the eldest resident of surveyed households was 88. The average length of residency in Eek was 25 years.

Table 5-2 compares this study's population estimate with the most recent U.S. Census. In 2010, the U.S. Census Bureau counted the Eek population at 296. Figure 5-1 shows the historic population estimates between 1950 and 2013. Eek's population has consistently increased from the first U.S. Census Bureau count of 141 in 1950 to the present study's estimate of 347 residents.

Table 5-1.–Sample achievement, Eek, 2013.

Sample information	Eek
Number of dwelling units	88
Survey goal	100%
Households surveyed	64
Households failed to be contacted	10
Households declined to be surveyed	16
Households moved or occupied by nonresident	3
Total households attempted to be surveyed	80
Refusal rate	20.0%
Final estimate of permanent households	90
Percentage of total households surveyed	71.1%
Survey weighting factor	1.4
Sampled population	247
Estimated population	347.3

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

Table 5-2.–Population estimates, Eek, 2010 and 2013.

	Census (2010)	5-year American Community Survey (2007–2011)	This study (2013)
Total population			
Households	91	105	90.0
Population	296	281	347.3
Alaska Native			
Population	289	274	337.5
Percentage	97.6%	97.5%	97.2%

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

Table 5-3.–Demographic characteristics, Eek, 2013.

Characteristics	Community Eek
Household size	
Mean	3.9
Minimum	1
Maximum	9
Age	
Mean	28.7
Minimum[a]	1
Maximum	88
Median	22.0
Length of residency	
Total population	
Mean	24.6
Minimum[a]	0
Maximum	88
Heads of household	
Mean	41.6
Minimum[a]	2
Maximum	88
Alaska Native households[b]	
Number	85.8
Percentage	95.3%

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.

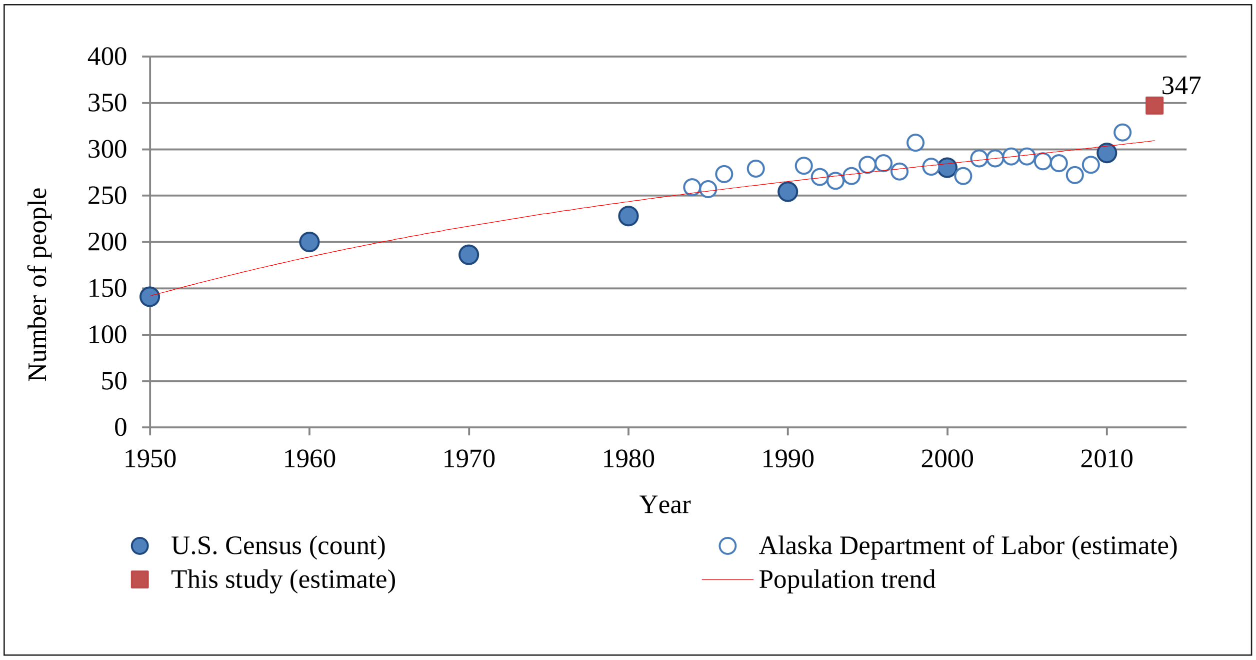


Figure 5-1.–Historical population estimates, Eek, 1950–2013.

Figure 5-2 shows the number of males and females in age groups from 0 to 89. There were approximately 179 males and 169 females in Eek in 2013 (Table 5-4). Eek has a young population: approximately 59% (204) of Eek residents were less than 30 years old in 2013. Also, approximately 26% (91) were children under the age of 10. This high number of children indicates a growing population.

Table 5-5 shows the birthplaces reported by Eek household heads. Seventy-six percent (76%) of household heads reported Eek as the place their parents were living when they were born. Seven percent (7%) of household heads reported Quinhagak as their birthplace. An additional 5% reported being born outside of Alaska, and the remaining household heads reported other Yukon-Kuskokwim Delta or Bristol Bay communities as their place of birth. Eighty-five percent (85%) of all Eek residents were born in Eek (Table 5-6). Three percent (3%) reported their birthplace as Quinhagak, 2% were born outside of Alaska, and the remaining residents were born in other Alaska communities.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Figure 5-3 reports the expanded levels of individual participation in the harvest and processing of wild resources by Eek residents in 2013.[5] Fifty-three percent (53%) of the community attempted to harvest some subsistence resource in 2013, and 49% participated in processing a resource. More people attempted to harvest vegetation than any other resource category: 56% of respondents gathered berries or other plants and greens, and 43% of the community played a role in processing these resources. The second most common resource category that Eek residents attempted to harvest was birds and eggs. Thirty-six percent (36%) of residents reported hunting some species of bird or attempting to gather bird eggs, and 30% processed birds or eggs. Approximately one-third of the population (33%) attempted to harvest fish, and 31% processed fish. Mammals were targeted by a smaller percentage of the population: 17% of Eek residents participated in land mammal hunting or trapping, and 12% attempted to hunt marine mammals. These 2 resource categories were the only categories in which more people participated in processing these resources than

5. See also Appendix D, Table D-3. Percentages are calculated based on valid responses, which excludes from the sample missing data for that category.

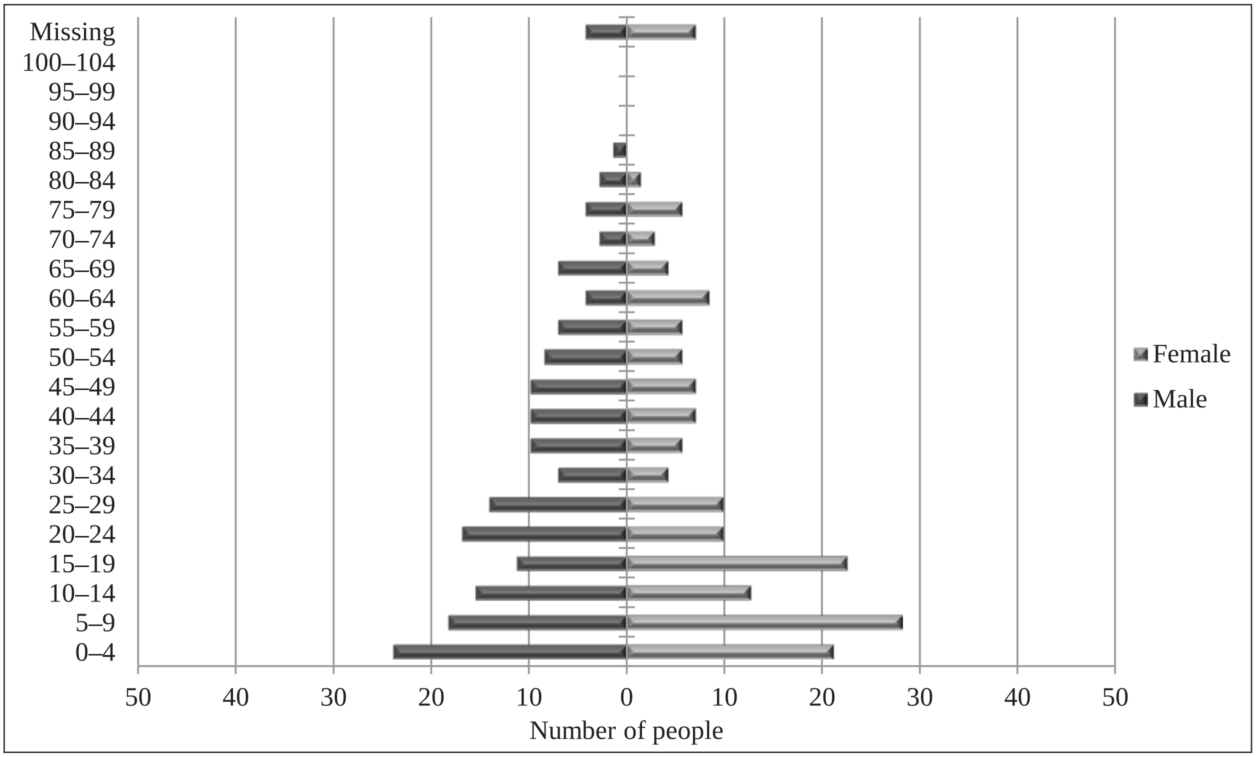


Figure 5-2.–Population profile, Eek, 2013.

Table 5-4.–Population profile, Eek, 2013.

Age	Male Number	Male Percentage	Male Cumulative percentage	Female Number	Female Percentage	Female Cumulative percentage	Total Number	Total Percentage	Total Cumulative percentage
0–4	23.9	13.4%	13.4%	21.1	12.5%	12.5%	45.0	13.0%	13.0%
5–9	18.3	10.2%	23.6%	28.1	16.7%	29.2%	46.4	13.4%	26.3%
10–14	15.5	8.7%	32.3%	12.7	7.5%	36.7%	28.1	8.1%	34.4%
15–19	11.3	6.3%	38.6%	22.5	13.3%	50.0%	33.8	9.7%	44.1%
20–24	16.9	9.4%	48.0%	9.8	5.8%	55.8%	26.7	7.7%	51.8%
25–29	14.1	7.9%	55.9%	9.8	5.8%	61.7%	23.9	6.9%	58.7%
30–34	7.0	3.9%	59.8%	4.2	2.5%	64.2%	11.3	3.2%	61.9%
35–39	9.8	5.5%	65.4%	5.6	3.3%	67.5%	15.5	4.5%	66.4%
40–44	9.8	5.5%	70.9%	7.0	4.2%	71.7%	16.9	4.9%	71.3%
45–49	9.8	5.5%	76.4%	7.0	4.2%	75.8%	16.9	4.9%	76.1%
50–54	8.4	4.7%	81.1%	5.6	3.3%	79.2%	14.1	4.0%	80.2%
55–59	7.0	3.9%	85.0%	5.6	3.3%	82.5%	12.7	3.6%	83.8%
60–64	4.2	2.4%	87.4%	8.4	5.0%	87.5%	12.7	3.6%	87.4%
65–69	7.0	3.9%	91.3%	4.2	2.5%	90.0%	11.3	3.2%	90.7%
70–74	2.8	1.6%	92.9%	2.8	1.7%	91.7%	5.6	1.6%	92.3%
75–79	4.2	2.4%	95.3%	5.6	3.3%	95.0%	9.8	2.8%	95.1%
80–84	2.8	1.6%	96.9%	1.4	0.8%	95.8%	4.2	1.2%	96.4%
85–89	1.4	0.8%	97.6%	0.0	0.0%	95.8%	1.4	0.4%	96.8%
90–94	0.0	0.0%	97.6%	0.0	0.0%	95.8%	0.0	0.0%	96.8%
95–99	0.0	0.0%	97.6%	0.0	0.0%	95.8%	0.0	0.0%	96.8%
100–104	0.0	0.0%	97.6%	0.0	0.0%	95.8%	0.0	0.0%	96.8%
Missing	4.2	2.4%	100.0%	7.0	4.2%	100.0%	11.3	3.2%	100.0%
Total	**178.6**	**100.0%**	**100.0%**	**168.8**	**100.0%**	**100.0%**	**347.3**	**100.0%**	**100.0%**

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

Table 5-5.–Birthplaces of household heads, Eek, 2013

Birthplace	Percentage
Bethel	1.9%
Dillingham	0.9%
Eek	75.9%
Emmonak	0.9%
Iliamna	0.9%
Kasigluk	0.9%
Kipnuk	0.9%
Kotlik	1.9%
Kwigillingok	0.9%
Napakiak	0.9%
Nunapitchuk	0.9%
Quinhagak	6.5%
Togiak	0.9%
Tuntutuliak	0.9%
Other U.S.	3.7%
Foreign	0.9%

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 5-6.–Birthplaces of population, Eek, 2013.

Birthplace	Percentage
Alakanuk	0.4%
Anchorage	0.4%
Bethel	1.2%
Dillingham	0.4%
Eek	85.4%
Emmonak	0.4%
Fairbanks	0.4%
Iliamna	0.4%
Kasigluk	0.4%
Kipnuk	0.4%
Kotlik	0.8%
Kwigillingok	0.4%
Napakiak	0.8%
Nunapitchuk	0.4%
Quinhagak	3.2%
Togiak	1.2%
Tuntutuliak	0.8%
Tununak	0.4%
Other U.S.	1.6%
Foreign	0.4%

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.

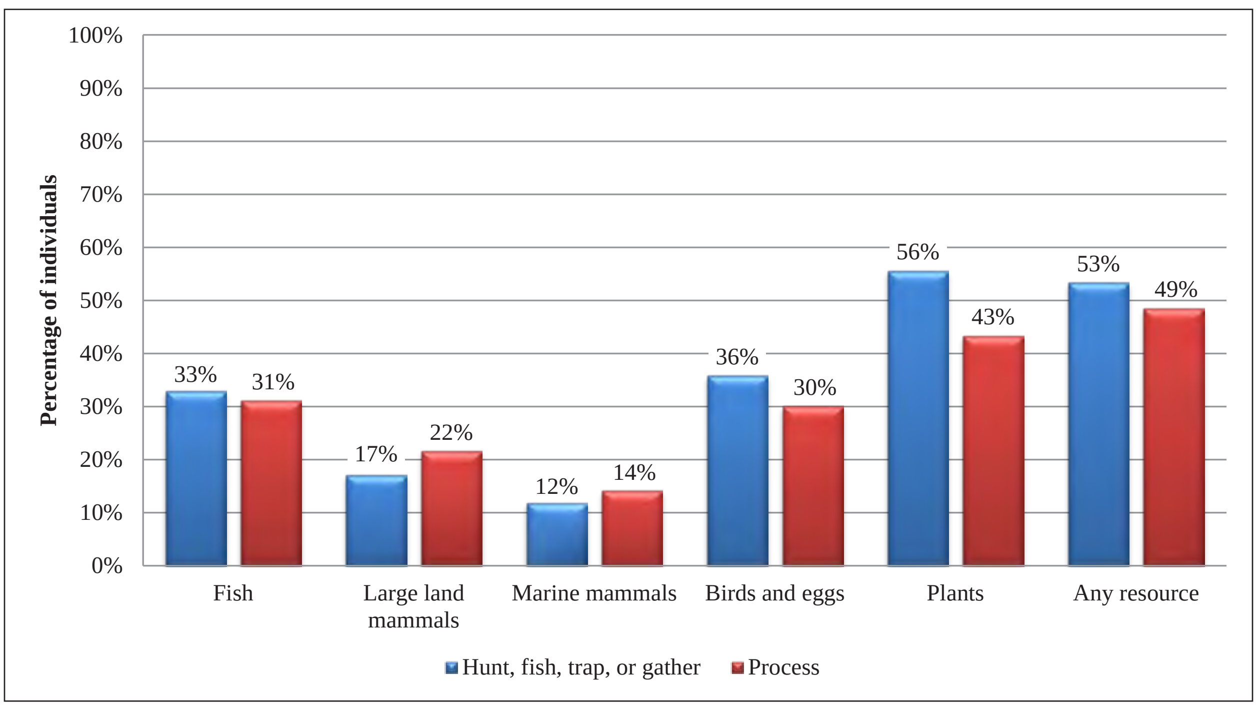


Figure 5-3.–Individual participation in subsistence harvesting and processing activities, Eek, 2013.

in hunting them; 22% helped to process land mammals, and 14% processed marine mammals. Some of the targeted species in these categories are massive, such as moose and bearded seal, which may necessitate a group effort in processing them.

Harvest and Use of Wild Resources at the Household Level

Figure 5-4 shows by resource category the percentages of households that used, attempted to harvest, and successfully harvested wild foods. Comparing the percentage of households that used a resource category to the percentage that harvested that category provides insight into how frequently those resources tend to be shared between households. The rates of using and harvesting vary between resource categories in a manner that might be predicted based on the equipment and resources needed to hunt, fish for, or gather those species. For example, 86% of households harvested vegetation, suggesting that people tend to pick their own berries and other plants. This is not surprising considering that some plant and berry picking can be done within walking distance of the community, and the only resources needed to harvest them successfully are abundance, time, and a bucket. On the contrary, salmon are not likely to be harvested in significant quantities without a boat, the money to fuel and maintain it, and a gillnet. Predictably, much of the community's salmon harvest is shared with nonharvesting households; the resource is utilized by nearly the entire community (92% of households), but only harvested by 55% of households. This also holds true for large land mammals and marine mammals. Hunting these animals can require long boat trips, specialized equipment, and extensive expertise. Although there are fewer households hunting these animals, most households in the community use them.

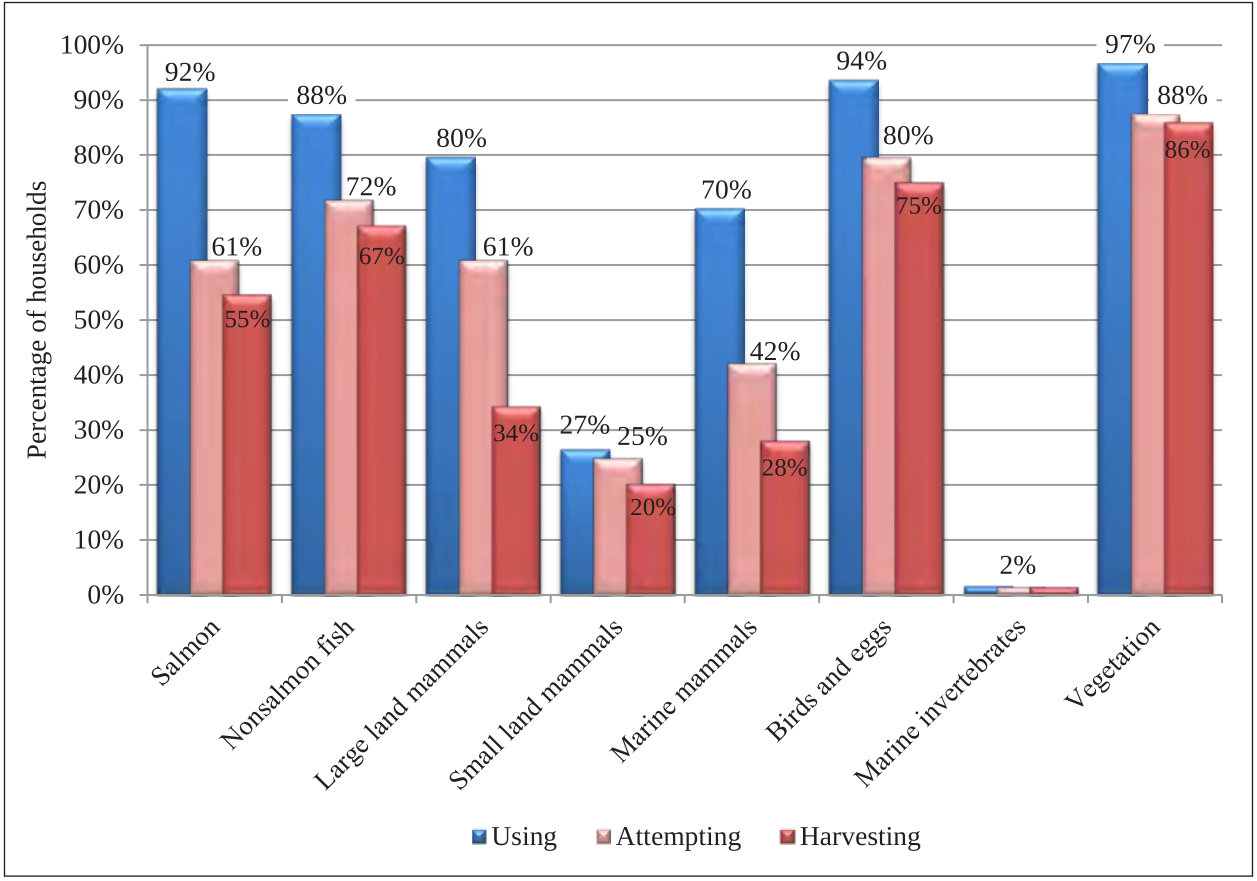


Figure 5-4.–Percentages of households using, attempting to harvest, or harvesting wild resources, by category, Eek, 2013.

Table 5-7.–Resource harvest and use characteristics, Eek, 2013.

Characteristic	
Mean number of resources used per household	**21.6**
Minimum	1
Maximum	46
95% confidence limit (±)	6.8%
Median	23.0
Mean number of resources attempted to harvest per household	**16.8**
Minimum	0
Maximum	42
95% confidence limit (±)	9.2%
Median	17.0
Mean number of resources harvested per household	**14.6**
Minimum	0
Maximum	42
95% confidence limit (±)	9.9%
Median	14.0
Mean number of resources received per household	**7.0**
Minimum	0
Maximum	33
95% confidence limit (±)	14.2%
Median	4.0
Mean number of resources given away per household	**8.8**
Minimum	0
Maximum	34
95% confidence limit (±)	13.2%
Median	6.5
Household harvest (pounds)	
Minimum	0
Maximum	3,391
Mean	941.9
Median	691.5
Number of resources asked about and identified voluntarily by respondents	131

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

Table 5-7 summarizes resource harvest and use characteristics for Eek in 2013 at the household level. The average harvest was 942 lb usable weight per household or 244 lb per capita. During the study year, community households harvested an average of 15 kinds of resources and used an average of 22 kinds of resources. The maximum number of resources used by any household was 46. In addition, households gave away an average of 9 kinds of resources. Overall, at least 131 resources were available for households to harvest in the study area; this includes resources that survey respondents identified but were not asked about in the survey instrument.

Harvest Quantities and Composition

Table 5-8 reports estimated wild resource harvests and uses by Eek 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 C for conversion factors[6]). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources taken, given away, or used by a household, and resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Purchased foods are not included, but resources such as firewood are included because they are an important part of the subsistence way of life. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

Eek residents harvested 84,775 edible pounds of wild foods for an estimated harvest of 244 lb per capita (Table 5-8). Figure 5-5 shows the percentage of edible pounds that each subsistence resource category contributed to Eek's total harvest. Salmon was the most harvested resource category and provided 29% of the total community harvest. Nonsalmon fish accounted for 25% of the total edible pounds harvested. Large land mammals provided 16% of the community's edible harvest, followed by birds and eggs with 13%. Vegetation and marine mammals each made up 8% of edible pounds harvested. Small land mammals and marine invertebrates did not contribute significantly to Eek's 2013 subsistence diet; each of these 2 resource categories accounted for less than 1% of the total harvest.

Use and Harvest Characteristics by Resource Category

Table 5-9 lists the top 10 ranked resources used by households during the 2013 study year. Use of a resource may include harvesting, processing, eating, or trading the resource. Also, feeding the resource to dogs, using it for bait, and making tools, clothes, or crafts from a resource or its byproducts are all considered use for this study.

Cloudberries (locally known as salmonberries) were most universally utilized by Eek households. Ninety percent (90%) of Eek households reported using cloudberries in 2013. Moose, used by 77% of households, was the second most commonly used resource and was the only representative of the large land mammal resource category among the top 10 most-utilized resources. White-fronted goose, used by 75% of households, was the third most commonly utilized resource, followed by Chinook salmon (73%) and sockeye salmon (70%). Crowberries were used by 64% of households, and chum salmon, coho salmon, and ptarmigans were each used by 63% of households. Although nonsalmon fish was utilized by 88% of households, no individual nonsalmon fish species ranks among the 10 most used resources (tables 5-8 and 5-9). Similarly the category of marine mammals, used by 70% of households, is not represented by any individual species among the top 10 most used resources.

Figure 5-6 shows the 10 species with the most edible pounds harvested per capita during the 2013 study year. Chinook salmon made up 10% of the community's per capita edible harvest, more than any other single resource species. Moose made a similar contribution to the community's diet, with 9% of the per capita harvest, followed by chum salmon, which accounted for 8%. Northern pike also contributed 8% to the community's per capita edible harvest; however, it was not among the 10 most commonly used resources (Figure 5-6; Table 5-9). Similarly, caribou, which made up 7% of the harvest, did not rank among the 10 resources most used throughout the community. Sockeye salmon also contributed 7% of the harvest, followed by burbot and white-fronted goose with 5% each, and finally cloudberry and coho salmon with 4% each. Each of the 4 primary salmon species available are represented in the top 10 most harvested resources.

6. Resources that are not eaten, such as firewood and some furbearers, are included in the table but are assigned an edible weight conversion factor of zero.

Table 5-8.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Eek, 2013.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
All resources	**100.0**	**92.2**	**92.2**	**95.3**	**81.3**	**84,774.9**	**941.9**	**244.1**				**13.1**
Salmon	**92.2**	**60.9**	**54.7**	**43.8**	**57.8**	**24,830.9**	**275.9**	**71.5**				**18.2**
Chum salmon	62.5	43.8	40.6	23.4	37.5	6,628.5	73.7	19.1	1,350.0	ind	15.0	24.3
Coho salmon	62.5	40.6	37.5	23.4	37.5	3,570.8	39.7	10.3	777.9	ind	8.6	25.7
Chinook salmon	73.4	50.0	43.8	34.4	37.5	8,615.1	95.7	24.8	783.9	ind	8.7	21.8
Pink salmon	4.7	3.1	3.1	1.6	1.6	11.5	0.1	0.0	4.2	ind	0.0	79.6
Sockeye salmon	70.3	48.4	43.8	26.6	42.2	6,005.0	66.7	17.3	1,201.0	ind	13.3	21.2
Unknown salmon	1.6	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Nonsalmon fish	**87.5**	**71.9**	**67.2**	**62.5**	**54.7**	**21,076.6**	**234.2**	**60.7**				**18.4**
Pacific herring	10.9	6.3	6.3	4.7	4.7	2,640.9	29.3	7.6	440.2	gal	4.9	66.1
* Pacific herring roe	3.1	0.0	0.0	3.1	1.6	0.0	0.0	0.0	0.0	gal	0.0	0.0
Smelt	28.1	7.8	6.3	20.3	10.9	1,032.2	11.5	3.0	172.0	gal	1.9	65.5
Saffron cod	6.3	1.6	1.6	4.7	1.6	116.0	1.3	0.3	154.7	ind	1.7	107.4
Pacific halibut	25.0	14.1	12.5	14.1	9.4	1,011.7	11.2	2.9	1,011.7	gal	11.2	65.7
Arctic lamprey	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Alaska blackfish	35.9	18.8	17.2	17.2	17.2	788.9	8.8	2.3	788.9	lb	8.8	39.9
Burbot	54.7	48.4	42.2	7.8	32.8	4,309.9	47.9	12.4	1,795.8	ind	20.0	31.0
Dolly Varden	18.8	7.8	6.3	10.9	4.7	86.1	1.0	0.2	95.6	ind	1.1	58.9
Arctic grayling	10.9	10.9	10.9	0.0	6.3	80.2	0.9	0.2	80.2	ind	0.9	49.1
Northern pike	53.1	43.8	39.1	15.6	20.3	6,461.0	71.8	18.6	1,435.8	ind	16.0	32.4
Sheefish	7.8	7.8	7.8	1.6	3.1	219.4	2.4	0.6	36.6	ind	0.4	60.3
Rainbow trout	12.5	7.8	4.7	7.8	4.7	112.2	1.2	0.3	80.2	ind	0.9	94.5
Broad whitefish	39.1	25.0	23.4	17.2	18.8	1,333.1	14.8	3.8	333.3	ind	3.7	31.4
Bering cisco	32.8	18.8	18.8	15.6	14.1	716.6	8.0	2.1	511.9	ind	5.7	36.0
Least cisco	10.9	6.3	6.3	6.3	6.3	147.7	1.6	0.4	147.7	ind	1.6	60.6
Humpback whitefish	45.3	32.8	31.3	20.3	20.3	2,020.8	22.5	5.8	673.6	ind	7.5	24.7
Round whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown whitefishes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

-continued-

Table 5-8.–Page 2 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Large land mammals	**79.7**	**60.9**	**34.4**	**59.4**	**35.9**	**13,658.1**	**151.8**	**39.3**				**23.3**
Black bear	3.1	0.0	0.0	3.1	1.6	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Caribou	60.9	37.5	26.6	34.4	26.6	6,064.4	67.4	17.5	46.6	ind	0.5	27.7
Moose	76.6	59.4	15.6	57.8	18.8	7,593.8	84.4	21.9	14.1	ind	0.2	31.4
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dall sheep	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	**26.6**	**25.0**	**20.3**	**4.7**	**10.9**	**315.0**	**3.5**	**0.9**				**49.0**
Beaver	7.8	9.4	6.3	0.0	1.6	168.8	1.9	0.5	21.1	ind	0.2	72.9
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	7.8	7.8	4.7	1.6	3.1	67.5	0.8	0.2	33.8	ind	0.4	67.1
Alaska hare	1.6	3.1	1.6	0.0	0.0	21.1	0.2	0.1	7.0	ind	0.1	107.4
River (land) otter	10.9	7.8	6.3	3.1	3.1	8.4	0.1	0.0	8.4	ind	0.1	75.3
Lynx	3.1	3.1	3.1	0.0	1.6	0.0	0.0	0.0	7.0	ind	0.1	76.9
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	3.1	3.1	1.6	0.0	1.6	0.0	0.0	0.0	4.2	ind	0.0	107.4
Muskrat	3.1	3.1	3.1	0.0	3.1	0.0	0.0	0.0	11.3	ind	0.1	84.5
Porcupine	6.3	6.3	4.7	1.6	4.7	49.2	0.5	0.1	9.8	ind	0.1	69.6
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gray wolf	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Wolverine	1.6	1.6	1.6	0.0	0.0	0.0	0.0	0.0	1.4	ind	0.0	107.4
Marine mammals	**70.3**	**42.2**	**28.1**	**56.3**	**35.9**	**6,496.9**	**72.2**	**18.7**				**41.4**
Bearded seal	25.0	28.1	14.1	10.9	10.9	2,362.5	26.3	6.8	16.9	ind	0.2	35.8
Ringed seal	18.8	21.9	7.8	10.9	10.9	708.8	7.9	2.0	12.7	ind	0.1	50.7
Spotted seal	34.4	29.7	15.6	18.8	23.4	1,260.0	14.0	3.6	22.5	ind	0.3	33.1
Unknown seal oil	29.7	3.1	0.0	26.6	4.7	0.0	0.0	0.0				0.0
Walrus	14.1	4.7	1.6	12.5	3.1	2,165.6	24.1	6.2	2.8	ind	0.0	107.4
Beluga whale	7.8	1.6	0.0	7.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Bowhead whale	1.6	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown marine mammals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0

-continued-

Table 5-8.–Page 3 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Birds and eggs	**93.8**	**79.7**	**75.0**	**39.1**	**50.0**	**11,304.2**	**125.6**	**32.5**				**18.3**
Common eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
King eider	4.7	4.7	4.7	0.0	0.0	14.1	0.2	0.0	9.8	ind	0.1	79.2
Spectacled eider	1.6	1.6	1.6	0.0	0.0	3.4	0.0	0.0	1.4	ind	0.0	107.4
Steller's eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
* Goldeneye	1.6	1.6	1.6	0.0	1.6	15.2	0.2	0.0	9.8	ind	0.1	107.4
Harlequin duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	35.9	32.8	32.8	3.1	20.3	454.1	5.0	1.3	232.9	ind	2.6	23.3
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pintail	18.8	15.6	15.6	3.1	10.9	173.0	1.9	0.5	115.3	ind	1.3	37.5
Scaup	17.2	12.5	12.5	4.7	10.9	107.6	1.2	0.3	119.5	ind	1.3	46.5
Black scoter	29.7	23.4	23.4	6.3	15.6	153.1	1.7	0.4	170.2	ind	1.9	31.9
Surf scoter	12.5	10.9	10.9	1.6	7.8	121.5	1.4	0.3	135.0	ind	1.5	56.9
White-winged scoter	18.8	18.8	18.8	0.0	14.1	637.6	7.1	1.8	278.4	ind	3.1	36.1
Northern shoveler	3.1	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Teal	4.7	4.7	4.7	0.0	1.6	6.7	0.1	0.0	12.9	ind	0.1	75.2
American wigeon	4.7	4.7	4.7	0.0	1.6	18.7	0.2	0.1	14.3	ind	0.2	76.3
Unknown ducks	1.6	1.6	1.6	0.0	0.0	4.4	0.0	0.0	4.2	ind	0.0	107.4
Brant	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Canada goose	53.1	48.4	42.2	12.5	25.0	635.8	7.1	1.8	529.8	ind	5.9	29.8
Emperor goose	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Snow goose	9.4	9.4	7.8	1.6	1.6	39.3	0.4	0.1	9.8	ind	0.1	49.5
White-fronted goose	75.0	62.5	59.4	15.6	33.3	4,197.6	46.6	12.1	990.0	ind	11.0	23.0
Unknown geese	1.6	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tundra (whistling) swan	37.5	32.8	31.3	6.3	20.3	1,529.1	17.0	4.4	136.4	ind	1.5	26.5
Sandhill crane	45.3	39.1	39.1	7.8	21.9	1,193.1	13.3	3.4	142.0	ind	1.6	33.8
Shorebirds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Seabirds, loons, grebes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Loon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ptarmigan	62.5	53.1	51.6	10.9	31.3	1,469.7	16.3	4.2	2,099.5	ind	23.3	36.9

-continued-

Table 5-8.–Page 4 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Snowy owl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Duck eggs	32.8	25.0	15.6	12.5	7.8	40.7	0.5	0.1	271.4	ind	3.0	40.4
Goose eggs	48.4	37.5	28.1	12.5	15.6	116.4	1.3	0.3	388.1	ind	4.3	32.4
Swan eggs	21.9	23.4	17.2	0.0	9.4	58.5	0.6	0.2	92.8	ind	1.0	35.6
* Crane eggs	7.8	7.8	6.3	0.0	3.1	8.9	0.1	0.0	14.1	ind	0.2	57.7
Common snipe eggs	1.6	1.6	1.6	0.0	0.0	0.2	0.0	0.0	4.2	ind	0.0	107.4
* Plover eggs	1.6	1.6	1.6	0.0	0.0	2.0	0.0	0.0	28.1	ind	0.3	107.4
* Unknown shorebird eggs	10.9	9.4	7.8	3.1	1.6	2.0	0.0	0.0	49.2	ind	0.5	50.8
Gull eggs	34.4	28.1	23.4	9.4	12.5	144.7	1.6	0.4	482.3	ind	5.4	39.0
Loon eggs	1.6	3.1	1.6	0.0	0.0	1.5	0.0	0.0	8.4	ind	0.1	107.4
* Murre eggs	12.5	4.7	4.7	7.8	7.8	145.1	1.6	0.4	659.4	ind	7.3	80.7
* Tern eggs	3.1	1.6	1.6	1.6	1.6	1.1	0.0	0.0	22.5	ind	0.3	107.4
* Ptarmigan eggs	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eggs	4.7	3.1	1.6	1.6	1.6	9.3	0.1	0.0	42.2	ind	0.5	107.4
Marine invertebrates	**1.6**	**1.6**	**1.6**	**0.0**	**1.6**	**41.4**	**0.5**	**0.1**				**107.4**
Clams	1.6	1.6	1.6	0.0	1.6	20.7	0.2	0.1	4.2	gal	0.0	107.4
King crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tanner crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown crab	1.6	1.6	1.6	0.0	1.6	20.7	0.2	0.1	4.2	ind	0.0	107.4
Mussels	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	gal	0.0	0.0
Vegetation	**96.9**	**87.5**	**85.9**	**48.4**	**43.8**	**7,051.7**	**78.4**	**20.3**	**2,352.1**	gal	**26.1**	**12.8**
Blueberry	57.8	56.3	56.3	3.1	9.4	580.7	6.5	1.7	145.2	gal	1.6	21.7
Lowbush cranberry	40.6	35.9	35.9	6.3	9.4	400.0	4.4	1.2	100.0	gal	1.1	26.6
Highbush cranberry	1.6	1.6	1.6	0.0	0.0	16.9	0.2	0.0	4.2	gal	0.0	107.4
Crowberry	64.1	54.7	54.7	17.2	20.3	1,493.2	16.6	4.3	373.3	gal	4.1	21.6
* Currants	1.6	0.0	0.0	1.6	1.6	0.0	0.0	0.0	0.0	gal	0.0	0.0
Cloudberry	89.1	81.3	81.3	17.2	28.1	3,672.9	40.8	10.6	918.2	gal	10.2	12.2

-continued-

Table 5-8.–Page 5 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Vegetation, continued												
Nagoonberry	15.6	15.6	15.6	3.1	6.3	59.4	0.7	0.2	14.9	gal	0.2	43.3
Raspberry	3.1	3.1	3.1	0.0	0.0	39.4	0.4	0.1	9.8	gal	0.1	76.1
Other wild berry	1.6	1.6	1.6	0.0	0.0	28.1	0.3	0.1	7.0	gal	0.1	107.4
* Wild rhubarb	3.1	3.1	3.1	0.0	1.6	5.6	0.1	0.0	5.6	gal	0.1	84.5
Fiddlehead ferns	15.6	12.5	12.5	3.2	3.2	21.5	0.2	0.1	21.5	gal	0.2	60.4
Hudson's Bay (Labrador) tea	21.9	21.9	21.9	0.0	7.8	32.6	0.4	0.1	32.6	gal	0.4	40.3
Sourdock	35.9	32.8	32.8	3.2	12.7	317.3	3.5	0.9	317.3	gal	3.5	34.8
Pallas buttercup	42.2	29.7	29.7	12.7	15.9	196.8	2.2	0.6	196.8	gal	2.2	53.4
* Willow leaves	1.6	1.6	1.6	0.0	1.6	0.4	0.0	0.0	0.4	gal	0.0	107.4
Wild celery	12.5	10.9	10.9	1.6	3.2	34.3	0.4	0.1	34.3	gal	0.4	61.4
Wild rose hips	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other wild greens	17.2	14.1	14.1	3.1	4.7	55.9	0.6	0.2	55.9	gal	0.6	46.2
Unknown mushrooms	1.6	1.6	1.6	0.0	0.0	0.7	0.0	0.0	0.7	gal	0.0	107.4
* Fireweed	1.6	1.6	1.6	0.0	1.6	7.0	0.1	0.0	7.0	gal	0.1	107.4
Stinkweed	20.3	19.0	18.8	0.0	3.2	40.8	0.5	0.1	40.8	gal	0.5	53.2
Punk	10.9	7.8	4.7	4.7	3.1	0.0	0.0	0.0	18.3	gal	0.2	61.4
Mousefoods	6.3	7.8	4.7	1.6	3.1	16.9	0.2	0.0	16.9	gal	0.2	64.9
* Sea chickweed	14.1	7.8	7.8	6.3	1.6	30.0	0.3	0.1	30.0	gal	0.3	70.1
Wood	64.1	50.0	50.0	21.9	7.8	0.0	0.0	0.0				0.0
* Unknown vegetation	1.6	1.6	1.6	1.6	1.6	1.4	0.0	0.0	1.4	gal	0.0	107.4

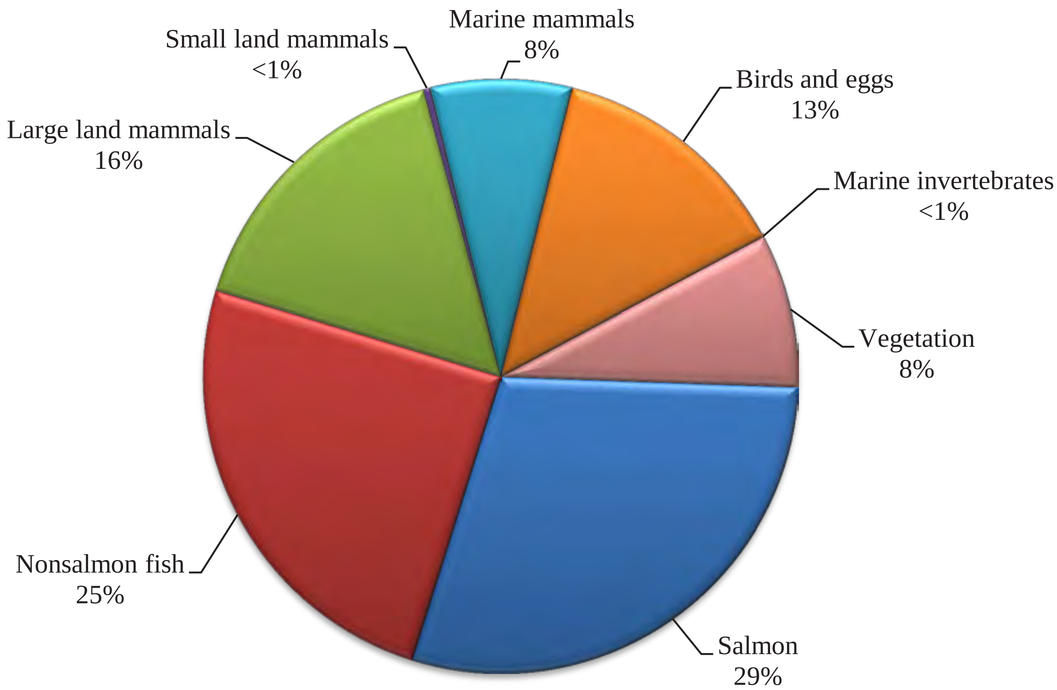
Source ADF&G Division of Subsistence household surveys, 2014.

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

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

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

* Resource was not asked on survey, but information was volunteered by participant.



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

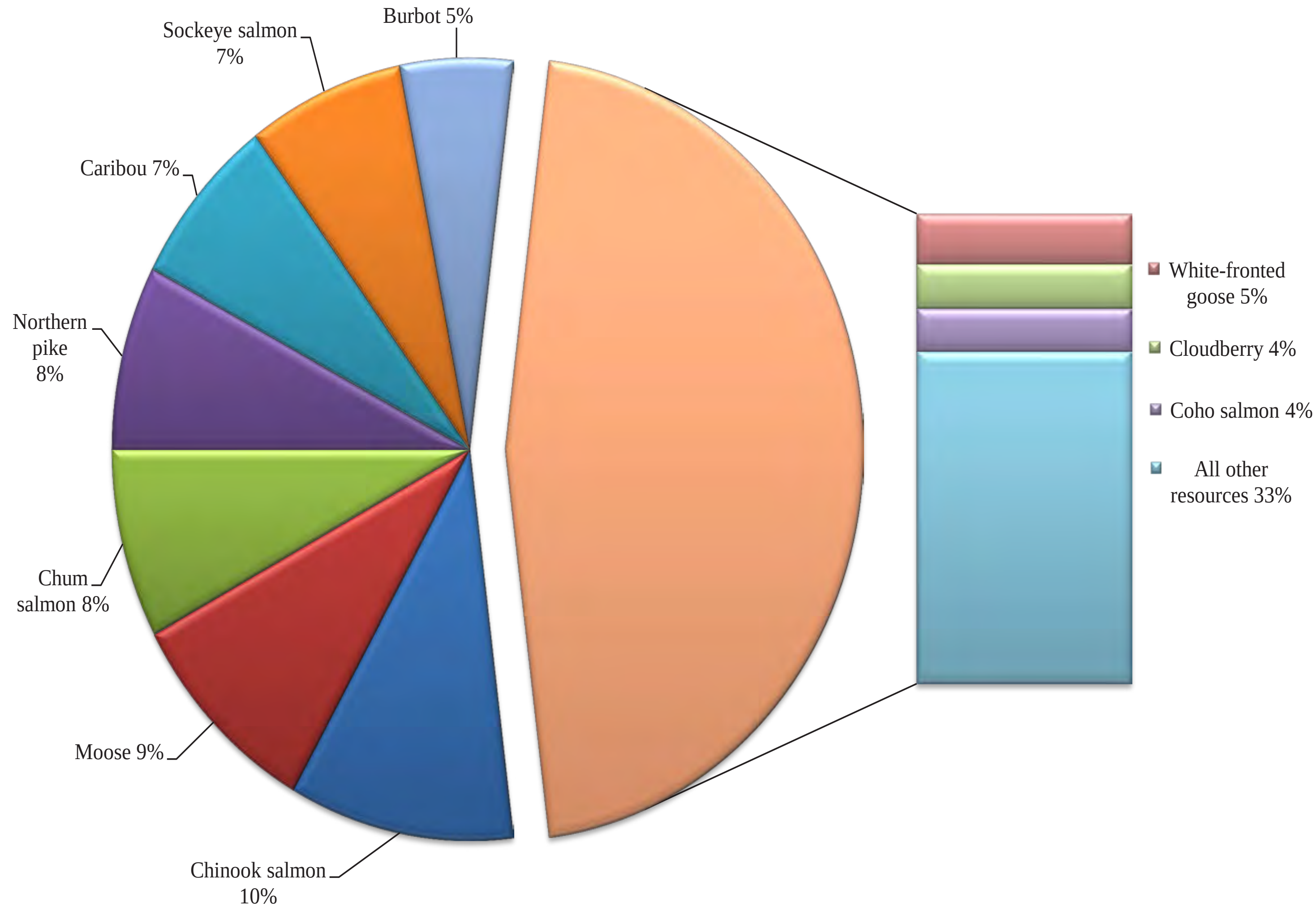
Figure 5-5.–Composition of edible harvest by resource category, Eek, 2013.

Table 5-9.–Top 10 ranked resources used by households, Eek, 2013.

Rank[a]	Resource	Percentage of households using
1.	Cloudberry	89.1%
2.	Moose	76.6%
3.	White-fronted goose	75.0%
4.	Chinook salmon	73.4%
5.	Sockeye salmon	70.3%
6.	Crowberry	64.1%
6.	Wood	64.1%
8.	Chum salmon	62.5%
8.	Coho salmon	62.5%
8.	Ptarmigan	62.5%

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.



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

Figure 5-6.–Top species harvested in pounds edible weight per capita, Eek, 2013.

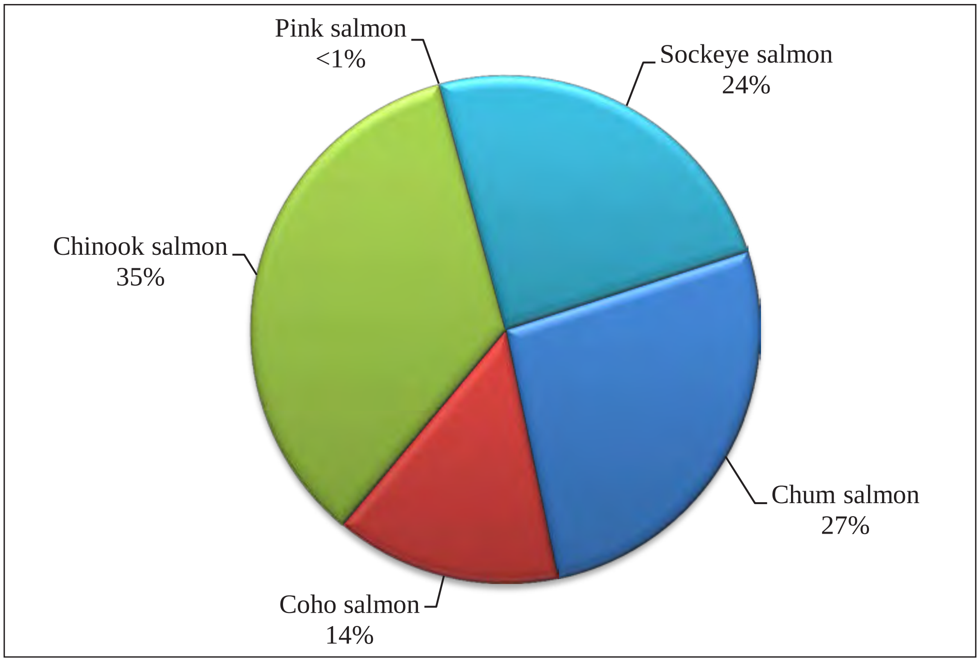


Figure 5-7.–Composition of edible salmon harvest, Eek, 2013.

Salmon

Eek residents harvested a total of 24,831 edible pounds of salmon in 2013, which made up 29% of their total subsistence harvest (Figure 5-5; Table 5-8). Figure 5-7 shows the composition of Eek's total salmon harvest by weight. Chinook salmon made up the largest portion of the salmon harvest (35%) with a total of 8,615 lb or 25 lb per capita (Figure 5-7; Table 5-8). Many residents indicated that the declining Chinook salmon harvest has had a major impact on their harvest: "Now it takes all day to try to get the amount of kings you want, and last year we had a really bad year, and the year before that. It's just kings haven't been running as strong" (051114EEK5).

Chum salmon accounted for 27% (6,629 lb) of the salmon harvest and provided an average of 19 lb of wild food to each Eek resident. A total of 6,005 lb of sockeye salmon accounted for 24% of the salmon harvest (17 lb per capita). One key respondent indicated that the declining Chinook salmon run has led him to rely more heavily on chum and sockeye salmon: "We supplemented our catch last year with reds and chums because the kings weren't as plentiful, and I didn't have enough time to go out fishing because of work so it's a lot easier getting the reds and chums" (051114EEK5). Approximately 3,571 lb of coho salmon made up 14% of the salmon harvest (10 lb per capita). Pink salmon did not make a significant contribution to the community's diet: the total harvest was only 12 edible pounds.

Ninety-two percent of households reported using salmon in 2013 (Table 5-8). Sixty-one percent (61%) of households fished for salmon, but only 55% successfully harvested salmon. Forty-four percent (44%) of households reported receiving salmon from another household, and 58% of households shared a portion of their salmon with other households. Chinook salmon was the most widely used (by 73% of households) and fished for (50% of households) salmon species. Also, more households reported receiving Chinook salmon (34%) than any other salmon species (Plate 5-3).

An estimated 2,821 (69% of the total salmon harvest) salmon were harvested with subsistence driftnets, 1,184 (29%) were harvested with subsistence setnets, 80 (2%) were removed from commercial harvests for home use, and 32 (1%) salmon were harvested using rod and reel (Figure 5-8; Table 5-10). Drift gillnets (driftnets) were the most common harvest method, accounting for approximately two-thirds of the harvest of each salmon species except for the few pink salmon harvested, which were all removed from a commercial catch. By harvest weight, set gillnets (setnets) were the second most common harvest method: 34% of

Plate 5-3.–Drying racks on the Eek River.

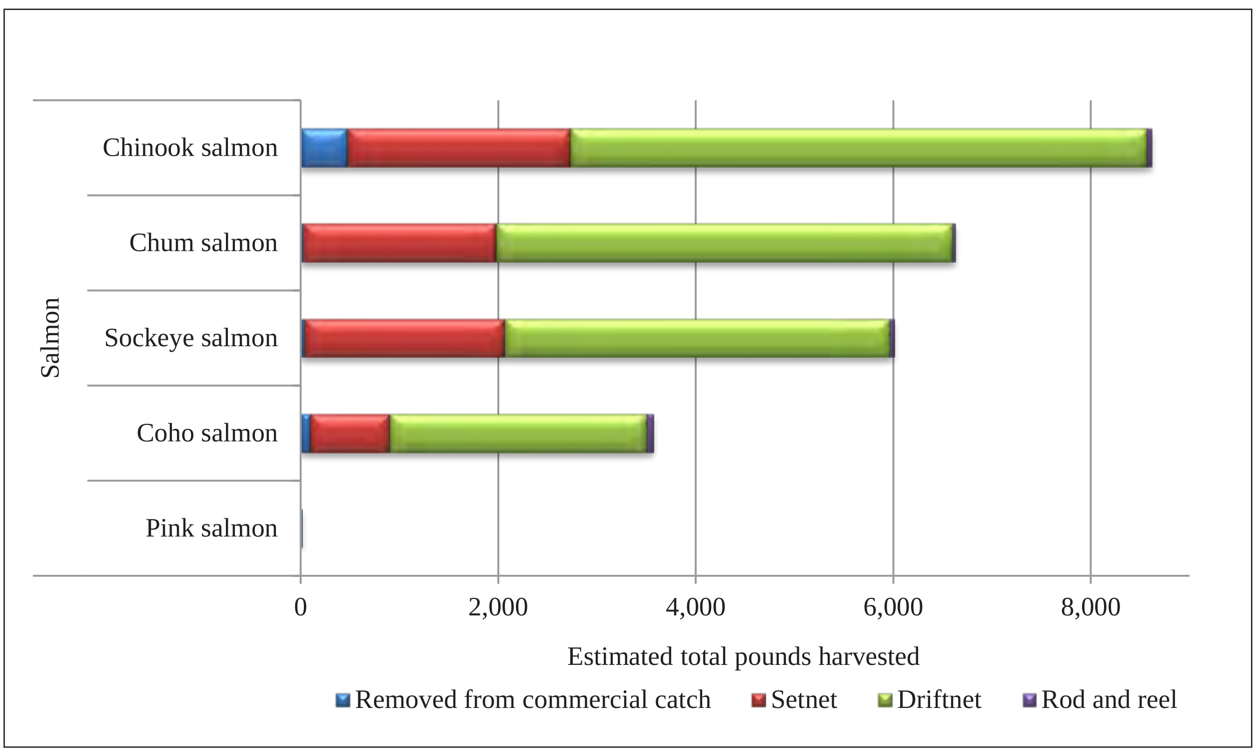


Figure 5-8.–Estimated salmon harvests by gear type, Eek, 2013.

Table 5-10.–Estimated salmon harvests by gear type, Eek, 2013.

	Removed from commercial catch		Subsistence methods: Setnet		Driftnet		Fish wheel		Jigging		Dip net		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**79.8**	**636.3**	**1,184.1**	**7,042.7**	**2,820.9**	**16,971.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**4,005.0**	**24,013.8**	**32.3**	**180.7**	**4,117.1**	**24,830.9**
Chum salmon	4.2	20.7	399.4	1,960.9	940.8	4,619.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,340.2	6,580.2	5.6	27.6	1,350.0	6,628.5
Coho salmon	21.4	98.2	174.4	800.4	568.1	2,607.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	742.5	3,408.1	14.1	64.5	777.9	3,570.8
Chinook salmon	42.8	470.5	205.3	2,256.4	531.6	5,841.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	736.9	8,098.3	4.2	46.4	783.9	8,615.1
Pink salmon	4.2	11.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	11.5
Sockeye salmon	7.1	35.5	405.0	2,025.0	780.5	3,902.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,185.5	5,927.3	8.4	42.2	1,201.0	6,005.0
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

Note The harvested number of salmon is represented as individual fish harvested.

Table 5-11.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Eek, 2013.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Jigging	Dip net	Other method	Subsistence gear, any method	Rod and reel	Any method
Salmon	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**2.6%**	**28.4%**	**68.3%**	**0.0%**	**0.0%**	**0.0%**	**96.7%**	**0.7%**	**100.0%**
	Total	**2.6%**	**28.4%**	**68.3%**	**0.0%**	**0.0%**	**0.0%**	**96.7%**	**0.7%**	**100.0%**
Chum salmon	Gear type	3.3%	27.8%	27.2%	0.0%	0.0%	0.0%	27.4%	15.3%	26.7%
	Resource	0.3%	29.6%	69.7%	0.0%	0.0%	0.0%	99.3%	0.4%	100.0%
	Total	0.1%	7.9%	18.6%	0.0%	0.0%	0.0%	26.5%	0.1%	26.7%
Coho salmon	Gear type	15.4%	11.4%	15.4%	0.0%	0.0%	0.0%	14.2%	35.7%	14.4%
	Resource	2.7%	22.4%	73.0%	0.0%	0.0%	0.0%	95.4%	1.8%	100.0%
	Total	0.4%	3.2%	10.5%	0.0%	0.0%	0.0%	13.7%	0.3%	14.4%
Chinook salmon	Gear type	73.9%	32.0%	34.4%	0.0%	0.0%	0.0%	33.7%	25.7%	34.7%
	Resource	5.5%	26.2%	67.8%	0.0%	0.0%	0.0%	94.0%	0.5%	100.0%
	Total	1.9%	9.1%	23.5%	0.0%	0.0%	0.0%	32.6%	0.2%	34.7%
Pink salmon	Gear type	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sockeye salmon	Gear type	5.6%	28.8%	23.0%	0.0%	0.0%	0.0%	24.7%	23.3%	24.2%
	Resource	0.6%	33.7%	65.0%	0.0%	0.0%	0.0%	98.7%	0.7%	100.0%
	Total	0.1%	8.2%	15.7%	0.0%	0.0%	0.0%	23.9%	0.2%	24.2%
Unknown salmon	Gear type	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%
	Total	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.

Table 5-12.–Estimated harvests of salmon and nonsalmon fish for consumption by dogs, Eek, 2013.

Resource	Amount	Pounds
Salmon		
Chum salmon	7.0 ind	34.5 lb
Nonsalmon fish		
Alaska blackfish	42.2 lb	42.2 lb
Burbot	56.3 ind	135.0 lb
Dolly Varden	11.3 ind	10.1 lb
Northern pike	126.6 ind	569.5 lb
Sheefish	7.0 ind	42.2 lb
Total	**250.3 ind**	**833.6 lb**

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

sockeye salmon, 30% of chum salmon, 26% of Chinook salmon, and 22% of coho salmon were harvested using set gillnets (Table 5-11). Finally, small harvests of each salmon species were attained with rod and reel. Approximately 2% of coho salmon and less than 1% of sockeye, chum, and Chinook salmon were caught using a rod and reel.

Table 5-12 shows the estimated number of whole salmon used to feed dogs. Seven chum salmon were used as dog food. No other salmon species was reported to be used for dog food.

Nonsalmon Fish

Eek residents harvested a total of 21,077 edible pounds of nonsalmon fish in 2013, which made up 25% of their total subsistence harvest (Figure 5-5; Table 5-8). Figure 5-9 shows the composition of Eek's nonsalmon fish harvest. Northern pike made up the largest portion (31%) with a total of 6,461 lb or 19 lb per capita (Table 5-8; Figure 5-9). Burbot accounted for 20% (4,310 lb) of the nonsalmon fish harvest and provided an average of 12 lb of wild food to each Eek resident. A total of 2,641 lb of Pacific herring accounted for 12% of the nonsalmon fish harvest (8 lb per capita), followed by 2,021 lb of humpback whitefish (10%, 6 lb per person). Broad whitefish made up 6% of the nonsalmon fish harvest, followed by Pacific halibut (5%), smelts (5%), Alaska blackfish (4%), and Bering cisco (3%; Figure 5-9). An additional 6 species of nonsalmon fish were harvested in 2013, including sheefish, least cisco, and saffron cod, however each of these species contributed less than 1 lb per capita to Eek's edible harvest (Table 5-8).

Eighty-eight percent of Eek households reported using nonsalmon fish in 2013 (Table 5-8). Seventy-two percent of households fished for nonsalmon fish, and 67% successfully harvested them. Sixty-three percent of households reported receiving nonsalmon fish from another household, and 55% of households shared a portion of their nonsalmon fish with others.

An estimated 10,888 lb of nonsalmon fish (52% of the total nonsalmon fish harvest) was harvested by jigging (Figure 5-10; tables 5-13 and 5-14). The majority of burbot and northern pike were harvested by jigging through the ice (Figure 5-10; Table 5-13). Set gillnets were the second most common gear type used to harvest nonsalmon fish, accounting for 18% of the harvest (Table 5-14). All of the whitefish species were primarily harvested with a set gillnet (Figure 5-10). Sixteen percent of the nonsalmon fish were harvested using a rod and reel, which was the primary gear type used for Pacific halibut, sheefish, and Arctic grayling fishing (Table 5-14). Other gear types used to harvest nonsalmon fish include traps set for Alaska blackfish and drift gillnets used to catch small numbers of whitefishes.

Table 5-12 shows the estimated nonsalmon fish harvest used to feed dogs. An estimated 570 lb of northern pike and 135 lb of burbot were used to feed dogs in 2013. Forty-two pounds of Alaska blackfish, 42 lb of sheefish, and 10 lb of Dolly Varden were the only other nonsalmon fish species used to feed dogs.

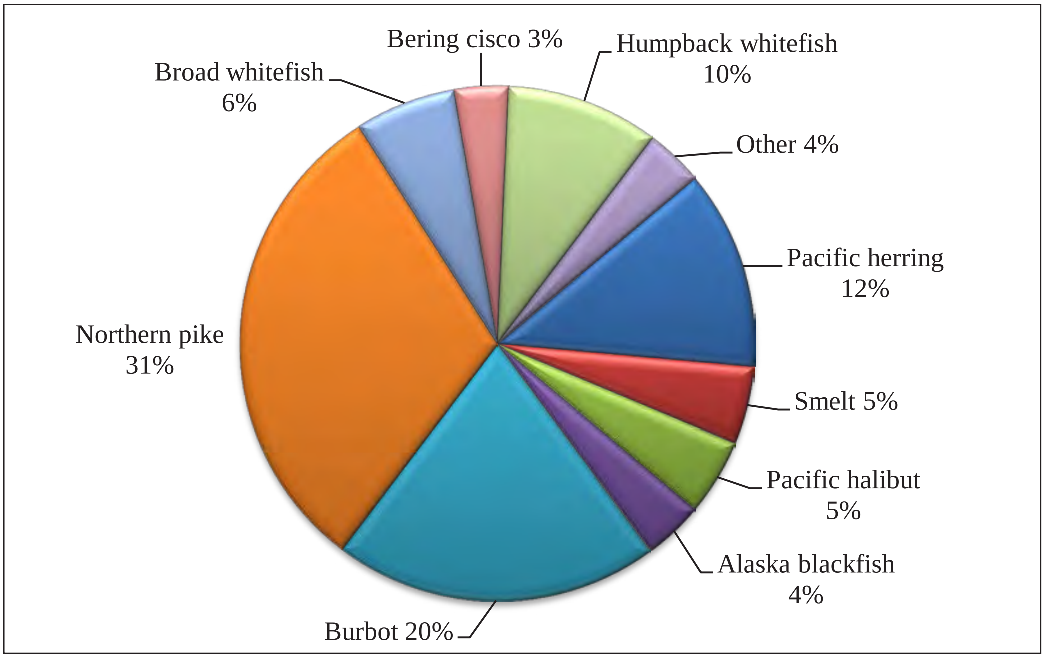


Figure 5-9.–Composition of edible nonsalmon fish harvest, Eek, 2013.

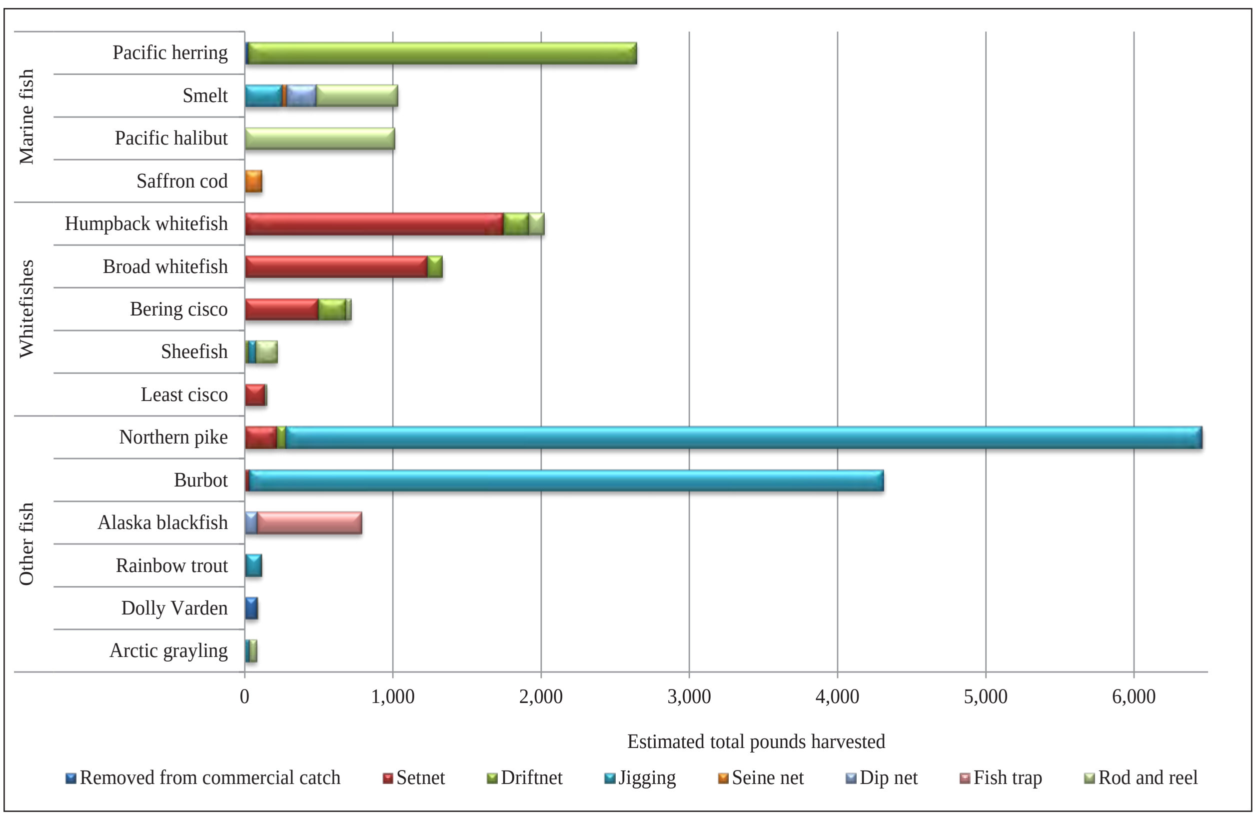


Figure 5-10.–Estimated nonsalmon fish harvests by gear type, Eek, 2013.

Table 5-13.–Estimated nonsalmon fish harvests by gear type, Eek, 2013.

				Subsistence methods																			
		Removed from commercial catch		Setnet		Driftnet		Jigging		Seine net		Dip net		Fish trap		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Units[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**116.2**		**3,851.7**		**3,166.3**		**10,887.5**		**144.1**		**293.2**		**704.5**		0.0		**19,047.4**		**1,913.1**		**21,076.6**
Pacific herring	gal	4.2	25.3	0.0	0.0	435.9	2,615.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	435.9	2,615.6	0.0	0.0	440.2	2,640.9
Pacific herring roe	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	42.2	253.1	4.7	28.1	33.8	202.5	0.0	0.0	0.0	0.0	80.6	483.8	91.4	548.4	172.0	1,032.2
Saffron cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	154.7	116.0	0.0	0.0	0.0	0.0	0.0	0.0	154.7	116.0	0.0	0.0	154.7	116.0
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,011.7	1,011.7	1,011.7	1,011.7
Arctic lamprey	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stickleback (needlefish)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	84.4	84.4	704.5	704.5	0.0	0.0	788.9	788.9	0.0	0.0	788.9	788.9
Burbot	ind	0.0	0.0	12.7	30.4	0.0	0.0	1,783.1	4,279.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,795.8	4,309.9	0.0	0.0	1,795.8	4,309.9
Dolly Varden	ind	90.0	81.0	0.0	0.0	5.6	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.1	0.0	0.0	95.6	86.1
Arctic grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	29.5	29.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.5	29.5	50.6	50.6	80.2	80.2
Northern pike	ind	0.0	0.0	47.8	215.2	14.1	63.3	1,372.5	6,176.3	0.0	0.0	1.4	6.3	0.0	0.0	0.0	0.0	1,435.8	6,461.0	0.0	0.0	1,435.8	6,461.0
Sheefish	ind	0.0	0.0	0.0	0.0	4.2	25.3	8.4	50.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.7	75.9	23.9	143.4	36.6	219.4
Rainbow trout	ind	7.0	9.8	0.0	0.0	0.0	0.0	70.3	98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.3	98.4	2.8	3.9	80.2	112.2
Broad whitefish	ind	0.0	0.0	308.0	1,231.9	25.3	101.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	333.3	1,333.1	0.0	0.0	333.3	1,333.1
Bering cisco	ind	0.0	0.0	353.0	494.2	133.6	187.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	486.6	681.2	25.3	35.4	511.9	716.6
Least cisco	ind	0.0	0.0	133.6	133.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	133.6	133.6	14.1	14.1	147.7	147.7
Humpback whitefish	ind	0.0	0.0	582.2	1,746.6	56.3	168.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	638.4	1,915.3	35.2	105.5	673.6	2,020.8
Round whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown whitefishes	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

Note The summary row that includes incompatible units of measure for harvest number has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

Table 5-14.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Eek, 2013.

			Subsistence methods									
Resource	Percentage base	Removed from commercial catch	Setnet	Driftnet	Jigging	Seine net	Dip net	Fish trap	Other method	Subsistence gear, any method	Rod and reel	Any method
Nonsalmon fish	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**0.6%**	**18.3%**	**15.0%**	**51.7%**	**0.5%**	**1.0%**	**2.4%**	**0.0%**	**90.4%**	**9.1%**	**100.0%**
	Total	**0.6%**	**18.3%**	**15.0%**	**51.7%**	**0.5%**	**1.0%**	**2.4%**	**0.0%**	**90.4%**	**9.1%**	**100.0%**
Pacific herring	Gear type	21.8%	0.0%	82.6%	0.0%	0.0%	0.0%	0.0%	0.0%	13.7%	0.0%	12.5%
	Resource	1.0%	0.0%	99.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.0%	0.0%	100.0%
	Total	0.1%	0.0%	12.4%	0.0%	0.0%	0.0%	0.0%	0.0%	12.4%	0.0%	12.5%
Pacific herring 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%
	Resource	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%
Smelt	Gear type	0.0%	0.0%	0.0%	2.3%	19.5%	69.1%	0.0%	0.0%	2.5%	28.7%	4.9%
	Resource	0.0%	0.0%	0.0%	24.5%	1.9%	14.0%	0.0%	0.0%	46.9%	53.1%	100.0%
	Total	0.0%	0.0%	0.0%	1.2%	0.1%	0.7%	0.0%	0.0%	2.3%	2.6%	4.9%
Saffron cod	Gear type	0.0%	0.0%	0.0%	0.0%	80.5%	0.0%	0.0%	0.0%	0.6%	0.0%	0.6%
	Resource	0.0%	0.0%	0.0%	0.0%	71.1%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.6%	0.0%	0.6%
Pacific halibut	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	52.9%	4.8%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	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%	0.0%	4.8%	4.8%
Arctic lamprey	Gear type	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%
	Total	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%
	Resource	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%
Alaska blackfish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	28.8%	100.0%	0.0%	4.1%	0.0%	3.7%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	7.6%	63.5%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	2.4%	0.0%	3.7%	0.0%	3.7%
Burbot	Gear type	0.0%	0.8%	0.0%	39.3%	0.0%	0.0%	0.0%	0.0%	22.6%	0.0%	20.4%
	Resource	0.0%	0.7%	0.0%	99.3%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.1%	0.0%	20.3%	0.0%	0.0%	0.0%	0.0%	20.4%	0.0%	20.4%
Dolly Varden	Gear type	69.7%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
	Resource	94.1%	0.0%	5.9%	0.0%	0.0%	0.0%	0.0%	0.0%	5.9%	0.0%	100.0%
	Total	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Arctic grayling	Gear type	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.2%	2.6%	0.4%
	Resource	0.0%	0.0%	0.0%	36.8%	0.0%	0.0%	0.0%	0.0%	36.8%	63.2%	100.0%
	Total	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.4%

-continued-

Table 5-14.–Page 2 of 2.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Jigging	Seine net	Dip net	Fish trap	Other method	Subsistence gear, any method	Rod and reel	Any method
Northern pike	Gear type	0.0%	5.6%	2.0%	56.7%	0.0%	2.2%	0.0%	0.0%	33.9%	0.0%	30.7%
	Resource	0.0%	3.3%	1.0%	95.6%	0.0%	0.1%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	1.0%	0.3%	29.3%	0.0%	0.0%	0.0%	0.0%	30.7%	0.0%	30.7%
Sheefish	Gear type	0.0%	0.0%	0.8%	0.5%	0.0%	0.0%	0.0%	0.0%	0.4%	7.5%	1.0%
	Resource	0.0%	0.0%	11.5%	23.1%	0.0%	0.0%	0.0%	0.0%	34.6%	65.4%	100.0%
	Total	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.4%	0.7%	1.0%
Rainbow trout	Gear type	8.5%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.5%	0.2%	0.5%
	Resource	8.8%	0.0%	0.0%	87.7%	0.0%	0.0%	0.0%	0.0%	87.7%	3.5%	100.0%
	Total	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.5%
Broad whitefish	Gear type	0.0%	32.0%	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	6.3%
	Resource	0.0%	92.4%	7.6%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	5.8%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	6.3%	0.0%	6.3%
Bering cisco	Gear type	0.0%	12.8%	5.9%	0.0%	0.0%	0.0%	0.0%	0.0%	3.6%	1.9%	3.4%
	Resource	0.0%	69.0%	26.1%	0.0%	0.0%	0.0%	0.0%	0.0%	95.1%	4.9%	100.0%
	Total	0.0%	2.3%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	0.2%	3.4%
Least cisco	Gear type	0.0%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.7%	0.7%
	Resource	0.0%	90.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	90.5%	9.5%	100.0%
	Total	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.1%	0.7%
Humpback whitefish	Gear type	0.0%	45.3%	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	10.1%	5.5%	9.6%
	Resource	0.0%	86.4%	8.4%	0.0%	0.0%	0.0%	0.0%	0.0%	94.8%	5.2%	100.0%
	Total	0.0%	8.3%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	9.1%	0.5%	9.6%
Round whitefish	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
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%
	Resource	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%

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

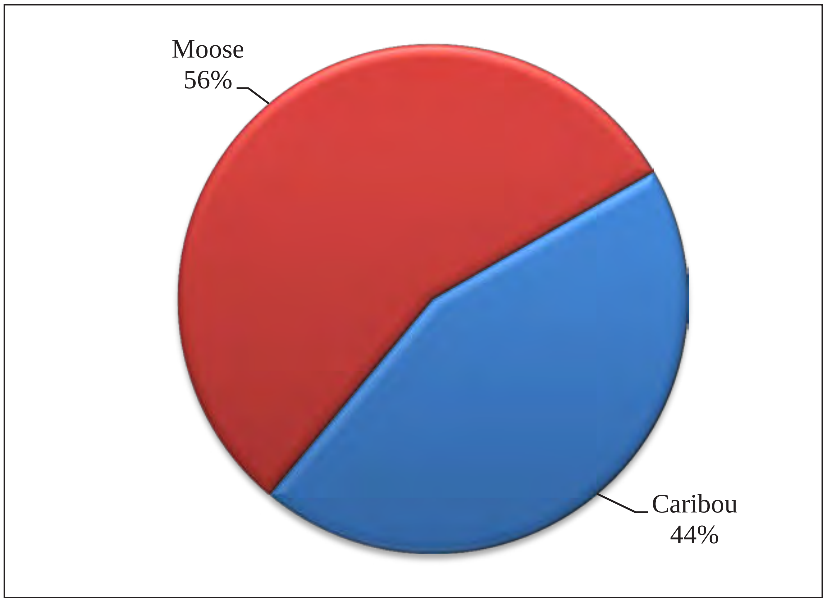


Figure 5-11.–Composition of edible large land mammal harvest, Eek, 2013.

Large Land Mammals

Eek residents harvested 13,658 edible pounds of large land mammals in 2013 (Table 5-8). Moose and caribou made up the entire large land mammal harvest; no surveyed household reported harvesting or hunting for any other large game, such as muskox, Dall sheep, or bears. Figure 5-11 illustrates that moose and caribou made similar contributions to Eek's large land mammal harvest; moose accounted for 56% of the large land mammal harvest, and caribou made up the remaining 44%. The estimated 14 moose harvested in 2013 provided 7,594 lb of food to the community, an average of 22 lb per person (Table 5-8). Approximately 47 caribou were harvested, yielding a total of 6,064 lb of food, which provided an average of 18 lb per person. One key respondent indicated that poor snow conditions and high gas prices have led to a decrease in caribou harvest in recent years:

> In winter it used to be easier. But now we have less snow, and winter is not what it seems anymore. And so we didn't get any snow and we weren't able to get caribou much at all. And gas price is so high that we don't go as far as we used to. So with those two things, us being backed up against those two. It gets pretty hard. (050914EEK3)

The majority of the community's households hunted for moose in 2013 (59%), and approximately 38% of households hunted for caribou. Caribou hunters were far more likely to be successful, however: 27% of households harvested at least 1 caribou, and only 16% harvested a moose. Both moose and caribou were widely shared among households; 58% of households received moose from another household, and 34% of households received caribou.

Table 5-15 summarizes the timing of Eek's moose and caribou harvest by month of harvest and sex of the animal. Nearly all of the moose that were harvested were bulls (male). Eek residents harvested 11 moose during the September hunt, during which only antlered bulls may be taken (Alaska Department of Fish and Game 2013). An additional estimated 1 bull moose and 1 cow (female) were harvested in December. Caribou were harvested throughout the winter from November through March, and the majority of harvests took place in February and March. A total of 27 male caribou were harvested throughout the winter, however the estimated 6 female caribou were all harvested in February and March. Respondents indicated that the timing of caribou hunting is very dependent on accessibility to the animals. Hunters are more likely to attempt to harvest caribou when the animals are closer to the community and snow conditions allow for easy travel by snowmachine.

Table 5-15.–Estimated large land mammal harvests by month and sex, Eek, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All large land mammals	**1.4**	**11.3**	**14.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**11.3**	**0.0**	**5.7**	**7.1**	**9.9**	**60.7**
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	1.4	11.3	14.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	4.2	9.9	**46.6**
Caribou, male	1.4	9.8	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	4.2	5.6	**32.3**
Caribou, female	0.0	1.4	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**5.6**
Caribou, unknown sex	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	**8.7**
Moose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	0.0	0.0	2.8	0.0	**14.1**
Moose, bull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	0.0	0.0	1.4	0.0	**12.7**
Moose, cow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	**1.4**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
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.

Small Land Mammals/Furbearers

Eek residents harvested 315 edible pounds of small land mammals in 2013 (Table 5-8). Figure 5-12 shows the composition of the small land mammal harvest by number of animals harvested. Thirty-four snowshoe hares were harvested, accounting for 32% of the small land mammals harvested (Table 5-8; Figure 5-12). Twenty-one beavers were harvested, providing 20% of the small land mammal harvest. Muskrats made up 11% of the small land mammal harvest, followed by porcupine (10%), river otter (8%), Alaska hare (7%), and lynx (7%).

Twenty-seven percent of households reported using small land mammals, and 11% shared them with other households. Twenty-five percent of households attempted to harvest small land mammals, and 20% successfully hunted or trapped some animals in this resource category. Some small land mammals were harvested specifically for fur and were not used for food. The edible pounds data in Table 5-8 only reflect those small land mammals that were reported to be eaten. Beaver contributed 169 edible pounds to the community's harvest, far more than any other small mammal species. Approximately 68 lb of snowshoe hare, 49 lb of porcupine, and 21 lb of Alaska hare account for most of the remaining food derived from Eek's 2013 small land mammal harvest. Eleven muskrats, 8 river otters, 7 lynx, 4 mink, and 1 wolverine were harvested only for their fur and were not eaten.

Figure 5-13 shows the number each small land mammal species that were used for fur only. All snowshoe hares, Alaska hares, and porcupines were used for food. Approximately 47% of the beaver harvest and 67% of the river otter harvest was used for fur only and was not eaten. Finally, all of the muskrats, lynx, mink, and wolverines were harvested for the use of their fur and were not eaten.

Table 5-16 shows the small land mammal harvest by month. Small land mammals were harvested throughout the year, but the majority of harvests took place in the winter, which corresponds with the furbearer trapping season. Beaver was most commonly harvested in early spring. Beaver was also taken in September, likely as opportunistic harvests during moose hunting trips. Snowshoe hare and Alaska hare were taken in winter from December through April. Porcupine was harvested in January and February. The majority of muskrat harvests took place in November.

Marine Mammals

Eek hunters harvested an estimated 6,497 lb of marine mammals in 2013 (Table 5-8). Figure 5-14 shows the composition of the marine mammal harvest in edible pounds. Seventeen bearded seals accounted for 36% of this harvest, providing approximately 7 lb of food per capita (Table 5-8; Figure 5-14). Walrus was the second most harvested marine mammal by weight. An estimated 3 walrus were harvested, making up 33% of the harvest and providing 6 lb per person. Twenty-three spotted seals accounted for an additional

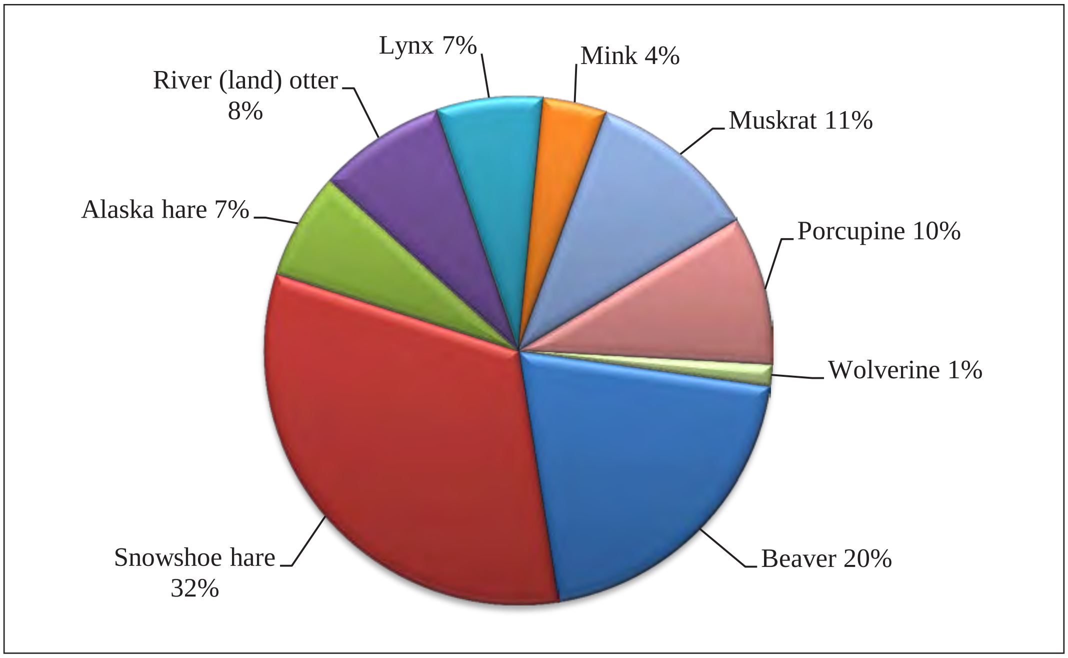


Figure 5-12.–Composition of small land mammal harvest in individual animals harvested, Eek, 2013.

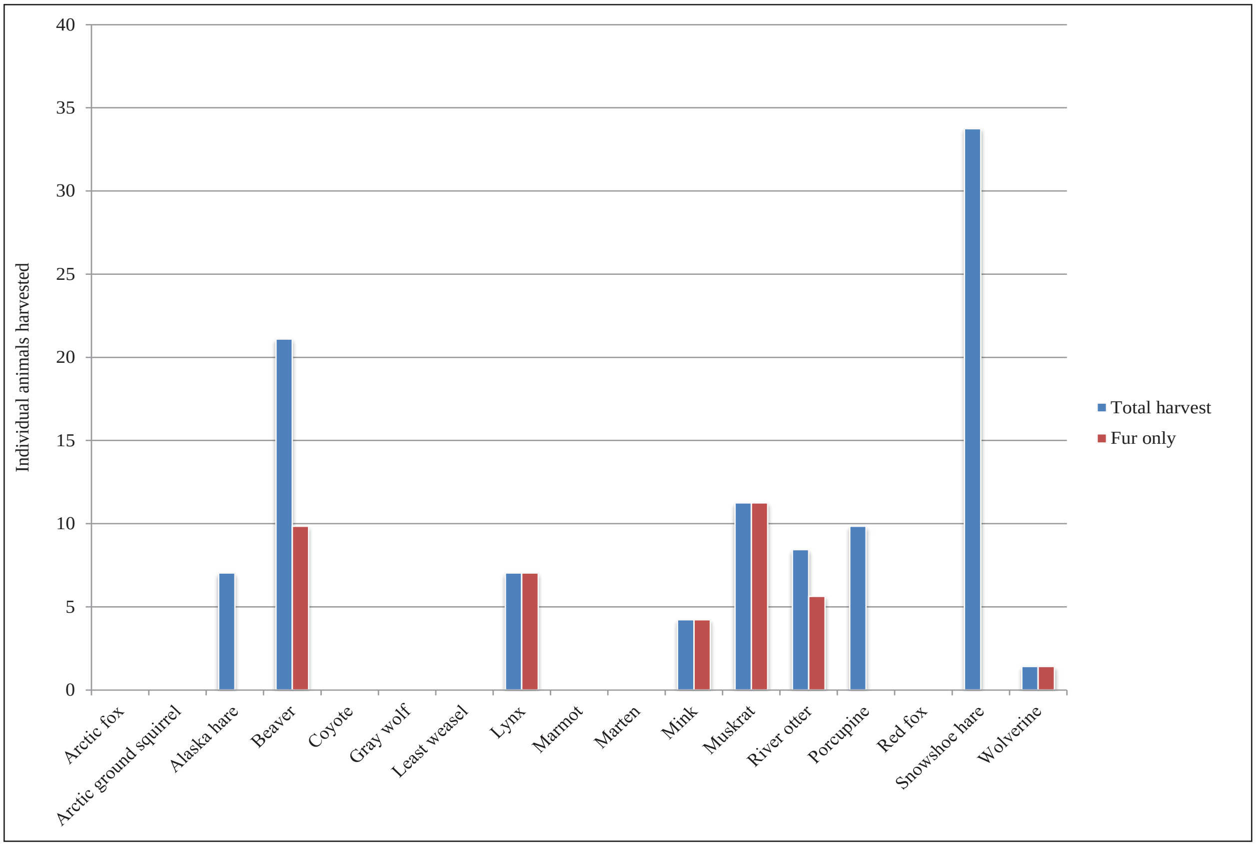


Figure 5-13.–Estimated small land mammal harvests for fur, Eek, 2013.

Table 5-16.–Estimated small land mammal harvests by month, Eek, 2013.

Resource	Estimated harvest by month													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
All small land mammals	**23.9**	**7.0**	**23.9**	**11.3**	**2.8**	**1.4**	**1.4**	**1.4**	**7.0**	**0.0**	**11.3**	**9.8**	**2.8**	**104.1**
Beaver	0.0	0.0	0.0	9.8	2.8	0.0	0.0	0.0	7.0	0.0	0.0	1.4	0.0	**21.1**
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	11.3	0.0	18.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	**33.8**
Alaska hare	0.0	2.8	2.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**7.0**
River (land) otter	2.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	1.4	**8.4**
Lynx	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	**7.0**
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	2.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.2**
Muskrat	0.0	0.0	0.0	0.0	0.0	1.4	1.4	0.0	0.0	0.0	8.4	0.0	0.0	**11.3**
Porcupine	7.0	1.4	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	**9.8**
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Gray wolf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Wolverine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	**1.4**

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

20% and provided approximately 4 lb per capita. Thirteen ringed seals made up the remaining 11% of the marine mammal harvest and averaged 2 edible pounds per resident.

Seventy percent of the community used some marine mammal species in 2013 (Table 5-8). The most commonly used marine mammals were spotted seal, utilized by 34% of households, and bearded seal, utilized by 25%. Ringed seal and walrus were less commonly used: 19% of households used ringed seal, and 14% used walrus. Seal oil was used by approximately 30%. Marine mammals were received by 56% of households, and 36% of respondents reported sharing part of their sea mammal harvest with another household.

Forty-two percent of households reported participating in marine mammal hunting, and 28% of these households were involved in a successful hunt. Seals were the most targeted marine mammals: 30% of households attempted to harvest spotted seal, and 28% hunted for bearded seal. Approximately one-half of these seal hunters met with success; 16% of households harvested spotted seal and 14% harvested bearded seal. Walrus hunting was far less common. Approximately 5% of households attempted to harvest and 2% successfully harvested walrus. The community also utilized whales. Two percent of households reported hunting for beluga whales without success. Eight percent said they received beluga whale from other households in Eek or from other communities. Also, 2% of households reported receiving bowhead whale.

Table 5-17 shows the timing of Eek's marine mammal harvest by month. Respondents did not know the harvest month of approximately 10 seals. The 42 seals with a known harvest month were harvested during 2 separate hunting periods. The first period extended from February to May; the majority of these harvests took place in April. This is the primary season for spotted seal hunting. Approximately 17 of a total of 23 spotted seals were harvested during this time. The second seal hunting period occurred in late summer and fall, and the majority of harvests took place in July and October. Small numbers of spotted seals were harvested at this time; however, this is the primary season that Eek hunters target bearded seals. Eleven bearded seals were harvested over these months; the majority of animals were harvested in September. A small number of ringed seals were harvested in each of the 2 hunting periods; there were 3 reported harvests in April and 3 in July. Finally, all of the estimated 3 walruses were harvested in May.

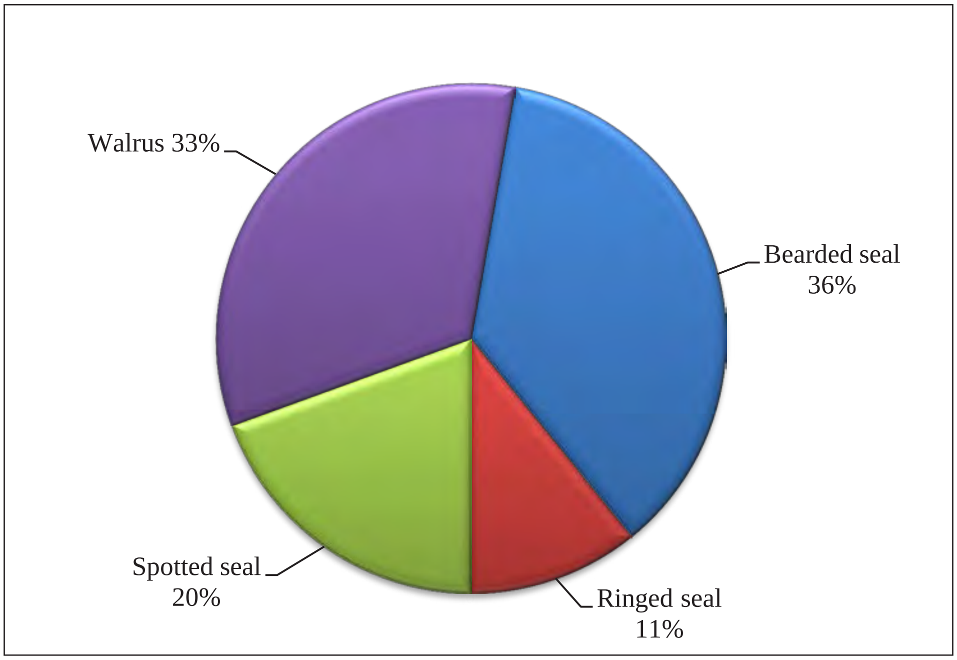


Figure 5-14.–Composition of edible marine mammal harvest, Eek, 2013.

Table 5-17.–Estimated marine mammal harvests by month and sex, Eek, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All marine mammals	**0.0**	**1.4**	**4.2**	**14.1**	**5.6**	**0.0**	**7.0**	**2.8**	**7.0**	**2.8**	**0.0**	**0.0**	**9.8**	**54.8**
Seal	0.0	1.4	4.2	14.1	2.8	0.0	7.0	2.8	7.0	2.8	0.0	0.0	9.8	**52.0**
Bearded seal	0.0	1.4	0.0	1.4	0.0	0.0	2.8	0.0	7.0	1.4	0.0	0.0	2.8	**16.9**
Ringed seal	0.0	0.0	0.0	2.8	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	7.0	**12.7**
Spotted seal	0.0	0.0	4.2	9.8	2.8	0.0	1.4	2.8	0.0	1.4	0.0	0.0	0.0	**22.5**
Walrus	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.8**
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**
Beluga whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Bowhead whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown marine mammals	0.0	0.0	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.

Birds and Eggs

Eek residents harvested an estimated 11,304 lb of birds and eggs in 2013, which amounts to 33 lb per capita (Table 5-8). Figure 5-15 shows the primary bird species harvested and the percentage of edible pounds that each provided to the bird and egg harvest. White-fronted geese made up 37% of Eek's bird and egg harvest in 2013—far greater than any other bird species. An estimated 990 white-fronted geese were harvested, which provided 12 edible pounds per person (Table 5-8). Tundra swan contributed 4 lb per capita and accounted for 13% of the bird and egg harvest (Table 5-8; Figure 5-15). Ptarmigans were the only upland game birds harvested in Eek in 2013 (Table 5-8). An estimated 2,100 ptarmigans were harvested, which amounted to 4 edible pounds per person. Canada goose and white-winged scoter each made up 6% of the total bird harvest, followed by mallard with 4% (Figure 5-15). A variety of other duck species were harvested in smaller numbers (Table 5-8). Eek residents gathered an estimated 2,063 bird eggs in 2013. More murre eggs were harvested than any other type of egg: 659 murre eggs contributed 145 lb to the community's diet (Plate 5-4). An estimated 482 gull eggs provided an additional 145 lb. Eek residents also collected an estimated 388 goose eggs, 271 duck eggs, and 93 swan eggs. Eggs from several other birds such as sandhill crane, terns, and various small shorebirds were also harvested in small numbers.

Most Eek households (94%) used birds and eggs. Eighty percent of households attempted to harvest birds and eggs, and 75% of households successfully harvested them. White-fronted geese played a particularly important role among birds for Eek residents. A full three-quarters of households used white-fronted geese, and 59% successfully hunted them. Ptarmigans also contributed to the diet of the majority of households (63%), and members of more than one-half of the community's households (52%) harvested ptarmigans. Other bird species that were used as well as harvested by large numbers of households include Canada goose, sandhill crane, tundra swan, and mallard. Goose eggs were used by nearly one-half of the community (48% of households) and harvested by 28% of households. Gull eggs were used by 34% of households, and duck eggs were used by 33%. Tundra swan eggs were used by 22% of households, a far higher percentage than many other types of eggs that were harvested in greater numbers.

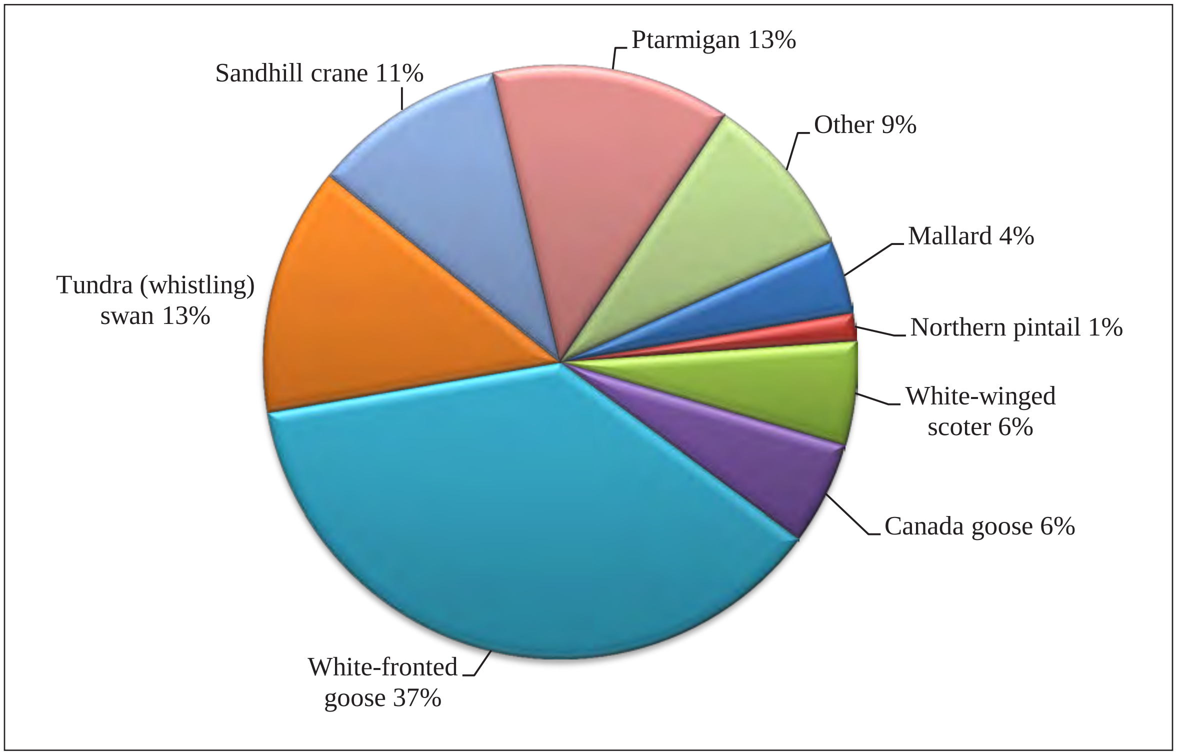


Figure 5-15.–Composition of edible bird and bird egg harvest, Eek, 2013.

Plate 5-4.–Murre eggs and hot dogs.

Table 5-18 shows the estimated bird harvest by season. The majority of Eek's migratory waterfowl harvest took place during the spring migration; the remainder occurred during the fall migration. Ptarmigans were harvested in winter and spring.

Marine Invertebrates

Marine invertebrates did not contribute significantly to Eek's diet in 2013. Unknown species of crab and clams each accounted for 50% of the marine invertebrate harvest (Figure 5-16). Approximately 2% of households harvested a total of 21 lb of clams, and 2% of households harvested 21 lb of crab (Table 5-8). No other attempts to harvest marine invertebrates were reported.

Vegetation

Eek residents harvested an estimated 7,052 lb (20 lb per capita) of vegetation in 2013 (Table 5-8). Berries made up 89% of the vegetation harvest by weight and a variety of other edible plants and greens accounted for the remaining 11% (Figure 5-17). Cloudberry, known as salmonberry in the region, was by far the most harvested berry in 2013 (Table 5-8). Community members gathered approximately 918 gal of cloudberries, which accounted for 52% of the total vegetation harvest and provided 11 lb of food per person. Crowberries were the next most harvested vegetation species, accounting for 21% of the vegetation harvest, with an estimated 373 gal gathered. An estimated 317 gal of sourdock and 197 gal of Pallas buttercup, known as *kapuukar* by Eek residents, were the primary edible greens harvested (Plate 5-5). One hundred forty-five gallons of blueberries also made a significant contribution to Eek's vegetation harvest as did 100 gal of lowbush cranberries. Other berry species, such as nagoonberry and raspberry, as well as a wide variety of other edible plants, such as stinkweed, wild celery, Hudson's Bay tea, and sea chickweed were gathered, but made much smaller contributions to Eek's subsistence diet.

Table 5-18.–Estimated bird and bird egg harvests by season, Eek, 2013.

Resource	Estimated harvest by season: Winter	Spring	Summer	Fall	Season unknown	**Total**
All birds	**1,500.5**	**4,888.0**	**0.0**	**685.8**	**0.0**	**7,074.2**
Common eider	0.0	0.0	0.0	0.0	0.0	**0.0**
King eider	0.0	8.4	0.0	1.4	0.0	**9.8**
Spectacled eider	0.0	1.4	0.0	0.0	0.0	**1.4**
Steller's eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Goldeneye	0.0	9.8	0.0	0.0	0.0	**9.8**
Harlequin duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	0.0	138.6	0.0	94.3	0.0	**232.9**
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Northern pintail	0.0	42.2	0.0	73.1	0.0	**115.3**
Scaup	0.0	102.7	0.0	16.9	0.0	**119.5**
Black scoter	0.0	153.3	0.0	16.9	0.0	**170.2**
Surf scoter	0.0	132.2	0.0	2.8	0.0	**135.0**
White-winged scoter	0.0	261.6	0.0	16.9	0.0	**278.4**
Northern shoveler	0.0	0.0	0.0	0.0	0.0	**0.0**
Teal	0.0	7.1	0.0	5.7	0.0	**12.9**
American wigeon	0.0	8.6	0.0	5.7	0.0	**14.3**
Unknown ducks	4.2	0.0	0.0	0.0	0.0	**4.2**
Brant	0.0	0.0	0.0	0.0	0.0	**0.0**
Canada goose	0.0	402.1	0.0	127.7	0.0	**529.8**
Emperor goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Snow goose	0.0	7.0	0.0	2.8	0.0	**9.8**
White-fronted goose	0.0	736.0	0.0	254.0	0.0	**990.0**
Unknown geese	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	0.0	80.2	0.0	56.3	0.0	**136.4**
Sandhill crane	0.0	130.8	0.0	11.3	0.0	**142.0**
Shorebirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Seabirds, loons, grebes	0.0	0.0	0.0	0.0	0.0	**0.0**
Loon	0.0	0.0	0.0	0.0	0.0	**0.0**
Grouse	0.0	0.0	0.0	0.0	0.0	**0.0**
Ptarmigan	1,496.3	603.3	0.0	0.0	0.0	**2,099.5**
Snowy owl	0.0	0.0	0.0	0.0	0.0	**0.0**
Duck eggs	0.0	271.4	0.0	0.0	0.0	**271.4**
Goose eggs	0.0	388.1	0.0	0.0	0.0	**388.1**
Swan eggs	0.0	92.8	0.0	0.0	0.0	**92.8**
Crane eggs	0.0	14.1	0.0	0.0	0.0	**14.1**
Common snipe eggs	0.0	4.2	0.0	0.0	0.0	**4.2**
Plover eggs	0.0	28.1	0.0	0.0	0.0	**28.1**
Unknown shorebird eggs	0.0	49.2	0.0	0.0	0.0	**49.2**
Gull eggs	0.0	482.3	0.0	0.0	0.0	**482.3**
Loon eggs	0.0	8.4	0.0	0.0	0.0	**8.4**
Murre eggs	0.0	659.4	0.0	0.0	0.0	**659.4**
Tern eggs	0.0	22.5	0.0	0.0	0.0	**22.5**
Ptarmigan eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown eggs	0.0	42.2	0.0	0.0	0.0	**42.2**

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

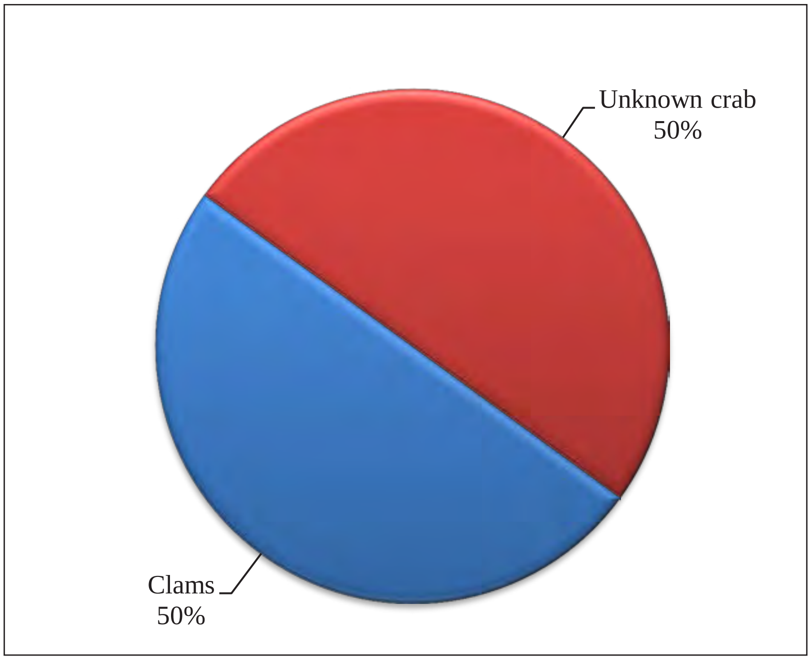


Figure 5-16.–Composition of edible marine invertebrate harvest, Eek, 2013.

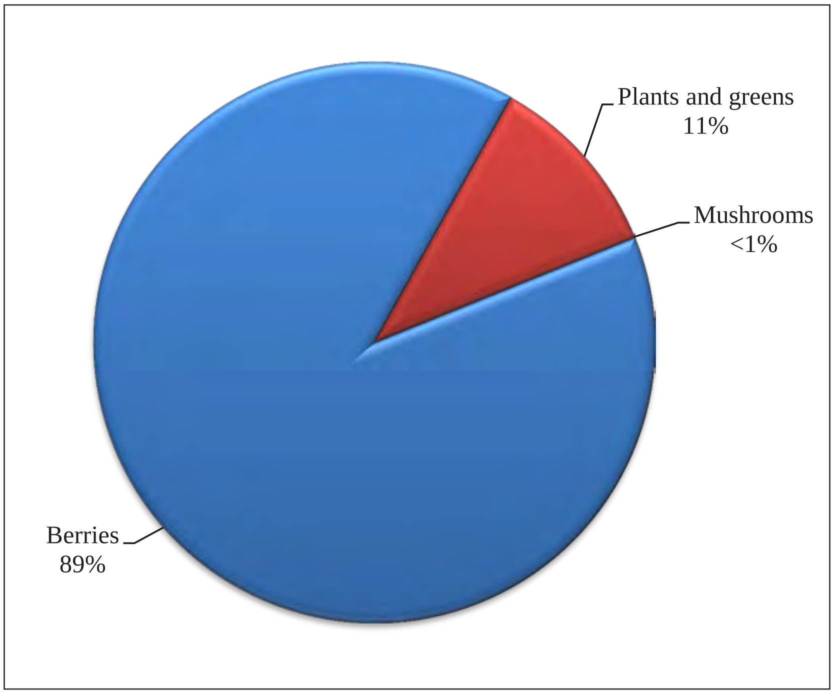


Figure 5-17.–Composition of edible vegetation harvest by type, Eek, 2013.

Plate 5-5.–Picking Pallas buttercup (kapuukar) in spring.

Vegetation was used and harvested by more households than any other resource category (Table 5-8). An estimated 97% of households used some species of vegetation. Picking berries and gathering other wild plants and greens was the most common subsistence activity among Eek residents: a full 86% of households participated in this harvest. Cloudberries were harvested by 81% of households, which made them the most commonly harvested of all individual subsistence resources. One-half of the community's households harvested wood, and 64% reported using wood in 2013. Table 5-19 shows the percentage of Eek households that used firewood for home heating. Approximately 39% of households reported that they did not use wood for heat. Nineteen percent of households obtained up to one-quarter of their heat from firewood, and 27% of households reported that they obtained from one-quarter to one-half of their home heating from firewood.

Table 5-19.–Use of firewood for home heating, Eek, 2013.

	Household use of wood for home heating as a percentage of sampled households													
	0%		1–25%		26–50%		51–75%		76–99%		100%		Did not respond	
Community	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Eek	25	39.1%	12	18.8%	17	26.6%	3	4.7%	3	4.7%	1	1.6%	3	4.7%

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

Harvest Areas

Surveyed households were asked to indicate on a map the areas they harvested or searched for resources. From these data, maps were produced depicting the harvest and search areas that were reported for 7 resource categories: salmon, nonsalmon fish, large land mammals, small land mammals, marine mammals, birds, and vegetation. Figure 5-18 summarizes all areas used for subsistence activities within approximately 110 miles of Eek in 2013. This includes areas used by Eek residents in 2013 to hunt, fish, gather, and search for all subsistence resources. However, many factors, including annual variations in weather and resource availability, require hunters, fishers, and gatherers to vary the areas that they utilize from year to year. Therefore, information gathered for any single year is unlikely to capture all of the subsistence harvest areas that are important to the community.

Eek households reported using an approximate total of 4,122 square miles for subsistence activities in 2013 (Figure 5-18). Respondents reported searching for and harvesting subsistence resources in all areas within 15 miles of the community, including the Eenayarak River and Eek Lake. The reported subsistence search area also extended along the Kuskokwim River from the river's mouth to the community of Tuluksak. Eek residents hunted throughout the entire Kuskokwim Bay, from the Kuskokwim River mouth to as far as 55 miles toward the Bering Sea. They also traveled the Eek River and the Middle Fork River for approximately 45 miles toward the mountains east of the community.

Figure 5-19 shows respondents' salmon harvest and search areas. Drift gillnet fishing areas are indicated by continuous lines on the rivers. Set gillnet sites are indicated by dots. The primary salmon drift gillnetting areas were on the Kuskokwim River just upstream of and extending along Eek Island as well in the Eek Channel to the east and southeast of Eek Island. Drift gillnetting also took place on sections of the lower Eek River from its mouth to just upstream of the community. Some respondents traveled to the community of Quinhagak, where they fished with drift gillnets along the coast where the Kanektok River enters the Kuskokwim Bay. The majority of set gillnet fishing took place on the Eek River from its mouth to a point approximately 12 air miles upstream from the community. Additional salmon setnet sites were located at the mouth of Kuskokwak Creek and near the mouth of the Kanektok River.

Harvest and search areas for whitefishes, burbot, sheefish, and northern pike are indicated in Figure 5-20. Burbot fishing took place along the Eenayarak River within 10 air miles of its mouth. The Eek River, from approximately 5 miles upstream of the community to 6 miles downstream, was a second primary location for burbot fishing. Northern pike fishing was focused along the Eek River from the community to a point approximately 15 air miles southeast at the mouth of the Ugaklik River. Some respondents also indicated that they traveled up the Kuskokwim River to points near the mouth of the Johnson River to fish for northern pike.

Respondents fished for whitefish in many locations, including sections of the Eek River directly in front of and downstream of the community. Whitefish fishing also took place along the upper Eenayarak River and in a wide area of sloughs and tundra lakes to the west and southwest of Eek Lake. Additional reported whitefish search and harvest locations include a few sections of the lower Eenayarak River approximately 10 miles northwest of Eek, in the Eek Channel along the northern edge of Eek Island, and on a branch of the Apokak slough approximately 5 air miles southwest of Eek. Finally, sheefish search and harvest took place on the Eek River just in front of the community and along a portion of the river approximately 3 air miles downstream from the community.

Figure 5-21 shows Eek's reported 2013 search areas for large land mammals. Moose hunting took place along the entire Eek River, including the Middle Fork Eek River, extending into the Eek Mountains approximately 45 air miles east of the community. Hunters also utilized the area surrounding the lower Eenayarak River as well as the Kuskokwim River from the northern section of Eek Channel to just above the community of Tuluksak. Other areas utilized for moose hunting include the Apokak Slough, as well as 2 areas along the southernmost bend of the Yukon River. Caribou hunting was focused more closely to Eek. Hunters targeted caribou in a large area extending from Eek to approximately 30 miles south and as far as 25 miles inland south of the Middle Fork Eek River. Caribou hunting also took place in an area just north

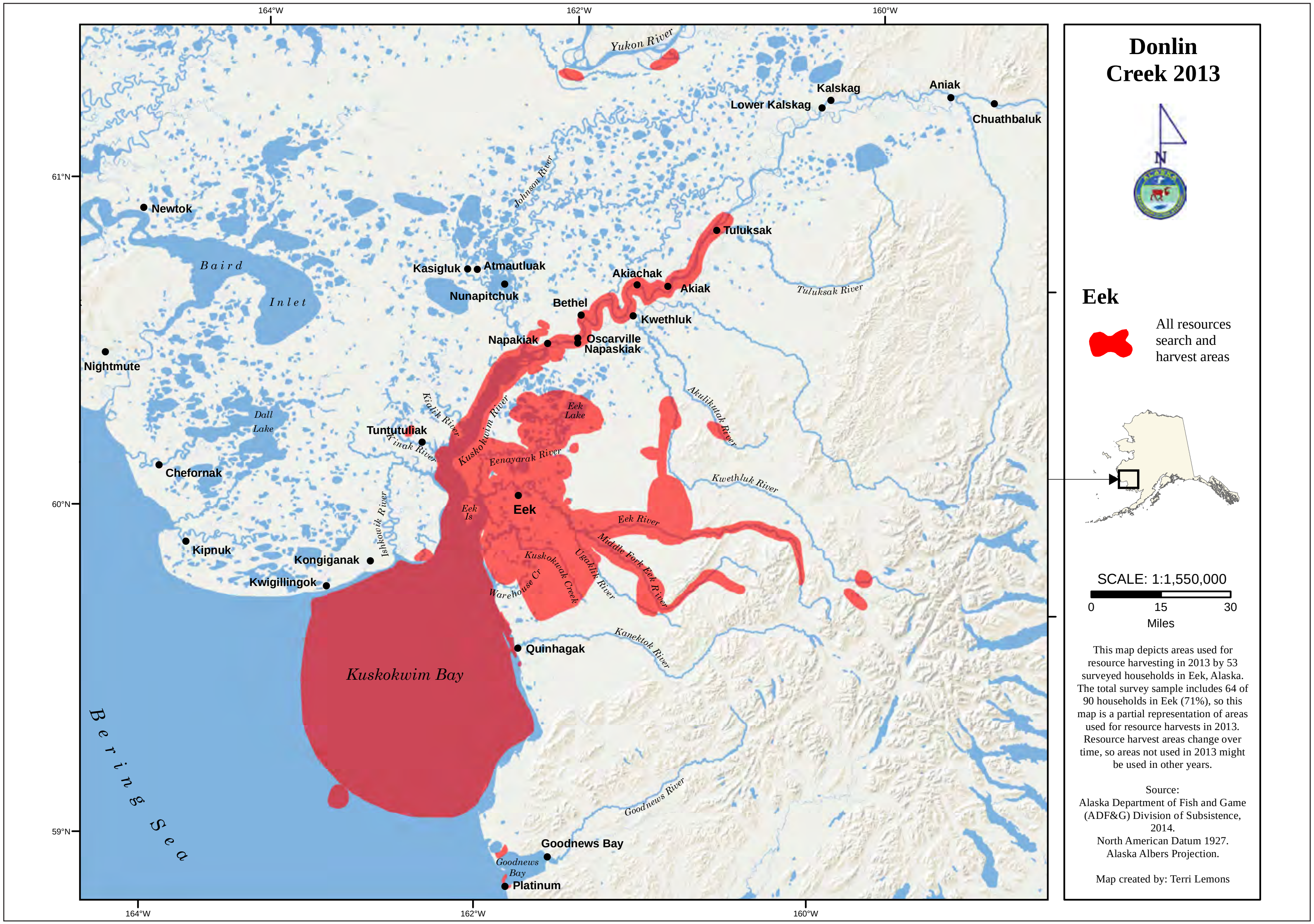


Figure 5-18.–Search and harvest areas, all resources, Eek, 2013.

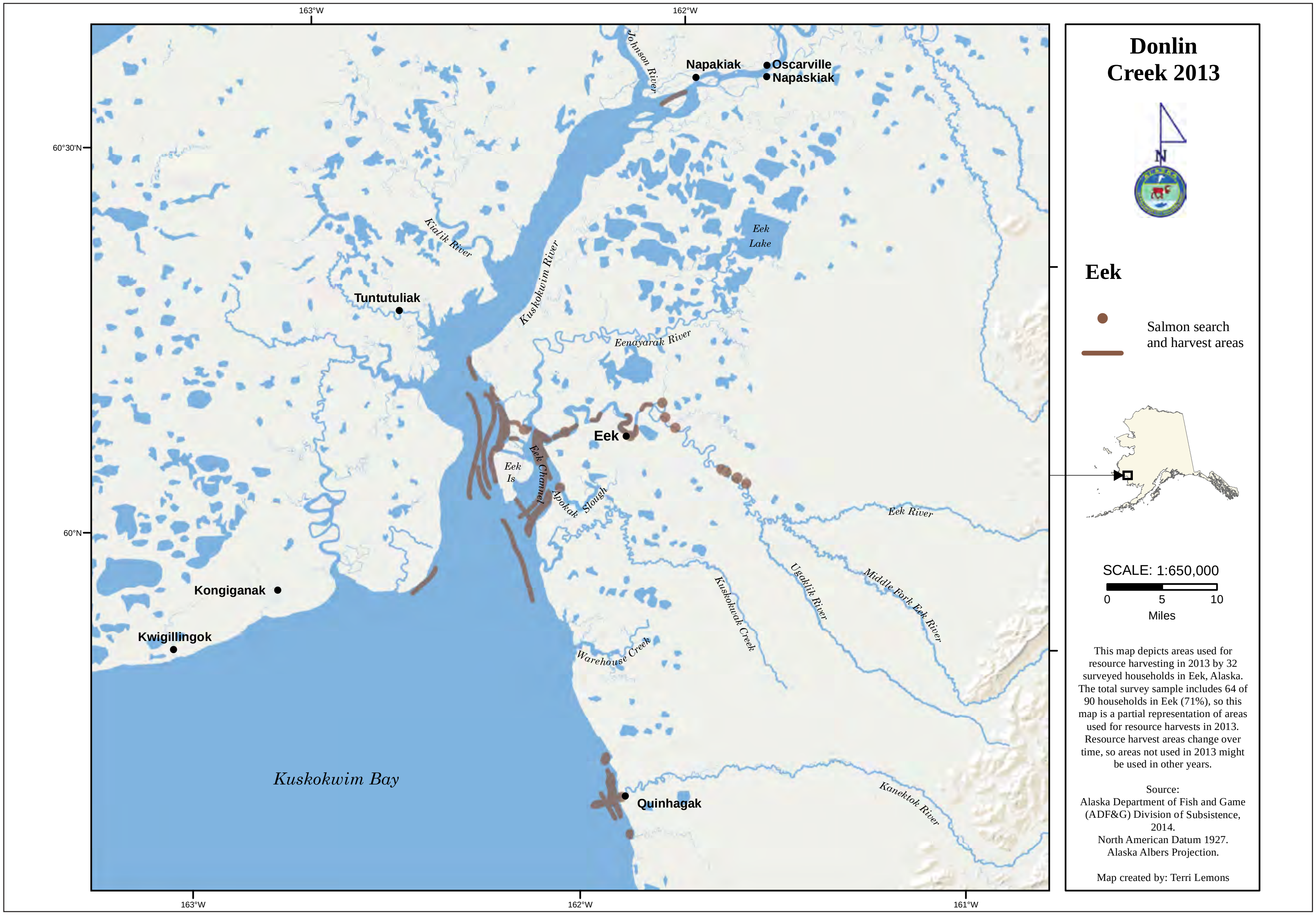


Figure 5-19.–Fishing and harvest areas, salmon, Eek, 2013.

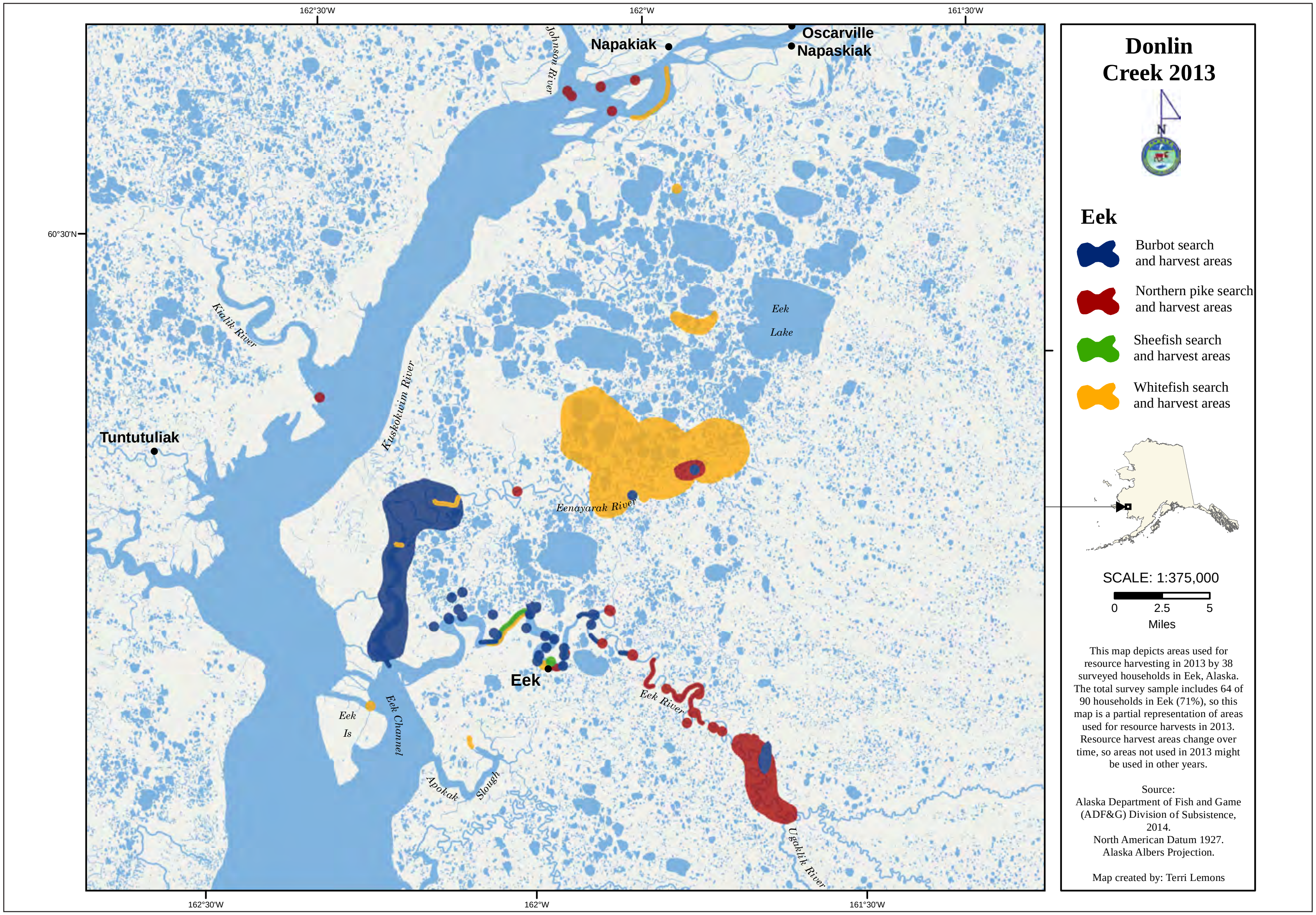


Figure 5-20.–Fishing and harvest areas, burbot, northern pike, sheefish, and whitefishes, Eek, 2013.

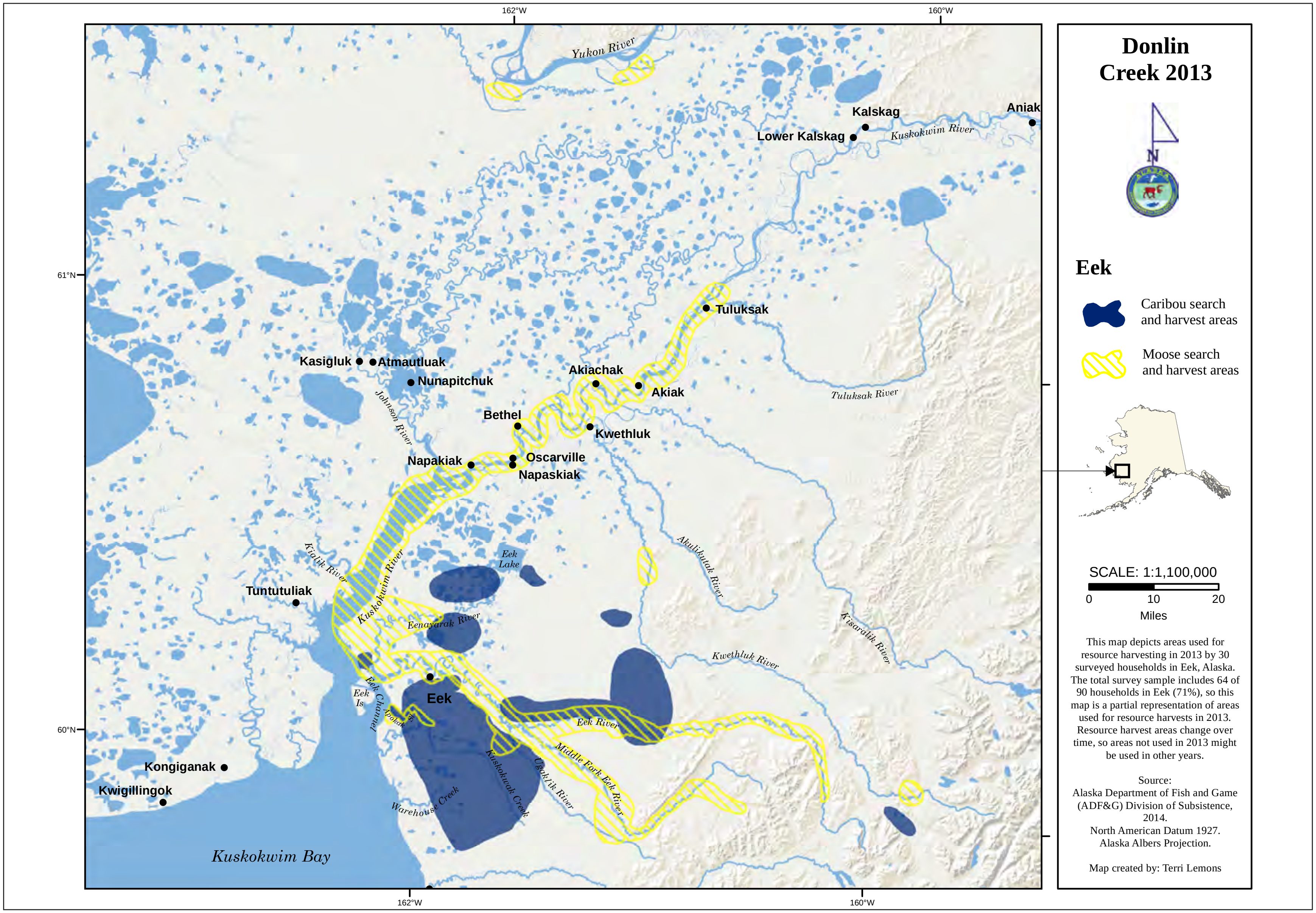


Figure 5-21.–Hunting and harvest areas, caribou and moose, Eek, 2013.

of the Eek River beginning approximately 12 miles southeast of the community, extending 25 miles to the east, and then extending north to the Kwethluk River. Finally, some respondents reported hunting caribou north of the Eek River in an area south of the Eenayarak River and in areas extending both southwest and southeast of Eek Lake.

Small land mammal hunting and trapping areas are shown in Figure 5-22. Eek's 2013 small land mammal search and harvest took place along the Eek River from approximately 3 air miles downstream from the community to 20 miles upstream. Other small land mammal hunting occurred on a slough extending from the Eek River a few miles northeast of the community and in an area of tundra and small lakes on the upper Eenayarak River a few miles south of Eek Lake. At least 1 household reported utilizing an area of tundra approximately 2 miles north of the community of Napakiak to search for small land mammals.

Figure 5-23 shows marine mammal hunting areas used by Eek residents in 2013. Respondents reported hunting for seals throughout the entire Kuskokwim Bay, from the Kuskokwim River mouth to as far as 55 miles toward the Bering Sea. This search area extended along the western coast of the bay as far as the community of Kwigillingok, and along the eastern coast, as far as 70 miles south of Eek. Seal hunting also took place along the Kuskokwim River from its mouth to just downstream of the community of Napakiak, throughout the Eek Channel, and along the Eek River downstream of Eek. All walrus hunting occurred in an area of the Kuskokwim Bay extending 20 miles along the coast south of the community of Kongiganak and extending approximately 15 miles south into the bay.

The search and harvest area for birds is shown in Figure 5-24. Migratory waterfowl hunting occurred throughout the area surrounding Eek, extending approximately 13 miles to the east and northeast of the community and to the west along the Eek River to the Eek Channel. Eek residents hunted waterfowl in a large area to the south of the community that extended as far as Warehouse Creek and from the coast to as far as 17 miles inland surrounding Kuskokwak Creek. Migratory birds were also hunted throughout Eek Channel, on Eek Island, and at the mouth of the Kuskokwim River. Additional migratory bird hunting areas included a 14-mile stretch along the Eek River beginning approximately 25 miles east of Eek, and in large areas of tundra and small lakes to the west as well as southwest of Eek Lake. Ptarmigan hunting took place in a more limited area and was focused around Eek, extending west as far as the mouth of the Eek River, north 12 miles to the Eenayarak River, and inland up to 10 miles east of the community.

The vegetation harvest is shown in Figure 5-25. Eek respondents reported gathering berries and other wild plants in a wide area surrounding the community. This area extends north from Eek approximately 10 miles to the Eenayarak River, south to Apokak Slough, and from the mouth of the Eek River to approximately 12 miles upstream from the community. Additional search and harvest areas for vegetation included the lower Kuskokwak Creek, a large area of tundra and lakes to the west of Eek Lake, and small areas near the communities of Tuntutuliak and Napakiak.

Comparing Harvests and Uses in 2013 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 2 ways: whether they got more, less, or about the same amount of 7 resource categories in 2013 as in recent years, and whether they got "enough" of each of the 7 resource categories. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different subsistence resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 5-20, Figure 5-26, and Figure 5-27 provide a broad overview of households' assessments of their harvests in 2013. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions.

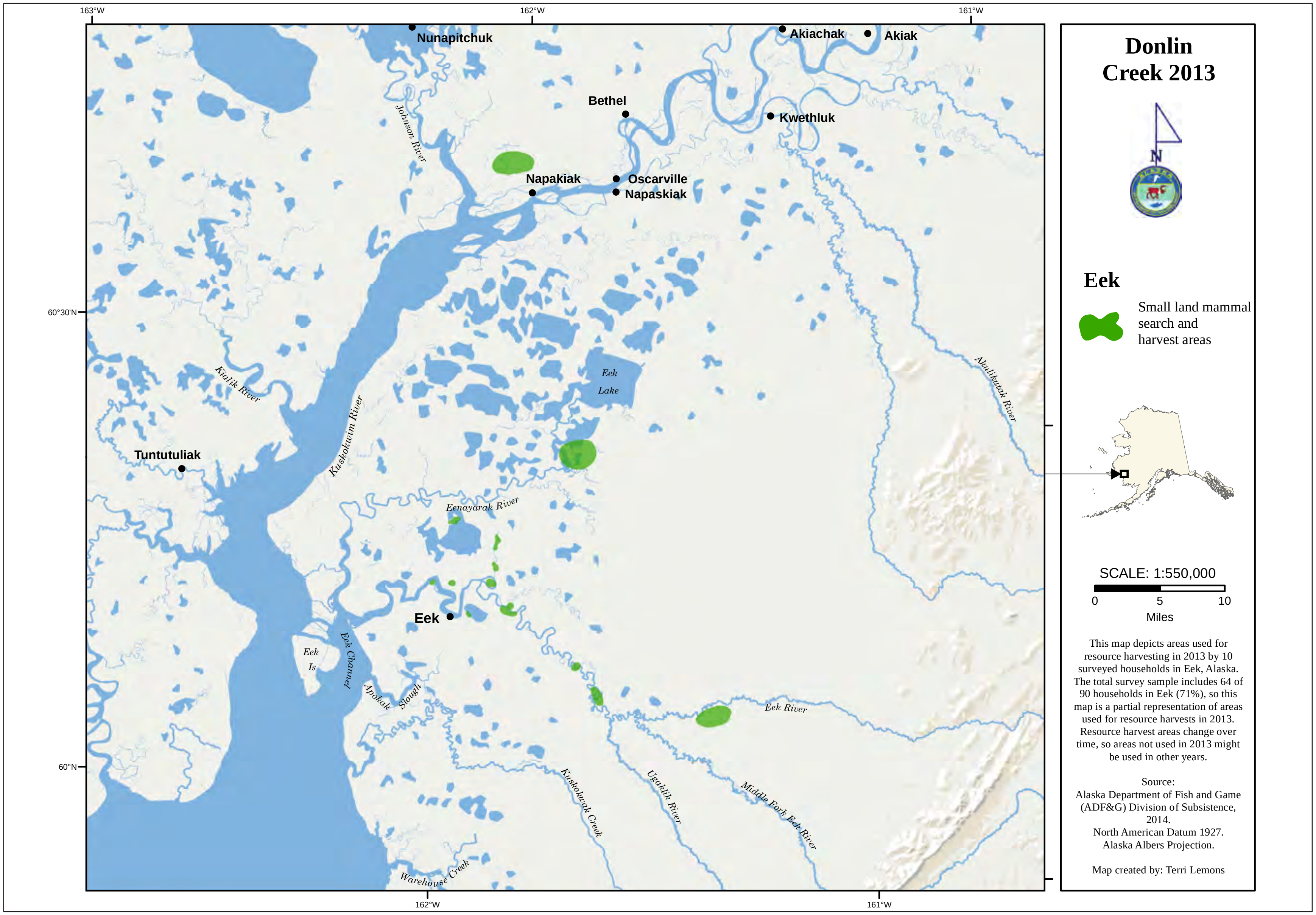


Figure 5-22.–Hunting and harvest areas, small land mammals, Eek, 2013.

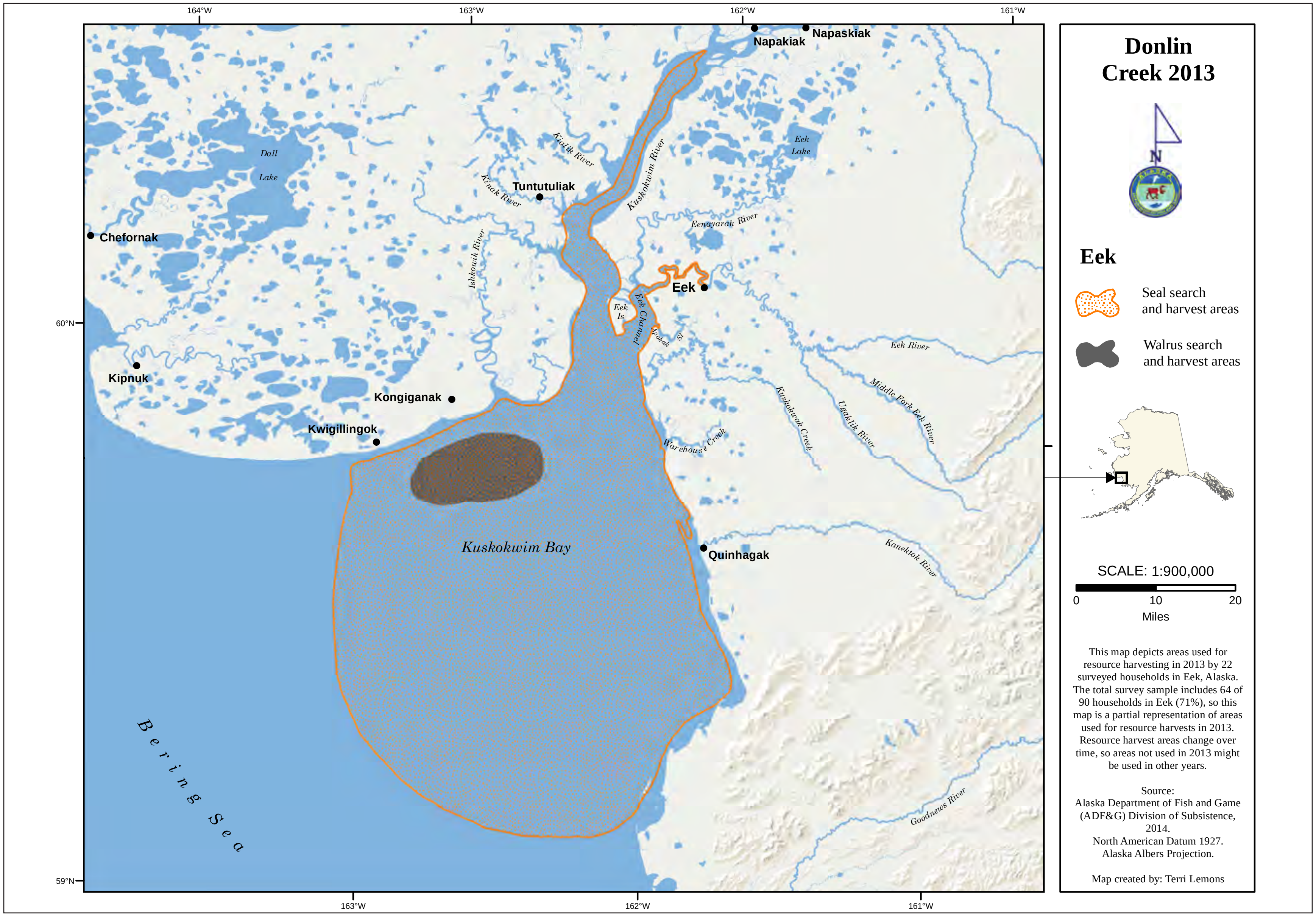


Figure 5-23.–Hunting and harvest areas, seals and walrus, Eek, 2013.

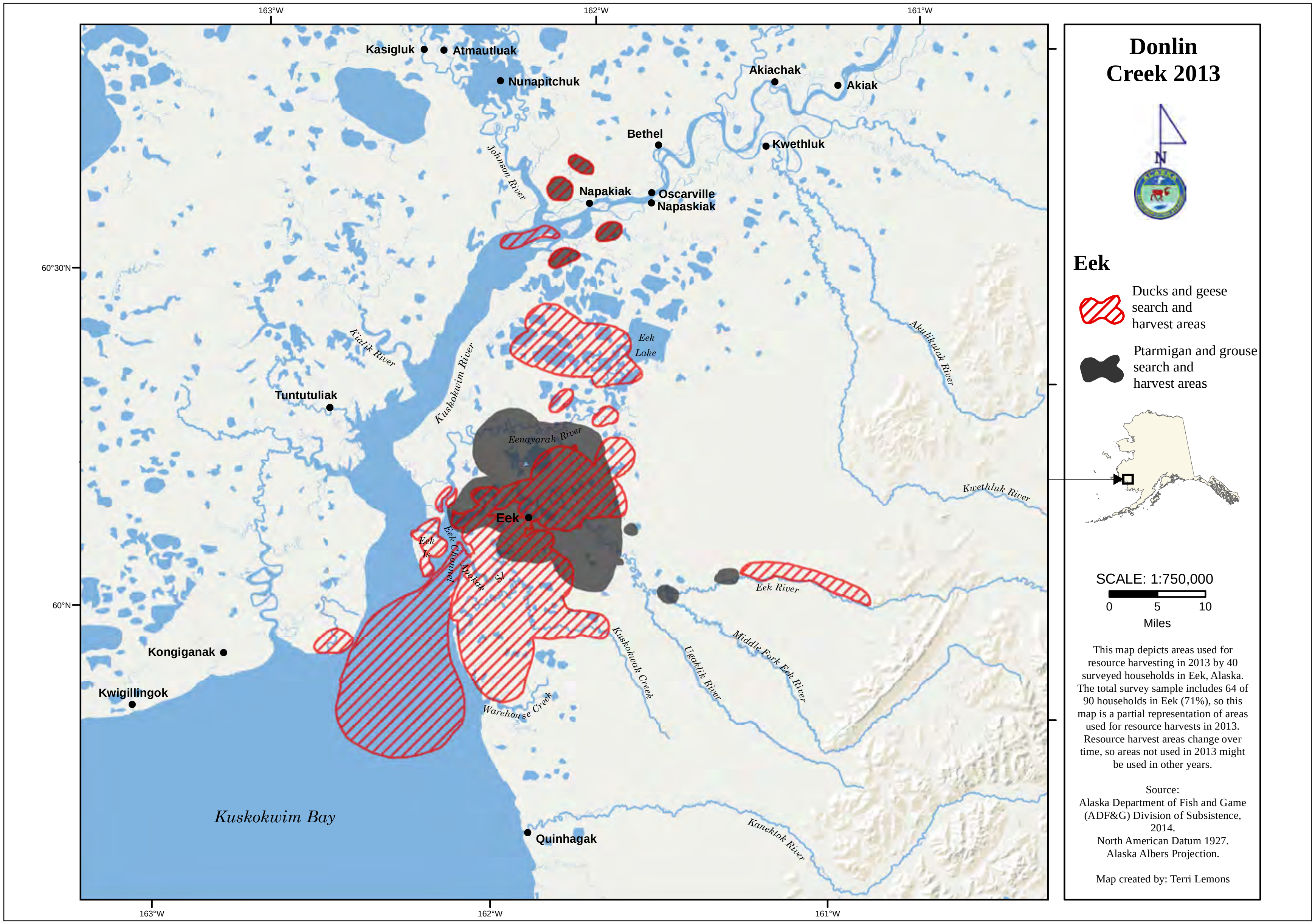


Figure 5-24.–Hunting and harvest areas, waterfowl and nonmigratory birds, Eek, 2013.

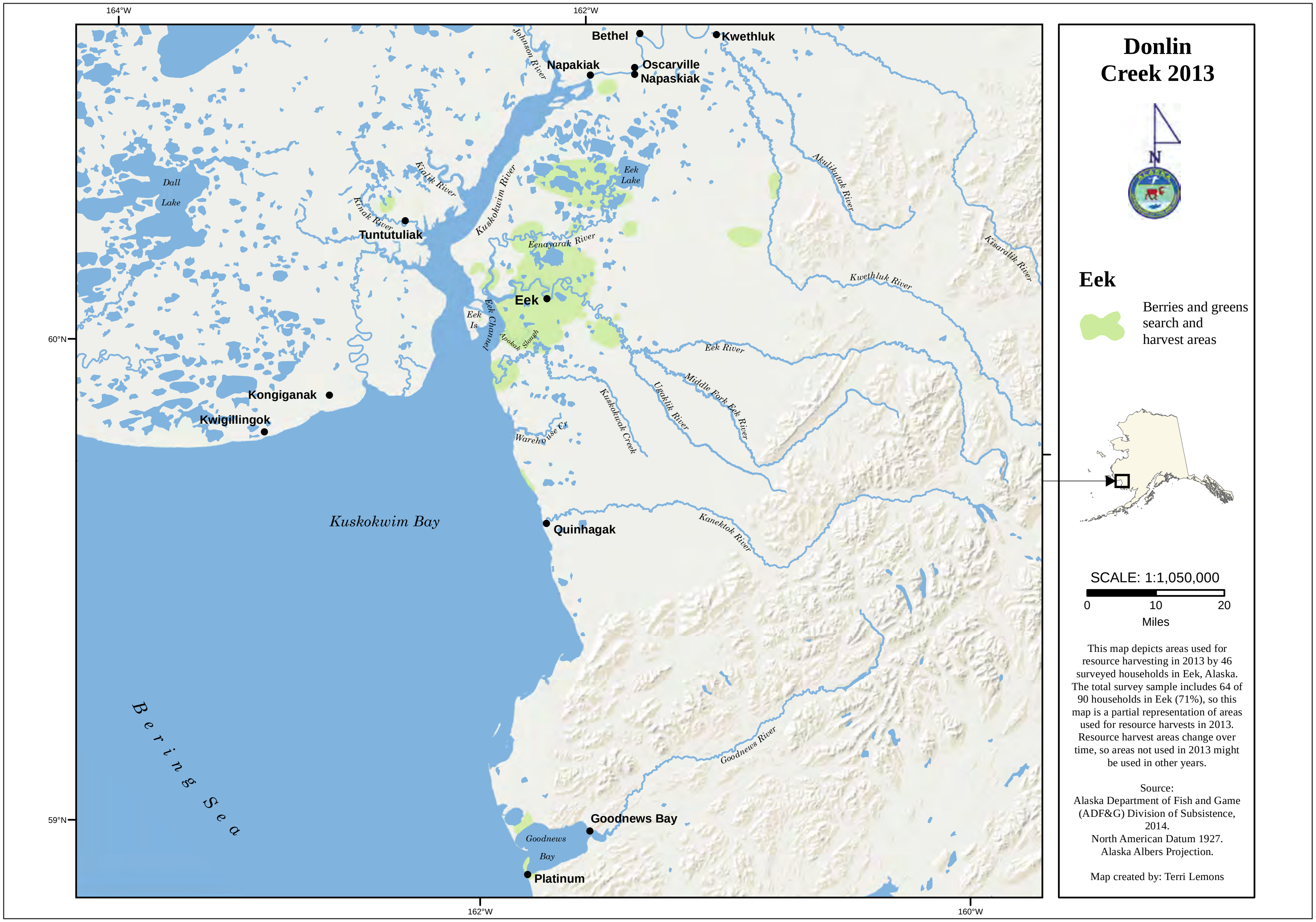


Figure 5-25.–Gathering and harvest locations of berries and greens, Eek, 2013.

Table 5-20.–Changes in household uses of resources compared to recent years, Eek, 2013.

			Households reporting use								Households not using	
			Total households		Less		Same		More			
Resource category	Sampled households	Valid responses[a]	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	64	61	61	95.3%	31	50.8%	24	39.3%	6	9.8%	0	0.0%
Salmon	64	63	61	95.3%	39	61.9%	14	22.2%	8	12.7%	2	3.2%
Nonsalmon fish	64	61	57	89.1%	28	45.9%	21	34.4%	8	13.1%	4	6.6%
Land mammals	64	59	56	87.5%	32	54.2%	21	35.6%	3	5.1%	3	5.1%
Marine mammals	64	60	52	81.3%	28	46.7%	21	35.0%	3	5.0%	8	13.3%
Birds and eggs	64	60	60	93.8%	23	38.3%	33	55.0%	4	6.7%	0	0.0%
Marine invertebrates	64	62	1	1.6%	1	1.6%	0	0.0%	0	0.0%	61	98.4%
Vegetation	64	59	57	89.1%	12	20.3%	34	57.6%	11	18.6%	2	3.4%

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

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

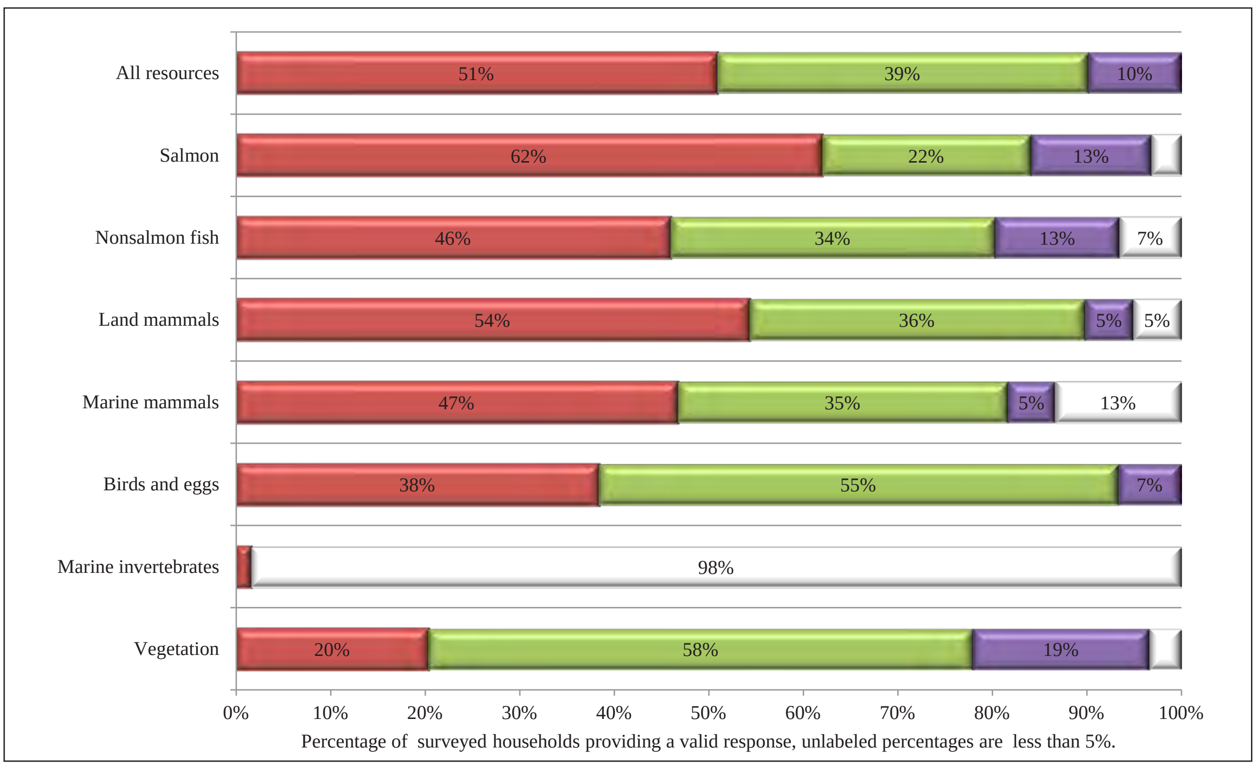


Figure 5-26.–Changes in household uses of resources compared to recent years, Eek, 2013.

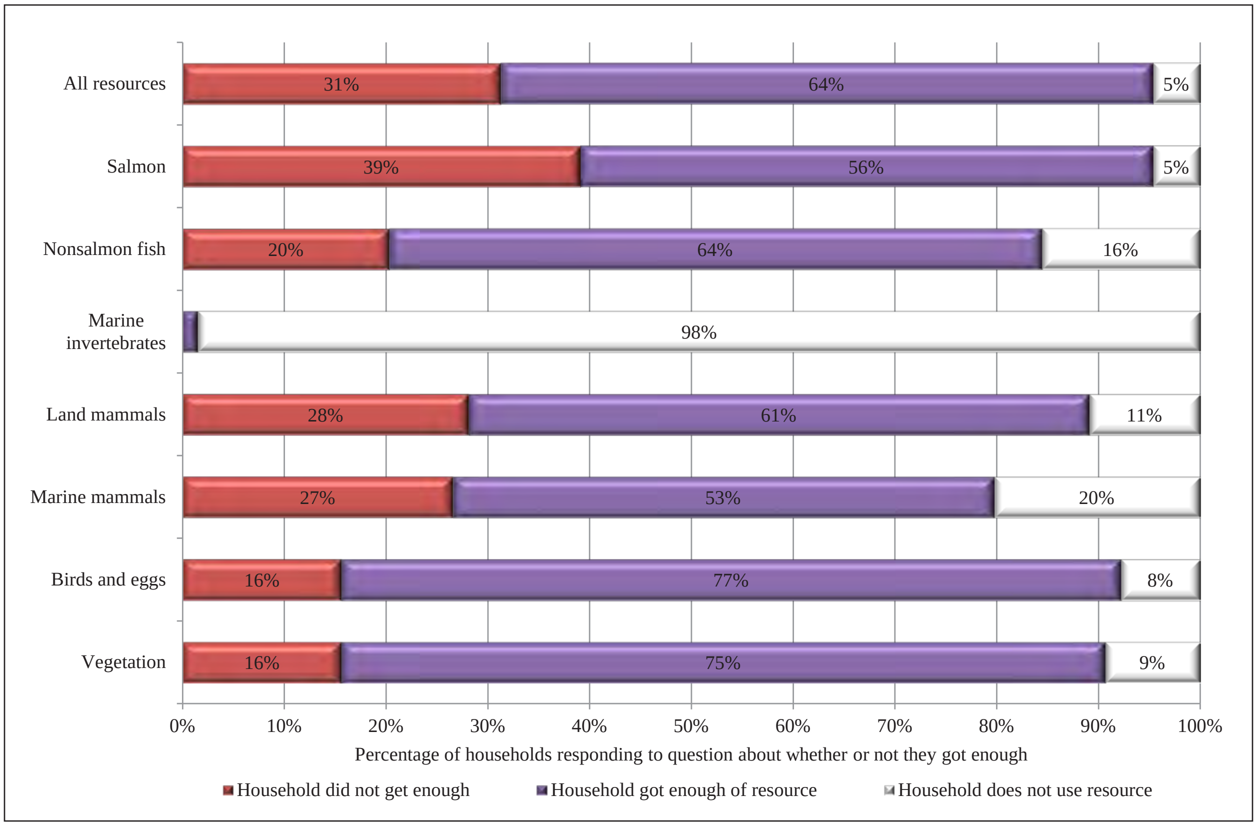


Figure 5-27.–Percentages of households reporting whether they got enough reources, Eek, 2013.

Salmon provided the most edible pounds (24,831 lb) of all subsistence resource categories used by Eek households (Figure 5-5; Table 5-8). Twenty-two percent of responding households explained that they used the same amount of salmon in 2013 as they had in previous years, 62% reported that they used less, and 13% said they used more (Table 5-20; Figure 5-26). When asked why they used less, 27% of respondents cited less sharing in 2013 (Table 5-21). Other reported reasons for using less salmon included having fewer salmon available (19%), not fishing as much as in recent years (16%), and less harvest due to regulations (14%). Of the 7 households that gave a reason for using more salmon in the study year, 3 reported that it was because their need for salmon had increased (Table 5-22). Three households also indicated that they used more salmon in 2013 because they fished more. Other reported reasons for using more salmon included experiencing greater success than in recent years (2 households), and having more help with fishing (1 household). Thirty-nine percent of Eek respondents stated that they did not get enough salmon (Figure 5-27). When asked to evaluate the impact on their household of not getting enough salmon, 1 described it as not noticeable, and 8 described the impact as minor (Table 5-23). An additional 8 households explained that not getting enough salmon had a major effect, and 4 stated that the impact was severe. Seven households that did not get enough salmon indicated that they adapted by getting more of other subsistence foods. Other adaptations to not getting enough salmon included using more commercial foods, and asking others for help (Table 5-24).

Nonsalmon fish contributed the second most edible pounds to Eek's harvest (21,076 lb; Figure 5-5; Table 5-8). Thirty-four percent of responding households explained that they used the same amount of nonsalmon fish in 2013 as they did in previous years, 46% reported that they used less, and 13% said they used more (Table 5-20; Figure 4-26). Twenty-nine percent of those who provided a reason for using less nonsalmon fish reported that it was due to expending less effort fishing in 2013 (Table 5-21). Other reasons for using less nonsalmon fish included not having the time due to wage employment, not having the proper equipment, and not receiving as much from other households. Of 8 households that gave a reason for using more nonsalmon

Table 5-21.–Reasons for less household uses of resources compared to recent years, Eek, 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
All resources	61	28	6	21.4%	7	25%	0	0.0%	4	14%	4	14%	3	11%	3	10.7%	3	10.7%
Salmon	63	37	4	10.8%	7	19%	0	0.0%	4	11%	10	27%	6	16%	1	2.7%	1	2.7%
Nonsalmon fish	59	24	2	8.3%	0	0%	2	8.3%	3	13%	3	13%	7	29%	2	8.3%	2	8.3%
Land mammals	60	30	2	6.7%	1	3%	0	0.0%	3	10%	11	37%	6	20%	9	30.0%	4	13.3%
Marine mammals	60	27	2	7.4%	2	7%	0	0.0%	2	7%	9	33%	5	19%	2	7.4%	2	7.4%
Birds and eggs	62	20	4	20.0%	2	10%	0	0.0%	2	10%	3	15%	3	15%	2	10.0%	1	5.0%
Marine invertebrates	59	1	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Vegetation	0	11	4	36.4%	2	18%	0	0.0%	0	0%	2	18%	3	27%	0	0.0%	3	27.3%

-continued-

Table 5-21.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Did not give any away		Equipment/ fuel expense		Used other resources	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	61	28	4	14%	2	7.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	63	37	4	11%	5	13.5%	0	0.0%	1	2.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	59	24	4	17%	0	0.0%	0	0.0%	1	4.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	60	30	1	3%	2	6.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	60	27	2	7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	3.7%	0	0.0%
Birds and eggs	62	20	3	15%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	59	1	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	0	11	1	9%	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.

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

Table 5-22.–Reasons for more household uses of resources compared to recent years, Eek, 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
All resources	61	6	3	50.0%	0	0.0%	1	16.7%	0	0.0%	2	33.3%	2	33.3%	0	0.0%
Salmon	63	7	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	42.9%	3	42.9%	1	14.3%
Nonsalmon fish	59	8	0	0.0%	1	12.5%	0	0.0%	1	12.5%	2	25.0%	3	37.5%	0	0.0%
Land mammals	60	3	1	33.3%	0	0.0%	0	0.0%	0	0.0%	1	33.3%	1	33.3%	0	0.0%
Marine mammals	60	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	100.0%	0	0.0%
Birds and eggs	62	3	1	33.3%	0	0.0%	0	0.0%	1	33.3%	1	33.3%	0	0.0%	0	0.0%
Marine invertebrates	59	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	0	10	6	60.0%	0	0.0%	0	0.0%	0	0.0%	2	20.0%	2	20.0%	0	0.0%

-continued-

Table 5-22.–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		Substituted for unavailable resource	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	61	6	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	63	7	1	14.3%	0	0.0%	0	0.0%	2	28.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	59	8	0	0.0%	0	0.0%	0	0.0%	1	12.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	60	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%
Marine mammals	60	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	62	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	59	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	0	10	0	0.0%	1	10.0%	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.

fish in the study year, 3 cited an increase in fishing effort, and 2 cited an increase in the household's needs (Table 5-22). Twenty percent of Eek respondents stated that they did not get enough nonsalmon fish in 2013 (Figure 5-27). When asked to evaluate the impact of not getting enough, 15% described it as not noticeable, 39% described the impact as minor, 15% explained that not getting enough nonsalmon fish had a major effect on their household, and 15% stated that the impact was severe (Table 5-23).

Land mammals accounted for 16% of Eek's 2013 subsistence harvest (Figure 5-5). Thirty-six percent of responding households reported using the same amount of land mammals in 2013 as they did in recent years, 54% reported that they used less, and 5% said they used more (Table 5-20; Figure 5-26). When asked why they used less, 37% of respondents reported that they had not received as much as in recent years, 30% said it was due to unsuccessful hunting, and 20% said it was due to less hunting effort (Table 5-21). Reasons for using more land mammals in the study year included an increased availability of the resource, increased hunting effort, and an increased need for the resource (Table 5-22). Twenty-eight percent of Eek respondents stated that they did not get enough land mammals in 2013 (Figure 5-27). When asked to evaluate the impact of not getting enough, 44% described the impact as minor, 22% said the impact was major, and 17% stated that the impact on their household was severe (Table 5-23).

Thirty-five percent of responding households explained that marine mammals contributed the same amount to their subsistence diet in 2013 as they did in previous years, 47% reported that they used less, and only 5% said they used more (Table 5-20; Figure 5-26). Thirty-three percent of respondents who gave a reason for using less marine mammals said that it was because they were given less, and 19% said they did not hunt as much as in recent years (Table 5-21). Other reasons for using less marine mammals included environmental factors, less hunting success, and general personal factors. Only 2 respondents gave a reason for having more marine mammals in 2013; both indicated that the increase was due to more hunting effort (Table 5-22). Twenty-seven percent of Eek respondents stated that they did not get enough marine mammals (Figure 5-27). When asked to evaluate the impact of not getting enough, 12% described it as not noticeable, 47% described the impact as minor, 18% indicated that not getting enough marine mammals had a major effect on their household, and 12% stated that the impact was severe (Table 5-23).

Birds and eggs was Eek's fourth most harvested subsistence resource category by edible pounds (13%; Figure 5-5). Fifty-five percent of responding households explained that they used the same amount of birds and eggs in 2013 as they did in recent years, 38% reported that they used less, and 7% said they used more (Table 5-20; Figure 5-26). Of the 20 respondents who gave a reason for using less birds and eggs, 4 said that it was due to unspecified personal reasons, and 3 cited not having time to attempt to harvest (Table 5-21). Other reasons for using less birds and eggs included receiving less in 2013 and not putting as much effort into hunting and gathering birds and eggs as in recent years. A few respondents gave reasons for getting more birds and eggs in the study year. These reasons included experiencing an increased availability of birds and eggs, receiving more, and having an increase in the household's need for the resources (Table 5-22). Sixteen percent of Eek respondents stated that they did not get enough birds and eggs (Figure 5-27). When these respondents were asked to evaluate the impact of not getting enough, 10% described it as not noticeable, 40% described the impact as minor, 20% explained that not getting enough birds and eggs had a major effect on their household, and 20% stated that the impact was severe (Table 5-23).

Vegetation was harvested and used by more Eek households than any other resource category in 2013 (Figure 5-4). Fifty-eight percent of responding households explained that they used the same amount of vegetation in 2013 as they did in recent years, 20% reported using less, and 19% said they used more (Table 5-20; Figure 5-26). Of respondents who gave a reason for using less vegetation, the majority said that it was due to unspecified family or personal reasons. Other reasons given for using less vegetation included weather or environmental factors, not spending as much effort harvesting compared to recent years, and less availability of the resources (Table 5-21). Six of the 10 respondents who provided a reason for using more vegetation in the study year indicated that it was due to an increase in availability of the resource compared to recent years (Table 5-22). A few other respondents indicated that an increased need for the resource, or an increase in harvest effort accounted for using more vegetation in 2013. Sixteen percent of Eek respondents stated that they did not get enough vegetation (Figure 5-27). When these respondents were asked to evaluate

Table 5-23.–Reported impact to households that did not get enough of a resource, Eek, 2013.

		Households not getting enough _______ .				Impact to those not getting enough ______ .									
	Sample	Valid responses[a]		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	64	61	95.3%	20	32.8%	1	5.0%	1	5.0%	7	35.0%	8	40.0%	3	15.0%
Salmon	64	61	95.3%	25	41.0%	4	16.0%	1	4.0%	8	32.0%	8	32.0%	4	16.0%
Nonsalmon fish	64	54	84.4%	13	24.1%	2	15.4%	2	15.4%	5	38.5%	2	15.4%	2	15.4%
Marine invertebrates	64	1	1.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	64	57	89.1%	18	31.6%	2	11.1%	1	5.6%	8	44.4%	4	22.2%	3	16.7%
Marine mammals	64	51	79.7%	17	33.3%	2	11.8%	2	11.8%	8	47.1%	3	17.6%	2	11.8%
Birds and eggs	64	59	92.2%	10	16.9%	1	10.0%	1	10.0%	4	40.0%	2	20.0%	2	20.0%
Vegetation	64	58	90.6%	10	17.2%	0	0.0%	0	0.0%	5	50.0%	2	20.0%	3	30.0%

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.

Table 5-24.–Things households reported doing differently as the result of not getting enough of a resource, Eek, 2013.

Resource category	Valid responses[a]	Bought/bartered		Used more commercial foods		Replaced with other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	10	0	0.0%	7	70.0%	0	0.0%	0	0.0%	1	10.0%
Salmon	12	0	0.0%	4	33.3%	7	58.3%	2	16.7%	1	8.3%
Nonsalmon fish	2	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%
Marine invertebrates	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	6	0	0.0%	3	50.0%	0	0.0%	0	0.0%	1	16.7%
Marine mammals	3	0	0.0%	2	66.7%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	4	0	0.0%	3	75.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	5	0	0.0%	2	40.0%	0	0.0%	0	0.0%	2	40.0%

-continued-

Table 5-24.–Continued.

Resource category	Valid responses[a]	Increased effort to harvest		Got a job		Obtained food from other sources		Got public assistance		Conserved resource		Other	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	10	0	0.0%	0	0.0%	0	0.0%	2	20.0%	0	0.0%	0	0.0%
Salmon	12	0	0.0%	0	0.0%	0	0.0%	1	8.3%	0	0.0%	0	0.0%
Nonsalmon fish	2	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Marine invertebrates	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	6	0	0.0%	1	16.7%	0	0.0%	1	16.7%	0	0.0%	0	0.0%
Marine mammals	3	0	0.0%	0	0.0%	1	33.3%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	25.0%
Vegetation	5	1	20.0%	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. Includes households failing to respond to the question and those households that never used the resource.

the impact of not getting enough, one-half of them described the impact as minor, 20% explained that not getting enough vegetation had a major effect on their household, and 30% stated that the impact was severe (Table 5-23).

Respondents who indicated that they did not get enough of a resource category were then asked to identify what resources were needed. Table 5-25 shows the resource categories and resource species of which Eek households reported needing more in 2013. Answers to this question varied in specificity; some respondents indicated that they needed more of a certain type of resource, such as fish, while others gave more precise answers, indicating that they needed more of a certain resource category, such as salmon, or of a certain species, such as Chinook salmon. Many households gave multiple answers to this question for each resource category, and all answers were recorded on the survey.

A total of 55 responses indicated that the household needed more of certain fish species. The majority of these responses (33) indicated a need for salmon, and 15 specified a need for Chinook salmon. Northern pike and burbot were the most common nonsalmon fish species that respondents indicated needing in 2013. Also, 18 households indicated a need for more moose, and 10 identified a need for more caribou. Twenty-four households needed more marine mammals; 17 indicated the need for various seal species. Sixteen households reported needing more birds or eggs in 2013, and the more precise responses indicated the need for a variety of migratory waterfowl species. Nineteen households identified a need for berries in 2013, and 5 households reported needing some other plant species. Cloudberry (locally known as salmonberry) and crowberry were the most common plant species for which respondents indicated a need.

Harvest Data

No other comprehensive subsistence harvest studies have been done in Eek, however, an ADF&G Division of Subsistence study documented nonsalmon fish harvest and use information in 2006 (Ray et al. 2010). Ray et al. reported a nonsalmon fish harvest of 144 lb per capita, far more than the 61 lb per capita estimated by the current study (Ray et al. 2010; Table 5-8). Though many species of nonsalmon fish were harvested in higher numbers in 2006, the difference of approximately 83 lb per capita is accounted for primarily by northern pike. In 2006, Eek residents reported harvesting far more northern pike (87 lb per capita) compared to 2013 (19 lb). Also, more whitefishes and sheefish were harvested in 2006. Humpback whitefish (18 lb per capita), broad whitefish (8 lb), Bering cisco (8 lb), and sheefish (5 lb), each contributed several more pounds to Eek's per capita harvest in 2006 (Ray et al. 2010). Only 2 nonsalmon fish species showed a significant increase in harvest from 2006 to 2013. Pacific herring contributed far more edible pounds per capita to Eek's harvest in 2013 (8 lb) than in 2006 (less than 1 lb; Table 5-8; Ray et al. 2010). Also, more burbot were harvested in the current study: an estimated 12 lb per capita in 2013 compared to 6 lb in 2006.

Figure 5-28 shows the harvest of each salmon species between 1991 and 2013. Data for this figure were gathered by the Subsistence and Commercial Fisheries Divisions of the Alaska Department of Fish and Game during annual postseason salmon surveys. Each fall, the Division of Commercial Fisheries asks a sample of heavy-, medium-, and low-harvesting households to estimate their salmon harvests. The results of this Division of Subsistence study are represented by an orange diamond on the figure.

Eek's Chinook salmon harvest has decreased steadily since 2008. Since that time, the Kuskokwim Chinook salmon numbers have decreased (Hamazaki and Liller 2015). Also, since 2010, fishing closures and gillnet mesh size restrictions have been implemented on the Kuskokwim River to limit the harvest of Chinook salmon.[7] The harvest numbers of chum, sockeye, and coho salmon have fluctuated throughout the years; however, other than a gradual increase in sockeye salmon harvest, there is no trend that would indicate a significant change in Eek's harvest and use of these species since 1991.

7. ADN (Alaska Daily News). 2015. Village residents face tough restrictions as king salmon arrive in Western Alaska. http://www.adn.com/article/20150611/village-residents-face-tough-restrictions-king-salmon-arrive-western-alaska

Table 5-25.–Resources of which households reported needing more, Eek, 2013.

Resource	Households needing	Percentage of households[a]
All resources	2	4.8%
Fish	7	16.7%
Salmon	7	16.7%
Chum salmon	3	7.1%
Coho salmon	5	11.9%
Chinook salmon	15	35.7%
Sockeye salmon	3	7.1%
Nonsalmon fish	1	2.4%
Pacific halibut	1	2.4%
Burbot	4	9.5%
Northern pike	5	11.9%
Whitefishes	2	4.8%
Broad whitefish	1	2.4%
Bering cisco	1	2.4%
Land mammals	1	2.4%
Caribou	10	23.8%
Moose	18	42.9%
Marine mammals	3	7.1%
Seal	5	11.9%
Bearded seal	4	9.5%
Ringed seal	1	2.4%
Spotted seal	3	7.1%
Unknown seal oil	4	9.5%
Walrus	2	4.8%
Whale	1	2.4%
Beluga whale	1	2.4%
Birds and eggs	4	9.5%
Ducks	2	4.8%
Geese	1	2.4%
Cackling goose	1	2.4%
Canada goose	1	2.4%
White-fronted goose	2	4.8%
Swans	1	2.4%
Sandhill crane	3	7.1%
Bird eggs	1	2.4%
Berries	6	14.3%
Blueberry	1	2.4%
Lowbush cranberry	1	2.4%
Crowberry	4	9.5%
Cloudberry	3	7.1%
Salmonberry	3	7.1%
Blackberry	1	2.4%
Plants, greens, and mushrooms	2	4.8%
Wild rhubarb	1	2.4%
Sourdock	1	2.4%
Sea chickweed	1	2.4%
Unknown	7	16.7%

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

a. Calculated using only households responding to needing at least one resource (n=42).

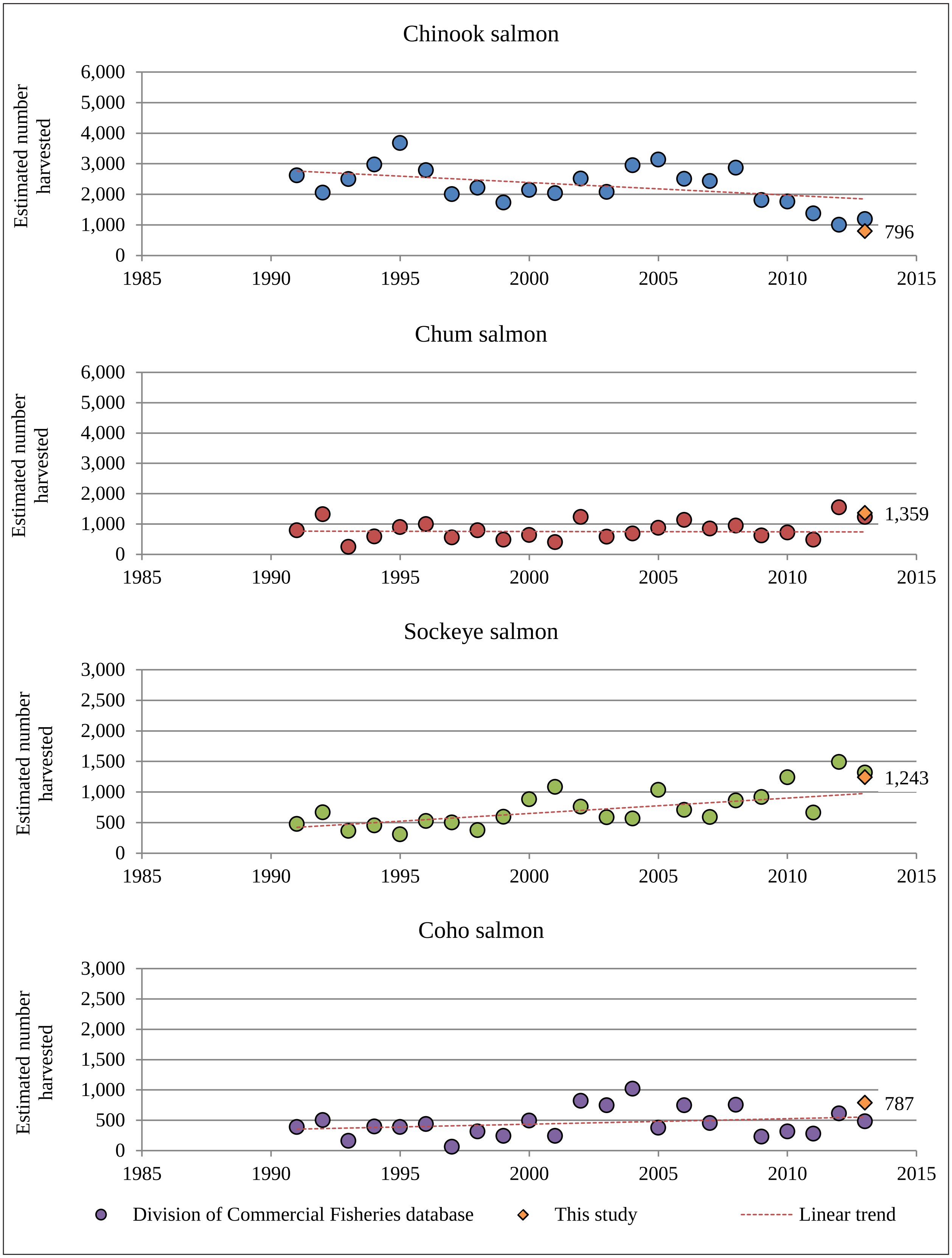


Figure 5-28.–Estimated numbers of Chinook, chum, coho, and sockeye salmon harvested, Eek, 1990–2013.

Income and Cash Employment

Respondents were asked about both earned income (jobs held and wages earned by all household members 16 years and older) and income from sources other than employment. The survey also asked about months worked and work schedules for employed residents in 2013. The most significant income source for Eek was from employment with local government, which provided 40% of all income to the community (Figure 5-29). Other contributions to Eek's income came from a variety of sources, including employment in service industries (17%), entitlements (10%), and the Alaska Permanent Fund dividend (8%).

Table 5-26 shows all reported sources of income in 2013. The estimated total of all earned and unearned income was $2,927,391 for the community, or an average of $32,527 per household and $8,436 per capita. Employment earnings provided approximately 68% of the community's income in 2013. Eek residents earned $1,991,435 from employment and $935,956 from other sources. The Alaska Permanent Fund dividend was the most significant source of other income, providing an average of $2,672 per household. Food stamps, providing an average of $2,293 per household, and Social Security ($1,832 per household) were also significant contributors to Eek's other income. Income from local government jobs totaled an estimated $1,163,329; these jobs employed 43 people in 2013. An additional 43 residents held service-related jobs and earned a total of $508,951 in wages. Employment in the transportation, communication, and utilities industries provided the third largest source of the community's total earned income ($122,155), followed by income gained from retail employment ($85,171).

The estimated median household income for Eek residents in 2013 was $26,243, within a 95% confidence interval of $17,810–$37,300 (Table 5-27). This estimated income differs from the $36,250 median household income estimated by the American Community Survey for 2008–2012. However, both the estimated median household income estimated by this study and the 2008–2012 American Community

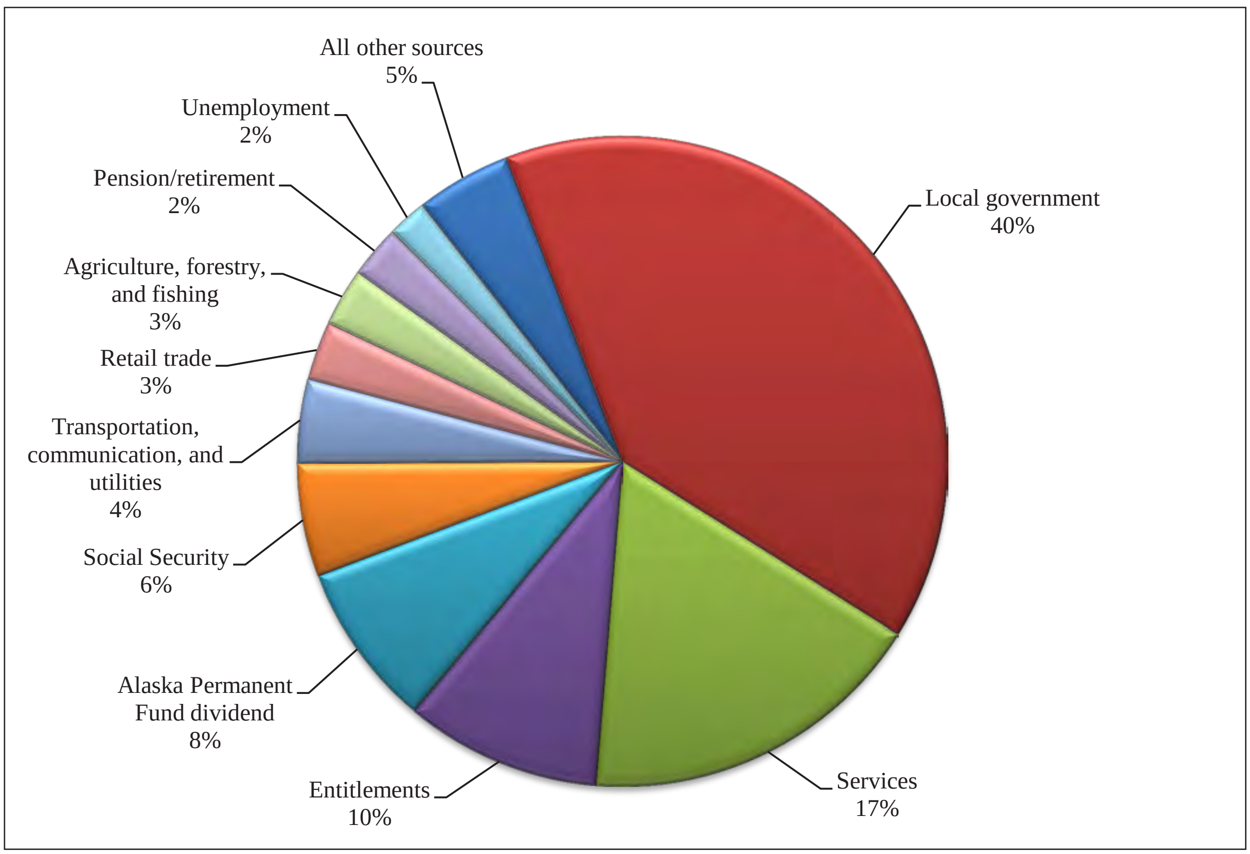


Figure 5-29.–Top income sources, Eek, 2013.

Table 5-26.–Estimated earned and other income, Eek, 2013.

Income source	Number of people	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government	43.4	32.1	$1,163,329	$611,617 – $1,898,737	$12,926	39.7%
Services	43.4	35.4	$508,951	$273,321 – $742,810	$5,655	17.4%
Transportation, communication, and utilities	9.6	6.4	$122,155	$24,609 – $289,883	$1,357	4.2%
Retail trade	8.0	6.4	$85,171	$7,264 – $238,274	$946	2.9%
Agriculture, forestry, and fishing	25.7	22.5	$84,440	$31,842 – $165,686	$938	2.9%
Manufacturing	1.6	1.6	$27,389	$25,174 – $55,372	$304	0.9%
Earned income subtotal	**104.5**	**61.1**	**$1,991,435**	**$1,316,160 – $2,694,828**	**$22,127**	**68.0%**
Other income						
Alaska Permanent Fund dividend		73.1	$240,469	$194,906 – $283,500	$2,672	8.2%
Food stamps		30.9	$206,343	$109,837 – $335,526	$2,293	7.0%
Social Security		19.9	$164,911	$70,609 – $282,796	$1,832	5.6%
Pension / retirement		11.3	$76,848	$23,687 – $165,312	$854	2.6%
Unemployment		11.3	$57,023	$16,572 – $134,007	$634	1.9%
Heating assistance		40.8	$35,746	$20,094 – $55,320	$397	1.2%
Supplemental Security Income		5.9	$35,013	$1,921 – $79,819	$389	1.2%
Native corporation dividend		53.9	$28,795	$21,652 – $36,694	$320	1.0%
TANF (Temporary Assistance for Needy Families)		4.2	$23,143	$16,457 – $64,286	$257	0.8%
Adult public assistance (OAA, APD)		7.3	$20,625	$2,453 – $46,069	$229	0.7%
Longevity bonus		8.7	$17,419	$3,098 – $36,295	$194	0.6%
Disability		1.4	$10,581	$7,524 – $21,161	$118	0.4%
CITGO fuel voucher		29.5	$7,497	$4,497 – $11,289	$83	0.3%
Meeting honoraria		2.8	$5,906	$4,200 – $16,453	$66	0.2%
Child support		2.8	$3,083	$2,192 – $9,398	$34	0.1%
Foster care		1.4	$1,688	$1,200 – $3,375	$19	0.1%
Workers' compensation / insurance		2.8	$868	$617 – $2,555	$10	0.0%
Veteran disability		0.0	$0	$0 – $0	$0	0.0%
Other		0.0	$0	$0 – $0	$0	0.0%
Other income subtotal		**74.5**	**$935,956**	**$705,839 – $1,201,570**	**$10,400**	**32.0%**
Community income total			**$2,927,391**	**$2,255,787 – $3,648,117**	**$32,526.57**	**100.0%**

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

Table 5-27.–Comparison of median income estimates, Eek, 2013.

Data source	Median[a]	Range[b,c]
2013 Division of Subsistence estimate	$26,243	$17,810 – $37,300
2008–2012 ACS (Eek)	$36,250	$23,153 – $49,347
2008–2012 ACS (All Alaska)	$69,014	$68,221 – $69,807

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

a. Division of Subsistence 2013 estimate does not include categories of income excluded by the 2008–2012 ACS median estimate, including food stamps, housing assistance, and one-time payments.

b. Range is a 95% confidence interval of the estimated median.

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

Table 5-28.–Employment by industry, Eek, 2013.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**140.2**	**61.1**	**105.9**	
Local government, including tribal	**33.7%**	**52.6%**	**41.5%**	**58.4%**
Executive, administrative, and managerial	1.2%	2.6%	1.5%	7.7%
Social scientists, social workers, religious workers, and lawyers	1.2%	2.6%	1.5%	1.0%
Teachers, librarians, and counselors	7.0%	15.8%	9.2%	20.1%
Technologists and technicians, except health	1.2%	2.6%	1.5%	2.6%
Marketing and sales occupations	1.2%	2.6%	1.5%	0.2%
Administrative support occupations, including clerical	5.8%	10.5%	7.7%	14.1%
Service occupations	11.6%	15.8%	12.3%	5.0%
Mechanics and repairers	1.2%	2.6%	1.5%	2.6%
Transportation and material moving occupations	1.2%	2.6%	1.5%	1.8%
Handlers, equipment cleaners, helpers, and laborers	2.3%	5.3%	3.1%	3.3%
Agriculture, forestry, and fishing	**18.6%**	**36.8%**	**24.6%**	**4.2%**
Agricultural, forestry, and fishing occupations	18.6%	36.8%	24.6%	4.2%
Manufacturing	**1.2%**	**2.6%**	**1.5%**	**1.4%**
Writers, artists, entertainers, and athletes	1.2%	2.6%	1.5%	1.4%
Transportation, communication, and utilities	**7.0%**	**10.5%**	**9.2%**	**6.1%**
Mechanics and repairers	1.2%	2.6%	1.5%	0.8%
Transportation and material moving occupations	5.8%	7.9%	7.7%	5.3%
Retail trade	**5.8%**	**10.5%**	**7.7%**	**4.3%**
Marketing and sales occupations	3.5%	7.9%	4.6%	1.5%
Handlers, equipment cleaners, helpers, and laborers	1.2%	2.6%	1.5%	0.8%
Occupation not indicated	1.2%	2.6%	1.5%	2.0%
Services	**33.7%**	**57.9%**	**41.5%**	**25.6%**
Executive, administrative, and managerial	2.3%	5.3%	3.1%	3.6%
Health technologists and technicians	5.8%	13.2%	7.7%	7.0%
Technologists and technicians, except health	1.2%	2.6%	1.5%	0.4%
Marketing and sales occupations	1.2%	2.6%	1.5%	0.2%
Administrative support occupations, including clerical	2.3%	5.3%	3.1%	2.1%
Service occupations	5.8%	13.2%	7.7%	1.7%
Construction and extractive occupations	7.0%	13.2%	7.7%	4.5%
Handlers, equipment cleaners, helpers, and laborers	7.0%	15.8%	9.2%	4.0%
Occupation not indicated	1.2%	2.6%	1.5%	2.0%

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

Survey estimates demonstrate that Eek's income is well below the 2008–2012 ACS median income for all Alaska households ($69,014).

Table 5-28 shows Eek's employment characteristics by industry and occupation. Survey results indicate an estimated total of 140 jobs in Eek in 2013. These jobs were distributed among 106 workers in 61 households. Local government accounted for 34% of Eek's jobs. A total of 42 individuals held employment with the local government in 2013; their earnings made up 58% of the community total. Service industries also accounted for 34% of jobs in Eek. The total earnings from this industry amounted to 26% of the community total. Agriculture, forestry, and fishing industries provided 19% of Eek's jobs, followed by transportation, communication, and utilities (7%) and retail trade (6%).

Sixty-two (44%) of the community's jobs were full-time positions, 38 (27%) were on-call or occasional employment, 36 (26%) were part-time, and 3 (2%) were shift positions (Table 5-29). Approximately 47

Table 5-29.–Reported job schedules, Eek, 2013.

	Jobs		Employed persons		Employed	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	61.9	44.2%	58.7	55.4%	46.6	76.3%
Part-time	35.9	25.6%	31.0	29.2%	24.1	39.5%
Shift	3.3	2.3%	3.3	3.1%	3.2	5.3%
On-call (occasional)	37.5	26.7%	37.5	35.4%	32.1	52.6%
Part-time shift	0.0	0.0%	0.0	0.0%	0.0	0.0%
Schedule not reported	1.6	1.2%	1.6	1.5%	1.6	2.6%

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

employed households (76% of households with at least 1 job) had at least 1 resident with a full-time position, 32 households (53%) included a resident with an on-call position, and 24 households (40%) included a resident with a part-time job. Out of a total of 212 adults residing in Eek in 2013, an estimated 106 persons held at least 1 job (50% of adult residents; Table 5-30). On average, employed adults worked approximately 7.5 months in 2013, and an estimated 45% worked year-round. Out of 90 total households, an estimated 61 households included at least 1 resident with a job (68% of all households). The number of jobs held per employed household ranged from 1 to 6 with an average of 2 jobs per household.

Food Security

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

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

Core questions and responses from Eek residents are summarized in Figure 5-30. Eight of the 10 statements listed in the figure are used to calculate a household's food security category. Thirty percent of households worried that they would not have enough food. Twenty-three percent of responding households said that they ran out of store-bought food at some point during the year, and a higher percentage (35%) reported that their subsistence food ran out. Thirty percent of households reported that once their food, either store-bought or subsistence, ran out, they were unable to get more. Twenty-six percent of responses indicated that the household lacked resources, such as equipment, transportation, or money, that they needed to get food. Twelve percent of responding households reported that they had to cut the size of their meals or skip meals at some point in 2013. Ten percent of households reported that at least 1 adult in the household ate less than they felt they should because they could not get the foods they needed. The most severe responses associated with low food security included household members who were hungry but did not eat (5%), household members who lost weight because they did not have enough food (4%), and those who did not eat for a whole day (3%).

Table 5-30.–Employment characteristics, Eek, 2013.

Characteristic	Community Eek
All adults	
Number	212.3
Mean weeks employed	16.3
Employed adults	
Number	105.9
Percentage	49.9%
Jobs	
Number	140.2
Mean	1.3
Minimum	1
Maximum	4
Months employed	
Mean	7.5
Minimum	0
Maximum	12
Percentage employed year-round	45.1%
Mean weeks employed	32.6
Households	
Number	90
Employed	
Number	61.1
Percentage	67.9%
Jobs per employed household	
Mean	1.6
Minimum	1
Maximum	6
Employed adults	
Mean	
Employed households	1.7
Total households	1.2
Minimum	1
Maximum	4
Mean person-weeks of employment	39.6

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

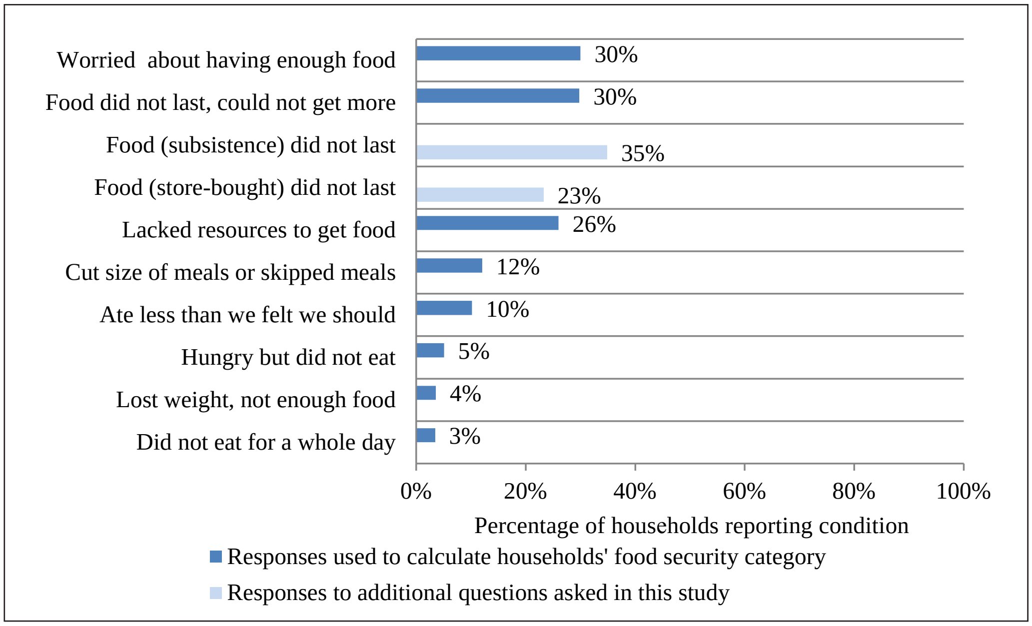


Figure 5-30.–Responses to questions about food insecure conditions, Eek, 2013.

Food security categories for Eek, the state of Alaska, and the United States are summarized in Figure 5-31. In Alaska, the percentages of households in each food security category were very similar to those in the rest of the United States. For example, 88% of Alaska households, compared to 86% of households in the United States, experienced high to marginal food security in 2013, while only 5% of Alaska households and 6% of households in the U.S. experienced very low food security. In Eek, 86% of households had high or marginal food security, 8% experienced low food security, and 6% of households experienced very low food security in 2013. These findings suggest that food security in Eek is comparable to the rest of the state and the nation.

Because the availability of wild resources fluctuates throughout the year, the food security of households participating in subsistence activities may be affected from month to month. Figure 5-32 portrays the mean number of food insecure conditions per household by food security category by month. Households with high and marginal food security (shown in blue) remained relatively stable throughout the year with less than 1 condition true for any given month. Households with very low food security (shown in green) showed the greatest variation throughout the year. Food insecurity for these households peaked in August with an average of 4 food insecure conditions and again in November and December with an average of 5. Food insecurity for these households was lowest from May through July, when an average of 2 conditions was reported. Unlike households with very low food security, households with low food security (shown in red), had less variability with only 1 food insecure condition for the majority of

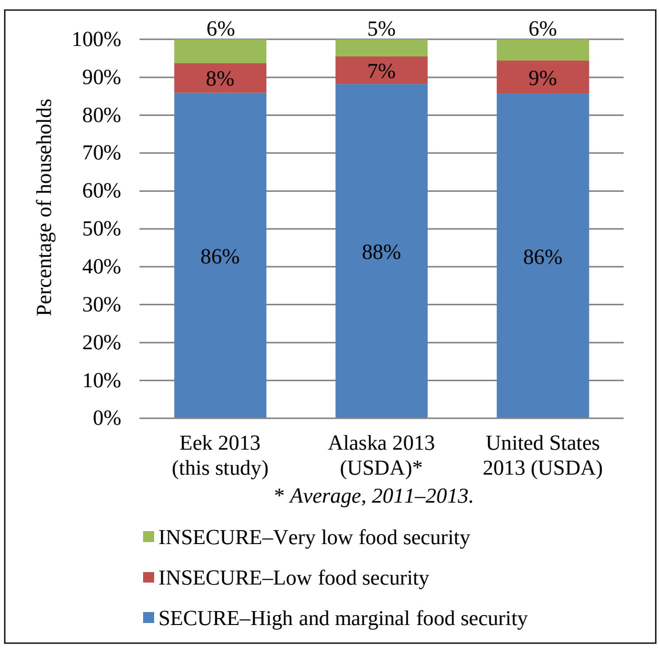


Figure 5-31.–Food security categories, Eek, 2013.

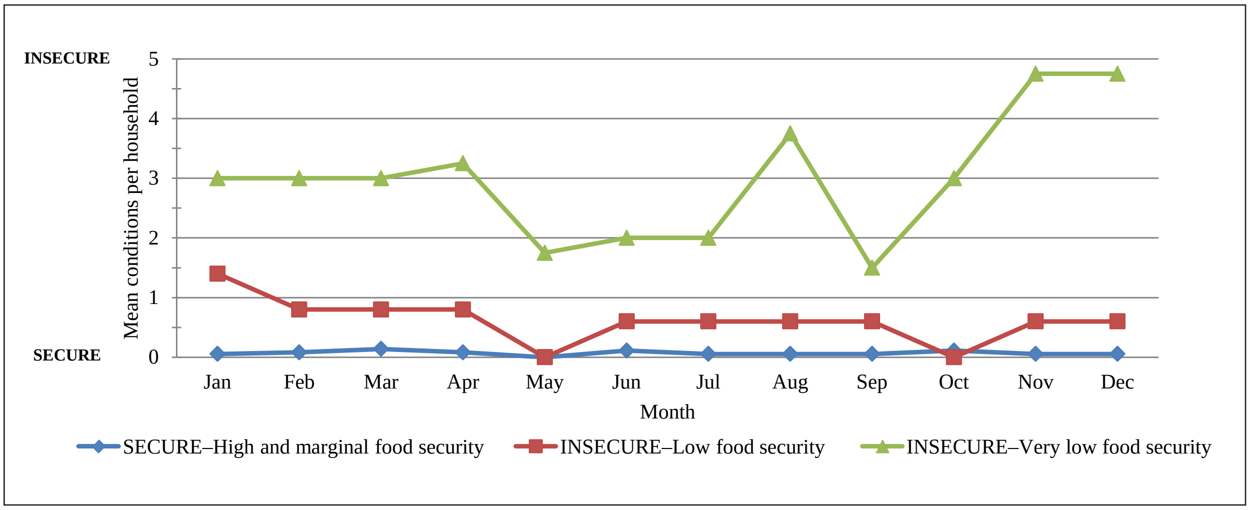


Figure 5-32.–Mean number of food insecure conditions by month and household category, Eek, 2013.

the year and a peak of 2 in January. This graph demonstrates that the fluctuations of food security increase as households become less food secure. Changes in the availability of wild resources, eligibility for food stamps, and access to the resources needed to obtain food, for example, may have impacted households with very low food security more than those with high or marginal food security.

Figure 5-33 shows in which months households reported that their food did not last. Subsistence foods (shown in red) had greater variability than store-bought foods (shown in green). Eight percent of households reported that their subsistence foods did not last in March and in December. No households reported that their subsistence foods did not last in May. Except for the months of March and December, a higher percentage of households reported running out of store-bought food than reported running out of subsistence foods. Six percent of households reported that their store-bought foods did not last for the majority of the year. Only the months of September and November show an increase to an average of 8% of households running out of store-bought foods.

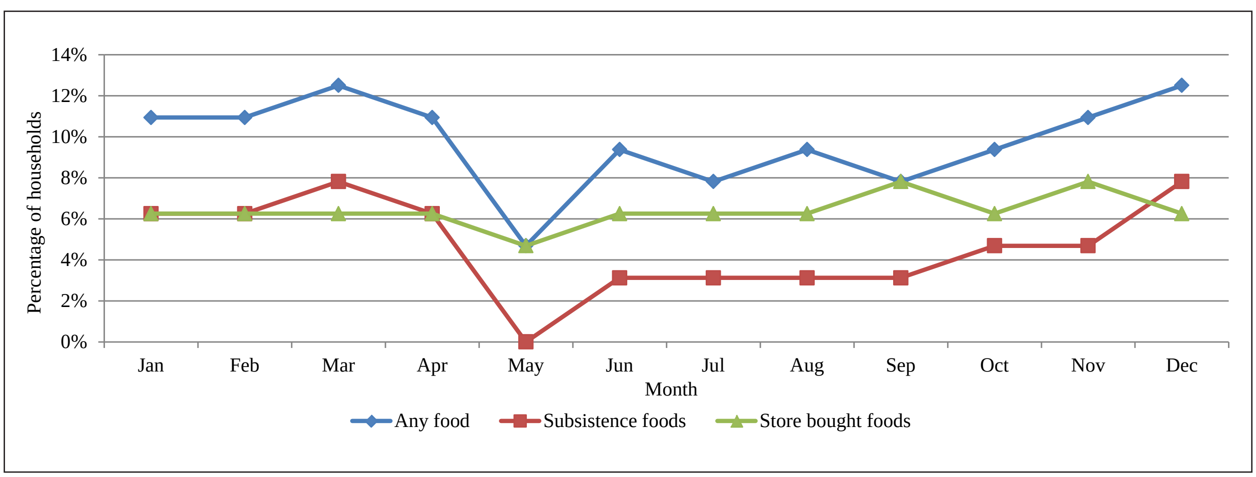


Figure 5-33.–Comparison of months when subsistence, store-bought, and any food did not last, Eek, 2013.

Sharing of Wild Resources

Household Specialization in Resource Harvesting

Previous studies (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 5-34, in the 2013 study year in Eek, 30% of the community's households harvested about 69% of wild resources as estimated in usable pounds. Further analysis of the study findings, beyond the scope of this report, might identify characteristics of the highly productive households in Eek and the other study communities.

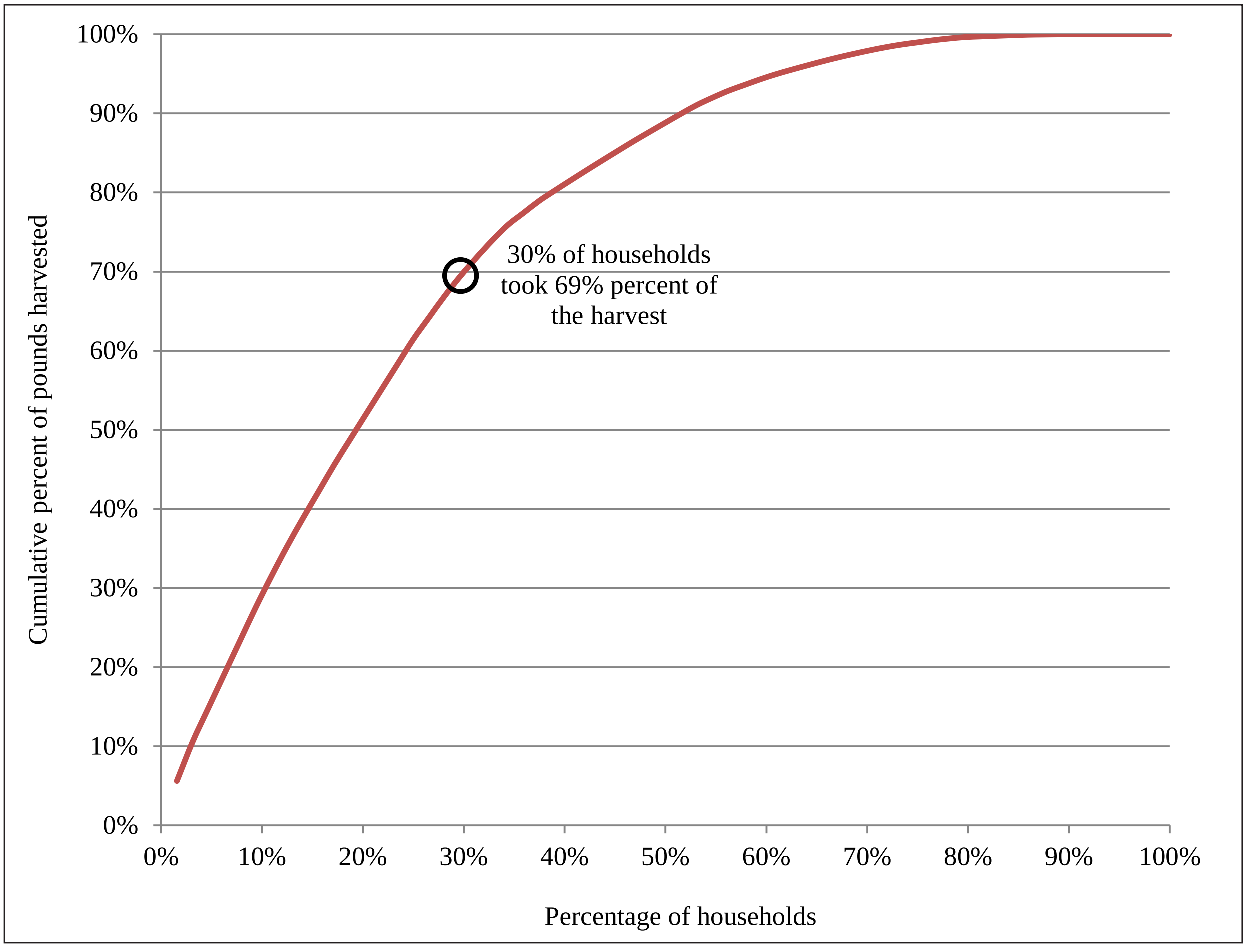


Figure 5-34.–Household harvest specialization, Eek, 2013.

Wild Food Networks

Although subsistence harvest surveys collect information based on individual households, in reality, much of the production (harvest and processing) of subsistence foods is achieved by households within a community that work cooperatively. The organization of the contemporary mixed market–subsistence economies that are predominant in rural Alaska communities has been documented ethnographically by numerous researchers.

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

Figure 5-35 shows the flow of wild foods into surveyed households from other Eek households and from communities in Alaska. Symbol shapes depict the type of household; colors show the age of heads of household, and size indicates the amount of its subsistence harvest in 2013 by edible weight. Arrows show the direction of food from one household to another, and the weight of lines show the number of resources. The position of a household relative to the center of the figure shows how tied it was to other households in Eek. The figure is a partial representation of sharing, trade, and barter in 2013. Because it only documents resources flowing into an individual household, the network diagram cannot imply patterns of reciprocity in the community. Also, the diagram does not illustrate other relationships which occur in subsistence sharing networks such as providing financial support for the harvesting effort or receiving food from an intermediary instead of directly from those harvesting or processing the resources.

Previous studies have found a positive association between the ages of household heads and the amount of subsistence foods harvested. Household characteristics associated with higher food production include those households with multiple working-age males, involvement with commercial fishing, and higher wage incomes. Characteristics common to lower producing households included female household heads, age of elders, non-Native household heads, and single-person households (Magdanz et al. 2009; Wolfe et al. 2010). Household “developmental cycles” (i.e., the relative age or “maturity” of household heads and number of productive household members) have also been associated with harvests.

In 2013, 95% of Eek households reported that they received wild food resources and 81% reported that they gave wild food resources to another household (Table 5-8). One key respondent described the importance of sharing the subsistence harvest:

> I help people. I help the people who don’t have, don’t go hunting. Like if I catch 2 or 3, I share to the elders, all of them, first catches, and that’s what all the Natives do. Give them to the elders who can’t hunt no more. And that’s why, because, they used to hunt and give our parents, and then in return we do that, even now. And we don’t waste. (050914EEK1)

A total of 440 instances of sharing resources were reported. Eek households experienced an average of 5 instances of subsistence resource sharing per household in 2013. One surveyed household reported experiencing no sharing, and at least one household reported as many as 74 instances of sharing. The highest harvesting households tended to be headed by couples of all age groups.

Eek residents also reported a network of exchange of wild foods involving at least 14 communities in the region. Respondents reported receiving foods from as far away as the community of Kotlik at the mouth of the Yukon River. The community of Quinhagak, approximately 32 miles south of Eek, had by far the highest frequency of giving wild foods to Eek residents, with 74 instances of sharing. Though Quinhagak is not the community located closest to Eek, it is clearly the community whose foodways are most interwoven with that of Eek’s. The nearby regional hub community of Bethel had the second highest frequency of sharing with Eek (13 instances), followed by the community of Napakiak (10).

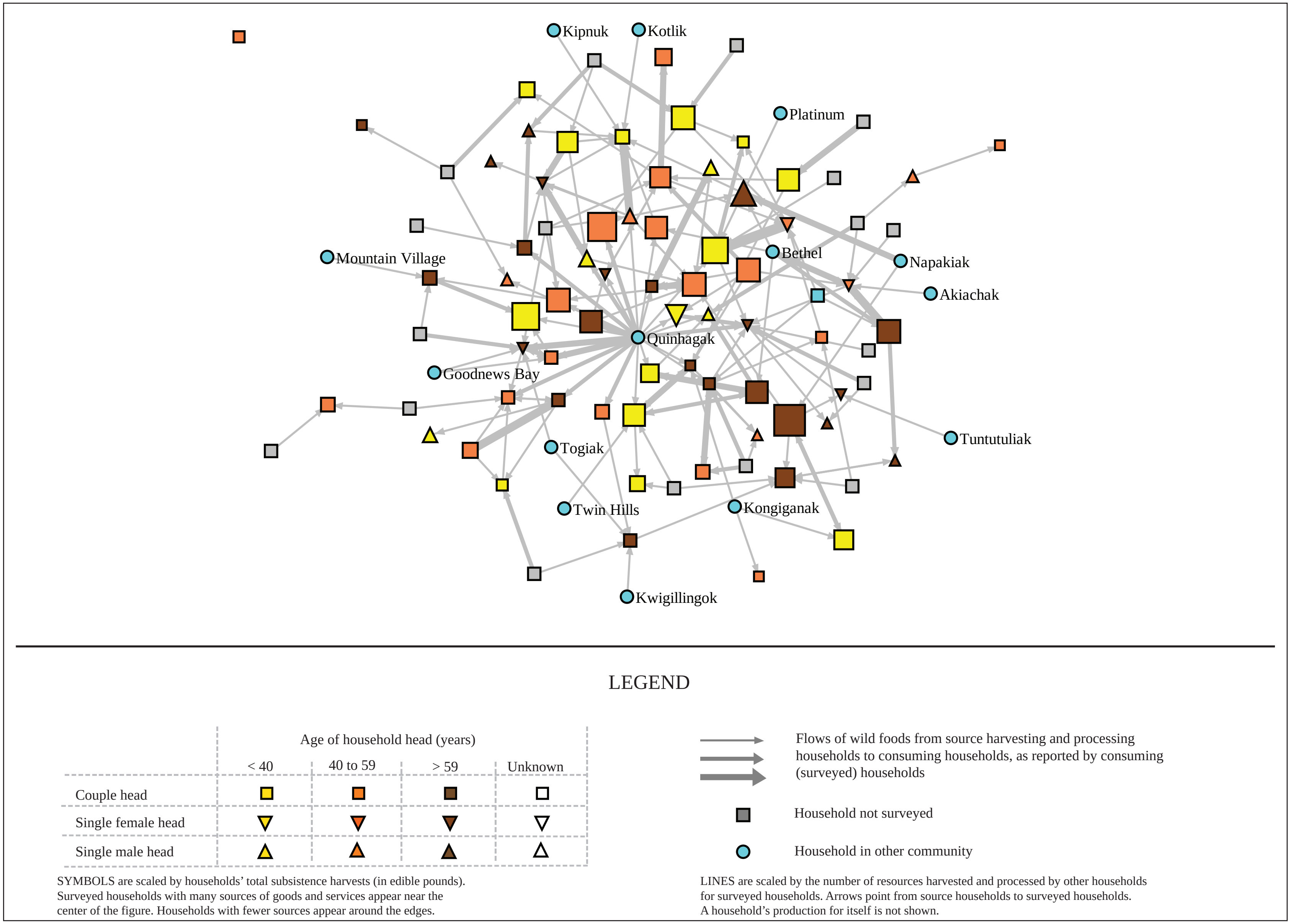


Figure 5-35.–Wild food harvesting and processing network, Eek, 2013.

Local Comments and Concerns

Following is a summary of local observations of wild resource populations and trends that were recorded during the surveys in Eek. 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.

Many residents of Eek voiced concern about their ability to feed their families. Of particular concern were the fishing restrictions during the Chinook salmon run in recent years. Some people were frustrated by short fishing openings because they were forced to arrange their life and work schedules around the brief opportunities to fish. Another concern was that these restrictions were causing them to get their salmon later in the seasons when the weather was not ideal for drying fish. A few people felt that bycatch of salmon in ocean fisheries was a potential cause of the Chinook salmon run decline, and focus should be on regulation of these commercial fisheries rather than on subsistence fishers.

Some respondents were unhappy with the 10-day moose season that is currently in place in GMU 18. Several people expressed desire for a 30-day opportunity to hunt moose as is the case in some neighboring GMUs. A few respondents were concerned about their ability to get the caribou they need. Their reasons included lack of snow in recent years, and a bag limit that makes it impossible for some hunters to harvest enough animals to feed many families as they have done in the past.

These concerns about resource abundance and harvest opportunities, combined with a lack of jobs, and high prices of fuel and groceries in the community, have led some people to question their ability to get the food that their families need. One respondent explained that his family cannot afford to live off store-bought food, and if they were hungry he would have no choice but to hunt and fish, regardless of regulations. Others indicated that, even if they could afford to live off of store-bought food, they would not choose to because it is less healthy and doing so would facilitate the loss of the subsistence way of life that is integral to their culture.

Acknowledgements

The author would like to express thanks to the residents of Eek for allowing us to explore their community, and for allowing us into their homes. During our fieldwork in Eek we were invited to attend a potlatch, invited to take a steam bath, and welcomed at bingo, the school graduation ceremony, and the prom. I would like to thank our key respondents for granting us interviews and freely providing details about their lives and in many cases the lives of their ancestors. Special thanks to Sally Teeluk for being our teacher, and for showing us how to pick kapuukar and mousefoods. I would like to thank the Eek Traditional Council and Tribal Administrator Nick Carter for facilitating this study. Finally, the research would not have been possible without the help of local research assistants who scheduled and administered surveys and shared their knowledge of the community with us.

Plate 6-1.–Aerial view of Tuntutuliak looking south. The blue building on the left is the school.

6. TUNTUTULIAK

Seth Wilson

In April 2014, ADF&G researchers surveyed 67 of 104 households (64%) in Tuntutuliak, Alaska. Expanding for the unsurveyed households, Tuntutuliak residents' estimated total harvest of wild foods between January and December 2013 was 149,047 lb (± 14%). The average harvest per household was 1,433 lb; the average harvest per person was 361 lb. During the study year, Tuntutuliak's residents harvested 81 different types of wild resources.

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

In addition to the comprehensive survey, 4 ethnographic interviews were conducted with 4 people. The ethnographic interviews help to provide context for the quantitative data presented in this chapter. Findings from these interviews, historical background information, and comparisons with earlier studies are presented throughout the chapter.

Community Background

Tuntutuliak is located along the Kinak River[2], locally known as the Tunt River, a short distance from its junction with the Kuskokwim River (Orth 1971rep.; Plate 6-1). Inaccessible by highway vehicle, the community is accessible year-round by commercial air services and in summer by barge services along the Kuskokwim River. Boats and snowmachines are used for local travel. Bethel, the regional hub, is located 45 miles to the northeast. Tuntutuliak is situated within the Yukon Delta National Wildlife Refuge, a federally-

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

2. Alternatively spelled "Qinaq" River.

managed area that encompasses the lower portions of the Kuskokwim and Yukon rivers. The Refuge is characterized by abundant wetlands and tundra lowlands. The community is located only 20 miles upriver from the Kuskokwim Bay, and as a result of this proximity, the Kinak River is tidally influenced.[3]

Tuntutuliak was established at its current location in 1945 by residents of 2 former communities: Qukakllircaraq and Kinak. Kinak (Qinaq), located 4 miles east of Tuntutuliak, was a sizable community that dated back to at least 1879 (Orth 1971rep.:521). One respondent noted that it was so large that there were 2 men's houses (*qasgiq)* when the missionaries first came (04292014WTL02). A Bureau of Indian Affairs (BIA) school was temporarily located in Kinak. The school was relocated to the community of Eek in 1923. Some Kinak residents may have followed the BIA school to Eek. The respondent stated that when the school was closed, residents moved to various other communities in the Yukon-Kuskokwim (Y-K) Delta. In 1923, the first Moravian chapel was built in Kinak with lumber and other support from Eek. In the late 1920s, a trading post and store was opened by John Johnson.[4] Less is known about the history of Qukakllircaraq (*Qukaqlirciraq*)[5], the second community (Ray et al. 2010:7).

Tuntutuliak was established at its present site on higher ground in 1945. It was located along a slough that Kinak residents referred to as Tuntutuliaq, where caribou used to congregate (04292014WTL02). The Bureau of Indian Affairs (BIA) built a school at the site in 1957. Thereafter, residents were compelled to settle near the school so that their children could attend. Participants in a previous study said that the Tuntutuliak community site was not a commonly used harvest area, and that they now have to travel a longer distance from the community for harvest activities (Ray et al. 2010:7). Infrastructure includes a post office, the Lewis Angapak Memorial School, a health clinic, and 2 community stores.

Seasonal Round

The annual subsistence calendar is driven by the 4 seasons. Some fish and wildlife resources are available seasonally and some year round. Families that have lived on the Y-K Delta for generations have accumulated traditional ecological knowledge of times and places to harvest these resources. For example, hunters and fishers know that certain resources may only be of optimal quality for as little as a week, as discussed by this respondent:

> Since they've been doing, doing subsistence for so long, they chose certain times of the year to harvest certain species. Because of the, you know, for quality. Certain times of the year, fish texture or quality changes. So do mammals. And our, when we chose to harvest certain species depended on their prime. (04292014WTL03)

The following is a summary of contemporary harvest patterns as described by community residents, researcher observations, and survey data.

Spring marks the renewal of the year. As the weather calms and days lengthen, subsistence activities increase. If the snow conditions allow travel, hunters haul their boats with snowmachines to the mouth of the Kuskokwim River to hunt seals and other marine mammals. Closer to the community, all family members begin ice fishing for northern pike and other nonsalmon fish species on the river ice adjacent to Tuntutuliak. Migratory waterfowl return to Tuntutuliak during the middle of April, and hunters take short trips on snowmachines to the lakes surrounding Tuntutuliak to hunt these birds. As travel conditions begin to deteriorate, residents are unable to leave the community. They then turn their attention to a brief window of gathering as bird eggs become available, and greens with tender shoots and stalks emerge during the spring.

---

3. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed December 16, 2015. http://commerce.alaska.gov/dcra/DCRAExternal/community. Hereafter referred to as ADCCED n.d.

4. ADCCED n.d.

5. A third spelling, Qukaqlircaramiut, is used in *Qaluyaarmiuni Nunamtenek Qanemciput: Our Nelson Island Stories* (Fienup-Riordan 2011).

Plate 6-2.–Summer fish camp.

> When I first started being aware of my surroundings I was inside a kayak with my mother and father going egg hunting. It was probably spring because there was eggs around. And, I saw my great-grandfather, you know, or my grandfather…going out by kayak, paddling, you know. Getting, you know, hunting out there in the sea. Um, we did berry picking, I remember that. Um, but I remember seeing a lot of eggs one time you know, just by going up a bank. You know, to the shore. A lot of birds during that time. And I remember the sky was very blue. 1950, mid-fifties. (04262014WTL04)

Spring is also a time to prepare for salmon fishing.

> Yeah, there was no sitting around, that's for sure, during spring, 'cause summer is short and, um, we just didn't sit around during spring time. Getting ready. Getting our boats, you know, painted, you know. We had wooden boats during that time. Now we have, everybody's got aluminum boats. Get our, fix up our nets, you know. Fish racks, you know, that need to be repaired, we repaired them. (04262014WTL04)

The lower Kuskokwim River and its tributaries generally become ice free in early May, which allows for fishers to target a succession of fish species as the fish ascend the river to spawn. However, during the 2013 study year, breakup on the lower Kuskokwim did not occur until May 29.[6]

The first available resource is whitefish species moving between tributaries and the mainstem. Smelts migrate in the Kuskokwim River soon after breakup, and families will travel the short distance to harvest them with dip nets.

6. National Weather Service. n.d. Breakup Database. (Accessed December 4, 2015) http://aprfc.arh.noaa.gov/php/brkup/breakupDb.php

"Late '70's. We'd move to fish camp. Springtime we'd move up to fish camp. It was up near Napakiak. There's a Tuntutuliak fish camp, little ways below Napakiak. That's where we used to spend the summers, when I was a kid" (04292014WTL03; Plate 6-2).

Various salmon runs mark the apex of the summer subsistence calendar. Fishers harvest a succession of Chinook, sockeye, chum, and coho salmon. For many families, harvesting and processing these fish take up the majority of their time in early summer and leave very few opportunities for other activities. As the salmon fishing slackens in late summer, residents then turn their attention to berry picking.

> Then after we put the fish away, we get ready for the berry season. And then after berry season, it's moose season. Hunting time again. For meat. And my people are meat eaters, and fish eaters. And we get greens during the spring, you know, when they are just, you know, starting to pop up. And, yeah, we stay pretty busy from spring until, you know, late winter. (04262014WTL04)

Fall transitions directly into a focus on moose hunting. Moose hunting patterns are fairly complex, and hunting takes place both far and near to the community. Even though the likelihood of success is often low, all harvested moose is shared widely throughout the community. Fishers make a more concerted effort to harvest whitefish in late fall, generally after moose hunting season. They specifically target both broad and humpback whitefish species in the fall, when they are fatter. "But for most of us, in Tunt—in uh, Kinak River, the lakes are pretty close, so we set nets and check and—practically, every day or every other day" (04292014WTL02). They also harvest a small amount of northern pike during this time.

Winter and the snow it brings allow greater access to the land around Tuntutuliak. However, respondents stated that the winter of 2013–2014 was unseasonably warm. "Yeah it's been very limited this winter. Because of, uh, the absence of snow. People weren't able to go out hunting as much as they can" (04292014WTL02). The river froze late, and many of the sloughs stayed open during the season. Residents typically continue fishing during the winter months, setting Alaska blackfish traps in the lakes near town. For those individuals who have the resources (i.e., snowmachines, gas) to travel, there are both moose and caribou hunting opportunities in the Y-K Delta. A small number of residents target furbearers and other small mammals throughout the winter.

Population Estimates and Demographic Information

Tuntutuliak has a steadily growing population. The American Community Survey estimates the 2008–2012 average population to be 409 individuals (Table 6-1). The 2010 U.S. census counted 408 individuals. This study estimates that 413 individuals lived in Tuntutuliak for at least 6 months during the 2013 study period. Figure 6-1 shows the historical population beginning in 1950. This is the only study community in this report that has historical population counts beginning close to its establishment. Researchers identified 104 permanent households, of which 67 were interviewed for this project. Sixty-four percent of the permanent households participated in this project (Table 6-2). Of all the households in Tuntutuliak, 94% were Alaska Native households (Table 6-3). The mean household size was 4 individuals.

Tuntutuliak has a relatively young population. The median age is 19 years (Table 6-3). The population profile depicted in Figure 6-2 shows a bottom-heavy pyramid, characteristic of a growing population. The largest cohorts are the age groups 5–9 and 10–14 (Table 6-4). Heads of households have lived in the community an average of 43 years; most (75%) were born in Tuntutuliak or neighboring communities (tables 6-3 and 6-5). Eighty-five percent of all residents were born in Tuntutuliak (Table 6-6). This information reaffirms one respondent's assertion that many families moved away from the old community of Qinaq when the school there closed in 1923, only to later move back to Tuntutuliak after a new school was established there approximately 20 years later (04292014WTL02).

Table 6-1.–Population estiamtes, Tuntutuliak, 2010 and 2013.

	Census (2010)	5-year American Community Survey (2008–2012)	This study (2013)
Total population			
Households	96	114	104.0
Population	408	409	412.9
Alaska Native			
Population	396	405	403.5
Percentage	97.1%	99.0%	97.7%

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.

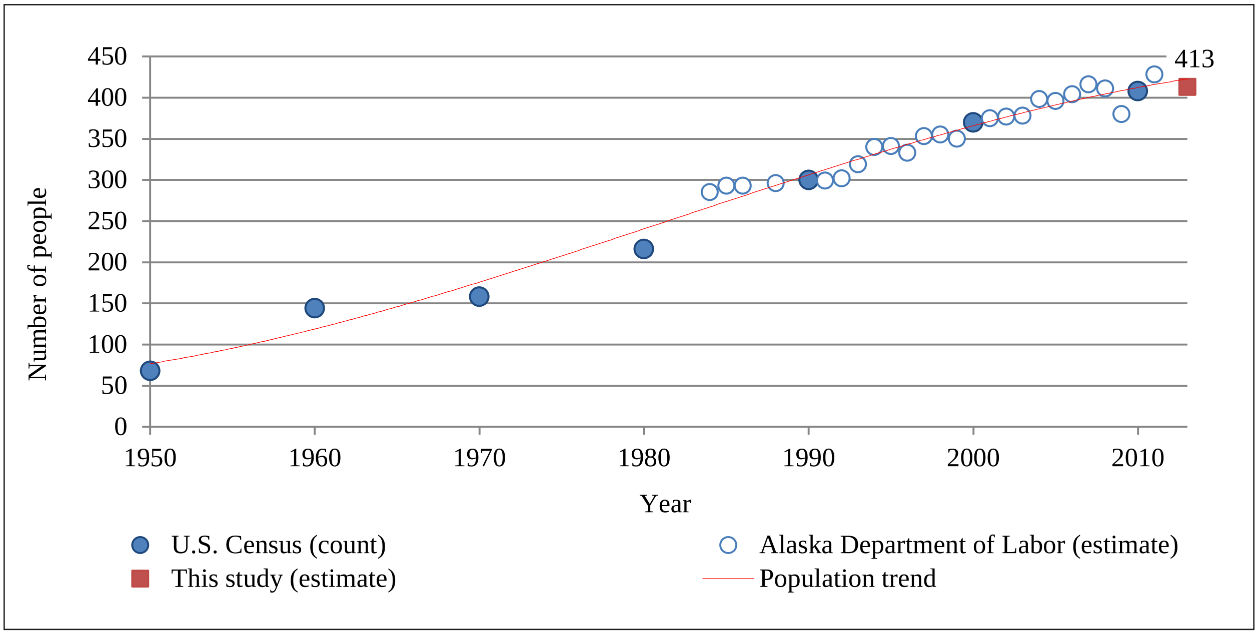


Figure 6-1.–Historical population estimates, Tuntutuliak, 2013.

Table 6-2.–Sample achievement, Tuntutuliak, 2013.

Sample information	Tuntutuliak
Number of dwelling units	90
Survey goal	100%
Households surveyed	67
Households failed to be contacted	13
Households declined to be surveyed	24
Households moved or occupied by nonresident	3
Total households attempted to be surveyed	91
Refusal rate	26.4%
Final estimate of permanent households	104
Percentage of total households surveyed	64.4%
Survey weighting factor	1.6
Sampled population	266
Estimated population	412.9

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

Table 6-3.–Demographic characteristics, Tuntutuliak, 2013.

	Community
Characteristics	Tuntutuliak
Household size	
Mean	4.0
Minimum	1
Maximum	10
Age	
Mean	27.9
Minimum[a]	0
Maximum	81
Median	19.0
Length of residency	
Total population	
Mean	25.1
Minimum[a]	0
Maximum	81
Heads of household	
Mean	43.1
Minimum[a]	2
Maximum	81
Alaska Native households[b]	
Number	97.8
Percentage	94.0%

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.

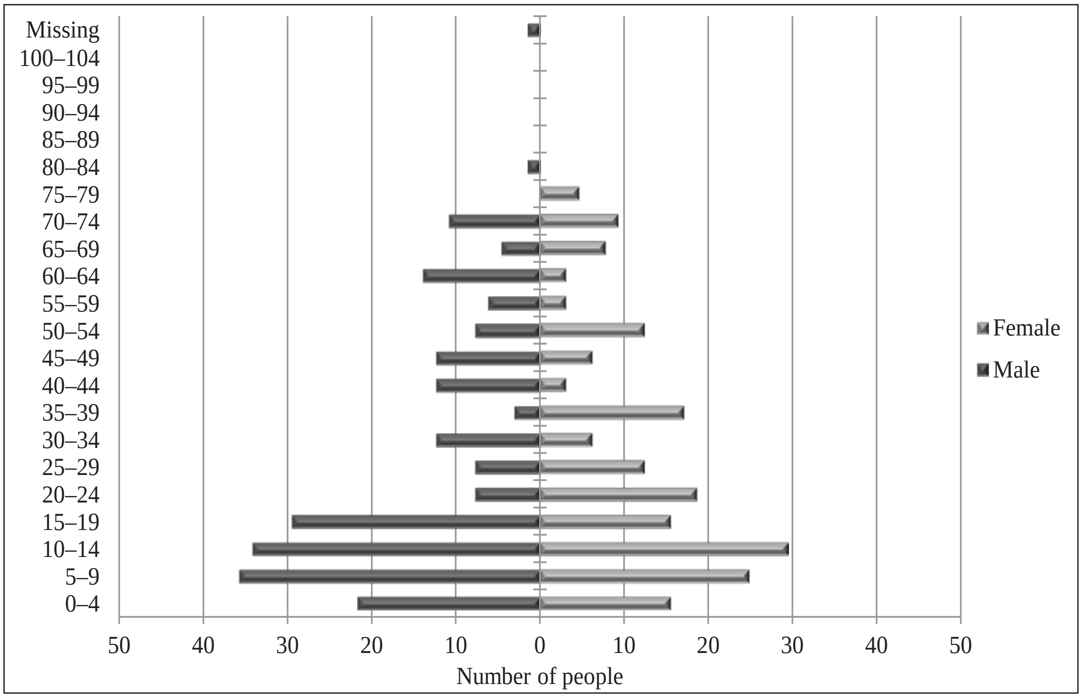


Figure 6-2.–Population profile, Tuntutuliak, 2013.

Table 6-4.–Population profile, Tuntutuliak, 2013.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	21.7	9.7%	9.7%	15.5	8.2%	8.2%	37.3	9.0%	9.0%
5–9	35.7	16.0%	25.7%	24.8	13.1%	21.3%	60.5	14.7%	23.7%
10–14	34.1	15.3%	41.0%	29.5	15.6%	36.9%	63.6	15.4%	39.1%
15–19	29.5	13.2%	54.2%	15.5	8.2%	45.1%	45.0	10.9%	50.0%
20–24	7.8	3.5%	57.6%	18.6	9.8%	54.9%	26.4	6.4%	56.4%
25–29	7.8	3.5%	61.1%	12.4	6.6%	61.5%	20.2	4.9%	61.3%
30–34	12.4	5.6%	66.7%	6.2	3.3%	64.8%	18.6	4.5%	65.8%
35–39	3.1	1.4%	68.1%	17.1	9.0%	73.8%	20.2	4.9%	70.7%
40–44	12.4	5.6%	73.6%	3.1	1.6%	75.4%	15.5	3.8%	74.4%
45–49	12.4	5.6%	79.2%	6.2	3.3%	78.7%	18.6	4.5%	78.9%
50–54	7.8	3.5%	82.6%	12.4	6.6%	85.2%	20.2	4.9%	83.8%
55–59	6.2	2.8%	85.4%	3.1	1.6%	86.9%	9.3	2.3%	86.1%
60–64	14.0	6.3%	91.7%	3.1	1.6%	88.5%	17.1	4.1%	90.2%
65–69	4.7	2.1%	93.8%	7.8	4.1%	92.6%	12.4	3.0%	93.2%
70–74	10.9	4.9%	98.6%	9.3	4.9%	97.5%	20.2	4.9%	98.1%
75–79	0.0	0.0%	98.6%	4.7	2.5%	100.0%	4.7	1.1%	99.2%
80–84	1.6	0.7%	99.3%	0.0	0.0%	100.0%	1.6	0.4%	99.6%
85–89	0.0	0.0%	99.3%	0.0	0.0%	100.0%	0.0	0.0%	99.6%
90–94	0.0	0.0%	99.3%	0.0	0.0%	100.0%	0.0	0.0%	99.6%
95–99	0.0	0.0%	99.3%	0.0	0.0%	100.0%	0.0	0.0%	99.6%
100–104	0.0	0.0%	99.3%	0.0	0.0%	100.0%	0.0	0.0%	99.6%
Missing	1.6	0.7%	100.0%	0.0	0.0%	100.0%	1.6	0.4%	100.0%
Total	**223.5**	**100.0%**	**100.0%**	**189.4**	**100.0%**	**100.0%**	**412.9**	**100.0%**	**100.0%**

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

Table 6-5.–Birthplaces of household heads, Tuntutuliak, 2013.

Birthplace	Percentage
Bethel	4.7%
Kongiganak	0.9%
Kwethluk	0.9%
Kwigillingok	0.9%
Napakiak	3.7%
Nunapitchuk	2.8%
Platinum	0.9%
Quinhagak	0.9%
Scammon Bay	0.9%
Togiak	0.9%
Tuluksak	0.9%
Tuntutuliak	74.8%
Missing	0.9%
Other U.S.	5.6%

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 6-6.–Birthplaces of population, Tuntutuliak, 2013.

Birthplace	Percentage
Bethel	4.1%
Kongiganak	0.8%
Kwethluk	0.4%
Kwigillingok	0.4%
Napakiak	1.5%
Nunapitchuk	1.9%
Platinum	0.4%
Quinhagak	0.4%
Scammon Bay	0.4%
Togiak	1.5%
Tuluksak	0.4%
Tuntutuliak	85.0%
Missing	0.8%
Other U.S.	2.3%

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.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Figure 6-3 and Appendix Table D-4 report the expanded levels of individual participation in the harvest and processing of wild resources by all Tuntutuliak residents in 2013[7]. Most residents participated in gathering plants (69% of community residents), followed by bird hunting (44%), and fishing (38%). Similarly, the most common processing activities were processing plants (54%), preparing birds and eggs (37%), and cutting fish (32%). In all, about 61% of residents harvested a resource, and 49% of the residents processed a resource.

Individual participation in subsistence hunting and fishing was a common theme in the key respondent interviews. Older respondents noted, for better or worse, that in their youth, participating in subsistence activities was a matter of necessity. The lack of commercial goods and dearth of employment opportunities required residents to be more invested in the subsistence economy. Cultural beliefs also influence participation in hunting and fishing activities.

> For example, I remember the elders saying that once you quit hunting certain types of animals that they would not be showing in large number. My belief in traditional [practices] is very strong. People don’t go out spring-camping anymore. And right now there’s not very many muskrats—hardly see them anymore. (04292014WTL02)

As the respondent states, participating in harvesting wild resources is, in the traditional world view, necessary to maintain a resource population.

Harvest and Use of Wild Resources at the Household Level

Figure 6-4 shows by resource category the percentages of Tuntutuliak households that used wild resources, attempted to harvest, and harvested wild foods in 2013. This figure gives a glimpse of the varied diet that coastal residents enjoy. Almost all households used salmon (99%), nonsalmon fish (97%), vegetation (96%), and birds and eggs (93%). Fewer households used large land mammals (88%), marine mammals (85%), and small land mammals (39%). Figure 6-4 suggests that hunters and fishers were largely successful. Most

7. Percentages are calculated based on valid responses, which excludes from the sample missing data for that category.

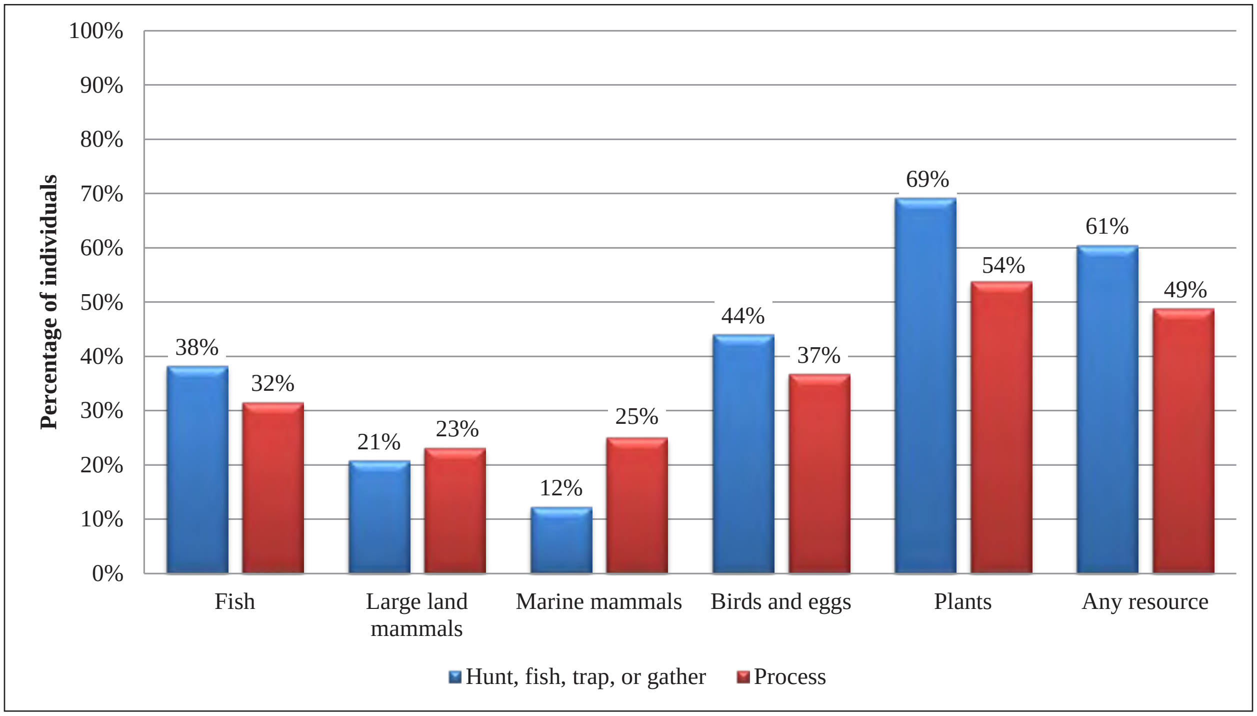


Figure 6-3.–Individual participation in subsistence harvesting and processing activities, Tuntutuliak, 2013.

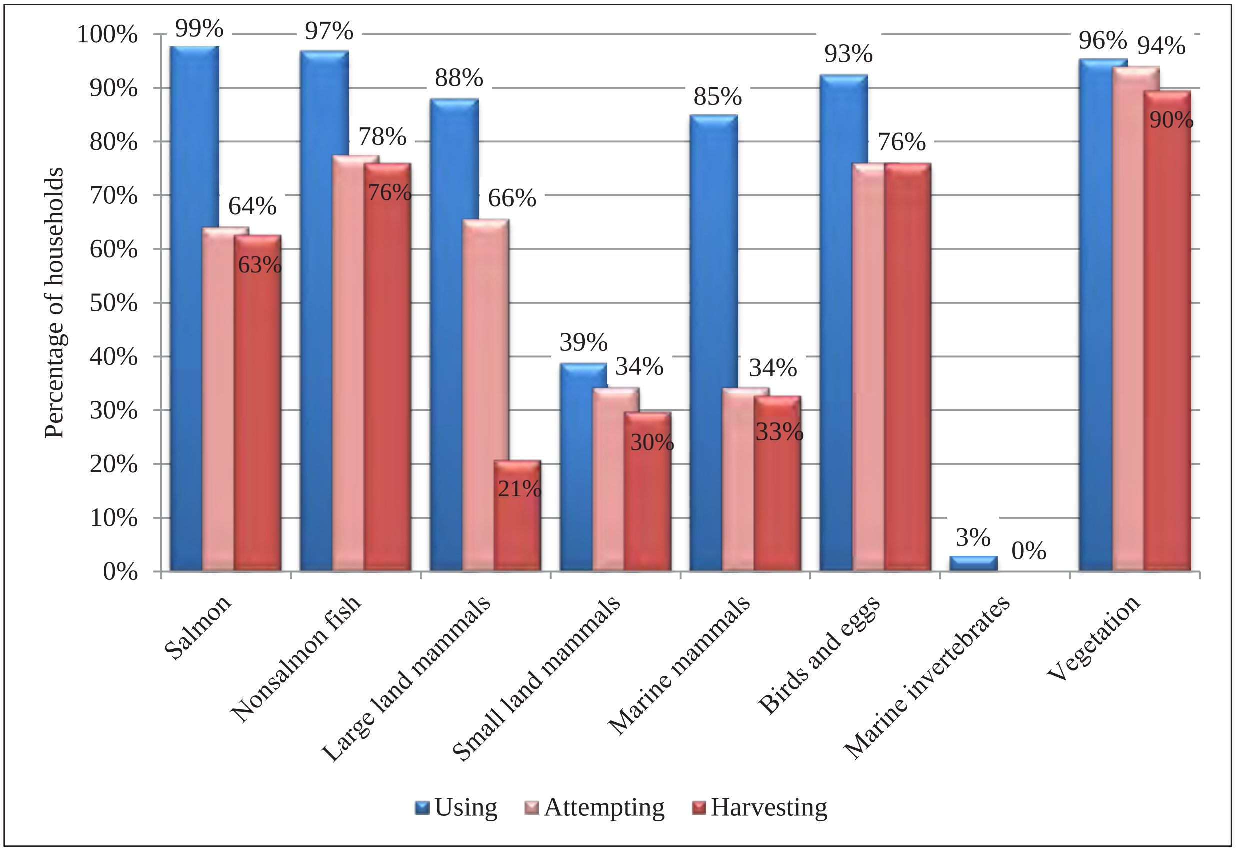


Figure 6-4.–Percentages of households using, attempting to harvest, or harvesting wild resources, Tuntutuliak, 2013.

Table 6-7.–Resource harvest and use characteristics, Tuntutuliak, 2013.

Characteristic	
Mean number of resources used per household	**22.9**
Minimum	3
Maximum	54
95% confidence limit (±)	6.9%
Median	22.0
Mean number of resources attempted to harvest per household	**16.4**
Minimum	0
Maximum	44
95% confidence limit (±)	9.5%
Median	17.0
Mean number of resources harvested per household	**15.1**
Minimum	0
Maximum	43
95% confidence limit (±)	10.0%
Median	14.0
Mean number of resources received per household	**10.1**
Minimum	0
Maximum	41
95% confidence limit (±)	11.1%
Median	9.0
Mean number of resources given away per household	**7.0**
Minimum	0
Maximum	42
95% confidence limit (±)	16.5%
Median	4.0
Household harvest (pounds)	
Minimum	0
Maximum	5,760
Mean	1,433.1
Median	1,054.3
Number of resources asked about and identified voluntarily by respondents	131

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

households that attempted to harvest a targeted resource succeeded in doing so. The main exception to this was hunters who targeted large land mammals. Sixty-six percent of households attempted to harvest a large land mammal, while only 21% were successful.

Table 6-7 summarizes resource harvest and use characteristics for Tuntutuliak in 2013 at the household level. The mean harvest was 1,433 lb usable weight per household, 361 per capita. During the study year, community households harvested an average of 15 kinds of resources and used an average of 23 kinds of resources. The maximum number of subsistence resources used by any household was 54. On average, households gave away approximately 7 kinds of subsistence resources. Overall, households used at least 67 resources; these included resources that survey respondents identified but were not asked about in the survey instrument.

Harvest Quantities and Composition

Table 6-8 reports estimated wild resource harvests and uses by Tuntutuliak 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 C for conversion factors[8]). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources taken, given away, or used by a household, and resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Purchased foods are not included, but resources such as firewood are included because they are an important part of the subsistence way of life. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

The total estimated community harvest for all resources was 149,047 lb. This figure corresponds to about 361 lb harvested per resident. Of the total harvest, fish represented the greatest contribution. Salmon harvests by the community totaled 56,945 lb (38% of total harvest), and nonsalmon fish species contributed 40,395 lb (27%; Figure 6-5; Table 6-8). Marine mammals contributed 21,145 lb (14%). The remaining resource categories—vegetation, large land mammals, birds and eggs, and small land mammals—each contributed less than 10% (Figure 6-5).

Use and Harvest Characteristics by Resource Category

Table 6-9 lists the top 10 ranked resources used by households and Figure 6-6 shows the species with the highest per capita harvests during the 2013 study year. The top species used includes a variety of resources, pointing toward preference for a diverse diet. The top 3 resources used, as reported by households, were cloudberries, moose, and Chinook salmon (Table 6-9). Conversely, the most harvested species, by edible weight per capita, are a reflection of what is available en masse to be harvested: namely, fish. The top 3 harvested species were Chinook salmon, chum salmon, and northern pike. The differences between the percentage of households using specific resources and the amount of resource the community harvests are due to modes of resource distribution.

Salmon

Salmon as a category provided the largest amount of food (56,945 lb of edible weight) for Tuntutuliak residents in 2013, and for some it marks the peak of the annual round (Table 6-8). Salmon is a near ubiquitous resource in Western Alaska, and 99% of the households in Tunututuliak reported some use of at least 1 salmon species in 2013. The mean household harvest was 548 lb or about 138 lb per person. The large harvest of salmon is due in part to its seasonal reliability: of the 64% households that attempted to harvest salmon, 63% were successful.

The largest salmon harvest in terms of edible weight was Chinook salmon (27,596 lb total, 67 lb per capita), representing 49% of the total salmon harvest by weight (Figure 6-7; Table 6-8). Chinook salmon was also the most distributed salmon species: 45% of households reported giving it away, and 42% reported receiving it (Table 6-8). Chum salmon accounted for the largest harvest in terms of individual fish (3,012 fish; Plate 6-3).

Table 6-10 shows the estimated fish harvest for feeding dogs. No salmon were reportedly used exclusively for dog food.

Drift gillnets (driftnets) were used to harvest 8,354 salmon (55,470 lb; Table 6-11). This was the only noncommercial gear type used to harvest salmon. Additionally, 204 salmon (1,475 lb) were removed from commercial harvests for home use. Figure 6-8 is a visual representation of the number of salmon harvested by gear type. As estimated in usable pounds, 97% of the salmon harvest was caught using drift gillnets (Table 6-12).

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

Table 6-8.–Estimated harvest and use of fish, wildlife, and vegetation resources, Tuntutuliak, 2013.

	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence limit (±) harvest
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
All resources	**100.0**	**97.0**	**97.0**	**98.5**	**80.6**	**149,047.4**	**1,433.1**	**361.0**				**14.1**
Salmon	**98.5**	**64.2**	**62.7**	**56.7**	**50.7**	**56,944.7**	**547.5**	**137.9**				**18.2**
Chum salmon	70.1	56.7	53.7	31.3	35.8	14,787.8	142.2	35.8	3,011.8	ind	29.0	21.8
Coho salmon	59.7	41.8	37.3	26.9	28.4	5,830.7	56.1	14.1	1,270.3	ind	12.2	58.9
Chinook salmon	82.1	58.2	56.7	41.8	44.8	27,595.9	265.3	66.8	2,511.0	ind	24.1	19.6
Pink salmon	10.4	9.0	9.0	3.0	3.0	113.4	1.1	0.3	42.0	ind	0.4	63.5
Sockeye salmon	74.6	53.7	52.2	35.8	37.3	8,616.9	82.9	20.9	1,723.4	ind	16.6	19.2
Unknown salmon	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Nonsalmon fish	**97.0**	**77.6**	**76.1**	**76.1**	**49.3**	**40,394.7**	**388.4**	**97.8**				**17.8**
Pacific herring	20.9	3.0	3.0	17.9	3.0	745.1	7.2	1.8	124.2	gal	1.2	93.7
Pacific herring roe	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Smelt	31.3	10.4	7.5	25.4	9.0	1,005.9	9.7	2.4	167.6	gal	1.6	68.3
Pacific tomcod	10.4	0.0	0.0	10.4	1.5	0.0	0.0	0.0	0.0	ind	0.0	0.0
Saffron cod	13.4	0.0	0.0	13.4	3.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pacific halibut	11.9	3.0	3.0	9.0	0.0	658.1	6.3	1.6	658.1	lb	6.3	93.7
Arctic lamprey	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Stickleback (needlefish)	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	59.7	29.9	29.9	40.3	17.9	3,567.8	34.3	8.6	3,567.8	lb	34.3	43.9
Burbot	76.1	64.2	61.2	28.4	28.4	4,120.3	39.6	10.0	1,716.8	ind	16.5	31.2
Brook trout	1.5	1.5	1.5	0.0	0.0	8.7	0.1	0.0	6.2	ind	0.1	119.1
Dolly Varden	3.0	3.0	3.0	1.5	0.0	14.0	0.1	0.0	15.5	ind	0.1	83.6
Lake trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown char	1.5	1.5	1.5	0.0	1.5	465.7	4.5	1.1	310.4	ind	3.0	119.1
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	64.2	53.7	50.7	26.9	25.4	12,084.2	116.2	29.3	2,685.4	ind	25.8	25.8
Sheefish	28.4	23.9	22.4	14.9	10.4	2,132.8	20.5	5.2	355.5	ind	3.4	57.5
Longnose sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Rainbow trout	3.0	1.5	1.5	1.5	0.0	2.2	0.0	0.0	1.6	ind	0.0	119.1
Unknown trout	3.0	3.0	3.0	0.0	1.5	116.4	1.1	0.3	38.8	ind	0.4	97.9

-continued-

Table 6-8.–Page 2 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence limit (±) harvest
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Nonsalmon fish, continued												
Broad whitefish	71.6	47.8	46.3	40.3	28.4	7,736.4	74.4	18.7	1,934.1	ind	18.6	24.7
Bering cisco	11.9	9.0	9.0	9.0	7.5	236.9	2.3	0.6	169.2	ind	1.6	51.1
Least cisco	1.5	1.5	1.5	0.0	1.5	12.4	0.1	0.0	12.4	ind	0.1	119.1
Humpback whitefish	64.2	47.8	46.3	35.8	26.9	7,488.0	72.0	18.1	2,496.0	ind	24.0	22.4
Round whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown whitefishes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Large land mammals	**88.1**	**65.7**	**20.9**	**82.1**	**23.9**	**10,834.6**	**104.2**	**26.2**				**31.9**
Black bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brown bear	4.5	1.5	0.0	3.0	3.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Caribou	19.4	9.0	7.5	13.4	6.0	1,614.3	15.5	3.9	12.4	ind	0.1	54.2
Moose	86.6	64.2	14.9	77.6	19.7	9,220.3	88.7	22.3	17.1	ind	0.2	36.5
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dall sheep	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	**38.8**	**34.3**	**29.9**	**11.9**	**16.4**	**543.3**	**5.2**	**1.3**				**49.0**
Beaver	9.0	4.5	4.5	4.5	1.5	186.3	1.8	0.5	15.5	ind	0.1	105.0
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red fox	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	16.4	14.9	13.4	3.0	7.5	161.4	1.6	0.4	80.7	ind	0.8	43.5
Large Alaska hare	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
River (land) otter	19.4	16.4	13.4	6.0	6.0	125.7	1.2	0.3	46.6	ind	0.4	44.9
Lynx	1.5	1.5	1.5	0.0	1.5	6.2	0.1	0.0	1.6	ind	0.0	119.1
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	6.0	4.5	3.0	3.0	1.5	15.5	0.1	0.0	7.8	ind	0.1	97.9
Muskrat	10.4	7.5	7.5	3.0	6.0	32.6	0.3	0.1	46.6	ind	0.4	64.7
Porcupine	3.0	3.0	3.0	0.0	0.0	15.5	0.1	0.0	4.7	ind	0.0	119.1
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gray wolf	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

-continued-

Table 6-8.–Page 3 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Marine mammals	**85.1**	**34.3**	**32.8**	**73.1**	**31.3**	**21,144.6**	**203.3**	**51.2**				**31.6**
Bearded seal	46.3	28.4	20.9	31.3	22.4	7,388.7	71.0	17.9	52.8	ind	0.5	37.5
Harbor seal	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ringed seal	53.7	28.4	23.9	34.3	22.4	4,172.4	40.1	10.1	74.5	ind	0.7	29.7
Spotted seal	58.2	25.4	23.9	37.3	22.4	5,997.9	57.7	14.5	107.1	ind	1.0	54.2
Unknown seal oil	27.3	1.5	0.0	20.9	3.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Walrus	38.8	10.4	4.5	32.8	9.0	3,585.7	34.5	8.7	4.7	ind	0.0	67.7
Beluga whale	4.5	0.0	0.0	4.5	1.5	0.0	0.0	0.0	0.0	ind	0.0	0.0
Bowhead whale	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown marine mammals	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Birds and eggs	**92.5**	**76.1**	**76.1**	**47.8**	**35.8**	**7,603.9**	**73.1**	**18.4**				**19.6**
Common eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
King eider	7.5	4.5	4.5	4.5	3.0	45.1	0.4	0.1	31.5	ind	0.3	82.9
Spectacled eider	4.5	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Steller's eider	3.0	3.0	3.0	0.0	0.0	7.9	0.1	0.0	7.9	ind	0.1	118.2
Harlequin duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	16.4	13.4	13.4	3.0	0.0	64.5	0.6	0.2	33.1	ind	0.3	42.6
Long-tailed duck	3.0	3.0	3.0	0.0	0.0	7.1	0.1	0.0	4.7	ind	0.0	118.2
Northern pintail	9.0	7.5	7.5	1.5	3.0	40.2	0.4	0.1	26.8	ind	0.3	65.2
Scaup	14.9	11.9	11.9	6.0	1.5	104.8	1.0	0.3	116.4	ind	1.1	50.8
Black scoter	22.4	19.4	19.4	7.5	4.5	227.7	2.2	0.6	253.0	ind	2.4	39.7
Surf scoter	6.0	6.0	6.0	0.0	3.0	18.7	0.2	0.0	20.8	ind	0.2	93.8
White-winged scoter	16.4	10.4	10.4	7.5	1.5	194.9	1.9	0.5	85.1	ind	0.8	57.2
Northern shoveler	3.0	3.0	3.0	0.0	0.0	25.8	0.2	0.1	23.6	ind	0.2	118.2
Teal	6.0	6.0	6.0	0.0	0.0	11.5	0.1	0.0	22.1	ind	0.2	69.7
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	3.0	1.5	1.5	1.5	0.0	18.7	0.2	0.0	23.3	ind	0.2	119.1
Brant	7.5	4.5	4.5	4.5	1.5	198.5	1.9	0.5	33.1	ind	0.3	112.6
Cackling goose	1.5	1.5	1.5	0.0	0.0	7.5	0.1	0.0	6.2	ind	0.1	119.1
Canada goose	74.6	53.7	53.7	31.3	16.7	624.0	6.0	1.5	520.0	ind	5.0	21.7

-continued-

Table 6-8.–Page 4 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Birds and eggs, continued												
Emperor goose	9.0	6.0	6.0	4.5	1.5	47.3	0.5	0.1	18.9	ind	0.2	99.2
Snow goose	1.5	1.5	1.5	0.0	0.0	6.2	0.1	0.0	1.6	ind	0.0	119.1
White-fronted goose	61.2	47.8	47.8	20.9	16.7	2,545.5	24.5	6.2	600.4	ind	5.8	23.5
Unknown geese	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tundra (whistling) swan	34.3	22.4	22.4	13.4	6.0	653.6	6.3	1.6	58.3	ind	0.6	32.2
Sandhill crane	47.8	32.8	31.3	17.9	9.0	1,191.3	11.5	2.9	141.8	ind	1.4	33.2
Shorebirds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Seabirds, loons, grebes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Loon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ptarmigan	73.1	52.2	50.7	28.4	20.9	1,080.8	10.4	2.6	1,544.0	ind	14.8	22.9
Snowy owl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Duck eggs	26.9	25.4	22.4	3.0	6.0	67.3	0.6	0.2	448.6	ind	4.3	40.3
Goose eggs	37.3	32.8	28.4	9.0	7.5	178.4	1.7	0.4	594.5	ind	5.7	29.8
Swan eggs	17.9	16.4	14.9	3.0	4.5	89.0	0.9	0.2	141.3	ind	1.4	40.9
Crane eggs	6.0	4.5	4.5	1.5	1.5	11.7	0.1	0.0	18.6	ind	0.2	73.4
Unknown shorebird eggs	6.0	6.0	6.0	0.0	1.5	3.7	0.0	0.0	93.1	ind	0.9	70.2
Gull eggs	20.9	20.9	16.4	3.0	4.5	106.2	1.0	0.3	353.9	ind	3.4	49.1
Loon eggs	3.0	3.0	1.5	0.0	0.0	0.6	0.0	0.0	3.1	ind	0.0	119.1
Tern eggs	4.5	4.5	3.0	0.0	0.0	1.9	0.0	0.0	37.3	ind	0.4	93.7
Ptarmigan eggs	4.5	4.5	4.5	0.0	1.5	20.8	0.2	0.1	208.0	ind	2.0	91.1
Unknown eggs	7.5	4.5	1.5	3.0	0.0	3.1	0.0	0.0	14.0	ind	0.1	119.1
Marine invertebrates	**3.0**	**0.0**	**0.0**	**3.0**	**0.0**	**0.0**	**0.0**	**0.0**				**0.0**
Clams	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
King crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tanner crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
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
Mussels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Shrimp	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0

-continued-

Table 6-8.–Page 5 of 5.

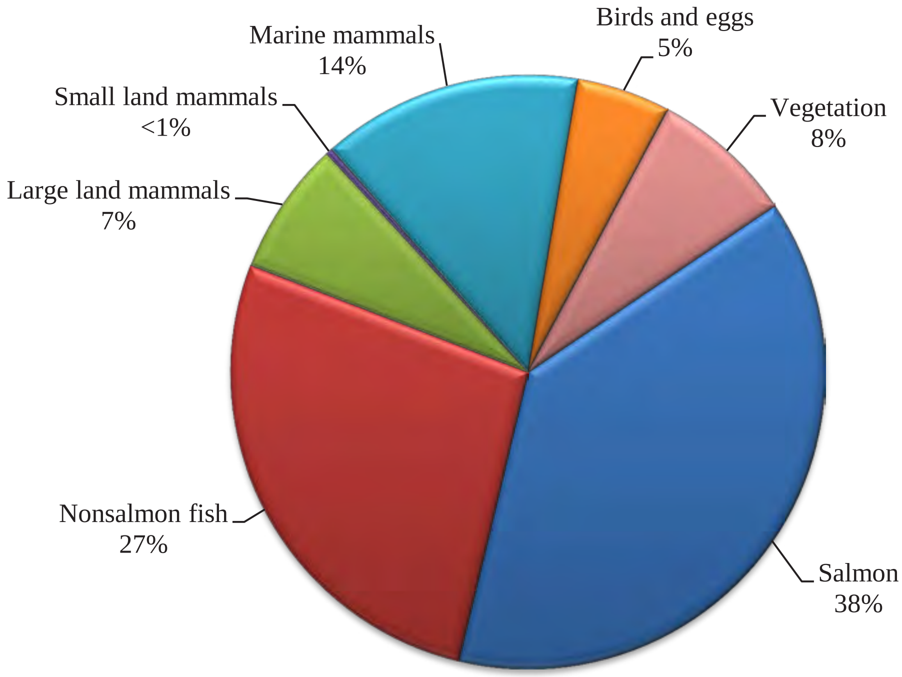
	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence limit (±) harvest
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Vegetation	**95.5**	**94.0**	**89.6**	**58.2**	**35.8**	**11,581.6**	**111.4**	**28.0**				**13.3**
Blueberry	52.2	47.8	47.8	11.9	13.4	575.2	5.5	1.4	143.8	gal	1.4	21.4
Lowbush cranberry	49.3	44.8	44.8	11.9	17.9	681.5	6.6	1.7	170.4	gal	1.6	25.0
Highbush cranberry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Crowberry	70.1	61.2	61.2	22.4	22.4	3,072.7	29.5	7.4	768.2	gal	7.4	21.2
Cloudberry	89.6	85.1	85.1	19.4	29.9	6,640.5	63.9	16.1	1,660.1	gal	16.0	13.5
Nagoonberry	17.9	17.9	17.9	0.0	4.5	67.1	0.6	0.2	16.8	gal	0.2	50.1
Raspberry	1.5	1.5	1.5	0.0	1.5	62.1	0.6	0.2	15.5	gal	0.1	119.1
Other wild berry	1.5	1.5	1.5	0.0	0.0	12.4	0.1	0.0	3.1	gal	0.0	119.1
Wild rhubarb	1.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Eskimo potato	3.0	1.5	0.0	1.5	1.5	0.0	0.0	0.0	0.0	gal	0.0	0.0
Fiddlehead ferns	9.0	6.0	6.0	3.0	3.0	15.5	0.1	0.0	15.5	gal	0.1	71.0
Hudson's Bay (Labrador) tea	47.8	44.8	44.8	6.0	9.0	194.0	1.9	0.5	194.0	gal	1.9	49.7
Sourdock	32.8	31.3	31.3	4.5	7.5	110.2	1.1	0.3	110.2	gal	1.1	33.4
Pallas buttercup	37.3	28.4	28.4	10.6	7.6	108.0	1.0	0.3	108.0	gal	1.0	33.8
Wild celery	1.5	1.5	1.5	0.0	0.0	1.6	0.0	0.0	1.6	gal	0.0	119.1
Wild rose hips	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other wild greens	6.0	6.0	6.0	0.0	1.5	9.7	0.1	0.0	9.7	gal	0.1	61.4
Unknown mushrooms	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Stinkweed	17.9	16.4	16.4	1.5	4.5	16.9	0.2	0.0	16.9	gal	0.2	46.7
Punk	16.4	9.0	7.5	7.6	1.5	0.0	0.0	0.0	58.3	gal	0.6	72.6
Mousefoods	11.9	6.0	4.5	9.0	4.5	14.2	0.1	0.0	14.2	gal	0.1	83.5
Wood	68.7	53.7	53.7	22.4	3.0	0.0	0.0	0.0				0.0

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

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

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

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



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

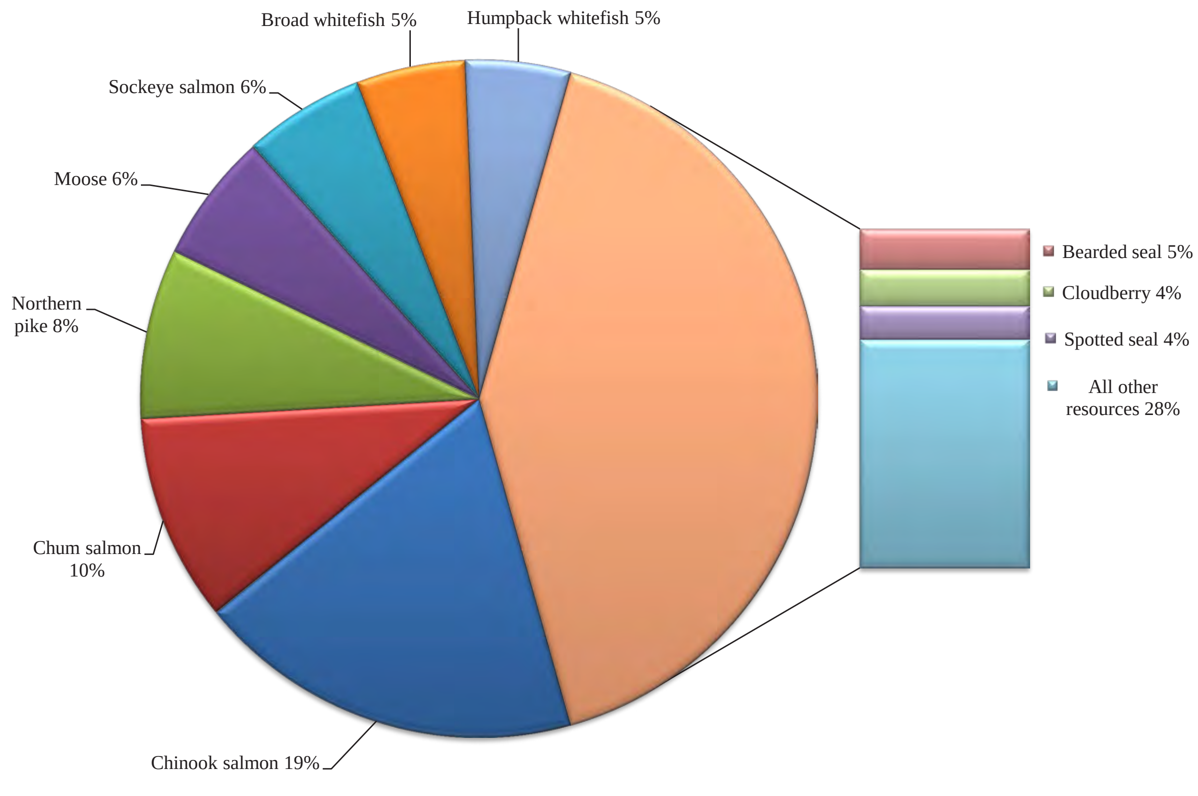
Figure 6-5.–Composition of edible harvest by resource category, Tuntutuliak, 2013.

Table 6-9.–Top 10 ranked resources used by households, Tuntutuliak, 2013.

Rank[a]	Resource	Percentage of households using
1.	Cloudberry	89.6%
2.	Moose	86.6%
3.	Chinook salmon	82.1%
4.	Burbot	76.1%
5.	Sockeye salmon	74.6%
5.	Canada goose	74.6%
7.	Ptarmigan	73.1%
8.	Broad whitefish	71.6%
9.	Chum salmon	70.1%
9.	Crowberry	70.1%

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.



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

Figure 6-6.–Top species harvested in pounds edible weight per capita, Tuntutuliak, 2013.

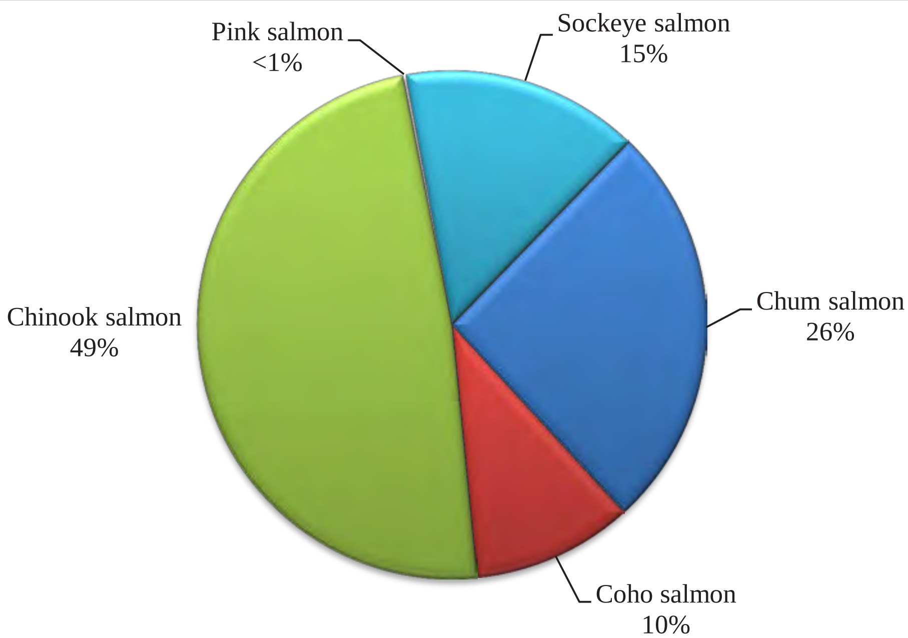


Figure 6-7.–Composition of edible salmon harvest, Tuntutuliak, 2013.

Plate 6-3.–Cutting salmon.

Table 6-10.–Estimated harvest of salmon and nonsalmon fish for consumption by dogs, Tuntutuliak, 2013.

Resource	Amount	Pounds
Other nonsalmon fish		
Alaska blackfish	179.3 lb	179.3 lb
Burbot	12.4 ind	29.8 lb
Northern pike	225.1 ind	1,012.8 lb
Sheefish	209.6 ind	1,257.3 lb
Whitefish		
Broad whitefish	40.4 ind	161.4 lb
Humpback whitefish	110.2 ind	330.6 lb
Total	**776.9 ind**	**2,971.3 lb**

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

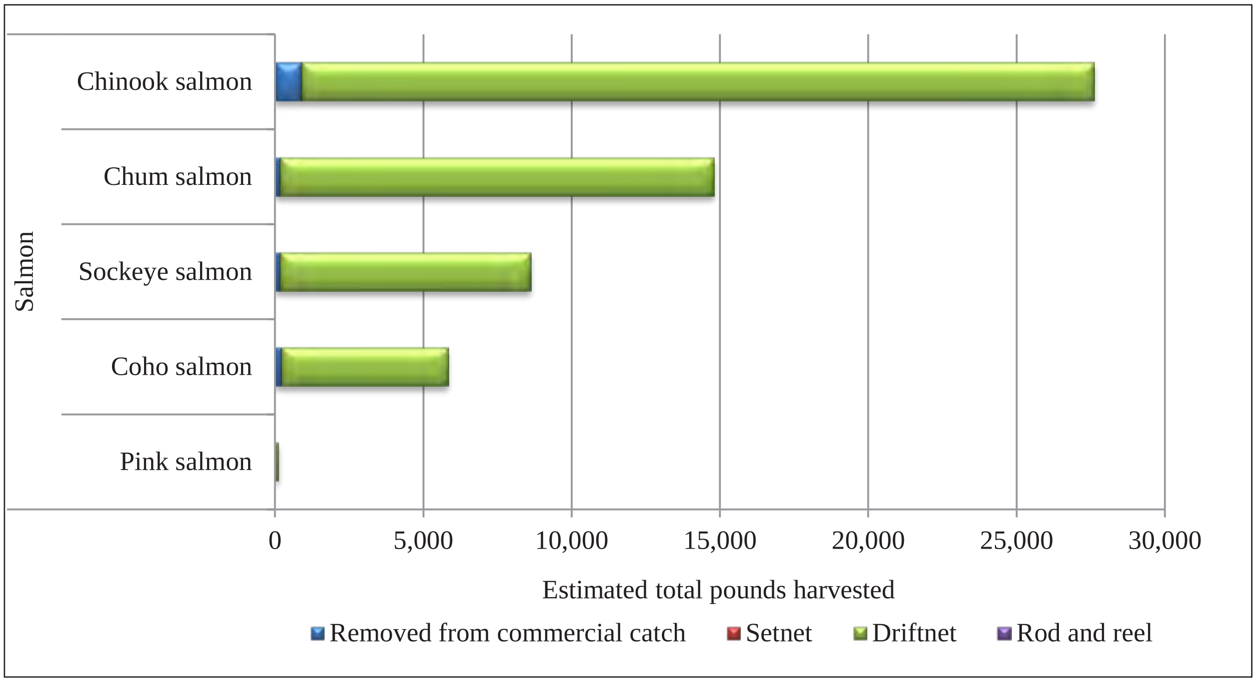


Figure 6-8.–Estimated salmon harvests by gear type, Tuntutuliak, 2013.

Table 6-11.–Estimated salmon harvests by gear type, Tuntutuliak, 2013.

			Subsistence methods							
	Removed from commercial catch		Setnet		Driftnet		Jigging		Dip net	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**204.3**	**1,474.8**	**0.0**	**0.0**	**8,354.1**	**55,469.9**	**0.0**	**0.0**	**0.0**	**0.0**
Chum salmon	36.1	177.4	0.0	0.0	2,975.6	14,610.4	0.0	0.0	0.0	0.0
Coho salmon	45.6	209.2	0.0	0.0	1,224.7	5,621.4	0.0	0.0	0.0	0.0
Chinook salmon	81.8	898.4	0.0	0.0	2,429.3	26,697.5	0.0	0.0	0.0	0.0
Pink salmon	6.3	17.0	0.0	0.0	35.7	96.4	0.0	0.0	0.0	0.0
Sockeye salmon	34.5	172.7	0.0	0.0	1,688.8	8,444.2	0.0	0.0	0.0	0.0
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

-continued-

Table 6-11.–Continued.

	Subsistence methods							
	Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**0.0**	**0.0**	**8,354.1**	**55,469.9**	**0.0**	**0.0**	**8,558.5**	**56,944.7**
Chum salmon	0.0	0.0	2,975.6	14,610.4	0.0	0.0	3,011.8	14,787.8
Coho salmon	0.0	0.0	1,224.7	5,621.4	0.0	0.0	1,270.3	5,830.7
Chinook salmon	0.0	0.0	2,429.3	26,697.5	0.0	0.0	2,511.0	27,595.9
Pink salmon	0.0	0.0	35.7	96.4	0.0	0.0	42.0	113.4
Sockeye salmon	0.0	0.0	1,688.8	8,444.2	0.0	0.0	1,723.4	8,616.9
Unknown salmon	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.
Note The harvested number of salmon is represented as individual fish harvested.

Table 6-12.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Tuntutuliak, 2013.

			Subsistence methods						
Resource	Percentage base	Removed from commercial catch	Setnet	Driftnet	Jigging	Other method	Subsistence gear, any method	Rod and reel	Any method
Salmon	**Gear type**	**100.0%**	**0.0%**	**100.0%**	**0.0%**	**0.0%**	**100.0%**	**0.0%**	**100.0%**
	Resource	**2.6%**	**0.0%**	**97.4%**	**0.0%**	**0.0%**	**97.4%**	**0.0%**	**100.0%**
	Total	**2.6%**	**0.0%**	**97.4%**	**0.0%**	**0.0%**	**97.4%**	**0.0%**	**100.0%**
Chum salmon	Gear type	12.0%	0.0%	26.3%	0.0%	0.0%	26.3%	0.0%	26.0%
	Resource	1.2%	0.0%	98.8%	0.0%	0.0%	98.8%	0.0%	100.0%
	Total	0.3%	0.0%	25.7%	0.0%	0.0%	25.7%	0.0%	26.0%
Coho salmon	Gear type	14.2%	0.0%	10.1%	0.0%	0.0%	10.1%	0.0%	10.2%
	Resource	3.6%	0.0%	96.4%	0.0%	0.0%	96.4%	0.0%	100.0%
	Total	0.4%	0.0%	9.9%	0.0%	0.0%	9.9%	0.0%	10.2%
Chinook salmon	Gear type	60.9%	0.0%	48.1%	0.0%	0.0%	48.1%	0.0%	48.5%
	Resource	3.3%	0.0%	96.7%	0.0%	0.0%	96.7%	0.0%	100.0%
	Total	1.6%	0.0%	46.9%	0.0%	0.0%	46.9%	0.0%	48.5%
Pink salmon	Gear type	1.2%	0.0%	0.2%	0.0%	0.0%	0.2%	0.0%	0.2%
	Resource	15.0%	0.0%	85.0%	0.0%	0.0%	85.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.2%	0.0%	0.0%	0.2%	0.0%	0.2%
Sockeye salmon	Gear type	11.7%	0.0%	15.2%	0.0%	0.0%	15.2%	0.0%	15.1%
	Resource	2.0%	0.0%	98.0%	0.0%	0.0%	98.0%	0.0%	100.0%
	Total	0.3%	0.0%	14.8%	0.0%	0.0%	14.8%	0.0%	15.1%

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

Salmon harvest patterns are driven by seasonal timing, food preferences, and, most recently, restrictive management influenced by conservation issues. Tuntutuliak fishers prefer to harvest salmon earlier in the summer to take advantage of favorable drying weather.

> Like, first part of June, end of May, we try to get as much as we can, while the weather is good. And then end of June when, you know, when the rain rains and the flies, you know—the blackflies. When they start laying [eggs], then that's when we stop. That's when we stop fishing. I mean, don't do as much fishing anymore. (04292014WTL03)

As described by respondents, harvest patterns are influenced by limited openings for harvest and net size restrictions. The result of such restrictions is delayed harvests: fishers are forced to fish later in the season, during less optimum drying weather. In the worst cases, fishers are not able to meet their needs and are forced to cope in ways outlined in the Harvests Assessments section, below.

Early season fishing includes the Chinook salmon run. Chinook is the most favored salmon due to its body mass and oil content. Sockeye and chum salmon run slightly later in the summer; they are harvested for freezing, but mostly drying. Coho salmon arrive last, when the weather is not conducive to drying. This run is not of major concern, because coho salmon are not particularly favored for their taste. For a more in-depth description of Tuntutualiak fishing patterns, including use and preservation, refer to "Socioeconomic Patterns in Subsistence Salmon Fisheries: Historical and Contemporary Trends in Five Kuskokwim River Communities and Overview of the 2012 Season" (Ikuta et al. 2013).

Nonsalmon Fish

Tuntutuliak fishers harvested 40,395 edible pounds of nonsalmon fish species, about 98 lb per person (Table 6-8). Fishing is a popular activity, and 97% of Tuntutuliak households attempted to harvest nonsalmon fish species. The resource category provided food to 78% of the households. Northern pike composed the largest portion of that harvest (12,084 lb), about 30% of the nonsalmon harvest (Table 6-8; Figure 6-9). Northern pike are harvested through the ice in the late winter in a number of river systems near the community; there is also some incidental catch in salmon gillnets. Many respondents favor pike dried.

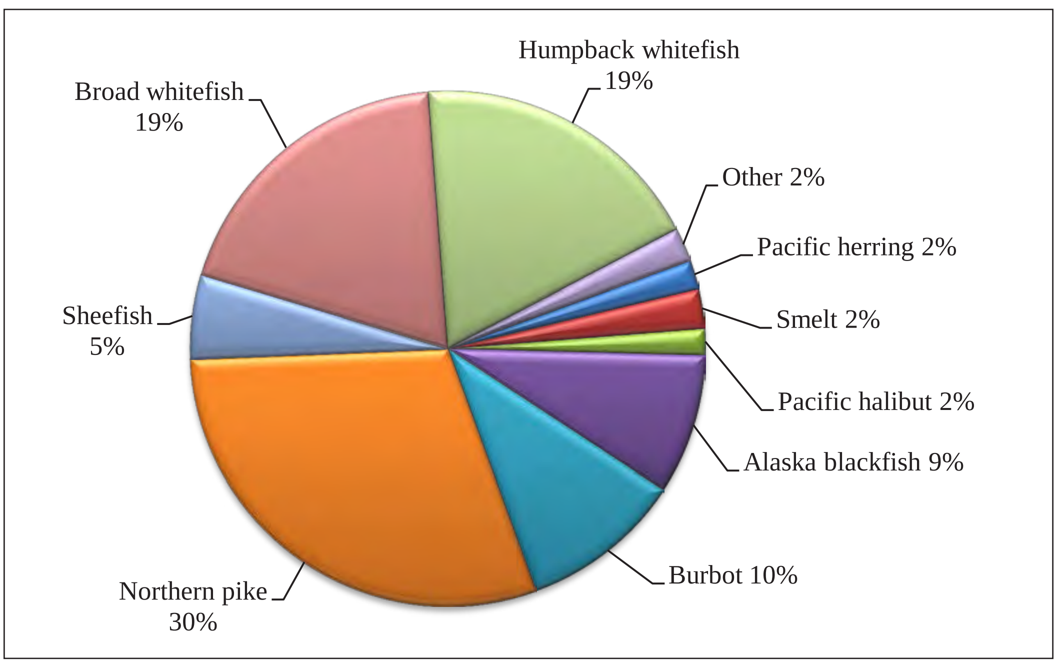


Figure 6-9.–Composition of edible nonsalmon fish harvest, Tuntutuliak, 2013.

Fishers harvested near equal portions of broad whitefish and humpback whitefish (7,736 lb; 7,488 lb), each of which contributed 19% to the nonsalmon fish harvest. Whitefish species are caught with set gillnets (Figure 6-10). Some fishers target whitefish in the spring, as the fish migrate between rivers and ponds after breakup. Spring whitefish are the first fishing opportunity in the seasonal cycle and are usually dried because they have less oil than later in the season. Most of the whitefish harvest effort is conducted in the fall months when the fish are fat. Residents often keep these frozen in their freezer. They are also harvested later in set gillnets through the ice.

Burbot was the most widely used and harvested nonsalmon fish resource (by 76% of households; Table 6-8). It was harvested by 61% of the households. Alaska blackfish was a significantly distributed resource: it was harvested by 30% of the households and used by 60%. Many residents still harvest Alaska blackfish by setting funnel-type traps in pond outlets during the winter.

Residents employed set gillnets (setnets) in open water to harvest 21,813 lb of nonsalmon fish; 11,552 lb of nonsalmon fish were harvested by jigging through the ice (Table 6-13). Figure 6-10 is a visual representation of the number of nonsalmon fish harvested by gear type. As estimated in usable pounds, 49% of the nonsalmon fish harvest was harvested using set gillnet gear (Table 6-14). Set gillnets were effective for catching whitefish species and a large number of northern pike.

Table 6-10 shows the estimated nonsalmon fish harvest for feeding dogs. Tuntutuliak residents used 2,971 lb of nonsalmon fish exclusively for dog food in 2013. They most commonly used sheefish (1,257 lb) and northern pike (1,013 lb).

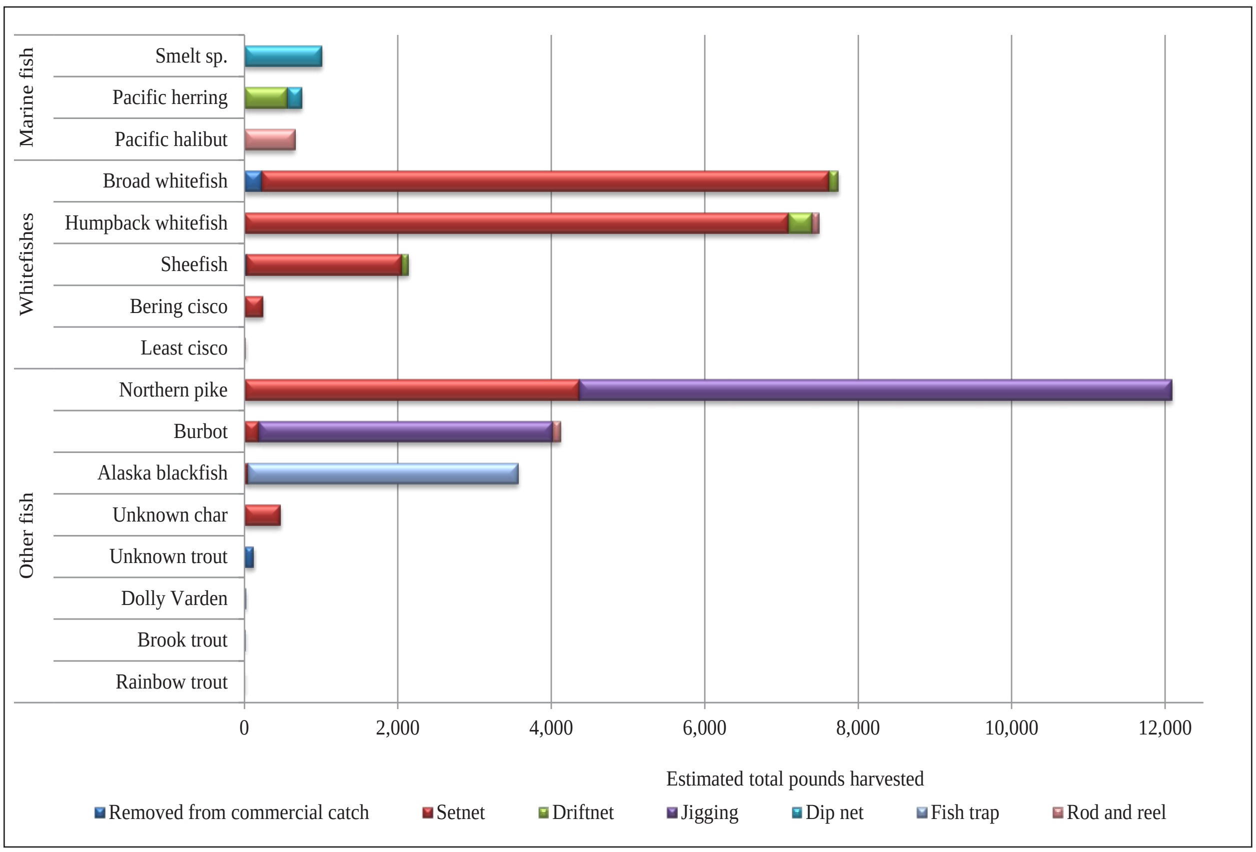


Figure 6-10.–Estimated nonsalmon fish harvests by gear type, Tuntutuliak, 2013.

Table 6-13.–Estimated harvests of nonsalmon fish by gear type and resource, Tuntutuliak, 2013.

				Subsistence methods									
		Removed from commercial catch		Setnet		Driftnet		Jigging		Dip net		Fish trap	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**392.7**		**21,813.1**		**1,067.9**		**11,551.9**		**1,192.1**		**3,521.3**
Pacific herring	gal	0.0	0.0	0.0	0.0	93.1	558.8	0.0	0.0	31.0	186.3	0.0	0.0
Pacific herring roe	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	167.6	1,005.9	0.0	0.0
Pacific tomcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saffron cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic lamprey	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stickleback (needlefish)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	lb	0.0	0.0	46.6	46.6	0.0	0.0	0.0	0.0	0.0	0.0	3,521.3	3,521.3
Burbot	ind	0.0	0.0	76.1	182.5	0.0	0.0	1,597.3	3,833.4	0.0	0.0	0.0	0.0
Brook trout	ind	6.2	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	ind	15.5	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lake trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown char	ind	0.0	0.0	310.4	465.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern pike	ind	0.0	0.0	970.1	4,365.7	0.0	0.0	1,715.2	7,718.5	0.0	0.0	0.0	0.0
Sheefish	ind	4.7	27.9	336.8	2,021.0	14.0	83.8	0.0	0.0	0.0	0.0	0.0	0.0
Longnose sucker	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow trout	ind	1.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown trout	ind	38.8	116.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	55.9	223.5	1,848.7	7,394.9	29.5	118.0	0.0	0.0	0.0	0.0	0.0	0.0
Bering cisco	ind	0.0	0.0	169.2	236.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least cisco	ind	0.0	0.0	12.4	12.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback whitefish	ind	0.0	0.0	2,362.5	7,087.5	102.4	307.3	0.0	0.0	0.0	0.0	0.0	0.0
Round whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown whitefishes	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

-continued-

Table 6-13.–Continued.

		Subsistence methods							
		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**0.0**		**39,146.4**		**855.6**		**40,394.7**
Pacific herring	gal	0.0	0.0	124.2	745.1	0.0	0.0	124.2	745.1
Pacific herring roe	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	gal	0.0	0.0	167.6	1,005.9	0.0	0.0	167.6	1,005.9
Pacific tomcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saffron cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	lb	0.0	0.0	0.0	0.0	658.1	658.1	658.1	658.1
Arctic lamprey	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stickleback (needlefish)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	lb	0.0	0.0	3,567.8	3,567.8	0.0	0.0	3,567.8	3,567.8
Burbot	ind	0.0	0.0	1,673.3	4,016.0	43.5	104.3	1,716.8	4,120.3
Brook trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	6.2	8.7
Dolly Varden	ind	0.0	0.0	0.0	0.0	0.0	0.0	15.5	14.0
Lake trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown char	ind	0.0	0.0	310.4	465.7	0.0	0.0	310.4	465.7
Arctic grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern pike	ind	0.0	0.0	2,685.4	12,084.2	0.0	0.0	2,685.4	12,084.2
Sheefish	ind	0.0	0.0	350.8	2,104.8	0.0	0.0	355.5	2,132.8
Longnose sucker	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	1.6	2.2
Unknown trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	38.8	116.4
Broad whitefish	ind	0.0	0.0	1,878.2	7,512.8	0.0	0.0	1,934.1	7,736.4
Bering cisco	ind	0.0	0.0	169.2	236.9	0.0	0.0	169.2	236.9
Least cisco	ind	0.0	0.0	12.4	12.4	0.0	0.0	12.4	12.4
Humpback whitefish	ind	0.0	0.0	2,465.0	7,394.9	31.0	93.1	2,496.0	7,488.0
Round whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown whitefishes	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

Note The summary row that includes incompatible units of measure for harvest number has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

Table 6-14.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Tuntutuliak, 2013.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Jigging	Dip net	Fish trap	Other method	Subsistence gear, any method	Rod and reel	Any method
Nonsalmon fish	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**1.0%**	**48.5%**	**2.6%**	**28.6%**	**1.9%**	**5.6%**	**0.0%**	**96.9%**	**2.1%**	**100.0%**
	Total	**1.0%**	**48.5%**	**2.6%**	**28.6%**	**1.9%**	**5.6%**	**0.0%**	**96.9%**	**2.1%**	**100.0%**
Pacific herring	Gear type	0.0%	0.0%	52.3%	0.0%	15.6%	0.0%	0.0%	1.9%	0.0%	1.8%
	Resource	0.0%	0.0%	75.0%	0.0%	16.1%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	1.4%	0.0%	0.3%	0.0%	0.0%	1.8%	0.0%	1.8%
Pacific herring roe	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Smelt	Gear type	0.0%	0.0%	0.0%	0.0%	84.4%	0.0%	0.0%	2.6%	0.0%	2.5%
	Resource	0.0%	0.0%	0.0%	0.0%	64.4%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	2.5%	0.0%	2.5%
Pacific tomcod	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Saffron cod	Gear type	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%
	Total	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%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	76.9%	1.6%
	Resource	0.0%	0.0%	0.0%	0.0%	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%	1.6%	1.6%
Arctic lamprey	Gear type	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%
	Total	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%
	Resource	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%
Alaska blackfish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	9.1%	0.0%	8.8%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	63.6%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	5.6%	0.0%	8.8%	0.0%	8.8%
Burbot	Gear type	0.0%	0.6%	0.0%	33.2%	0.0%	0.0%	0.0%	10.3%	12.2%	10.2%
	Resource	0.0%	3.1%	0.0%	93.0%	0.0%	0.0%	0.0%	97.5%	2.5%	100.0%
	Total	0.0%	0.3%	0.0%	9.5%	0.0%	0.0%	0.0%	9.9%	0.3%	10.2%

-continued-

Table 6-14.–Page 2 of 3.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Jigging	Dip net	Fish trap	Other method	Subsistence gear, any method	Rod and reel	Any method
Brook trout	Gear type	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Dolly Varden	Gear type	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lake trout	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown char	Gear type	0.0%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	1.2%
	Resource	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	1.2%
Arctic grayling	Gear type	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%
	Total	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%	16.8%	0.0%	66.8%	0.0%	0.0%	0.0%	30.9%	0.0%	29.9%
	Resource	0.0%	27.2%	0.0%	63.9%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	8.1%	0.0%	19.1%	0.0%	0.0%	0.0%	29.9%	0.0%	29.9%
Sheefish	Gear type	7.1%	5.6%	7.8%	0.0%	0.0%	0.0%	0.0%	5.4%	0.0%	5.3%
	Resource	1.3%	51.1%	3.9%	0.0%	0.0%	0.0%	0.0%	98.7%	0.0%	100.0%
	Total	0.1%	2.7%	0.2%	0.0%	0.0%	0.0%	0.0%	5.2%	0.0%	5.3%
Longnose sucker	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rainbow trout	Gear type	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown trout	Gear type	29.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%

-continued-

Table 6-14.–Page 3 of 3.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Jigging	Dip net	Fish trap	Other method	Subsistence gear, any method	Rod and reel	Any method
Broad whitefish	Gear type	56.9%	37.8%	11.0%	0.0%	0.0%	0.0%	0.0%	19.2%	0.0%	19.2%
	Resource	2.9%	95.6%	1.5%	0.0%	0.0%	0.0%	0.0%	97.1%	0.0%	100.0%
	Total	0.6%	18.3%	0.3%	0.0%	0.0%	0.0%	0.0%	18.6%	0.0%	19.2%
Bering cisco	Gear type	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.6%
	Resource	0.0%	87.2%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.6%
Least cisco	Gear type	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Humpback whitefish	Gear type	0.0%	35.7%	28.8%	0.0%	0.0%	0.0%	0.0%	18.9%	10.9%	18.5%
	Resource	0.0%	93.4%	4.1%	0.0%	0.0%	0.0%	0.0%	98.8%	1.2%	100.0%
	Total	0.0%	17.3%	0.8%	0.0%	0.0%	0.0%	0.0%	18.3%	0.2%	18.5%
Round whitefish	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown whitefishes	Gear type	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%
	Total	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.

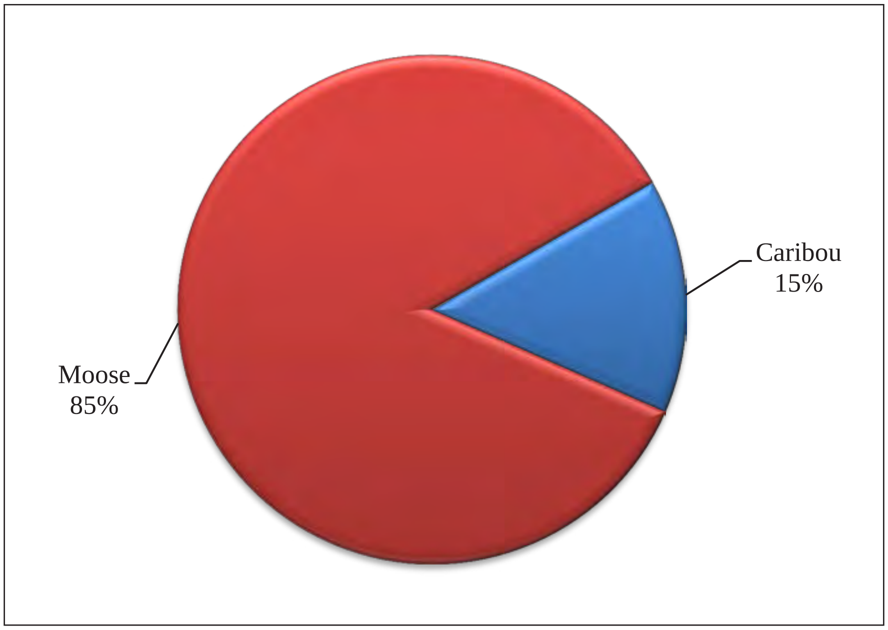


Figure 6-11.–Composition of edible large land mammal harvest, Tuntutuliak, 2013.

Large Land Mammals

Large land mammal hunters focused on 2 species, caribou and moose, the combined contribution of which added 10,835 lb to the subsistence harvest in 2013 (Figure 6-5; Table 6-8). Tuntutuliak hunters harvested 17 moose that contributed 9,220 lb usable weight (Table 6-8). The harvest was produced by 15% of households, distributed by 20%, and used by 87%. All moose harvested were bulls taken in the month of September (Table 6-15). There was very little discussion about moose hunting during the ethnographic interviews. Two respondents noted that moose populations had increased near Tuntutuliak, and they attributed the increase directly to the 5-year hunting moratorium. All respondents stated that moose is an important part of their annual cycle and diet.

Hunters were less successful in harvesting caribou. Hunters harvested an estimated 12 caribou, which provided 1,614 lb, approximately 15% of the large land mammal harvest (Table 6-8; Figure 6-11). Caribou was also less widely used throughout the community. Only 19% of the respondents reported using caribou in their households during 2013 (Table 6-8). One-half of the caribou taken were bulls, 2 were female, and 5 were of unknown sex (Table 6-15). The harvest was conducted between the months of January and March. Tuntutuliak residents target caribou from the Mulchatna herd that winters in the foothills of the Kilbuck Mountains inland from Eek. One resident explained that the 2013 caribou harvest was suppressed because the warm winter prevented the Kuskokwim River from freezing thoroughly enough to cross and because the caribou wintered further east (04292014WTL02).

Two percent of Tuntutuliak households hunted for brown bear, though none were successful (Table 6-8). Some households did report receiving and using brown bear.

Small Land Mammals/Furbearers

Many Tuntutuliak households use small land mammals for food, fur, or both. According to survey data, 39% of households used small mammals, and 30% harvested them (Table 6-8). The most commonly harvested species of small land mammals were snowshoe hare and river otter. Thirteen percent of Tuntutuliak households harvested an estimated 81 snowshoe hares, representing 40% of the total small land mammal harvest (Table 6-8; Figure 6-12). Snowshoe hare is targeted in the winter months, between November and April; in 2013, the highest harvests occurred in February and March (Table 6-16).

Table 6-15.–Estimated large land mammal harvests by month and sex, Tuntutuliak, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
All large land mammals	**4.7**	**3.1**	**3.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**17.1**	**0.0**	**0.0**	**0.0**	**1.6**	**29.5**
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	4.7	3.1	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	**12.4**
Caribou, male	0.0	3.1	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	**6.2**
Caribou, female	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.6**
Caribou, unknown sex	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.7**
Moose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.1	0.0	0.0	0.0	0.0	**17.1**
Moose, bull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.1	0.0	0.0	0.0	0.0	**17.1**
Moose, cow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
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.

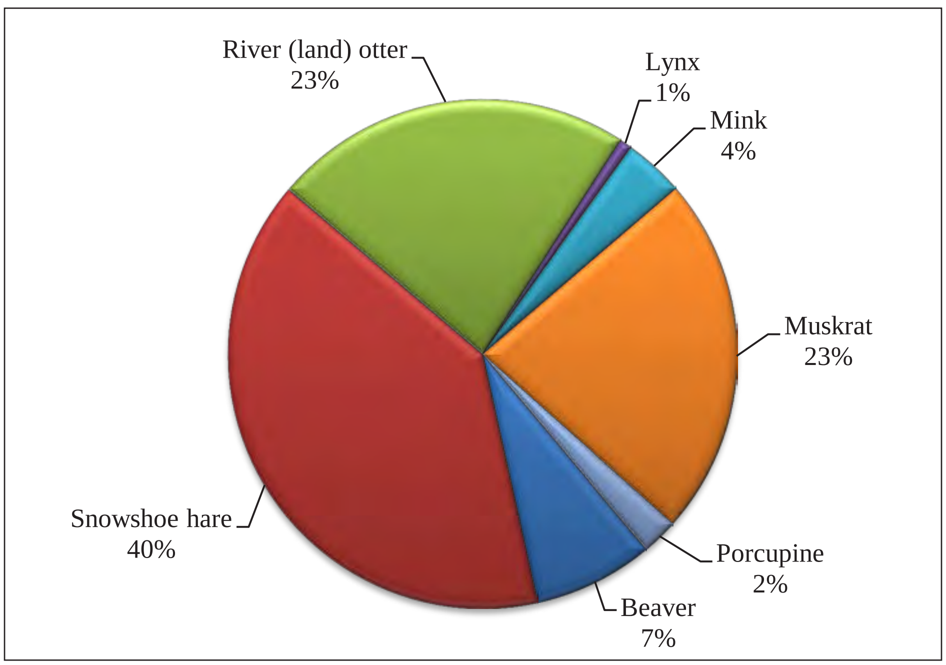


Figure 6-12.–Composition of small land mammal harvest in individual animals harvested, Tuntutuliak, 2013.

Table 6-16.–Estimated small land mammal harvests by month, Tuntutuliak, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All small land mammals	**18.6**	**24.8**	**23.3**	**80.7**	**3.1**	**1.6**	**0.0**	**6.2**	**0.0**	**0.0**	**41.9**	**3.1**	**0.0**	**203.3**
Beaver	0.0	0.0	0.0	10.9	0.0	1.6	0.0	3.1	0.0	0.0	0.0	0.0	0.0	**15.5**
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	17.1	23.3	21.7	7.8	0.0	0.0	0.0	0.0	0.0	0.0	10.9	0.0	0.0	**80.7**
Alaska hare	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
River (land) otter	0.0	0.0	0.0	15.5	3.1	0.0	0.0	0.0	0.0	0.0	24.8	3.1	0.0	**46.6**
Lynx	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.6**
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	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2	0.0	0.0	**7.8**
Muskrat	0.0	0.0	0.0	46.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**46.6**
Porcupine	0.0	0.0	1.6	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	**4.7**
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Gray wolf	0.0	0.0	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.

Trappers harvested near equal numbers of river otters and muskrats, both commonly used for food (Table 6-8). Thirteen percent of households reported harvesting river otters, and that harvest was used by 19% of households. In all, about 47 individual river otters were taken. Beaver contributed the most to the small land mammal harvest by weight (186 lb), though the harvest was only 16 individuals.

Tuntutuliak residents harvest small mammals more for food than for fur. Of the 203 individual small mammals harvested, 12 (6%) were harvested for fur only (Figure 6-13). Many respondents spoke of spring muskrat trapping as a popular pastime; they often travel to camps for the sole purpose of harvesting muskrats, migratory waterfowl, and nonsalmon fish species.

> For, for me it was, uh, time to go out and uh, we'll take the whole family to go egg-hunting. And…muskrats—hunting muskrats—there were [an] abundance of muskrats and…like I said, the fur was the main source of income, and uh, people used to catch a lotta muskrats. And we—I did…a lot of…muskrat hunting, too. (04292014WTL02)

Muskrats were harvested by 8% of households, and the estimated harvest was 47 individuals.

Marine Mammals

Although Tuntutuliak is a tundra community, the community uses marine mammals extensively. Eighty-five percent of responding households reported using either seals, walrus, or whales (Table 6-8). One-third of the households harvested marine mammals. Tuntutuliak hunters harvested approximately 21,145 lb of marine mammals, representing 14% of the total community harvest (Figure 6-5; Table 6-8). As an indication of marine mammals' value among Tuntutuliak residents, 73% of households reported receiving marine mammal meat from another household (Table 6-8).

Seals were the most commonly harvested marine mammal. Hunters harvested 107 spotted seals, which contributed 5,998 lb of meat. Bearded seal, the largest seal species, accounted for the greatest harvest by weight, supplying approximately 7,389 lb of food and composing 35% of the total marine mammal harvest (Table 6-8; Figure 6-14). The overwhelming majority of seals were harvested during the spring (Table 6-17).

Seal hunting by Tuntutuliak residents is an involved effort, requiring long travel. As one resident explained,

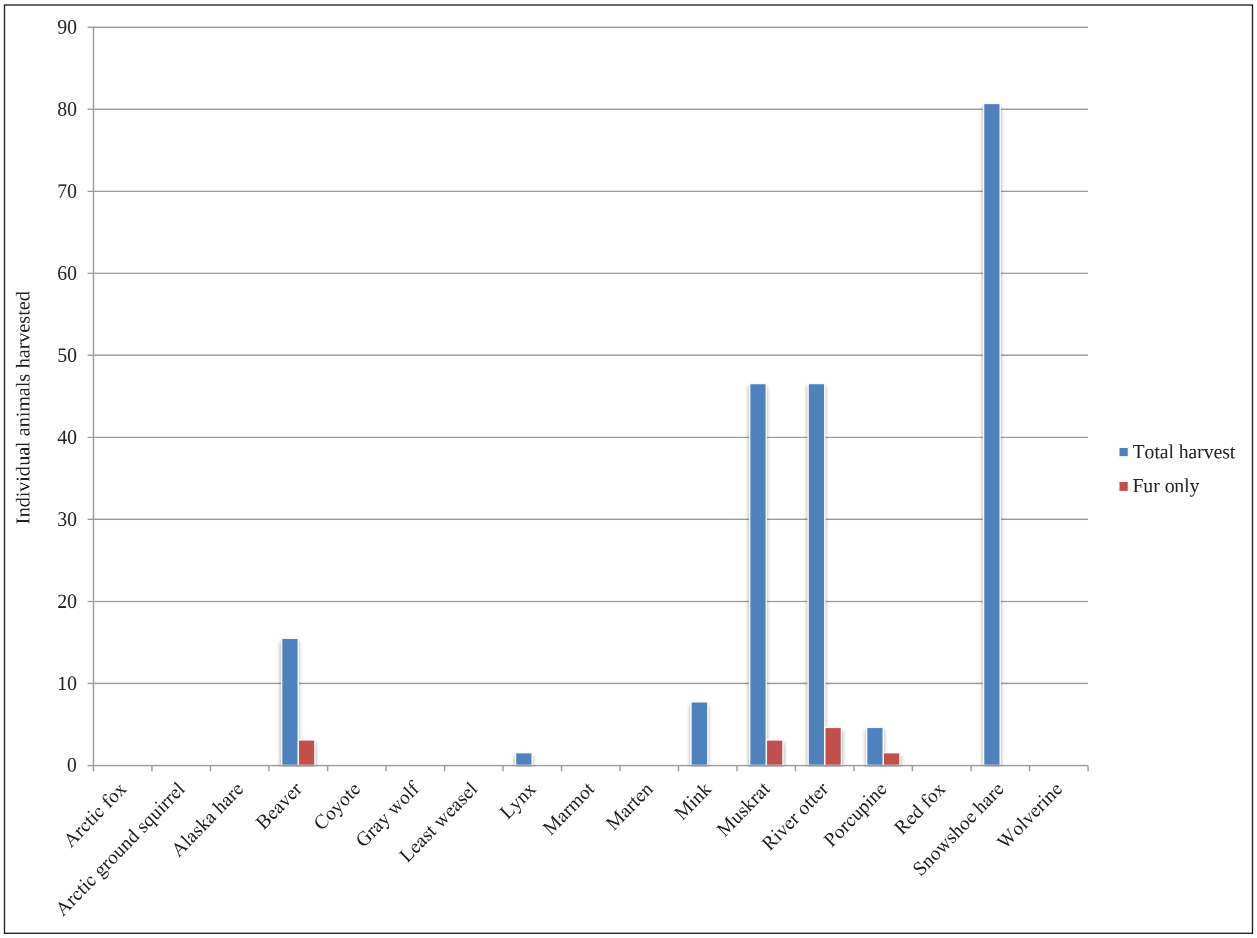


Figure 6-13.–Estimated small land mammal harvests for fur, Tuntutuliak, 2013.

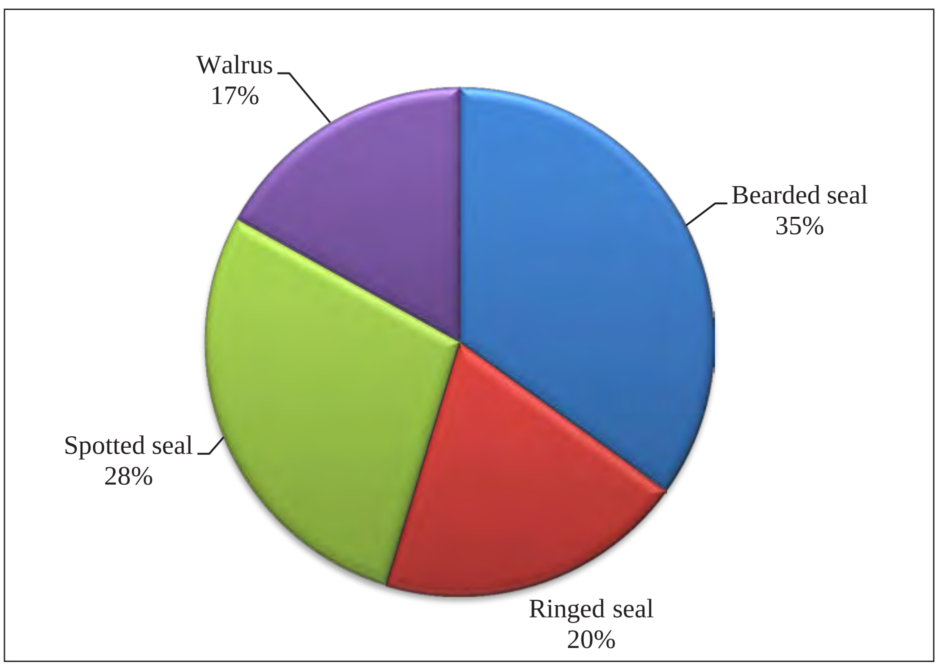


Figure 6-14.–Composition of edible marine mammal harvest, Tuntutuliak, 2013.

Table 6-17.–Estimated marine mammal harvests by month, Tuntutuliak, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All marine mammals	**0.0**	**0.0**	**35.7**	**145.9**	**29.5**	**0.0**	**3.1**	**17.1**	**3.1**	**4.7**	**0.0**	**0.0**	**0.0**	**239.0**
Seal	0.0	0.0	34.1	144.4	29.5	0.0	3.1	17.1	3.1	3.1	0.0	0.0	0.0	**234.4**
Bearded seal	0.0	0.0	4.7	27.9	6.2	0.0	1.6	9.3	1.6	1.6	0.0	0.0	0.0	**52.8**
Harbor seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Ringed seal	0.0	0.0	6.2	62.1	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**74.5**
Spotted seal	0.0	0.0	23.3	54.3	17.1	0.0	1.6	7.8	1.6	1.6	0.0	0.0	0.0	**107.1**
Walrus	0.0	0.0	1.6	1.6	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	**4.7**
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**
Beluga whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Bowhead whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown marine mammals	0.0	0.0	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.

> You know, mouth of Kuskokwim. You know. We haul our aluminum boats out there. That's Lund boats, with 40 horsepower, outboard motors. And we hunt seal. We go as far as below Kwigluk, you know. We hunt for walrus, bearded seal, spotted seal, and *nayiq* [ringed seal]. (04262014WTL04)

Another respondent offered an historical perspective,

> We used to do a lot; we'd bring our boats down. Arrive—when I was growing up before the aluminum boat—Lunds—came, my dad used to take his kayak and hunt seal in this area. And with the introduction of boat and motors—with the aluminum Lund boats start hunting further below Kwigillingok—somewhere between Kipnuk and Kwigillingok for bearded seals and walrus. (04292014WTL02)

The amount of effort expended for seal hunting is largely dictated by the absolute utility of marine mammal parts. Each harvest yields a large amount of meat and, perhaps most importantly, seal oil, which is used with almost every meal. Furthermore, the hides are dried and stretched for use in handicrafts and garment sewing.

In addition to seals, Tuntutuliak hunters harvested an estimated 5 walruses, which provided 3,586 lb of meat. The walrus was distributed widely and was used by 39% of the households.

Birds and Eggs

Tuntutuliak hunters harvested 21 types of migratory waterfowl and other birds (Table 6-8). Bird and egg harvests totaled 7,604 lb and were used by 93% of households. Every household that attempted to harvest either birds or eggs (76%) was successful in doing so.

The largest bird harvest by weight was white-fronted goose, which contributed 2,546 lb of food (33% of the total bird and egg harvest) and was used by 61% of the households (Table 6-8; Figure 6-15). Sandhill cranes were the second largest harvest by weight, totaling 1,191 lb. Other notable bird harvests were ptarmigans, tundra swan, and Canada goose. Tuntutuliak residents also harvested an estimated 1,912 eggs. Goose and duck eggs were the largest egg harvest; residents collected an estimated 595 and 449 individual eggs, respectively.

Though available in both spring and fall, the overwhelming majority of birds were harvested during the spring (Table 6-18). Research for this community was conducted in the spring, during the week that waterfowl hunting commenced, and hunters were visibly excited. For most, waterfowl hunting in the spring marks the beginning of the annual calendar of subsistence activities, and the first opportunity to harvest fresh meat after the winter. More waterfowl was harvested during the spring migration than during the fall migration. A small number of geese, sandhill cranes, and ducks were harvested in the fall. In addition, hunters harvested 502 ptarmigans during the winter.

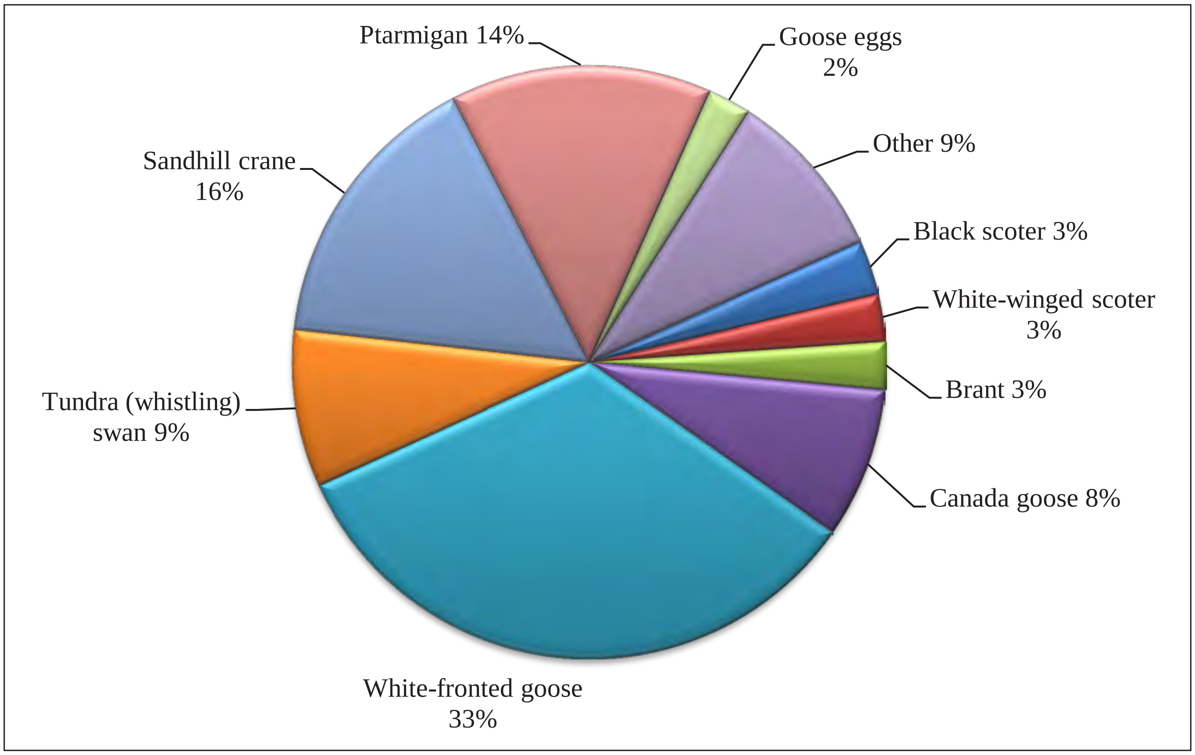


Figure 6-15.–Composition of edible bird and bird egg harvest, Tuntutuliak, 2013.

Marine Invertebrates

No marine invertebrates were harvested in 2013, though some households reported receiving clams and shrimp (Table 6-8).

Vegetation

Vegetation, both berries and greens, contributed 11,582 lb to the total harvest for Tuntutuliak residents in 2013, 28 lb per capita (Table 6-8; Plate 6-4). Though the harvest is fairly small, vegetation is used by nearly the entire community. Approximately 96% of the households used some type of vegetation. Moreover, nearly every household (90%) picked or gathered vegetation, the highest household participation of any category. Unlike hunting or fishing, gathering is an activity in which most people can participate, regardless of age or material wealth.

Due to their water content, berries provided the largest harvest by weight (96% of the vegetation harvest; Figure 6-16). The largest berry harvest by weight was cloudberries, also commonly referred to as salmonberries. Tuntutuliak residents picked approximately 6,641 lb. The second largest harvest was crowberries (3,073 lb); residents picked only one-half as much crowberries as cloudberries. Respondents typically consider the amount of winter snowfall as a natural indicator of the coming berry harvest. More snowfall than normal during 2012 to 2013 in the Tuntutuliak area likely influenced the berry production.

Though wood was the most common resources used, the Division did not estimate or include the weight of the harvest. Table 6-19 summarizes the percentage of household heating that is met by wood. The largest percentage of households (40%) responded that they do not use wood to heat their household.

Tuntutuliak residents commonly harvest the greens Hudson's Bay tea (194 gal), sourdock (110 gal), and Pallas buttercup (108 gal). Pallas buttercup, locally referred to as *kapuukar*, is a good example of seasonally prime greens. Residents gather the young, tender shoots of kapuukar that grow in tundra in early spring. If the plants are collected any later, they are too stringy and tough to be palatable. The plant is cooked, never eaten raw, and is eaten with fish or in *akutaq* (Eskimo ice cream).

Table 6-18.–Estimated bird and bird egg harvests by season, Tuntutuliak, 2013.

Resource	Estimated harvest by season: Winter	Spring	Summer	Fall	Season unknown	**Total**
All birds	**502.4**	**4,859.9**	**18.6**	**104.0**	**0.0**	**5,484.9**
Common eider	0.0	0.0	0.0	0.0	0.0	**0.0**
King eider	0.0	31.5	0.0	0.0	0.0	**31.5**
Spectacled eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Steller's eider	0.0	7.9	0.0	0.0	0.0	**7.9**
Harlequin duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	0.0	29.9	0.0	3.2	0.0	**33.1**
Long-tailed duck	0.0	4.7	0.0	0.0	0.0	**4.7**
Northern pintail	0.0	26.8	0.0	0.0	0.0	**26.8**
Scaup	0.0	110.2	6.2	0.0	0.0	**116.4**
Black scoter	0.0	240.6	12.4	0.0	0.0	**253.0**
Surf scoter	0.0	20.8	0.0	0.0	0.0	**20.8**
White-winged scoter	0.0	85.1	0.0	0.0	0.0	**85.1**
Northern shoveler	0.0	23.6	0.0	0.0	0.0	**23.6**
Teal	0.0	7.9	0.0	14.2	0.0	**22.1**
American wigeon	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown ducks	0.0	23.3	0.0	0.0	0.0	**23.3**
Brant	0.0	33.1	0.0	0.0	0.0	**33.1**
Cackling goose	0.0	6.2	0.0	0.0	0.0	**6.2**
Canada goose	0.0	464.8	0.0	55.2	0.0	**520.0**
Emperor goose	0.0	18.9	0.0	0.0	0.0	**18.9**
Snow goose	0.0	1.6	0.0	0.0	0.0	**1.6**
White-fronted goose	0.0	584.6	0.0	15.8	0.0	**600.4**
Unknown geese	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	0.0	58.3	0.0	0.0	0.0	**58.3**
Sandhill crane	0.0	126.1	0.0	15.8	0.0	**141.8**
Shorebirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Seabirds, loons, grebes	0.0	0.0	0.0	0.0	0.0	**0.0**
Loon	0.0	0.0	0.0	0.0	0.0	**0.0**
Grouse	0.0	0.0	0.0	0.0	0.0	**0.0**
Ptarmigan	502.4	1,041.6	0.0	0.0	0.0	**1,544.0**
Snowy owl	0.0	0.0	0.0	0.0	0.0	**0.0**
Duck eggs	0.0	448.6	0.0	0.0	0.0	**448.6**
Goose eggs	0.0	594.5	0.0	0.0	0.0	**594.5**
Swan eggs	0.0	141.3	0.0	0.0	0.0	**141.3**
Crane eggs	0.0	18.6	0.0	0.0	0.0	**18.6**
Unknown shorebird eggs	0.0	93.1	0.0	0.0	0.0	**93.1**
Gull eggs	0.0	353.9	0.0	0.0	0.0	**353.9**
Loon eggs	0.0	3.1	0.0	0.0	0.0	**3.1**
Tern eggs	0.0	37.3	0.0	0.0	0.0	**37.3**
Ptarmigan eggs	0.0	208.0	0.0	0.0	0.0	**208.0**
Unknown eggs	0.0	14.0	0.0	0.0	0.0	**14.0**

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

Plate 6-4.–Spring harvest of cow parsnip.

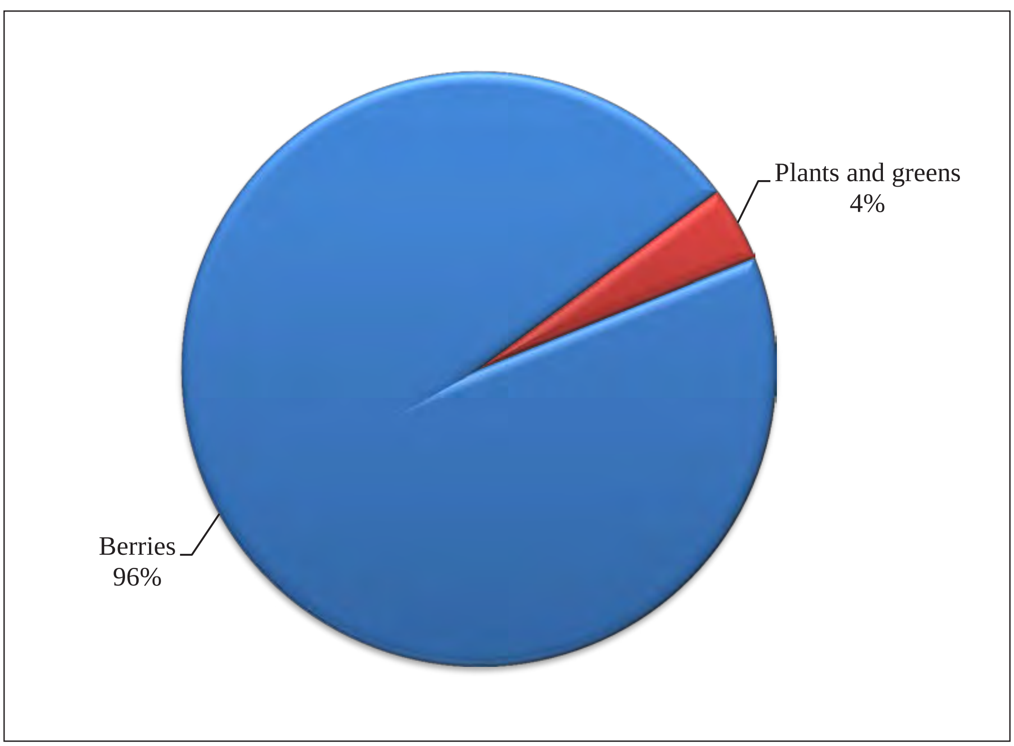


Figure 6-16.–Composition of edible vegetation harvest by type, Tuntutuliak, 2013.

Table 6-19.–Use of firewood for home heating, Tuntutuliak, 2013.

	Household use of wood for home heating as a percentage of sampled households													
	0%		1–25%		26–50%		51–75%		76–99%		100%		Did not respond	
Community	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Tuntutuliak	27	40.3%	8	11.9%	12	17.9%	12	17.9%	4	6.0%	1	1.5%	3	4.5%

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

Harvest Areas

Tuntutuliak residents accessed a large area of land and waters to hunt, fish, and gather wild resources in 2013. Respondents were asked to document these areas on maps and to specify which areas they used for which species, what time of the year they accessed these places, and what they harvested. The following maps depict, by resource category, consolidations of all maps created by respondents. Figure 6-17 shows the area used by Tuntutuliak residents for all subsistence activities. They used a large portion of the Kuskokwim Bay, the lower Kuskokwim River up to and including the Napaskiak area, and 3 drainages emptying into the Kuskokwim River.

Figures 6-18 and 6-19 depict fishing locations. Salmon were harvested along both banks of the Kuskokwim River adjacent to Tuntutuliak, as well as offshore of Quinhagak and Eek (Figure 6-18). Nonsalmon fish harvest areas varied by species. The Kinak River, closest to the community, was used to harvest a variety of species (Figure 6-19). Whitefish areas are depicted on tundra lakes. Whitefish were harvested on the Kuskokwim River at specific points, and with sheefish in driftnet locations. Burbot were harvested in the 3 drainages near Tuntutuliak.

Figures 6-20, 6-21, and 6-22 all depict hunting locations. Small land mammal hunting, which also includes trapping, occurred very close to the community (Figure 6-20). By comparison, large land mammal hunting occurred far and wide. Most moose hunting occurred in a 10-mile radius around the community (Figure 6-21). However, some residents traveled as far as the lower Yukon River, and some as far as the upriver community of Akiak. Caribou hunting occurred across the Kuskokwim River from Tuntutuliak near the community of Eek and in the foothills of the Kilbuck Mountains. One respondent reported brown bear hunting next to or within the community. Seals and walrus were searched for south of the community, primarily in Kuskokwim Bay and adjoining tributaries (Figure 6-22). The search for birds occurred both on land and in the Kuskokwim Bay (Figure 6-23).

The need to gather berries and greens prompted residents to search adjacent to the 3 rivers near Tuntutuliak and across the Kuskokwim River (Figure 6-24). Some residents searched as far upriver as Napakiak and as far south as Goodnews Bay.

Past mapping of Tuntutuliak harvest areas is fairly limited. During the lower Kuskokwim nonsalmon harvest monitoring project, Ray et al. (2010), mapped seasonal nonsalmon harvest locations with 5 key respondents. The maps produced by Ray et al. (2010) represent life-long fishing locations rather than those used in a single year. The maps depict an extent of use similar to Figure 6-19. The mainstem of the Kuskokwim River was used to target northern pike, whitefish species, and burbot; however, the bulk of nonsalmon fishing occurred in the rivers and tundra lakes north of the community.

Comparing Harvests and Uses in 2013 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 2 ways: whether they got more, less, or about the same amount of 7 resource categories in 2013 as in the past 5 years, and whether they got "enough" of each of the 7 resource categories. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a

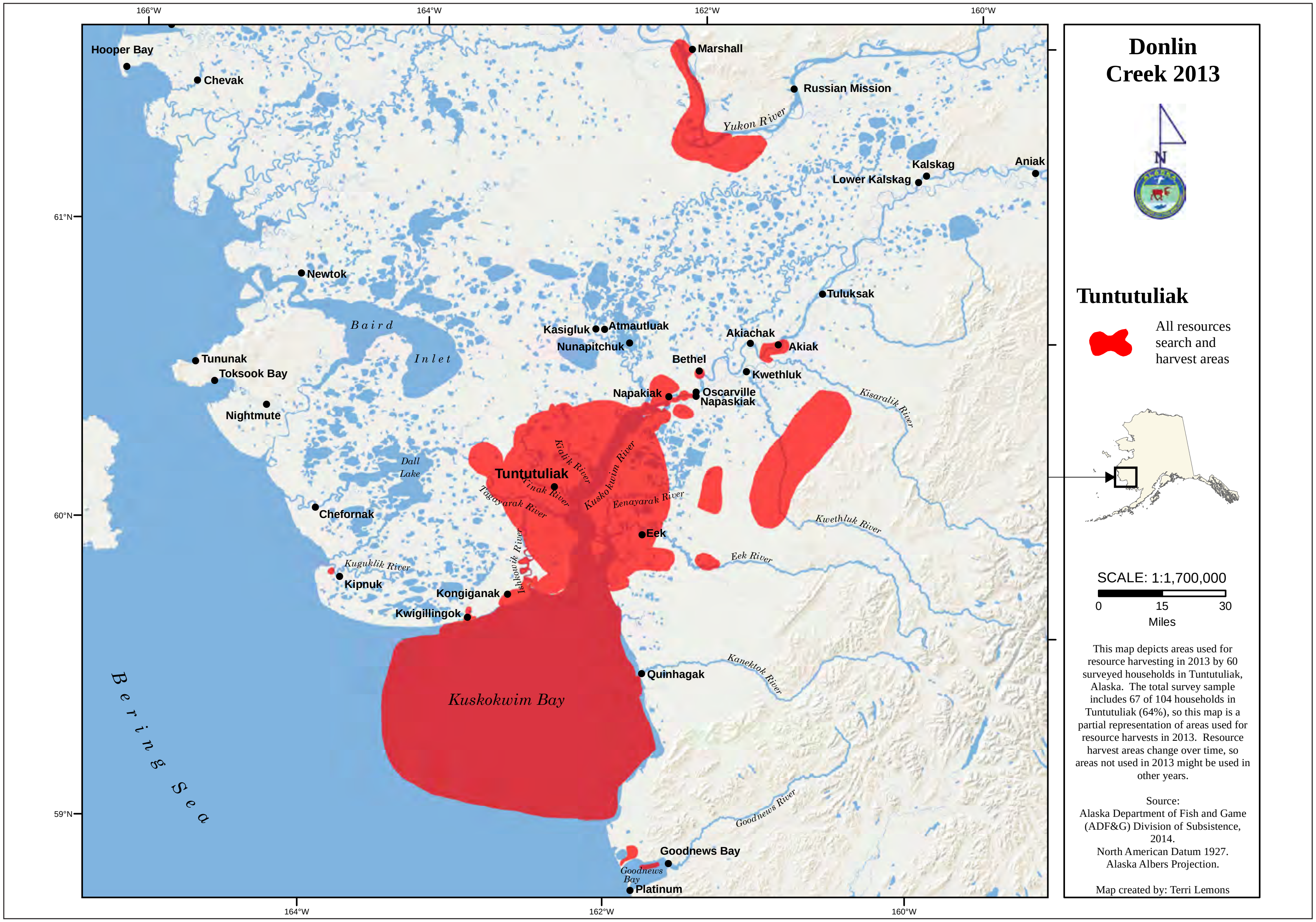


Figure 6-17.–Search and harvest areas, all resources, Tuntutuliak, 2013.

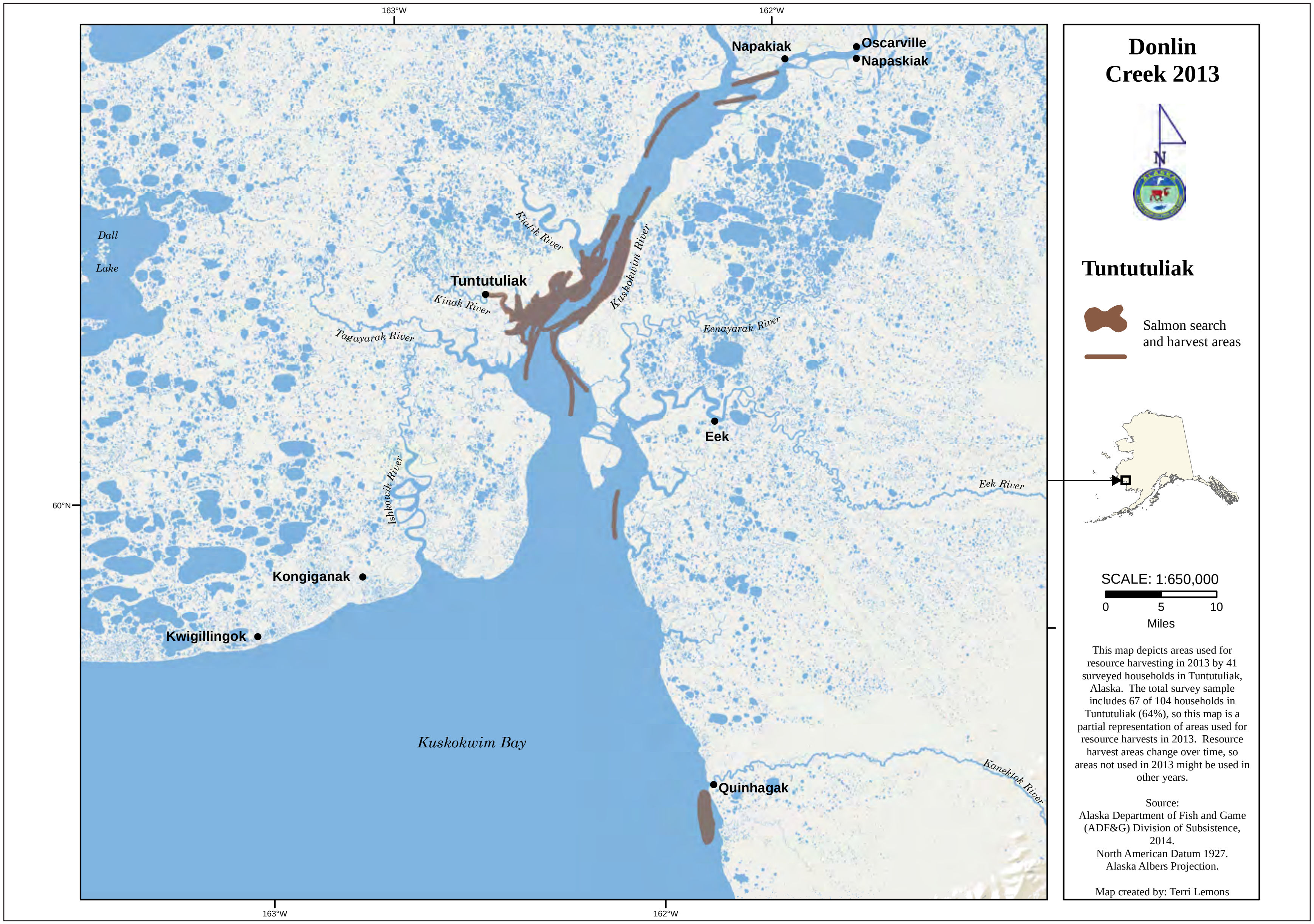


Figure 6-18.–Fishing and harvest areas, salmon, Tuntutuliak, 2013.

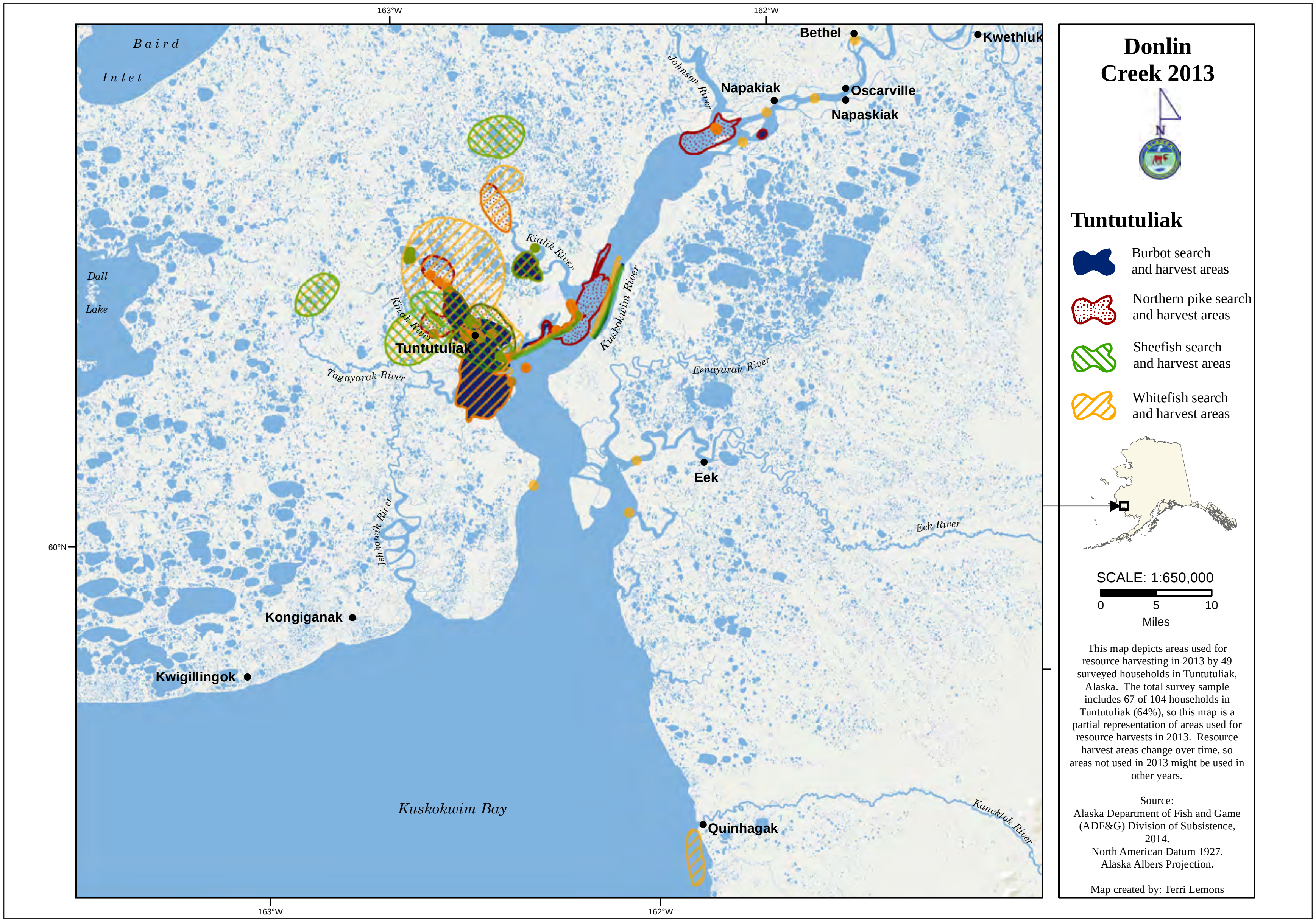


Figure 6-19.–Fishing and harvest areas, burbot, northern pike, sheefish, and whitefishes, Tuntutuliak, 2013.

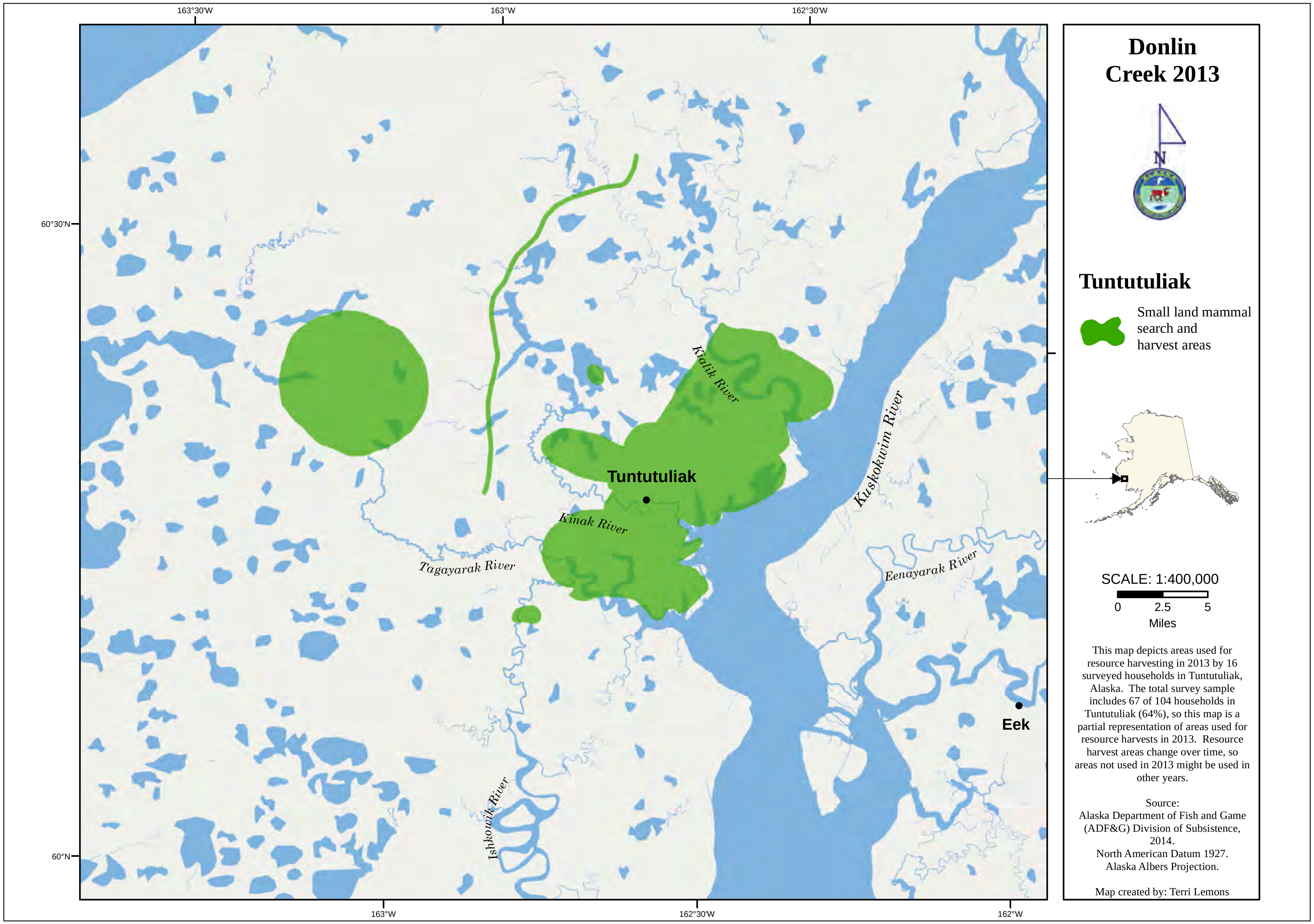


Figure 6-20.–Hunting and harvest areas, small land mammals, Tuntutuliak, 2013.

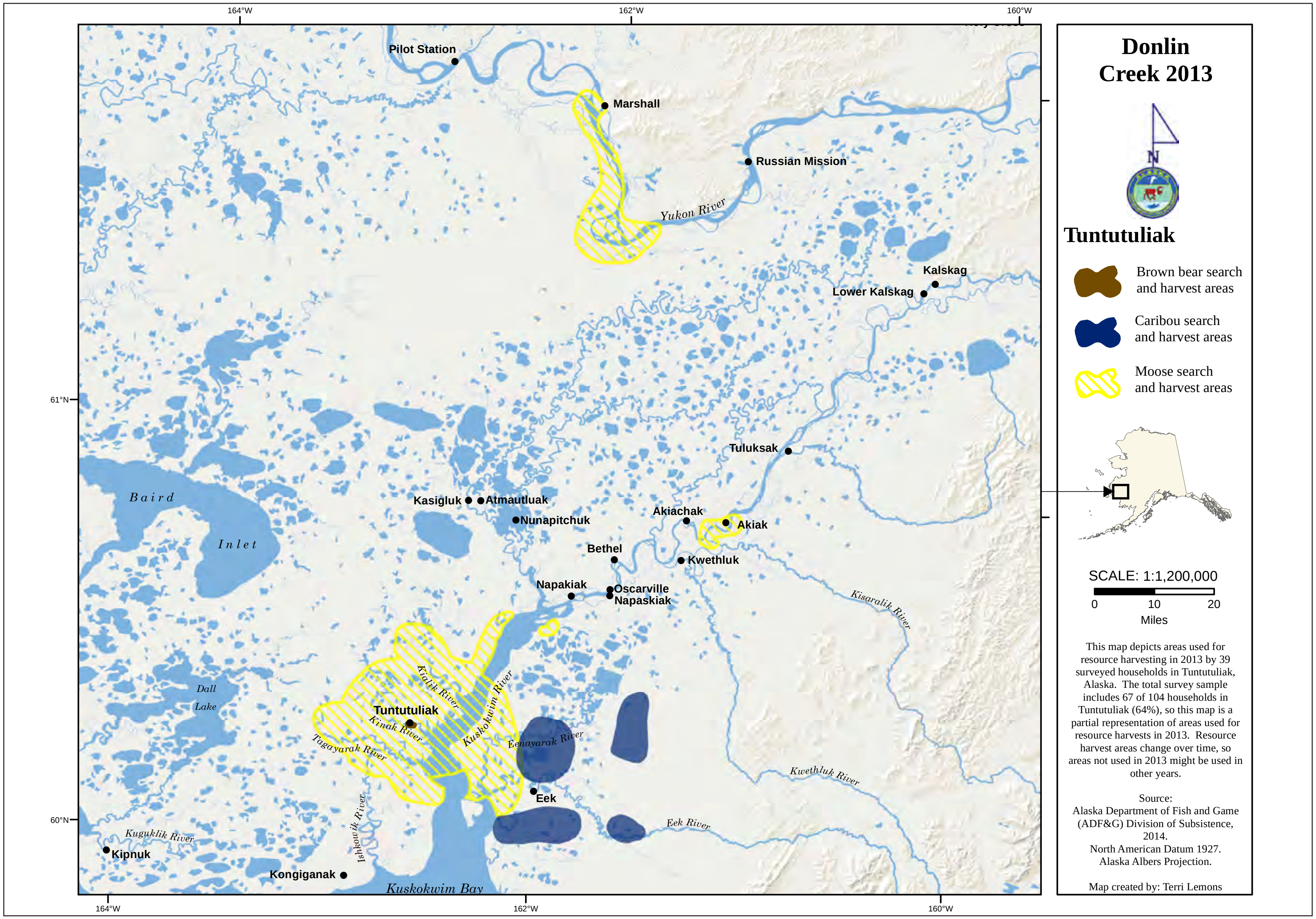


Figure 6-21.–Hunting and harvest areas, caribou and moose, Tuntutuliak, 2013.

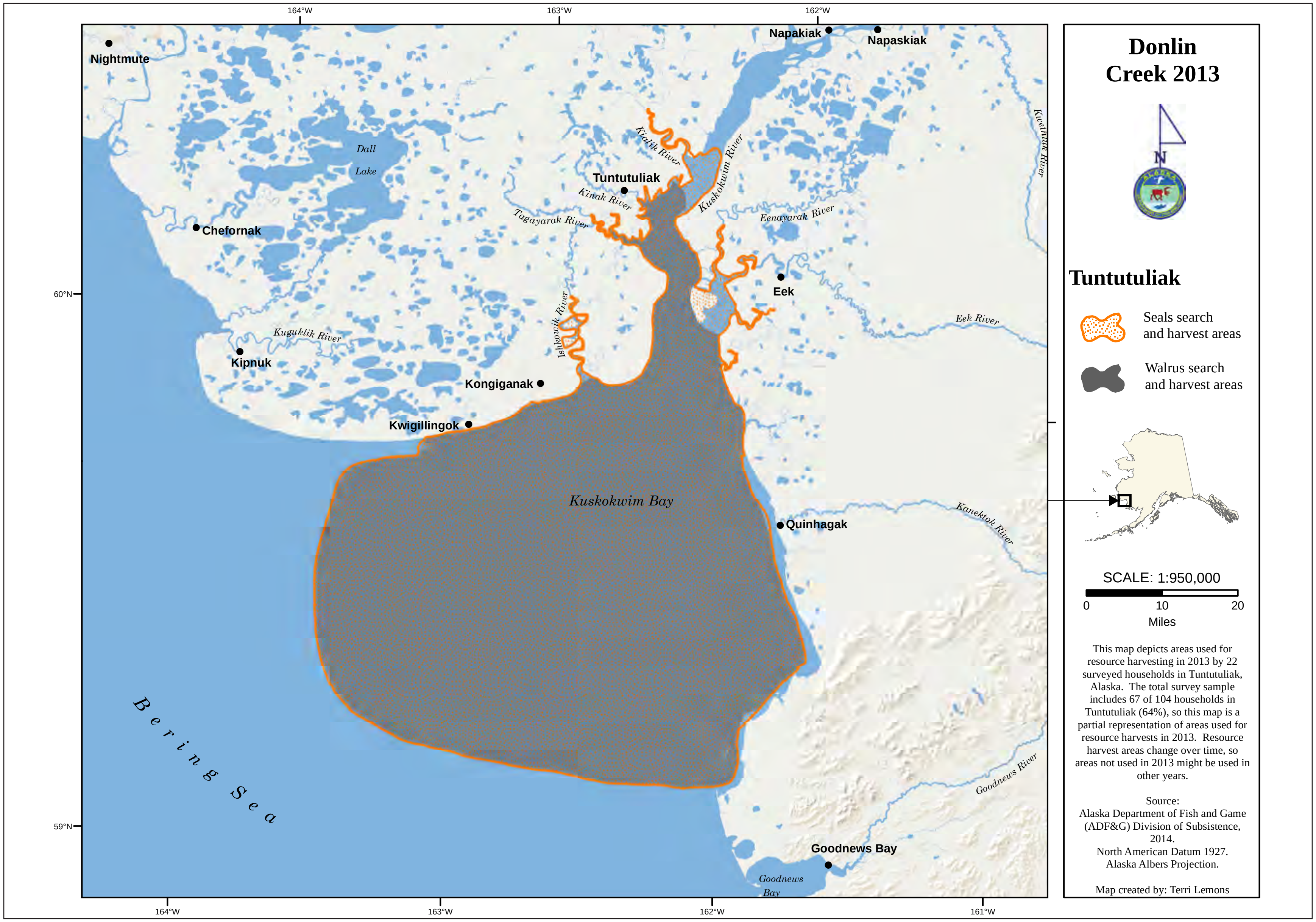


Figure 6-22.–Hunting and harvest areas, seals and walrus, Tuntutuliak, 2013.

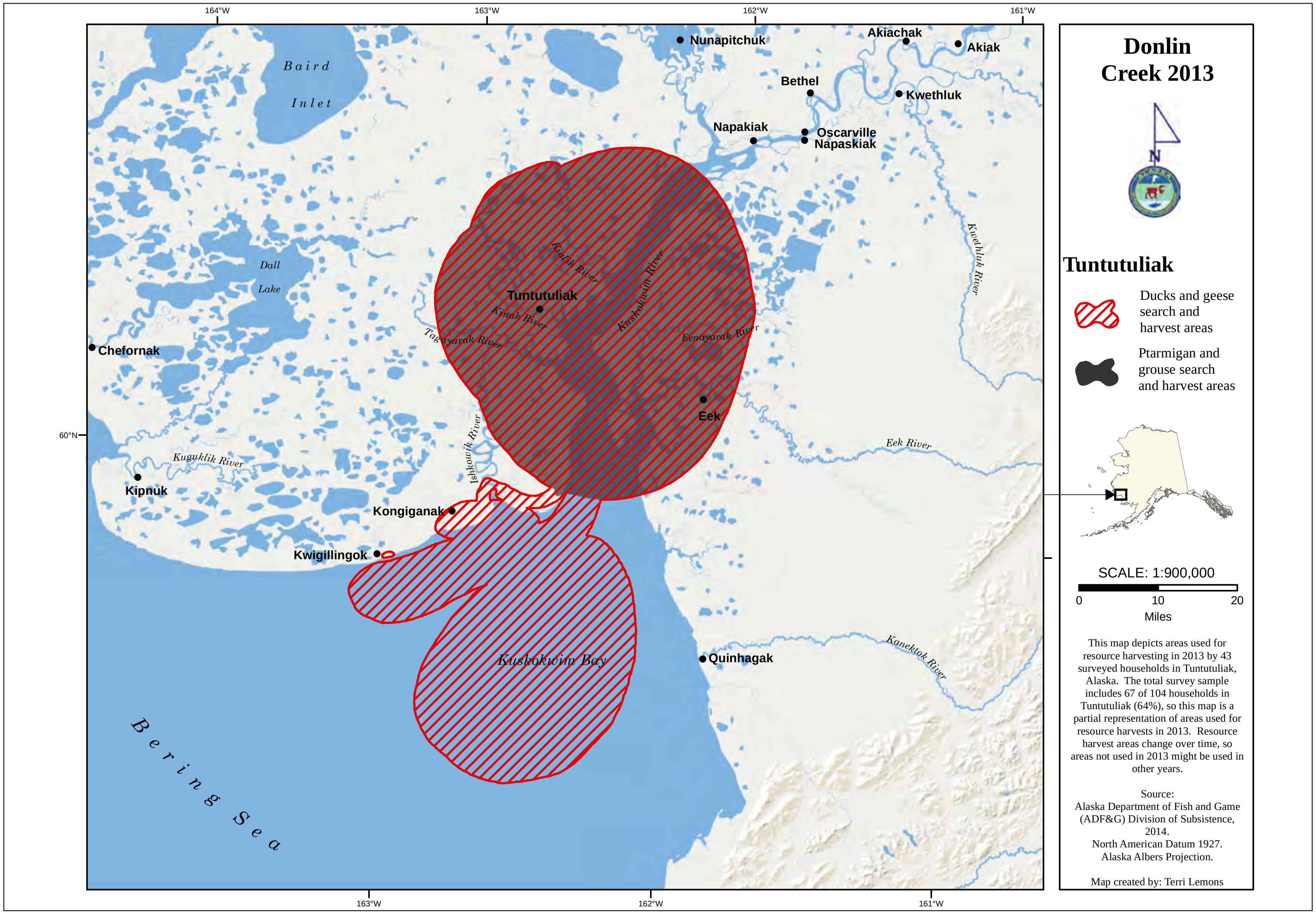


Figure 6-23.–Hunting and harvest areas, waterfowl and nonmigratory birds, Tuntutuliak, 2013.

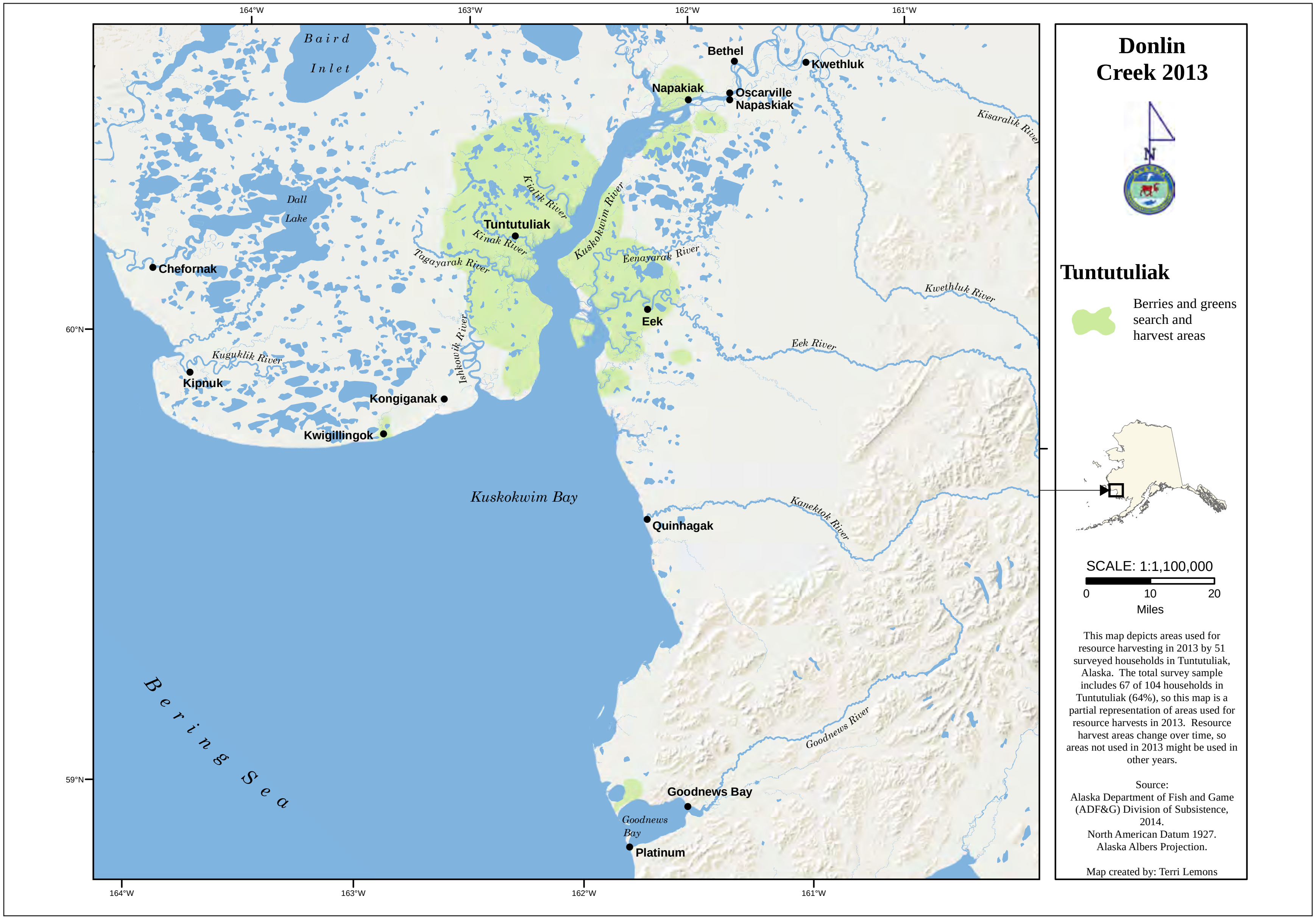


Figure 6-24.–Gathering and harvest areas, berries and greens, Tuntutuliak, 2013.

Table 20.–Changes in household uses of resources compared to recent years, Tuntutuliak, 2013.

			Households reporting use								Households not using	
	Sampled	Valid	Total households		Less		Same		More			
Resource category	households	responses[a]	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All Resources	67	61	61	91.0%	37	60.7%	23	37.7%	1	1.6%	0	0.0%
Salmon	67	67	66	98.5%	48	71.6%	15	22.4%	3	4.5%	1	1.5%
Nonsalmon fish	67	63	62	92.5%	32	50.8%	21	33.3%	9	14.3%	1	1.6%
Land mammals	67	62	60	89.6%	40	64.5%	19	30.6%	1	1.6%	2	3.2%
Marine mammals	67	65	59	88.1%	23	35.4%	29	44.6%	7	10.8%	6	9.2%
Birds and eggs	67	65	61	91.0%	27	41.5%	29	44.6%	5	7.7%	4	6.2%
Marine invertebrates	67	66	4	6.0%	2	3.0%	2	3.0%	0	0.0%	62	93.9%
Vegetation	67	59	55	82.1%	18	30.5%	24	40.7%	13	22.0%	4	6.8%

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

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

different subsistence resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 6-20, Figure 6-25, and Figure 6-26 provide a broad overview of households' assessments of their harvests in 2013. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions.

Salmon is the most harvested of all subsistence resource categories used by Tuntutuliak households. Twenty-two percent of responding households explained that they used the same amount of salmon in 2013 as they did in previous years, 72% reported that they used less, and 5% said they used more (Table 6-20; Figure 6-25). When asked why they used less salmon, 64% of respondents reported that they did so due to regulations, and 16% said because the resource was less available. (Table 6-21). Only 1 household said it used more salmon due to increased availability (Table 6-22). In Tuntutuliak, 51% of respondents stated that their households did not get enough salmon (Figure 6-26). When asked to evaluate the impact of not getting enough salmon, 3% described it as not noticeable, 18% described the impact as minor, 38% explained that not getting enough salmon had a major effect on their households, and 32% stated that the impact was severe (Table 6-23). Households that did not get enough salmon adapted by buying more commercial foods (52%) or replacing salmon with other subsistence foods (20%; Table 6-24).

Nonsalmon fish species are the most used resource in Tuntutuliak, however, one-half of households (51%) reported that they used less in 2013 compared to other years (tables 6-8 and 6-20; Figure 6-25). There were many reasons respondents used less nonsalmon fish species, but the most common was adverse weather conditions. Eight respondents reported reasons for using more nonsalmon fish in 2013 (Table 6-22). Even though most respondents reported using less, 67% qualified their harvest as sufficient to meet their needs (Figure 6-26).

A large portion (65%) of households reported that they used less land mammals in 2013 (Figure 6-25). The most prominent reason for reduced use was unsuccessful hunting (Table 6-21). Two percent of households reported that they used more land mammals. Fifty percent of households did not get enough to meet their needs, and about one-third of those reported it as a major impact to their household (Table 6-23; Figure 6-26). Of all the resources that respondents reported needing more, moose stood out as the most needed resource (Table 6-25). Sixty-one percent of households reported they needed more moose, and 33% of households said they needed more caribou. Households that did not get enough said that they adapted by buying more store foods (87%; Table 6-24).

More respondents reported a steady use of marine mammals (45%) than less use (35%) for 2013 (Figure 6-25). There were numerous explanations for using less marine mammal resources, but, as with land mammals, the biggest reason was a lack of effort (Table 6-21). Approximately 60% of the respondents felt that they had enough marine mammals to fulfill their needs (Figure 6-26).

Respondents gave similar responses to their use of birds as to their use of marine mammals. Forty-five percent said that they used the same amount of birds and eggs in 2013 as they did in recent years (Figure

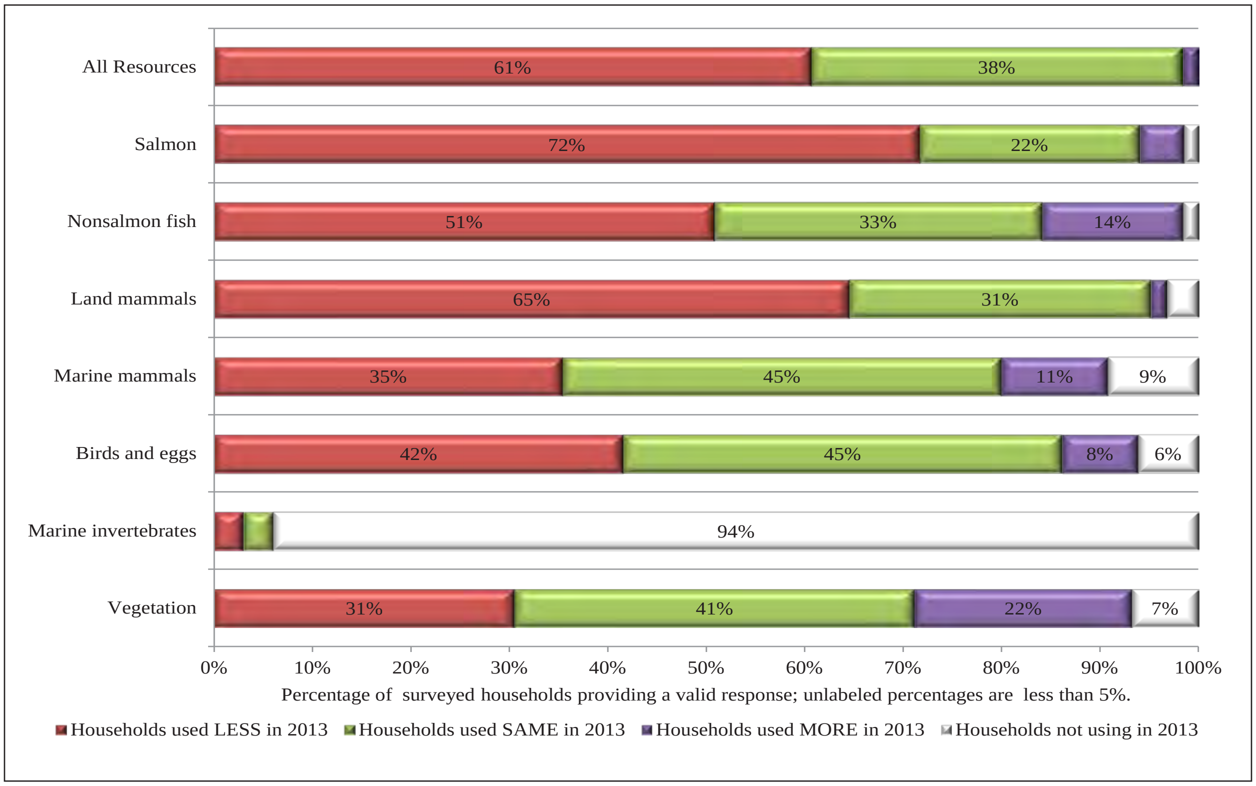


Figure 6-25.–Changes in household use of resources compared to recent years, Tuntutuliak, 2013.

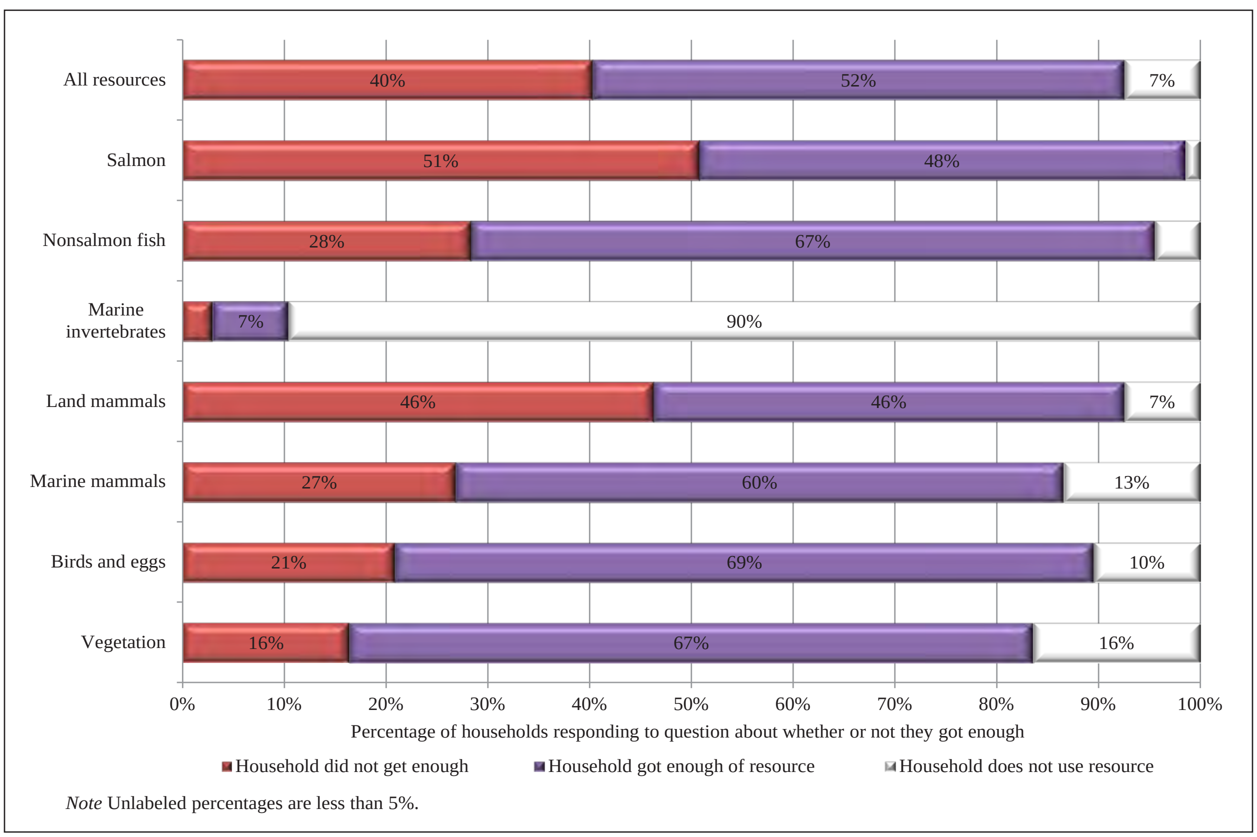


Figure 6-26.–Percentages of households reporting whether they got enough resources, Tuntutulikak, 2013.

Table 6-21.–Reasons for less household uses of resources compared to recent years, Tuntutuliak, 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		Other reasons	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All Resources	61	31	2	6.5%	7	23%	0	0.0%	6	19%	1	3%	6	19%	2	6.5%	3	9.7%	0	0.0%
Salmon	67	44	4	9.1%	7	16%	0	0.0%	1	2%	4	9%	5	11%	0	0.0%	3	6.8%	1	2.3%
Nonsalmon fish	63	26	1	3.8%	4	15%	0	0.0%	3	12%	2	8%	2	8%	2	7.7%	5	19.2%	2	7.7%
Land mammals	62	33	2	6.1%	2	6%	1	3.0%	1	3%	3	9%	6	18%	11	33.3%	4	12.1%	0	0.0%
Marine mammals	65	18	2	11.1%	3	17%	0	0.0%	2	11%	3	17%	5	28%	0	0.0%	3	16.7%	1	5.6%
Birds and eggs	65	20	1	5.0%	3	15%	1	5.0%	1	5%	2	10%	7	35%	1	5.0%	2	10.0%	1	5.0%
Marine invertebrates	66	1	0	0.0%	1	100%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	59	16	5	31.3%	1	6%	1	6.3%	0	0%	1	6%	1	6%	0	0.0%	4	25.0%	2	12.5%

-continued-

Table 6-21.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Working/no time		Regulations		Small/diseased animals		Did not get enough		Did not need		Did not give any away		Equipment/fuel expense		Used other resources		Competition	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All Resources	61	31	2	6%	8	25.8%	0	0.0%	1	3.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	3.2%
Salmon	67	44	1	2%	28	63.6%	0	0.0%	1	2.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	63	26	3	12%	3	11.5%	0	0.0%	1	3.8%	1	3.8%	0	0.0%	0	0.0%	1	3.8%	0	0.0%
Land mammals	62	33	1	3%	4	12.1%	0	0.0%	0	0.0%	2	6.1%	0	0.0%	0	0.0%	0	0.0%	1	3.0%
Marine mammals	65	18	1	6%	0	0.0%	0	0.0%	1	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	65	20	2	10%	0	0.0%	0	0.0%	0	0.0%	1	5.0%	0	0.0%	0	0.0%	0	0.0%	2	10.0%
Marine invertebrates	66	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%
Vegetation	59	16	1	6%	1	6.3%	0	0.0%	0	0.0%	1	6.3%	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 6-22.–Reasons for more household uses of resources, Tuntutuliak, 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
All Resources	61	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	67	3	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	63	8	1	12.5%	1	12.5%	0	0.0%	1	12.5%	0	0.0%	2	25.0%	0	0.0%
Land mammals	62	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	65	6	0	0.0%	0	0.0%	0	0.0%	2	33.3%	1	16.7%	2	33.3%	0	0.0%
Birds and eggs	65	5	0	0.0%	0	0.0%	0	0.0%	3	60.0%	0	0.0%	2	40.0%	0	0.0%
Marine invertebrates	66	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	59	12	4	33.3%	0	0.0%	4	33.3%	1	8.3%	0	0.0%	3	25.0%	0	0.0%

-continued-

Table 6-22.–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		Substituted for unavailable resource	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All Resources	61	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Salmon	67	3	0	0.0%	1	33.3%	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	63	8	1	12.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	12.5%	1	12.5%
Land mammals	62	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%
Marine mammals	65	6	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	16.7%
Birds and eggs	65	5	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	66	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	59	12	0	0.0%	0	0.0%	0	0.0%	1	8.3%	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 use.

Table 6-23.–Reported impact to households that did not get enough of a resource, Tuntutuliak, 2013.

		Households not getting enough _______ .				Impact to those not getting enough ______ .									
	Sample	Valid responses[a]		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	67	62	92.5%	27	43.5%	4	14.8%	1	3.7%	6	22.2%	9	33.3%	7	25.9%
Salmon	67	66	98.5%	34	51.5%	3	8.8%	1	2.9%	6	17.6%	13	38.2%	11	32.4%
Nonsalmon fish	67	64	95.5%	19	29.7%	1	5.3%	0	0.0%	7	36.8%	9	47.4%	2	10.5%
Marine invertebrates	67	7	10.4%	2	28.6%	0	0.0%	0	0.0%	2	100.0%	0	0.0%	0	0.0%
Land mammals	67	62	92.5%	31	50.0%	3	9.7%	0	0.0%	8	25.8%	10	32.3%	10	32.3%
Marine mammals	67	58	86.6%	18	31.0%	1	5.6%	0	0.0%	5	27.8%	6	33.3%	6	33.3%
Birds and eggs	67	60	89.6%	14	23.3%	0	0.0%	3	21.4%	5	35.7%	5	35.7%	1	7.1%
Vegetation	67	56	83.6%	11	19.6%	0	0.0%	0	0.0%	6	54.5%	5	45.5%	0	0.0%

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.

Table 6-24.–Things households reported doing differently as the result of not getting enough of a resource, Tuntutuliak, 2013.

Resource category	Valid responses[a]	Bought/bartered		Used more commercial foods		Replaced with other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	20	0	0.0%	16	80.0%	2	10.0%	0	0.0%	1	5.0%
Salmon	25	1	4.0%	13	52.0%	5	20.0%	0	0.0%	3	12.0%
Nonsalmon fish	10	0	0.0%	9	90.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	2	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	28	0	0.0%	22	78.6%	1	3.6%	1	3.6%	1	3.6%
Marine mammals	12	0	0.0%	7	58.3%	0	0.0%	1	8.3%	0	0.0%
Birds and eggs	10	0	0.0%	10	100.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	10	0	0.0%	9	90.0%	0	0.0%	0	0.0%	0	0.0%

-continued-

Table 6-24.–Continued.

Resource category	Valid responses[a]	Increased effort to harvest		Got a job		Obtained food from other sources		Got public assistance		Conserved resource		Other	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	20	1	5.0%	0	0.0%	0	0.0%	0	0.0%	1	5.0%	0	0.0%
Salmon	25	1	4.0%	1	4.0%	0	0.0%	0	0.0%	1	4.0%	2	8.0%
Nonsalmon fish	10	0	0.0%	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	28	2	7.1%	1	3.6%	1	3.6%	1	3.6%	0	0.0%	1	3.6%
Marine mammals	12	0	0.0%	0	0.0%	1	8.3%	0	0.0%	1	8.3%	2	16.7%
Birds and eggs	10	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	10	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	10.0%	0	0.0%

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.

Table 6-25.–Resources of which households reported needing more, Tuntutuliak, 2013.

Resource	Households needing	Percentage of households[a]
All resources	9	18.4%
Fish	3	6.1%
Salmon	11	22.4%
Chum salmon	13	26.5%
Coho salmon	6	12.2%
Chinook salmon	28	57.1%
Sockeye salmon	11	22.4%
Nonsalmon fish	3	6.1%
Smelt sp.	3	6.1%
Saffron cod	1	2.0%
Alaska blackfish	1	2.0%
Burbot	2	4.1%
Northern pike	4	8.2%
Whitefishes	9	18.4%
Broad whitefish	1	2.0%
Humpback whitefish	1	2.0%
Land mammals	2	4.1%
Large land mammals	4	8.2%
Caribou	16	32.7%
Moose	30	61.2%
Muskox	1	2.0%
Beaver	1	2.0%
Snowshoe hare	1	2.0%
River (land) otter	3	6.1%
Mink	2	4.1%
Marine mammals	5	10.2%
Seal	6	12.2%
Bearded seal	6	12.2%
Ringed seal	4	8.2%
Spotted seal	3	6.1%
Unknown seal oil	3	6.1%
Walrus	3	6.1%
Birds and eggs	8	16.3%
Ducks	2	4.1%
Geese	3	6.1%
White-fronted goose	1	2.0%
Sandhill crane	2	4.1%
Ptarmigan sp.	1	2.0%
Bird eggs	1	2.0%
Gull eggs	1	2.0%
Marine invertebrates	2	4.1%
Vegetation	1	2.0%
Berries	6	12.2%
Crowberry	2	4.1%
Cloudberry	5	10.2%
Salmonberry	1	2.0%
Plants, greens, and	3	6.1%
Wood	1	2.0%
Unknown	4	8.2%

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

a. Calculated using only households responding to needing at least 1 resource (n=49).

6-25). However, nearly as many reported that they used less, mostly due to lack of effort (Table 6-21; Figure 6-25). Still, the majority (69%) reported that they got enough of these resources (Figure 6-26).

Lastly, 41% of respondents said that they used about the same amount of vegetation as in recent years, and the majority of respondents (67%) reported that they got enough vegetation (figures 6-25 and 6-26).

At the end of the survey, respondents were asked to evaluate their use of all wild resources. Most respondents (61%) said that they used less wild resources in 2013, and 38% said that they used the same amount (Figure 6-25). Reasons respondents gave for using less included, most notably, regulations and less availability of resources.

Harvest Data

Changes in the harvest of resources over time by Tuntutuliak residents can also be discerned through comparisons with findings from other study years. No other comprehensive harvest survey has been conducted in Tuntutuliak. However, ADF&G has conducted annual salmon harvest surveys in Tuntutuliak for most years since 1960, with survey samples averaging 69% between 1990 and 2008 with a range of 38% to 84%, except 0% in 2008 (Hamazaki 2011). The Division of Subsistence conducted nonsalmon harvest surveys and mapping in Tuntutuliak in 2006 (Ray et al. 2010).

Historical salmon harvest information is displayed in Figure 6-27. Historical Chinook salmon harvests have ranged from as high as 5,019 fish to as low as 1,123 fish, but have averaged 3,604 fish annually. Average chum salmon harvests were fairly similar to Chinook salmon harvests, averaging 3,499 fish. Both coho and sockeye salmon are a later-season fish, and harvest rates are generally less than the other 2 species. Sockeye salmon harvests have averaged 1,645, and coho salmon harvests have averaged 909 fish.

Ray et al. (2010) documented the harvest and use of nonsalmon fish species. The survey found that during a 1-year period, the 2005 to 2006 study years, Tuntutuliak fishers harvested 100,297,273 lb of nonsalmon fish species compared with 40,395 lb documented by this single year study (Ray et al. 2010; Table 6-8). The largest nonsalmon fish species harvests by weight were Alaska blackfish (31,302 lb), northern pike (8,679 lb), and humpback whitefish (4,334 lb). Though northern pike and both species of large whitefish made up large portions of harvest in 2013, only about 3,568 lb of Alaska blackfish were harvested in 2013. In both studies, 97% of the community used nonsalmon fish species.

Income and Cash Employment

The flow of cash in and out of Tuntutuliak constitutes the other half of the mixed economy. This section discusses findings regarding the 2 categories of cash income accessible to Tuntutuliak residents. Earned income is sourced from wages associated with employment in the industry sectors identified below. Other income is received by Tuntutuliak residents through transfer payments from private and public sector institutions.

Local government jobs provided the greatest amount of income to Tuntutuliak residents (33%) in 2013 (Figure 6-28). This was followed by entitlement payments (17%), such as Supplemental Security Income (SSI), public assistance, and food stamps. The service sector, which accounted for 11% of the local economy, included paid jobs such as childcare work, police work, and food and beverage occupations.

Table 6-26 shows the estimated amounts of earned and other income by source. This study estimated the total community income to be $4.0 million. Earned income accounted for 58% of that figure, and other income accounted for 42%. The mean income per household in 2013 was $38,824, and the per capita income was $9,779. The largest industry sector in terms of employment was the local government, which, as mentioned above, provided 33% of the community's income, and also employed 57 people. Agriculture, forestry, and fishing was the second largest employment sector, employing 36 people. However, this sector provided a small fraction of income overall (4%). This study estimated the median income to be $26,351, compared to $35,972 median income estimated by the American Community Survey (Table 6-27). Both estimates are well below the median income of all of Alaska, which is approximately $69,014.

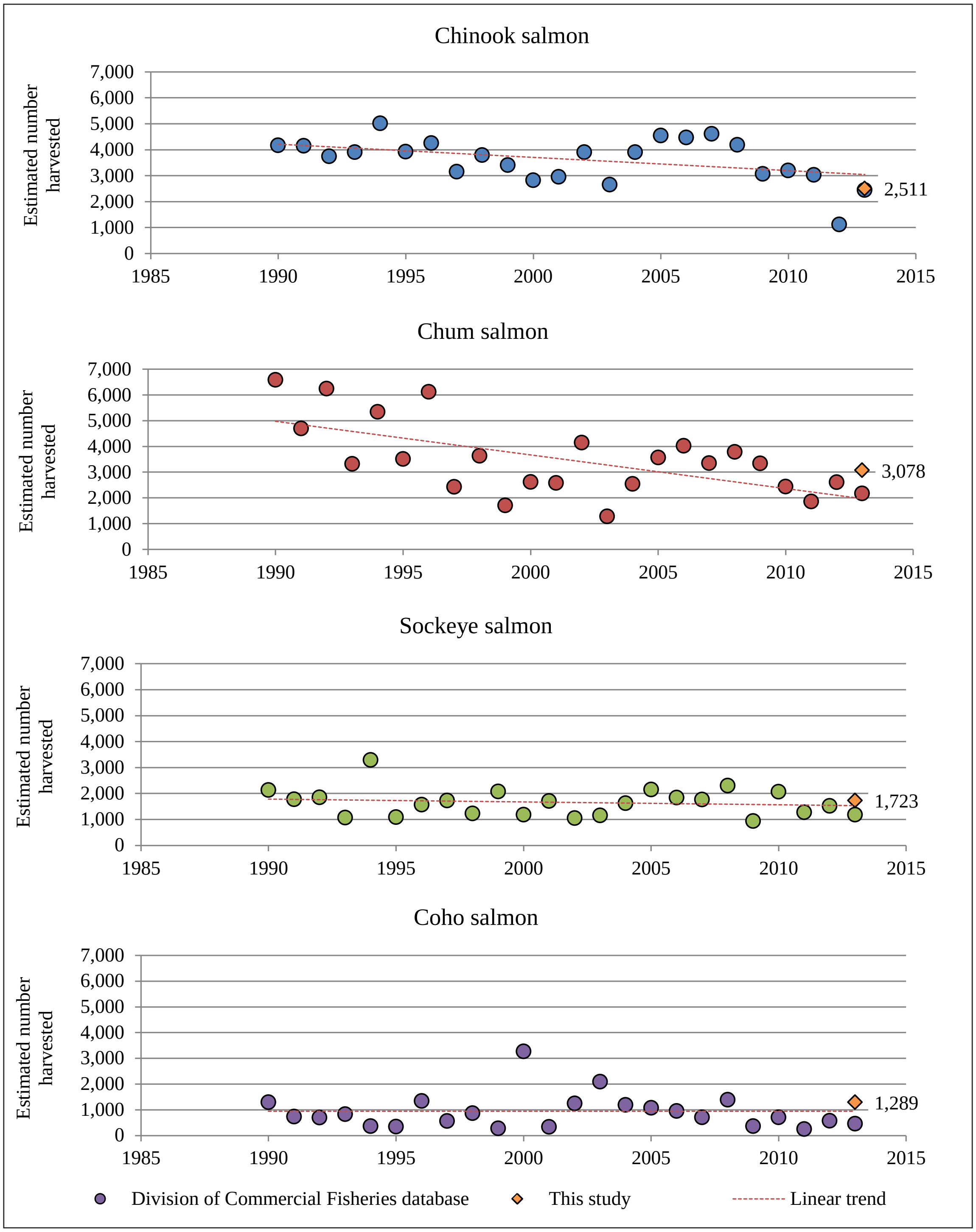


Figure 6-27.–Estimated numbers of Chinook, chum, sockeye, and coho salmon harvested, Tuntutuliak, 1990 –2013.

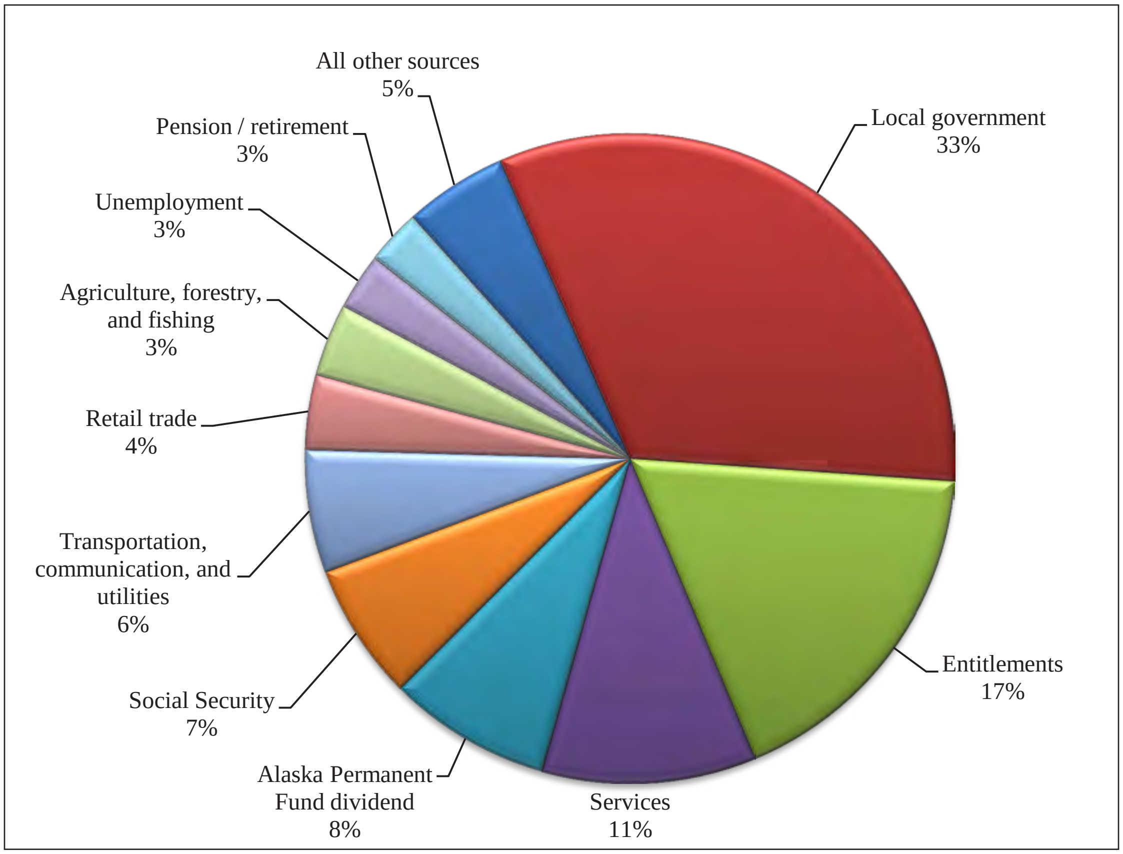


Figure 6-28.–Top income sources, Tuntutuliak, 2013.

A total of 161 jobs, employing 136 individuals, were documented by this study. (Table 6-28). Though this may seem like a large number of jobs for a small community, less than one-half of these jobs were full time (Table 6-29). Many were, in fact, on-call or occasional employment. Only about 31% of the 136 employed adults were employed year round (Table 6-30). Employed adults were employed a mean of 7.3 months.

Food Security

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

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

Table 6-26.–Estimated earned and other income, Tuntutuliak, 2013.

Income source	Number of people	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government	56.7	45.7	$1,318,160	$737,675 – $2,237,125	$12,675	32.6%
Services	22.1	18.9	$430,671	$196,891 – $830,022	$4,141	10.7%
Transportation,	11.0	11.0	$246,398	$73,248 – $506,633	$2,369	6.1%
Retail trade	18.9	18.9	$150,024	$34,011 – $317,232	$1,443	3.7%
Agriculture, forestry, and fishing	36.2	28.4	$146,986	$64,816 – $251,990	$1,413	3.6%
Federal government	1.6	1.6	$40,425	$36,731 – $43,452	$389	1.0%
Manufacturing	4.7	4.7	$5,855	$436 – $15,102	$56	0.1%
Other employment	1.6	1.6	$279	$253 – $317	$3	0.0%
Earned income subtotal	**129.2**	**75.6**	**$2,338,797**	**$1,596,215 – $3,269,281**	**$22,488**	**57.9%**
Other income						
Food stamps		49.7	$526,726	$361,731 – $708,988	$5,065	13.0%
Alaska Permanent Fund dividend		96.2	$328,609	$272,418 – $387,284	$3,160	8.1%
Social Security		29.5	$275,758	$141,402 – $437,669	$2,652	6.8%
Unemployment		23.6	$113,278	$50,080 – $219,035	$1,089	2.8%
Pension / retirement		10.9	$110,290	$29,281 – $225,623	$1,060	2.7%
Supplemental Security Income		15.5	$73,204	$31,479 – $135,231	$704	1.8%
TANF (Temporary Assistance for Needy Families)		9.3	$70,053	$17,506 – $140,443	$674	1.7%
Native corporation dividend		70.2	$50,821	$36,418 – $71,271	$489	1.3%
Adult public assistance (OAA, APD)		10.9	$40,029	$13,486 – $74,712	$385	1.0%
Disability		1.6	$39,116	$25,200 – $78,233	$376	1.0%
Heating assistance		31.0	$24,239	$14,006 – $39,325	$233	0.6%
CITGO fuel voucher		52.8	$18,250	$11,665 – $25,845	$175	0.5%
Longevity bonus		7.8	$14,436	$3,260 – $28,872	$139	0.4%
Child support		3.1	$9,438	$6,080 – $27,257	$91	0.2%
Other		1.6	$4,657	$3,000 – $9,313	$45	0.1%
Workers' compensation / insurance		0.0	$0	$0 – $0	$0	0.0%
Veteran disability		0.0	$0	$0 – $0	$0	0.0%
Foster care		0.0	$0	$0 – $0	$0	0.0%
Meeting honoraria		0.0	$0	$0 – $0	$0	0.0%
Other income subtotal		**97.8**	**$1,698,905**	**$1,386,659 – $2,058,988**	**$16,336**	**42.1%**
Community income total			**$4,037,702**	**$3,324,895 – $4,894,617**	**$38,824**	**100.0%**

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

Table 6-27.–Comparison of median income estimates, Tuntutuliak, 2013.

Data source	Median[a]	Range[b,c]
2013 Division of Subsistence estimate	$26,351	$18,785–$36,850
2008–2012 ACS (Tuntutuliak CDP)	$35,972	$32,246–$39,698
2008–2012 ACS (All Alaska)	$69,014	$68,221–$69,807

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

a. Division of Subsistence 2013 estimate does not include categories of income excluded by the 2008–2012 ACS median estimate including food stamps, housing assistance, and one-time payments.

b. Range is a 95% confidence interval of the estimated median.

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

Table 6-28.–Employment by industry, Tuntutuliak, 2013.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**160.7**	**75.6**	**135.8**	
Federal government	**1.0%**	**2.1%**	**1.2%**	**1.7%**
Technologists and technicians, except health	1.0%	2.1%	1.2%	1.7%
Local government, including tribal	**37.1%**	**60.4%**	**43.9%**	**56.4%**
Executive, administrative, and managerial	1.0%	2.1%	1.2%	0.4%
Teachers, librarians, and counselors	10.3%	16.7%	12.2%	31.1%
Writers, artists, entertainers, and athletes	1.0%	2.1%	1.2%	0.0%
Marketing and sales occupations	1.0%	2.1%	1.2%	0.2%
Administrative support occupations, including clerical	5.2%	10.4%	6.1%	7.1%
Service occupations	11.3%	20.8%	13.4%	7.5%
Mechanics and repairers	1.0%	2.1%	1.2%	1.4%
Handlers, equipment cleaners, helpers, and laborers	6.2%	12.5%	7.3%	8.5%
Agriculture, forestry, and fishing	**23.7%**	**37.5%**	**28.0%**	**6.3%**
Service occupations	1.0%	2.1%	1.2%	0.1%
Agricultural, forestry, and fishing occupations	22.7%	35.4%	26.8%	6.2%
Manufacturing	**3.1%**	**6.3%**	**3.7%**	**0.3%**
Writers, artists, entertainers, and athletes	3.1%	6.3%	3.7%	0.3%
Transportation, communication, and utilities	**7.2%**	**14.6%**	**8.5%**	**10.5%**
Executive, administrative, and managerial	1.0%	2.1%	1.2%	2.4%
Technologists and technicians, except health	2.1%	4.2%	2.4%	4.3%
Service occupations	1.0%	2.1%	1.2%	1.2%
Precision production occupations	1.0%	2.1%	1.2%	0.5%
Transportation and material moving occupations	2.1%	4.2%	2.4%	2.2%
Retail trade	**12.4%**	**25.0%**	**14.6%**	**6.4%**
Executive, administrative, and managerial	3.1%	6.3%	3.7%	4.3%
Marketing and sales occupations	6.2%	12.5%	7.3%	1.4%
Administrative support occupations, including clerical	1.0%	2.1%	1.2%	0.4%
Service occupations	1.0%	2.1%	1.2%	0.2%
Handlers, equipment cleaners, helpers, and laborers	1.0%	2.1%	1.2%	0.1%
Services	**14.4%**	**25.0%**	**17.1%**	**18.4%**
Executive, administrative, and managerial	2.1%	4.2%	2.4%	1.6%
Social scientists, social workers, religious workers, and	1.0%	2.1%	1.2%	1.4%
Teachers, librarians, and counselors	1.0%	2.1%	1.2%	3.7%
Health technologists and technicians	3.1%	6.3%	3.7%	3.1%
Administrative support occupations, including clerical	3.1%	6.3%	3.7%	6.9%
Service occupations	2.1%	4.2%	2.4%	0.7%
Construction and extractive occupations	1.0%	2.1%	1.2%	0.3%
Handlers, equipment cleaners, helpers, and laborers	1.0%	2.1%	1.2%	0.7%
Industry not indicated	**1.0%**	**2.1%**	**1.2%**	**0.0%**
Handlers, equipment cleaners, helpers, and laborers	1.0%	2.1%	1.2%	0.0%

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

Table 6-29.–Reported job schedules, Tuntutuliak, 2013.

Schedule	Jobs		Employed persons		Employed	
	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	71.2	44.3%	71.2	52.4%	55.2	72.9%
Part-time	24.8	15.5%	24.8	18.3%	15.8	20.8%
Shift	1.7	1.0%	1.7	1.2%	1.6	2.1%
On-call (occasional)	59.6	37.1%	53.0	39.0%	36.2	47.9%
Part-time shift	0.0	0.0%	0.0	0.0%	0.0	0.0%
Schedule not reported	3.3	2.1%	3.3	2.4%	1.6	2.1%

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

Table 6-30.–Employment characteristics, Tuntutuliak, 2013.

Characteristic	Community
	Tuntutuliak
All adults	
Number	245.3
Mean weeks employed	17.5
Employed adults	
Number	135.8
Percentage	55.4%
Jobs	
Number	160.7
Mean	1.2
Minimum	1
Maximum	2
Months employed	
Mean	7.3
Minimum	0
Maximum	12
Percentage employed year-round	30.9%
Mean weeks employed	31.5
Households	
Number	104
Employed	
Number	75.6
Percentage	72.7%
Jobs per employed household	
Mean	1.5
Minimum	1
Maximum	6
Employed adults	
Mean	
Employed households	1.8
Total households	1.3
Minimum	1
Maximum	4
Mean person-weeks of employment	39.8

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

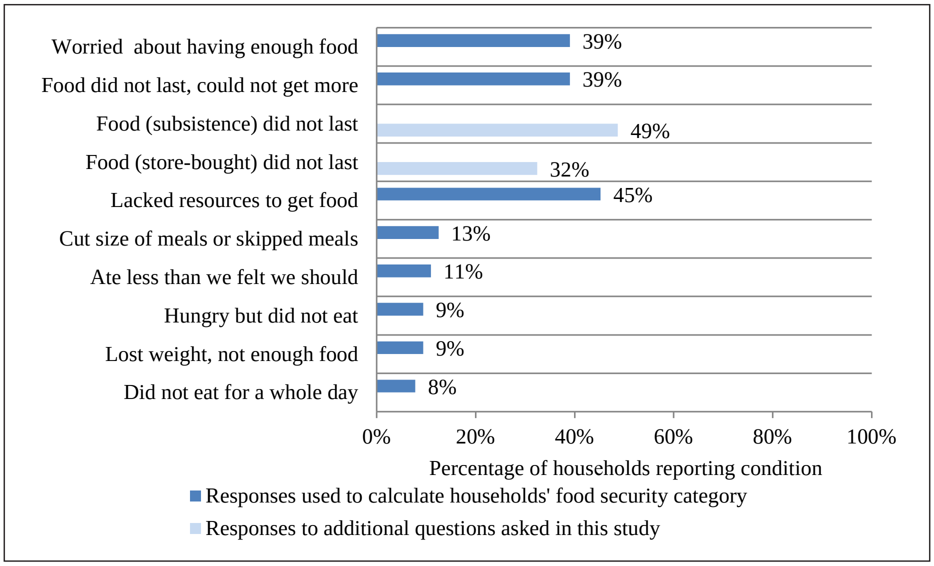


Figure 6-29.–Responses to questions about food insecure conditions, Tuntutuliak, 2013.

Core questions and responses from Tuntutuliak residents are summarized in Figure 6-29. Food security results for surveys for Tuntutuliak, the state of Alaska, and the United States are summarized in Figure 6-30. Approximately 39% of Tuntutuliak households reported that they worried about having enough food at some point during the year (Figure 6-29). Similarly, 39% reported that they found that at times their food did not last, and that they couldn't get more. More households identified this as an issue with subsistence foods rather than store-bought foods. Lastly, many households (45%) said that they lacked the material resources to get food (Figure 6-30). These included items such as guns, boats, cash, or fishing gear. Eighty-one percent of the households in Tuntutuliak were classified as food secure as compared to nearly 88% of households statewide. Nearly 9% of Tuntutuliak households were classified as having very low food security. This percentage is nearly twice that of households statewide.

Figure 6-31 portrays the mean number of food insecure conditions per household by food security category by month. Food secure households (both high and marginal) did not link seasonality to conditions of food insecurity. Households with low food security reported that insecurity peaked during November and December and gradually decreased over the course of spring. Households with very low food security consistently reported more food insecurity conditions all year, only lessening slightly in spring and early summer.

Figure 6-32 shows the months during which households reported foods not lasting. Many respondents struggled with the topic of food security, particularly the topic of their food lasting. Respondents reported that the condition worsens as the year progresses, peaking in November and December. Store-bought food is generally more attainable than

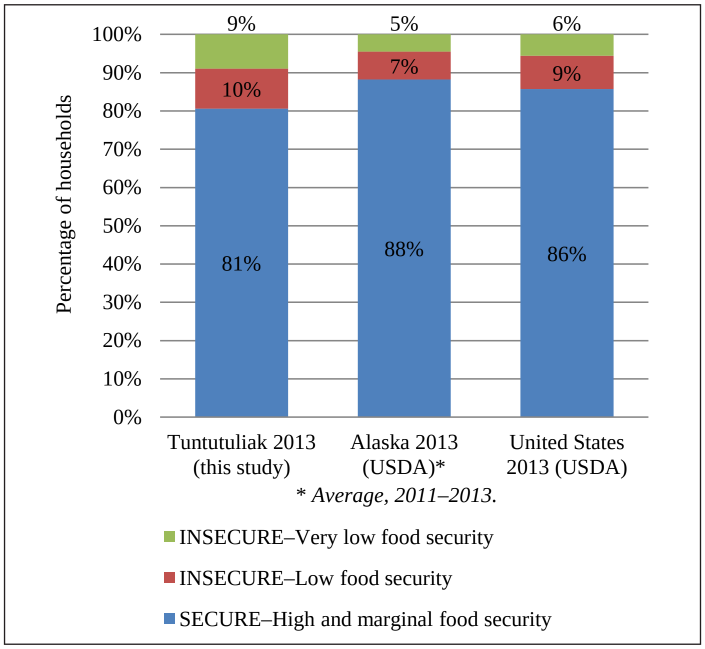


Figure 6-30.–Food security categories, Tuntutuliak, 2013.

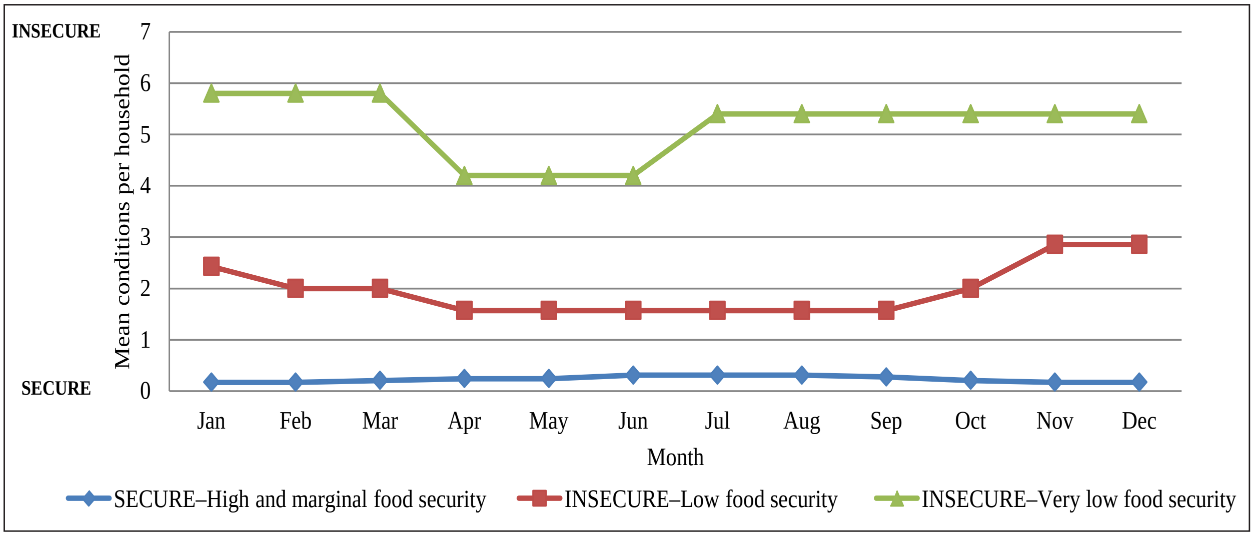


Figure 6-31.–Mean number of food insecure conditions by month and household category, Tuntutuliak, 2013.

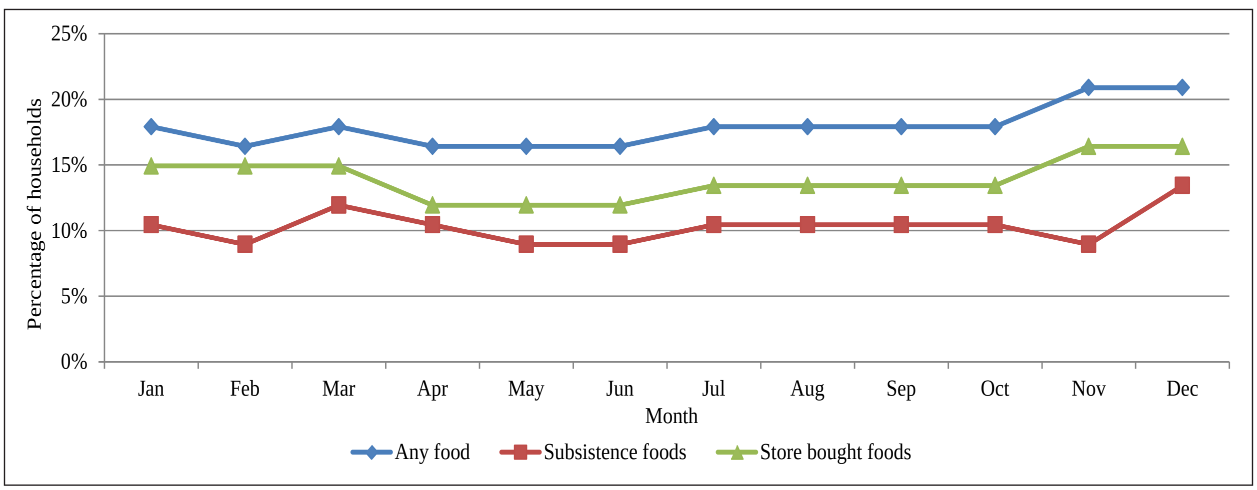


Figure 6-32.–Comparison of months when subsistence, store-bought, and any food did not last, Tuntutuliak, 2013.

subsistence foods for most households, although households reporting the store-bought food did not last reported that this was a chronic issue throughout the year. Subsistence food is generally less attainable, in that more households said that it did not last (Figure 6-29). However, for the many households that indicated that this was a condition, most said that this condition only occurs sporadically throughout the year (Figure 6-32).

Sharing of Wild Resources

Household Specialization in Resource Harvesting

Previous studies (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 6-33, for the 2013 study year in Tuntutuliak, about 71% of the harvests of wild resources as estimated in usable pounds were harvested by 33% 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 Tuntutuliak and the other study communities.

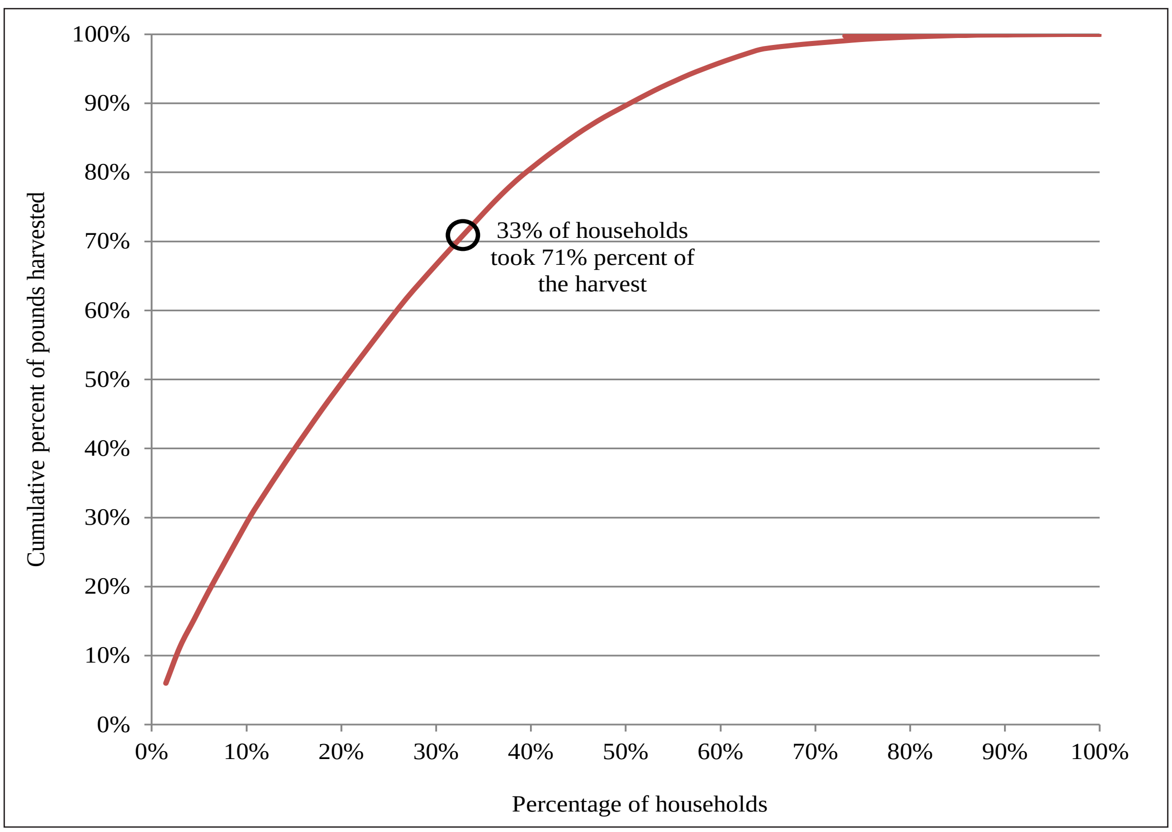


Figure 6-33.–Household harvest specialization, Tuntutuliak, 2013.

Wild Food Networks

Although subsistence harvest surveys collect information based on individual households, in reality, much of the production (harvest and processing) of subsistence foods is achieved by households within a community that work cooperatively. This cooperation is often organized based on kinship in the manner of traditional Yupik communities. The organization of the contemporary mixed market–subsistence economies that are predominant in rural Alaska communities has been documented ethnographically by numerous researchers.

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

Figure 6-34 shows the flow of wild foods into surveyed households from other Tuntutuliak households and communities in Alaska. Symbol shapes depict the type of household; colors show the age of heads of household, and size indicates the amount of its subsistence harvest in 2013 by edible weight. Arrows show the direction of food from one household to another, with the weight of lines showing the number of resources. The position of a household relative to the center of the figure shows how tied it was to other households in Tuntutuliak. The figure is a partial representation of sharing, trade, and barter in 2013 because it only documents the food flows into the 67 surveyed households.[9]

Previous studies have found a positive association between the ages of household heads and the amount of subsistence foods harvested. Household characteristics associated with higher food production include those households with multiple working-age males, involvement with commercial fishing, and higher wage incomes. Characteristics common to lower producing households included female household heads, age of elders, non-Native household heads, and single-person households (Magdanz et al. 2009; Wolfe et al. 2010). Household "developmental cycles" (i.e., the relative age or "maturity" of household heads and number of productive household members) have also been associated with harvest levels.

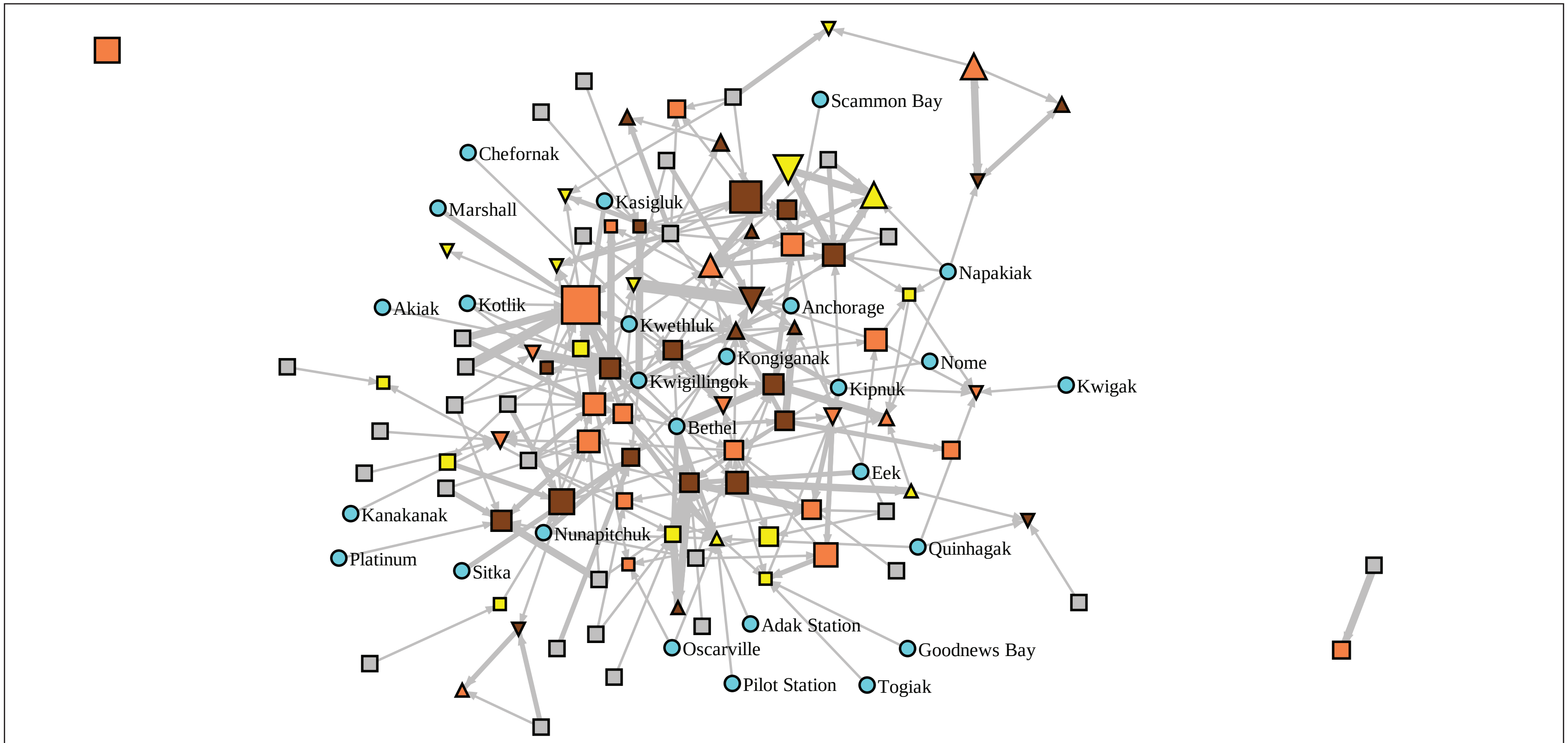
The surveyed households in Tuntutuliak reported an average of 7 instances of support from other households or communities (Figure 6-34). Only 1 household reported receiving no support from other households. Notable communities that provided support to the local subsistence economy were Kwigillingok (38 instances), Bethel (36), and Kipnuk (14), among others. One of the highest-producing households in Tuntutuliak in 2013 was middle aged, and the other was mature; both were headed by couples. Both households reported that they received much support from others, and many households, in turn, received support from them.

Local Comments and Concerns

The following is a summary of local comments and concerns expressed by Tuntutuliak respondents. Survey participants often offer additional comments after the survey. Furthermore, key respondents often voiced concerns. 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.

Regulations were the most salient topic introduced by key respondents and other residents. Some respondents questioned the moral right of the State of Alaska to manage fish and wildlife resources in the Y-K Delta, citing thousands of years of Native occupation in the area compared to the relatively recent advent of Western management. Respondents expressed further frustrations with the paperwork burden associated with hunting and fishing and with short seasons that do not provide the flexibility needed to respond to annual ecological variations.

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



LEGEND

	Age of household head (years)			
	< 40	40 to 59	> 59	Unknown
Couple head				
Single female head				
Single male head				

SYMBOLS are scaled by households' total subsistence harvests (in edible pounds). Surveyed households with many sources of goods and services appear near the center of the figure. Households with fewer sources appear around the edges.

Flows of wild foods from source harvesting and processing households to consuming households, as reported by consuming (surveyed) households

Household not surveyed

Household in other community

LINES are scaled by the number of resources harvested and processed by other households for surveyed households. Arrows point from source households to surveyed households. A household's production for itself is not shown.

Figure 6-34.–Wild food harvesting and processing network, Tuntutuliak, 2013.

> Certain times of the year fish texture or quality changes. So do mammals. And our, when we chose to harvest certain species depended on their prime. And today, they'll open—there'll be an opening for something, and that's when it's not at its best. I mean that's not, when, ideally we would want to harvest it. Those are the types of effects that these regulations have. (04292014WTL03)

Most survey respondents simply advocated for more time to harvest salmon and moose.

Despite a generally negative opinion toward regulatory systems, all respondents did express a strong conservation ethic. This ethic was most often conveyed by respondents as their willingness to limit their own harvest to within their needs. Some said that they would be willing to limit themselves further in the interest of conservation, even to go so far as a temporary cessation of harvest. "We have to conserve, you know, this—our resources right now. Instead of getting 'em, well, until they are gone. And, we need to conserve, you know. That's why I'm not going to fish for king salmon this year." (04262014WTL04) Residents agreed that cooperation in management activities was an important component of a contemporary conservation ethic.

Respondents spoke about their concerns toward the proposed Donlin gold mine and its possible effects on fishery resources. Some raised concerns about the possibility of catastrophic failure, pointing out that similar occurrences have happened to mines with similar operational plans. Respondents also postulated that increased barge traffic would change river channels, increase pollution, and affect both returning and out-migrating salmon species. All respondents seem to agree that the mine and its associated activities would come with a great deal of risk directed primarily towards fishery resources and the aquatic habitat. "Donlin is, in my opinion, a very high risk endeavor. I know and have read about other places in the world where mining and accidents have wiped out all fishing in the area" (04262014WTL04).

The topic of Donlin Creek mine was enveloped within the larger theme of economic and social development in the Y-K Delta region. Many older respondents noted, given the advantage of a historical perspective, that Y-K Delta has modernized considerably during their lifetimes. However, given the expansion of modern amenities, many residents acknowledge that they have a tenuous relationship with the cash economy. "Even with westernization, we're still not economically sound. Our lifestyle is still about 70% subsistence today. We work, but it's not enough without subsistence. We would have a hard time without subsistence."

The proposed mine has the potential to transform life on the Kuskokwim River in ways yet unseen. Faced with the prospect of an uncertain future, respondents emphasized what is most presently essential to their lives. As many vouched, and this study confirmed, reliance on wild resources continues to be a quintessential component of life in Tuntutuliak.

Acknowledgements

The author would like to acknowledge the Tuntutuliak Tribal Council and its employees for facilitating this research, the Tuntutuliak School for lodging, and the Tuntutuliak Ravn Alaska agent for rides to and from the airport. Furthermore, this research would have been very difficult without the local research associates who advised, led, and assisted Division of Subsistence staff while in the community. Above all, thank you to the Tuntutuliak household members who invited us into their homes, endured our questions, and offered their thoughts as gifts in good faith.

7. PILOT STATION

Alida Trainor

In April 2014, 5 researchers surveyed 94 of 128 eligible households in Pilot Station (73%). Expanding for 35 unsurveyed households, Pilot Station's estimated total harvest of wild foods between January and December 2013 was 99,145 edible pounds (±15%). The average harvest per household was 775 lb; the average harvest per capita was 158 lb.

A variety of fish species, including both salmon and nonsalmon species, made up 44% of the edible weight harvested by Pilot Station residents. Large land mammals, including moose and black bear, contributed 39% (38,209 lb) to the community harvest. Moose contributed more edible weight than any other single species, a total of 36,766 lb for a per capita harvest of 59 lb.

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

In addition to the comprehensive survey, 5 key respondent interviews were conducted with 6 individuals including an elder, a married couple, and several active hunters. All respondents were actively engaged in hunting, fishing, gathering, or preparing subsistence foods. All had spent the majority of their lives in Pilot Station with some travel away from the community at various times in their lives. By providing a better understanding of the seasonal round, local history, and subsistence activities in the area, the ethnographic interviews contextualize the quantitative harvest and use data collected in the surveys.

Community Background

Pilot Station is a remote Central Yup'ik Eskimo community that is heavily dependent upon a subsistence way of life. It is located on the northwest bank of the Yukon River approximately 430 air miles west of Anchorage and approximately 121 river miles upstream from the mouth of the Yukon River.[2] Pilot Station's nearest neighboring communities are St. Mary's, 11 miles to the west, and Marshall, 26 miles to the east.[3] The townsite is a picturesque village situated on and among small rolling hills and surrounded by tundra and boreal forests (Plate 7-1). Traveling along the Yukon River from the treeless coast, birch and spruce trees regularly line the riverbanks and sloughs just upriver of Pilot Station (Fienup-Riordan 2007:53). The community is located within the Yukon Delta National Wildlife Refuge. It falls within a transitional climate zone, but is slightly more maritime than continental. It averages approximately 60 inches of snowfall and 16 inches of precipitation per year (Valencia 2005). Weather patterns of long, cold winters and shorter, warm summers are the norm. The lower Yukon River is ice-free from mid-June through October.[4]

There are no roads connecting Pilot Station with other communities: access to and from the community is by boat or airplane. Residents use snowmachines in winter to travel to nearby communities on established

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

2. Alaska Department of Fish and Game, Juneau. 2015. Yukon (Pilot) River. Accessed December 10, 2015. http://www.adfg.alaska.gov/index.cfm?adfg=sonar.site_info&site=12

3. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed November 3, 2015. http://commerce.alaska.gov/dcra/DCRAExternal/community. Hereafter referred to as ADCCED n.d.

4. ADCCED n.d.

Plate 7-1.–An aerial photo taken in April 2014 shows the colorful houses of Pilot Station and the boreal forest that surrounds the community.

trails. Summer travel within the community and to nearby areas is done primarily on ATVs. Barges deliver fuel and other bulk supplies during the summer via the Yukon River.[5]

The contemporary community of Pilot Station has been known historically by different names and has been located in several nearby locations. The first written mention of the community appeared in the journal of Russian-American Company employee Petr Korsakovskiy in 1818. In his journal, Korsakovskiy lists Anvychagmiut [Ankachak] as a village along the Kuihpakh [Yukon] River with a Toyon [leader] named Lumaakhumati (Korsakovskiy and Vasilev 1988:64). Ankachak was later moved one-third of a mile upriver to a site located just south of and across Kashunak Slough from the old village of Kurgpallermuit [Kuigpalleq].[6] The Russian priest Iakov Netsvetov visited Kuigpalleq in 1862 and described it as the “winter village of the Kanigmuit settlement” and listed it as having 7 dwellings with 35 people. He also noted nearby Akachak as having 10 dwellings and 20 people (Black 2004). Pratt (2009:149) recorded that Kuigpalleq was ancestral to Pilot Station.

Alaska Native Claims Settlement Act 14(h)(1) records indicate that Calista Corporation applied for Kuigpalleq (and the area around modern day Pilot Station) to receive designation as an historical place due to its involvement in the famous Bow and Arrow Wars between the coastal and Yukon Eskimos (Pratt 2009:150). The application describes Kuigpalleq as an “Old village at the confluence of Kashunak Slough and Yukon River [across the slough from Pilot Station] occupied during the Bow and Arrow War between Yukon and Coastal Eskimos.” According to several historical accounts and current residents of Pilot Station, the Ankachak [Pilot Station]-area people and Chevak-area people periodically fought when the Chevak-area people traveled up the Kashunak River.[7] Funk (2010:536) states that during the wars, “the Qavinarmiut and Qissunamiut, ancestral Chevak villagers, fought the Kuigpagmiut and Unalirmuit, villagers from the area near present-day Pilot Station.”

5. Calista Corporation, Anchorage. 2014. “Pilot Station.” Accessed November 3, 2015.
http://www.calistacorp.com/shareholders/village/pilot-station. Hereafter referred to as Calista Corporation 2014.

6. ADCCED n.d.

7. ADCCED n.d.

Plate 7-2.–Edgar Frances with dance mask at Pilot Station. Steve McCutcheon Collection, University of Alaska Anchorage Museum.

The place name "Pilot Station" was first recorded in 1916 by R.H. Sargent of the U.S. Geological Survey. He noted that local riverboat pilots used the community as a checkpoint when navigating the Yukon River. These local pilots were responsible for the name change, but the exact time of the name change is not clear.[8] The first public school in the community however, was listed as Pilot Station School in 1910 by the Bureau of Indian Affairs (Barnhardt 1985).

Pilot Station residents are known for their adherence to traditional ways. In addition to relying on a subsistence way of life, many Pilot Station residents are bilingual, speaking both Central Yup'ik and English at home, in school, and at work. In 1967, the ceremonial practice of potlatch and dancing was revived after many years' absence (Fienup-Riordan 2007:96–99). Harvesting for and participating in potlatch ceremonies and dancing continues to be an integral part of life and subsistence practices in Pilot Station today (Plate 7-2).

Pilot Station was incorporated as a second-class city in 1969. The community is a federally recognized tribe known as Pilot Station Traditional Village. Pilot Station has a 2,500-foot gravel airstrip, a school, a medical clinic, a water treatment facility, a power plant, a dock, a public safety facility, a volunteer fire department, a post office, and a store (Plate 7-3).[9] One of the oldest structures in the Calista Corporation region is located in Pilot Station. The Transfiguration of Our Lord Church, a Russian Orthodox church, was built in the early 1900s and is listed on the National Park Service's National Register of Historic Places. A Catholic Church, St. Charles Spinola, also serves the community.[10] Subsistence activities and commercial fishing are the mainstays of this community.

The Alaska Department of Fish and Game (ADF&G) runs a sonar test-net fishery site near the community. The Department began sonar monitoring in 1989. The sonar site consists of 2 counting stations located across from one another on both banks of the Yukon River. At each of the stations, a sonar transducer is submerged near the bank. This site was chosen due to its location in a single-channel segment of the Yukon River near Pilot Station where all migrating salmon must pass between the 2 counting stations.[11] Yukon River fisheries managers rely heavily on the sonar estimates at Pilot Station to make in-season management decisions. The timing of subsistence and commercial openings and closures depends on the counts at the Pilot Station sonar site.

8. Calista Corporation 2014.

9. ADCCED n.d.

10. Calista Corporation 2014.

11. Alaska Department of Fish and Game, Juneau. 2015. Yukon (Pilot) River. Accessed December 10, 2015. http://www.adfg.alaska.gov/index.cfm?adfg=sonar.site_info&site=12

Plate 7-3.–Downtown Pilot Station. Most houses in Pilot Station were colorfully repainted by high school students.

Seasonal Round

The harvest of wild foods varies in response to a variety of factors, including fluctuations in animal populations, employment opportunities, changes in local climate, and changes in hunting and fishing regulations. This holds true in Pilot Station, where declines in Chinook salmon abundance have affected harvest patterns, and regulatory changes to the legal allowable gear types have altered who is able to fish. Unseasonably warm weather and limited snowfall, as experienced during the study year, have changed the hunting and trapping patterns of residents. Despite these changes, however, subsistence harvest activities in Pilot Station continue to occur in a patterned seasonal round as they have since historical times. This section discusses contemporary harvest patterns throughout the year. Historic harvest information can be found in a later section.

In April, when the days begin to grow longer and geese begin to fly overhead, Pilot Station residents know spring has come. Migratory birds, including Canada geese, white-fronted geese, mallards, and black scoters are used and harvested by many residents. In general, men and boys hunt birds, while women pluck and prepare the fowl. Stores of salmon are often depleted by early spring, and migratory birds are a welcome change in diet for those who have eaten a lot of fish throughout the winter. A key respondent noted that in addition to hunting migratory birds, "people want to be hunting rabbits. Jackrabbits. Stuff like that. Ptarmigans. Maybe moose…if somebody needs it they are gonna go get it" (040414PQS5). Another respondent agreed, "towards the end of [April] that's when geese and ducks start coming in, right about the end of this month. Fish, moose, bears. Anything they can get home" (040514PQS3). Residents participate in nonsalmon fishing in the spring until there is "enough to put away until we start getting chums" in the summer (040514PQS4). For residents of Pilot Station, spring is a time to replenish food stores and prepare for summer fishing.

For many residents, summer is a special time. Some families in Pilot Station travel to fish camps. One respondent described the transition to camp:

> After the ice is cleared, we gather wood for the winter supply and we fish up the fish camp. Clean it out, get it, you know, takes a lot of work to get a fish camp ready, and we do that as a family. (040414PQS1)

Once camp is ready, "we start cutting fish in June, July and August. The August fall chum, we try and make strips" (040414PQS1).

Despite regulatory changes and restrictions on subsistence fishing, the significance of Chinook salmon in the lives of Pilot Station residents remains unchanged.[12] An elder respondent fondly recalled, "I like my earliest memories—watching my mom and my grandma cutting fish, king salmon. Making strips. Salt fish, dried fish" (0414PQS2). Salmon are considered a valuable food source, a cultural mainstay, and are a frequently shared and bartered good.

In addition to Chinook salmon, residents have access to abundant summer chum salmon. Subsistence fishing for summer chum salmon is often done simultaneously with commercial fishing, a common and long-standing practice among Pilot Station fishers. Ethnographic respondents who participated in the commercial fishery described removing summer chum salmon from their commercial catch to share with their family, friends, and neighbors (040414PQS5; 040414PQS1). Profit from commercial fishing is often used to finance the gear and fuel needed for subsistence fishing (040414PQS1).

In fall time, families spend time together picking cloudberries, locally known as salmonberries, and blueberries in the hills surrounding Pilot Station. In September, many hunters travel inland to search of moose, while others travel to the coast to hunt beluga whales and seals. A respondent explains, "Early fall, that's when they start doing their berry picking. Whale hunting for a few of us…and moose hunting" (040414PQS5). A high abundance of moose in the area prompted the respondent to add that, although moose hunting primarily takes place in September, it is "almost to the point where it is almost year round" (040414PQS5).

As fall comes to a close, residents prepare for winter. Pilot Station residents have the opportunity to take advantage of abundant nonsalmon species including northern pike, burbot, sheefish and other whitefishes that are available year round. Some residents set gillnets under the ice to harvest nonsalmon species throughout the winter. Others construct fish traps out of wood and chicken wire to submerge under the ice. Nets and traps are often set in the Yukon River near town, but some nonsalmon fishing also occurs in nearby lakes. Residents of all ages enjoy jigging for northern pike during the winter months. In addition to fishing, some residents spend time tending a trapline, which targets fur-bearing animals including wolverines, foxes, lynx, and marten. Some residents target Alaska hare, a popular food source locally known as jackrabbit, during the late winter months. Recently however, Alaska hare has become more difficult to track during the winter, because there is less snow. Respondents said it is more difficult to find them and nearly impossible to travel long distances in search of them without the use of a snowmachine.

In summary, regulatory actions, resource availability, and climate changes have impacted the harvest patterns of wild foods by Pilot Station residents. The seasonal nature of these harvests, however, has not changed. Residents continue to rely on wild foods throughout the year.

Population Estimates and Demographic Information

Four hundred sixty residents lived in the 94 surveyed households in Pilot Station in 2013 (Table 7-1). Expanding for unsurveyed households, the estimated population of 633 people includes 318 males (50%) and 315 females (50%); 613 were Alaska Native (97%; tables 7-1, 7-2, and 7-3).

---

12. Chinook salmon, a primary species used by residents, begin passing Pilot Station in early June. In an effort to conserve Chinook salmon, the Alaska Department of Fish and Game (ADF&G) prohibited fishing on the first pulse of fish in 2009, 2011, 2012, and 2013. The Chinook salmon run in 2013 was weaker than expected, however, and ADF&G management decided to close subsistence fishing on all 4 pulses of Chinook salmon. Limited opportunity was provided to subsistence fishers between pulses, but fishers were encouraged to focus on summer chum salmon. The extremely weak run of Chinook salmon coupled with unprecedented conservation efforts altered the traditional seasonal round and harvest strategies of Pilot Station residents. Historic harvest patterns and the significance of Chinook salmon to Pilot Station residents are discussed in later sections.

Table 7-1.–Sample achievement, Pilot Station, 2013.

Sample information	Pilot Station
Number of dwelling units	136
Interview goal	100%
Households surveyed	94
Households failed to be contacted	12
Households declined to be surveyed	23
Households moved or occupied by nonresident	3
Total households attempted to be surveyed	117
Refusal rate	19.7%
Final estimate of permanent households	128
Percentage of total households surveyed	73.4%
Interview weighting factor	1.4
Sampled population	460
Estimated population	626.4

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

Household sizes ranged from 1 to 11 occupants with an average of 5 residents per household (Table 7-4). During the survey period, the median age was 22; the oldest resident was 88, and the youngest was less than 1. The average length of residency was 25 years. The majority of residents were born in the immediate area: 82% of household heads reported Pilot Station or the nearby community of Pitkas Point (3%) as their birthplace (Table 7-5). The remainder of respondents identified birthplaces in the Yukon-Kuskokwim Delta. The birthplaces of the remaining residents were similar to that of household heads. Pilot Station was the birthplace for 91% of the total population (Table 7-6). Two percent of the population reported birthplaces outside of Alaska.

Figure 7-1 shows the historic population estimates between 1970 and 2013. The figure compares this study's population estimate with the estimates from the U.S. Census and the Alaska Department of Labor. With the exception of decennial U.S. census years, the Alaska Department of Labor estimates population annually. In 2010 the U.S. Census Bureau reported an estimated 568 residents in Pilot Station (Table 7-2). The American Community Survey estimate for 2007–2011 was 510 residents. In 2012, the Alaska Department of Labor estimated a population of 596. This study's estimate of 633 shows a trend of steadily increasing population since 1970, the first year that population data are available. In 1970, 290 people lived in Pilot Station. By 2013, the population had more than doubled.

Figure 7-2 is a population profile depicting the number of males and females in age groups from 0 to 88. The sex distribution is relatively equal in all age cohorts. The population profile shows that more than one-half (55%) of the population is under the age of 25, and that only 33 residents are over the age of 65 (5%; Table 7-3). Out of the 633 residents, 210 were under the age of 15 (33% of the total population). The high percentage of children indicates a growing population. Some community members reported to the ADF&G Division of Subsistence researchers that, in addition to a recent rise in births, young families are moving back to Pilot Station after having a challenging time away from the community in cities such as Fairbanks and Anchorage. Residents cited a competitive job market and limited social networks in large cities as factors in the return of young people and their families.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Table D-5, found in Appendix D of this report, and Figure 7-3 show the expanded levels of individual participation in the harvest and processing of wild resources by all Pilot Station residents in 2013.[13] Overall, 59% of people attempted to harvest resources or reported some participation in processing wild foods. In all resource categories except plants, a higher percentage of people processed wild foods than the percentage of

13. Percentages are calculated based on valid responses, which excludes from the sample missing data for that category.

Table 7-2.–Population estimates, Pilot Station, 2010 and 2013.

	Census (2010)	5-year American Community Survey (2007–2011)	This study (2013)
Total population			
Households	121	115	128.0
Population	568	510	626.4
Alaska Native population			
Population	558	495	606.0
Percentage	98.2%	97.1%	96.7%

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.

Table 7-3.–Population profile, Pilot Station, 2013.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	31.7	10.0%	10.0%	38.5	12.2%	12.2%	70.2	11.1%	11.1%
5–9	35.8	11.3%	21.2%	37.2	11.8%	24.0%	72.9	11.5%	22.6%
10–14	35.8	11.3%	32.5%	31.7	10.0%	34.1%	67.4	10.7%	33.3%
15–19	28.9	9.1%	41.6%	28.9	9.2%	43.2%	57.8	9.1%	42.4%
20–24	42.7	13.4%	55.0%	35.8	11.4%	54.6%	78.5	12.4%	54.8%
25–29	27.5	8.7%	63.6%	28.9	9.2%	63.8%	56.4	8.9%	63.7%
30–34	17.9	5.6%	69.3%	9.6	3.1%	66.8%	27.5	4.3%	68.0%
35–39	12.4	3.9%	73.2%	13.8	4.4%	71.2%	26.2	4.1%	72.2%
40–44	11.0	3.5%	76.6%	9.6	3.1%	74.2%	20.6	3.3%	75.4%
45–49	20.6	6.5%	83.1%	13.8	4.4%	78.6%	34.4	5.4%	80.9%
50–54	17.9	5.6%	88.7%	19.3	6.1%	84.7%	37.2	5.9%	86.7%
55–59	11.0	3.5%	92.2%	13.8	4.4%	89.1%	24.8	3.9%	90.7%
60–64	8.3	2.6%	94.8%	9.6	3.1%	92.1%	17.9	2.8%	93.5%
65–69	5.5	1.7%	96.5%	4.1	1.3%	93.4%	9.6	1.5%	95.0%
70–74	1.4	0.4%	97.0%	5.5	1.7%	95.2%	6.9	1.1%	96.1%
75–79	1.4	0.4%	97.4%	4.1	1.3%	96.5%	5.5	0.9%	97.0%
80–84	2.8	0.9%	98.3%	5.5	1.7%	98.3%	8.3	1.3%	98.3%
85–89	1.4	0.4%	98.7%	1.4	0.4%	98.7%	2.8	0.4%	98.7%
90–94	0.0	0.0%	98.7%	0.0	0.0%	98.7%	0.0	0.0%	98.7%
95–99	0.0	0.0%	98.7%	0.0	0.0%	98.7%	0.0	0.0%	98.7%
100–104	0.0	0.0%	98.7%	0.0	0.0%	98.7%	0.0	0.0%	98.7%
Missing	4.1	1.3%	100.0%	4.1	1.3%	100.0%	8.3	1.3%	100.0%
Total	**317.9**	**100.0%**	**100.0%**	**315.2**	**100.0%**	**100.0%**	**633.1**	**100.0%**	**100.0%**

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

Table 7-4.–Demographic characteristics, Pilot Station, 2013.

Characteristics	Community Pilot Station
Household size	
Mean	4.9
Minimum	1
Maximum	11
Age	
Mean	27.1
Minimum[a]	0
Maximum	88
Median	22
Length of residency	
Total population	
Mean	25.2
Minimum[a]	0
Maximum	88
Heads of household	
Mean	44.7
Minimum[a]	2
Maximum	88
Alaska Native households[b]	
Number	121.2
Percentage	94.7%

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.

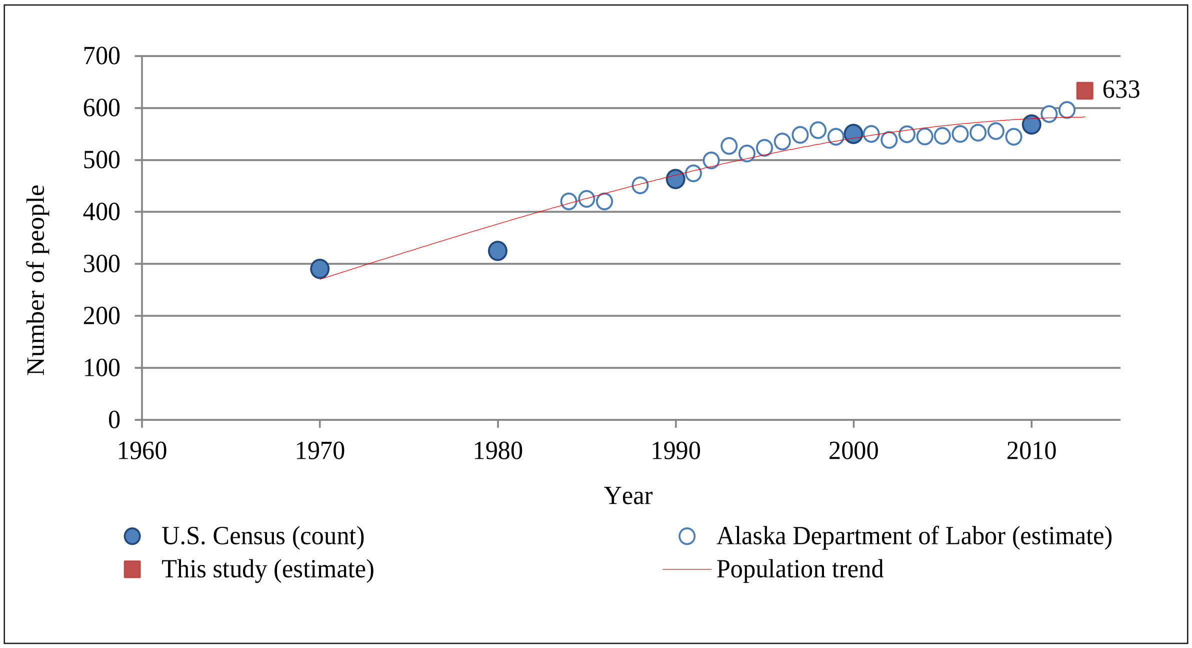


Figure 7-1.–Historical population estimates, Pilot Station, 1970–2013.

Table 7-5.–Birthplaces of household heads, Pilot Station, 2013.

Birthplace	Percentage
Alakanuk	0.6%
Aniak	1.3%
Balance of Wade Hampton Census Sub-Area	1.3%
Chuathbaluk	0.6%
Kotlik	0.6%
Marshall (Fortuna Ledge)	1.9%
Mountain Village	0.6%
Nunapitchuk	0.6%
Pilot Station	81.9%
Pitkas Point	2.6%
Scammon Bay	0.6%
Saint Michael	0.6%
Kalskag	0.6%
Kotlik/Hamilton	0.6%
Other Alaska	0.6%
Other U.S.	1.9%
Foreign	2.6%

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 7-6.–Birthplaces of population, Pilot Station, 2013.

Birthplace	Percentage
Alakanuk	0.4%
Anchorage	0.2%
Aniak	0.4%
Balance of Wade Hampton Census Sub-Area	0.4%
Chuathbaluk	0.2%
Kotlik	0.2%
Marshall (Fortuna Ledge)	0.9%
Mountain Village	0.2%
Nunapitchuk	0.2%
Pilot Station	91.1%
Pitkas Point	0.9%
Russian Mission	0.2%
Scammon Bay	0.4%
Saint Michael	0.2%
Kalskag	0.2%
Kotlik/Hamilton	0.2%
Other Alaska	0.4%
Other U.S.	1.3%
Foreign	0.9%
Missing	0.9%

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.

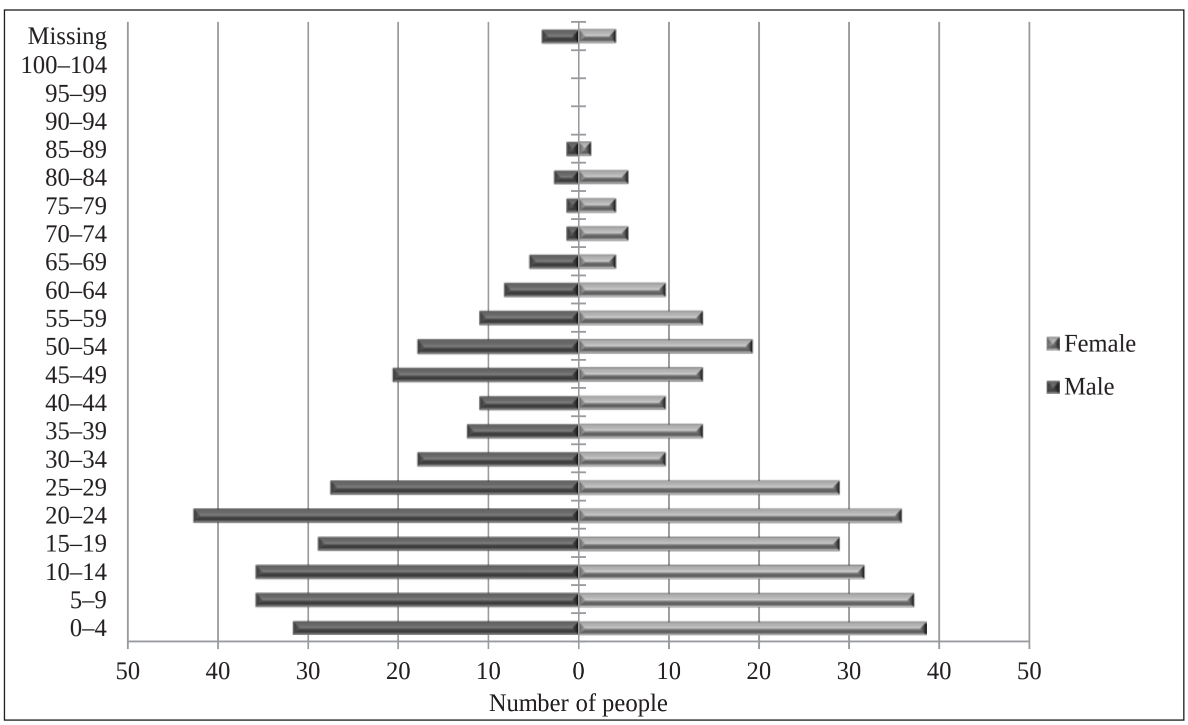


Figure 7-2.–Population profile, Pilot Station, 2013.

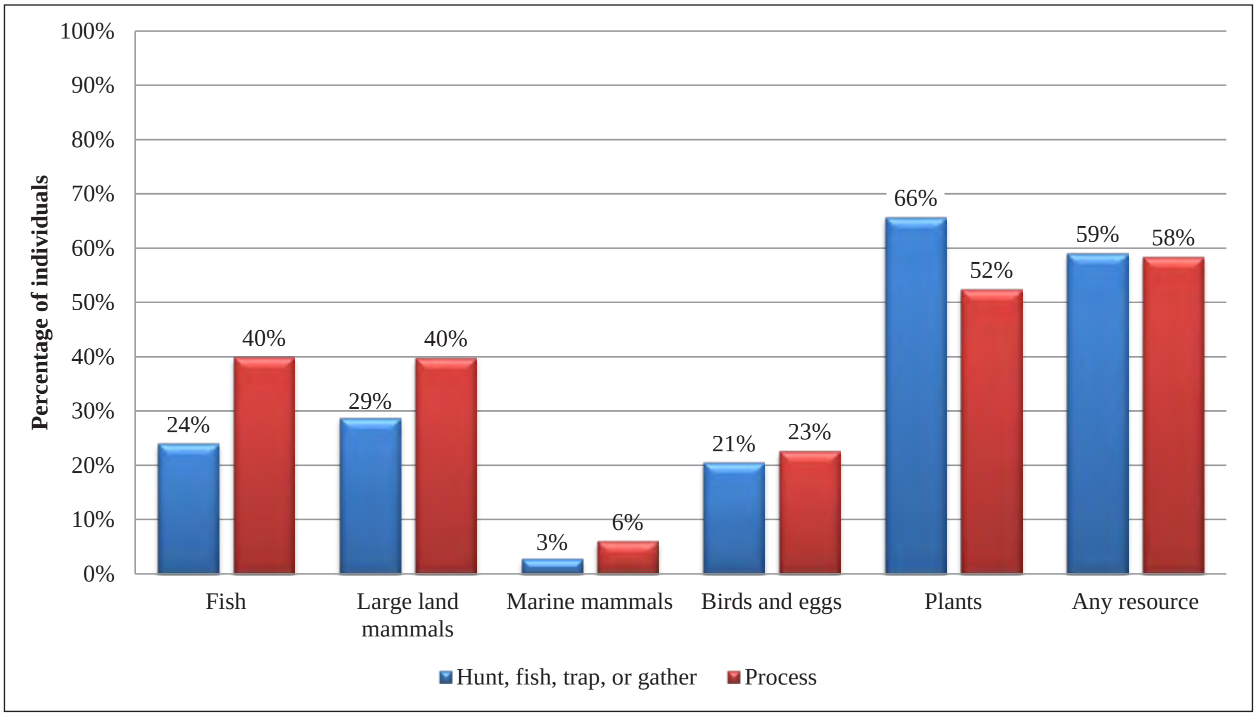


Figure 7-3.–Individual participation in subsistence harvesing and processing activities, Pilot Station, 2013.

people who participated in the harvest of those foods. These differences demonstrate the cooperative nature of hunting and gathering wild foods. Although not everyone is able to go out hunting or fishing, a group effort is often needed to effectively process and store wild foods. Approximately 40% of residents reported processing both fish and land mammals, while 24% harvested fish and 29% harvested land mammals. Residents harvested and processed marine mammals along a similar pattern. Although marine mammals are not heavily hunted or used by Pilot Station residents, twice as many individuals helped process marine mammals (6%) than hunted them (3%). One possible explanation for this difference is the location of Pilot Station on the Yukon River; residents who want to hunt marine mammals must travel approximately 120 miles downriver to the Bering Sea coast. As a result, considerably more financial resources are needed to hunt marine mammals than terrestrial animals, thus limiting the number of people who are able to participate. Processing, however, often takes place in Pilot Station after hunters have returned home. Additionally, a high percentage of residents (63%) received marine mammals, likely leading to more reports of processing by individuals (Table 7-7).

Residents reported a different pattern in their plant harvesting and processing activities than those for other resource categories. Thirteen percent more people reported harvesting plants (66%), including berries and greens, than processing them (53%). Cleaning berries or storing plants is less labor intensive than, for example, processing a moose. There are fewer steps involved in properly putting away vegetation, so the work may not be distributed among other helpers as for land mammals or fish.

Harvest and Use of Wild Resources at the Household Level

Figure 7-4 shows the percentages of households that used wild resources, attempted to harvest, and harvested wild foods by resource category. Most households used wild foods from a variety of resource categories. Large land mammals and vegetation, including plants and berries, were both used by 96% of Pilot Station households. Both salmon and nonsalmon fish were used by 95% of households. Although the use of resources in these categories is high, the percentages of households attempting harvest and harvesting are much lower. Ninety-five percent of households reported using salmon, but only 36% actually harvested them, a wider difference than any other resource category. Fishing for salmon takes gear, time,

Table 7-7.–Estimated harvests of fish, wildlife, and vegetation resources, Pilot Station, 2013.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
All resources	**100.0**	**91.5**	**88.3**	**95.7**	**70.2**	**99,144.9**	**774.6**	**158.3**				**14.5**
Salmon	**94.7**	**36.2**	**36.2**	**83.0**	**26.6**	**26,882.3**	**210.0**	**42.9**				**21.5**
Summer chum salmon	83.0	30.9	30.9	64.9	22.3	20,080.4	156.9	32.1	4,337.0	ind	33.9	23.1
Fall chum salmon	42.6	12.8	12.8	33.0	11.7	3,404.5	26.6	5.4	735.3	ind	5.7	59.6
Unknown chum salmon	9.6	9.6	9.6	0.0	1.1	788.1	6.2	1.3	170.2	ind	1.3	42.2
Coho salmon	31.9	9.6	8.5	23.4	6.4	581.3	4.5	0.9	126.6	ind	1.0	53.6
Chinook salmon	55.3	20.2	19.1	42.6	6.4	2,022.0	15.8	3.2	211.1	ind	1.6	33.6
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sockeye salmon	3.2	2.1	1.1	1.1	0.0	6.0	0.0	0.0	1.4	ind	0.0	102.3
Unknown salmon	2.1	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Nonsalmon fish	**94.7**	**55.3**	**55.3**	**77.7**	**36.2**	**17,179.7**	**134.2**	**27.4**				**18.5**
Pacific herring	6.4	0.0	0.0	6.4	1.1	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe	4.3	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Smelt	21.3	3.2	3.2	18.1	3.2	156.3	1.2	0.2	26.0	gal	0.2	81.9
Pacific tomcod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Saffron cod	6.4	1.1	1.1	5.3	1.1	15.3	0.1	0.0	20.4	ind	0.2	102.3
Pacific halibut	5.3	1.1	0.0	5.3	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0
Arctic lamprey	13.8	1.1	0.0	13.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sculpin	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)	1.1	0.0	0.0	1.1	1.1	0.0	0.0	0.0	0.0	ind	0.0	0.0
Alaska blackfish	37.2	8.5	8.5	31.9	6.4	706.7	5.5	1.1	706.7	lb	5.5	42.2
Burbot	33.0	13.8	13.8	22.3	6.4	790.9	6.2	1.3	329.5	ind	2.6	38.3
Dolly Varden	4.3	4.3	4.3	0.0	0.0	12.3	0.1	0.0	13.6	ind	0.1	65.8
Lake trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic grayling	5.3	5.3	5.3	1.1	1.1	136.2	1.1	0.2	136.2	ind	1.1	49.3
Northern pike	33.0	24.5	24.5	11.7	9.6	1,752.5	13.7	2.8	389.4	ind	3.0	26.9
Sheefish	62.8	37.2	36.2	38.3	20.2	3,390.6	26.5	5.4	565.1	ind	4.4	25.4
Longnose sucker	1.1	1.1	1.1	0.0	1.1	2.7	0.0	0.0	1.4	ind	0.0	102.3
Rainbow trout	1.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Broad whitefish	75.5	39.4	38.3	44.7	23.4	5,975.1	46.7	9.5	1,493.8	ind	11.7	26.0

-continued-

Table 7-7.–Page 2 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Nonsalmon fish, continued												
Bering cisco	20.2	7.4	5.3	14.9	4.3	223.0	1.7	0.4	159.3	ind	1.2	53.5
Least cisco	7.4	4.3	4.3	3.2	3.2	53.1	0.4	0.1	53.1	ind	0.4	62.7
Humpback whitefish	59.6	30.9	29.8	36.2	23.4	3,938.0	30.8	6.3	1,312.7	ind	10.3	26.3
Round whitefish	11.7	4.3	4.3	7.4	1.1	25.9	0.2	0.0	51.7	ind	0.4	67.1
Unknown whitefishes	2.1	1.1	1.1	2.1	1.1	1.0	0.0	0.0	2.7	ind	0.0	102.3
Large land mammals	**95.7**	**67.0**	**44.7**	**73.4**	**43.6**	**38,209.4**	**298.5**	**61.0**				**14.5**
Bison	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Black bear	12.8	6.4	6.4	6.4	5.3	1,089.4	8.5	1.7	10.9	ind	0.1	46.9
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Caribou	6.4	1.1	1.1	5.3	1.1	354.0	2.8	0.6	2.7	ind	0.0	102.3
Moose	95.7	67.0	42.6	71.3	42.6	36,766.0	287.2	58.7	68.1	ind	0.5	14.5
Common muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dall sheep	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	**44.7**	**30.9**	**29.8**	**18.1**	**21.3**	**1,525.4**	**11.9**	**2.4**				**26.6**
Beaver	33.0	21.3	21.3	16.0	13.8	1,266.4	9.9	2.0	106.2	ind	0.8	27.4
Red fox	3.2	3.2	3.2	0.0	0.0	0.0	0.0	0.0	6.8	ind	0.1	60.8
Snowshoe hare	17.0	12.9	9.6	6.4	7.4	103.5	0.8	0.2	55.8	ind	0.4	45.7
Large Alaska hare	10.6	6.5	6.4	4.3	4.3	61.3	0.5	0.1	21.8	ind	0.2	45.8
North American river	2.1	2.1	2.1	0.0	0.0	8.2	0.1	0.0	8.2	ind	0.1	102.3
Lynx	5.3	5.3	5.3	0.0	3.2	21.8	0.2	0.0	10.9	ind	0.1	81.1
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	3.2	5.3	3.2	0.0	0.0	0.0	0.0	0.0	76.3	ind	0.6	93.4
Mink	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	9.5	ind	0.1	102.3
Muskrat	2.1	2.1	2.1	0.0	1.1	3.1	0.0	0.0	12.3	ind	0.1	102.3
Porcupine	6.4	5.3	5.3	1.1	3.2	61.3	0.5	0.1	12.3	ind	0.1	48.7
Arctic ground (parka) squirrel	1.1	1.1	1.1	0.0	1.1	0.0	0.0	0.0	9.5	ind	0.1	102.3
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	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	1.4	ind	0.0	102.3
Wolverine	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	1.4	ind	0.0	102.3

-continued-

Table 7-7.–Page 3 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Feral animals	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**				**0.0**
Reindeer–feral	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	**63.8**	**8.5**	**3.2**	**62.8**	**10.6**	**5,388.1**	**42.1**	**8.6**				**89.6**
Bearded seal	10.6	1.1	1.1	9.6	2.1	190.6	1.5	0.3	1.4	ind	0.0	102.3
Ribbon seal	1.1	1.1	1.1	0.0	1.1	121.2	0.9	0.2	1.4	ind	0.0	102.3
Ringed seal	5.3	0.0	0.0	5.3	2.1	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spotted seal	9.6	3.2	1.1	8.5	2.1	76.3	0.6	0.1	1.4	ind	0.0	102.3
Unknown seal oil	41.5	1.1	0.0	41.5	5.4	0.0	0.0	0.0				0.0
Walrus	4.3	0.0	0.0	4.3	1.1	0.0	0.0	0.0	0.0	ind	0.0	0.0
Beluga whale	39.4	5.3	3.2	37.2	7.4	5,000.0	39.1	8.0	5.0	ind	0.1	91.8
Bowhead whale	1.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown marine mammals	1.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0				0.0
Birds and eggs	**87.2**	**62.8**	**62.8**	**46.8**	**45.7**	**5,900.9**	**46.1**	**9.4**				**16.9**
Bufflehead	1.1	1.1	1.1	0.0	1.1	3.8	0.0	0.0	9.5	ind	0.1	102.3
Canvasback	1.1	1.1	1.1	0.0	1.1	18.1	0.1	0.0	9.5	ind	0.1	102.3
Common eider	1.1	1.1	1.1	1.1	1.1	12.0	0.1	0.0	5.4	ind	0.0	102.3
King eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Goldeneye	1.1	1.1	1.1	0.0	1.1	14.7	0.1	0.0	9.5	ind	0.1	102.3
Mallard	24.5	21.3	21.3	3.2	10.6	223.0	1.7	0.4	114.4	ind	0.9	23.4
Long-tailed duck	4.3	3.2	3.2	1.1	2.1	36.8	0.3	0.1	24.5	ind	0.2	59.0
Northern pintail	8.5	8.5	8.5	1.1	5.3	100.1	0.8	0.2	66.7	ind	0.5	40.0
Scaup	1.1	1.1	1.1	0.0	1.1	8.6	0.1	0.0	9.5	ind	0.1	102.3
Black scoter	27.7	20.2	20.2	12.8	14.9	433.8	3.4	0.7	482.0	ind	3.8	36.7
Surf scoter	2.1	2.1	2.1	0.0	2.1	12.3	0.1	0.0	13.6	ind	0.1	73.4
White-winged scoter	1.1	1.1	1.1	0.0	0.0	12.5	0.1	0.0	5.4	ind	0.0	102.3
Northern shoveler	6.4	5.3	5.3	1.1	4.3	31.2	0.2	0.0	28.6	ind	0.2	51.5
Teal	3.2	3.2	3.2	0.0	3.2	10.6	0.1	0.0	20.4	ind	0.2	61.6
American wigeon	3.2	2.1	2.1	1.1	2.1	30.3	0.2	0.0	23.1	ind	0.2	73.1
Unknown ducks	6.4	1.1	1.1	5.3	1.1	1.6	0.0	0.0	2.7	ind	0.0	102.3
Brant	3.2	2.1	2.1	1.1	2.1	16.5	0.1	0.0	2.8	ind	0.0	101.8

-continued-

Table 7-7.–Page 4 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Birds and eggs, continued												
Cackling goose	3.2	2.1	2.1	1.1	0.0	16.3	0.1	0.0	13.6	ind	0.1	72.0
Canada goose	60.6	42.6	42.6	26.6	26.6	390.5	3.1	0.6	325.4	ind	2.5	19.8
Emperor goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Snow goose	31.9	25.5	24.5	6.4	13.8	554.7	4.3	0.9	139.0	ind	1.1	42.2
White-fronted goose	60.6	44.7	43.6	19.1	20.2	1,686.5	13.2	2.7	397.8	ind	3.1	19.8
Unknown geese	2.1	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tundra (whistling) swan	63.8	43.6	42.6	29.8	18.1	1,892.8	14.8	3.0	168.9	ind	1.3	17.8
Sandhill crane	6.4	4.3	4.3	2.1	2.1	80.1	0.6	0.1	9.5	ind	0.1	55.9
Shorebirds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Whimbrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
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	14.9	10.6	10.6	4.3	5.3	56.2	0.4	0.1	80.3	ind	0.6	36.0
Ruffed grouse	2.1	1.1	1.1	1.1	1.1	4.8	0.0	0.0	6.8	ind	0.1	102.3
Ptarmigan	34.0	20.2	20.2	14.9	14.9	249.7	2.0	0.4	356.8	ind	2.8	42.5
Duck eggs	3.2	2.1	1.1	2.1	0.0	2.5	0.0	0.0	16.3	ind	0.1	102.3
Goose eggs	2.1	1.1	0.0	2.1	1.1	0.0	0.0	0.0	0.0	ind	0.0	0.0
Swan eggs	2.1	1.1	0.0	2.1	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sandhill crane eggs	1.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown shorebird eggs	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gull eggs	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Loon eggs	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tern eggs	2.1	2.1	2.1	0.0	1.1	0.8	0.0	0.0	16.3	ind	0.1	80.7
Ptarmigan eggs	1.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eggs	3.2	1.1	0.0	3.2	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine invertebrates	**6.4**	**4.3**	**4.3**	**5.3**	**3.2**	**50.4**	**0.4**	**0.1**				**59.7**
Clams	6.4	4.3	4.3	5.3	3.2	50.4	0.4	0.1	13.9	gal	0.1	59.7
King crab	1.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tanner crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
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
Mussels	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	gal	0.0	0.0

-continued-

Table 7-7.–Page 5 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Marine invertebrates, continued												
Unknown marine invertebrates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Vegetation	**95.7**	**88.3**	**83.0**	**43.6**	**39.4**	**4,008.7**	**31.3**	**6.4**				**15.4**
Blueberry	80.9	71.3	71.3	15.2	15.2	1,503.6	11.7	2.4	375.9	gal	2.9	14.1
Lowbush cranberry	39.4	33.0	33.0	9.6	5.3	350.0	2.7	0.6	87.5	gal	0.7	27.9
Highbush cranberry	1.1	1.1	1.1	1.1	0.0	5.4	0.0	0.0	1.4	gal	0.0	102.3
Crowberry	38.3	29.8	29.8	15.1	5.4	320.1	2.5	0.5	80.0	gal	0.6	24.6
Cloudberry	74.5	56.4	56.4	19.1	12.8	1,499.3	11.7	2.4	374.8	gal	2.9	20.1
Nagoonberry	4.3	2.1	2.1	2.1	0.0	1.7	0.0	0.0	0.4	gal	0.0	84.2
Raspberry	7.4	7.4	7.4	0.0	1.1	22.5	0.2	0.0	5.6	gal	0.0	45.5
Other wild berry	1.1	1.1	1.1	0.0	0.0	2.7	0.0	0.0	0.7	gal	0.0	102.3
Wild rhubarb	37.2	33.0	33.0	4.3	5.3	98.1	0.8	0.2	90.7	gal	0.7	25.3
Eskimo potato	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other beach greens	1.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Fiddlehead ferns	2.1	2.1	2.1	0.0	0.0	1.7	0.0	0.0	1.7	gal	0.0	84.2
Hudson's Bay (Labrador) tea	57.4	51.1	51.1	6.4	9.7	132.4	1.0	0.2	132.4	gal	1.0	23.7
Sourdock	1.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Wild celery	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Wild rose hips	1.1	1.1	1.1	0.0	0.0	2.7	0.0	0.0	0.7	gal	0.0	102.3
Other wild greens	1.1	1.1	1.1	0.0	0.0	1.4	0.0	0.0	1.4	gal	0.0	102.3
Unknown mushrooms	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Fireweed	1.1	1.1	1.1	0.0	0.0	1.4	0.0	0.0	1.4	gal	0.0	102.3
Stinkweed	34.0	31.9	31.9	3.2	5.3	65.9	0.5	0.1	65.9	gal	0.5	44.3
Punk	33.0	27.7	14.9	7.4	8.5	0.0	0.0	0.0	194.1	gal	1.5	49.4
Mousefoods	1.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Wood	90.2	80.4	80.4	22.2	21.1	0.0	0.0	0.0				0.0

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

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

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

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

* Resource was not asked on survey, but information volunteered by participant.

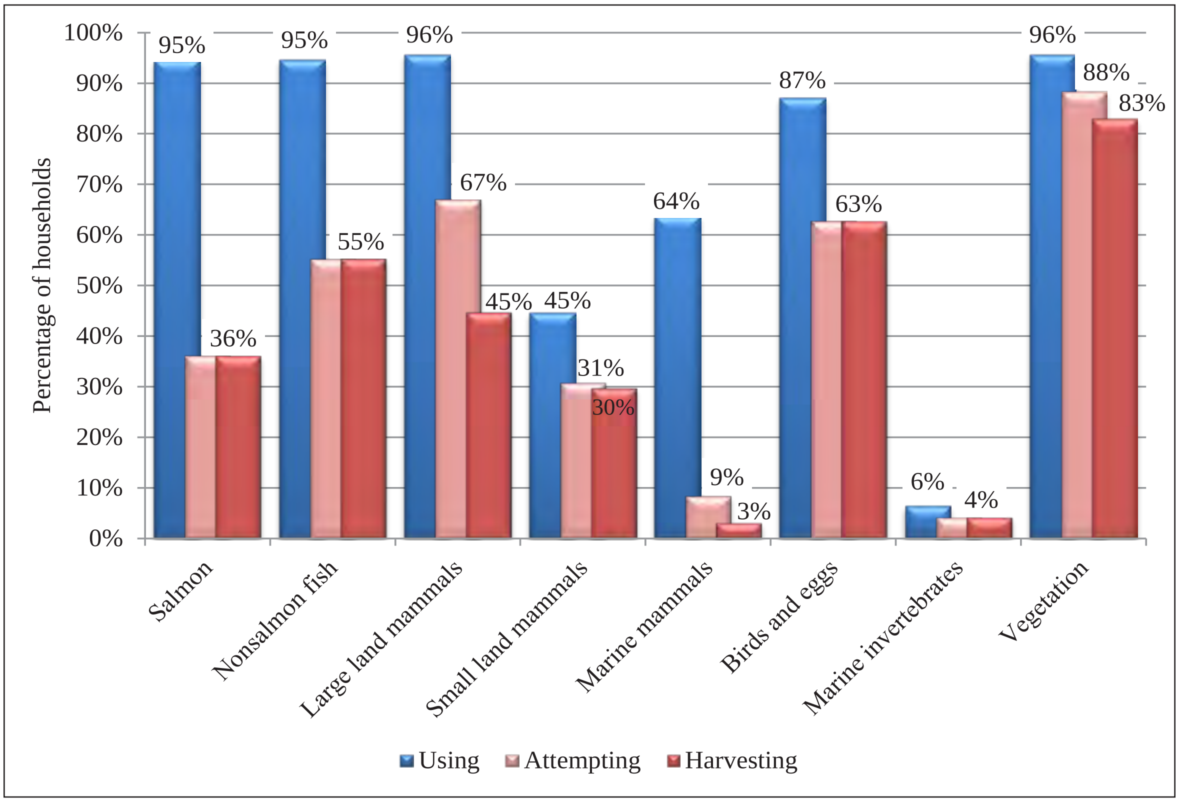


Figure 7-4.–Percentages of households using, attempting to harvest, or harvesting wild resources, Pilot Station, 2013.

and money for gas, which are not available to all residents. All households that attempted to harvest salmon reported harvesting (36%) suggesting that catching salmon is highly dependent on whether a household has the means to fish rather than on other factors, such as luck. As with salmon, in the large land mammals resource category households reported significantly different use levels (96%) from harvest levels (45%; Figure 7-4; Table 7-7). Unlike salmon however, a high percentage of households reported trying to harvest large land mammals (67%). Putting forth the effort to hunt moose or another large land mammal does not guarantee success, but the harvest and use levels suggest that those who successfully harvest moose often distribute the moose to those who did not harvest one. Sharing, bartering, and trading food are common, local means by which wild foods are distributed to those who are unable to go out for a variety of reasons.

Table 7-8 summarizes resource harvest and use characteristics for Pilot Station in 2013 at the household level. The average harvest was 775 lb usable weight per household, 158 lb per capita. During the study year, community households harvested an average of 11 kinds of resources and used an average of 19 kinds of resources. The maximum number of resources used by any household was 90. In addition, households gave away an average of 4 kinds of resources. Overall, as many as 94 resources were available for households to harvest in the study area; this included resources that survey respondents identified but were not asked about in the survey instrument.

Harvest Quantities and Composition

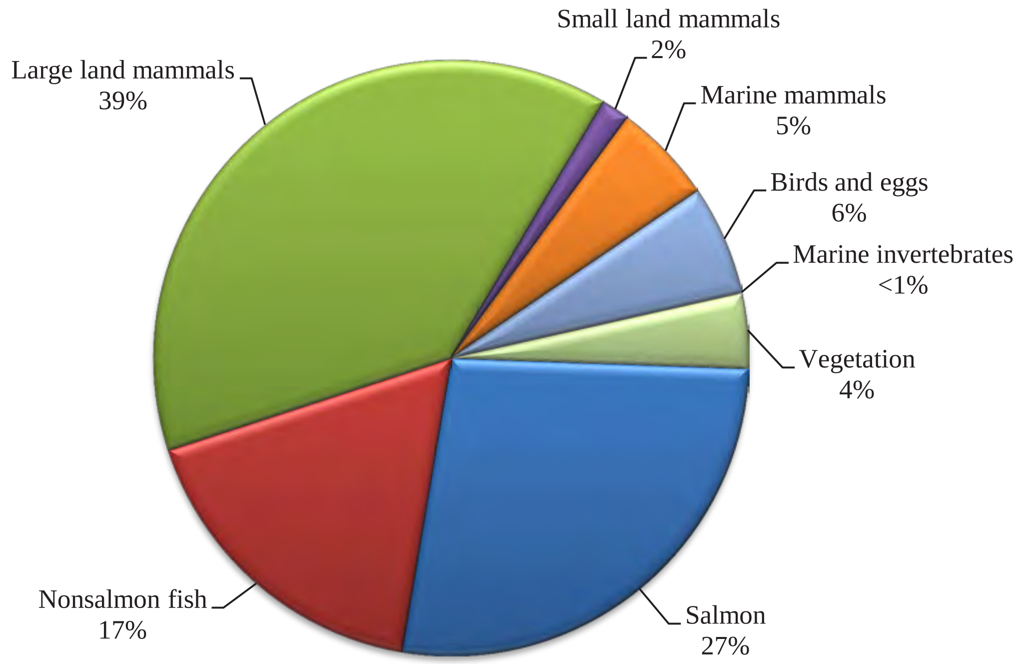
Table 7-7 reports estimated wild resource harvests and uses by Pilot Station residents in 2013 and is organized first by resource category and then by species. All edible resources are reported in pounds usable weight (see Appendix C for conversion factors[14]). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources taken,

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

Table 7-8.–Resource harvest and use characteristics, Pilot Station, 2013.

Characteristic	
Mean number of resources used per household	**18.6**
Minimum	1
Maximum	60
95% confidence limit (±)	5.7%
Median	18.0
Mean number of resources attempted to harvest per household	**11.4**
Minimum	0
Maximum	51
95% confidence limit (±)	8.7%
Median	10.0
Mean number of resources harvested per household	**10.7**
Minimum	0
Maximum	42
95% confidence limit (±)	8.5%
Median	9.0
Mean number of resources received per household	**9.2**
Minimum	0
Maximum	38
95% confidence limit (±)	8.0%
Median	8.0
Mean number of resources given away per household	**5.1**
Minimum	0
Maximum	36
95% confidence limit (±)	13.3%
Median	2.5
Household harvest (pounds)	
Minimum	0
Maximum	6,161
Mean	774.6
Median	524.2
Number of resources asked about and identified voluntarily by respondents	137

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



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

Figure 7-5.–Composition of edible harvest by resource category, Pilot Station, 2013.

given away, or used by a household, and resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and nonlocal hunters. Purchased foods are not included, but resources such as firewood are included, because they are an important part of the subsistence way of life. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

Pilot Station residents harvested 99,145 edible pounds of wild foods for an estimated harvest of 158 lb per capita (Table 7-7). Figure 7-5 shows the composition of Pilot Station's harvest by resource category. Large land mammals made up 39% of the total harvest, and salmon and nonsalmon fish followed at 27% and 17%, respectively. Large land mammals contributed 38,209 lb to the community total, more than any other resource category (Table 7-7). At the household level, an estimated 299 lb of large land mammals were taken (61 lb per capita). Both fish resource categories contributed significantly to the community total. Residents harvested a total of 26,882 lb of salmon, accounting for a 210 lb average harvest per household or 43 lb per capita. Nonsalmon species followed, adding 17,180 lb to the community total, roughly 134 lb per household or 27 lb per capita. Together, all fish species accounted for a higher harvest by weight than even large land mammals and made up 44% of the community harvest (Figure 7-5). The other resource categories made a smaller contribution to the community's harvest. Marine mammals, including seals and whales, contributed 5,338 lb: 42 lb per household or 9 lb per capita (Table 7-7). Birds and eggs followed with 5,901 lb harvested in 2013, an average of 46 lb per household or 9 lb per capita. Plants and berries, which were harvested by nearly all residents, added 4,009 lb to the community harvest, a total of 31 lb per household or 6 lb per capita. Small land mammals contributed 1,525 lb, accounting for 12 lb per household or 2 lb per capita. Marine invertebrates, rarely used or harvested by Pilot Station residents, only added 50 lb to the total usable weight harvested, less than one-half pound per household (0.4 lb) or per capita (0.1 lb).

Harvest and Use Characteristics by Resource Category

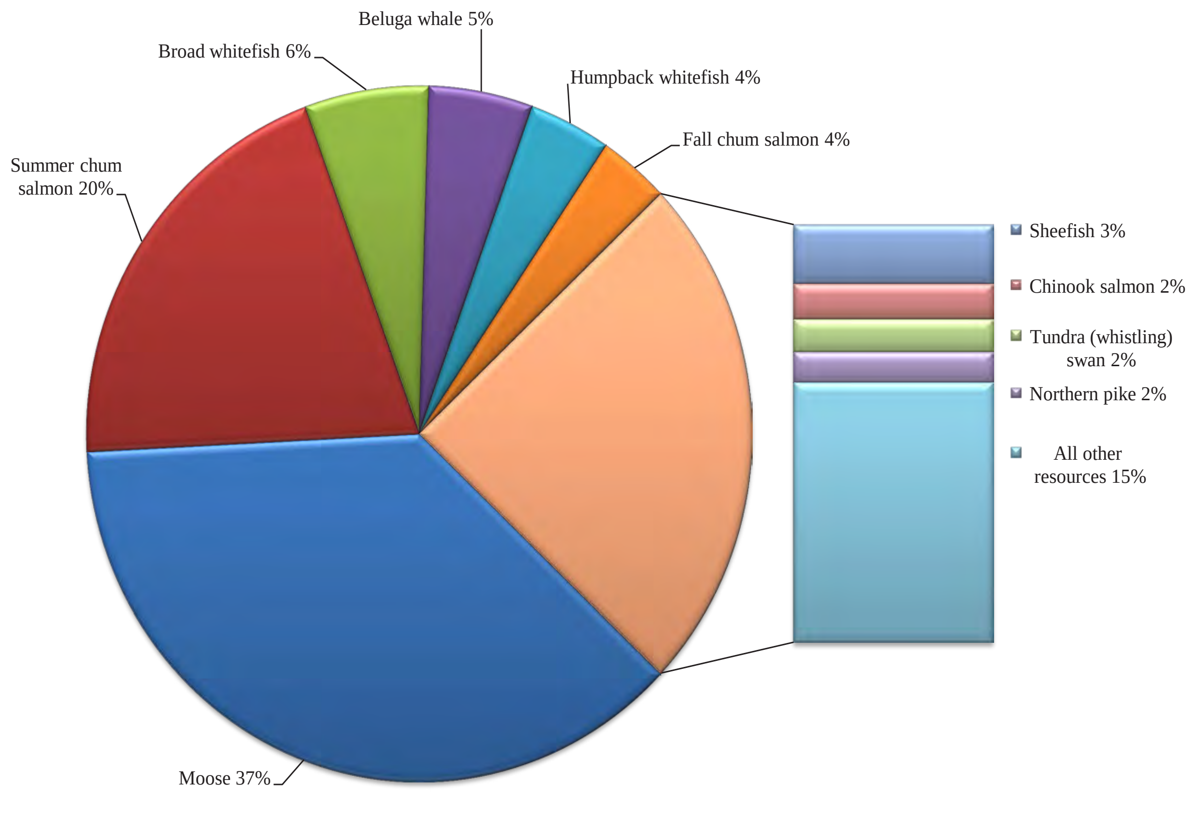
Table 7-9 lists the top 10 ranked resources used by households, and Figure 7-6 shows the resources with the highest per capita harvests during the 2013 study year. Nearly all (96%) of Pilot Station households

Table 7-9.–Top 10 ranked resources used by households, Pilot Station, 2013.

Rank[a]	Resource	Percentage of households
1.	Moose	95.7%
2.	Wood	90.2%
3.	Summer chum salmon	83.0%
4.	Blueberry	80.9%
5.	Broad whitefish	75.5%
6.	Cloudberry	74.5%
7.	Tundra (whistling) swan	63.8%
8.	Sheefish	62.8%
9.	Canada goose	60.6%
9.	White-fronted goose	60.6%

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.



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

Figure 7-6.–Top species harvested in pounds edible weight per capita, Pilot Station, 2013.

used moose, which contributed more edible weight than any other species (37% of the total per capita harvest; Figure 7-6). Moose is commonly shared between households and used during memorial potlatches (Table 7-9). The use characteristics of moose are discussed in the large land mammal section below. The high rate of use was accompanied by the highest harvest. Similarly, Pilot Station households harvested and used summer chum salmon at high levels. Summer chum salmon was used by 83% of households and contributed 20% of the harvest per capita (Figure 7-6; Table 7-9).

Table 7-9 ranks the top resources used by households in Pilot Station. Because wood is not an edible resource, it is not included in the per capita harvest. However, due to the high cost of heating fuel, residents rely heavily on firewood to reduce their heating costs. Ninety percent of households used wood in 2013, and it was the second most used resource by households (Table 7-9). Species in 3 other resource categories—nonsalmon fish, migratory birds, and vegetation—made up the remaining top used resources (Figure 7-6). Broad whitefish and sheefish, both nonsalmon species, were heavily used by households (76% and 63%, respectively) and were also top contributors to the per capita harvest (6% and 3%, respectively; Figure 7-6; Table 7-9). Unlike moose and summer chum salmon, berries and geese were used by most households, but were not top contributors to the total community harvest. Blueberries were used by 81% of households but added less than 1% to the community harvest. Similarly, cloudberries were used by 75% of households even though they contributed minimally to total harvests by weight. Canada geese and white-fronted geese were both used by 61% of households, but were not significant contributors in terms of edible weight.

Salmon

Although Pilot Station residents have always harvested summer chum salmon in large numbers, their greater reliance on chum salmon in 2013 likely results from years of reduced abundance and restrictions on Chinook salmon. Although only 36% of households attempted or harvested salmon, nearly all households (95%) used it (Table 7-7). Figure 7-7 shows the composition of salmon harvest. In addition to the salmon harvested by residents in Pilot Station, ADF&G staff bring to the community all the salmon they are unable to safely release back into the water after being caught in the sonar test drift gillnet. In 2013, 1,343 summer chum salmon, 101 Chinook salmon, 583 fall chum salmon and 114 coho salmon were brought to Pilot Station for subsistence use.[15] The fish caught by ADF&G and used by Pilot Station residents are not included

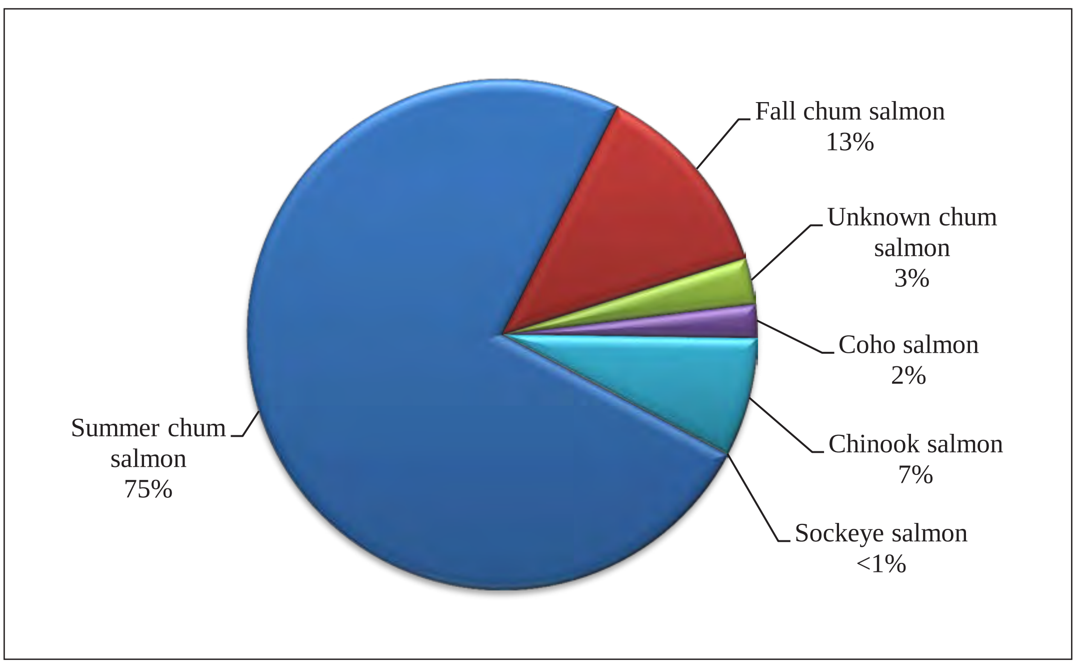


Figure 7-7.–Composition of edible salmon harvest, Pilot Station, 2013.

15. D. Jallen, ADF&G fisheries biologist, personal communication, February 9, 2016

in this study's harvest totals. However, households that reported using salmon were counted regardless of whether the salmon they used was caught in the test-net fishery. When converted to edible pounds, 6,594 lb of summer chum, 1,110 lb of Chinook salmon, 2,863 lb of fall chum and 523 lb of coho salmon were donated by ADF&G and used by the community.

Ethnographic respondents commented on the "change" occurring within their community. They believed that the poor Chinook salmon runs and the resulting restrictions have forced fishermen to target other species. Pilot Station residents reported a heavy reliance on summer chum salmon. Of the 26,882 edible pounds of salmon harvested (43 lb per capita), 20,080 lb (75%) were summer chum salmon (Figure 7-7; Table 7-7). Thirty-one percent of households reported trying to harvest summer chum salmon, and all who attempted were successful. Summer chum salmon were shared throughout the community at high levels: 22% reported giving summer chum salmon away, and 65% reported receiving the resource, resulting in 83% of households using this type of salmon. Ethnographic respondents believed that the high harvest of summer chum in 2013 was unusual when compared to earlier decades. In the past,

> People used to put [Chinook] salmon away, hang 'em, dry 'em, and freeze 'em. They are not doing that anymore because they are not allowed to fish for the king salmon. [The restrictions] are forcing them, forcing us to move to chum salmon. Summer chum or fall chum salmon…they never used those as much. (040414PQS5)

Pilot Station residents preserve their salmon in a variety of ways. Drying and salting are favored methods:

> You just, split 'em up and pull the guts out, chop their heads off. Cut all the meat off the bones. Slice 'em up and hang 'em to dry. Throw them in the smoker. They are pretty good. Everybody's got their own flavor…almost like a fingerprint, but with your taste. (040414PQS5)

Those who salt fish use a 5-gallon bucket. Salmon are placed in the bucket between layers of salt. In order to eat the fish after the salting process, pieces are removed from the bucket and soaked in water overnight until most of the salt has been removed from the fish (040514PQS3).

Respondents described preferred methods of preparing salmon. One elder remembered her mother teaching her how to make Chinook salmon "cheese." First, the skin is carefully peeled off the salmon. Next, the skin is hung up and dried overnight. In the morning, the skin is sewn into a bag, "and that bag is filled with the king salmon eggs that we [also] dried, dried-up fish eggs" (0414PQS2). The bag is sewn closed and stored until winter. During this time, the Chinook salmon eggs break down and solidify into a paste, "just like cheese." The respondent remembers cutting the cheese into pieces and eating it with dried fish and tea on cold spring days when she jigged for northern pike. It gives you "lots of energy and you are not cold. You don't feel the cold." The same respondent favors fish-head soup made from Chinook salmon that can include the tail, intestines, and a little blood. Without the ability to fish for oil-rich Chinook salmon, this respondent no longer makes these delicacies.

Pilot Station fishers caught 5,582 salmon (26,882 lb) using set gillnets (setnets), drift gillnets (driftnets), dip nets, and rod and reel (Table 7-10). An estimated 237 salmon (1,393 lb) were removed from commercial harvests for subsistence use. Figure 7-8 provides a visual representation of the number of salmon harvested by gear type. In Pilot Station, driftnets are the primary gear used to harvest salmon, and in 2013, residents used drift gillnets to harvest 86% of their salmon (Table 7-11). The Yukon River at Pilot Station has ideal drifting conditions. Ethnographic respondents explained that the best drift sites have steady current, deep water, and a relatively smooth river bottom that will neither snag nor catch the net (040514PQS3). Drift gillnets were used to catch all types of salmon, especially summer chum salmon. By weight, summer chum salmon made up 89% of the salmon harvested by a drift gillnet (Table 7-11). Overall, 3,855 (17,849 lb) summer chum salmon were caught in drift gillnets (Table 7-10). Respondents caught 147 Chinook salmon in drift gillnets. Because summer chum salmon enter the Yukon River at the same time as Chinook salmon, ADF&G allowed the use of selective gear types, including dip nets, that enabled fishers to catch summer chum salmon while releasing Chinook salmon back into the river unharmed. In the subsistence fishery, Pilot Station fishers harvested 347 summer chum salmon with dip nets. One respondent reported that although

Table 7-10.–Estimated salmon harvests by gear type, Pilot Station, 2013.

	Removed from commercial catch		Subsistence methods: Setnet		Subsistence methods: Driftnet		Subsistence methods: Jigging		Subsistence methods: Dip net	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**236.9**	**1,393.1**	**134.8**	**644.4**	**4,824.5**	**23,061.1**	**0.0**	**0.0**	**375.8**	**1,739.5**
Summer chum salmon	0.0	0.0	130.7	605.2	3,855.0	17,848.6	0.0	0.0	347.2	1,607.7
Fall chum salmon	0.0	0.0	0.0	0.0	714.9	3,310.0	0.0	0.0	15.0	69.4
Unknown chum salmon	170.2	788.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coho salmon	5.4	25.0	0.0	0.0	107.6	493.8	0.0	0.0	13.6	62.5
Chinook salmon	59.9	574.0	4.1	39.1	147.1	1,408.9	0.0	0.0	0.0	0.0
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sockeye salmon	1.4	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

-continued-

Table 7-10.–Continued.

	Subsistence methods: Other method		Subsistence methods: Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**0.0**	**0.0**	**5,335.1**	**25,445.1**	**9.5**	**44.1**	**5,581.6**	**26,882.3**
Summer chum salmon	0.0	0.0	4,332.9	20,061.5	4.1	18.9	4,337.0	20,080.4
Fall chum salmon	0.0	0.0	729.9	3,379.3	5.4	25.2	735.3	3,404.5
Unknown chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	170.2	788.1
Coho salmon	0.0	0.0	121.2	556.3	0.0	0.0	126.6	581.3
Chinook salmon	0.0	0.0	151.1	1,448.0	0.0	0.0	211.1	2,022.0
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sockeye salmon	0.0	0.0	0.0	0.0	0.0	0.0	1.4	6.0
Unknown salmon	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.
Note The harvested number of salmon is represented as individual fish harvested.

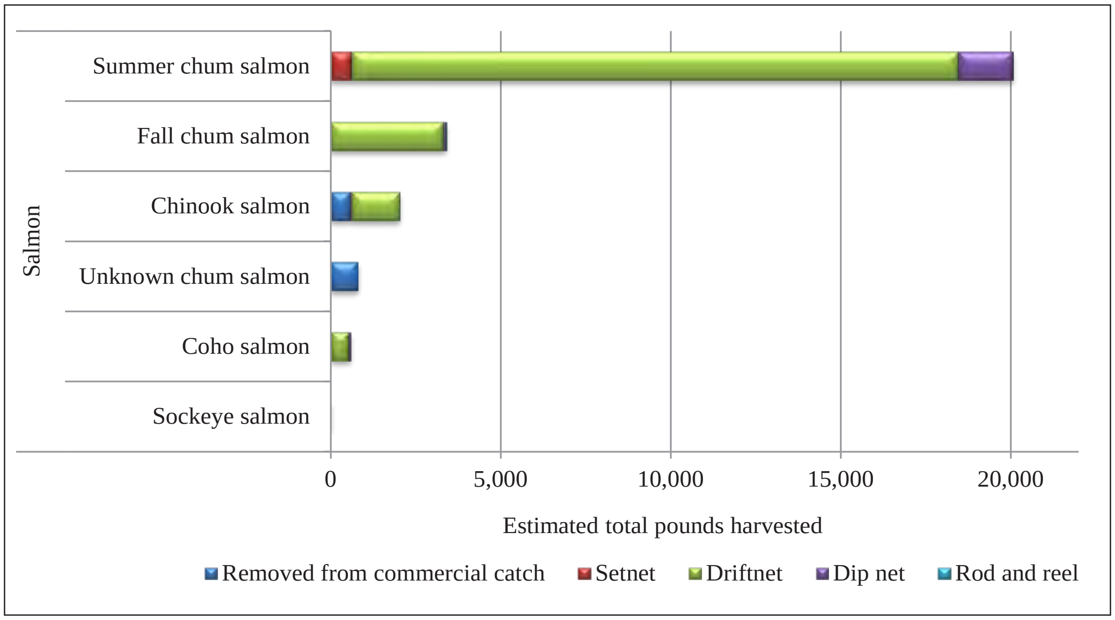


Figure 7-8.–Estimated harvests of salmon by gear type, Pilot Station, 2013.

dip nets were effective in catching summer chum salmon without removing Chinook salmon from the water, the new gear type was most effective for "younger guys" who are strong, have good backs, and are able to pull up the heavy dip nets (040514PQS15). The respondent, a longtime fisherman, believed that "it's lots of work, hard work, harder than using those [drift] nets." Additionally, because most fishers in Pilot Station had never used a dip net before, commercial fishermen had to quickly learn the technique in order to make a profit. One fisherman explained:

> It was kind of slow at first because it was like, you know, something we never did. People that were fishing before us, they said hey, you know, they tell us you put the dip net way down and when you feel a bump you just pull it up as fast as you could and that's how we…teach each other…We watch and we fish. (040414PQS1)

Approximately 188,244 summer chum salmon were harvested commercially on the Yukon River in 2013, the highest harvest on record (JTC 2014:14). Fishermen who participated in the summer chum salmon commercial fishery were allowed to remove summer chum salmon for their personal consumption. In Pilot Station, however, commercial fishermen did not report keeping any summer chum salmon for their subsistence use. Responding fishermen did report removing 170 unknown chum salmon and 60 Chinook salmon from their commercial catch to keep for their own use.

Table 7-12 shows the estimated salmon harvest for the feeding of dogs. No salmon were harvested exclusively to feed dogs in 2013.

Nonsalmon Fish

Nonsalmon fish contributed less than salmon in terms of estimated usable weight (17,180 lb versus 26,882 lb, respectively), but still accounted for 17% of Pilot Station's total subsistence harvest (Figure 7-5; Table 7-8). Pilot Station residents harvested 27 lb of nonsalmon fish per person. Nearly all households used nonsalmon fish (95%), and about one-half of households (55%) reported harvest. Ethnographic respondents stressed the importance of nonsalmon fish species because of their year-round availability (040414PQS5, 0414PQS2). Many respondents concentrated their fishing effort in the winter months when other resources are unavailable. Four nonsalmon species—broad whitefish, humpback whitefish, northern pike and sheefish—were among the top harvested species per capita (Figure 7-6). Broad whitefish, a species favored by ethnographic respondents, accounted for 35% of the nonsalmon harvest in 2013 (Figure 7-9). Thirty-

Table 7-11.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Pilot Station, 2013.

			Subsistence methods							
Resource	Percentage base	Removed from commercial catch	Setnet	Driftnet	Jigging	Dip net	Other method	Subsistence gear, any method	Rod and reel	Any method
Salmon	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**100.0%**	**0.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**5.2%**	**2.4%**	**85.8%**	**0.0%**	**4.8%**	**0.0%**	**94.7%**	**0.2%**	**100.0%**
	Total	**5.2%**	**2.4%**	**85.8%**	**0.0%**	**4.8%**	**0.0%**	**94.7%**	**0.2%**	**100.0%**
Summer chum salmon	Gear type	0.0%	93.9%	77.4%	0.0%	92.4%	0.0%	78.8%	42.9%	74.7%
	Resource	0.0%	3.0%	88.9%	0.0%	5.9%	0.0%	99.9%	0.1%	100.0%
	Total	0.0%	2.3%	66.4%	0.0%	4.4%	0.0%	74.6%	0.1%	74.7%
Fall chum salmon	Gear type	0.0%	0.0%	14.4%	0.0%	4.0%	0.0%	13.3%	57.1%	12.7%
	Resource	0.0%	0.0%	97.2%	0.0%	1.5%	0.0%	99.3%	0.7%	100.0%
	Total	0.0%	0.0%	12.3%	0.0%	0.2%	0.0%	12.6%	0.1%	12.7%
Unknown chum salmon	Gear type	56.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%
Coho salmon	Gear type	1.8%	0.0%	2.1%	0.0%	3.6%	0.0%	2.2%	0.0%	2.2%
	Resource	4.3%	0.0%	84.9%	0.0%	7.9%	0.0%	95.7%	0.0%	100.0%
	Total	0.1%	0.0%	1.8%	0.0%	0.2%	0.0%	2.1%	0.0%	2.2%
Chinook salmon	Gear type	41.2%	6.1%	6.1%	0.0%	0.0%	0.0%	5.7%	0.0%	7.5%
	Resource	28.4%	1.9%	69.7%	0.0%	0.0%	0.0%	71.6%	0.0%	100.0%
	Total	2.1%	0.1%	5.2%	0.0%	0.0%	0.0%	5.4%	0.0%	7.5%
Pink salmon	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sockeye salmon	Gear type	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	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%	0.0%	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%
	Total	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.

Table 7-12.–Estimated harvests of salmon and nonsalmon fish for consumption by dogs, Pilot Station, 2013.

Resource	Amount	Pounds
Other nonsalmon fish		
Burbot	9.6 ind	23.1 lb
Dolly Varden	1.4 ind	1.2 lb
Northern pike	34.4 ind	154.8 lb
Sheefish	20.6 ind	123.9 lb
Whitefish		
Broad whitefish	2.8 ind	3.9 lb
Humpback whitefish	6.9 ind	20.6 lb
Total	**75.7 ind**	**327.6 lb**

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

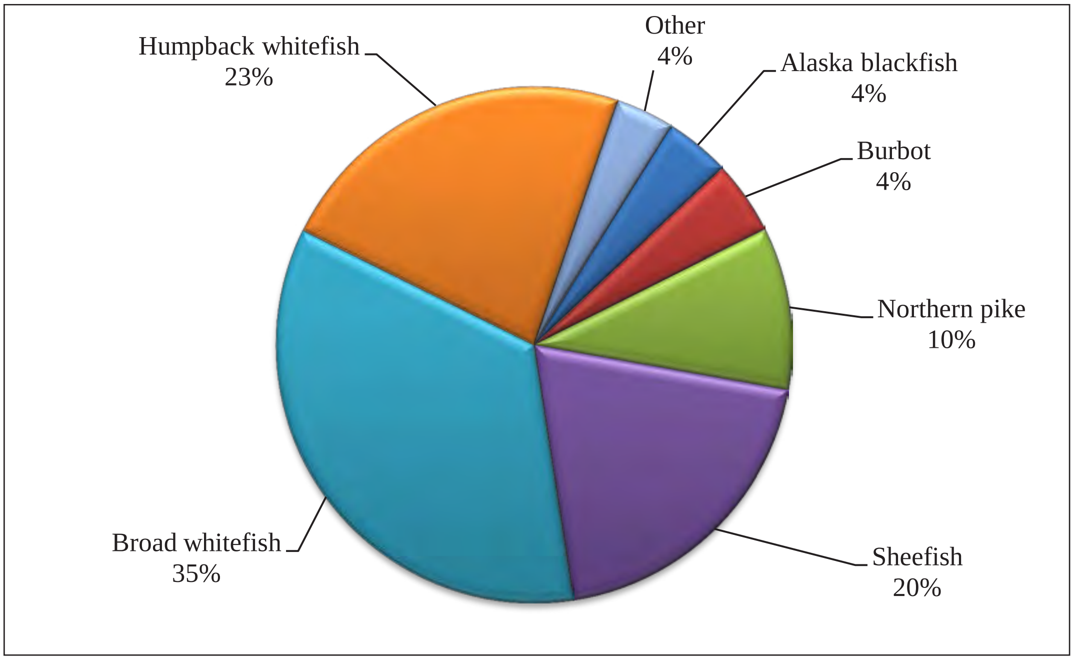


Figure 7-9.–Composition of edible nonsalmon fish harvest, Pilot Station, 2013.

Table 7-13.–Estimated harvests of nonsalmon fish by gear type, Pilot Station, 2013.

		Removed from commercial catch		Subsistence methods									
				Setnet		Driftnet		Jigging		Dip net		Fish trap	
Resource	Units[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**1,521.0**		**10,323.6**		**2,090.5**		**1,148.9**		**330.6**		**1,101.6**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.0	156.3	0.0	0.0
Pacific tomcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saffron cod	ind	0.0	0.0	0.0	0.0	0.0	0.0	20.4	15.3	0.0	0.0	0.0	0.0
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic lamprey	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sculpin	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stickleback (needlefish)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	584.2	584.2
Burbot	ind	0.0	0.0	95.3	228.8	30.0	71.9	0.0	0.0	0.0	0.0	204.3	490.2
Dolly Varden	ind	0.0	0.0	1.4	1.2	8.2	7.4	0.0	0.0	0.0	0.0	0.0	0.0
Lake trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern pike	ind	0.0	0.0	134.8	606.6	0.0	0.0	251.9	1,133.6	0.0	0.0	0.0	0.0
Sheefish	ind	83.1	498.4	232.9	1,397.1	174.3	1,045.8	0.0	0.0	10.9	65.4	0.0	0.0
Longnose sucker	ind	0.0	0.0	0.0	0.0	1.4	2.7	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	143.0	571.9	1,199.7	4,798.6	137.5	550.1	0.0	0.0	13.6	54.5	0.0	0.0
Bering cisco	ind	0.0	0.0	138.9	194.5	20.4	28.6	0.0	0.0	0.0	0.0	0.0	0.0
Least cisco	ind	8.2	8.2	16.3	16.3	0.0	0.0	0.0	0.0	0.0	0.0	27.2	27.2
Humpback whitefish	ind	147.1	441.2	1,024.0	3,072.0	128.0	384.0	0.0	0.0	13.6	40.9	0.0	0.0
Round whitefish	ind	2.7	1.4	15.0	7.5	0.0	0.0	0.0	0.0	27.2	13.6	0.0	0.0
Unknown whitefish	ind	0.0	0.0	2.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

-continued-

Table 7-13.–Continued.

Resource	Units[a]	Subsistence methods: Other method Number[a]	Other method Pounds	Subsistence gear, any method Number[a]	Subsistence gear, any method Pounds	Rod and reel Number[a]	Rod and reel Pounds	Any method Number[a]	Any method Pounds
Nonsalmon fish			**130.7**		**15,126.0**		**532.7**		**17,179.7**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	gal	0.0	0.0	26.0	156.3	0.0	0.0	26.0	156.3
Pacific tomcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saffron cod	ind	0.0	0.0	20.4	15.3	0.0	0.0	20.4	15.3
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic lamprey	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sculpin	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stickleback (needlefish)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	lb	122.6	122.6	706.7	706.7	0.0	0.0	706.7	706.7
Burbot	ind	0.0	0.0	329.5	790.9	0.0	0.0	329.5	790.9
Dolly Varden	ind	0.0	0.0	9.5	8.6	4.1	3.7	13.6	12.3
Lake trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	ind	0.0	0.0	0.0	0.0	136.2	136.2	136.2	136.2
Northern pike	ind	0.0	0.0	386.7	1,740.3	2.7	12.3	389.4	1,752.5
Sheefish	ind	1.4	8.2	419.4	2,516.4	62.6	375.8	565.1	3,390.6
Longnose sucker	ind	0.0	0.0	1.4	2.7	0.0	0.0	1.4	2.7
Rainbow trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	0.0	0.0	1,350.8	5,403.2	0.0	0.0	1,493.8	5,975.1
Bering cisco	ind	0.0	0.0	159.3	223.0	0.0	0.0	159.3	223.0
Least cisco	ind	0.0	0.0	43.6	43.6	1.4	1.4	53.1	53.1
Humpback whitefish	ind	0.0	0.0	1,165.6	3,496.9	0.0	0.0	1,312.7	3,938.0
Round whitefish	ind	0.0	0.0	42.2	21.1	6.8	3.4	51.7	25.9
Unknown whitefish	ind	0.0	0.0	2.7	1.0	0.0	0.0	2.7	1.0

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

Note The summary row that includes incompatible units of measure for harvest number has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

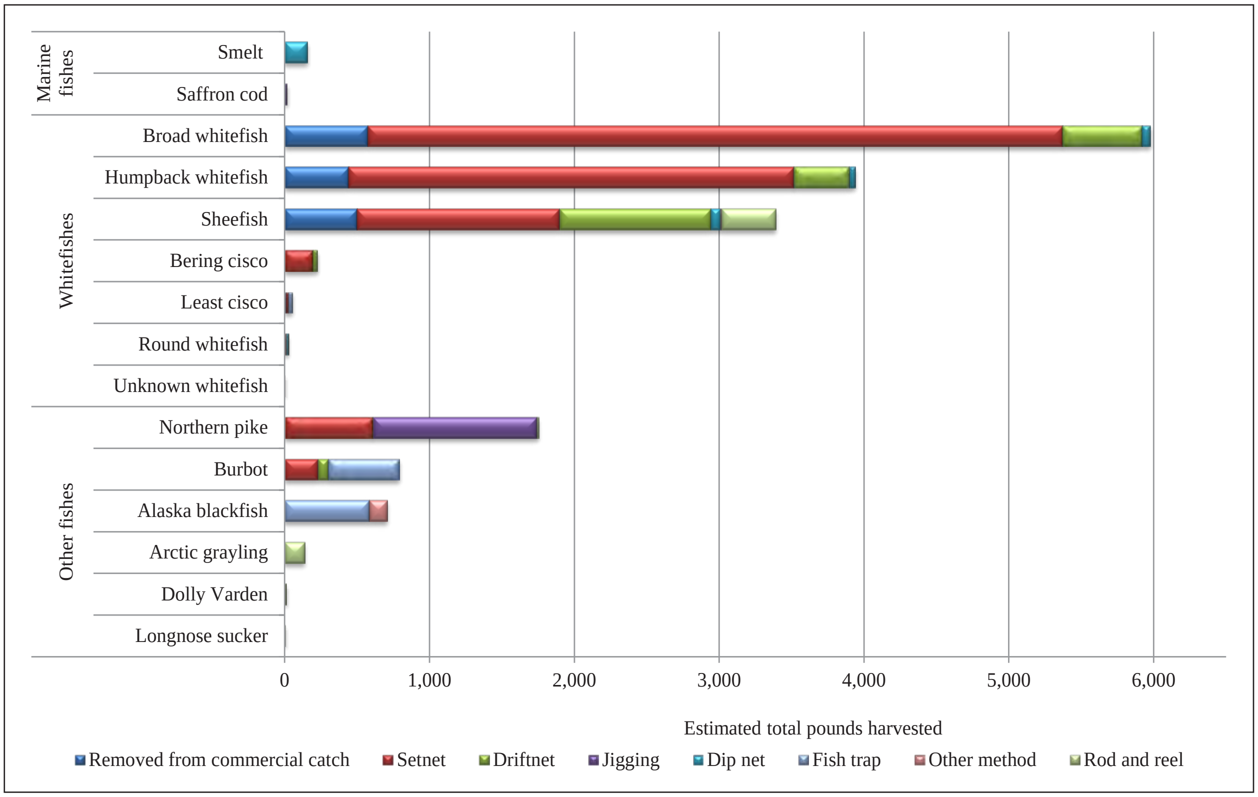


Figure 7-10.–Estimated harvests of nonsalmon fish by gear type, Pilot Station, 2013.

eight percent of households harvested an estimated 5,975 lb of broad whitefish (10 lb per capita; Table 7-7). Nearly one-half (45%) of all households in Pilot Station reported receiving broad whitefish from others.

Figure 7-10 is a visual representation of the number of nonsalmon fish harvested by gear type. Broad whitefish were harvested in a variety of ways throughout the year. Approximately 1,200 broad whitefish were harvested in a set gillnet, which accounted for more than one-half (54%) of the broad whitefish harvest in 2013 (tables 6-13 and 6-14). In the fall time, broad whitefish are processed like salmon: "just dry them and smoke them, you don't need to smoke them long...and they dry faster than salmon" (0404PQS2).

Humpback whitefish accounted for 3,938 lb of the total community harvest (4% of the total harvest, 6 lb per capita) and represented 23% of the nonsalmon harvest (Table 7-7; Figure 7-9). Sixty percent of Pilot Station households reported using humpback whitefish (Table 7-7). Similar to broad whitefish, most humpback whitefish (73%) were caught with set gillnets (Table 7-14). One respondent explained that setting a net for whitefish is easier than setting one for salmon because an eddy is not necessary (040514PQS4). Under-the-ice setnets are used to catch a variety of nonsalmon species "usually all winter long. As soon as the ice freezes up and it's safe enough to go out there and set it all the way up until it's getting too dangerous to be on the river" (040414PQS5). Sheefish, harvested by 36% of households and used by 63%, accounted for 20% of the nonsalmon harvest by weight (Table 7-7; Figure 7-9). A total of 3,391 lb were harvested in 2013 (5 lb per capita; Table 7-7). Sheefish were harvested in a variety of ways, but were mostly caught in open water conditions. Set gillnets (38% of harvest), drift gillnets (31%), and retention from a commercial catch (15%) were the primary methods used by Pilot Station fishers to catch sheefish.

Ethnographic respondents described the use of fish traps for harvesting nonsalmon fish, primarily burbot and Alaska blackfish (Table 7-14). Burbot, a nonsalmon species used by 33% of households, added 1 lb per capita (791 lb total; Table 7-7). Residents caught 204 burbot (490 lb) in fish traps during the study year, which represented 46% of the total burbot harvest by weight (tables 7-13 and 7-14). Traps for both Alaska blackfish and burbot are square shaped with a wooden frame and surrounded by wire mesh. Blackfish

Table 7-14.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Pilot Station, 2013.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Jigging	Dip net	Fish trap	Other method	Subsistence gear, any method	Rod and reel	Any method
Nonsalmon fish	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**8.9%**	**46.6%**	**12.2%**	**6.7%**	**1.4%**	**4.7%**	**0.6%**	**88.0%**	**3.1%**	**100.0%**
	Total	**8.9%**	**46.6%**	**12.2%**	**6.7%**	**1.4%**	**4.7%**	**0.6%**	**88.0%**	**3.1%**	**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%
	Resource	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%
Pacific herring roe	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Smelt	Gear type	0.0%	0.0%	0.0%	0.0%	47.3%	0.0%	0.0%	1.0%	0.0%	0.9%
	Resource	0.0%	0.0%	0.0%	0.0%	73.4%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.9%	0.0%	0.9%
Pacific tomcod	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Saffron cod	Gear type	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
	Resource	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
Pacific halibut	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Arctic lamprey	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sculpin	Gear type	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%
	Total	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%
	Resource	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%
Alaska blackfish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	53.0%	93.8%	4.7%	0.0%	4.1%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	60.7%	12.7%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	0.5%	4.1%	0.0%	4.1%
Burbot	Gear type	0.0%	1.2%	3.4%	0.0%	0.0%	44.5%	0.0%	5.2%	0.0%	4.6%
	Resource	0.0%	12.0%	9.1%	0.0%	0.0%	45.5%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.6%	0.4%	0.0%	0.0%	2.1%	0.0%	4.6%	0.0%	4.6%

continued

Table 7-14.–Page 2 of 2.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Jigging	Dip net	Fish trap	Other method	Subsistence gear, any method	Rod and reel	Any method
Dolly Varden	Gear type	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.1%	0.7%	0.1%
	Resource	0.0%	10.0%	60.0%	0.0%	0.0%	0.0%	0.0%	70.0%	30.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Lake trout	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Arctic grayling	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.6%	0.8%
	Resource	0.0%	0.0%	0.0%	0.0%	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%	0.8%	0.8%
Northern pike	Gear type	0.0%	4.1%	0.0%	98.7%	0.0%	0.0%	0.0%	11.5%	2.3%	10.2%
	Resource	0.0%	18.5%	0.0%	64.7%	0.0%	0.0%	0.0%	99.3%	0.7%	100.0%
	Total	0.0%	1.9%	0.0%	6.6%	0.0%	0.0%	0.0%	10.1%	0.1%	10.2%
Sheefish	Gear type	32.8%	15.9%	50.0%	0.0%	19.8%	0.0%	6.3%	16.6%	70.6%	19.7%
	Resource	14.7%	37.6%	30.8%	0.0%	1.4%	0.0%	0.2%	74.2%	11.1%	100.0%
	Total	2.9%	7.4%	6.1%	0.0%	0.3%	0.0%	0.0%	14.6%	2.2%	19.7%
Longnose sucker	Gear type	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	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%
	Resource	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%
Broad whitefish	Gear type	37.6%	40.2%	26.3%	0.0%	16.5%	0.0%	0.0%	35.7%	0.0%	34.8%
	Resource	9.6%	53.9%	9.2%	0.0%	0.7%	0.0%	0.0%	90.4%	0.0%	100.0%
	Total	3.3%	18.7%	3.2%	0.0%	0.2%	0.0%	0.0%	31.5%	0.0%	34.8%
Bering cisco	Gear type	0.0%	2.4%	1.4%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	1.3%
	Resource	0.0%	87.2%	12.8%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	1.3%
Least cisco	Gear type	0.5%	0.2%	0.0%	0.0%	0.0%	2.5%	0.0%	0.3%	0.3%	0.3%
	Resource	15.4%	30.8%	0.0%	0.0%	0.0%	37.7%	0.0%	82.1%	2.6%	100.0%
	Total	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.3%	0.0%	0.3%
Humpback whitefish	Gear type	29.0%	35.8%	18.4%	0.0%	12.4%	0.0%	0.0%	23.1%	0.0%	22.9%
	Resource	11.2%	72.8%	9.8%	0.0%	0.8%	0.0%	0.0%	88.8%	0.0%	100.0%
	Total	2.6%	16.7%	2.2%	0.0%	0.2%	0.0%	0.0%	20.4%	0.0%	22.9%
Round whitefish	Gear type	0.1%	0.1%	0.0%	0.0%	4.1%	0.0%	0.0%	0.1%	0.6%	0.2%
	Resource	5.3%	28.9%	0.0%	0.0%	38.7%	0.0%	0.0%	81.6%	13.2%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.2%
Unknown whitefishes	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	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.

Plate 7-4.–Division of Subsistence staff ride with a respondent on the frozen Yukon River in April 2014. By snowmachine, travel to the burbot trap took less than 30 minutes.

traps are "probably a few feet long by maybe a foot high. It has a funnel in there and you set them inside a little creek, but burbot [traps]…are way bigger" (040414PQS5). Funnels within the traps allow the fish to swim into the trap, but prevent them from escaping. Respondents described checking their burbot traps every other day, "if you are checking it every day, you're overworking and probably not getting as much fish" (040414PQS5). Division of Subsistence staff traveled with 1 respondent to check his burbot trap (Plate 7-4). This respondent encourages young men in the community to accompany him by announcing his trips on a VHF radio. He hopes that by inviting others to join, the knowledge of trap fishing and the resulting harvest will be shared more widely. The trap, located about 4 miles downriver from Pilot Station, was set only a few feet from shore and about 8 feet below the surface of the ice. Long poles of driftwood were secured to each corner of the trap. Five men worked together to clear the ice above the trap and pulled the trap to the surface by the corner poles (Plate 7-5). The trap held approximately 25 burbot and was quite cumbersome to remove from the water. The men were careful to raise each corner at equal pace to avoid dropping the trap sideways back into the water. Once the trap was safely on the ice, the respondent pulled the fish from the trap with a makeshift garden hoe. The fish were divided among the men and placed in burlap sacks for transport back to the community (Plate 7-6).

Pilot Station residents jig for northern pike. Of the 1,753 lb caught (389 fish, 3 lb per capita), 1,134 lb (65%) were caught by jigging (tables 7-7, 7-13, and 7-14). In the spring, respondents go "hooking, fishing hooking, jigging, mostly for pike" (040514PQS3). Respondents noted that catching northern pike near Pilot Station is not difficult. Bait is not necessary, but some people choose to use "left-over blackfish, I'd bring blackfish or dry fish skins. Some people put bright pink flagging tape on" the hooks (040514PQS4). Some northern pike are used to feed dogs (155 lb in 2013; Table 7-12). Other nonsalmon species, including sheefish and humpback whitefish, among others, were also fed to dogs. In total 328 lb of nonsalmon fish were fed to dogs.

Large Land Mammals

Land mammals contributed substantially to the diets of Pilot Station residents. Overall, 96% of Pilot Station households reported use of land mammals, and 45% reported harvest (Table 7-7). Moose, the only large land mammal included in the top 10 resources harvested per capita (by edible weight) constituted 96% of the total large land mammal harvest (59 lb per capita; figures 7-6 and 7-11; Table 7-7). Seventy-one percent of households reported receiving moose from others. Ethnographic respondents stressed the importance of sharing moose within the community. After a successful hunt, members of the hunting party "think of who may not have somebody to hunt for them. That's what we taught the boys, if you know that there is a widow…think of them first, especially elders" (0414PQS2). For young boys, sharing with elders is particularly important when they catch their first moose. The entire animal is customarily distributed throughout the community, with the best pieces given to elders (040514PQS4). "Namesakes," or the people

Plate 7-5.–Pilot Station men clear ice from above a burbot trap and prepare to pull the trap to the surface with corner poles.

Plate 7-6.–Live burbot are struck and killed on the ice and then divided among the men. Each catch is widely distributed throughout the community.

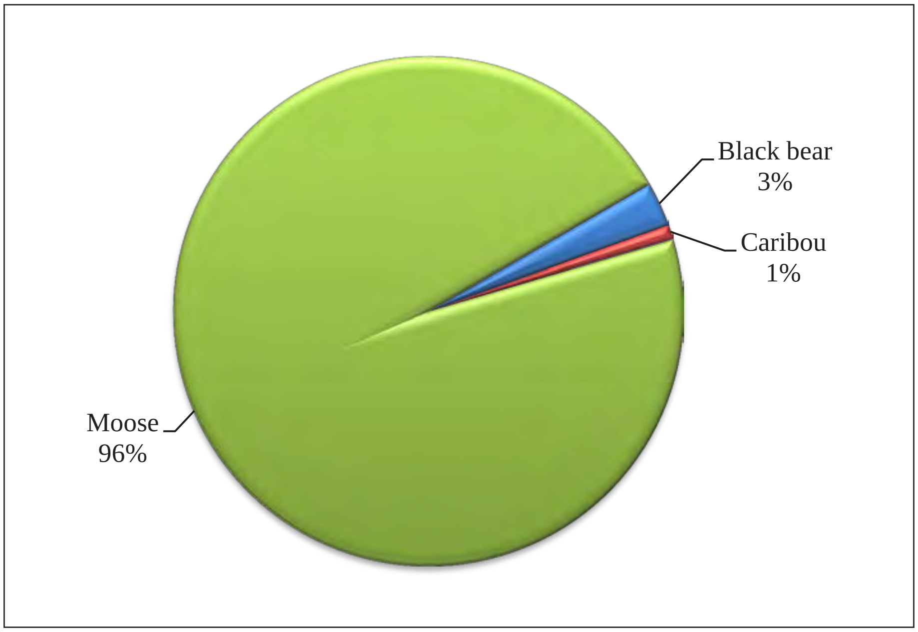


Figure 7-11.–Composition of edible large land mammal harvest, Pilot Station, 2013.

after whom hunters were named, are also among the first to receive moose. Pilot Station hunters harvested 68 moose in 2013. Pilot Station falls in Game Management Unit 18, which provides 3 general season moose hunts. The first occurs between August 1 and September 30. The second is open between October 1 and November 30, and the final season occurs between December 1 and March 15. Eighty percent of moose were taken in September (Table 7-15). The remaining harvest occurred in months throughout the year. Some survey respondents reported moose harvest in unknown months. One ethnographic respondent explained that he prefers to hunt moose in the winter rather than in the fall because the meat stays cleaner during the butchering process, “winter time you can skin everything out there, wipe it off with snow [and] bring it home” (040514PQS4). Ethnographic respondents described the hunting season as an enjoyable time when families and friends come together to help each other meet their harvest needs (040414PQS2, 0405PQS3). Relatives and friends from St. Michael, Hooper Bay, and Chevak travel to Pilot Station each September to help in the hunt (040514PQS3). Hunting cooperatively ensures that the work and the catch will be shared between hunting partners. One respondent explained, “…if I took 3 different families with me…we’d catch a moose and we’d divide it equally. And you know it doesn’t matter who shot the moose because like, it’s ours” (040414PQS1).

Some hunters are asked to provide for memorial potlatches by harvesting a moose during winter months. One respondent explained that changes in local weather have made this tradition difficult in recent years. In the winter, hunters often travel by snowmachine in search of moose, but low snowfall, including during the winter of 2013, has made snowmachine travel more difficult (040514PQS3).

Pilot Station residents enjoy preparing moose in a variety of ways. Organs, including the heart, liver, and kidneys, are either fried in a pan or sliced thin and served raw and eaten immediately (040514PQS4, 040514PQS3). The meat from the head is “oilier and softer” and well suited for soup, but takes a lot of “hard work” to remove all the meat from the head, often more than 30 lb of meat (040514PQS3). One respondent preferred to soak thin slices of moose meat in salt water before letting them air dry into jerky (040514PQS3).

In addition to moose, survey respondents reported harvesting and using black bear. In 2013, 13% of Pilot Station residents used black bear, and 6% harvested the large land mammal (Table 7-7). In total, 11 black bears were taken, accounting for 1,089 usable pounds (2 lb per capita). One respondent who occasionally

Table 7-15.–Estimated large land mammal harvests by month and sex, Pilot Station, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All large land mammals	**5.4**	**0.0**	**0.0**	**4.1**	**0.0**	**1.4**	**0.0**	**2.7**	**61.3**	**0.0**	**0.0**	**0.0**	**6.8**	**81.7**
Bison	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Black bear	0.0	0.0	0.0	2.7	0.0	1.4	0.0	0.0	6.8	0.0	0.0	0.0	0.0	**10.9**
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.7**
Caribou, male	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.4**
Caribou, female	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.4**
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	2.7	0.0	0.0	1.4	0.0	0.0	0.0	2.7	54.5	0.0	0.0	0.0	6.8	**68.1**
Moose, bull	2.7	0.0	0.0	1.4	0.0	0.0	0.0	2.7	53.1	0.0	0.0	0.0	6.8	**66.7**
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	1.4	0.0	0.0	0.0	0.0	**1.4**
Common muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
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.

hunts black bears noted that the best time to hunt them is in spring or fall when they are fat (040514PQS3). Table 7-15 shows that the majority of black bears were harvested in September (62%).

Caribou, less significant than moose in terms of harvest and use by residents, was used by 6% of Pilot Station households in 2013 and hunted by 1% of households (Table 7-7). Survey respondents reported harvesting both male and female caribou in the month of January (Table 7-15). Ethnographic respondents who hunt caribou often travel by snowmachine to Three Step Mountain near the community of Kwethluk in the lower Kuskokwim River, where caribou are more abundant (040514PQS4). Similar to moose hunting, caribou hunting was hindered by limited snowfall, which made travel difficult. An elder respondent remembered a time when caribou were present closer to Pilot Station, but reported that caribou herds have not been seen near the community for decades (040514PQS3, 0414PQS2). One respondent recalled her mother telling stories of herding caribou across the river, and another remembered a trip he took in the 1950s with his uncle to see the remains of a caribou corral across the river. In the past, hunters would attempt to drive large groups of caribou towards fences, either made from wood or rocks, in a funnel formation. This structure would force caribou to a particular location where other hunters would spear or shoot them (Anderson et al. 1977:133; Burch Jr. 1988:144). Today, caribou harvested by Pilot Station residents are shared throughout the community; caribou are also received from friends or relatives in other parts of the state.

Small Land Mammals/Furbearers

Thirty-one percent of households in Pilot Station attempted to hunt or trap small land mammals (Table 7-7); nearly all were successful. Eighteen percent of households received small land mammal resources from another household. Of the 332 small land mammals taken in 2013, almost one-half were used only for fur (Figure 7-12). For example, martens, mink, and Arctic ground squirrels did not contribute any edible pounds to the total community harvest in 2013 (Table 7-7). Figure 7-12 shows the contrast between the numbers of small land mammals that provided food versus those that were only used for their fur. The Arctic ground squirrels, gray wolves, martens, mink, red foxes, and wolverines harvested by Pilot Station residents in 2013 were not eaten, but some of the remaining small land mammals were.

Beaver, an animal commonly trapped and eaten by residents, contributed 1,266 usable pounds to the community harvest (2 lb per capita) and made up the bulk of the small land mammal harvest (Table 7-7). Figure 7-13 shows the composition of harvest. Of the 332 small land mammals harvested, 32% were beaver. Twenty-one percent of households harvested beaver, and 33% used the animal (Table 7-7). Residents both eat beaver meat and use the fur. Only 22 (21% of the total beaver harvest) of the beavers harvested were used only for their fur. The rest were either used solely for food or for both food and fur. Ethnographic respondents praised beaver meat for its flavor, "it's really good meat…some people bake it, boil it, maybe

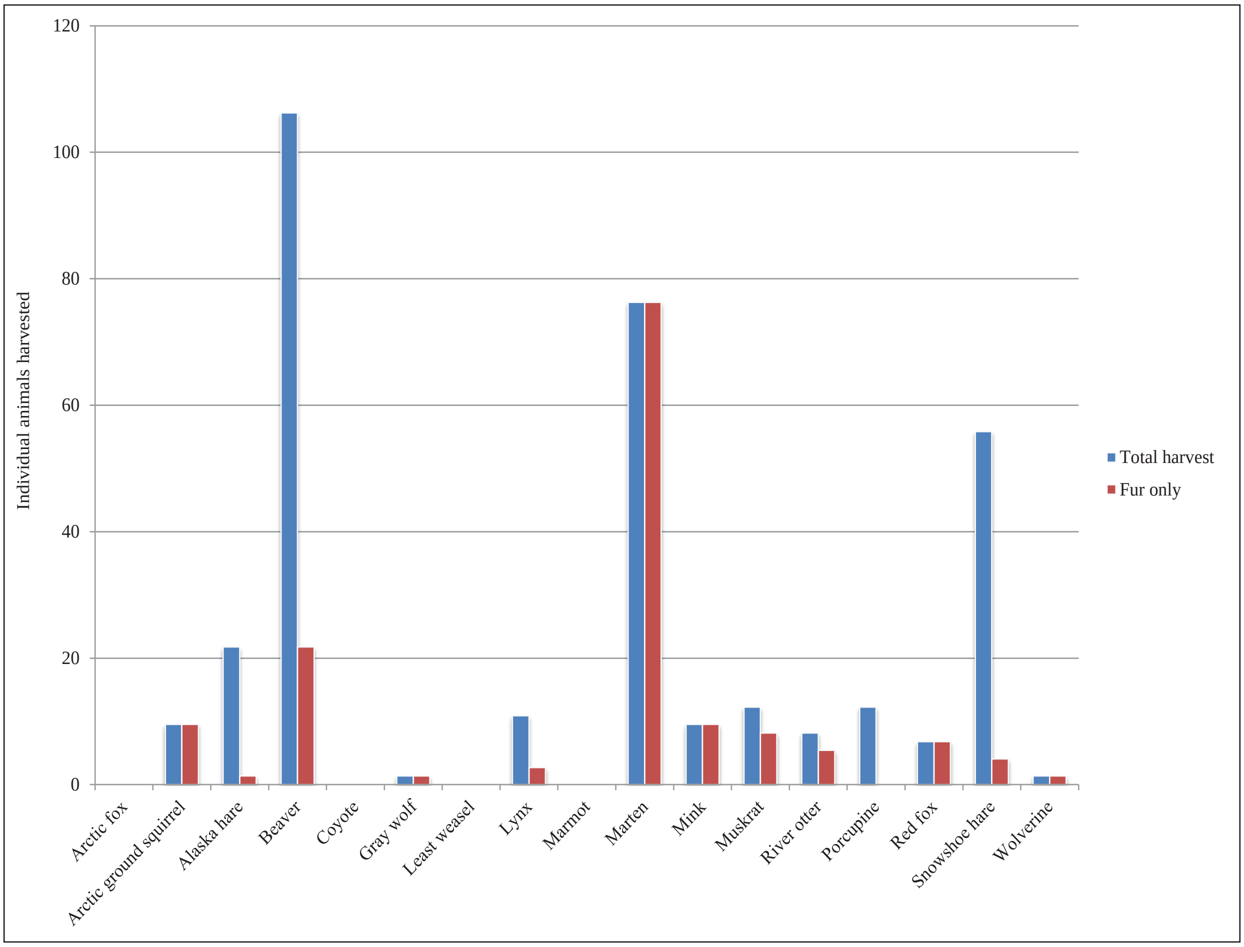


Figure 7-12.–Estimated small land mammal harvests for fur, Pilot Station, 2013.

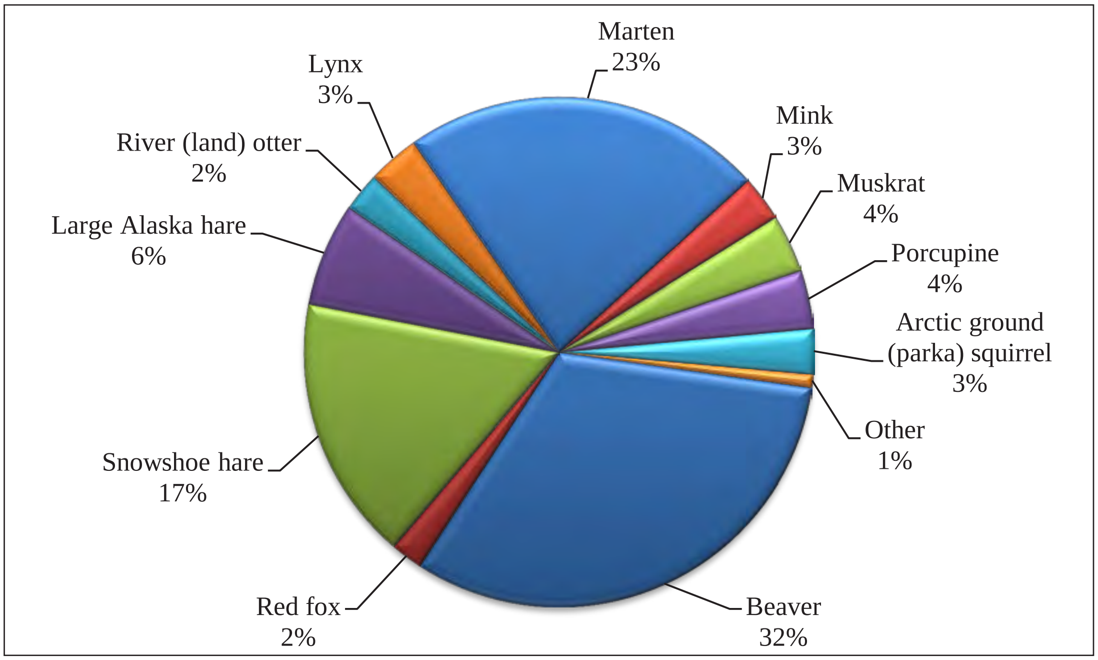


Figure 7-13.–Composition of small land mammal harvest by individual animals harvested, Pilot Station, 2013.

Table 7-16.–Estimated small land mammal harvests by month, Pilot Station, 2013.

Resource	Estimated harvest by month													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All small land mammals	**83.1**	**51.7**	**58.6**	**21.8**	**24.5**	**19.1**	**0.0**	**6.8**	**35.4**	**9.5**	**4.1**	**9.5**	**8.2**	**332.3**
Beaver	23.1	4.1	5.4	1.4	16.3	8.2	0.0	1.4	30.0	8.2	2.7	5.4	0.0	**106.2**
Red fox	1.4	1.4	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	**6.8**
Snowshoe hare	15.0	5.4	16.3	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	8.2	**55.8**
Jackrabbit	0.0	4.1	10.9	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**21.8**
River (land) otter	5.4	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**8.2**
Lynx	2.7	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	**10.9**
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Marten	25.9	27.2	23.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**76.3**
Mink	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**9.5**
Muskrat	0.0	0.0	0.0	0.0	8.2	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	**12.3**
Porcupine	0.0	0.0	1.4	2.7	0.0	1.4	0.0	1.4	5.4	0.0	0.0	0.0	0.0	**12.3**
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**9.5**
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	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.4**
Wolverine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	**1.4**

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

pressure cook or slow cook it, fry it" (040414PQS5). An elder who enjoys fried beaver meat with a side of potatoes spends her free time sewing with beaver fur (0414PQS2). Beaver fur is often used for hats and as decorative trim on boots and parkas. In order to sew with beaver skin, the hide must be tanned. One ethnographic respondent remembered her mother tanning beaver after she was done salting salmon. The salt water is reused to tan beaver, "they don't throw it away when they are done with the fish. They use that salt and water and spread it onto the skin, roll it up, let it stay for a day or so and then they open it again and just scrape it off with a scraper…it just gets soft" (0414PQS2). Survey respondents reported harvesting beaver in every month except July, with higher harvests in September, January, and May (Table 7-16). No other small land mammal had such wide-ranging harvest. Ethnographic respondents described the methods used for catching beaver. The trapper spends time observing the area and watching the paths used by the beavers to enter and exit the den. If the water is still frozen, the trapper cuts a small hole in the ice and sets a snare in the water near the den (040414PQS5). "The challenge is trying to find out how deep it is or how deep to put your snare." If the snare is set too low or too close to the ice, the beavers will swim away unharmed (040414PQS5).

Marten, a furbearing animal not used for food in Pilot Station, made up 23% of the small land mammal harvest by number of animals (Figure 7-13). Seventy-six marten were harvested by 3% of households (Table 7-7). Trappers targeting marten reported harvest in the winter months of January, February, and March (Table 7-16). In these months, the quality of the fur is at its peak and is most desirable.

In the late winter and early spring of 2013, survey respondents harvested 56 snowshoe hares (tables 7-7 and 7-16). Snowshoe hares were the third most harvested small land mammal species (Figure 7-13). Thirteen percent of households attempted to harvest snowshoe hares, and 10% were successful (Table 7-7). Seventeen percent of households used this animal. Only 4 (7%) of the snowshoe hares harvested were not eaten (Figure 7-12). In the spring, hunters travel by snowmachine looking for Alaska hare (jackrabbit) tracks (040514PQS4). Alaska hares made up 6% of the small land mammal harvest in 2013 and provided a total of 61 usable pounds (less than 1 lb per capita; Table 7-7; Figure 7-13).

Muskrat, a favored food among elders, was harvested by only 2% of households and made up 4% of the small land mammal harvest. One elder key respondent remembers her mother making thread from muskrat sinew by twisting the tip of a muskrat tail between her fingers. If twisted for a long enough time, the tip of the tail will break off, and long strands of sinew can be pulled out. Once dried, the sinew was used for sewing boots and other clothing (0414PQS2).

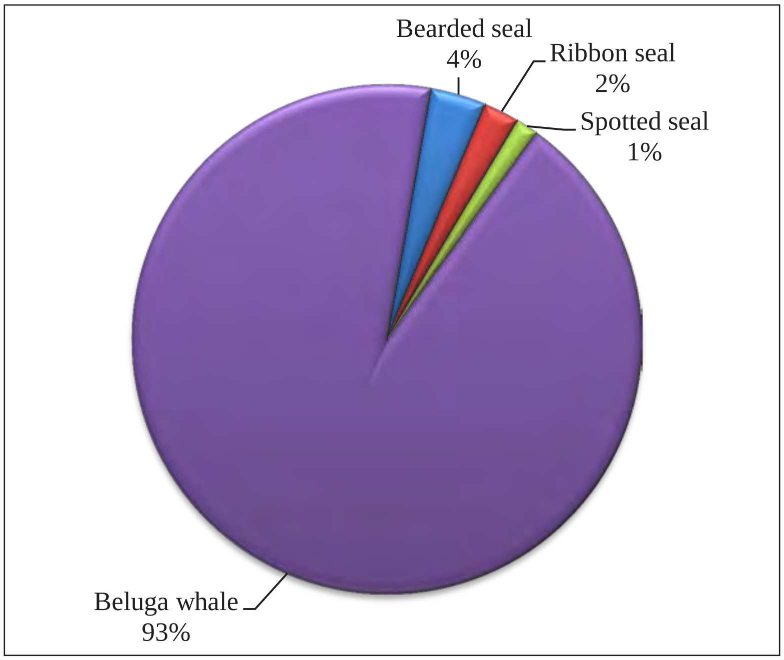


Figure 7-14.–Composition of edible marine mammal harvest, Pilot Station, 2013.

Marine Mammals

Despite living over 120 river miles from the ocean, some Pilot Station residents routinely travel to the coast to hunt marine mammals. Nine percent of households reported participating in hunting marine mammals in 2013 (Table 7-7). Of the households that hunted, only 3% were successful. Sharing marine mammals is common in Pilot Station. Sixty-four percent of households reported receiving marine mammals from others. In total, 5,388 usable pounds (9 lb per capita) were harvested in 2013. Beluga whale accounted for 93% of the marine mammal harvest by weight (Figure 7-14). Five thousand pounds of beluga, or 8 lb per capita, were harvested in 2013 (Table 7-7). An ethnographic respondent who regularly hunts beluga whale travels by boat to the coast and often hunts with friends from Pilot Station or other neighboring communities (040414PQS5). According to the same respondent, depending on the tide, beluga whales can be found close to shore or a few miles away from shore. Hunters wait until late summer or fall to harvest belugas because the "skin is thicker [and] that's probably the best part of a whale." Table 7-17 shows the marine mammal harvest by month. About one-quarter of the marine mammal harvest occurred in August, while the majority (74%) occurred in October. Residents of Pilot Station occasionally observe beluga whales in the Yukon

Table 7-17.–Estimated marine mammal harvests by month, Pilot Station, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
All marine mammals	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**2.4**	**0.0**	**6.7**	**0.0**	**0.0**	**0.0**	**9.1**
Seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	2.7	0.0	0.0	0.0	**4.1**
Bearded seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	**1.4**
Ribbon seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	**1.4**
Ringed seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Spotted seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	**1.4**
Walrus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	4.0	0.0	0.0	0.0	**5.0**
Beluga whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	4.0	0.0	0.0	0.0	**5.0**
Bowhead whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown marine mammals	0.0	0.0	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.

River, presumably following the salmon upstream. Similarly, seals have been spotted in late September (040414PQS5). Seals made up the remaining marine mammal harvest. Bearded seal contributed 191 lb to the community harvest (less than 1 lb per capita). Ten percent of households reported receiving bearded seal from other households. Seal oil rendered from any seal species had the highest use in the marine mammal category. Forty-two percent of households used seal oil. The same percentage reported receiving seal oil from other households either within Pilot Station or from friends or relatives outside of the community.

Pilot Station residents used and received other marine mammals including walrus and bowhead whale, but reported no harvest of these species in 2013.

Birds and Eggs

In 2013, Pilot Station residents used 25 different types of birds and 6 kinds of bird eggs. Figure 7-15 shows the composition of bird and egg harvest. A total of 5,901 lb of birds were harvested (9 lb per capita; Table 7-7). Eighty-seven percent of households used birds, eggs, or both. Birds and eggs are an integral part of food distribution within Pilot Station; many households (47%) reported receiving birds or eggs from others, and about the same percentage (46%) reported giving some away. Most of the birds harvested were migratory. Table 7-18 reports the harvest of birds and eggs by season. Although migratory birds are available in both the spring and fall, the majority (89%) of migratory bird harvest occurred in the spring of 2013. When the snow "really starts melting, just before the river breaks up and flows, you know it's waterfowl, ducks, geese" (040414PQS5). Pilot Station residents communicate with friends and family on the Kuskokwim River, less than 100 miles south, to predict when the birds will arrive near Pilot Station (040514PQS5).

Swans, a delicacy in Pilot Station, were shared throughout the community. Thirty percent of households reported receiving tundra swan, more than any other type of bird (Table 7-7). Pilot Station residents harvested a total of 170 swans in 2013, which accounted for 1,893 usable pounds of the community harvest (3 lb per capita). A key respondent who hunts swans each year explained that when he and his hunting partners go out for swans in the spring, they only get "between 2 and 4" because swans "take up all the room" on the

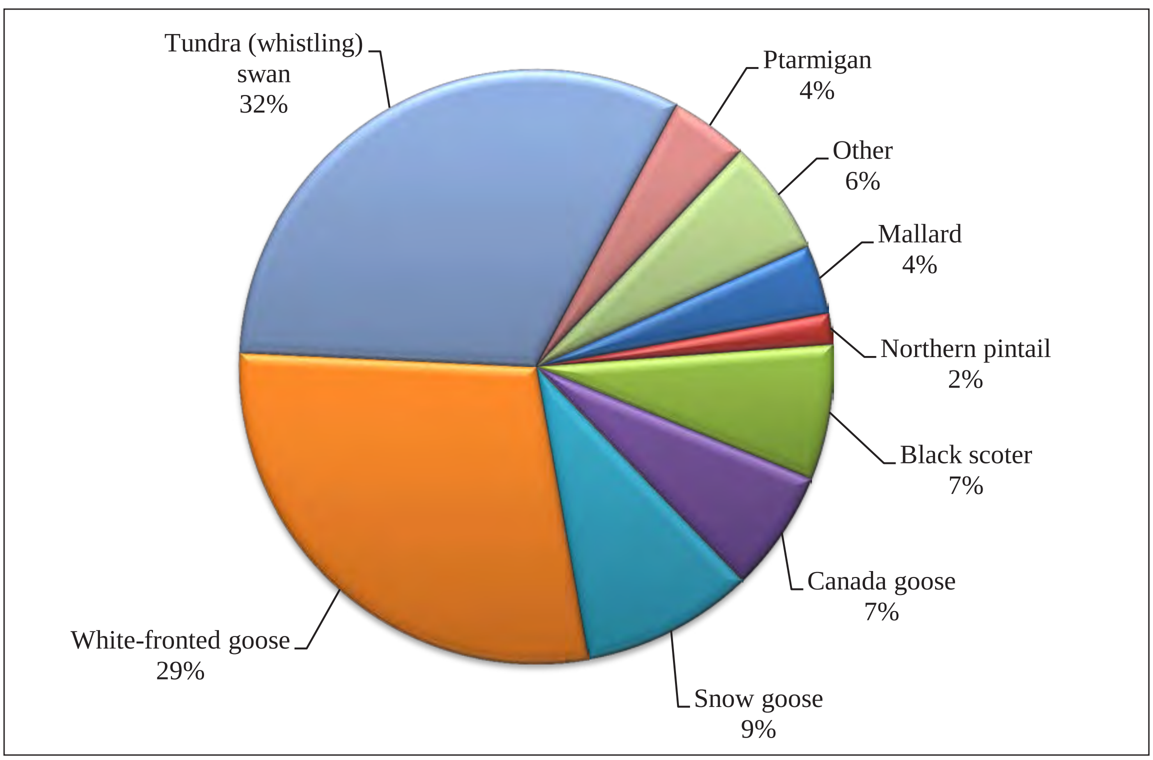


Figure 7-15.–Composition of edible bird and bird egg harvest by season, Pilot Station, 2013.

Table 7-18.–Estimated bird and bird egg harvests by season, Pilot Station, 2013.

	Estimated harvest by season					
Resource	Winter	Spring	Summer	Fall	Season unknown	**Total**
All birds	**61.3**	**1,976.8**	**0.0**	**320.7**	**0.0**	**2,358.8**
Bufflehead	0.0	9.5	0.0	0.0	0.0	**9.5**
Canvasback	0.0	9.5	0.0	0.0	0.0	**9.5**
Common eider	0.0	5.4	0.0	0.0	0.0	**5.4**
King eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Goldeneye	0.0	0.0	0.0	9.5	0.0	**9.5**
Mallard	0.0	94.0	0.0	20.4	0.0	**114.4**
Long-tailed duck	0.0	15.0	0.0	9.5	0.0	**24.5**
Northern pintail	0.0	55.8	0.0	10.9	0.0	**66.7**
Scaup	0.0	0.0	0.0	9.5	0.0	**9.5**
Black scoter	0.0	458.9	0.0	23.1	0.0	**482.0**
Surf scoter	0.0	13.6	0.0	0.0	0.0	**13.6**
White-winged scoter	0.0	5.4	0.0	0.0	0.0	**5.4**
Northern shoveler	0.0	28.6	0.0	0.0	0.0	**28.6**
Teal	0.0	16.3	0.0	4.1	0.0	**20.4**
American wigeon	0.0	13.6	0.0	9.5	0.0	**23.1**
Unknown ducks	0.0	2.7	0.0	0.0	0.0	**2.7**
Brant	0.0	2.8	0.0	0.0	0.0	**2.8**
Cackling goose	0.0	13.6	0.0	0.0	0.0	**13.6**
Canada goose	0.0	300.9	0.0	24.5	0.0	**325.4**
Emperor goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Snow goose	0.0	95.0	0.0	44.0	0.0	**139.0**
White-fronted goose	0.0	379.9	0.0	17.9	0.0	**397.8**
Unknown geese	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	1.4	143.0	0.0	24.5	0.0	**168.9**
Sandhill crane	0.0	9.5	0.0	0.0	0.0	**9.5**
Shorebirds	0.0	0.0	0.0	0.0	0.0	**0.0**
Whimbrel	0.0	0.0	0.0	0.0	0.0	**0.0**
Loon	0.0	0.0	0.0	0.0	0.0	**0.0**
Spruce grouse	0.0	13.6	0.0	66.7	0.0	**80.3**
Ruffed grouse	0.0	0.0	0.0	6.8	0.0	**6.8**
Ptarmigan	59.9	257.4	0.0	39.5	0.0	**356.8**
Duck eggs	0.0	16.3	0.0	0.0	0.0	**16.3**
Goose eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Swan eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Sandhill crane eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown shorebird eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Gull eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Loon eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Tern eggs	0.0	16.3	0.0	0.0	0.0	**16.3**
Ptarmigan eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown eggs	0.0	0.0	0.0	0.0	0.0	**0.0**

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

sleds that they take with them (040514PQS4). White-fronted geese also had high harvest and use; 44% of households harvested and 61% of households used the resource. Residents harvested 398 white-fronted geese or 1,687 lb (3 lb per capita). Other migratory birds including Canada goose, snow goose, and sandhill crane were harvested in lesser amounts. One respondent, a grandmother, described her role in processing birds:

> I never really go bird hunting. I pluck 'em. Clean them, gut them, and either freeze them—mainly put them away in the freezer. And I learned to skin birds. That's faster than plucking…I cut them straight across the back and then you peel, peel [the skin] off. What do my grandkids always say? Grandma, you took his coat off! (040514PQS2)

Other respondents described a simpler method of preserving geese and swans. Some people "just throw them in" a freezer without plucking the feathers first. Leaving the feathers on helps to prevent freezer burn by acting "like a Ziploc bag" (040414PQS5). Ptarmigans and spruce grouse, which are available to residents year round, made up the bulk of the nonmigratory bird harvest by Pilot Station residents in 2013. Ptarmigans, used by 34% of households and harvested by 20%, contributed 250 lb (less than one-half pound per capita) to the total community harvest (Table 7-7). Seventy-two percent of the ptarmigans harvested by residents occurred in the spring, with the remaining harvest in the fall or winter (Table 7-18). Eleven percent of households harvested spruce grouse, and 15% used them (Table 7-7). Residents harvested a total of 80 individual birds, contributing 56 lb to the community harvest. Two percent of households harvested tern eggs, and 1% harvested duck eggs for a combined total of 33 individual eggs, or 3 lb. The season of egg harvest was not known or reported by survey respondents but likely occurred in spring months (Table 7-18). Survey respondents did report receiving a variety of eggs, including those from swans, geese, cranes, and ptarmigans (Table 7-7).

Marine Invertebrates

The use of marine invertebrates by Pilot Station residents is uncommon. Six percent of households used marine invertebrates. Only 4% of households actually harvested any. Table 7-7 shows that, aside from 14 gallons of freshwater mussels, locally referred to as clams, there was no other harvest of marine invertebrate species. Freshwater mussels are available in certain muddy riverbanks or slough banks near Pilot Station. Harvest of freshwater mussels could be recorded on the survey in the marine invertebrate category given the absence of a freshwater invertebrate data collection category (see Appendix A). However, without notation or ethnographic commentary, it is impossible to know what types of shellfish were harvested.

Vegetation

Lastly, the survey asked about vegetation harvested and or used by respondents (Appendix A). The category of vegetation included berries, plants, and wood. Figure 7-16 shows the composition of vegetation harvest in Pilot Station by usable weight. Berries made up 92% of the vegetation harvest. Respondents characterized 2013 as a very good berry year. One respondent noted that "last summer there were a lot of people who were happy to see lots of berries up here. Enough for everybody to put them away, first time they grow that much around here" (040514PQS3). Households primarily used blueberries, cloudberries, and crowberries (81%, 75%, and 39%, respectively; Table 7-7). The 71% of households that picked blueberries in 2013 gathered a total of 1,504 lb (2 lb per capita) or 376 gallons. Cloudberries, locally known as salmonberries, were picked by fewer households (56%) but contributed 1,499 lb (2 lb per capita) or 375 gallons to the total community harvest, nearly the same amount as blueberries.

Some respondents described gathering medicinal plants throughout the year. Stinkweed, harvested by 32% of households and used by 34%, can treat skin rashes or sores (040514PQS3; Table 7-7). Stinkweed is gathered in the fall, dried, and stored in buckets or processed into a salve. Residents harvested 66 gallons of stinkweed in 2013. Willow branches are used to heal cold sores and sore throats (0414PQS2, 040514PQS3). The bark is peeled off the branches, and a small portion of the branch is chewed to release the medicinal qualities.

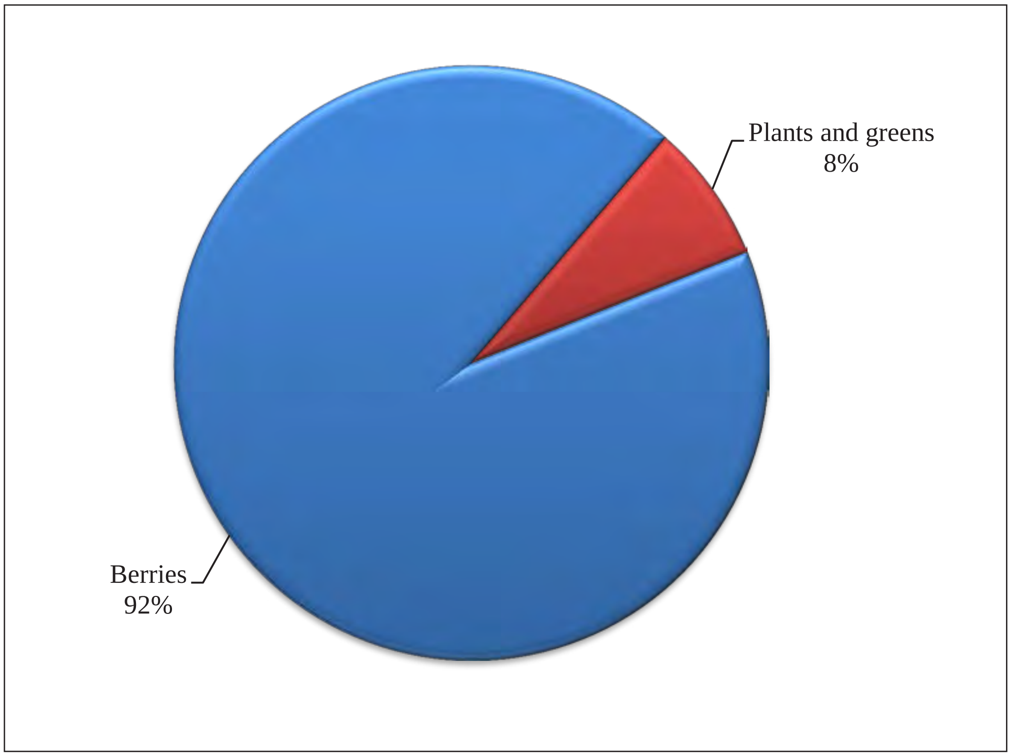


Figure 7-16.–Composition of edible vegetation harvest, Pilot Station, 2013.

Eighty percent of households gathered wood during 2013, and 90% reported use. Twenty-one percent of households shared wood with others, and 22% received some wood. Wood was harvested both on land and collected as drift in the river. One respondent who does not use oil to heat his home relies solely on driftwood. In order to gather the wood from the river:

> You just go out there and pull up beside [the logs] by your boat, and tie them up, and drag them back. With 15 gallons of gas, I can get probably half the winter supply of logs instead of buying 55 gallons of heating fuel every 2 weeks or so. (040414PQS5)

Table 7-19.–Use of firewood for home heating, Pilot Station, 2013.

	Household use of wood for home heating as a percentage of sampled households													
	0%		1–25%		26–50%		51–75%		76–99%		100%		Did not respond	
Community	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Pilot Station	12	12.9%	7	7.5%	21	22.6%	16	17.2%	23	24.7%	11	11.8%	4	4.3%

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

The survey asked respondents to estimate how much of their home's heat came from wood. Twenty-five percent of households reported that 76–99% of their heating came from wood (Table 7-19). Only 13% of households reported that none of their heat came from wood.

Harvest Areas

As part of the survey, households were asked to mark on a map the areas where they harvested or searched for resources. From these data, ADF&G produced maps that depict the search and harvest areas used by Pilot Station residents for 7 resource categories (salmon, nonsalmon fish, large land mammals, small land mammals, marine mammals, birds and eggs, and berries and greens). Additionally, a comprehensive map was produced depicting harvest and search areas for all resource categories.

In 2013, Pilot Station residents reported using 7,446 square miles for subsistence activities. These use areas were not limited to the immediate vicinity of Pilot Station. Instead, residents traveled extensively in the Yukon-Kuskokwim Delta region, utilizing areas near the community of Kwethluk in the Kuskokwim River, the community of Hooper Bay on the Bering Sea coast west of Pilot Station, and the coastal region that encompasses the south, middle, and north mouths of the Yukon River (Figure 7-17). Travel along the Yukon River occurred between Mountain Village and Holy Cross, an approximate distance of 209 river miles.[16] Residents also traveled along smaller drainages including the Andreafsky, East Fork Andreafsky, Nageethluk, Atchuelinguk and Bonasila rivers. The search area for each resource category varied. In combination with ethnographic commentary, these maps illustrate a variety of factors that influence harvest including resource availability, kinship relationships, gear type, and seasonal constraints.

The search areas for salmon were more localized than for other resources (Figure 7-18). Residents fished along the Yukon River in front of town, with some gillnet drifting occurring near the neighboring community of Marshall. Pilot Station is located within District 2 of the Yukon River Fisheries Management Area.[17] Fishers in District 2 typically have both subsistence and commercial fishing opportunities for salmon. Because some households kept salmon from their commercial catch for subsistence use, the locations of those commercial fishing locations are included in this map (Table 7-10; Figure 7-18). Although the majority of salmon fishing occurred on the Yukon River, fishers also searched for salmon on a portion of the Atchuelinguk River (Figure 7-18). An additional spot closer to the mouth of the Atchuelinguk River appears on the map as well. None of the ethnographic respondents interviewed for this study mentioned the Atchuelinguk River when discussing salmon. However, the Anadromous Waters Catalog maintained by the Alaska Department of Fish and Game identifies the Atchuelinguk River as a migration tributary for summer chum salmon.[18]

The search areas for nonsalmon species occurred on the Yukon River near Pilot Station, in lakes and sloughs, and on the Atchuelinguk River. Figure 7-19 depicts the search areas for burbot, northern pike, sheefish, and whitefish species. Residents caught burbot with a variety of winter gear types including fish traps and under-the-ice set gillnets (Figure 7-9). Some respondents caught burbot in set gillnets and drift gillnets. All but 1 burbot fishing location was mapped on the Yukon River near Pilot Station (Figure 7-19). A small dot appears on the Kashunuk River across the Yukon River from Pilot Station. The search areas for northern pike are larger than any other nonsalmon fish species. Some northern pike fishing occurred directly in front of Pilot Station on the Yukon River, but Figure 7-19 also shows fishing locations on the Kashunuk Slough and the Atchuelinguk River. Most notably, a large polygon to the northeast of Pilot Station indicates a large search area for northern pike. This polygon covers numerous lakes, sloughs, and other waterways. However, it also covers a considerable amount of land. The mapped data collected in this study are not precise; areas identified by survey participants can sometimes include generalizations. In

---

16. Google Earth, 2015. "Mountain Village to Holy Cross, Alaska." 2013 Landsat Data SIO, NOAA, U.S. Navy, NGA, GEBCO. Accessed December 10, 2015.

17. ADF&G, Division of Commercial Fisheries, n.d. "Commercial Fisheries Overview: Yukon Management Area." Accessed November 5, 2015. http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareayukon.main

18. ADF&G, Division of Habitat, n.d. "Fish Resource Monitor." Accessed November 5, 2015.
http://extra.sf.adfg.state.ak.us/FishResourceMonitor/?mode=awc

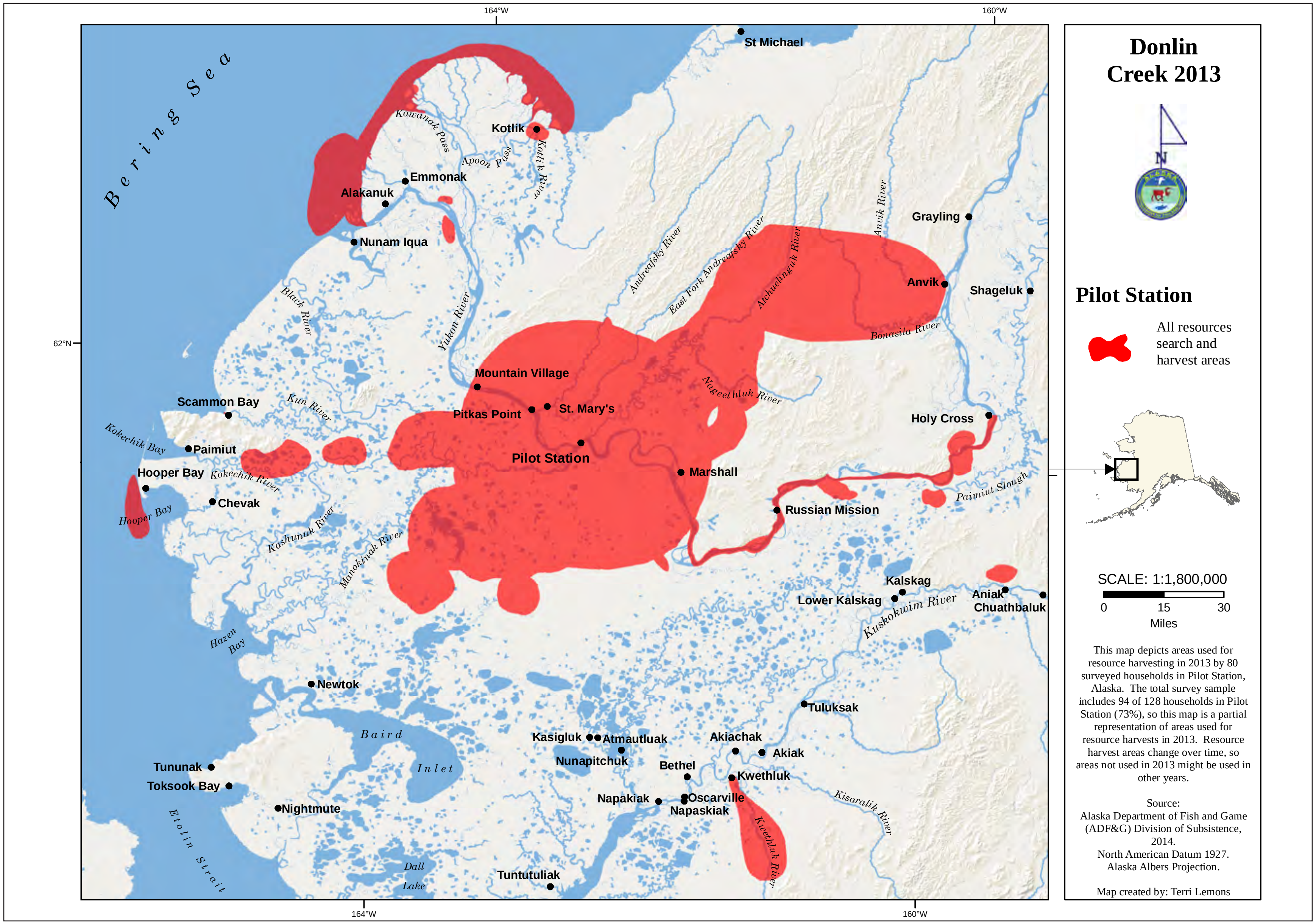


Figure 7-17.–Search and harvest areas, all resources, Pilot Station, 2013.

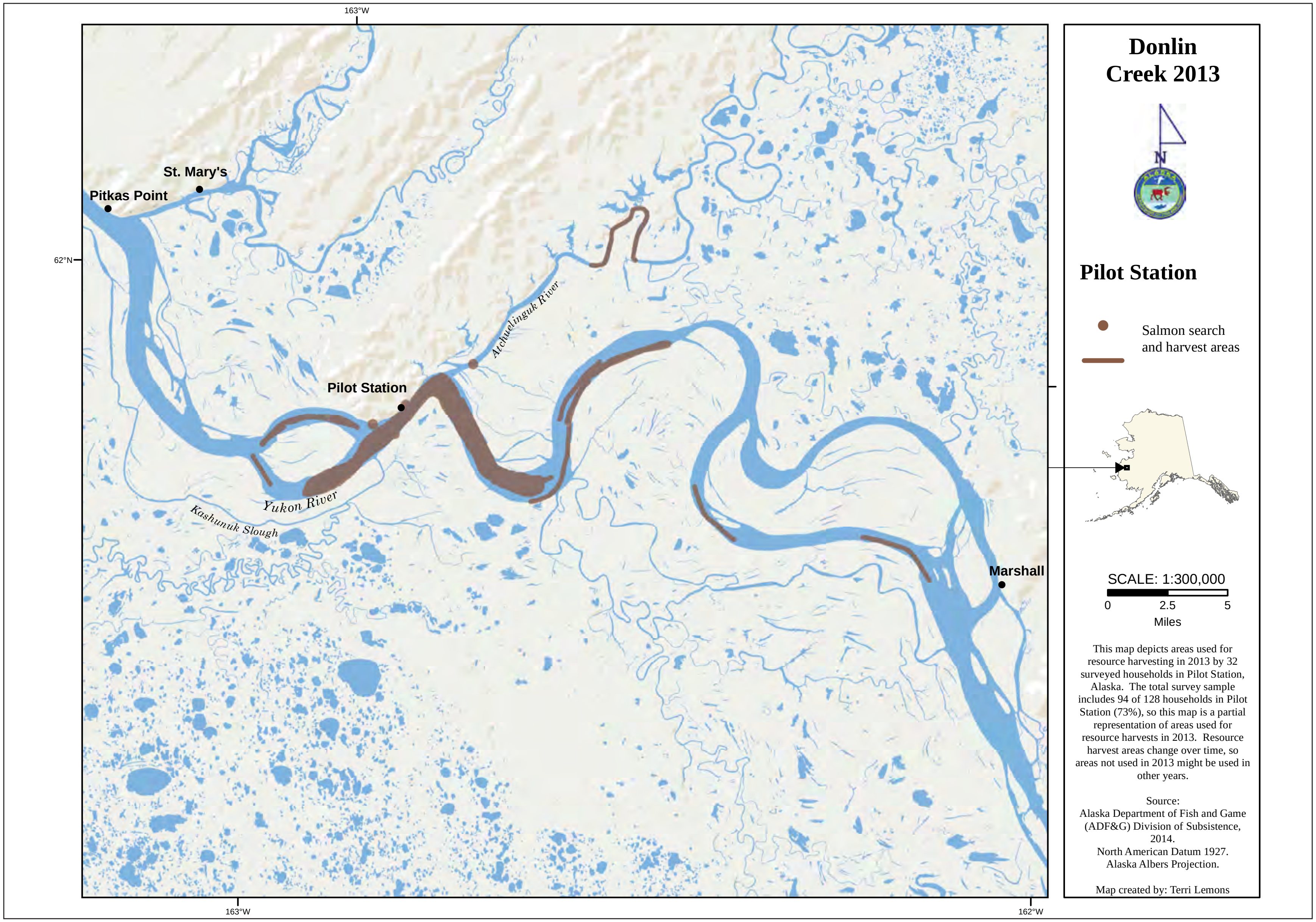


Figure 7-18.–Fishing and harvest areas, salmon, Pilot Station, 2013.

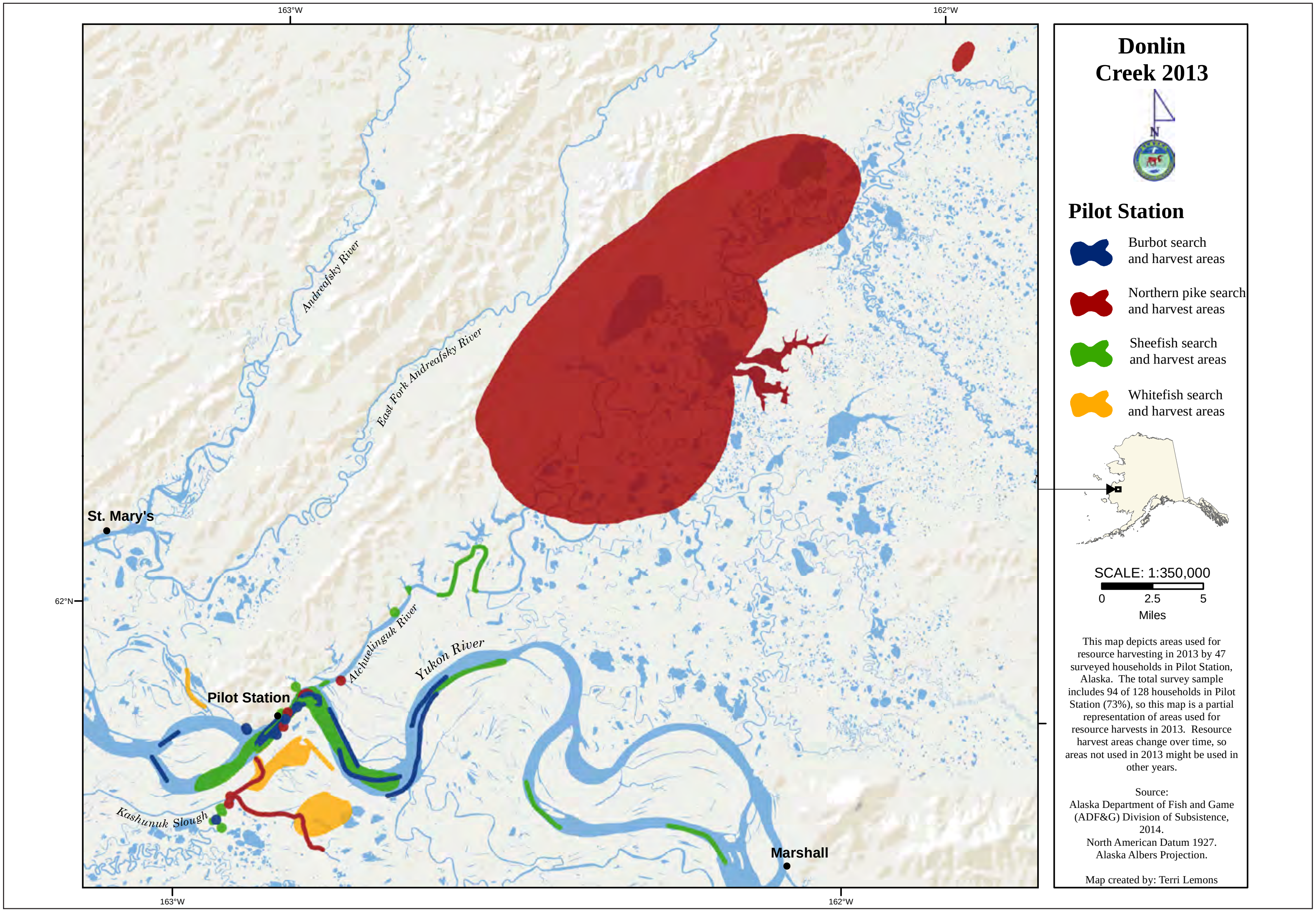


Figure 7-19.–Fishing and harvest areas, burbot, northen pike, sheefish, and whitefishes, Pilot Station, 2013.

this case, residents did not search for northern pike in the hills outside of town, but rather in the lakes and sloughs in this large area.

Residents primarily caught sheefish, an abundant species harvested throughout the year, along the Yukon River. Unlike the other nonsalmon species, participating respondents mapped whitefish harvests entirely off the Yukon River mainstem, primarily in sloughs.

Figure 7-20 depicts the search areas for large land mammals, including black bear, caribou, and moose. Pilot Station residents traveled further in search of moose than any other large land mammal. Search areas extended along the Yukon River between St. Mary's and Holy Cross. Residents also traveled throughout the lake-dense area to the south and the hillier terrain to the north. Search areas covered portions of the Nageethluk River and the Atchuelinguk River and extended norward towards the Bonasila and Anvik rivers. Depending on the season, residents travel by boat, by snowmachine, or by foot in search of moose. Bear hunting appears more limited: only 3 areas were identified by mapping participants. Each polygon, indicated by black lines, is south of Pilot Station where low-lying tundra is interspersed with many lakes. The mapped areas for caribou, a migratory large land mammal, were much further away from the community than other species. According to ethnographic respondents, caribou once migrated near Pilot Station and were a common food source. Today however, they have left the area, and residents must travel to hunt them (0414PQS2, 040514PQS3, 040514PQS4). Figure 7-20 shows a caribou search area along the Kwethluk River south of Kwethluk. In 2013, residents harvested 3 caribou.

Figure 7-21 depicts the areas used for hunting and trapping of small land mammals. The polygon shows hunting or trapping as far east as Marshall with use areas encompassing the land on either side of the Atchuelinguk and Nageethluk rivers north of Pilot Station. Residents also used flatlands south of Pilot Station.

Ethnographic respondents described their use and harvest of marine mammals and explained that they must travel to the Bering Sea coast to hunt them. Figure 7-22 shows the search areas for marine mammals including beluga whales and seals. Pilot Station residents primarily used the coastal region that borders the south, middle, and north mouths of the Yukon River for both beluga and seal hunting. Some beluga whale hunting did occur near Hooper Bay, but more hunting areas were reported near the Yukon River delta. Seal hunting overlapped in this area with one exception. A small portion of the Yukon River adjacent to Pilot Station is included in the seal search area. Ethnographic respondents explained that in September, it is not uncommon to see a few seals in the river. During a fall chum salmon commercial opening, one respondent remembers seeing a seal that seemed to be in good health, "just eating, just trying to eat I guess" (040414PQS5). Respondents believed that seals sometimes follow abundant salmon runs into the river and then return to the ocean after feeding. Harvest of seals in the Yukon River occurs opportunistically when seals are seen.

The harvest of migratory birds, either in the spring or fall, occurred throughout the Yukon River delta in 2013. Figure 7-23 shows the search areas for ducks and geese and for ptarmigans and grouses. Residents traveled up the Atchuelinguk River for both migratory and resident species and extended their search area as far east as Marshall. Lakes near the Kashunuk River, west of Pilot Station, were identified by participants who hunted ducks or geese, but not by those who searched for nonmigratory species. Instead, residents hunted ptarmigans and grouses south of Pilot Station, in the lowlands across the Yukon River from the community.

Figure 7-24 shows the search areas for plants and berries. Participants identified a wide area around Pilot Station, extending from Mountain Village past Marshall along the Yukon River, northeast along the Atchuelinguk River, and southwest towards the Manokinak River. Smaller, isolated search areas appear on the map near the communities of Aniak, Holy Cross, Emmonak, and Kotlik. One ethnographic respondent commented that the price of gas can determine where to pick berries. Typically, this respondent goes across the river by boat to pick berries. However, in years like 2013, when the price of fuel was over 8 dollars a gallon, she picks on a nearby hillside closer to town (0414PQS2). In years of high abundance, the respondent will either boat or fly to neighboring Pitkas Point to pick with friends and family.

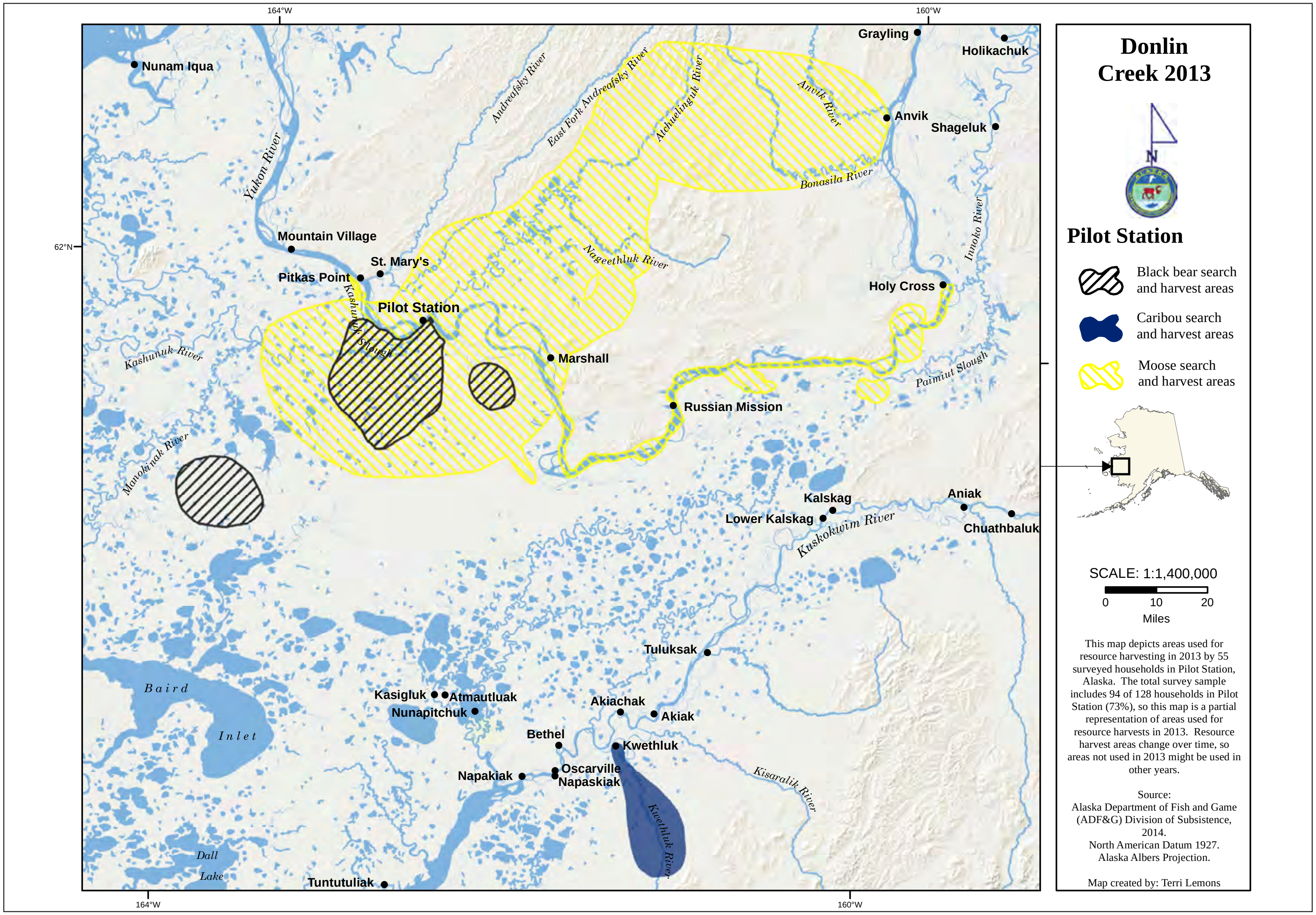


Figure 7-20.–Hunting and harvest areas, black bear, caribou, and moose, Pilot Station, 2013.

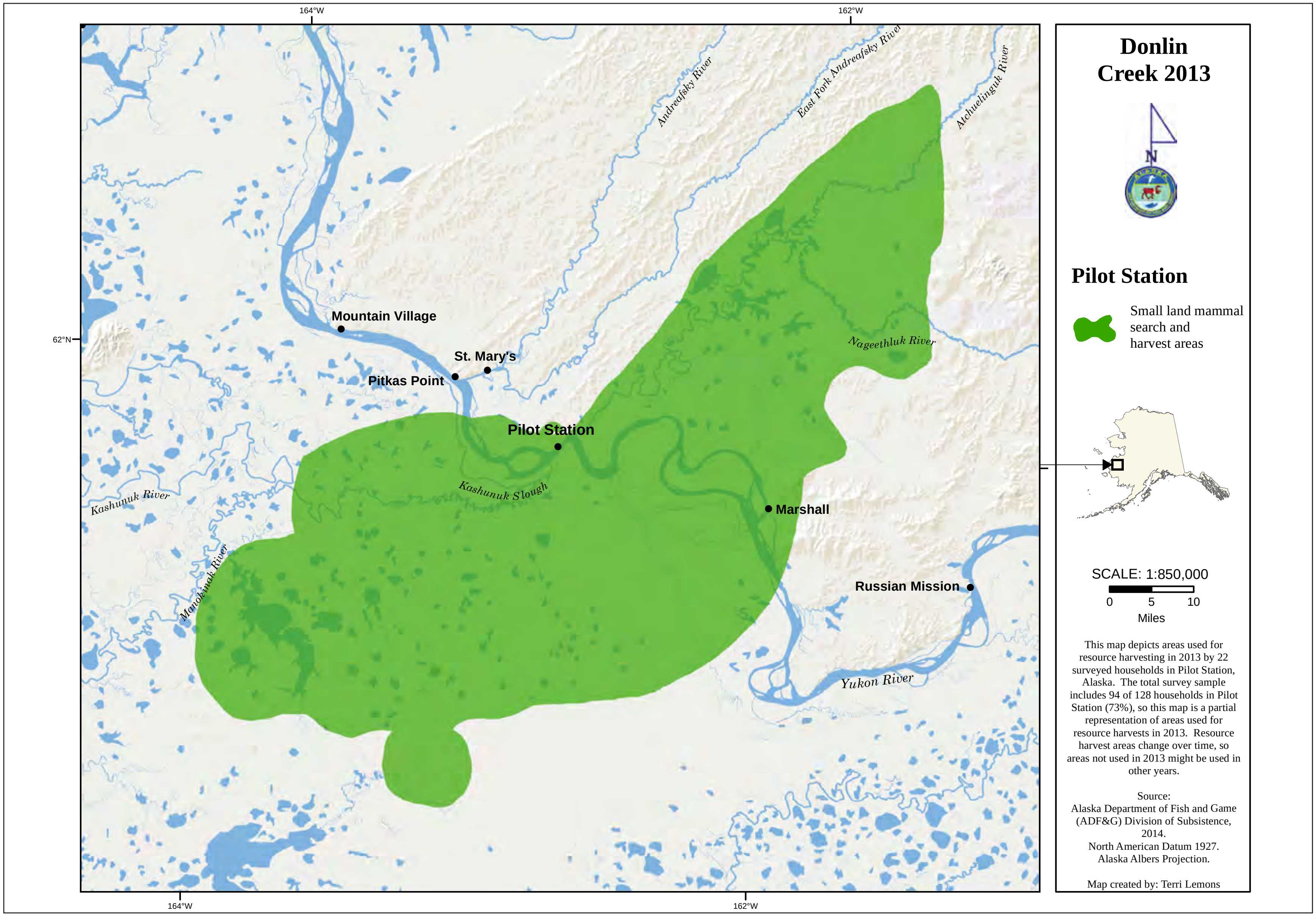


Figure 7-21.–Hunting and harvest areas, small land mammals, Pilot Station, 2013.

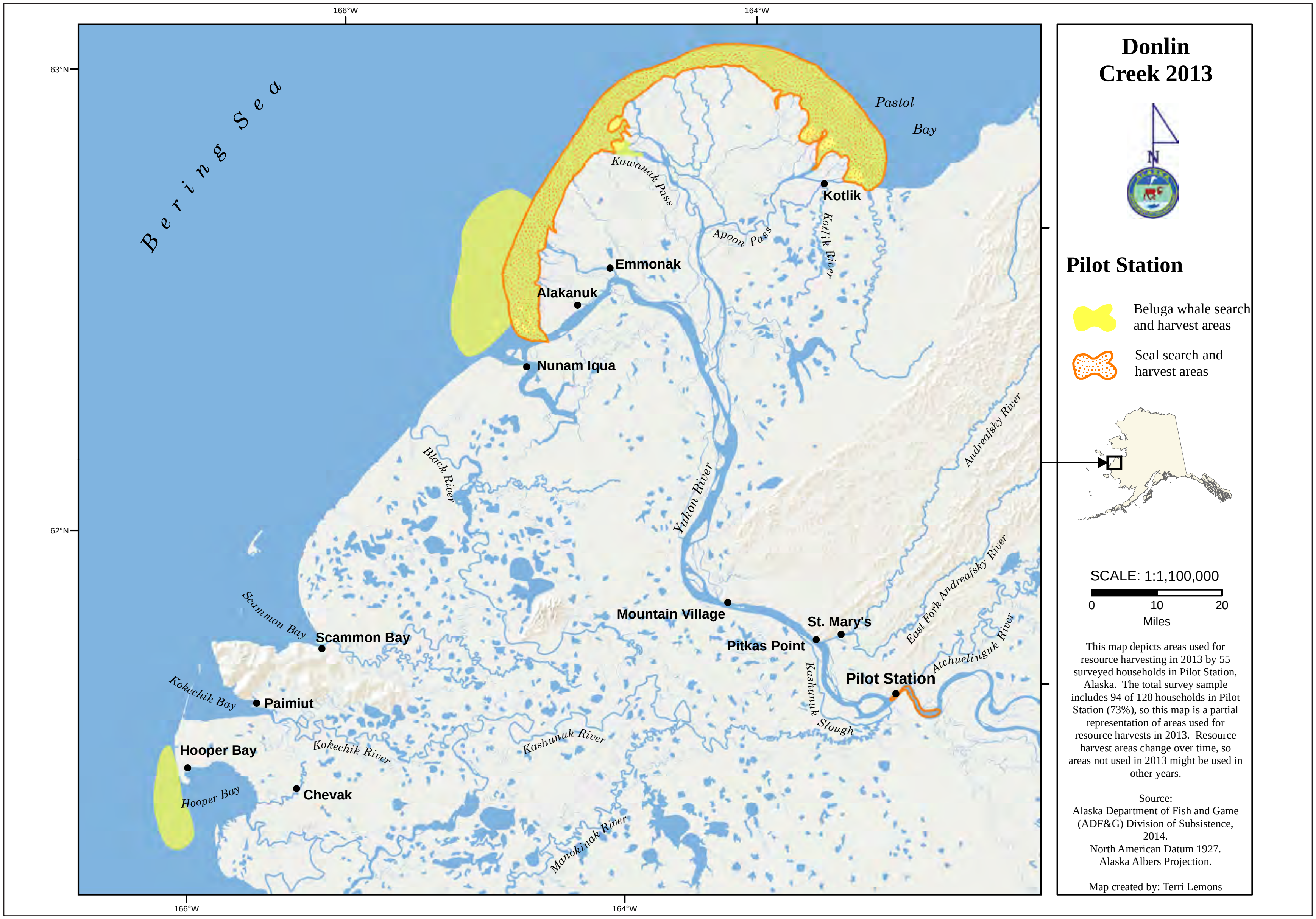


Figure 7-22.–Hunting and harvest areas, beluga whales and seals, Pilot Station, 2013.

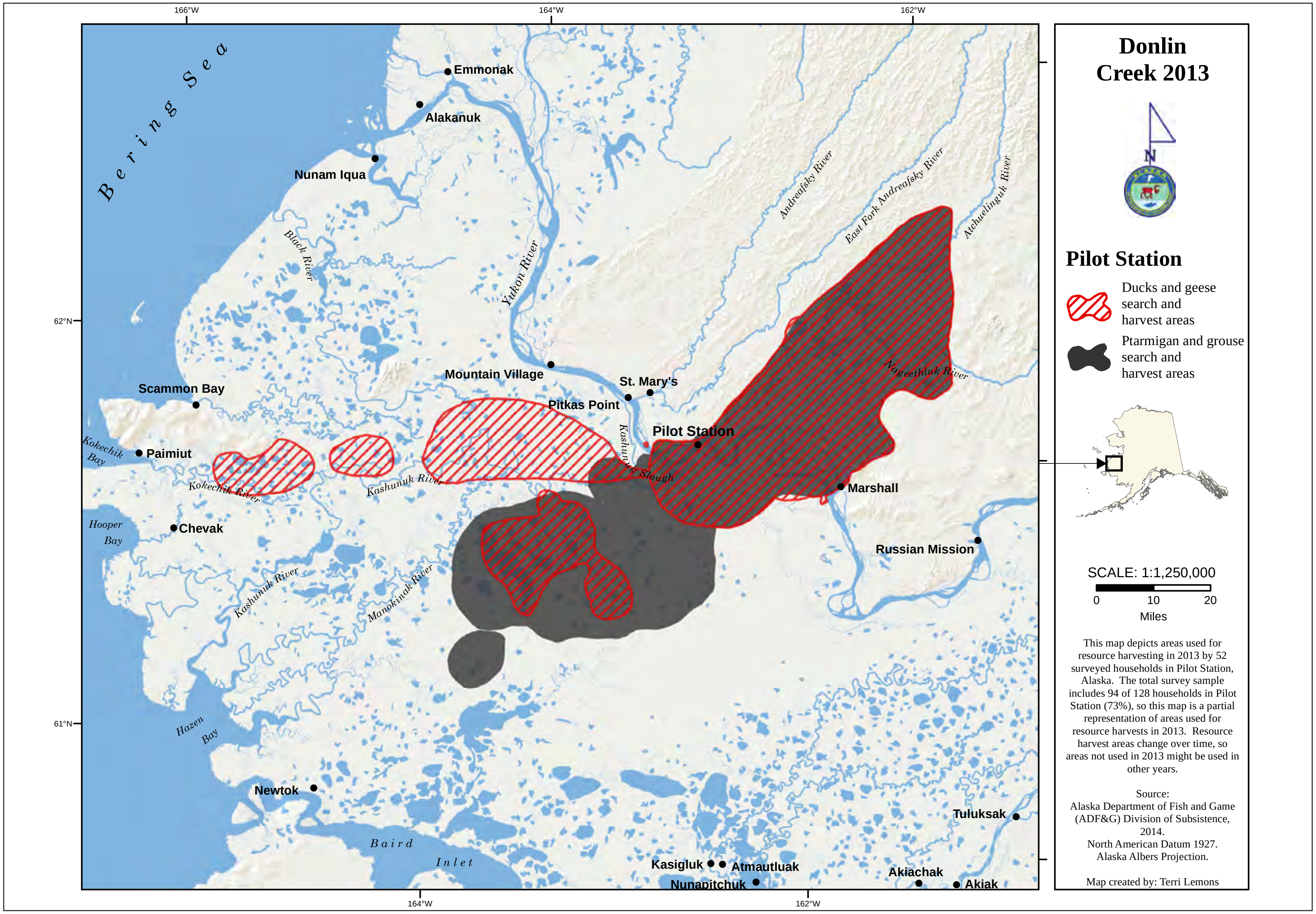


Figure 7-23.–Hunting and harvest areas, waterfowl and nonmigratory birds, Pilot Station, 2013.

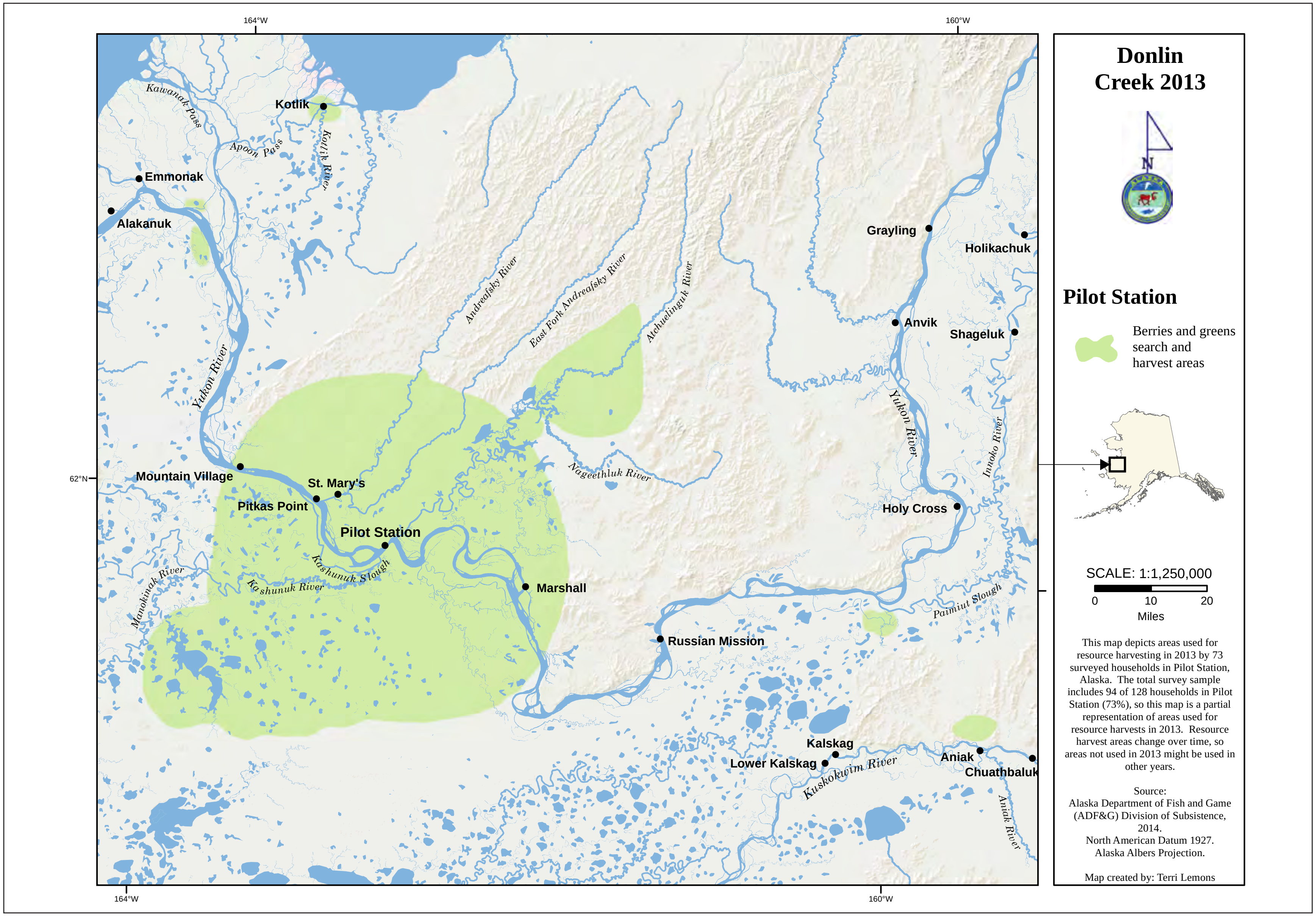


Figure 7-24.–Gathering and harvest areas, berries and greens, Pilot Station, 2013.

Table 7-20.–Changes in household uses of resources compared to recent years, Pilot Station, 2013.

			Households reporting use								Households	
	Sampled	Valid	Total households		Less		Same		More		not using	
Resource category	households	responses[a]	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All Resources	94	91	91	96.8%	35	38.5%	44	48.4%	12	13.2%	0	0.0%
Salmon	94	91	89	94.7%	60	65.9%	19	20.9%	10	11.0%	2	2.2%
Nonsalmon fish	94	89	86	91.5%	50	56.2%	28	31.5%	8	9.0%	3	3.4%
Land mammals	94	91	88	93.6%	22	24.2%	55	60.4%	11	12.1%	3	3.3%
Marine mammals	94	90	62	66.0%	22	24.4%	33	36.7%	7	7.8%	28	31.1%
Birds and eggs	94	89	82	87.2%	39	43.8%	38	42.7%	5	5.6%	7	7.9%
Marine invertebrates	94	92	9	9.6%	5	5.4%	1	1.1%	3	3.3%	83	90.2%
Vegetation	94	89	87	92.6%	32	36.0%	37	41.6%	18	20.2%	2	2.2%

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

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

Comparing Harvests and Uses in 2013 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 2 ways: whether they got more, less, or about the same amount of 7 resource categories in 2013 as in the past 5 years, and whether they got "enough" of each of the 7 resource categories. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different subsistence resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 7-20, Figure 7-25, and Figure 7-26 provide a broad overview of households' assessments of their harvests in 2013. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions.

Figure 7-25 reports the percentages of households that reported whether they got enough of each resource category. More than one-half (66%) of households got enough wild foods in 2013. Seventy-one percent of households reported getting enough land mammals, more than any other resource category. In Figure 7-26, 60% of households reported that their use of land mammals in 2013 was the same as in prior years. Together, these figures show a greater consistency in the use of land mammals when compared to other resource categories. Salmon, for example, did not meet the needs of most households in 2013. Fifty-four percent of households reported that they did not get enough salmon, and 66% reported using less salmon than in recent years (figures 7-25 and 7-26). This is the highest percentage of unmet needs out of the 7 resource categories.

Table 7-21 reports the reasons Pilot Station households used less of each resource category. For households that used less salmon in 2013 than in recent years, 36% answered that regulations were the cause of their reduced use. Additionally, lack of equipment and lack of effort, both identified by 16% of households, affected households use of salmon. Unlike the salmon category, the use of marine mammals depended heavily on the sharing of these resources. Forty-eight percent of households reported that decreases in sharing reduced the use of marine mammals. Less sharing was also the leading cause of reduced use in the nonsalmon fish and birds and eggs categories (21% and 26% respectively).

Table 7-22 reports the reasons households used more of a resource in comparison to recent years. Overall, 36% of households noted that their increased effort in harvesting wild foods resulted in more use of those resources. Sharing followed, with 18% of households identifying receipt of subsistence foods as the cause for higher use. The rate of sharing can strongly influence a household's use of wild foods (tables 7-21 and 7-22). Sharing practices had the greatest influence on a household's use of marine mammals. Due to Pilot Station's location on the Yukon River, hunters must travel to the Bering Sea coast to hunt marine mammals. The rest of Pilot Station residents who are unable to travel or hunt marine mammals rely on hunters to share

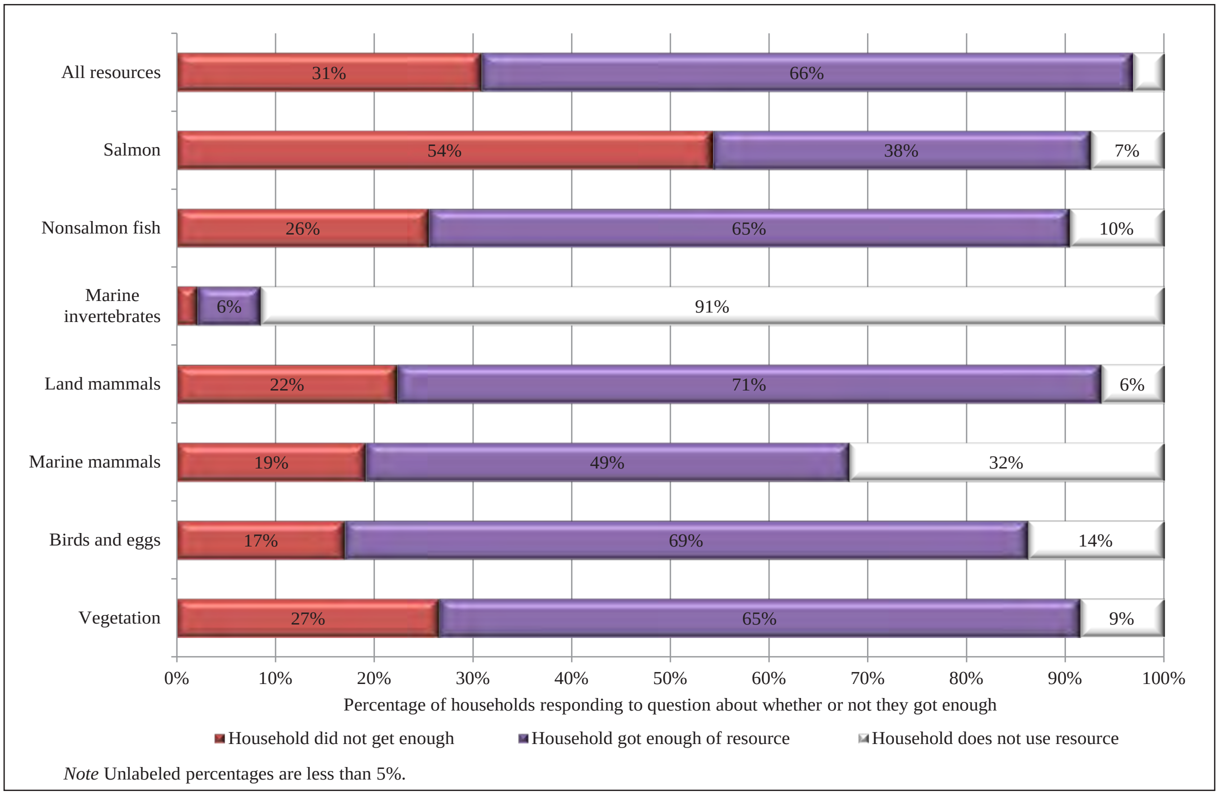


Figure 7-25.–Percentages of households reporting whether or not they got enough resources, Pilot Station, 2013.

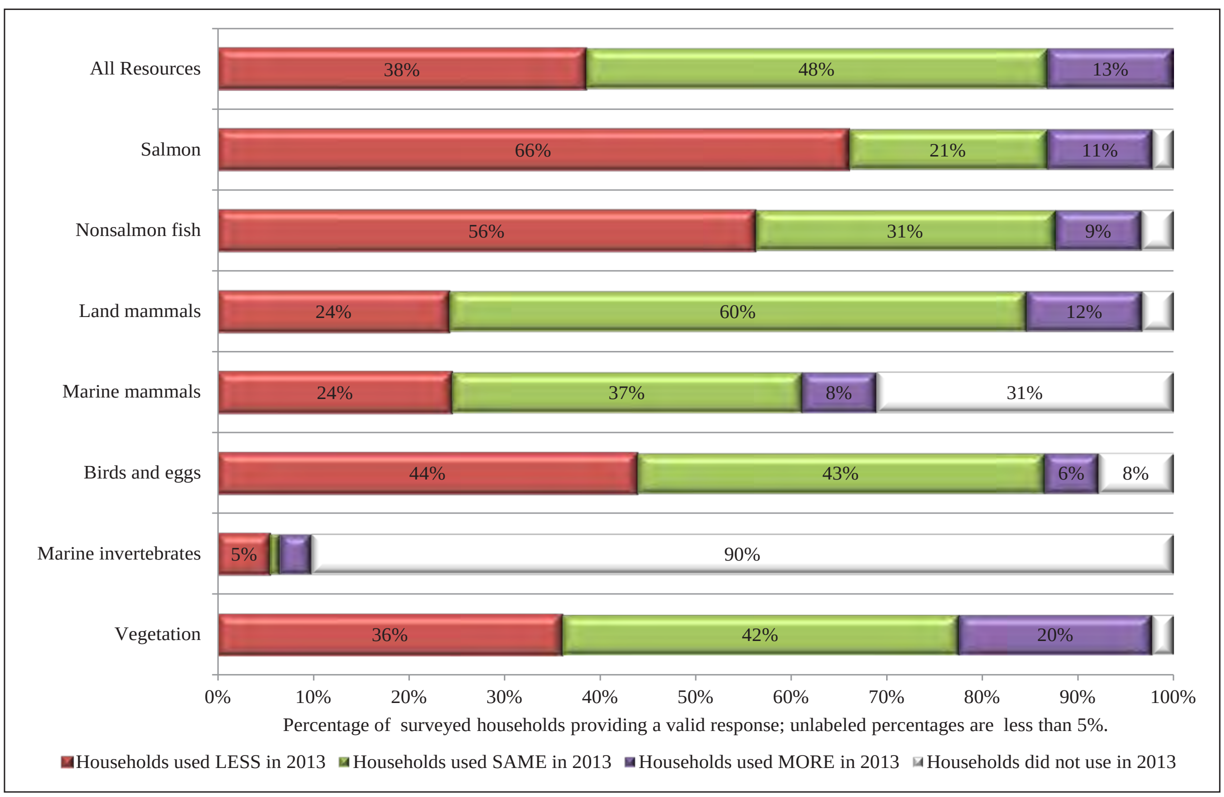


Figure 7-26.–Household uses of resources compared to recent years, Pilot Station, 2013.

Table 7-21.–Reasons for less household uses of resources compared to recent years, Pilot Station, 2013.

			Family/ personal		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful		Weather/ environment		Other reasons	
Resource category	Valid responses[a]	Households reporting reasons for less use	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All Resources	91	34	5	14.7%	5	15%	0	0.0%	5	15%	3	9%	2	6%	0	0.0%	2	5.9%	3	8.8%
Salmon	91	58	6	10.3%	9	16%	0	0.0%	9	16%	6	10%	9	16%	0	0.0%	2	3.4%	1	1.7%
Nonsalmon fish	89	43	3	7.0%	5	12%	0	0.0%	6	14%	9	21%	5	12%	1	2.3%	3	7.0%	2	4.7%
Land mammals	91	21	3	14.3%	0	0%	0	0.0%	2	10%	4	19%	4	19%	4	19.0%	0	0.0%	0	0.0%
Marine mammals	90	21	0	0.0%	2	10%	0	0.0%	2	10%	10	48%	2	10%	0	0.0%	1	4.8%	0	0.0%
Birds and eggs	89	35	3	8.6%	6	17%	0	0.0%	4	11%	9	26%	3	9%	0	0.0%	6	17.1%	0	0.0%
Marine invertebrates	92	5	1	20.0%	0	0%	0	0.0%	0	0%	0	0%	1	20%	0	0.0%	2	40.0%	0	0.0%
Vegetation	89	30	3	10.0%	6	20%	1	3.3%	5	17%	0	0%	6	20%	0	0.0%	1	3.3%	0	0.0%

-continued-

Table 7-21.–Continued.

			Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Did not give any away		Equipment/ fuel expense		Used other resources		Competition	
Resource category	Valid responses[a]	Households reporting reasons for less use	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All Resources	91	34	4	12%	3	8.8%	0	0.0%	1	2.9%	2	5.9%	0	0.0%	8	23.5%	0	0.0%	0	0.0%
Salmon	91	58	2	3%	21	36.2%	0	0.0%	3	5.2%	2	3.4%	0	0.0%	1	1.7%	0	0.0%	1	1.7%
Nonsalmon fish	89	43	4	9%	6	14.0%	0	0.0%	2	4.7%	1	2.3%	0	0.0%	4	9.3%	0	0.0%	0	0.0%
Land mammals	91	21	0	0%	1	4.8%	0	0.0%	1	4.8%	3	14.3%	0	0.0%	3	14.3%	0	0.0%	0	0.0%
Marine mammals	90	21	0	0%	0	0.0%	0	0.0%	0	0.0%	2	9.5%	0	0.0%	3	14.3%	0	0.0%	0	0.0%
Birds and eggs	89	35	1	3%	0	0.0%	0	0.0%	1	2.9%	5	14.3%	0	0.0%	6	17.1%	0	0.0%	0	0.0%
Marine invertebrates	92	5	0	0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%	0	0.0%	1	20.0%	0	0.0%	0	0.0%
Vegetation	89	30	3	10%	0	0.0%	0	0.0%	1	3.3%	2	6.7%	0	0.0%	6	20.0%	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 7-22.–Reasons for more household uses of resources compared to recent years, Pilot Station, 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
All Resources	91	11	1	9.1%	0	0.0%	0	0.0%	2	18.2%	1	9.1%	4	36.4%	0	0.0%
Salmon	91	9	1	11.1%	0	0.0%	0	0.0%	2	22.2%	1	11.1%	2	22.2%	1	11.1%
Nonsalmon fish	89	7	1	14.3%	1	14.3%	0	0.0%	1	14.3%	0	0.0%	0	0.0%	1	14.3%
Land mammals	91	10	1	10.0%	0	0.0%	0	0.0%	2	20.0%	0	0.0%	1	10.0%	0	0.0%
Marine mammals	90	7	0	0.0%	0	0.0%	0	0.0%	2	28.6%	0	0.0%	2	28.6%	0	0.0%
Birds and eggs	89	4	0	0.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	92	3	0	0.0%	0	0.0%	0	0.0%	1	33.3%	0	0.0%	2	66.7%	0	0.0%
Vegetation	89	17	3	17.6%	0	0.0%	2	11.8%	1	5.9%	1	5.9%	4	23.5%	5	29.4%

-continued-

Table 6-22.–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		Substituted for unavailable resource	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All Resources	91	11	1	9.1%	0	0.0%	0	0.0%	0	0.0%	1	9.1%	0	0.0%	0	0.0%	1	9.1%
Salmon	91	9	0	0.0%	0	0.0%	0	0.0%	2	22.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	89	7	1	14.3%	0	0.0%	0	0.0%	1	14.3%	0	0.0%	0	0.0%	0	0.0%	1	14.3%
Land mammals	91	10	2	20.0%	0	0.0%	0	0.0%	1	10.0%	0	0.0%	2	20.0%	0	0.0%	2	20.0%
Marine mammals	90	7	2	28.6%	0	0.0%	0	0.0%	2	28.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	89	4	2	50.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%
Marine invertebrates	92	3	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	89	17	5	29.4%	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.

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

their harvest when they return. Receiving more marine mammal species from other households resulted in 29% of households reporting they used more.

Survey respondents who answered that they did not get enough of a resource were asked to assess how severe the resulting impact was to their household. Respondents chose minor, major, severe, or not noticeable to describe the effect of not getting enough. Overall, 35% of households reported that not getting enough only had a minor impact on their household (Table 7-23). Slightly fewer households reported either a major or severe impact (both 31%). Twenty-six percent of households reported a severe impact to their household because they did not get enough salmon, more reports of a severe effect than in any other category. A measureable level of residents (16%) also reported severe effects from not getting enough vegetation, despite reports of a good berry year. Far fewer households reported severe effects in the remaining resource categories. Forty-three percent of responding households that did not get enough land mammals reported a major impact but only 5% reported a severe impact. Only 11% of responding households reported a major impact of not getting enough marine mammals, and no household reported a severe impact from lacking marine mammals.

Respondents who reported not getting enough of a resource were asked to explain what, if anything, they did differently to compensate. Table 7-24 lists the responses. Fifty percent of respondents who did not get enough salmon and 33% of those who did not get enough nonsalmon fish replaced those fish with other subsistence foods. One respondent (25% of valid responses) used more commercial food after not getting enough salmon in 2013. The only respondent who reported doing something differently after not getting enough land mammals reported an increased hunting effort.

Survey respondents reported the kinds of wild foods of which they need more in 2013. Table 7-25 summarizes these responses. Sixty-nine percent of households specified that they needed more Chinook salmon, and 16% of households reported more generally that they needed more salmon. Chum salmon was also a desired species: 26% of households needed more. Of the 62 valid responses to this question, 23% of households reported needing more whitefish, and 3% specified that they needed more humpback whitefish.

Harvest Data

This study represents the first comprehensive subsistence harvest survey in Pilot Station. In 1992, brown bear harvest was estimated in a number of western Alaska communities by an independent researcher who provided data results to the division for inclusion in the CSIS; however, zero brown bear harvest was listed for Pilot Station.[19] No other harvest data exists except for annual salmon harvest estimates developed by the department.

Figure 7-27 shows the harvest of each salmon species between 1990 and 2013. Data for this figure were gathered by the Alaska Department of Fish and Game, Division of Commercial Fisheries during their annual postseason salmon survey. Each fall, the Division of Commercial Fisheries asks a stratified sample households to estimate their salmon harvests from the previous summer. The 2013 estimates, represented by an orange diamond on the figure, come from the results of this Division of Subsistence study. The methodological differences between the 2 surveys are important to consider when comparing the study year to prior years.

The harvest of each type of salmon was highest in 1990, the earliest year shown on the figure. Each type of salmon has experienced a decline in harvest since then. The decline is most pronounced in the case of Chinook salmon. In 1990, there were no restrictions on subsistence fishing for Chinook salmon and few restrictions on commercial fishing. An estimated 3,786 Chinook salmon were harvested by Pilot Station residents for subsistence in that year. Twenty-three years later, declining runs have required the elimination of commercial fishing opportunity and have resulted in extensive reductions in subsistence fishing opportunity. This study estimated a harvest of 213 Chinook salmon in 2013, a significant reduction in harvest from the 1990s. Continued conservation efforts and concern for Chinook salmon stocks will likely keep harvest low for years to come.

---

19. ADF&G CSIS

Table 7-23.–Reported impact to households that did not get enough of a resource, Pilot Station, 2013.

		Households not getting enough _______ .				Impact to those not getting enough ______ .										
	Sample	Valid responses[a]		Did not get enough		No response		Not noticeable		Minor		Major		Severe		
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	
All resources	94	91	96.8%	29	31.9%	1	3.4%	0	0.0%	10	34.5%	9	31.0%	9	31.0%	
Salmon	94	87	92.6%	51	58.6%	1	2.0%	4	7.8%	18	35.3%	15	29.4%	13	25.5%	
Nonsalmon fish	94	85	90.4%	24	28.2%	2	8.3%	2	8.3%	12	50.0%	6	25.0%	2	8.3%	
Marine invertebrates	94	8	8.5%	2	25.0%	0	0.0%	0	0.0%	1	50.0%	1	50.0%	0	0.0%	
Land mammals	94	88	93.6%	21	23.9%	0	0.0%	1	4.8%	10	47.6%	9	42.9%	1	4.8%	
Marine mammals	94	64	68.1%	18	28.1%	1	5.6%	6	33.3%	9	50.0%	2	11.1%	0	0.0%	
Birds and eggs	94	81	86.2%	16	19.8%	1	6.3%	4	25.0%	8	50.0%	2	12.5%	1	6.3%	
Vegetation	94	86	91.5%	25	29.1%	1	4.0%	3	12.0%	9	36.0%	8	32.0%	4	16.0%	

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

a. Includes households that did not respond to the question and households that never used the resource.

Table 7-24.–Things households reported doing differently as the result of not getting enough of a resource, Pilot Station, 2013.

Resource category	Valid responses[a]	Bought/bartered		Used more commercial foods		Replaced with other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	15	0	0.0%	10	66.7%	2	13.3%	1	6.7%	1	6.7%
Salmon	30	1	3.3%	5	16.7%	19	63.3%	0	0.0%	4	13.3%
Nonsalmon fish	8	0	0.0%	4	50.0%	1	12.5%	0	0.0%	3	37.5%
Marine invertebrates	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	14	0	0.0%	9	64.3%	2	14.3%	0	0.0%	1	7.1%
Marine mammals	5	1	20.0%	0	0.0%	1	20.0%	1	20.0%	0	0.0%
Birds and eggs	8	0	0.0%	6	75.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	13	3	23.1%	9	69.2%	0	0.0%	0	0.0%	0	0.0%

-continued-

Table 7-24.–Continued.

Resource category	Valid responses[a]	Increased effort to harvest		Got a job		Obtained food from other sources		Got public assistance		Conserved resource		Other	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	15	1	6.7%	0	0.0%	0	0.0%	1	6.7%	0	0.0%	1	6.7%
Salmon	30	1	3.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	4	13.3%
Nonsalmon fish	8	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	12.5%	2	25.0%
Marine invertebrates	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Land mammals	14	1	7.1%	1	7.1%	0	0.0%	1	7.1%	0	0.0%	0	0.0%
Marine mammals	5	0	0.0%	0	0.0%	0	0.0%	1	20.0%	1	20.0%	0	0.0%
Birds and eggs	8	0	0.0%	0	0.0%	1	12.5%	1	12.5%	1	12.5%	0	0.0%
Vegetation	13	0	0.0%	0	0.0%	0	0.0%	1	7.7%	0	0.0%	1	7.7%

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

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

Table 7-25.–Resources of which households reported needing more, Pilot Station, 2013.

Resource	Households needing	Percentage of households[a]
All resources	3	4.8%
Fish	11	17.7%
Salmon	10	16.1%
Chum salmon	16	25.8%
Summer chum salmon	3	4.8%
Fall chum salmon	2	3.2%
Coho salmon	2	3.2%
Chinook salmon	39	62.9%
Nonsalmon fish	3	4.8%
Saffron cod	1	1.6%
Alaska blackfish	3	4.8%
Burbot	1	1.6%
Northern pike	1	1.6%
Sheefish	6	9.7%
Whitefishes	14	22.6%
Broad whitefish	3	4.8%
Humpback whitefish	2	3.2%
Moose	22	35.5%
Marine mammals	1	1.6%
Seal	4	6.5%
Unknown seal oil	4	6.5%
Beluga whale	11	17.7%
Birds and eggs	2	3.2%
Migratory birds	1	1.6%
Black scoter	1	1.6%
Geese	5	8.1%
Snow goose	2	3.2%
White-fronted goose	1	1.6%
Swans	3	4.8%
Tundra (whistling) swan	2	3.2%
Bird eggs	1	1.6%
Goose eggs	1	1.6%
Swan eggs	1	1.6%
Freshwater clams	1	1.6%
King crab	1	1.6%
Berries	13	21.0%
Blueberry	15	24.2%
Lowbush cranberry	4	6.5%
Crowberry	6	9.7%
Cloudberry	15	24.2%
Wood	5	8.1%
Unknown	7	11.3%

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

a. Calculated using only households responding to needing at least 1 resource (n=62).

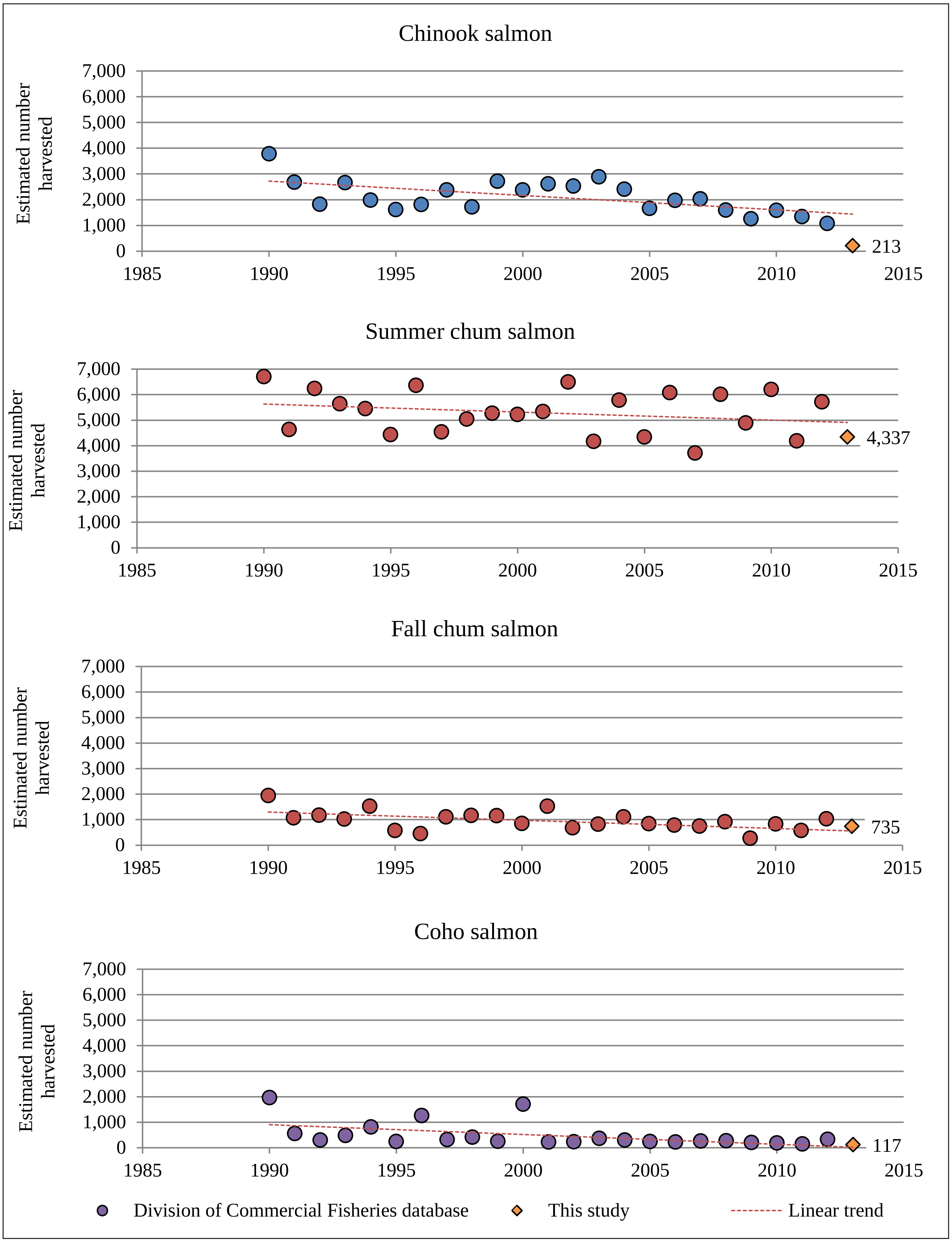


Figure 7-27.–Estimated number of Chinook, summer chum, fall chum, and coho salmon harvested, Pilot Station, 1990–2013.

Although ethnographic respondents discussed their preference for Chinook salmon, the harvest of summer chum salmon has consistently been higher than Chinook salmon in Pilot Station. In 1990, 6,698 summer chum salmon were harvested, substantially more than Chinook salmon. In recent years ADF&G has increased efforts to provide both subsistence and commercial opportunities for summer chum salmon while protecting Chinook salmon, encouraging fishermen to focus their effort on the more abundant types of salmon. Despite these efforts, the subsistence harvest of summer chum salmon has not increased in recent years.

The harvests of fall chum and coho salmon have remained low since 1990 in comparison to the higher harvests of Chinook or summer chum salmon. In the past 23 years, the harvests of fall chum and coho salmon have experienced similar fluctuations. Harvest in the 1990s varied for both types of salmon, while the years between 2001 and 2008 experienced relatively stable harvest.

Income and Cash Employment

Survey respondents were asked about both earned income (jobs held and wages earned by all household members 16 and older) and other income (Alaska Permanent Fund dividend, Social Security, public assistance, etc.). In 2013, Pilot Station households earned or received an estimated community total of $5,840,123, with an average household income of $45,626. Of the total community income, $3,731,500 (64%) was from wage employment and $2,108,623 (36%) was from other sources (Table 7-26). Table 7-27 compares the estimated median income from this study with American Community Survey (ACS) estimates of median income in Pilot Station and all of Alaska between 2008 and 2012. The 2013 median income estimate is slightly lower than the ACS calculation and significantly lower than the median income of all of Alaska. Figure 7-28 shows the top income sources for residents of Pilot Station. Local government provided $1,622,861 or 28% to the community total, more income than any other source (Table 7-26; Figure 7-28). Forty percent of jobs held by employed adults were in the local government sector (Table 7-28). Services including health care, social services, and education followed, with $1,244,726, or 21% of the total community income (Table 7-26). Thirty-two percent of all the jobs held by Pilot Station residents were service positions (Table 7-28). The seasonal forestry and commercial fishing occupations contributed $279,600 to the total community income (Table 7-26). Commercial fishing, once a primary occupation for Pilot Station residents, has declined in recent years as a result of Chinook salmon conservation efforts.

An estimated 241 of 399 adults (61%) held at least 1 job in 2013 (Table 7-29). Of the jobs reported by Pilot Station residents, 52% were full time, 19% were part time (fewer than 35 hours per week), and 28% were on-call positions, in which individuals worked when needed (Table 7-30). On average, employed adults worked 31 weeks out of the year; 27% of those worked year-round (Table 7-29). Eighty-four percent of households contained at least 1 employed adult. On average, 2 employed adults lived in these households (Table 7-29). Employed adults often reported more than 1 job; the number of jobs held ranged from 1 to 8 positions.

Food stamps, the largest contributor of money in the "other income" category, paid an average of $6,081 per household in Pilot Station (a total of $778,330; Table 7-26). This is roughly 13% of Pilot Station's total income. The Alaska Permanent Fund dividend was the next highest contributor to other income. Nearly all (121 of 128) Pilot Station households received a Permanent Fund check in 2013 (tables 7-2 and 7-26). This added $530,655 to the community income total. In 2013, eligible recipients received $900.[20] A variety of social assistance sources including unemployment, retirement, and Social Security also contributed to the community income.

20. Alaska Department of Revenue Permanent Fund Dividend Division. Juneau, 2015 "Summary of Dividend Applications & Payments." Accessed November 6, 2015. https://pfd.alaska.gov/Division-Info/Summary-of-Applications-and-Payments

Table 7-26.–Estimated earned and other income, Pilot Station, 2013.

Income source	Number of people	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government	109.7	76.0	$1,622,861	$1,134,618 – $2,419,719	$12,679	27.8%
Services	88.6	66.1	$1,244,726	$922,711 – $1,656,936	$9,724	21.3%
Agriculture, forestry, and fishing	33.8	26.7	$279,600	$112,622 – $827,164	$2,184	4.8%
Federal government	12.7	11.3	$129,469	$33,439 – $288,292	$1,011	2.2%
Transportation, communication, and utilities	2.8	2.8	$125,465	$15,796 – $442,930	$980	2.1%
Retail trade	8.4	8.4	$122,680	$30,709 – $257,617	$958	2.1%
State government	11.3	9.8	$103,086	$35,602 – $238,002	$805	1.8%
Other employment	9.8	8.4	$83,591	$11,084 – $227,652	$653	1.4%
Mining	1.4	1.4	$20,021	$18,707 – $40,420	$156	0.3%
Earned income subtotal	**239.1**	**106.9**	**$3,731,500**	**$3,058,042 – $4,712,538**	**$29,152**	**63.9%**
Other income						
Food stamps		68.1	$778,330	$592,200 – $979,709	$6,081	13.3%
Alaska Permanent Fund dividend		121.2	$530,655	$465,702 – $598,060	$4,146	9.1%
Social Security		31.3	$214,244	$127,871 – $329,965	$1,674	3.7%
Supplemental Security Income		20.4	$116,055	$61,386 – $183,917	$907	2.0%
Unemployment		47.7	$109,848	$67,527 – $162,196	$858	1.9%
TANF (Temporary Assistance for Needy Families)		16.3	$99,164	$41,565 – $170,391	$775	1.7%
Native corporation dividend		98.3	$64,002	$50,981 – $82,685	$500	1.1%
Longevity bonus		12.5	$56,947	$13,873 – $136,057	$445	1.0%
Heating assistance		39.5	$33,305	$18,755 – $51,268	$260	0.6%
Disability		8.2	$32,195	$4,328 – $80,057	$252	0.6%
Adult public assistance (OAA, APD)		9.5	$27,839	$9,183 – $54,011	$217	0.5%
Foster care		2.7	$17,021	$12,500 – $51,064	$133	0.3%
Pension / retirement		2.7	$15,359	$11,279 – $42,154	$120	0.3%
Veteran disability		2.7	$6,441	$4,730 – $19,538	$50	0.1%
Child support		5.4	$3,701	$140 – $11,342	$29	0.1%
CITGO fuel voucher		5.4	$2,938	$255 – $7,774	$23	0.1%
Meeting honoraria		2.7	$579	$425 – $1,464	$5	0.0%
Workers' compensation / insurance		0.0	$0	$0 – $0	$0	0.0%
Other		0.0	$0	$0 – $0	$0	0.0%
Other income subtotal		**122.6**	**$2,108,623**	**$1,825,006 – $2,397,864**	**$16,474**	**36.1%**
Community income total			**$5,840,123**	**$5,186,644 – $6,863,100**	**$45,626**	**100.0%**

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

Table 7-27.–Comparison of median income estimates, Pilot Station, 2013.

Data source	Median[a]	Range[b,c]
2013 Division of Subsistence estimate	$33,740	$24,352–$41,156
2008–2012 ACS (Pilot Station)	$41,250	$32,366–$50,134
2008–2012 ACS (All Alaska)	$69,014	$68,221–$69,807

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

a. Division of Subsistence 2013 estimate does not include categories of income excluded by the 2008–2012 ACS median estimate, including food stamps, housing assistance, and one-time payments.

b. Division of Subsistence range is a 95% confidence interval of the estimated median.

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

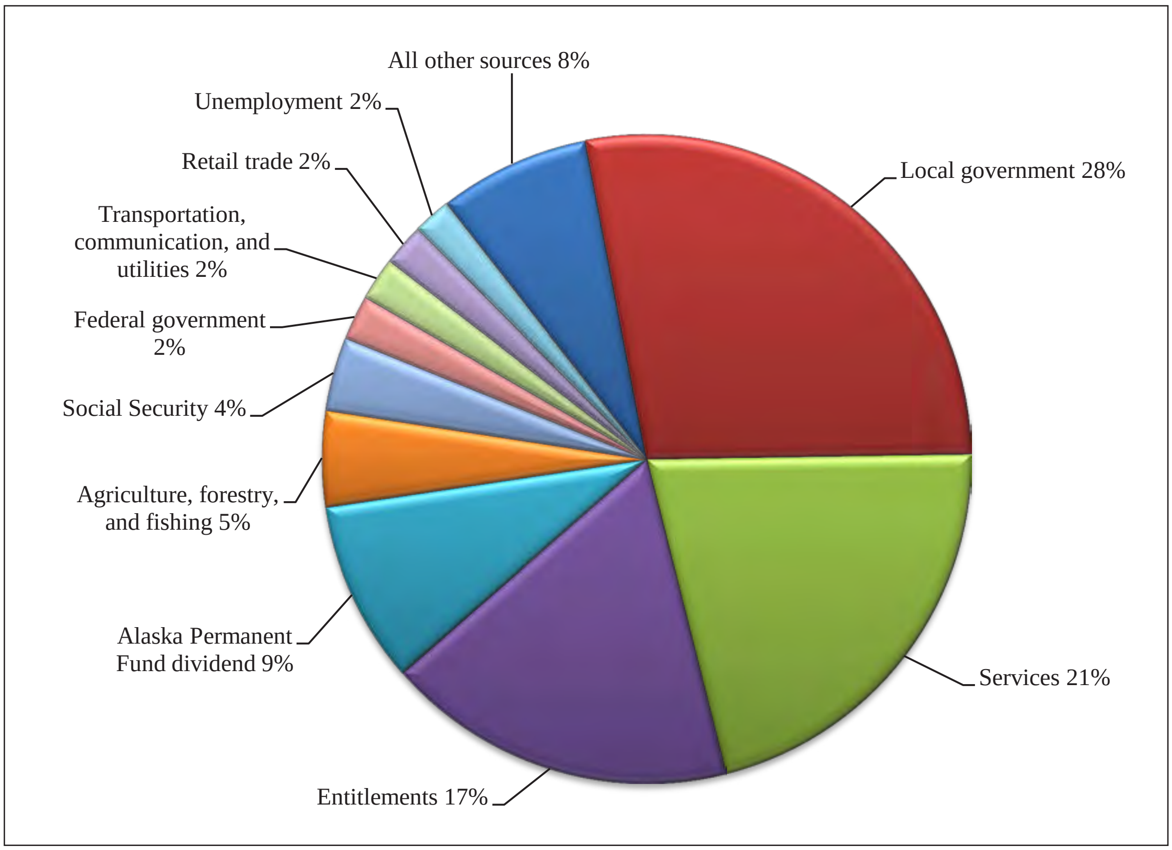


Figure 7-28.–Top income sources, Pilot Station, 2013.

Table 7-28.–Employment by industry, Pilot Station, 2013.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**292.4**	**106.9**	**241.3**	
Federal government	**4.3%**	**10.5%**	**5.3%**	**3.5%**
Executive, administrative, and managerial	0.5%	1.3%	0.6%	1.4%
Marketing and sales occupations	0.5%	1.3%	0.6%	0.4%
Service occupations	3.4%	7.9%	4.1%	1.7%
State government	**4.3%**	**9.2%**	**4.7%**	**2.8%**
Technologists and technicians, except health	1.4%	3.9%	1.8%	1.3%
Administrative support occupations, including clerical	1.4%	2.6%	1.2%	1.0%
Service occupations	1.0%	1.3%	1.2%	0.2%
Handlers, equipment cleaners, helpers, and laborers	0.5%	1.3%	0.6%	0.3%
Local government, including tribal	**40.1%**	**71.1%**	**45.9%**	**43.5%**
Executive, administrative, and managerial	1.4%	3.9%	1.8%	2.2%
Teachers, librarians, and counselors	11.1%	21.1%	13.5%	18.4%
Marketing and sales occupations	2.4%	6.6%	2.9%	2.7%
Administrative support occupations, including clerical	6.8%	18.4%	8.2%	1.9%
Service occupations	7.7%	21.1%	9.4%	11.1%
Mechanics and repairers	0.5%	1.3%	0.6%	0.7%
Precision production occupations	1.0%	2.6%	1.2%	0.7%
Transportation and material moving occupations	1.0%	1.3%	0.6%	0.3%
Handlers, equipment cleaners, helpers, and laborers	7.7%	21.1%	9.4%	5.0%
Occupation not indicated	0.5%	1.3%	0.6%	0.3%
Agriculture, forestry, and fishing	**11.6%**	**25.0%**	**14.1%**	**7.5%**
Agricultural, forestry, and fishing occupations	11.6%	25.0%	14.1%	7.5%
Mining	**0.5%**	**1.3%**	**0.6%**	**0.5%**
Construction and extractive occupations	0.5%	1.3%	0.6%	0.5%
Transportation, communication, and utilities	**1.0%**	**2.6%**	**1.2%**	**3.4%**
Transportation and material moving occupations	1.0%	2.6%	1.2%	3.4%
Retail trade	**2.9%**	**7.9%**	**3.5%**	**3.3%**
Executive, administrative, and managerial	1.0%	2.6%	1.2%	1.4%
Marketing and sales occupations	1.9%	5.3%	2.4%	1.9%
Services	**31.9%**	**61.8%**	**37.1%**	**33.4%**
Executive, administrative, and managerial	1.0%	2.6%	1.2%	2.8%
Teachers, librarians, and counselors	0.5%	1.3%	0.6%	0.1%
Health technologists and technicians	1.9%	5.3%	2.4%	3.4%
Technologists and technicians, except health	0.5%	1.3%	0.6%	0.5%
Marketing and sales occupations	1.0%	2.6%	1.2%	1.0%
Administrative support occupations, including clerical	2.9%	7.9%	3.5%	3.9%
Service occupations	6.8%	17.1%	8.2%	6.5%
Construction and extractive occupations	5.8%	15.8%	7.1%	5.8%
Transportation and material moving occupations	1.9%	5.3%	2.4%	1.7%
Handlers, equipment cleaners, helpers, and laborers	9.2%	23.7%	10.6%	6.6%
Occupation not indicated	0.5%	1.3%	0.6%	1.0%
Industry not indicated	**3.4%**	**7.9%**	**4.1%**	**2.2%**
Administrative support occupations, including clerical	0.5%	1.3%	0.6%	0.2%
Service occupations	1.0%	2.6%	1.2%	0.3%
Agricultural, forestry, and fishing occupations	0.5%	1.3%	0.6%	0.1%
Construction and extractive occupations	0.5%	1.3%	0.6%	0.5%
Handlers, equipment cleaners, helpers, and laborers	0.5%	1.3%	0.6%	0.1%
Occupation not indicated	0.5%	1.3%	0.6%	1.1%

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

Table 7-29.–Employment characteristics, Pilot Station, 2013.

Characteristic	Community: Pilot Station
All adults	
Number	399.0
Mean weeks employed	18.7
Employed adults	
Number	241.3
Percentage	60.5%
Jobs	
Number	292.4
Mean	1.2
Minimum	1
Maximum	3
Months employed	
Mean	7.1
Minimum	0
Maximum	12
Percentage employed year-round	27.1%
Mean weeks employed	30.9
Households	
Number	128
Employed	
Number	106.9
Percentage	83.5%
Jobs per employed household	
Mean	2.3
Minimum	1
Maximum	8
Employed adults	
Mean	
Employed households	2.3
Total households	1.9
Minimum	1
Maximum	5
Mean person-weeks of employment	41.0

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

Table 7-30.–Reported job schedules, Pilot Station, 2013.

Schedule	Jobs		Employed persons		Employed households	
	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	151.2	51.7%	142.5	59.4%	85.8	80.3%
Part-time	55.1	18.8%	52.2	21.8%	39.4	36.8%
Shift	2.8	1.0%	2.8	1.2%	2.8	2.6%
On-call (occasional)	81.9	28.0%	73.4	30.6%	50.6	47.4%
Part-time shift	0.0	0.0%	0.0	0.0%	0.0	0.0%
Schedule not reported	1.4	0.5%	1.4	0.6%	1.4	1.3%

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

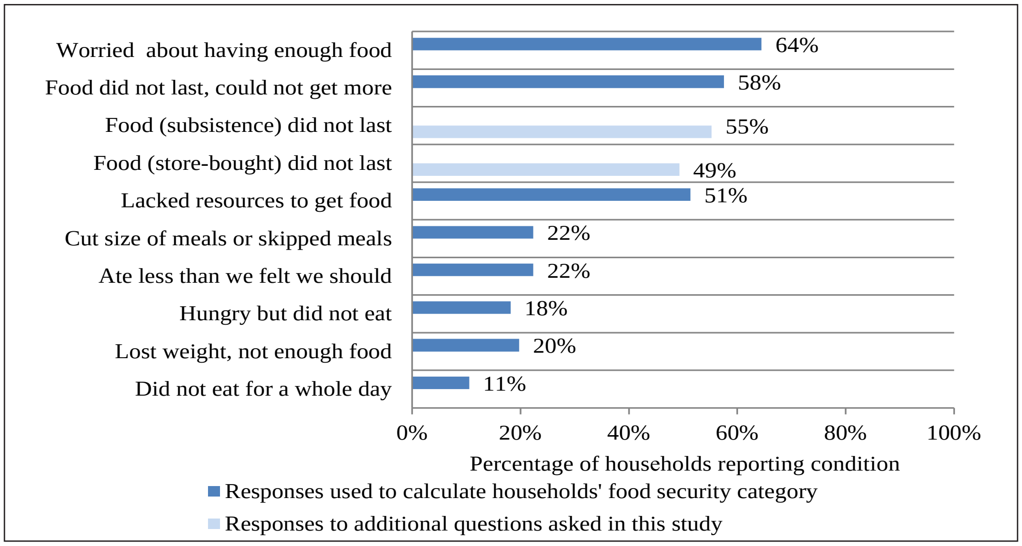


Figure 7-29.–Responses to questions about food insecure conditions, Pilot Station, 2013.

Food Security

Survey respondents were asked a set of questions intended to assess their household's food security, defined as "access by all people at all times to enough food for an active, healthy life" (Coleman-Jensen et al. 2012). The food security questions were modeled after those developed by the U.S. Department of Agriculture (USDA) but modified by ADF&G to account for differences in access to subsistence and store-bought foods. Eight of the 10 statements listed in the figure are used to calculate a household's food security. Based on their responses to these questions, households were broadly categorized as food secure or food insecure following a USDA protocol (Bickel et al. 2000). Food secure households were broken down further into 2 subcategories—high or marginal food security. Food insecure households were divided into 2 subcategories: low food security or very low food security.

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

Responses by Pilot Station residents to questions about food insecure conditions are summarized in Figure 7-29. Sixty-four percent of households worried at some point during the year that they would not have enough food. Forty-nine percent of responding households said that they ran out of store-bought food at some point during the year, and a slightly higher percentage (51%) reported that their subsistence food ran out. Fifty-eight percent of households reported that once their food, either store-bought or subsistence, ran out, they were unable to get more. Twenty-two percent of households reported that at least 1 adult in the household ate less than they felt they should because they could not get the foods they needed. Other responses associated with low food security included household members who were hungry but did not eat (18%), household members who lost weight because they did not have enough food (20%), and those who did not eat for a whole day (11%).

Food security results for surveys for Pilot Station, the state of Alaska, and the United States are summarized in Figure 7-30. In Alaska, the percentages of households in each food security category were very similar to those in the rest of the United States. For example, 88% of Alaska households, compared to 86% of United States households, experienced high to marginal food security in 2013, while only 5% of Alaska households

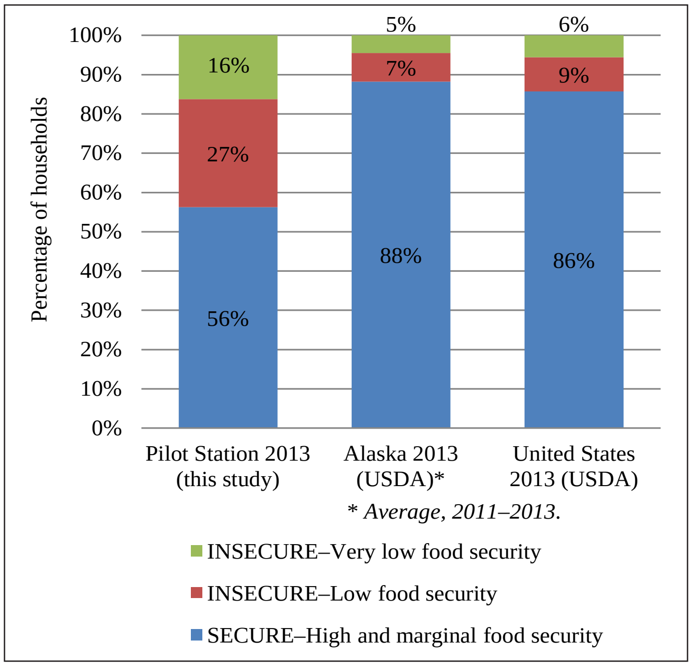


Figure 7-30.–Food security categories, Pilot Station, 2013.

and 6% of U.S. households experienced very low food security. Reflecting the data in the previous paragraph, Pilot Station had much lower food security than the rest of the state or the nation. Only 56% of households were classified as high or marginal food security, while 16% of households experienced very low food security. Twenty-seven percent of Pilot Station households had low food security: 20% more than the number of Alaska households in the same category and 18% more than others in the nation.

Figure 7-31 portrays the mean number of food insecure conditions per household by food security category and by month. As discussed previously, subsistence harvests occur year-round based on the seasonal availability of wild resources. The availability of wild resources fluctuates throughout the year and may affect the month to month food security of households participating in subsistence activities. Households with high and marginal food security (shown in blue) remained relatively stable throughout the year; these households experienced less than 1 food insecure condition in any given month. Households with very low food security (shown in green) experienced the greatest variation throughout the year. Food insecurity for these households peaked in June and November, when they experienced an average of 4 to 5 food insecure conditions. As discussed earlier, the heavy fishing restrictions in 2013 affected households' ability to catch enough salmon for subsistence or commercial sale and possibly increased the number of households that worried about getting the food they needed. This factor could explain the rise in food insecurity beginning in June and lasting throughout the summer. Food insecurity for these households was lowest in January, February, and May, when they experienced an average of only 3 conditions. Unlike households with very low food security, households with low food security (shown in red), had less variability, with only 2 to 3 true food insecure conditions throughout the year. These households also experienced a rise in food insecurity the summer months of June and July with the highest level of food insecurity in October. This graph demonstrates that the food security fluctuates more as households become less food secure. Changes in the availability of wild resources, eligibility for food stamps, and access to the resources needed to obtain food, for example, affected households with very low food security more than those with high or marginal food security.

Figure 7-32 shows the months in which households reported that their food did not last. Subsistence foods (shown in red) had the greater fluctuations than store bought food (shown in green); the highest percentages of households reported that their subsistence food did not last in April and December (24% and 26%, respectively). September and October were months in which the lowest levels of households reported that they ran out of subsistence foods (both 15%). Successful moose hunting in September could explain this decrease. In every month, a higher percentage of households reported running out of store-bought foods than they did of subsistence foods. Between 24% and 31% of households ran out of store-bought foods throughout the year; the highest percentage of households reported running out of food in December (31%).

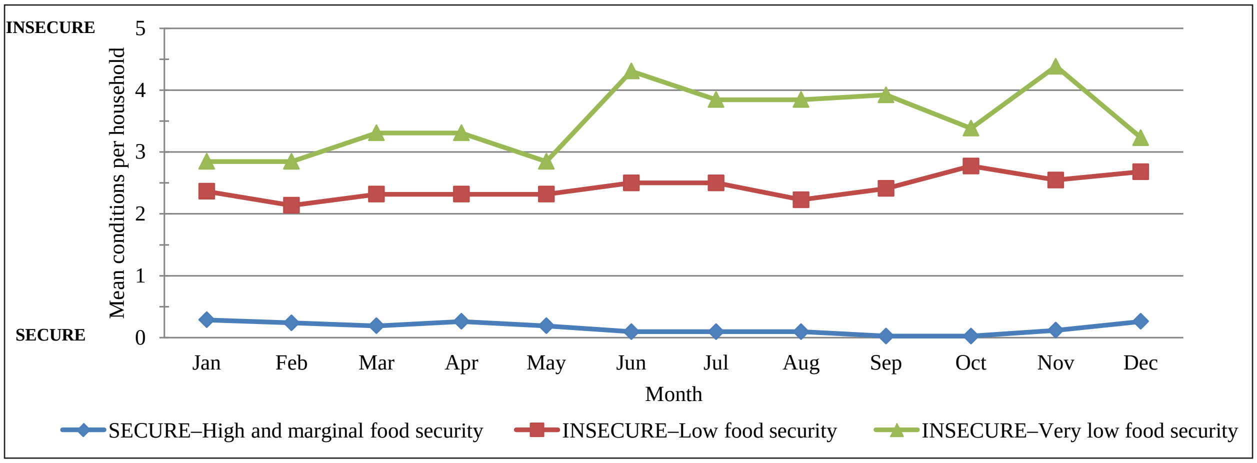


Figure 7-31.–Mean number of food insecure conditions by month and by household category, Pilot Station, 2013.

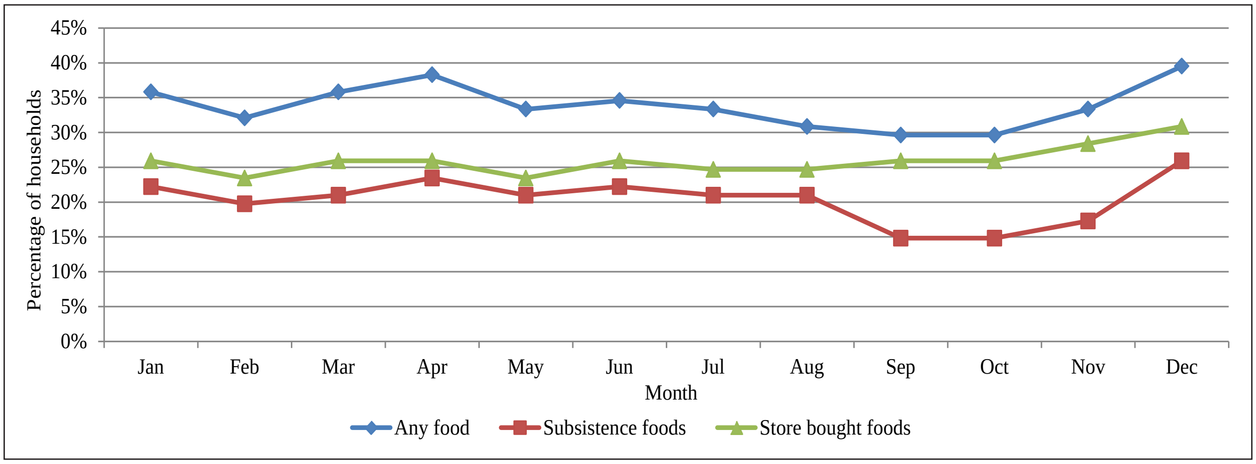


Figure 7-32.–Comparison of months when subsistence, store-bought, and any food did not last, Pilot Station, 2013.

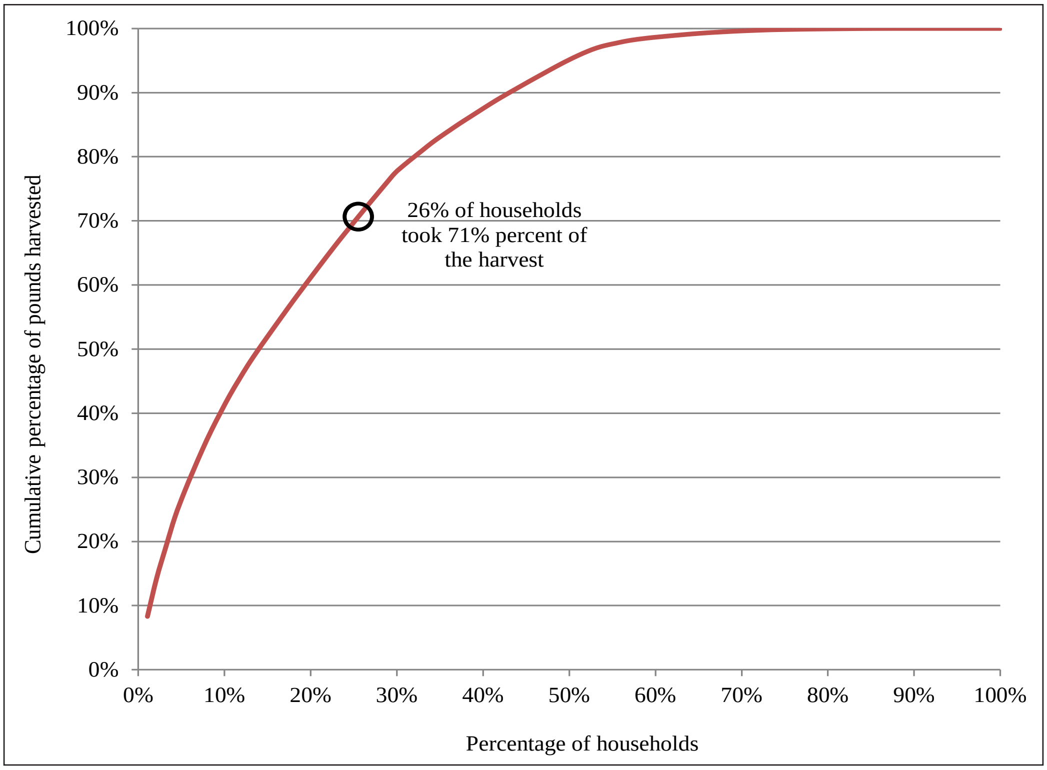


Figure 7-33.–Household harvest specialization, Pilot Station, 2013.

Sharing of Wild Resources

Household Specialization in Resource Harvesting

Previous studies (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 harvested 76% of the total wild foods for the community (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.

Pilot Station in 2013 follows this pattern as shown in Figure 7-33: 71% of the harvests of wild resources as estimated in usable pounds was harvested by 26% 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 Pilot Station and the other study communities.

Wild Food Networks

Although subsistence harvest surveys collect information based on individual households, in reality, much of the production (harvest and processing) of subsistence foods is achieved by households within a community that work cooperatively. This cooperation is often organized along kinship or other social ties. The organization of contemporary mixed market–subsistence economies that predominate in rural Alaska communities has been documented ethnographically by numerous researchers.

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

Figure 7-34 shows the flow of wild foods into surveyed households from other Pilot Station households and from other communities in Alaska. The shape of the symbol depicts the type of household; colors show the ages of heads of household; and symbol size indicates the size of the household's subsistence harvest in 2013 by usable weight. Arrows show the direction of food from 1 household to another, and the weight of lines show the number of exchanges. Households closer to the center received resources more often; households that were less connected migrated to the margins. The figure is only a partial representation of food exchange in 2013, however, because it only documents the food flows into the 94 surveyed households, or receipt of food.[21]

Previous studies have found a positive association between the ages of household heads and the amount of subsistence foods harvested. Household characteristics associated with higher food production include multiple working-age males, involvement with commercial fishing, and higher wage incomes. Characteristics common to lower producing households included female household heads, age of elders, non-Native household heads, and single-person households (Magdanz et al. 2009; Wolfe et al. 2010). Household "developmental cycles" (i.e., the relative age or "maturity" of household heads and number of productive household members) have also been associated with harvests.

It is clear that Pilot Station households also rely on sharing and exchange to distribute wild resources. As discussed above in the Harvest and Use of Wild Resources at the Household Level section, 70% of Pilot Station households gave some wild resources away, and 96% of households received some wild foods from others (Table 7-7). The diagram shows that none of the surveyed households, represented by a colored square or triangle, were left out of this exchange; all received food from at least 1 other household within the community (Figure 7-34). At the center of the diagram, a variety of demographic characteristics are represented. Single males, single females, and couples of all ages reported receiving food frequently, suggesting that a household's demographics may not dictate which households tend to receive the most food. Ethnographic respondents discussed a variety of motivations for sharing and bartering: providing food for those who do not have enough or cannot harvest wild foods themselves, continuing a cultural tradition that values sharing, and maintaining positive relationships with friends and family in other regions of the state.

Survey respondents reported receiving food from 30 other Alaskan communities. Scammon Bay, a coastal community south from the mouth of the Yukon River, was named as a common sharing partner and had the highest frequency of sharing with Pilot Station residents (37 instances). An ethnographic respondent described his bartering relationships with friends from Scammon Bay and other coastal communities, "When they want [something] they give [food]" (040414PQS1). For example, the respondent often sends dried smelt in exchange for walrus meat or seal oil. The neighboring communities of Saint Mary's, Marshall, and Emmonak also appear near the center of the network, illustrating the connections between communities in the Yukon Delta region. Respondents reported 35 instances of receiving food from Bethel, a regional hub community located on the lower Kuskokwim River. One ethnographic respondent explained:

> I share a lot of my food. Last fall, we put out fish nets across in the river, and that river feeds a lot of people from all over the Y-K Delta. And [people from] the Y-K Delta, the Yukon-Kuskokwim Delta, they call me, "Hey, can you get me some fish or hunt moose for me?" That's how we kind of been all these years. (040414PQS1)

Two heavy harvesting households at the left of the diagram, one represented by an orange square and the other a brown square, are nearly surrounded by instances of food flow. Numerous survey respondents reported receiving food from these 2 households, suggesting that high harvesters are an integral component of Pilot Station's subsistence economy. During fishing season, high harvesting households are keenly aware of who is unable to fish. A respondent provided an ethnographic example:

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

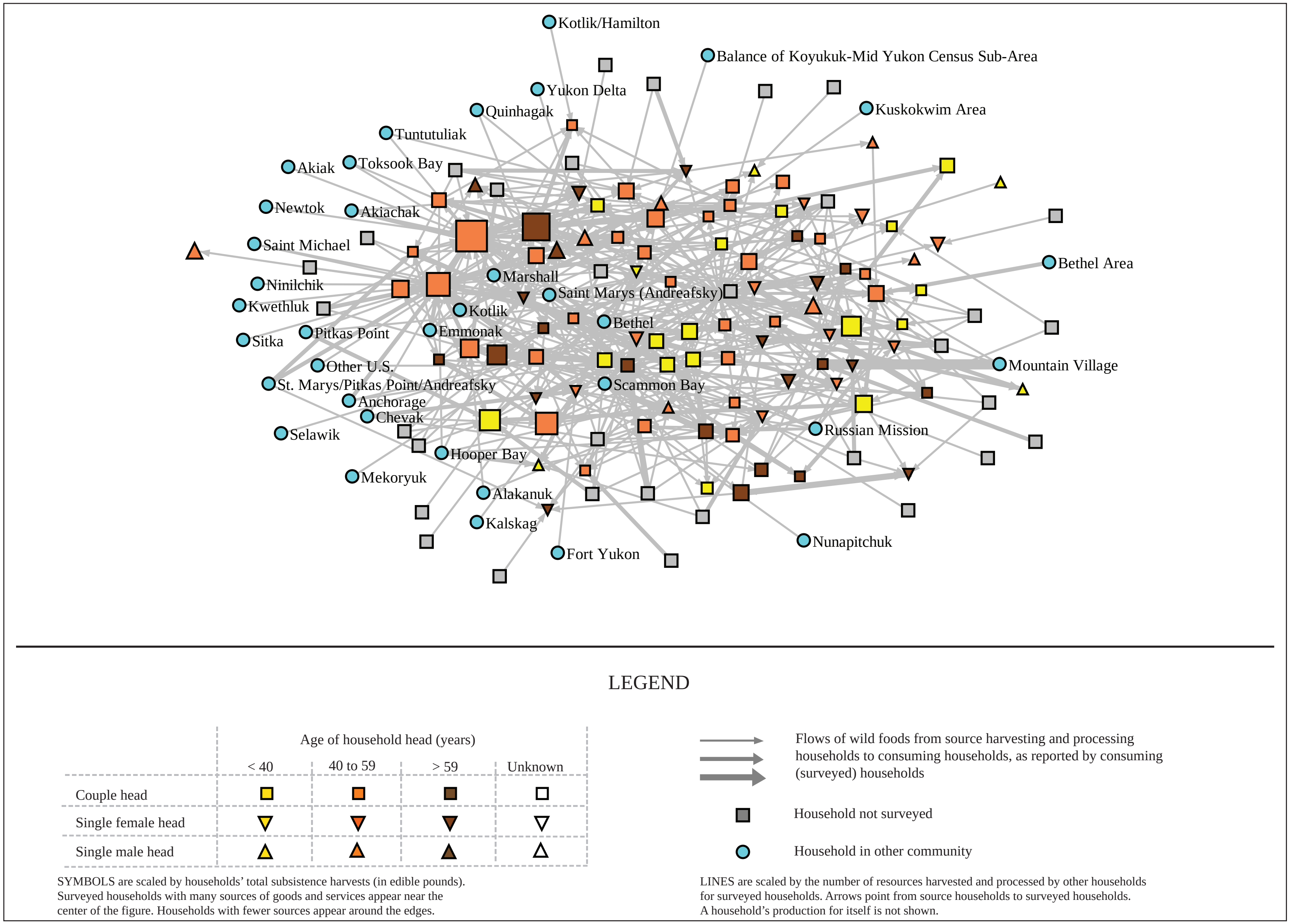


Figure 7-34.–Wild food harvesting and processing network, Pilot Station, 2013.

> All the subsistence chums we get, I would divide, we would divide it, we would divide it between me and my in-laws because they, they don't have a boat or a smoker so we try to catch enough for [them]. (040514PQS4)

As a gesture of gratitude, those who receive food often later bring food to those who are able to share their harvest. In this way, sharing becomes a fundamental component of subsistence harvests and a continual factor when considering how much to harvest. A respondent who described giving food to many households in Pilot Station receives a considerable amount of food in return throughout the year:

> Don't ask for nothing when you give something up. That's the way I put it, but sooner or later on down the road, they'll turn around and give [to] you…Young people always bring me birds and moose, I don't ask for nothing, they just bring them. We caught a moose, we gave it out, [a] couple of days later I come back and there's another half a moose laying in my porch. (040414PQS1)

The interconnectedness of households, both within Pilot Station and with other communities across the state, demonstrates the communal nature of subsistence harvests. Ethnographic respondents often described their fishing, hunting and gathering activities by naming the friends and family members who helped them. Naturally, a shared effort leads to a shared harvest and creates the ability to harvest enough for those who cannot fish, hunt, or gather all that they need by themselves.

Local Comments and Concerns

Local concerns and comments are included throughout this chapter. A summary of the remaining concerns documented on the household surveys, during the ethnographic interviews or expressed at the community review meeting are described in this section. Some households did not offer any additional information during the survey interviews, so not all households are represented in the summary.

Ethnographic respondents expressed concern over the ADF&G sonar station near Pilot Station. In addition to counting fish, technicians use drift gillnets to estimate the species apportionment of sonar counts throughout the summer season. During these drifts, some Chinook and chum salmon are sampled for age, sex, and length, and genetic samples are taken for further analysis. Sampled fish are either returned to the water or, if deemed unfit for migration, distributed to the community of Pilot Station each day. Ethnographic respondents expressed concern that the fish released back to the river are not capable of surviving and are worried that fish are being harmed and wasted.

Acknowledgements

The author would like to express gratitude to all the residents of Pilot Station for their interest and participation in the 2013 comprehensive study. During fieldwork in April 2014, Pilot Station residents were generous with their time and hospitable to Division of Subsistence researchers who spent a week in the community. Researchers were given a tour of the community, encouraged to participate in the weekly Yupik dance practice, challenged to play bingo, and invited to go ice fishing. Special thanks go to Pilot Station elders and the subsistence harvesters who contributed their time and wisdom as key respondents. Their knowledge of the Yukon River and the customary and traditional uses of fish and wildlife adds invaluable context for this report. Additionally, members of the Pilot Station tribal council and particularly Martin Kelly, the tribal administrator, deserve recognition for their help facilitating this study. Finally, the research would not have been possible without the help of local research assistants who scheduled and administered surveys and shared their knowledge of the community with Division of Subsistence research staff.

8. SHAGELUK

Andrew R. Brenner

In February 2014, researchers surveyed 26 of 29 households (90%) in Shageluk. The surveyed households reported harvesting 21,955 edible pounds of wild food between January and December 2013. Expanding for 3 unsurveyed households, Shageluk residents' estimated total harvest of wild food in 2013 was 24,489 lb (±18%). The average harvest per household was 844 lb; the average harvest per person was 289 lb.

Moose, 7 species of fish, beaver, and blueberries made up the top 10 harvested resources and represented 92% of all harvested wild foods by edible weight. The estimated harvest of 11 moose represented the largest percentage (25%) of Shageluk's annual wild food harvest in 2013, contributing more than any other individual resource or resource category by edible weight (6,023 lb). Fish of all species formed a large percentage (65%) of the total wild food harvest. Seven fish species formed the majority of the fish harvest by edible weight, with estimated harvests of 1,035 individual broad whitefish, 622 summer chum salmon, 637 northern pike, 425 coho salmon, 392 sheefish, 84 Chinook salmon, and 184 humpback whitefish. An estimated 42 beavers and 72 gallons of blueberries also contributed a substantial amount of food to the overall harvest.

This chapter summarizes findings from the household surveys, including demographic characteristics, responses to harvest assessment questions, harvest estimates, reported employment and income, wild food networks, and responses to food security questions.

In addition to surveys, ADF&G staff conducted 6 ethnographic interviews with respondents who were knowledgeable about subsistence harvest and use patterns in Shageluk. Five men and 1 woman, ranging in age from 21 to 88 years, were asked about their past and current subsistence practices, including species targeted, gear types, timing of harvests, generational transmission of knowledge, distribution and sharing, processing and preservation, and use areas. They were also asked about changes in their households' and their community's subsistence practices, fish and game populations, and the environment witnessed during their lifetimes.

Community Background

The community of Shageluk is located on the Innoko River, approximately 34 miles northeast of Holy Cross (Orth 1971rep.:858). The surrounding area is often referred to as the GASH subregion, an acronym that references the 4 communities in this section of Interior Alaska: Grayling, Anvik, Shageluk, and Holy Cross (Wheeler et al. 1992:1). Characteristic of the Yukon-Koyukuk Census Area (Shanks 2013), Shageluk is a relatively small community with a population of approximately 85 individuals in 2013. Nearly all residents are Alaska Native, primarily of Deg Hit'an[1] descent. The place name "Shageluk" is derived from *Caarilluk,*[2] the Central Yup'ik name for the Innoko River. The Deg Xinag[3] name for the location is Łeggi *Jitno'*[4]. Following the construction of a school at Shageluk's contemporary location in 1966, the community relocated from "Old Shageluk," an older site a few miles upriver (VanStone 1979a:19). Shageluk was

1. The Athabascan language developed by the people of Shageluk, nearby communities, and their ancestors is *Deg Xinag*; people having this language as their heritage are *Deg Hit'an*.

2. *Caarilluk* has the literal meaning of white alder (Jacobson 2012:171). According to Zagoskin (1967:193), Chagelyuk (sic) was how the "Yukon people" referred to the Innoka (sic) River as a whole.

3. Deg Xinag meaning and orthography from Alaska Native Knowledge Network, Fairbanks, n.d. "Deg Xinag Ałixi Ni'elyoy: the local language is gathered together." Accessed June 3, 2016. http://ankn.uaf.edu/ANL/mod/glossary/view.php?id=17.

4. Łeggi Jitno' is described by Osgood as meaning "rotten fish place" (1958:29). There may be an alternate meaning of "place for smoking fish," see Kari, James M. *Deh Hit'an Stem List: Root-Cross-reference List #1, May 8, 1996*, unpublished document, 1996. The manuscript of this work is on file with ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.

Plate 8-1.–Photo of Shageluk taken from the hills near town while facing northwest.

incorporated as a city in 1970, and amenities include a school and health clinic.[5] The majority of homes do not have running water; residents obtain water for home use from a community washeteria. Fuel and heavy equipment are shipped into the community via barge; groceries and other supplies arrive year-round by air. Shageluk is not on a road system and can only be reached by air, river, or winter trails.

Shageluk is on the boundary of the Kuskokwim Mountains and Yukon River Lowlands ecological regions (ADF&G 2006:45), and the distinction between the 2 is readily apparent (Plate 8-1). The landscape to the west of Shageluk, referred to locally as "the flats," is dominated by lowlands and numerous waterbodies between the Yukon and Innoko rivers. In contrast, lands to the east of Shageluk consist of forested hills with tundra at higher elevations. The subarctic climate is typical of Interior Alaska, with extreme seasonal temperatures ranging from -62°F to 93°F (Wheeler 1998:60). Lands surrounding Shageluk are owned by individuals, Zho-Tse Inc., and Doyon Corporation (Doyon Limited 2015). Much of the land north of Shageluk is part of the Innoko National Wildlife Refuge (USFWS, Alaska Region 2008:3-9).

Contemporary subsistence practices in Shageluk reflect and are influenced by practices that developed over millennia. Although documented archeological sites near Shageluk generally date to the past few centuries (Andrews 1977:49), evidence from a broader scope indicates that Shageluk residents have ancient links to Interior Alaska that may extend back over 14,000 years (Raghavan et al. 2015; Saleeby 2010; Sicoli and Holton 2014). Over this time period, Interior Alaskans have adapted their harvest and settlement patterns in response to major environmental change (Mann et al. 1998). For example, Potter (2008a–b) suggests that around 1000 years BP the effects of a changing climate and development of new hunting methods may have led to the loss of bison as a reliable year-round food source. Likely in response, groups of people transitioned from relatively nomadic year-round hunting patterns to a more seasonal pattern where large amounts of food were harvested during discrete times and stored for future use (Halfman et al. 2014; Potter

5. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed March 15, 2016. http://commerce.alaska.gov/dcra/DCRAExternal/community

2008a–b). The key features of this pattern involved seasonally hunting and snaring caribou, harvesting salmon and whitefish with wooden weirs and traps, and using a diversity of other resources throughout the year (Hosley 1981:534, 535). Similar to what has been described as a "baseline Athabascan adaptive strategy" (VanStone 1974:24), this may represent the general foundation from which subsistence patterns unique to the Shageluk area developed beginning around 1,000 years ago.[6]

Over the past 1,000 years, residents of northern Alaska maintained flexibility in subsistence practices as they responded to environmental changes, fluctuations in resource populations, and a complex political landscape (Darwent and Darwent 2014:188–191; Farrell et al. 2015; Mann et al. 1998; Mason and Gerlach 1995; Wiles et al. 2004). Before historical records, residents of the Shageluk area had established complex trade relationships with nearby coastal groups, exchanging furs, dried fish, and wooden dishes for trade items including beluga whale oil and Siberian reindeer skin clothing (Loyens 1966:9–10; Ream 1986:18, 19). Maintaining access to nonlocal resources likely affected seasonal harvest and settlement patterns (VanStone and Goddard 1981:561). Following the establishment of a Russian trading post at Anadyr in the Russian Far East in 1649, it appears that the prehistoric trade networks extending across Bering Strait intensified, and residents of the Shageluk area likely became indirect participants in the Russian fur trade by the 1600s (McFayden Clark 1996:17). The Russian explorer Zagoskin visited the Shageluk area in the 1840s, and his accounts provide a limited description[7] of life during the mid-1800s. Residents were described as being "chiefly occupied in trading both with their fellow-tribesmen and with the neighboring tribes of Kang-yulit[8]" (Zagoskin 1967:244). Trade provided distantly sourced goods that were well integrated into local practices, such as sealskin that was used to weave salmon nets and make snares for larger animals (Nelson 1978:46; Zagoskin 1967:231–242).

Direct contact with Russian traders became more common after 1840, and the establishment of trading posts along the Yukon River increased both the availability of trade goods and the demand for furs (VanStone 1979a:90–98). During this period, the smallpox epidemic of 1838–1839 may have reduced the pre-epidemic population of the Anvik-Shageluk area[9] by as much as two-thirds; this surely had profound socioeconomic effects that likely included alterations to subsistence patterns (Chapman 1914:3; VanStone 1979a:77–78). For example, prior to the 1840s caribou hunting often involved large groups of people;[10] it is possible that more individual-based hunting was necessary following the epidemic. Around this time, firearms became increasingly available, and this may have enabled or further encouraged such more individual-based hunting techniques.[11]

The fur trade in western Alaska continued to expand throughout the second half of the 19th century, particularly following the introduction of steamboats on the Yukon River in 1869. By 1880, trappers in the Shageluk area maintained increasingly extensive trap lines, and became "heavily (and) successfully involved in a trapping-trading economy" (Nelson 1978:35; VanStone 1976:201). Increasing numbers and types of trade goods were received in exchange for furs during this period. Similar to older patterns of

6. Contemporary Athabascan languages in western Alaska likely did not begin to diverge from each other until between 600 and 1,100 years ago (Snoek and Stang 2014:9, 10; VanStone 1974:5), thus it is assumed here that unique features of Deg Hit'an subsistence patterns relative to neighboring peoples likely emerged within this same timeframe.

7. In February, Zagoskin noted that most young people were away trapping marten. Elders remaining in winter villages shared hares, grouse, and dried fish with Zagoskin (1967:233, 234). The interior-coastal trade networks were vibrant, but had begun to be altered somewhat by the establishment of Russian forts at modern day Saint Michael and Nulato (Zagoskin 1967:101, 125).

8. Central Yup'ik groups of the lower Yukon River, "speakers of one language" (Zagoskin 1967:242).

9. The pre-epidemic population was as high as 2,000 individuals (VanStone 1979a:77–78). A series of epidemics continued throughout the next century, particularly in the years 1900 and 1918 (VanStone 1979b:224–228).

10. Caribou harvests prior to firearms often involved communal caribou drives: herds were driven into corrals where they were caught in snares (Chapman 1914:3). These efforts could involve the entire community, and 20–30 people working together could potentially harvest several hundred animals (Ream 1986:177–178).

11. VanStone (1976:205–206) questions the utility of rifles in the mid-19th century, but Nelson describes the effectiveness and widespread use of firearms by 1880 (Nelson 1978:34)

trade in clothing and food items,[12] preferred goods at American trading posts in 1880 included fabric for clothing and food staples such as flour (VanStone 1979b:116). Shageluk area residents likely increased their reliance on fish in the later 1800s, both to compensate for reduced harvests of other resources and because of greater needs for dog food related to increased trapping efforts in winter (Ream 1986:173; Schwatka 1885:100). Harvests of fish were also likely influenced by the introduction of commercial twine for nets (Loyens 1966:148) and declines in caribou and beaver populations during the later 1800s (Burch Jr. 2012:77; Valkenburg et al. 2003:133; VanStone 1976:201–206).

During the early 20th century, steamboats and trading posts increased in number following gold discoveries and subsequent mining activity in the upper Yukon River and Innoko River drainage (VanStone 1979b:169–170). Markets for local resources including fish, game meat, and firewood expanded accordingly, leading to a sense of prosperity (VanStone 1979b:169, 170, 186). By 1913, the widespread use of fishwheels at camps along the mainstem Yukon River allowed a surplus harvest of salmon, and with the introduction of gasoline-powered boat motors in the 1920s, families could more easily travel between Shageluk and these camps (022114SH6, VanStone 1979b:183–184). Fishwheel harvests represented a ready source of cash and a significant increase in fishing efficiency, both of which provided fishers with more resources and time to pursue other economic opportunities (Loyens 1966:151). Construction of a school in 1906, a post office in 1922 (VanStone 1979a:22), and a trading post, as well as establishment of a Shageluk reindeer herd between 1917 and 1930 (VanStone 1979b:232–233) led to the stabilization of Shageluk as the predominant community of the lower Innoko River. Such infrastructure suggests that during the early decades of the 20th century Shageluk residents had in many ways effectively adapted the long-standing trading patterns and traditions of the area to multiple new markets (see Heaton 2012). The economic basis of the community continued to be grounded primarily in local natural resources that were sold or traded into external markets as well as utilized extensively within Shageluk and neighboring communities for food, fuel, transportation, heat, and clothing, as well as for complex social and religious purposes.

Beginning in the mid-1920s, several factors led to a decline in the area's cash economy. Completion of the Alaska Railroad in 1923 and related declines in riverboat traffic near Shageluk led to the area being largely "cut off from settled Alaska and the outside world" (VanStone 1979b:192). Reductions in mining activity by 1920, the introduction of airplane mail transport, and the collapse of the fur market during the Great Depression resulted in a dramatic reduction in external economic input (Heaton 2012:142; Schneider 2012:xi, xii; VanStone 1979b:191). In the 1930s, Cornelius Osgood conducted ethnographic research in the area; his descriptions of "a quiet and peaceful land of muskrats and salmon…off the main lines of communication…an isolated area…not noted for trade" (Osgood 1958:21), would likely have differed a decade prior. Nevertheless, census records reveal that even at the end of the Great Depression the contribution of local natural resources to the cash economy in Shageluk was substantial.[13] Subsistence harvests were often closely intertwined with cash-generating activities. For example, various whitefish and Chinook salmon caught in fish wheels were typically kept for household use, while larger numbers of chum salmon caught in fishwheels were typically preserved as dog food that was sold and used for family dog teams that supported cash-generating trapping activities (022114SH6).

Opportunities for such mixed subsistence-cash activities became increasingly scarce following the Great Depression. Some families continued to utilize salmon fishing as a way to meet both subsistence and cash needs, but a reduction in dog teams, a collapse in the market (Andersen 1992:67; Pennoyer et al. 1965:11, 31, 34), prohibitions on sales of noncommercially harvested fish (Magdanz et al. 2007:5), and

12. For example, reindeer hide and marine mammal oils. These older trade networks continued into the 1880s (Nelson 1978:46) but appear to have declined by the 20th century, with the exception of trade for seal oil which was fairly common until recent decades (022214SH1)

13. As one indication of this substantial contribution, 19 Shageluk households in 1940 reported an average income of around $500 (equivalent to approximately $8,500 in 2013 when adjusted for inflation), derived primarily from trapping, fishing, wood chopping, employment on riverboats, and basket making (U.S. Department of Commerce, Bureau of the Census 1940; U.S. Department of Labor, Bureau of Labor Statistics. Washington D.C. "CPI Inflation Calculator." Accessed March 15, 2016. http://data.bls.gov/cgi-bin/cpicalc.pl).

the emergence of nonlocal seasonal work during salmon fishing season (Loyens 1966:175, 224; Todd and Jewkes 2006:28, 36) all likely contributed to the virtual disappearance of this mixed subsistence-cash fishery by the 1970s. Although trapping had provided the most consistent cash and trade generating product of the Shageluk area since before historical records, reduced markets for wild furs over the second half of the 20th century eliminated trapping as a reliable source of primary income (Andersen 1993:12, 24). Opportunities for employment within Shageluk emerged in local government support capacities following the early 1970s incorporation of the City of Shageluk and formation of Zho-tse, Inc., a village corporation established under ANCSA (Wheeler 1998:82). In the late 20th century, local resource-based contributions to Shageluk's cash economy were minute relative to the previous century; the majority of cash income was derived from distant funding sources via local government employment and various transfer payments (Shanks 2013:11–12; Wheeler 1998:106–107). However, noncommercial subsistence harvests continued to contribute substantially to overall community noncash income, providing large quantities of food, heating fuel in the form of firewood, and numerous educational, social, and cultural services.

Seasonal Round

In contrast to the multiple historical changes that have occurred in the Shageluk area over the past 2 centuries, patterns in the seasonal availability of most wild food resources have generally remained consistent. In the early 21st century, Shageluk residents continue to follow patterns of hunting, fishing, and gathering wild foods that reflect differences between species in life history, migration patterns, and seasonal habitat use. The seasonal round of the early 21st century is best understood within the previously described context of a long term development that occurred as area residents balanced between the maintenance and modification of prior traditions: seasonal patterns developed long before the earliest memories of current Shageluk residents, and many have persisted into the 21st century. Nevertheless, community members have regularly adopted modifications to these patterns and continue to do so. The following section provides an overview of broad[14] seasonal patterns of subsistence for Shageluk residents in the early 21st century.

Contemporary Shageluk residents engage in a variety of subsistence activities throughout a typical year. Each spring, warmer temperatures, increased daylight, and the renewed availability of numerous subsistence resources coincide with a particularly active period of wild food harvesting. During March, April, and often until ice is no longer safe for travel later in the spring, families regularly cut holes in the ice on lakes near Shageluk and jig for northern pike (021814SH3). When ice begins to break up on the Innoko River, Shageluk residents dipnet for broad whitefish. Broad whitefish typically migrate upriver past Shageluk towards lakes that provide important feeding habitat during summer months (021814SH4). In the spring, dipnetters launch their boats while ice floes are still moving down the river. When they find an ice-free area, fishers will anchor or tie their boats to the bank and dipnet for whitefish. Around the same time, flocks of geese migrate through the lower Innoko River area near Shageluk and hunters often set up grass or sedge blinds to harvest them. When the Innoko River first becomes ice-free, some Shageluk residents harvest beaver or muskrat from boats with small caliber firearms in the many lakes and sloughs near Shageluk. Respondents described watching the Innoko River after breakup for driftwood floating downstream. During spring high water, driftwood can be harvested by roping or snagging it in the water and hauling it to shore for use during the following winter (021814SH3).

In early June, Shageluk residents begin fishing for northern pike and sheefish with rod and reel and with setnets on the Innoko River (021814SH3). Through the remainder of the summer, fishers often continue fishing with setnets on the Innoko River, harvesting whitefish, summer chum salmon, and small numbers of Chinook salmon (022214SH1). Although less frequently in recent years than in prior decades, in the summer some families or individuals travel to the Yukon River to harvest salmon. The Yukon River provides a higher abundance of salmon, a variety of species, and higher quality of salmon compared to the Innoko River (022214SH1). A substantial number of residents often travel away from Shageluk to work

14. Descriptions of seasonal subsistence patterns are necessarily broad to account for interannual variation in a number of factors that affect hunting, fishing, and gathering practices (e.g. weather patterns, resource abundance, personal matters affecting individuals and families, etc.), as well as differences between individuals and families due to any number of influences.

as seasonal wildland firefighters. Seasonal work to obtain needed cash can limit an individual's ability to harvest fish during summer months (021814SH3). Many residents pick berries of several species as they ripen between July and September (022114SH4). During summer months, some residents travel upriver to harvest firewood, typically building and floating rafts of logs downriver to Shageluk (021814SH2). Some residents gather freshwater mussels from nearby lakes: "It's pretty much the whole summer, getting clams…a lot of those kids are up there, you know, they just put them right on the hot coals. Then when they open 'em, they just eat them" (022114SH4).

In September, concurrent with established hunting regulations, families typically invest substantial energy in moose hunting. Access to moose hunting locations is mainly via boat along the many waterways of the lower Innoko River. Some residents harvest migratory waterfowl, grouse, beaver, or muskrat during early fall. Several species of whitefish are harvested in fall months with set gillnets in open water, and also with nets set under ice later in the fall (022214SH1). Following heavy ice formation on the Innoko, a major community-wide activity in Shageluk often consists of constructing a "fish fence" to harvest broad whitefish and smaller numbers of other fish species. Constructing the fish fence requires substantial ice accumulation prior to the end of the broad whitefish upstream spawning migration past Shageluk; ice must be thick enough for multiple individuals to stand on top of it and construct the fish fence. As a result of delayed river ice formation that occurred in multiple consecutive years, such fish fences had not been constructed for a few years at the time of field research in 2013.

> Over here we usually have a fish fence. That's why we didn't have a fish fence this year, because the river didn't actually get froze up until almost December. You know, by the time we're supposed to be having fish fence, we were setting nets just like fall time, you know. That's just, winter's been crazy. 021814SH2

When conditions allow, fish fences, or "leads" (5 AAC 01.010(a)(4)), are constructed by standing tree trunks and other vegetation through ice holes and into the river bed; this partial barrier directs fish into gillnets set under the ice. Some residents travel to the Yukon River to dipnet for lamprey through ice in November, although similar to fish fence construction, this activity is highly dependent on the relationship between early ice formation and the timing of fish migration. During warmer years, ice is often too thin to allow for lamprey fishing with dipnets or eel rakes during the brief window of opportunity when they migrate past the area of the Yukon River near Shageluk (021814SH2; Brown et al. 2005).

Throughout winter months, some residents trap furbearers, with marten often representing the largest component of the harvest. Hunting small game, including grouse and snowshoe hare, occurs sporadically throughout the winter and into early spring. The amount of effort invested into small game hunting often fluctuates from year to year in relation to the cyclic populations of these resources. Also during winter months, Shageluk residents travel by snowmachine to harvest firewood at locations that are difficult to access at other times of year (021814SH2).

Population Estimates and Demographic Information

In 2013, an estimated 85 individuals lived in Shageluk (Table 8-1). This estimate is higher than the estimated population of 76 for 2013 and 69 for 2012 by the Alaska Department of Labor and Workforce Development (ADLWD), but is consistent with the estimated ADLWD estimate of 85 individuals in 2011.[15] Discrepancies between years may be due to differences in sample achievements and sampling methodology, namely the use of a census approach in this study verses the ADLWD approach that incorporates information from the 2010 U.S. Census and Alaska Permanent Fund dividend applications.[16] In spite of such interannual variation, historical population estimates from this study, U.S. Census, and ADLWD indicate that Shageluk's population has declined substantially over the past decade. Between 1960 and 2000, Shageluk's population

15. Alaska Department of Labor and Workforce Development (ADLWD), Research and Analysis Section, Juneau, n.d. "Alaska Local and Regional Information." Accessed March 1, 2015. http://live.laborstats.alaska.gov/alari/index.cfm

16. Alaska Department of Labor and Workforce Development (ADLWD), Research and Analysis Section, Juneau, n.d. "Alaska Local and Regional Information, ALARI Frequently Asked Questions." Accessed March 1, 2016. http://live.laborstats.alaska.gov/alari/faqs/csm

Table 8-1.–Population estimates, Shageluk, 2010 and 2013.

	Census (2010)	5-year American Community Survey (2008–2012)	This study (2013)
Total population			
Households	36	50	29.0
Population	83	64	84.8
Alaska Native			
Population	80	61	82.5
Percentage	96.4%	95.3%	97.4%

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.

remained fairly stable, ranging from a low of 129 to a high of 167 individuals (Figure 8-1). Between 2000 and 2013, the population in Shageluk has declined substantially by approximately 3% on average each year. Although there does not appear to be one specific factor that explains this decline, key respondents in Shageluk described how seeking outside employment opportunities, as well as multiple deaths in the community, have contributed to Shageluk's recent reduction in population.

Twenty-six Shageluk households participated in household surveys as part of this study, representing 90% of the 29 households identified by community informants as residing in Shageluk for at least 6 months in 2013 (Table 8-2). The remaining 3 eligible but unsurveyed households were no longer Shageluk residents at the time of fieldwork in Shageluk during 2014. Thus, 100% of eligible households that were residing in Shageluk at the time of fieldwork participated in and contributed to this study. The mean household size for surveyed households was 3 individuals, and households ranged in size from 1 to 7 individuals (Table 8-3). Shageluk's population included an estimated 51 males (60%) and 34 females (40%; Figure 8-2; Table 8-4). The average age of Shageluk residents was 29 years; the oldest surveyed person was 88 at the time of

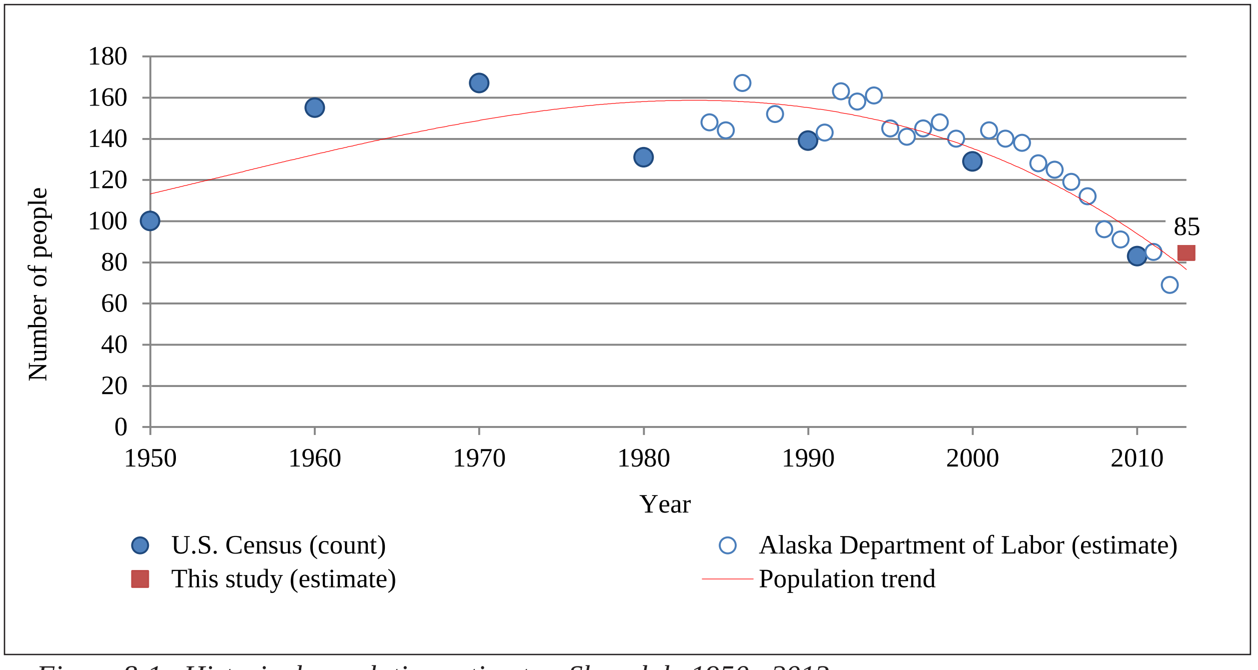


Figure 8-1.–Historical population estimates, Shageluk, 1950 –2013.

Table 8-2.–Sample achievement, Shageluk, 2013.

Sample information	Shageluk
Number of dwelling units	28
Survey goal	100%
Households surveyed	26
Households failed to be contacted	3
Households declined to be surveyed	0
Households moved or occupied by nonresident	3
Total households attempted to be surveyed	26
Refusal rate	0.0%
Final estimate of permanent households	29
Percentage of total households surveyed	89.7%
Survey weighting factor	1.1
Sampled population	76
Estimated population	84.8

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

Table 8-3.–Demographic characteristics, Shageluk, 2013.

Characteristics	Community Shageluk
Household size	
Mean	2.9
Minimum	1
Maximum	7
Age	
Mean	29.3
Minimum[a]	1
Maximum	88
Median	26.0
Length of residency	
Total population	
Mean	25.4
Minimum[a]	1
Maximum	88
Heads of household	
Mean	37.6
Minimum[a]	1
Maximum	88
Alaska Native households[b]	
Number	29.0
Percentage	100.0%

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.

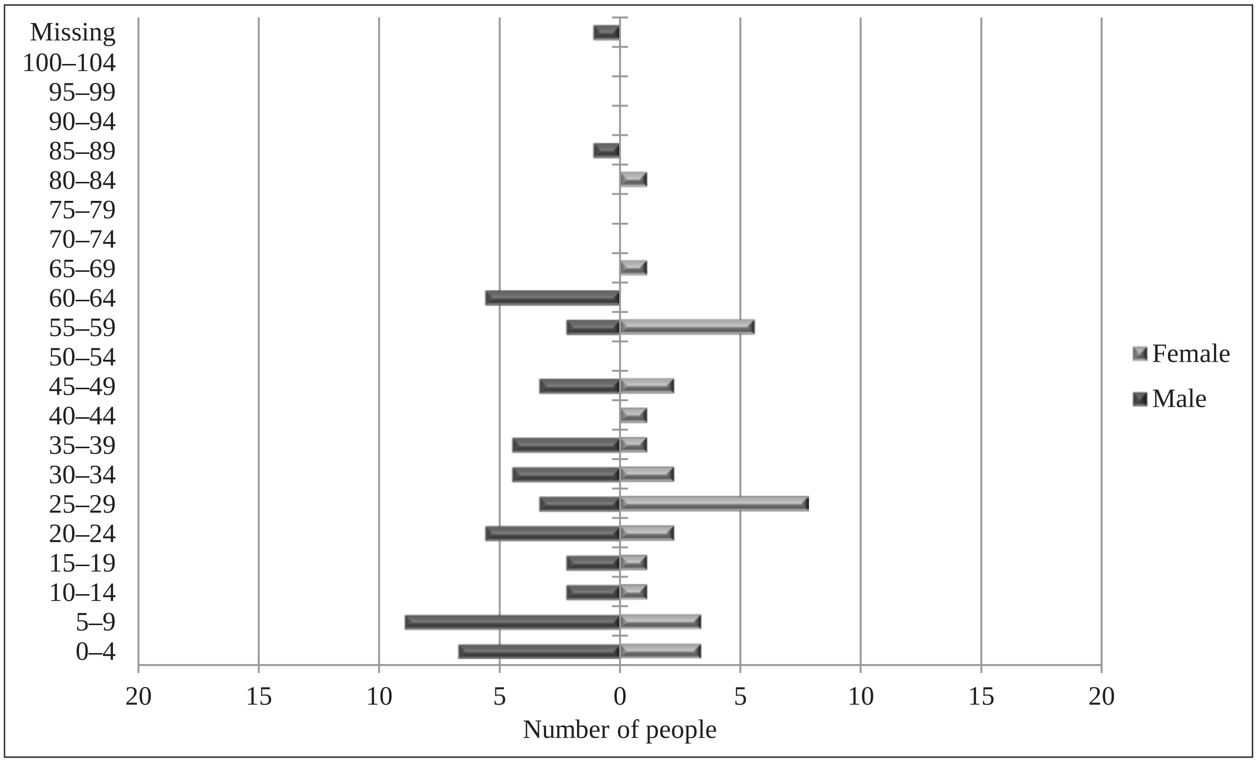


Figure 8-2.–Population profile, Shageluk, 2013.

Table 8-4.–Population profile, Shageluk, 2013.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	6.7	13.0%	13.0%	3.3	10.0%	10.0%	10.0	11.8%	11.8%
5–9	8.9	17.4%	30.4%	3.3	10.0%	20.0%	12.3	14.5%	26.3%
10–14	2.2	4.3%	34.8%	1.1	3.3%	23.3%	3.3	3.9%	30.3%
15–19	2.2	4.3%	39.1%	1.1	3.3%	26.7%	3.3	3.9%	34.2%
20–24	5.6	10.9%	50.0%	2.2	6.7%	33.3%	7.8	9.2%	43.4%
25–29	3.3	6.5%	56.5%	7.8	23.3%	56.7%	11.2	13.2%	56.6%
30–34	4.5	8.7%	65.2%	2.2	6.7%	63.3%	6.7	7.9%	64.5%
35–39	4.5	8.7%	73.9%	1.1	3.3%	66.7%	5.6	6.6%	71.1%
40–44	0.0	0.0%	73.9%	1.1	3.3%	70.0%	1.1	1.3%	72.4%
45–49	3.3	6.5%	80.4%	2.2	6.7%	76.7%	5.6	6.6%	78.9%
50–54	0.0	0.0%	80.4%	0.0	0.0%	76.7%	0.0	0.0%	78.9%
55–59	2.2	4.3%	84.8%	5.6	16.7%	93.3%	7.8	9.2%	88.2%
60–64	5.6	10.9%	95.7%	0.0	0.0%	93.3%	5.6	6.6%	94.7%
65–69	0.0	0.0%	95.7%	1.1	3.3%	96.7%	1.1	1.3%	96.1%
70–74	0.0	0.0%	95.7%	0.0	0.0%	96.7%	0.0	0.0%	96.1%
75–79	0.0	0.0%	95.7%	0.0	0.0%	96.7%	0.0	0.0%	96.1%
80–84	0.0	0.0%	95.7%	1.1	3.3%	100.0%	1.1	1.3%	97.4%
85–89	1.1	2.2%	97.8%	0.0	0.0%	100.0%	1.1	1.3%	98.7%
90–94	0.0	0.0%	97.8%	0.0	0.0%	100.0%	0.0	0.0%	98.7%
95–99	0.0	0.0%	97.8%	0.0	0.0%	100.0%	0.0	0.0%	98.7%
100–104	0.0	0.0%	97.8%	0.0	0.0%	100.0%	0.0	0.0%	98.7%
Missing	1.1	2.2%	100.0%	0.0	0.0%	100.0%	1.1	1.3%	100.0%
Total	**51.3**	**100.0%**	**100.0%**	**33.5**	**100.0%**	**100.0%**	**84.8**	**100.0%**	**100.0%**

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

Table 8-5.–Birthplaces of household heads, Shageluk, 2013.

Birthplace	Percentage
Galena	2.4%
Grayling	7.1%
Holy Cross	2.4%
Shageluk	83.3%
Tok	2.4%
Other U.S.	2.4%

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 8-6.–Birthplaces of population, Shageluk, 2013.

Birthplace	Percentage
Anchorage	2.6%
Galena	1.3%
Grayling	5.3%
Holy Cross	2.6%
Shageluk	85.5%
Tok	1.3%
Other U.S.	1.3%

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.

data collection (Table 8-3). Approximately 83 residents (97%) were Alaska Native, and all households had at least 1 head of household who was Alaska Native (tables 8-2 and 8-3). On average, residents of all ages had lived in Shageluk for 25 years (Table 8-3). The survey asked for the name of each household member's birth community (defined as an individual's parents' residence at the time of birth). The majority (83%) of household heads reported Shageluk as their birth community, 10% of household heads reported birth homes in the neighboring communities of Holy Cross or Grayling, and all remaining household heads (7%) were born in other Alaska communities or other areas of the United States outside of Alaska (Table 8-5). Similar to the birthplaces of household heads, the majority (86%) of residents in 2013 reported Shageluk as their birth community (Table 8-6). Other birth communities included the nearby communities of Grayling (for 5% of all 2013 Shageluk residents), Holy Cross (3%), and Galena (1%), as well as Anchorage (3%), Tok (1%), and other United States communities outside of Alaska (1%).

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Figure 8-3 and Table D6 report the expanded levels of individual participation in the harvest and processing of wild resources by all Shageluk residents in 2013.[17] An estimated 78% of Shageluk residents hunted, fished, trapped, or attempted to gather at least 1 type of wild resource, and an estimated 72% of residents processed at least 1 kind of wild resource in 2013. Vegetation (including berries, edible wild plants, fungi, and firewood) had the highest participation rates by individuals of any individual category of subsistence resources; 66% of individuals harvested and 63% of individuals processed (prepared for use or preservation) vegetation. Fish represent the resource category with the next highest rates of individual participation in harvesting or processing (49% of individuals harvested and 46% of individuals processed fish), followed by land mammals (26% harvested, 37% processed) and birds and eggs (23% harvested, 28% processed).

Harvest and Use of Wild Resources at the Household Level

Figure 8-4 shows the percentages of households that used, attempted to harvest and harvested wild foods.[18] An estimated 96% of households attempted to harvest, and 92% of households actually harvested, at least 1 type of wild resource in 2013 (Table 8-7). The resource category with the highest levels of use in 2013 was large land mammals: 100% of households used large land mammals in 2013 (Figure 8-4). Following large land mammals, the most widely used resource categories in Shageluk were nonsalmon fish (used by

17. Percentages are calculated based on valid responses, which excludes from the sample missing data for that category.

18. Percentages of harvest and use on the household level are generally higher than those reported in the previous paragraph at the individual level: multiple individuals that are unable to harvest or process wild resources due to various factors such as age, health, or employment conflicts are members of households in which other individuals did attempt to harvest or processed wild resources.

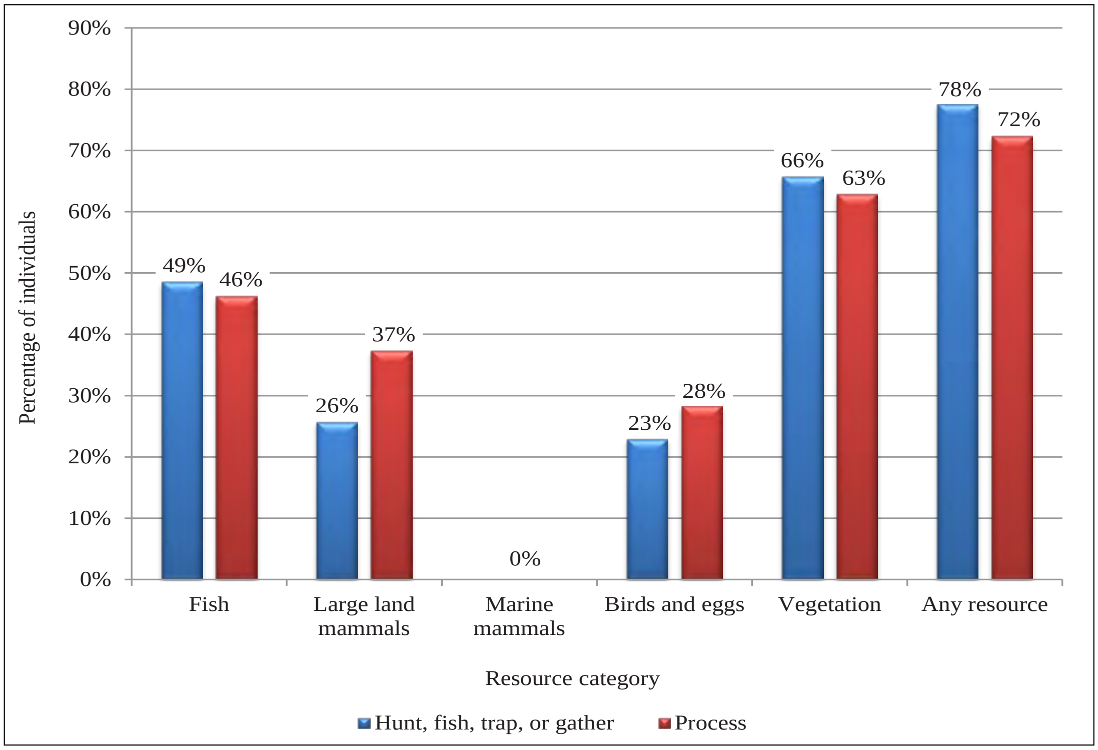


Figure 8-3.–Individual participation in subsistence harvesting and processing activities, Shageluk, 2013.

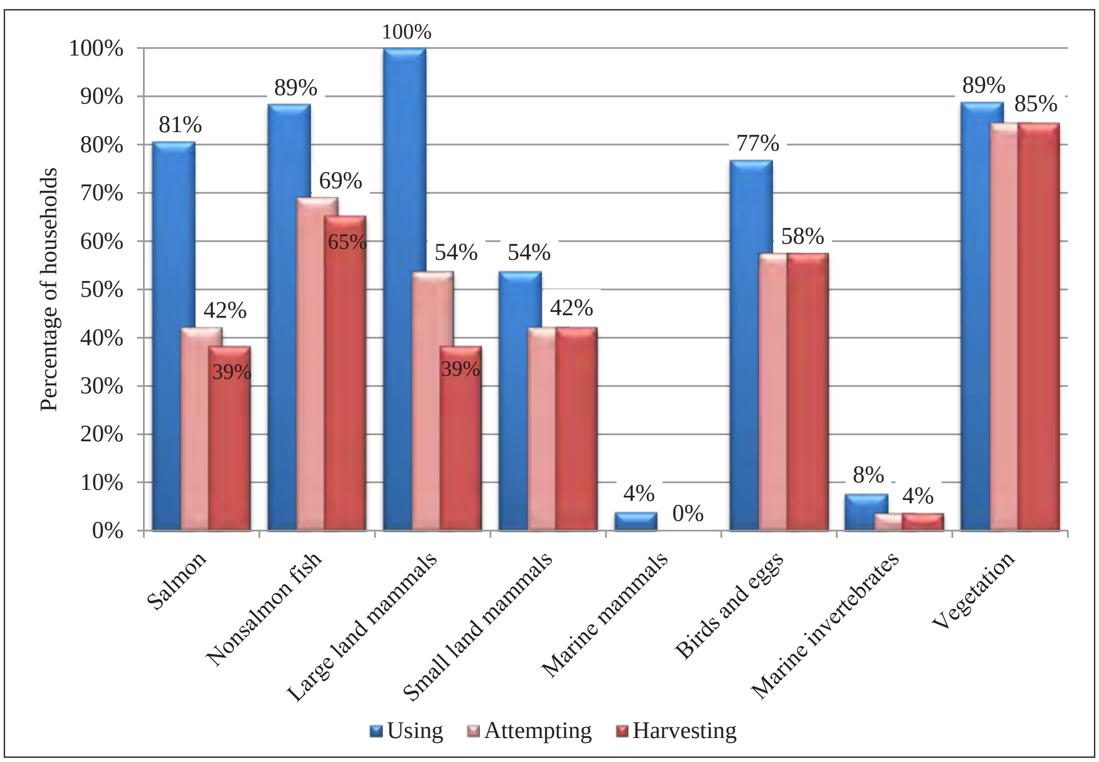


Figure 8-4.–Percentages of households using, attempting to harvest, or harvesting wild resources, Shageluk, 2013.

89% of households in 2013), vegetation (89%), salmon (81%), birds and eggs (77%), small land mammals (54%), marine[19] invertebrates (8%), and marine mammals (4%). An estimated 92% of households received at least 1 type of wild resource from another household, and 73% of households gave at least 1 type of wild resource to another household. For all resource categories, percentages of households harvesting different types of resources are lower than percentages of households using these resources. Such differences reflect sharing between those households that harvested resources and those that did not or were not able to.

In general, differences between the percentages of households attempting to harvest resources and those households that actually harvested them are small; for all resource categories other than large land mammals, percentages of households that attempted to harvest a type of resource but did not actually harvest that resource are less than 4%. This similarity between attempted harvests and actual harvests indicates that most households were able to harvest some quantity of the resources they sought.

By resource category, percentages of households attempting to harvest and actually harvesting were highest for vegetation (85% attempted to harvest vegetation, 85% actually harvested vegetation), followed by nonsalmon fish (69% attempted, 65% harvested), birds and eggs (58% attempted, 58% harvested), large land mammals (54% attempted, 39% harvested), small land mammals (42% attempted, 42% harvested), salmon (42% attempted, 39% harvested), and marine invertebrates (4% of households attempted, 4% harvested). No households attempted to harvest or actually harvested marine mammals in 2013.

Although the difference in the proportion of Shageluk households that attempted harvest and those households that actually harvested large land mammals is larger than for any other resource category, the majority of households that attempted to harvest large land mammals did succeed in harvesting at least one large land mammal. Although not all households that attempted to harvest large land mammals reported harvest, many hunters still participated in successful group hunts that resulted in a shared harvest.

Table 8-8 summarizes resource harvest and use characteristics for Shageluk in 2013 at the household level. The average harvest was 844 lb of edible weight per household, 298 lb per capita. During the study year, community households harvested an average of 10 kinds of resources and used an average of 14 kinds of resources. The maximum number of resources used by any household was 39. In addition, households gave away an average of 5 kinds of resources. Overall, as many as 128 different kinds of resources were available for households to harvest in the study area; this included resources that survey respondents identified but were not asked about in the survey instrument.

Harvest Quantities and Composition

Table 8-7 reports the estimated harvest and use of wild resources by Shageluk residents in 2013. The table is organized first by general category and then by species. All edible resources are reported in pounds usable weight (see Appendix C for conversion factors[20]). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources harvested, given away, or used by a household, and resources received from other local or nonlocal harvesters, either as gifts, or by barter or customary trade. Purchased foods are not included, but nonedible wild 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.

In 2013, Shageluk residents harvested an estimated 24,489 lb (±18%) of wild foods (Table 8-7). As shown in Figure 8-5, the majority of Shageluk's subsistence harvest in terms of edible weight was made up of nonsalmon fish (41% of total harvest), large land mammals (25%), and salmon (24%). These 3 resource categories contributed large amounts of food to the total harvest: nonsalmon fish contributed an estimated 10,003 lb to the harvest as a whole or 118 lb per capita; large land mammals contributed 6,246 total pounds or 74 lb per capita; and salmon contributed 5,901 total pounds or 70 lb per capita (Table 8-7). Birds and

19. For the purposes of this chapter, the marine invertebrates category also includes freshwater clams or mussels.

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

Table 8-7.–Estimated harvests and uses of fish, wildlife, and vegetation resources, Shageluk, 2013.

	Percentage of households					Harvest weight (lb)			Harvest amount[a]			
Resource	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total	Mean per household	Per capita	Total	Unit	Mean per household	95% confidence limit (±) harvest
All resources	**100.0**	**96.2**	**92.3**	**92.3**	**73.1**	**24,488.6**	**844.4**	**288.9**				**18.0**
Salmon	**80.8**	**42.3**	**38.5**	**65.4**	**30.8**	**5,900.8**	**203.5**	**69.6**				**22.8**
Summer chum salmon	46.2	30.8	30.8	23.1	19.2	2,881.6	99.4	34.0	622.4	ind	21.5	27.0
Fall chum salmon	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Coho salmon	65.4	34.6	30.8	46.2	19.2	1,950.6	67.3	23.0	425.0	ind	14.7	25.5
Chinook salmon	46.2	30.8	26.9	26.9	15.4	801.4	27.6	9.5	83.7	ind	2.9	32.8
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sockeye salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown salmon	3.8	3.8	3.8	0.0	3.8	267.1	9.2	3.2	27.9	ind	1.0	66.2
Nonsalmon fish	**88.5**	**69.2**	**65.4**	**53.8**	**34.6**	**10,003.3**	**344.9**	**118.0**				**25.7**
Pacific herring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Smelt	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Eulachon (hooligan, candlefish)	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific tomcod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pacific halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0
Arctic lamprey	7.7	0.0	0.0	7.7	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Rockfish	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Stickleback (needlefish)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0
Burbot	30.8	23.1	19.2	11.5	7.7	80.3	2.8	0.9	33.5	ind	1.2	45.1
Dolly Varden	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Lake trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pike	73.1	61.5	57.7	30.8	30.8	2,866.0	98.8	33.8	636.9	ind	22.0	25.6
Sheefish	69.2	53.8	46.2	42.3	30.8	2,349.0	81.0	27.7	391.5	ind	13.5	38.2
Longnose sucker	3.8	3.8	3.8	0.0	3.8	4.5	0.2	0.1	2.2	ind	0.1	66.2
Rainbow trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Broad whitefish	73.1	53.8	46.2	46.2	30.8	4,140.3	142.8	48.8	1,035.1	ind	35.7	25.6

-continued-

Table 8-7.–Page 2 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Nonsalmon fish, continued												
Bering cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Least cisco	3.8	3.8	3.8	0.0	3.8	11.2	0.4	0.1	11.2	ind	0.4	66.2
Humpback whitefish	30.8	23.1	23.1	11.5	7.7	552.1	19.0	6.5	184.0	ind	6.3	41.3
Round whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown whitefishes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Large land mammals	**100.0**	**53.8**	**38.5**	**80.8**	**38.5**	**6,246.2**	**215.4**	**73.7**				**18.8**
Bison	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Black bear	7.7	7.7	7.7	0.0	7.7	223.1	7.7	2.6	2.2	ind	0.1	45.9
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Caribou	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Moose	100.0	50.0	34.6	80.8	38.5	6,023.1	207.7	71.1	11.2	ind	0.4	19.3
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dall sheep	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	**53.8**	**42.3**	**42.3**	**26.9**	**30.8**	**655.8**	**22.6**	**7.7**				**30.1**
Beaver	46.2	26.9	26.9	23.1	30.8	635.8	21.9	7.5	42.4	ind	1.5	31.1
Red fox	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	3.3	ind	0.1	48.6
Small Alaska hare	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	11.5	3.8	3.8	7.7	0.0	8.9	0.3	0.1	4.5	ind	0.2	66.2
River (land) otter	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	1.1	ind	0.0	66.2
Lynx	7.7	7.7	7.7	0.0	3.8	4.5	0.2	0.1	3.3	ind	0.1	66.2
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	26.9	23.1	23.1	3.8	0.0	0.0	0.0	0.0	90.3	ind	3.1	33.1
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	3.8	3.8	3.8	0.0	3.8	6.7	0.2	0.1	8.9	ind	0.3	66.2
Porcupine	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Least weasel	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gray wolf	3.8	7.7	3.8	0.0	0.0	0.0	0.0	0.0	1.1	ind	0.0	66.2
Wolverine	3.8	7.7	3.8	0.0	0.0	0.0	0.0	0.0	1.1	ind	0.0	66.2

-continued-

Table 8-7.–Page 3 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Marine mammals	**3.8**	**0.0**	**0.0**	**3.8**	**0.0**	**0.0**	**0.0**	**0.0**				**0.0**
Bearded seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ringed seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spotted seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown seal	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0				0.0
Walrus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Beluga whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Bowhead whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Birds and eggs	**76.9**	**57.7**	**57.7**	**42.3**	**46.2**	**1,064.6**	**36.7**	**12.6**				**24.7**
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	7.7	7.7	7.7	0.0	3.8	10.6	0.4	0.1	5.6	ind	0.2	46.9
Common eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Goldeneye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	42.3	34.6	34.6	7.7	15.4	174.0	6.0	2.1	89.2	ind	3.1	22.8
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
Unknown merganser	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pintail	34.6	26.9	26.9	7.7	15.4	125.5	4.3	1.5	83.7	ind	2.9	40.3
Scaup	3.8	3.8	3.8	0.0	3.8	6.0	0.2	0.1	6.7	ind	0.2	66.2
Black scoter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Surf scoter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
White-winged 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	3.8	3.8	3.8	0.0	0.0	3.6	0.1	0.0	3.3	ind	0.1	66.2
Green-winged teal	26.9	19.2	19.2	7.7	11.5	31.9	1.1	0.4	61.3	ind	2.1	38.8
American wigeon	19.2	19.2	15.4	3.8	11.5	38.0	1.3	0.4	29.0	ind	1.0	36.2
Unknown ducks	15.4	3.8	3.8	15.4	3.8	16.1	0.6	0.2	16.7	ind	0.6	66.2
Brant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Canada goose	61.5	46.2	42.3	30.8	38.5	226.2	7.8	2.7	188.5	ind	6.5	29.2

-continued-

Table 8-7.–Page 4 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Birds and eggs, continued												
Emperor goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Snow goose	19.2	19.2	15.4	3.8	3.8	49.0	1.7	0.6	12.3	ind	0.4	39.0
White-fronted goose	26.9	26.9	23.1	7.7	15.4	193.9	6.7	2.3	45.7	ind	1.6	34.3
Unknown geese	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tundra (whistling) swan	15.4	11.5	11.5	3.8	11.5	75.0	2.6	0.9	6.7	ind	0.2	40.0
Sandhill crane	3.8	3.8	3.8	0.0	0.0	9.4	0.3	0.1	1.1	ind	0.0	66.2
Whimbrel	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	46.2	42.3	42.3	11.5	7.7	91.4	3.2	1.1	130.5	ind	4.5	25.2
Sharp-tailed grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Ruffed grouse	11.5	11.5	11.5	0.0	0.0	14.1	0.5	0.2	20.1	ind	0.7	41.4
Ptarmigan	3.8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
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
Goose eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Swan eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown shorebird eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gull eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
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	**7.7**	**3.8**	**3.8**	**3.8**	**3.8**	**3.3**	**0.1**	**0.0**				**66.2**
Clams	7.7	3.8	3.8	3.8	3.8	3.3	0.1	0.0	0.1	gal	0.0	66.2
King crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tanner crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
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
Shrimp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown marine invertebrates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Vegetation	**88.5**	**84.6**	**84.6**	**30.8**	**30.8**	**614.6**	**21.2**	**7.3**				**20.1**
Blueberry	65.4	65.4	65.4	7.7	23.1	287.8	9.9	3.4	71.9	gal	2.5	19.0
Lowbush cranberry	23.1	23.1	23.1	0.0	11.5	61.3	2.1	0.7	15.3	gal	0.5	30.3

-continued-

Table 8-7.–Page 5 of 5.

Resource	Percentage of households: Using	Attempting harvest	Harvesting	Receiving	Giving away	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence limit (±) harvest
Vegetation, continued												
Highbush cranberry	15.4	11.5	11.5	3.8	7.7	31.2	1.1	0.4	7.8	gal	0.3	48.4
Crowberry	23.1	23.1	23.1	0.0	3.8	34.6	1.2	0.4	8.6	gal	0.3	35.9
Currant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Cloudberry	46.2	42.3	42.3	3.8	15.4	131.6	4.5	1.6	32.9	gal	1.1	24.6
Raspberry	7.7	7.7	7.7	0.0	3.8	15.6	0.5	0.2	3.9	gal	0.1	50.3
Wild rhubarb	3.8	3.8	3.8	0.0	0.0	1.1	0.0	0.0	1.1	gal	0.0	66.2
Eskimo potato	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Fiddlehead ferns	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Nettle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Hudson's Bay (Labrador) tea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Spruce tips	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Willow leaves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Wild rose hips	7.7	7.7	7.7	0.0	7.7	17.8	0.6	0.2	4.5	gal	0.2	51.7
Yarrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other wild greens	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown mushrooms	11.5	7.7	7.7	3.8	0.0	22.3	0.8	0.3	22.3	gal	0.8	51.7
Fireweed	3.8	3.8	3.8	0.0	3.8	11.2	0.4	0.1	11.2	gal	0.4	66.2
Stinkweed	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	66.2
Punk	19.2	19.2	15.4	3.8	7.7	0.0	0.0	0.0	94.8	gal	3.3	35.1
Puffballs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Wood	76.9	65.4	65.4	26.9	11.5	0.0	0.0	0.0				0.0

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

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

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

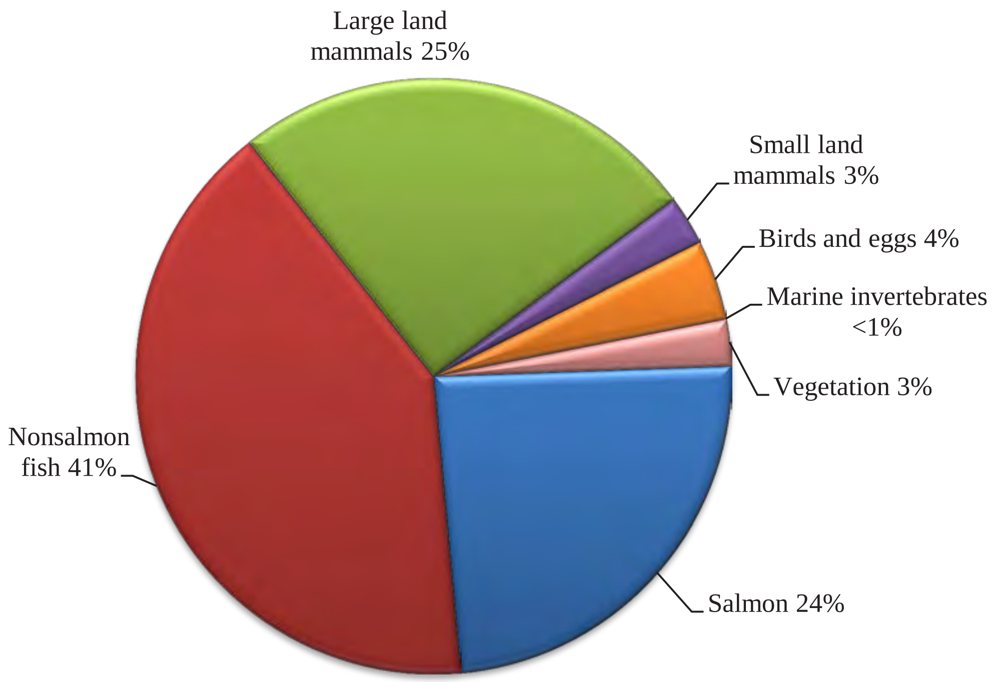
a. Summary rows that include incompatible units of measure have been left blank.

* Resource not asked on survey, information donated by participant.

Table 8-8.–Resource harvest and use characteristics, Shageluk, 2013.

Characteristic	
Mean number of resources used per household	**13.7**
Minimum	2
Maximum	39
95% confidence limit (±)	8.6%
Median	11.0
Mean number of resources attempted to harvest per household	**10.4**
Minimum	0
Maximum	37
95% confidence limit (±)	11.4%
Median	7.0
Mean number of resources harvested per household	**9.7**
Minimum	0
Maximum	33
95% confidence limit (±)	11.7%
Median	5.0
Mean number of resources received per household	**5.5**
Minimum	0
Maximum	21
95% confidence limit (±)	11.5%
Median	3.5
Mean number of resources given away per household	**5.0**
Minimum	0
Maximum	20
95% confidence limit (±)	15.2%
Median	3.0
Household harvest (pounds)	
Minimum	0
Maximum	4,536
Mean	844.4
Median	571.1
Number of resources asked about and identified voluntarily by respondents	128

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



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

Figure 8-5.–Composition of edible harvest by resource category, Shageluk, 2013.

eggs, small land mammals, and vegetation represent 4%, 3%, and 3%, respectively of the total harvest (Figure 8-5). Birds and eggs contributed 1,065 total pounds and 13 lb per capita, small land mammals contributed 656 total pounds and 8 lb per capita. Vegetation contributed 615 total pounds and 7 lb per capita. The harvest of marine invertebrates was negligible, with an estimated total harvest of 3 lb, and no marine mammals were harvested.

Use and Harvest Characteristics by Resource Category

Table 8-9 lists the top 10 ranked resources used by households,[21] and Figure 8-6 shows the species with the highest per capita harvests during the 2013 study year. All households (100%) used moose, more than any other resource in 2013 (Table 8-9). In addition to moose, 6 resources were used by the majority of households in 2013. These resources included wood (used as firewood, 77%), 4 species of fish (northern pike, broad whitefish, sheefish, and coho salmon), blueberry, and Canada goose. The next most frequently used resources included summer chum salmon, Chinook salmon, beaver, spruce grouse, and cloudberry[22]; these 5 resources were used by an equal percentage of households (46%), and are listed in Table 8-9 in order of their appearance in other tables. With the exception of firewood, which was widely used but has no value for edible weight, the top 10 species ranked according to per capita edible weight largely correspond to the top species used by households (Figure 8-6; Table 8-9). Moose, for example, was both the resource used by the highest percentage of households in 2013, and also the species that contributed the most to per capita edible weight estimates. Similarly, the 6 fish species that are among the most widely used resources (northern pike, broad whitefish, sheefish, summer chum salmon, coho salmon, and Chinook salmon) also contributed among the highest quantities of edible weight to the total harvest (61%). Notable exceptions to this correspondence occur for humpback whitefish, which was used by less than one-third of households

21. For Shageluk, the top 10 resources used by households table includes 13 resources, because multiple resources were used by the same percentage of households; when percentages of resources used were ranked from most used to least used, the 8 highest ranking percentages were distributed over 13 different resources.

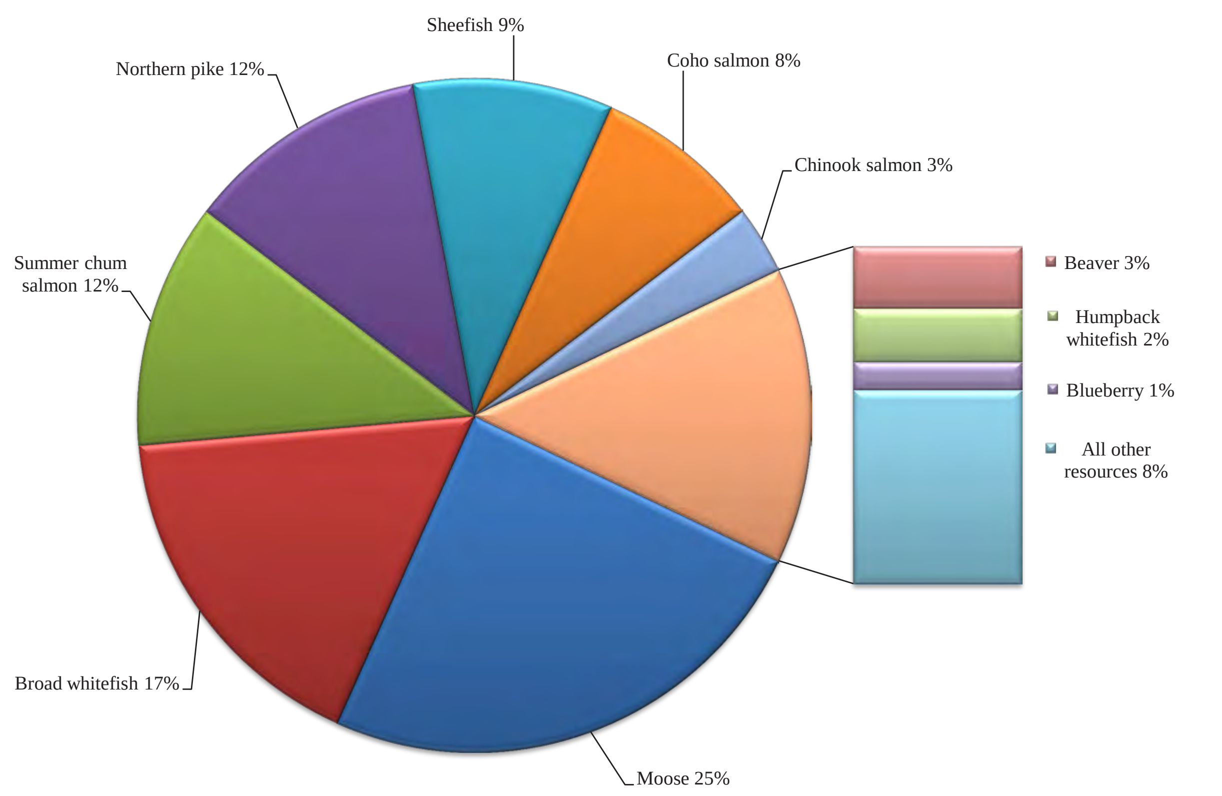
22. Locally known as salmonberry.

Table 8-9.–Top 10 ranked resources used by households, Shageluk, 2013.

Rank[a]	Resource	Percentage of households using
1.	Moose	100.0%
2.	Wood	76.9%
3.	Northern pike	73.1%
3.	Broad whitefish	73.1%
5.	Sheefish	69.2%
6.	Coho salmon	65.4%
6.	Blueberry	65.4%
8.	Canada goose	61.5%
9.	Summer chum salmon	46.2%
9.	Chinook salmon	46.2%
9.	Beaver	46.2%
9.	Spruce grouse	46.2%
9.	Cloudberry	46.2%

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.



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

Figure 8-6.–Top species harvested in pounds edible weight per capita, Shageluk, 2013.

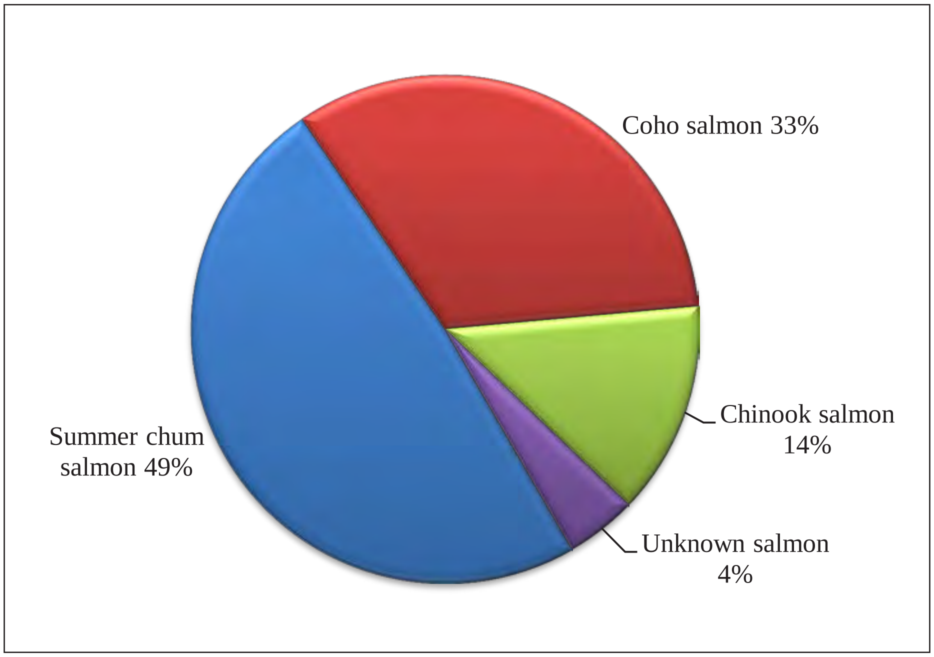


Figure 8-7.–Composition of edible salmon harvest, Shageluk, 2013.

(31%) but also was harvested in large enough quantities that it had the ninth highest pounds per capita contribution (Figure 8-6; Table 8-7). Conversely, Canada goose, spruce grouse and cloudberry were widely used but did not significantly contribute to the per capita harvest. (Figure 8-6; Table 8-9).

Salmon

All types of salmon composed 24% of Shageluk residents' total wild food harvest in 2013 with 5,901 total edible pounds, and most households (81%) reported using salmon during the study year (Figure 8-5; Table 8-7). Shageluk residents harvested summer chum salmon (622 individual chum salmon, 34 edible pounds per capita), coho salmon (425 individual, 23 edible pounds per capita), and Chinook salmon (84 individual, 10 edible pounds per capita; Table 8-7). Residents did not report harvesting fall chum salmon, which spawn in upper Yukon River tributaries and are generally not present within the Innoko River (U.S. Fish and Wildlife Service, Alaska Region 2008:3-53). Summer chum salmon have a spawning population specific to the Innoko River and are typically abundant during spawning migrations.

Although Chinook salmon was described by some survey participants as the most important salmon for household food use, the Chinook salmon harvest in 2013 composed only 14% of the total salmon harvest in 2013 (Figure 8-7). The percentages of households attempting to harvest each type of salmon were similar to the percentages of households actually harvesting, indicating that most households that tried to harvest salmon were able to catch some (Table 8-7). However, as discussed in following sections, multiple households described not being able to attempt to harvest Chinook salmon as a result of specific conservation measures implemented in 2013. The percentage of households using salmon was higher than the percentage of households harvesting for all species, indicating that multiple households that did not harvest salmon received some from other households (Table 8-7). However, multiple households indicated that in 2013 they were unable to share as much salmon with other households as they would like to, if any; and similarly, multiple households indicated that they received less or no salmon in 2013. In addition to the salmon described above, households also harvested 28 individual "unknown" salmon; these were salmon for which identification to the species level during surveys was not conclusive.

Table 8-10 shows the estimated salmon harvest in Shageluk by gear type. Shageluk residents harvested an estimated 5,901 usable pounds of salmon in 2013, all of which were harvested with either set gillnets (751 individual salmon, 3,657 lb) or drift gillnets (408 individual salmon, 2,244 lb). No households in

Table 8-10.–Estimated salmon harvests by gear type, Shageluk, 2013.

	Removed from commercial catch		Subsistence methods: Setnet		Subsistence methods: Driftnet		Subsistence methods: Fish wheel		Subsistence methods: Seine net	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**0.0**	**0.0**	**750.7**	**3,657.2**	**408.2**	**2,243.5**	**0.0**	**0.0**	**0.0**	**0.0**
Summer chum salmon	0.0	0.0	562.2	2,602.8	60.2	278.9	0.0	0.0	0.0	0.0
Fall chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coho salmon	0.0	0.0	150.6	691.1	274.4	1,259.4	0.0	0.0	0.0	0.0
Chinook salmon	0.0	0.0	37.9	363.3	45.7	438.1	0.0	0.0	0.0	0.0
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sockeye salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown salmon	0.0	0.0	0.0	0.0	27.9	267.1	0.0	0.0	0.0	0.0

-continued-

Table 8-10.–Continued.

	Subsistence methods: Other method		Subsistence methods: Subsistence gear, any method		Rod and reel		Any method	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**0.0**	**0.0**	**1,158.9**	**5,900.8**	**0.0**	**0.0**	**1,158.9**	**5,900.8**
Summer chum salmon	0.0	0.0	622.4	2,881.6	0.0	0.0	622.4	2,881.6
Fall chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coho salmon	0.0	0.0	425.0	1,950.6	0.0	0.0	425.0	1,950.6
Chinook salmon	0.0	0.0	83.7	801.4	0.0	0.0	83.7	801.4
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sockeye salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown salmon	0.0	0.0	27.9	267.1	0.0	0.0	27.9	267.1

Source ADF&G Division of Subsistence household surveys, 2014.
Note The harvested number of salmon is represented as individual fish harvested.

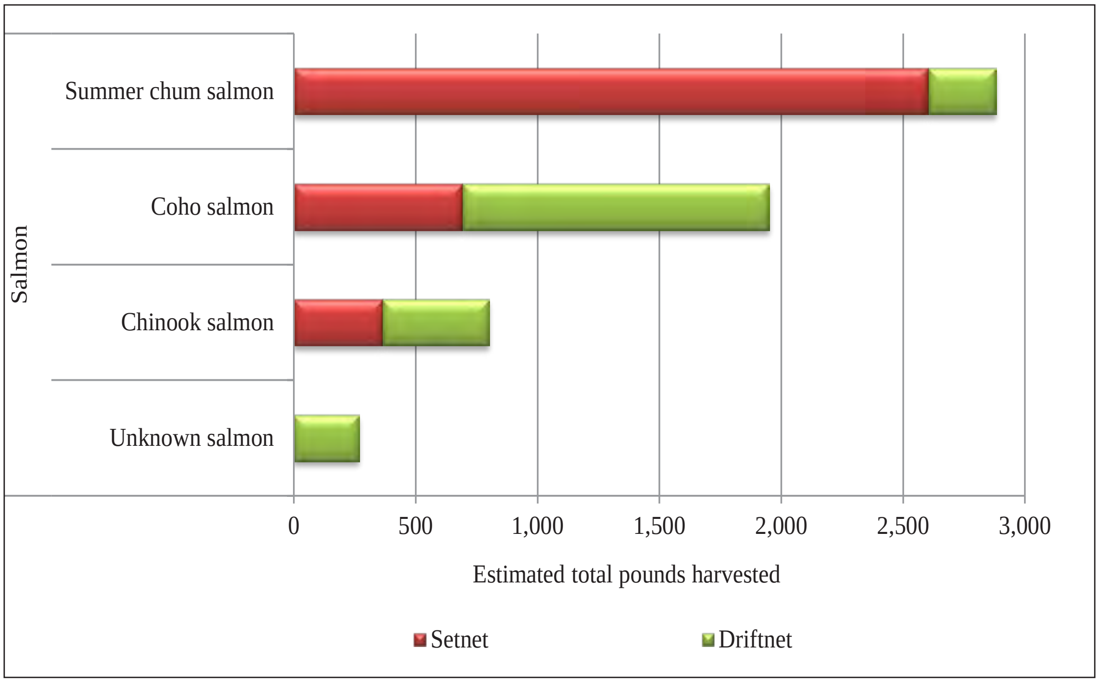


Figure 8-8.–Estimated salmon harvests by gear type, Shageluk, 2013.

Shageluk participated in commercial fishing in 2013. Figure 8-8 is a visual representation of the number of salmon harvested by gear type in 2013. For summer chum salmon, set gillnet was the most commonly used gear: 90% of summer chum salmon was harvested with set gillnet (Table 8-11). Drift gillnet was used to harvest the largest percentages of Chinook (55%) and coho (65%) salmon. The use of drift versus set gillnet is highly dependent on harvest area. Compared to the mainstem of the Yukon River near Shageluk, where deploying a driftnet for salmon is common, driftnets are impractical on the Innoko River. Shageluk residents who fish in the Innoko River are generally not able to use driftnets due to the narrower water channel, high sinuosity of the river, and high loads of debris. Chinook and coho salmon are generally in low abundance in the Innoko River relative to the mainstem Yukon River (Alt [*n.d.*]:66), and fall chum salmon are normally absent from the Innoko River. Because of this, the 2013 harvest of salmon species by gear type reflects both differences in species distribution and differences in gears used between the mainstem Yukon River and the Innoko River.

Table 8-12 shows the estimated numbers of harvested fish that Shageluk residents used for feeding dogs in 2013. Summer chum salmon was the only type of salmon used for feeding dogs in the study year; residents used an estimated 86 chum salmon (398 edible pounds) to feed to dogs.

Nonsalmon Fish

As mentioned previously, when considered as a resource category, nonsalmon fish of all species contributed a large percentage (41%) of Shageluk residents' subsistence harvest in 2013; this is a greater percentage than for any other resource category (Figure 8-5). Although Shageluk residents harvested 7 species of nonsalmon fish in 2013, 4 species in particular predominated: broad whitefish, sheefish, northern pike, and humpback whitefish. Together these fish composed over 99% of the total nonsalmon fish harvest (Figure 8-9). Each of these 4 species contributed substantial quantities of edible weight to the community harvest: of the estimated 10,003 total lb of nonsalmon fish harvested, 1,035 broad whitefish contributed the largest quantity (4,140 total pounds, 49 lb per capita).This was followed by 637 northern pike (2,866 total pounds, 34 lb per capita), 392 sheefish (2,349 total pounds, 28 lb per capita), and 184 humpback whitefish (552 total pounds, 7 lb per capita; Table 8-7). The remaining nonsalmon harvest included 36 burbots, 11 least ciscoes, and 2 longnose suckers. Each contributed less than 1 lb per capita.

Shageluk residents used several gear types to harvest nonsalmon fish in 2013 (Figure 8-10; Table 8-13). Set gillnets were used for all species of nonsalmon fish, and the quantity of nonsalmon fish of all species harvested with setnets was greater than for all other gear types combined: a total of 6,891 edible pounds, or 53% of the total nonsalmon fish harvest by edible weight (tables 8-13 and 8-14). Individual nonsalmon fish species harvested with set gillnets included 661 broad whitefish (2,646 edible pounds), 418 northern pike (1,882 lb), 306 sheefish (1,834 lb), 26 burbot (62 lb), and 2 longnose suckers (5 lb; Table 8-13). Several respondents indicated that in 2013 they caught multiple longnose suckers in their setnets, but that they typically released these fish if possible due to the difficulty in processing them for human or dog consumption because of their many bones (022214SH1). Shageluk residents also set gillnets under the ice during winter months. Harvests from both open-water and under-ice setnets are combined in tables 8-13 and 8-14 and Figure 8-10. Although open-water and under-ice setnets were effective at catching most species of nonsalmon fish that were harvested in 2013, other gear types used in 2013 were more specific to the species they targeted. In particular, dipnets were used to harvest broad whitefish, with a total harvest of 223 broad whitefish (892 edible pounds). As previously described, Shageluk residents dipnetted around the time of ice breakup on the Innoko River, and multiple respondents described that during this time large numbers of broad whitefish can be harvested during their upstream migration into summer habitat throughout the upper Innoko River drainage (022114SH4; Alt [*n.d.*]:55–60; Brown et al. 2005). Although broad whitefish were the primary species harvested, Shageluk residents also harvested smaller numbers of humpback whitefish (6 fish) and 1 burbot with dipnets. As described previously, drift gillnets are generally not used on the Innoko River itself; residents described a largely incidental harvest of nonsalmon fish that were present in the Yukon River during targeted salmon fishing with driftnets in 2013. These fish included relatively small numbers of broad whitefish (an estimated 28 fish, 112 edible pounds), 28 humpback whitefish (84 lb), and 11 sheefish (67 lb). Rod and reel was also a frequently used gear type for harvesting nonsalmon fish in

Table 8-11.–Estimated percentages of salmon harvested by gear type, resource, and total salmon harvest in usable pounds, Shageluk, 2013.

			Subsistence methods							
Resource	Percentage base	Removed from commercial catch	Setnet	Driftnet	Fish wheel	Seine net	Other method	Subsistence gear, any method	Rod and reel	Any method
Salmon	**Gear type**	**0.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**0.0%**	**100.0%**
	Resource	**0.0%**	**62.0%**	**38.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**0.0%**	**100.0%**
	Total	**0.0%**	**62.0%**	**38.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**0.0%**	**100.0%**
Summer chum salmon	Gear type	0.0%	71.2%	12.4%	0.0%	0.0%	0.0%	48.8%	0.0%	48.8%
	Resource	0.0%	90.3%	9.7%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	44.1%	4.7%	0.0%	0.0%	0.0%	48.8%	0.0%	48.8%
Fall chum salmon	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown chum salmon	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Coho salmon	Gear type	0.0%	18.9%	56.1%	0.0%	0.0%	0.0%	33.1%	0.0%	33.1%
	Resource	0.0%	35.4%	64.6%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	11.7%	21.3%	0.0%	0.0%	0.0%	33.1%	0.0%	33.1%
Chinook salmon	Gear type	0.0%	9.9%	19.5%	0.0%	0.0%	0.0%	13.6%	0.0%	13.6%
	Resource	0.0%	45.3%	54.7%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	6.2%	7.4%	0.0%	0.0%	0.0%	13.6%	0.0%	13.6%
Pink salmon	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sockeye salmon	Gear type	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%
	Total	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%	11.9%	0.0%	0.0%	0.0%	4.5%	0.0%	4.5%
	Resource	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	4.5%	0.0%	0.0%	0.0%	4.5%	0.0%	4.5%

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

Table 8-12.–Estimated harvests of salmon and nonsalmon fish for consumption by dogs, Shageluk, 2013.

Resource	Amount	Pounds
Salmon		
Summer chum salmon	85.9 ind	397.6 lb
Other nonsalmon fish		
Burbot	1.1 ind	2.7 lb
Northern pike	239.8 ind	1,079.1 lb
Longnose sucker	2.2 ind	4.5 lb
Whitefishes		
Broad whitefish	83.7 ind	334.6 lb
Least cisco	5.6 ind	5.6 lb
Humpback whitefish	11.2 ind	33.5 lb
Total	**429.4 ind**	**1,857.6 lb**

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

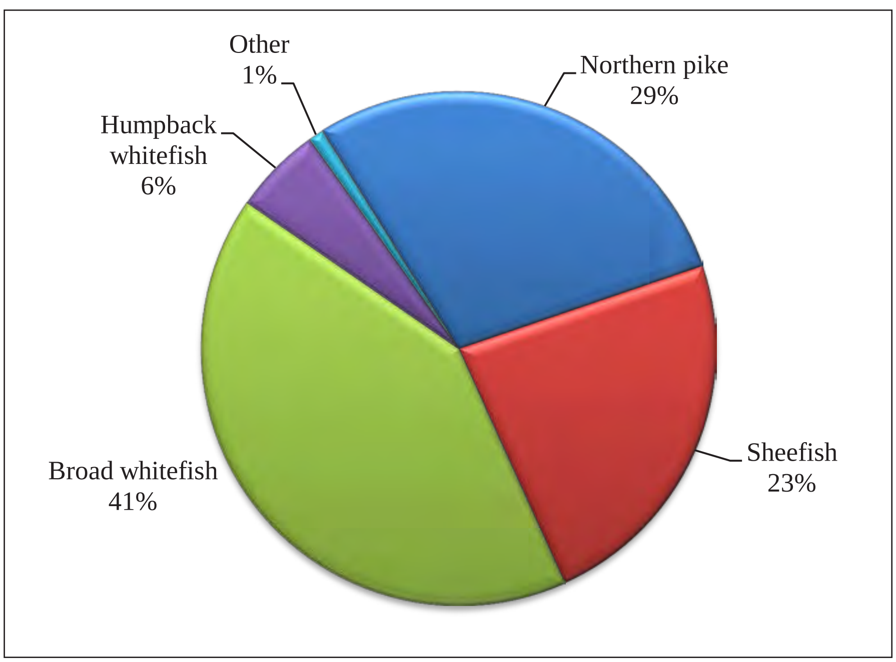


Figure 8-9.–Composition of edible nonsalmon fish harvest, Shageluk, 2013.

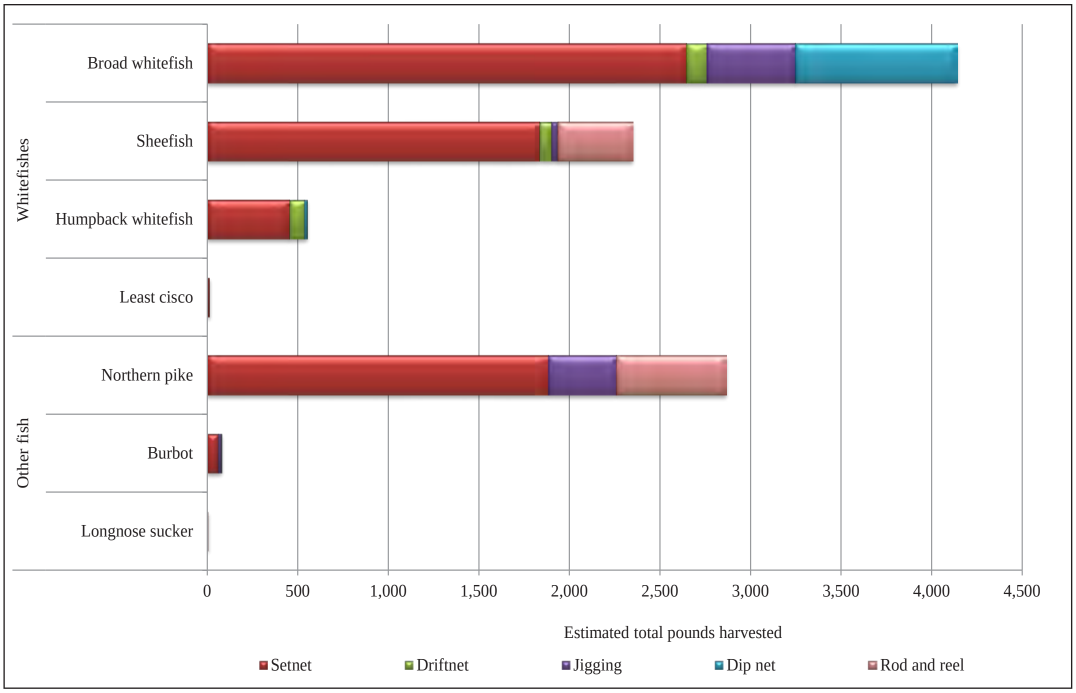


Figure 8-10.–Harvests of nonsalmon fish by gear type, Shageluk, 2013.

2013; multiple households that did not fish otherwise did harvest fish with rod and reel. Although individual household harvests of fish with rod and reel were generally smaller than for other gear types such as setnets, their combined harvest of 135 northern pike and 69 sheefish contributed approximately 607 lb and 415 lb, respectively, to the total community harvest.

Table 8-12 shows the estimated number of nonsalmon fish fed to dogs.[23] Most nonsalmon fish harvested in Shageluk in 2013 were used primarily for human food. Shageluk residents used an estimated 429 individual nonsalmon fish exclusively for dog food, equivalent to approximately 1,460 edible pounds, or 15% of the total nonsalmon fish harvest by edible weight (tables 8-7 and 8-12). Several fish species were used to some extent for dog food; 240 northern pike, 84 broad whitefish, and 11 humpback whitefish formed the majority (99% by edible weight) of the total nonsalmon harvest that was used to feed dogs (Table 8-12). The small remainder represents fewer than 10 fish, comprising least cisco, longnose sucker, and burbot.

Large Land Mammals

Large land mammals formed a substantial portion of Shageluk's subsistence harvest in 2013, composing 25% of all wild foods harvested by edible weight (Figure 8-5). All households reported using land mammals in 2013, although less than one-half of households harvested them (39%; Table 8-7). Additionally, all households that harvested the resource reported giving it to other households, and a large percentage of households (81%) reported that they received large land mammals. The estimated harvest of 11 individual moose made up nearly all of the large land mammal harvest (96%), contributing 6,023 lb to the community harvest and 71 lb per capita (Table 8-7; Figure 8-11). An estimated 50% of households attempted to harvest moose in 2013, and 35% actually harvested at least one moose. Black bear was the only large land mammal harvested in 2013 other than moose; 2 individual black bears contributed 223 lb and 3 lb per capita. Eight percent of households reported attempting to harvest black bear in 2013, and all of these households were successful. Large land mammals were harvested exclusively during the fall season, with 1 bull moose and 1 black bear in August, 10 bull moose in September, and 1 black bear in October (Table 8-15). The respective

23. Shageluk residents commonly feed fish scraps left over from processing to dogs. However, only whole fish are used to estimate the number of fish fed to dogs.

Table 8-13.–Estimated harvests of nonsalmon fish by gear type, Shageluk, 2013.

				Subsistence methods											
		Removed from commercial catch		Setnet		Driftnet		Fish wheel		Jigging		Seine net		Dip net	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**0.0**		**6,890.5**		**262.1**		**0.0**		**916.7**		**0.0**		**911.7**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eulachon (hooligan, candlefish)	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific tomcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic lamprey	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rockfish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stickleback (needlefish)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	ind	0.0	0.0	25.7	61.6	0.0	0.0	0.0	0.0	6.7	16.1	0.0	0.0	1.1	2.7
Dolly Varden	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lake trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern pike	ind	0.0	0.0	418.3	1,882.2	0.0	0.0	0.0	0.0	83.7	376.4	0.0	0.0	0.0	0.0
Sheefish	ind	0.0	0.0	305.6	1,833.7	11.2	66.9	0.0	0.0	5.6	33.5	0.0	0.0	0.0	0.0
Longnose sucker	ind	0.0	0.0	2.2	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	0.0	0.0	661.4	2,645.7	27.9	111.5	0.0	0.0	122.7	490.8	0.0	0.0	223.1	892.3
Bering cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least cisco	ind	0.0	0.0	11.2	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback whitefish	ind	0.0	0.0	150.6	451.7	27.9	83.7	0.0	0.0	0.0	0.0	0.0	0.0	5.6	16.7
Round whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown whitefishes	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

-continued-

Table 8-13.–Page 2 of 2.

		Subsistence methods							
		Other method		Subsistence gear, any method		Rod and reel		Any method	
Resource	Unit[a]	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds	Number[a]	Pounds
Nonsalmon fish			**0.0**		**8,981.1**		**1,022.3**		**10,003.3**
Pacific herring	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eulachon (hooligan, candlefish)	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific tomcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic lamprey	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rockfish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stickleback (needlefish)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	ind	0.0	0.0	33.5	80.3	0.0	0.0	33.5	80.3
Dolly Varden	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lake trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern pike	ind	0.0	0.0	501.9	2,258.7	135.0	607.3	636.9	2,866.0
Sheefish	ind	0.0	0.0	322.3	1,934.1	69.2	414.9	391.5	2,349.0
Longnose sucker	ind	0.0	0.0	2.2	4.5	0.0	0.0	2.2	4.5
Rainbow trout	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	ind	0.0	0.0	1,035.1	4,140.3	0.0	0.0	1,035.1	4,140.3
Bering cisco	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least cisco	ind	0.0	0.0	11.2	11.2	0.0	0.0	11.2	11.2
Humpback whitefish	ind	0.0	0.0	184.0	552.1	0.0	0.0	184.0	552.1
Round whitefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown whitefishes	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

Note The summary row that includes incompatible units of measure for harvest numbers has been left blank.

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

Table 8-14.–Estimated percentages of nonsalmon fish harvested by gear type, resource, and total nonsalmon fish harvest in usable pounds, Shageluk, 2013.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Fish wheel	Jigging	Seine net	Dip net	Other method	Subsistence gear, any method	Rod and reel	Any method
Nonsalmon fish	**Gear type**	**0.0%**	**100.0%**	**100.0%**	**0.0%**	**100.0%**	**0.0%**	**100.0%**	**0.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**0.0%**	**52.8%**	**2.6%**	**0.0%**	**1.3%**	**0.0%**	**8.2%**	**0.0%**	**89.8%**	**10.2%**	**100.0%**
	Total	**0.0%**	**52.8%**	**2.6%**	**0.0%**	**1.3%**	**0.0%**	**8.2%**	**0.0%**	**89.8%**	**10.2%**	**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%
	Resource	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%
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%
	Resource	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%
Eulachon (hooligan, candlefish)	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pacific tomcod	Gear type	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%
	Total	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%	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Arctic lamprey	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
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%
	Resource	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%
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%
	Resource	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%
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%
	Resource	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%
Burbot	Gear type	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.9%	0.0%	0.8%
	Resource	0.0%	73.3%	0.0%	0.0%	0.0%	0.0%	3.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.8%

-continued-

Table 8-14.–Page 2 of 2.

Resource	Percentage base	Removed from commercial catch	Subsistence methods: Setnet	Driftnet	Fish wheel	Jigging	Seine net	Dip net	Other method	Subsistence gear, any method	Rod and reel	Any method
Dolly Varden	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lake 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%
	Resource	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%
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%
	Resource	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%
Northern pike	Gear type	0.0%	26.5%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	25.1%	59.4%	28.7%
	Resource	0.0%	48.9%	0.0%	0.0%	4.4%	0.0%	0.0%	0.0%	78.8%	21.2%	100.0%
	Total	0.0%	14.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	22.6%	6.1%	28.7%
Sheefish	Gear type	0.0%	34.1%	25.5%	0.0%	0.0%	0.0%	0.0%	0.0%	21.5%	40.6%	23.5%
	Resource	0.0%	76.6%	2.8%	0.0%	0.0%	0.0%	0.0%	0.0%	82.3%	17.7%	100.0%
	Total	0.0%	18.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	19.3%	4.1%	23.5%
Longnose sucker	Gear type	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	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%
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%
	Resource	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%
Broad whitefish	Gear type	0.0%	29.8%	42.6%	0.0%	0.0%	0.0%	97.9%	0.0%	46.1%	0.0%	41.4%
	Resource	0.0%	38.0%	2.7%	0.0%	0.0%	0.0%	19.3%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	15.7%	1.1%	0.0%	0.0%	0.0%	8.0%	0.0%	41.4%	0.0%	41.4%
Bering cisco	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Least cisco	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
Humpback whitefish	Gear type	0.0%	8.4%	31.9%	0.0%	0.0%	0.0%	1.8%	0.0%	6.1%	0.0%	5.5%
	Resource	0.0%	80.6%	15.2%	0.0%	0.0%	0.0%	2.7%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	4.4%	0.8%	0.0%	0.0%	0.0%	0.1%	0.0%	5.5%	0.0%	5.5%
Round whitefish	Gear type	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%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
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%
	Resource	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%

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

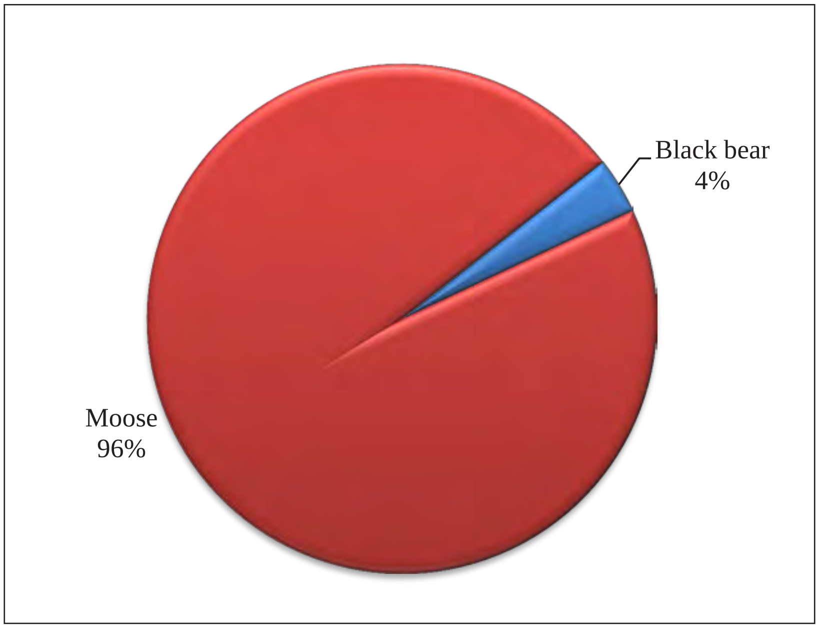


Figure 8-11.–Composition of edible large land mammal harvest, Shageluk, 2013.

percentages of households using moose and black bear reflect the relative contributions of these species to the total large land mammal harvest; all households (100%) used moose in 2013, and 8% used black bear (Table 8-7). The only additional large land mammal species with reported use in 2013 was bison[24]; 4% of households received bison from at least one non-Shageluk household.

Small Land Mammals/Furbearers

Over one-half of Shageluk households (54%) used small land mammals in 2013 (Table 8-7). Small land mammals including 42 beavers, 9 muskrats, and 5 snowshoe hares contributed a combined estimate of 8 edible pounds per person. Because other small land animals are harvested for their fur and are not usually eaten, Figure 8-12 shows the composition of the small land mammal harvest by individual animals harvested rather than by edible pounds. Small land mammals harvested primarily for their fur included 90 marten, 3 red foxes, 3 lynx, 1 river otter, 1 gray wolf, and 1 wolverine; this furbearer harvest likely represented an important source of cash income and materials for clothing or crafts for some households. All small land mammals other than muskrat and beaver were harvested exclusively during winter months from November to March, corresponding to established trapping seasons and higher fur quality during these months (Table 8-16). Beaver and muskrat were the only small land mammals harvested outside of winter months; because they are often eaten, fur quality does not dictate harvest timing to the same extent as furbearers that are typically harvested exclusively for fur. In addition to beaver and muskrat, of which all individuals were utilized for food, Shageluk residents used 3 other small land mammal species for purposes other than fur only (Figure 8-13). For example, all snowshoe hare and lynx were eaten. Figure 8-13 also shows that 3 martens were not used exclusively for fur; in this case, these martens were reported as harvested, but were partially consumed by other furbearers prior to removal from traps, and were used for neither food nor fur.

Marine Mammals

The survey asked each household about their harvest and use of marine mammals in 2013. Given the location of Shageluk within Interior Alaska and the difficulty of marine access, there was no reported harvest of marine mammals in 2013. As discussed above in the Community Background section, trade for marine

24. This bison was almost surely plains bison, not wood bison. Wood bison were not introduced into the Shageluk area until 2015 and are not open for hunting at this time.

Table 8-15.–Estimated large land mammal harvest by month and sex, Shageluk, 2013.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
All large land mammals	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**2.2**	**10.0**	**1.1**	**0.0**	**0.0**	**0.0**	**13.4**
Bison	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Black bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.1	0.0	0.0	0.0	**2.2**
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	10.0	0.0	0.0	0.0	0.0	**11.2**
Moose, bull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	10.0	0.0	0.0	0.0	0.0	**11.2**
Moose, cow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Muskox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
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.

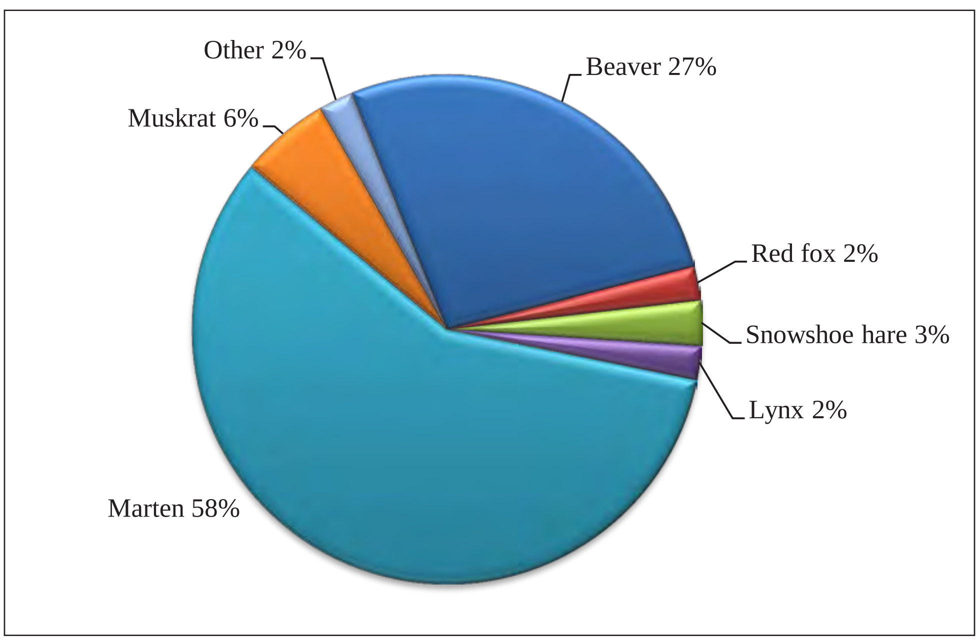


Figure 8-12.–Composition of small land mammal harvest in individual animals harvested, Shageluk, 2013.

Table 8-16.–Estimated small land mammal harvests by month, Shageluk, 2013.

Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	Total
	Estimated harvest by month													
All small land mammals	**23.4**	**33.5**	**31.2**	**17.8**	**2.2**	**0.0**	**0.0**	**3.3**	**0.0**	**1.1**	**14.5**	**29.0**	**0.0**	**156.2**
Beaver	0.0	6.7	20.1	8.9	2.2	0.0	0.0	3.3	0.0	1.1	0.0	0.0	0.0	**42.4**
Red fox	1.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**3.3**
Alaska hare	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Snowshoe hare	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.5**
River (land) otter	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.1**
Lynx	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	**3.3**
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Marten	21.2	23.4	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	29.0	0.0	**90.3**
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	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**8.9**
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
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	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.1**
Wolverine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	**1.1**

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

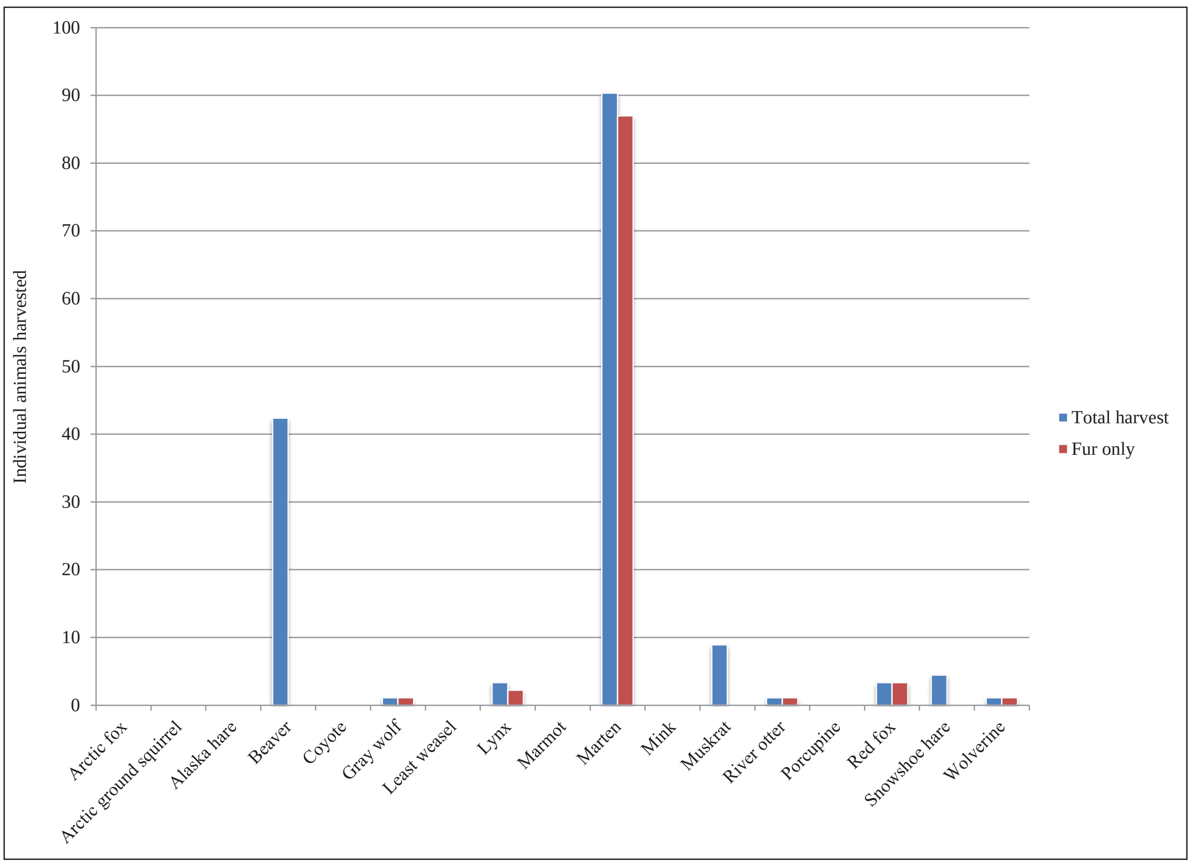


Figure 8-13.–Estimated small land mammal harvests for fur, Shageluk, 2013.

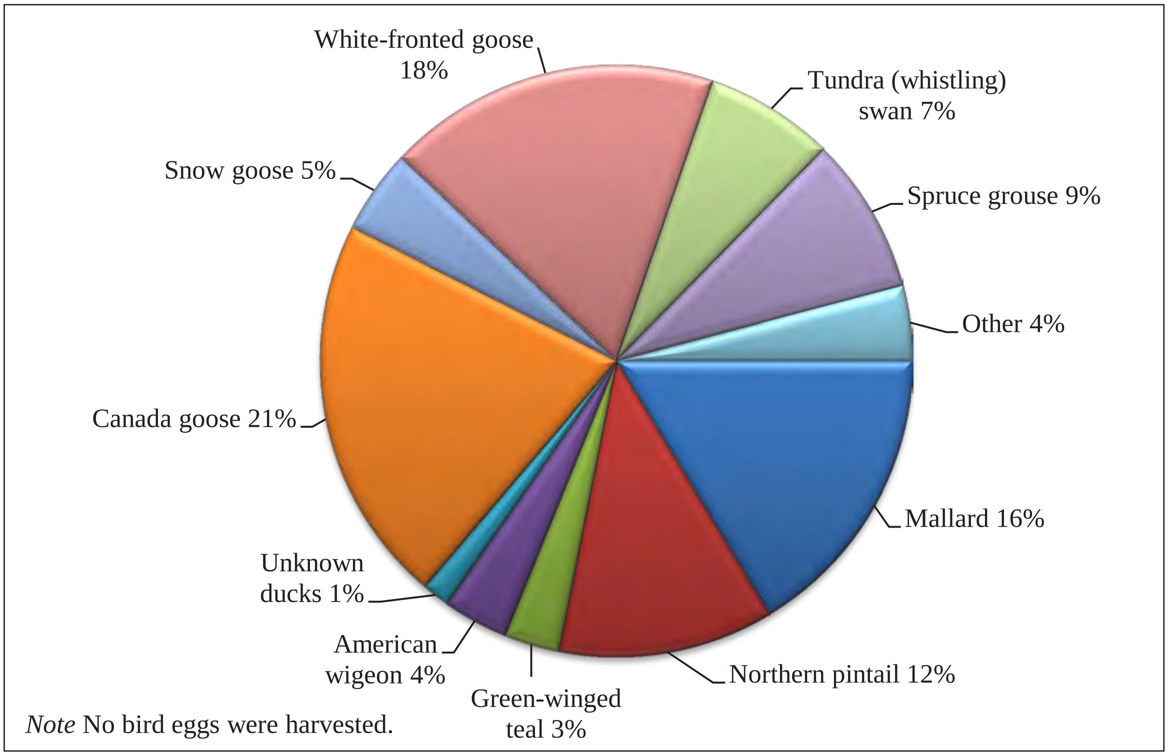


Figure 8-14.–Composition of edible bird and bird egg harvests, Shageluk, 2013.

mammal products including seal oil was fairly common in the area until recent decades: "Actually, when I was growing up, yeah, I had seal oil...That kind of faded out" (022214SH1). Although uncommon in 2013, 1 household did report using seal oil that they had received (of a seal species unknown to respondents).

Birds and Eggs

Wild birds and eggs as a resource category[25] contributed an estimated 4% (1,064 total edible pounds, 23 lb per capita) to the 2013 wild food harvest (Figure 8-5; Table 8-7). Although this relatively minor edible weight estimate contrasts with those of fish or land mammals, the high percentage of households using birds in 2013 (77%) is comparable to use levels for these other resources (Table 8-7). The majority of households (58%) attempted to harvest birds in 2013, and all of these households reported harvesting at least 1 bird in 2013. The bulk of the bird harvest (94% of total edible weight) comprised 9 bird species (Figure 8-14). Ranked in descending order by edible weight contribution, these 9 species included 189 Canada geese, 46 white-fronted geese, 89 mallards, 84 northern pintails, 131 spruce grouse, 7 tundra swans, 12 snow geese, 29 American wigeons, and 61 green-winged teals (Table 8-7). Shageluk residents also harvested 20 ducks that respondents were unable to identify to the species level at the time of the survey and small numbers of ruffed grouse, canvasbacks, sandhill cranes, scaups, and northern shovelers. The majority of the bird harvest occurred during spring, although most grouse and some ducks and geese were harvested during fall months (Table 8-17).

Marine Invertebrates[26]

The survey asked each household about their harvest and use of marine invertebrates in 2013. Given the location of Shageluk within Interior Alaska and the difficulty of marine access, harvest and use of marine

25. Hereafter referred to as "birds" rather than "birds and eggs." No Shageluk residents reported harvesting or using wild bird eggs for subsistence in 2013 (Table 8-7). Tables and figures retain the birds and eggs label for the purpose of comparisons with other community results in this report and others.

26. For the purposes of this chapter, the marine invertebrates category also includes freshwater clams or mussels.

Table 8-17.–Estimated bird and bird egg harvests by season, Shageluk, 2013.

	Estimated harvest by season					
Resource	Winter	Spring	Summer	Fall	Season unknown	**Total**
All birds	**0.0**	**435.0**	**27.9**	**237.6**	**0.0**	**700.5**
Bufflehead	0.0	0.0	0.0	0.0	0.0	**0.0**
Canvasback	0.0	2.2	0.0	3.3	0.0	**5.6**
Common eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Goldeneye	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	0.0	53.5	0.0	35.7	0.0	**89.2**
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**
Unknown merganser	0.0	0.0	0.0	0.0	0.0	**0.0**
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Northern pintail	0.0	71.4	0.0	12.3	0.0	**83.7**
Scaup	0.0	0.0	0.0	6.7	0.0	**6.7**
Black scoter	0.0	0.0	0.0	0.0	0.0	**0.0**
Surf scoter	0.0	0.0	0.0	0.0	0.0	**0.0**
White-winged scoter	0.0	0.0	0.0	0.0	0.0	**0.0**
Northern shoveler	0.0	3.3	0.0	0.0	0.0	**3.3**
Green-winged teal	0.0	22.3	0.0	39.0	0.0	**61.3**
American wigeon	0.0	12.3	0.0	16.7	0.0	**29.0**
Unknown ducks	0.0	16.7	0.0	0.0	0.0	**16.7**
Brant	0.0	0.0	0.0	0.0	0.0	**0.0**
Canada goose	0.0	187.4	0.0	1.1	0.0	**188.5**
Emperor goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Snow goose	0.0	12.3	0.0	0.0	0.0	**12.3**
White-fronted goose	0.0	45.7	0.0	0.0	0.0	**45.7**
Unknown geese	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	0.0	6.7	0.0	0.0	0.0	**6.7**
Sandhill crane	0.0	1.1	0.0	0.0	0.0	**1.1**
Whimbrel	0.0	0.0	0.0	0.0	0.0	**0.0**
Spruce grouse	0.0	0.0	27.9	102.6	0.0	**130.5**
Sharp-tailed grouse	0.0	0.0	0.0	0.0	0.0	**0.0**
Ruffed grouse	0.0	0.0	0.0	20.1	0.0	**20.1**
Ptarmigan	0.0	0.0	0.0	0.0	0.0	**0.0**
Duck eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Goose eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Swan eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown shorebird eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Gull eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Tern eggs	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown eggs	0.0	0.0	0.0	0.0	0.0	**0.0**

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

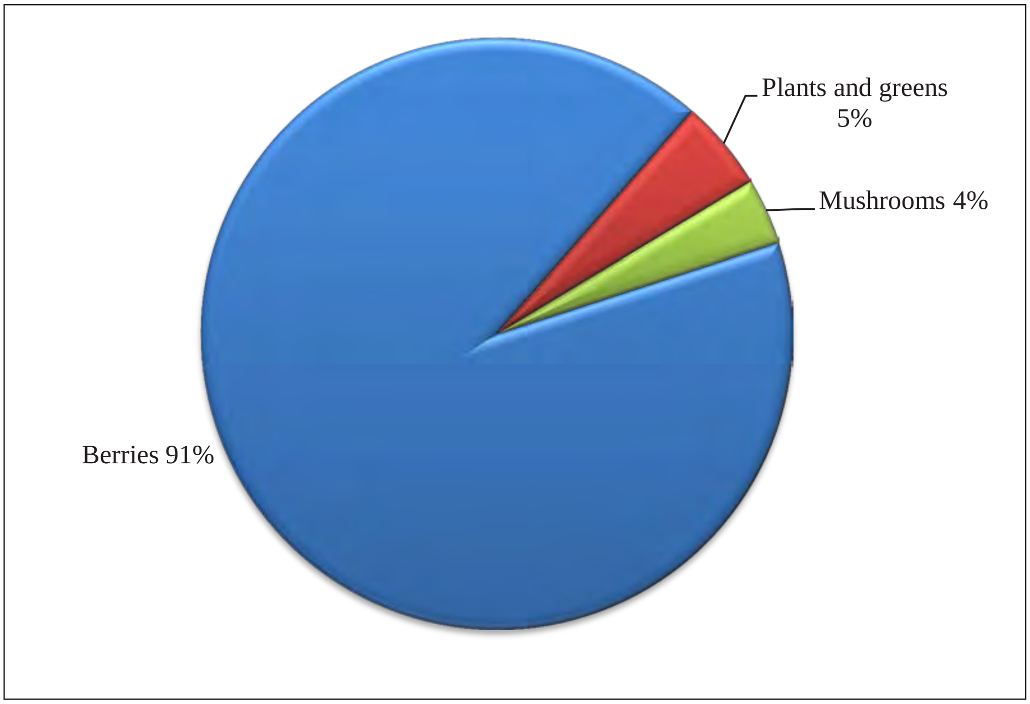


Figure 8-15.–Composition of edible vegetation harvest by type, Shageluk, 2013.

invertebrates was negligible. Eight percent of households reported using subsistence harvested marine invertebrates, and only 4% of households reported harvesting marine invertebrates for food (Table 8-7). The exclusive marine invertebrate resource harvested and used in Shageluk in 2013 was "clams" (likely freshwater mussels, Smith et al. 2005:2) that were harvested in the vicinity of Shageluk.

Vegetation

Vegetation as a resource category[27] contributed an estimated 3% (615 edible pounds, 7 lb per capita) to the 2013 wild food harvest (Figure 8-5; Table 8-7). Most Shageluk residents (89%) used wild plants during the study year. Berries were the most harvested wild plant resource; the average household gathered an estimated 19 lb of berries in 2013, and berries represented 91% of the total plant harvest by edible weight (Table 8-7; Figure 8-15). Six species of berry composed the berry harvest: blueberries (an estimated 72 gallons harvested), cloudberries[28] (33 gallons), lowbush cranberries (15 gallons), and smaller quantities of crowberries,[29] highbush cranberries, and raspberries (Table 8-7). Other wild plants and fungi harvested in 2013 included an estimated 95 gallons of punk[30], mushrooms[31] (22 gallons), wild rose hips (5 gallons), fireweed[32] (11 gallons), wild rhubarb (1 gallon), stinkweed[33] (less than 1 gallon). In addition to the previously mentioned plants, 77% of Shageluk households reported using locally harvested wood, primarily for use as firewood for home heating. Although the survey form did not collect quantities of firewood harvested, households reported use of firewood in terms of the percentage of their home heating needs met by firewood

27. For the purposes of this chapter, vegetation includes wild and noncommercially harvested fruits, plants, wood, and fungi.

28. Locally known as salmonberries or *dondhi'on.*

29. Locally known as blackberries.

30. The polypore fungus *Phellinus ignarius* is commonly used by Shageluk residents as a mosquito repellent (Ross [*n.d.*]).

31. Although the standard survey form did not provide for identification of mushrooms to species level, in this case the reported harvest of unknown mushrooms was composed exclusively of chaga mushroom, *Inonotus obliquus,* a conk fungus growing on birch trees that is typically used to produce a beverage or tea (Ross [*n.d.*]).

32. Fireweed flowers, used for making jelly (Dinstel and Shallcross 2014)

33. Common wormwood, *Artemisia tilesii,* a plant commonly used in the region as a medicinal.

Table 8-18.–Use of firewood for home heating, Shageluk, 2013.

	Household use of wood for home heating as a percentage of sampled households													
	0%		1–25%		26–50%		51–75%		76–99%		100%		Did not respond	
Community	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Shageluk	7	26.9%	0	0.0%	6	23.1%	1	3.8%	2	7.7%	10	38.5%	0	0.0%

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

(Table 8-18). In 2013, 39% of households in Shageluk used firewood exclusively for their home heating needs, 27% of households did not use firewood, and all other households used firewood for between 25% and 99% of their home heating needs.

Harvest Areas

As part of the survey, households were asked to mark on a map the areas where they harvested or searched for subsistence resources in 2013. Figure 8-16 summarizes all the mapped data collected from 25 of 26 surveyed households in Shageluk. In 2013, respondents reported using a total of 279 square miles for subsistence. The numerous water bodies and surrounding lands of the Innoko River drainage near Shageluk composed the core of Shageluk residents' search and harvest area in 2013, extending from Holikachuk north of Shageluk to areas roughly 15 miles south of Shageluk. Shageluk residents also reported subsistence search and harvest areas on and adjacent to the Yukon River, primarily within the vicinity of the communities of Grayling and Holy Cross.

Salmon fishing in 2013 occurred primarily on the mainstem Innoko River near Shageluk as well as on the Yukon River near Grayling and Holy Cross (Figure 8-17). The presence of point versus line harvest areas on the Innoko River and Yukon River, respectively, is related to gear types used in these differing water bodies; salmon were harvested exclusively with set gillnets on the Innoko River (represented by dots on the map) and with drift gillnets nets on the Yukon River (represented by lines). The use of set versus drift gillnets in these 2 water bodies is related to the comparatively small, sinuous, and debris loaded character of the Innoko River, in which drift gillnetting would be more difficult than in the Yukon River, according to Shageluk residents. In addition, fishing for salmon by Shageluk residents on the Yukon River in 2013 typically occurred during brief trips to the Yukon River lasting no more than a few days. Such travel to the Yukon River from Shageluk often corresponded to regulatory fishing openings that were limited in duration in 2013 (Estensen et al. 2015:61–69), in contrast to the Innoko River, which did not have time-limited subsistence fishing periods in 2013. The use of driftnets on the mainstem Yukon River may have been more convenient or efficient than use of set gillnets during these short timeframes.

Whitefish, sheefish, northern pike, and burbot search and harvest areas were limited to the Innoko River drainage, where they overlapped with but were more extensive than salmon fishing areas; such overlap corresponds to the use of specific setnet sites for harvesting both salmon and nonsalmon fish species in the same fishing locations (figures 8-17 and 8-18). Search and harvest areas for all 4 previously mentioned nonsalmon fish species included extensive use of the Innoko River in the immediate vicinity of Shageluk as well as the sharp bend in the Innoko River located roughly 5 miles downriver form Shageluk (locally referred to as Quick Bend; Figure 8-18). Search and harvest areas for northern pike extended farther downriver from Shageluk and included several portions of the mainstem Innoko River and surrounding lakes and sloughs, where northern pike were harvested by jigging under ice as well as with rod and reel in open water. Relatively limited fishing for sheefish, whitefishes, and northern pike occurred upstream from Shageluk on the Innoko River and surrounding water bodies, extending up to approximately 20 miles north of Shageluk.

Shageluk residents made extensive use of the Innoko River drainage near Shageluk while hunting for large and small land mammals (figures 8-19 and 8-20). For moose in particular, residents hunted over a large portion of the area from approximately 10 miles south of Shageluk, north to Holikachuk, and extending approximately 5 miles west of the Innoko River (Figure 8-19). These search and harvest areas were located

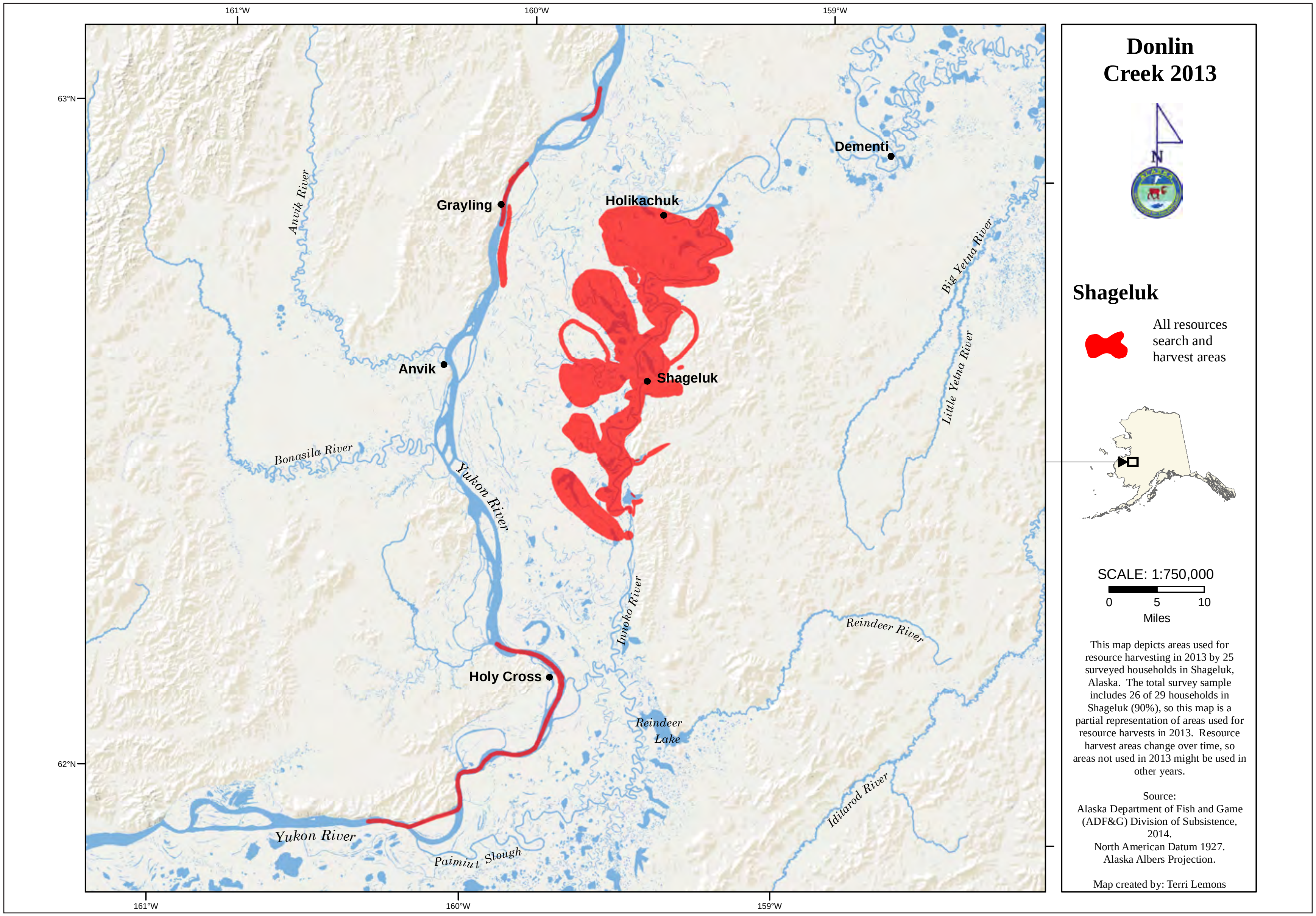


Figure 8-16.–Search and harvest areas, all resources, Shageluk, 2013.

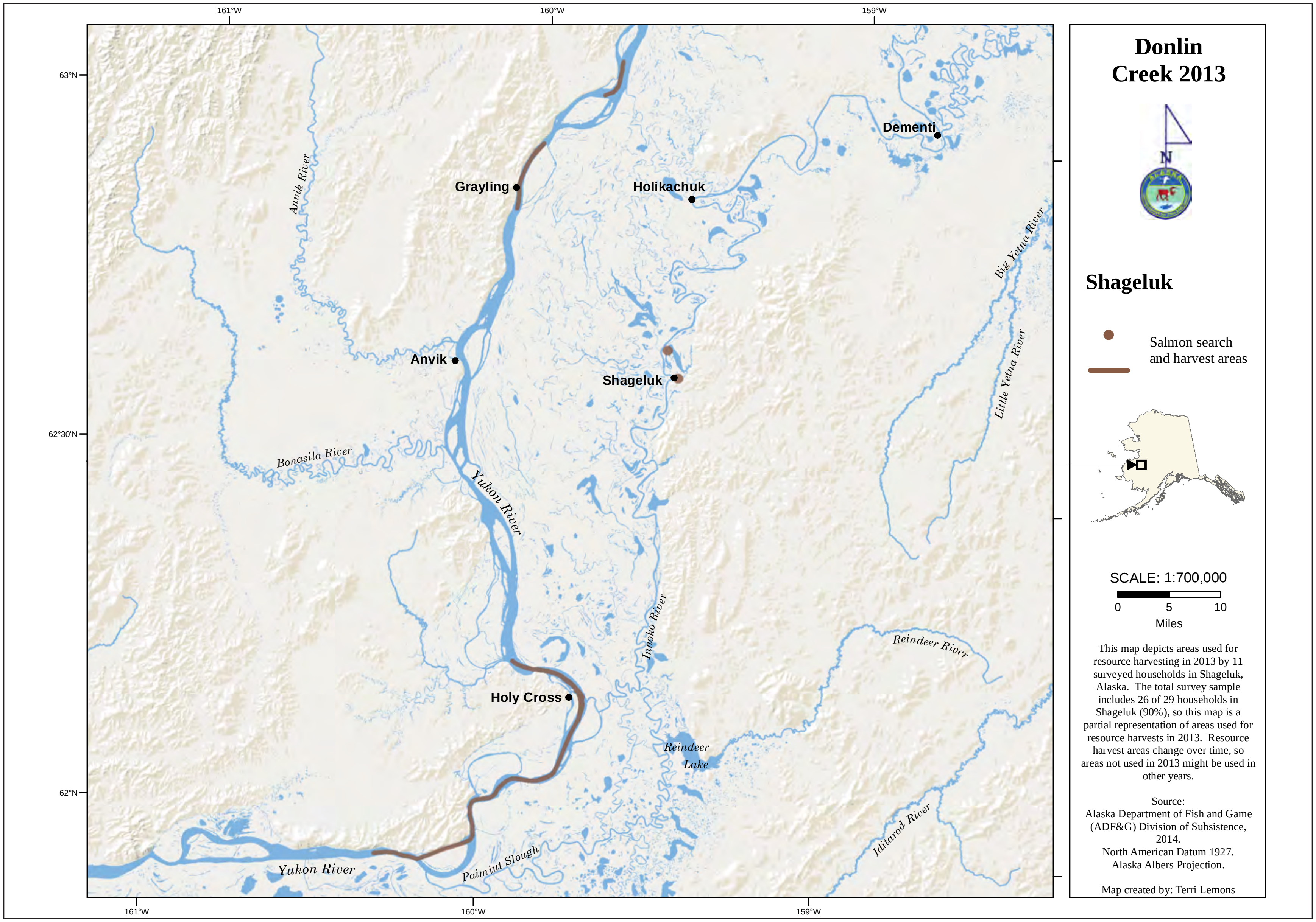


Figure 8-17.–Fishing and harvest areas, salmon, Shageluk, 2013.

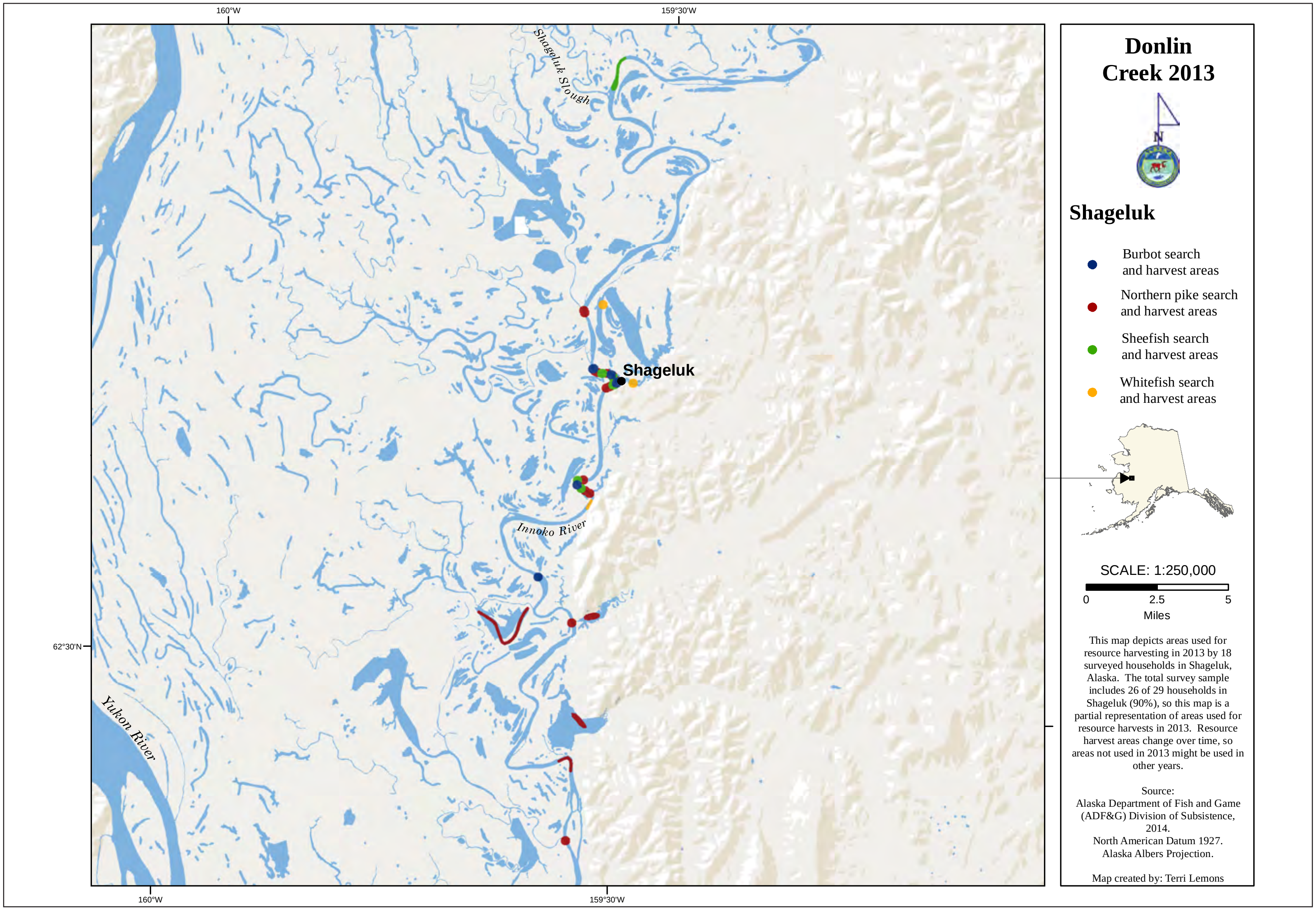


Figure 8-18.–Fishing and harvest areas, burbot, northern pike, sheefish, and whitefishes, Shageluk, 2013.

within an area locally referred to as "the flats" between the Innoko and Yukon Rivers, an area characterized by relatively flat country with an extremely dense assemblage of river channels, lakes, and sloughs. Search and harvest areas for black bear were limited relative to moose, and included an area northwest of Shageluk within the area utilized for moose hunting as well as the east bank of the Yukon River downriver from Grayling. Small land mammal search and harvest occurred within the flats west of Shageluk, but also included more extensive use of the uplands located to the east of the Innoko River near Shageluk (Figure 8-20). Shageluk residents described these densely forested hills as containing ideal habitat for marten, while the flat country to the west of the Innoko River mainstem is productive habitat for other small land mammals such as beaver and muskrat.

Search and harvest area for ducks and geese covered much of the relatively flat country to the west of Shageluk, extending over the numerous water bodies within a broad, several-mile corridor bordering the mainstem Innoko River between approximately 15 miles north and south of Shageluk. (Figure 8-21). Search and harvest areas for birds show considerable overlap with other use areas, reflecting similar habitats used by multiple resources, as well as opportunistic hunting for birds during other activities such as moose hunting during the fall. Harvest areas for grouse were located within a corridor extending along the Innoko River to approximately 10 miles north of Shageluk, and also into the hills to the east of Shageluk. Many residents also harvested grouse when they were available in the immediate vicinity of Shageluk.

Search and harvest areas for berries and greens were located along the mainstem Innoko River near Shageluk, as well as along sloughs and lakes to the northwest of Shageluk and along lakes draining from the hills and into the Innoko River to the south of Shageluk (Figure 8-22). Many residents harvest berries close to Shageluk, although the variability of berry patches' productivity from year to year often requires some families to travel considerable distances for berry picking.

Comparing Harvests and Uses in 2013 with Previous Years

Harvest Assessments

Researchers asked respondents to assess their own harvests in 2 ways: whether they got more, less, or about the same amount of 7 resource categories in 2013 as in the past 5 years, and whether they got "enough" of each of the 7 resource categories. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different subsistence resource) because they did not get enough. This section discusses responses to those questions.

Together, Table 8-19, Figure 8-23, and Figure 8-24 provide a broad overview of households' assessments of their harvests in 2013. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions.

Assessment questions for salmon differed somewhat from those asked for other resource categories. Because of widespread concern during the study year related to Chinook salmon abundance, regulation of harvest, and harvest amounts, the survey form included assessment questions for both Chinook salmon and for all salmon other than Chinook salmon. Twenty households (77%) answered questions assessing their use of Chinook and other salmon in 2013 relative to recent years[34] (Table 8-19). Of these 20 households, 9 households described not using Chinook salmon, and 3 described not using other salmon in recent years; because questions asked about 2013 relative to recent years, these households did not provide an assessment of whether their use of salmon was less, same, or more in 2013. However, multiple households that reported not using Chinook salmon in the past 5 years commented that if the question had referenced 2013 relative to the previous 10 to 15 years rather than 5, their use in 2013 would have been less; several

34. "Recent" was defined for Shageluk fieldwork as the previous 5 years in cases when survey respondents requested clarification as to the meaning of recent.

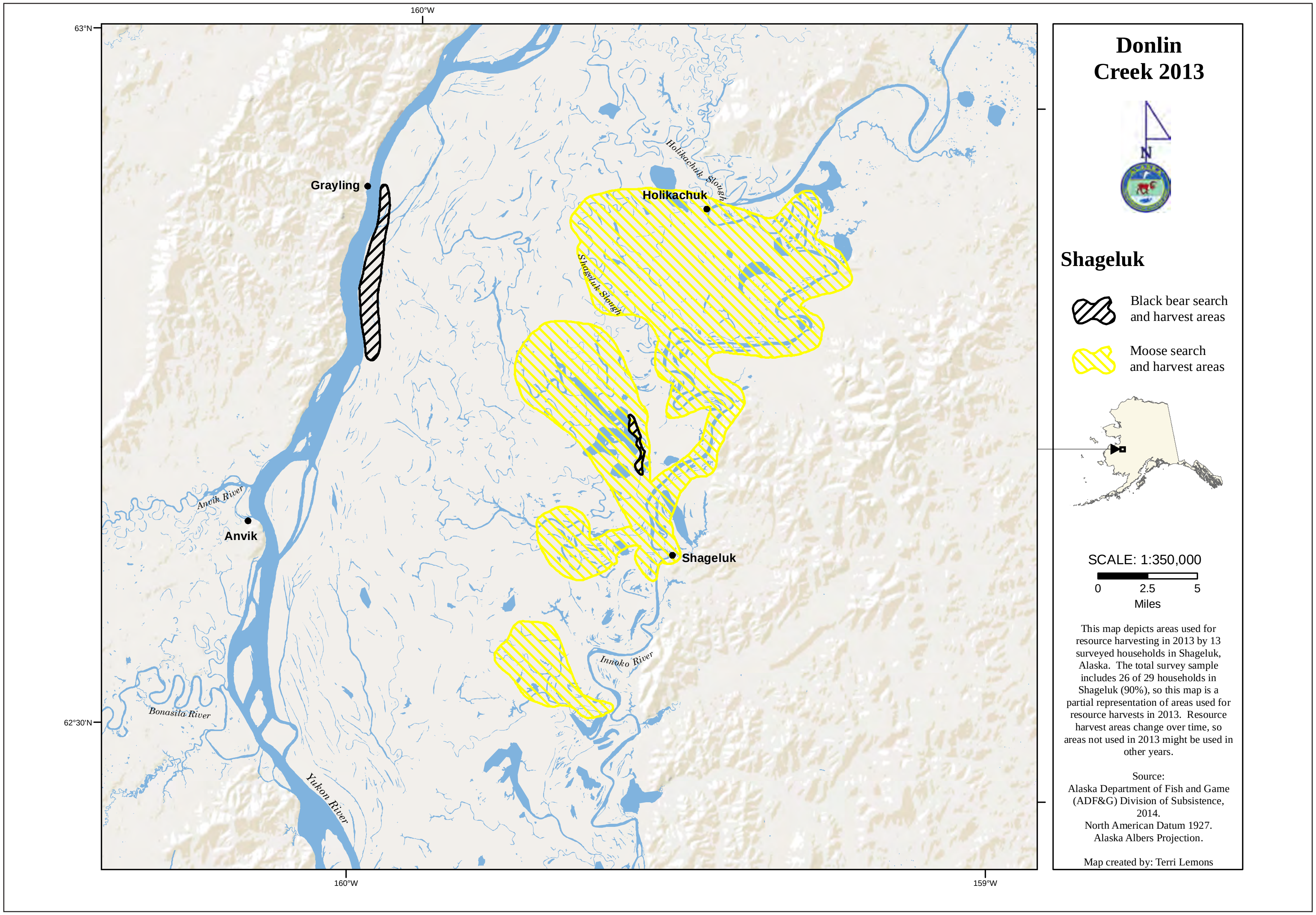


Figure 8-19.–Hunting and harvest areas, caribou and moose, Shageluk, 2013.

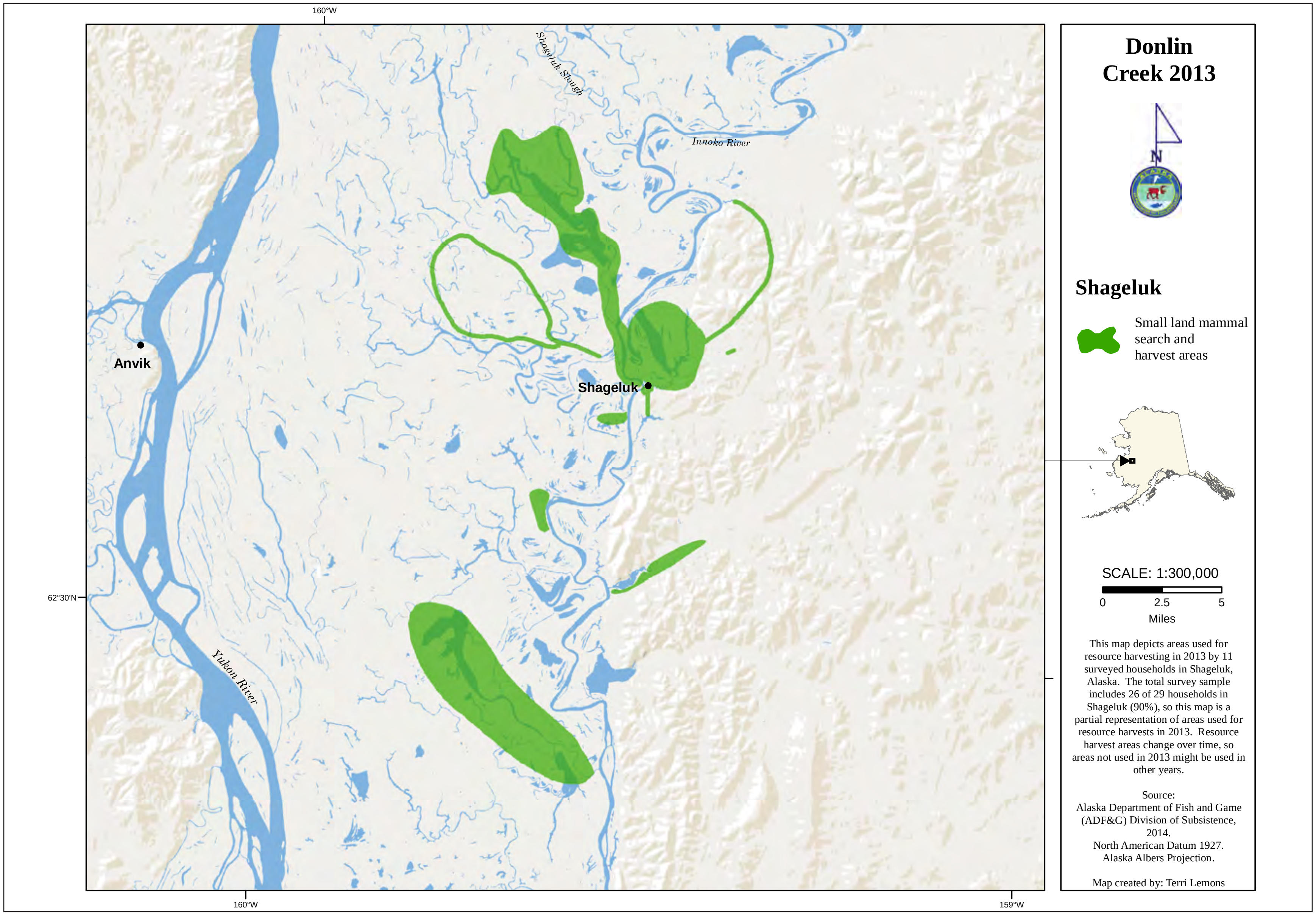


Figure 8-20.–Hunting and harvest locations, small land mammals, Shageluk, 2013.

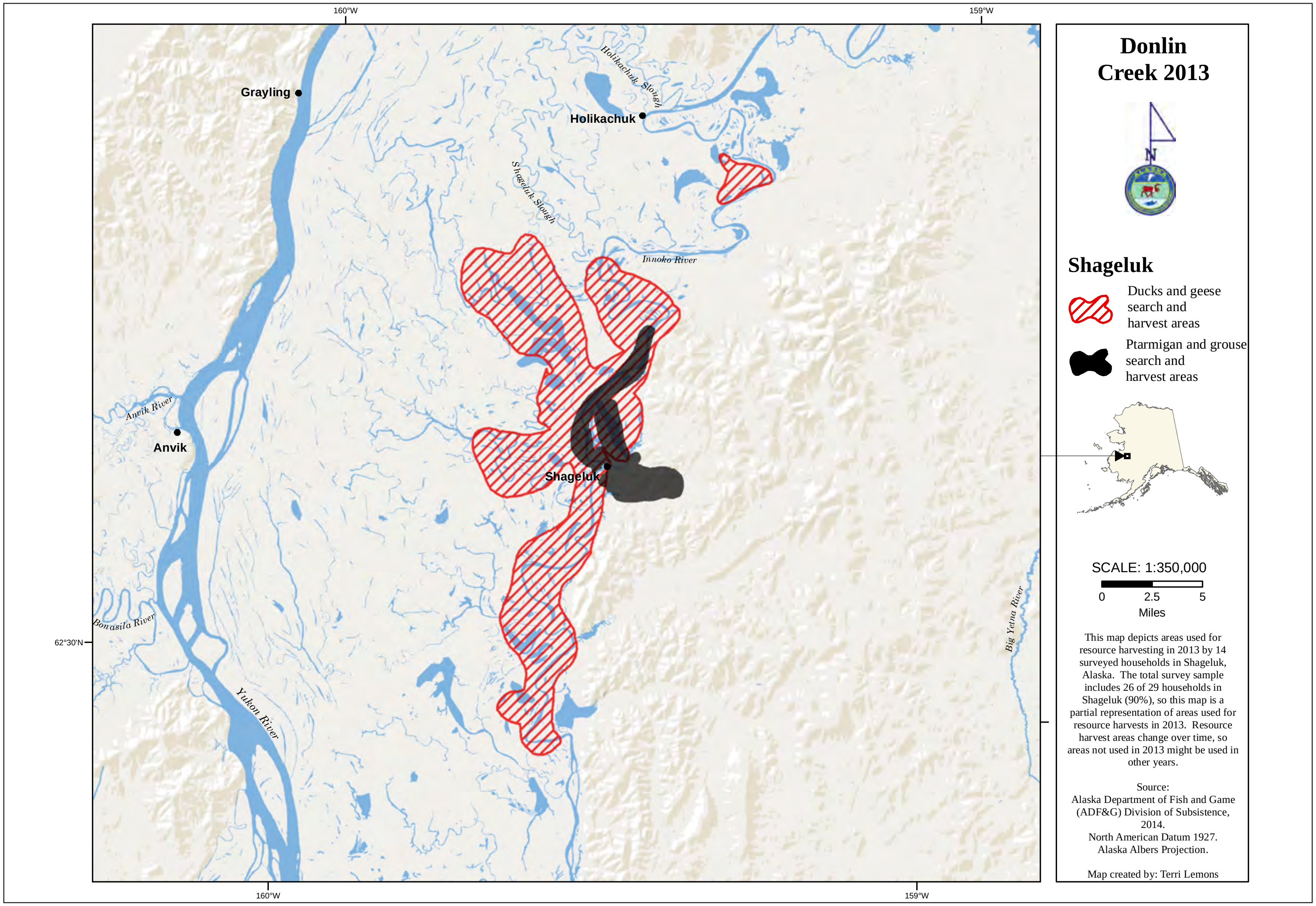


Figure 8-21.–Hunting and harvest areas, waterfowl and nonmigratory birds, Shageluk, 2013.

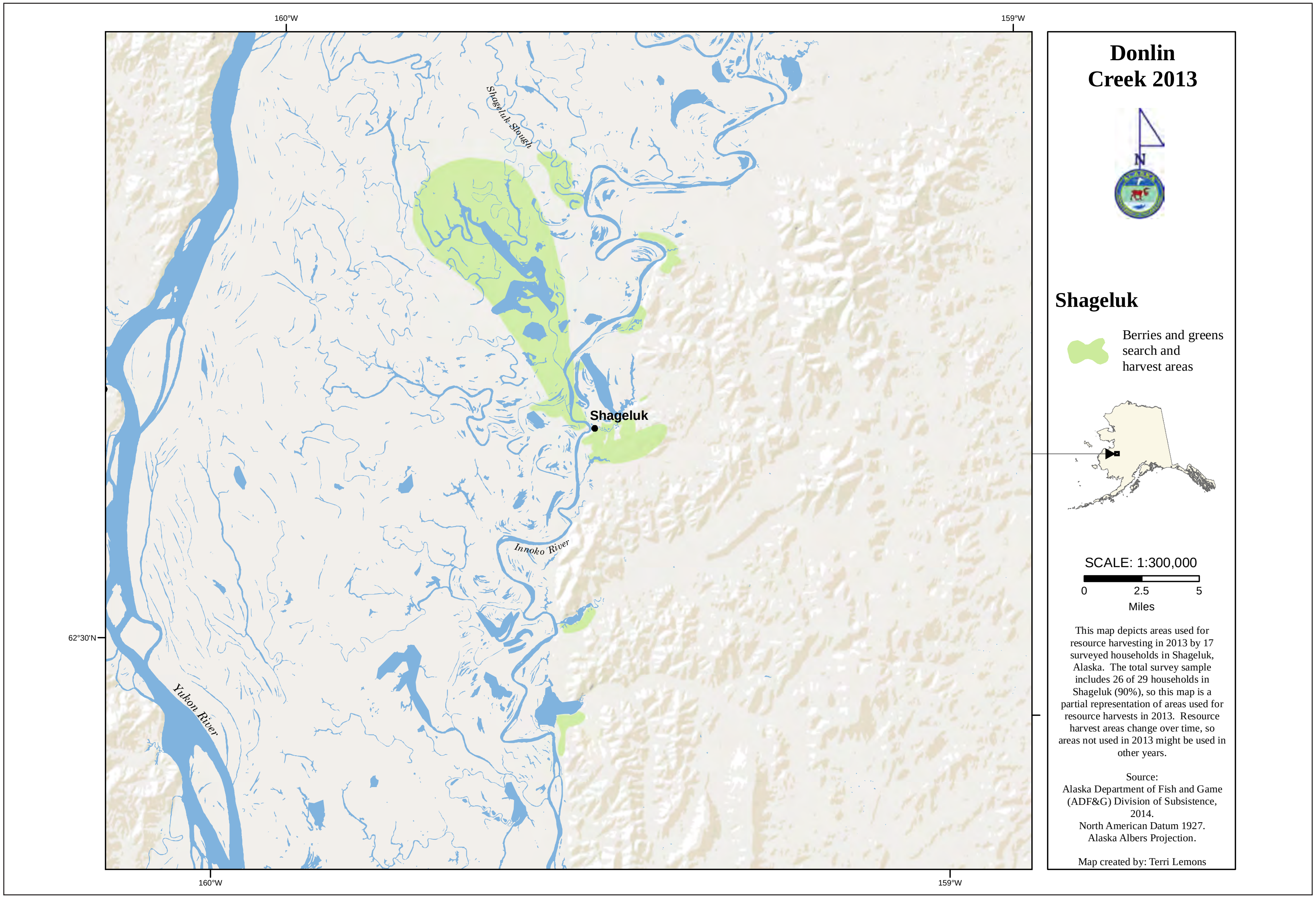


Figure 8-22.–Gathering and harvest areas, berries and greens, Shageluk, 2013.

of these households indicated that although Chinook salmon had previously formed a substantial portion of their annual consumption of subsistence foods, during the past decade their use of Chinook salmon had diminished to such negligible quantities they did not consider it a part of their household diet any longer (further discussion of this topic is provided below in the Harvest Data section).

Of the 11 households that did report using Chinook salmon in recent years, use of Chinook salmon was described as less in 2013 by 9 households (45% of households), the same in 2013 by 1 household, and more in 2013 by 1 household (Table 8-19). Of the 17 households that reported using species of salmon other than Chinook in recent years, use of these salmon species was less for 11 households (55% of households), the same in 2013 by 3 households and more in 2013 by 3 households.

Households that reported changes in use for Chinook or other salmon in 2013 were asked why their use was less or more. For Chinook salmon, 9 households provided explanations for less use in 2013 relative to recent years; explanations included reduced abundance or availability of Chinook salmon in 2013 (5 households, or 56% of households providing a reason) as well as regulations that restricted the opportunity to harvest Chinook salmon (5 households, 56%; Table 8-20).[35] The 1 household describing more use in 2013 attributed this to increased effort in 2013 relative to recent prior years (Table 8-21). For other species of salmon, reasons for less use in 2013 were more varied; 10 households provided explanations for less use, including reduced availability or abundance (4 households, or 40% of households providing a reason), regulations (3 households), lack of equipment (2 households), family or personal reasons (2 households), reduced effort in 2013 (1 household), smaller or diseased fish in 2013 (1 household), and other reasons not specified (1 household; Table 8-20). The 3 households describing more use of salmon species other than Chinook attributed this to increased effort in 2013 (2 households) and regulations, in particular regulations that limited mesh size to reduce harvest of Chinook salmon while providing for harvest of other salmon species (1 household; Table 8-21).

In addition to survey respondents' assessments of resource use in terms of less, same, or more, households provided assessments of whether they "got enough"[36] Chinook salmon and other salmon species in 2013. In Shageluk, 85% of respondents that provided an answer to this question (42% of all households) stated that their household did not get enough Chinook salmon in 2013, and 72% did not get enough of other salmon species (50% of all Shageluk households; Table 8-22; Figure 8-24). When asked to evaluate the impact to their household of not getting enough Chinook salmon in 2013, households described impacts as minor (3 households of those not getting enough Chinook salmon in 2013), major (5), or severe (2). Respondents reported the impacts of not getting enough salmon other than Chinook in 2013 as not noticeable (3 households), minor (1), major (6), or severe (3). Households were also asked what they did differently when they did not get enough of a specific resource; 7 households responded to this question for Chinook salmon (Table 8-23). Things these households reported doing differently included made do without (3 households), increased efforts to harvest other resources, (2 households), replaced with other subsistence foods (1), used more commercial foods (1), and "other," which represented an answer that was not able to be categorized into standard coded responses. An example of doing some "other" thing differently in 2013 included not sharing as much Chinook salmon with other households as in previous years. Things that households did differently as a result of not getting enough salmon other than Chinook salmon were similar to the responses for Chinook salmon, but more households reported using more commercial foods, and fewer reported making do without. Households that described not getting enough salmon were also asked of what type salmon they needed more; households indicated needing more Chinook salmon (10 households, or 59% of households that answered the question), chum salmon (3 households), coho salmon (3), or any species of salmon (2; Table 8-24).

35. Households were able to provide more than 1 reason for less use in 2013, and thus total percentages may exceed 100% for this and other resources.

36. Questions on the survey form (Appendix A) included the specific phrasing "did your household get enough of (X resource) in 2013?" Assessment of what "get enough" meant was open to interpretation by survey respondents. In Shageluk, when respondents requested further clarification on the meaning of "get enough," researchers provided the additional phrasing "did you get enough for your subsistence needs?"

Table 8-19.–Changes in household uses of resources compared to recent years, Shageluk, 2013.

			Households reporting use								Households not using	
	Sampled	Valid	Total households		Less		Same		More			
Resource category	households	responses[a]	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	26	25	25	96.2%	13	52.0%	9	36.0%	3	12.0%	0	0.0%
Chinook salmon	26	20	11	42.3%	9	45.0%	1	5.0%	1	5.0%	9	45.0%
Other salmon	26	20	17	65.4%	11	55.0%	3	15.0%	3	15.0%	3	15.0%
Nonsalmon fish	26	22	19	73.1%	13	59.1%	2	9.1%	4	18.2%	3	13.6%
Land mammals	26	21	21	80.8%	5	23.8%	12	57.1%	4	19.0%	0	0.0%
Marine mammals	26	26	2	7.7%	0	0.0%	1	3.8%	1	3.8%	24	92.3%
Birds and eggs	26	20	15	57.7%	5	25.0%	6	30.0%	4	20.0%	5	25.0%
Marine invertebrates	26	26	2	7.7%	2	7.7%	0	0.0%	0	0.0%	24	92.3%
Vegetation	26	19	17	65.4%	4	21.1%	6	31.6%	7	36.8%	2	10.5%

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

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

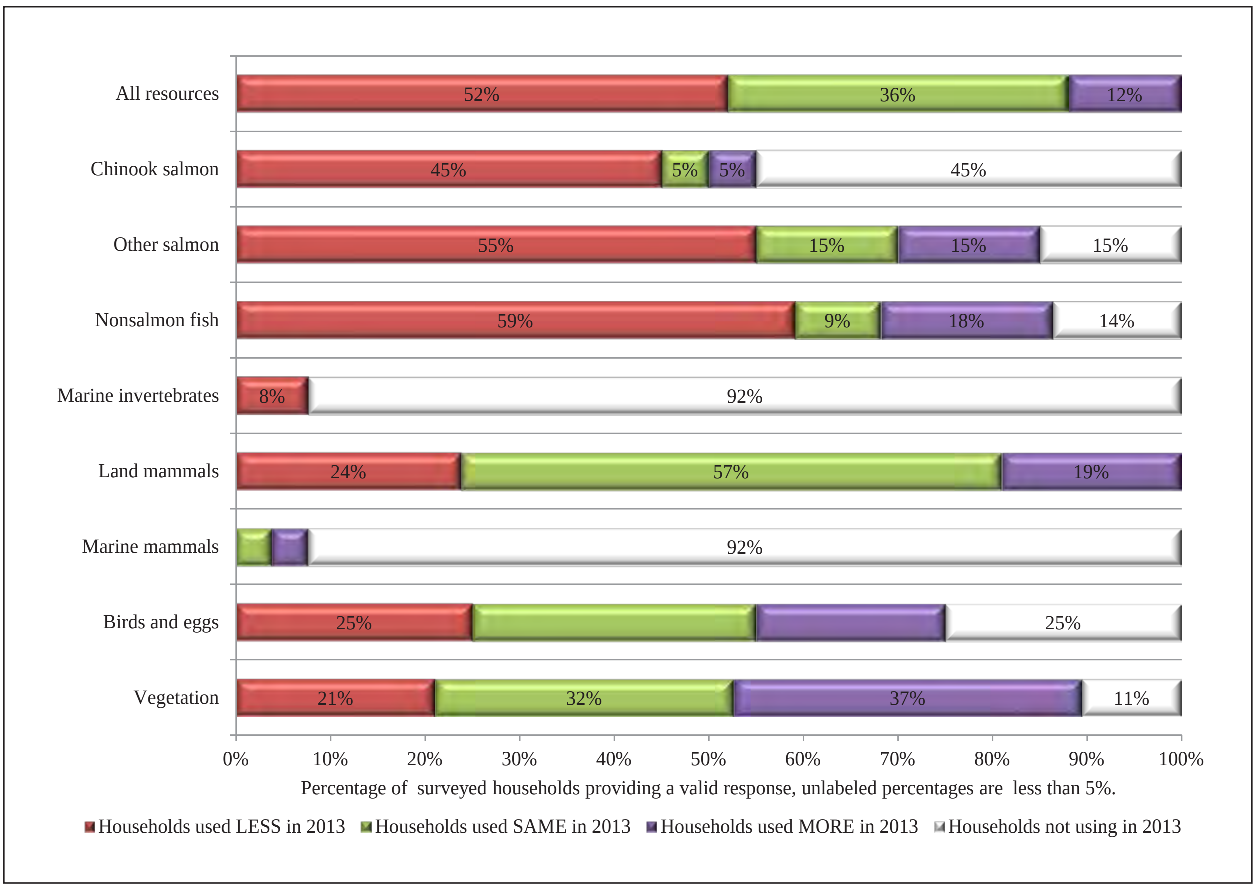


Figure 8-23.–Changes in household uses of resources compared to recent years, Shageluk, 2013.

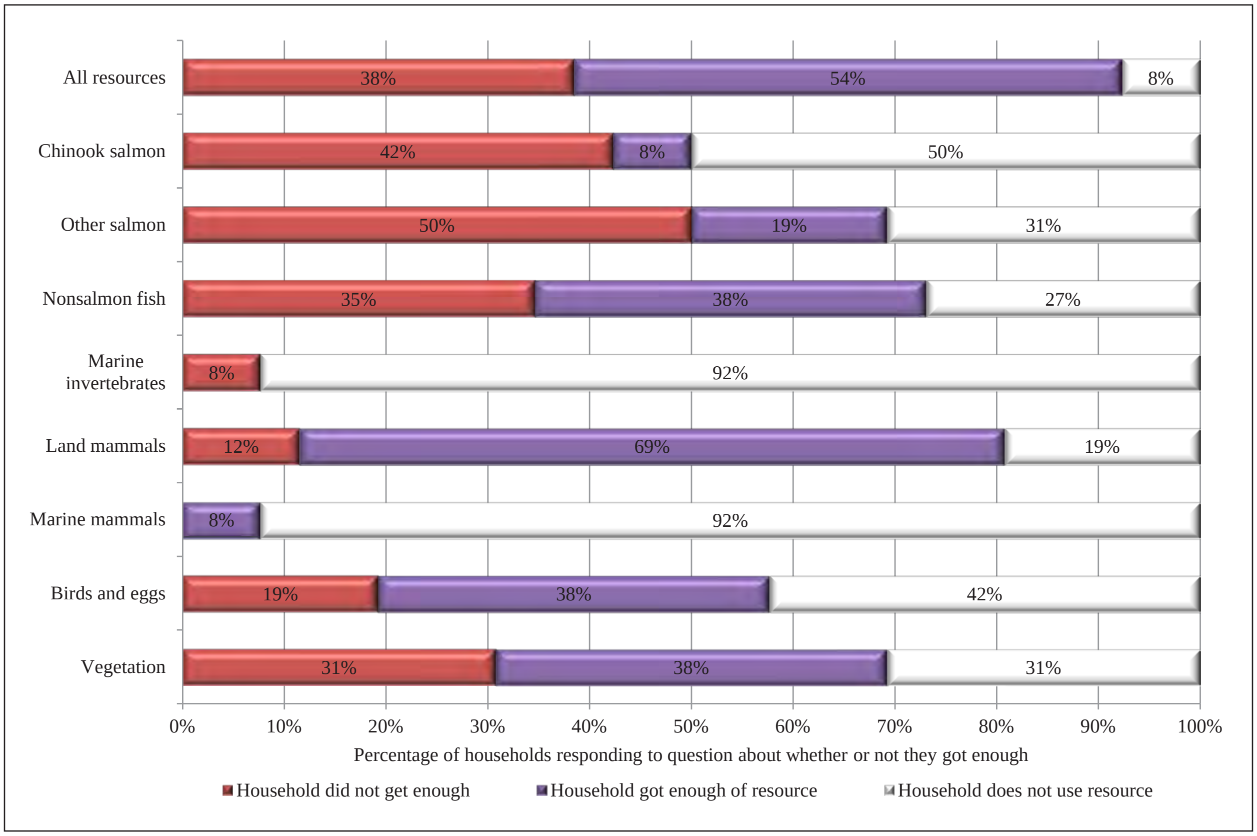


Figure 8-24.–Percentages of households reporting whether they got enough resources, Shageluk, 2013.

Twenty-two households answered questions assessing their use of nonsalmon fish in 2013 relative to the previous 5 years. Of these 22 households, 3 described not using nonsalmon fish in recent years, and these households did not provide an assessment of whether their use of nonsalmon fish was less, the same, or more in 2013 (Table 8-19). Of the 19 households that had used nonsalmon fish in recent years, use of these fish was reported as less in 2013 by 13 households (59% of households answering this question), the same by 2 households (9%), and more by 4 households (18%; Table 8-19; Figure 8-23).

Households that reported changes in use in 2013 were asked why their use was less or more. For all nonsalmon fish, 10 households provided explanations for less use in 2013 relative to recent years; explanations included weather or environment (3 households), reduced effort in 2013 (2), family or personal reasons (1), resource abundance or availability (1), lack of equipment (1), regulations (1), and other reasons that did not clearly fall into a particular category (2). The 4 households describing more use of nonsalmon fish in 2013 attributed this increased use to increased effort (2 households), favorable weather (1 household), increased need (1 household), and increased use of nonsalmon fish as a replacement for other unavailable resources (1 household).

Households also provided assessments of whether they got enough nonsalmon fish in 2013. Of the 19 households that responded to this question, 9 (47%) reported that they did not get enough nonsalmon fish in 2013 (Table 8-22). When asked to evaluate the impacts to their household of not getting enough nonsalmon fish in 2013, 1 household described impacts as not noticeable; others described impacts as minor (2 households) and major (6 households). Households were asked what they did differently when they did not get enough nonsalmon fish; 4 households reported using more commercial foods, 2 made do without, and 1 increased harvest efforts (Table 8-23). Households reported needing more whitefish of any species (4 households), sheefish (3), broad whitefish (2), northern pike (2), burbot (1), and any type of nonsalmon fish (1; Table 8-24).

Twenty-one households answered questions assessing their use of land mammals in 2013 relative to recent years (Table 8-19). All of these 21 households used land mammals in 2013, and each household assessed their use of land mammals as less (24%), the same (57%), or more (19%) than in recent years (Figure 8-23).

Households that reported changes in use in 2013 were asked why their use of land mammals was less or more. For all land mammals as a resource category, 4 households provided explanations for less use in 2013 relative to recent years: explanations included reduced effort in 2013 (1 household), having poor luck or generally being unsuccessful harvesting land mammals in 2013 (1), other reasons that did not correspond to coded categories (1), and competition with other hunters (1; Table 8-20). All 4 households that described more use of land mammals in 2013 provided explanations as to why their use was more. Explanations included receiving more land mammals from other households (2 households) and that they were generally more successful harvesting land mammals in 2013 (2; Table 8-21).

Households also provided assessments of whether they got enough land mammals in 2013. Of the 21 households that responded to this question, the majority (86%) reported getting enough land mammals in 2013 (Table 8-22). Three households (14%) described that they did not get enough land mammals in 2013. When asked to evaluate the impact to their households of not getting enough land mammals, 1 of these 3 households described the impact as not noticeable, 1 as severe, and 1 did not provide an impact assessment response. The 1 household that described doing something differently in 2013 related to not getting enough land mammals reported using more commercial foods (Table 8-23). When asked of which type of land mammals they needed more, 5 respondents in total said that their households needed more moose in 2013 (Table 8-24).

Twenty-six households answered questions assessing their use of marine mammals in 2013 relative to the previous recent years. Of these 26 households, 24 (92% of Shageluk households) reported not using marine mammals in recent years, and these households did not provide an assessment of whether their use was less, the same, or more in 2013 (Table 8-19; Figure 8-23). The 2 households that had used marine mammals in recent years described their use as the same in 2013 (1 household) and more in 2013 (1 household). The household that reported increased use in 2013 attributed this to receiving more marine mammal products in 2013 (Table 8-21). Both households reported that they got enough marine mammals in 2013, and no households said that they needed more marine mammals (Figure 8-24).

Twenty survey respondents provided a self-assessment of their household's 2013 use levels of birds and eggs in relation to use levels during recent years (Table 8-19). Out of these households, 5 respondents reported not using birds or eggs in recent years, and these households did not provide an assessment of whether their use of birds and eggs was less, the same, or more in 2013. Among the 15 households that used birds or eggs during recent years, 5 respondents described their household's use in 2013 as less than in recent years (33%), 6 respondents as the same (40%), and 5 respondents as more (33%).

Survey respondents that reported changes in use in 2013 were asked why their household's use was less or more. For all birds and eggs, 5 households provided explanations for less use in 2013 relative to recent prior years. Explanations included reduced effort in 2013 (2 households), lack of equipment (1), bad luck or general lack of success in harvesting birds in 2013 (1), weather or environmental conditions (1), other unspecified reasons (1), and lack of time due to employment or other time commitments (1; Table 8-20). Of the 5 households that described more use of birds and eggs in 2013, 4 provided explanations for why their use was more; explanations included increased effort (2 households), receiving more (1), and more success in general in harvesting birds in 2013 (1; Table 8-21).

Households also provided assessments of whether they got enough birds in 2013. Of the 15 households that responded to this question, 5 described that they did not get enough birds in 2013 (Table 8-22). When asked to evaluate the impacts to their household of not getting enough birds in 2013, households described impacts as not noticeable (2 households), minor (1), and major (1). Households were asked what they did differently when they did not get enough birds: of the 2 households responding to this question, 1 used more commercial foods and 1 reported getting a job (Table 8-23). Households that described not getting enough

Table 8-20.–Reasons for less household uses of resources compared to recent years, Shageluk, 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
All resources	25	12	4	33.3%	4	33%	0	0.0%	4	33%	0	0%	1	8%	0	0.0%	1	8.3%
Chinook salmon	20	9	0	0.0%	5	56%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Other salmon	20	10	2	20.0%	4	40%	0	0.0%	2	20%	0	0%	1	10%	0	0.0%	0	0.0%
Nonsalmon fish	22	10	1	10.0%	1	10%	0	0.0%	1	10%	0	0%	2	20%	0	0.0%	3	30.0%
Land mammals	21	4	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	1	25%	1	25.0%	0	0.0%
Marine mammals	26	0	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	0	0%	0	0.0%	0	0.0%
Birds and eggs	20	5	0	0.0%	0	0%	0	0.0%	1	20%	0	0%	2	40%	1	20.0%	1	20.0%
Marine invertebrates	26	2	0	0.0%	0	0%	0	0.0%	0	0%	1	50%	1	50%	0	0.0%	0	0.0%
Vegetation	19	4	0	0.0%	0	0%	0	0.0%	0	0%	0	0%	1	25%	0	0.0%	1	25.0%

-continued-

Table 8-20.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Working/ no time		Regulations		Small/ diseased animals		Did not get enough		Did not need		Did not give any away		Equipment/ fuel expense		Used other resources	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	25	12	0	0%	2	16.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Chinook salmon	20	9	1	11%	5	55.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	20	10	0	0%	3	30.0%	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	22	10	0	0%	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	21	4	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	26	0	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	20	5	1	20%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	26	2	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	19	4	1	25%	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.

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

Table 8-21.–Reasons for more household uses of resources compared to recent years, Shageluk, 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
All resources	25	3	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%	0	0.0%
Chinook salmon	20	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%
Other salmon	0	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	66.7%	0	0.0%
Nonsalmon fish	21	4	0	0.0%	0	0.0%	1	25.0%	0	0.0%	1	25.0%	2	50.0%	0	0.0%
Land mammals	26	4	0	0.0%	0	0.0%	0	0.0%	2	50.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	20	1	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	26	4	0	0.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%	2	50.0%	0	0.0%
Marine invertebrates	19	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	0	6	2	33.3%	0	0.0%	1	16.7%	0	0.0%	1	16.7%	3	50.0%	0	0.0%

-continued-

Table 8-21–Continued.

Resource category	Valid responses[a]	Households reporting reasons for more use	Other		Regulations		Traveled farther		More success		Needed less		Store-bought expense		Got/ fixed equipment		Substituted for unavailable resource	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	25	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%	0	0.0%	0	0.0%
Chinook salmon	20	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%
Other salmon	0	3	0	0.0%	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	21	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	25.0%
Land mammals	26	4	0	0.0%	0	0.0%	0	0.0%	2	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	20	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%
Birds and eggs	26	4	0	0.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	19	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	0	6	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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.

birds in 2013 were also asked of which type of birds they needed more: households described needing more geese of any species (4 households), ducks (1 household), grouses (1), and ptarmigans (1; Table 8-24).

Twenty-six households answered questions assessing their use of marine invertebrates in 2013 relative to the previous 5 years (Table 8-19). Of these 26 households, 24 reported not using marine invertebrates in recent years, and these households did not provide an assessment of whether their use was less, the same, or more in 2013. One of the 2 households that described using marine invertebrates in recent years indicated that their use was less in 2013; according to this household, reduced use resulted from less sharing and lack of effort. Both households reported that they did not get enough marine invertebrates in 2013, and that the impact of not getting enough was minor. The 1 household that described doing something differently as a result used more commercial foods (Table 8-23). Marine invertebrates of which these 2 households reported needing more included unspecified clams and freshwater clams.

Twenty survey respondents provided a self-assessment of their household's 2013 use levels of vegetation in relation to use levels during recent prior years. For 3 of these 20 households, respondents described not using vegetation in recent years, and these households did not provide an assessment of whether their use of vegetation was less, the same, or more in 2013 (Table 8-19). Among the 17 households that used vegetation during recent years, 4 respondents evaluated their household's use in 2013 as less than in recent years (24%), 6 respondents as the same (35%), and 7 respondents as more (41%).

For all vegetation, including berries and other plants, 4 households provided explanations for less use in 2013 relative to recent years; explanations included reduced effort in 2013 (1 household), weather or environmental conditions (1), lack of time due to employment or other time commitments (1) and other reasons (1; Table 8-20). Of the 7 households that described more use of vegetation in 2013, 6 provided explanations for why their use was more; explanations included increased effort (50%), increased abundance or availability (33% of households providing a reason), favorable weather (17%), and more need for vegetation in 2013 (17%; Table 8-21).

Households also provided assessments of whether they got enough vegetation in 2013. Of the 18 households that responded to this question, 8 (44%) indicated that they did not get enough vegetation in 2013 (Table 8-22). When asked to evaluate the impacts to their households of not getting enough vegetation in 2013, households described impacts as not noticeable (1 household), minor (6), and severe (1). Households were asked what they did differently when they did not get enough vegetation; 6 households responded to this question, of which 4 used more commercial foods and 2 made do without (Table 8-23). Households that reported not getting enough vegetation in 2013 were also asked of what type of vegetation they needed more; households described needing more blueberries (6 households), cloudberries (2), lowbush cranberries (1), highbush cranberries (1) and raspberries (1; Table 8-24).

Upon completion of those portions of the harvest survey specific to individual resource categories, the survey prompted respondents to provide a self-assessment of their household's 2013 use levels of all subsistence resources considered as a whole in relation to use levels during recent years. Twenty-five of 26 survey respondents assessed how their overall levels of subsistence use in 2013 differed from other recent years for their households (Table 8-19). All 25 of these households had used subsistence resources in recent years, and respondents reported that their overall subsistence use was either less in 2013 than in recent prior years (52% of households that answered questions), the same in 2013 (36%), or more in 2013 (12%; Table 8-19; Figure 8-23).

Respondents that reported changes in overall subsistence use in 2013 were asked why their household's use was less or more. Although most households' reasons for differing levels of subsistence use in 2013 had been mentioned previously (in reference to individual resource categories), asking about factors that affected overall subsistence use highlights which of these factors had the largest influence on subsistence as a whole in their households in 2013. For those households that described less subsistence use overall in 2013, reasons for less use included family or personal reasons (4 households), reduced resource availability (4), lack of equipment for participating in subsistence activities (4), regulations that respondents described as affecting subsistence harvest (2), reduced effort in 2013 (1), and weather or environmental conditions in

Table 8-22.–Reported impact to households that did not get enough of a resource, Shageluk, 2013.

		Households not getting enough _____ .				Impact to those not getting enough ______ .										
	Sample	Valid responses[a]		Did not get enough		No response		Not noticeable		Minor		Major		Severe		
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	
All resources	26	24	92.3%	10	41.7%	1	10.0%	1	10.0%	3	30.0%	3	30.0%	2	20.0%	
Chinook salmon	26	13	50.0%	11	84.6%	1	9.1%	0	0.0%	3	27.3%	5	45.5%	2	18.2%	
Other salmon	26	18	69.2%	13	72.2%	0	0.0%	3	23.1%	1	7.7%	6	46.2%	3	23.1%	
Nonsalmon fish	26	19	73.1%	9	47.4%	0	0.0%	1	11.1%	2	22.2%	6	66.7%	0	0.0%	
Marine invertebrates	26	2	7.7%	2	100.0%	0	0.0%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	
Land mammals	26	21	80.8%	3	14.3%	1	33.3%	1	33.3%	0	0.0%	0	0.0%	1	33.3%	
Marine mammals	26	2	7.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	
Birds and eggs	26	15	57.7%	5	33.3%	0	0.0%	2	40.0%	1	20.0%	1	20.0%	1	20.0%	
Vegetation	26	18	69.2%	8	44.4%	0	0.0%	1	12.5%	6	75.0%	0	0.0%	1	12.5%	

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.

Table 8-23.–Things households reported doing differently as the result of not getting enough of a resource, Shageluk, 2013.

Resource category	Valid responses[a]	Bought/bartered		Used more commercial foods		Replaced with other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	7	0	0.0%	3	42.9%	0	0.0%	0	0.0%	3	42.9%
Chinook salmon	7	0	0.0%	1	14.3%	1	14.3%	0	0.0%	3	42.9%
Other salmon	7	0	0.0%	3	42.9%	1	14.3%	0	0.0%	1	14.3%
Nonsalmon fish	7	0	0.0%	4	57.1%	0	0.0%	0	0.0%	2	28.6%
Marine invertebrates	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	2	0	0.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	6	0	0.0%	4	66.7%	0	0.0%	0	0.0%	2	33.3%

-continued-

Table 8-23.–Continued.

Resource category	Valid responses[a]	Increased effort to harvest		Got a job		Obtained food from other sources		Got public assistance		Conserved resource		Other	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	7	1	14.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	28.6%
Chinook salmon	7	2	28.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	28.6%
Other salmon	7	2	28.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	7	1	14.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Land mammals	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	2	0	0.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	6	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. Includes households failing to respond to the question and those households that never used the resource.

Table 8-24.–Resources of which households reported needing more, Shageluk, 2013.

Resource	Households needing	Percentage of households[a]
All resources	1	5.9%
Fish	7	41.2%
Salmon	2	11.8%
Chum salmon	3	17.6%
Coho salmon	3	17.6%
Chinook salmon	10	58.8%
Nonsalmon fish	1	5.9%
Burbot	1	5.9%
Northern pike	2	11.8%
Sheefish	3	17.6%
Whitefishes	4	23.5%
Broad whitefish	2	11.8%
Moose	5	29.4%
Beaver	1	5.9%
Ducks	1	5.9%
Geese	4	23.5%
Grouse	1	5.9%
Ptarmigan	1	5.9%
Clams	1	5.9%
Freshwater clams	1	5.9%
Berries	1	5.9%
Blueberry	6	35.3%
Lowbush cranberry	1	5.9%
Highbush cranberry	1	5.9%
Raspberry	1	5.9%
Cloudberry	2	11.8%
Unknown	8	47.1%

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

a. Calculated using only households responding to needing at least one resource (n=17).

2013 (1; Table 8-20). Three households (12% of households that answered overall assessment questions) reported that their household used more subsistence resources overall in 2013. Reasons for more use included increased availability of resources (1 household), increased effort in 2013 (1), and the high costs of store-bought foods (1; Table 8-21).

Households also provided assessments of whether they got enough of all subsistence resources in 2013. Of the 24 households that responded to this question, 10 (42%) indicated that they did not get enough of all subsistence resources in 2013 (Table 8-22). When asked to evaluate the impacts to their household of not getting enough of all resources in 2013, households described impacts as not noticeable (1 household), minor (3), major (3), and severe (2). For the 7 households that described doing something differently in 2013 as a result of not getting enough of all resources, 3 used more commercial foods, 3 made do without, 1 increased harvest efforts, and 2 described unique “other” responses. Households that reported not getting enough of all resources in 2013 were asked a final time which resources in particular they needed more in 2013; the most frequently reported resources of which households needed more included Chinook salmon (10 households), fish in general (7), blueberry (6), moose (5), geese (4), and whitefishes (4; Table 8-24).

Harvest Data

Changes in the harvest of resources by Shageluk residents can also be discerned through comparisons with findings from other study years: the following section presents subsistence harvest estimate data from this study (2013) in the context of historical data. Historical harvest estimates for Shageluk come from several sources. The ADF&G Division of Commercial Fisheries has reported annual estimates of subsistence salmon harvests for Shageluk in a standardized format since 1990. Wheeler (1992; 1998) provided harvest estimates for subsistence resources in Shageluk based on results from a subsistence harvest survey for the study year 1990. Information reported by ADF&G Division of Subsistence includes harvest estimates for large land mammals harvested by Shageluk residents in 2002–2005 (Brown and Koster 2005, 2015; Brown et al. 2004) and for nonsalmon fish species in Shageluk in 2002 (Brown et al. 2005).

Salmon

Annual harvests of Chinook, summer and fall chum, and coho salmon for Shageluk households between 1990 and 2012 (Figure 8-25) were recorded during ADF&G Division of Commercial Fisheries postseason subsistence salmon harvest surveys. In spite of considerable variation from year to year, the 2013 salmon harvest estimates (this study) appear to reflect a decline in total harvests for summer chum salmon relative to harvests in the 1990s and for Chinook salmon relative to harvests in the 2000s. Such declines are likely related to several interconnected economic, demographic, and environmental factors.

Harvests of summer chum salmon were generally higher during the 1990s than in later years leading up to 2013. The average annual harvest for years 1990 to 1999 was 5,913 individual summer chum salmon; for the years 2000 to 2012, the average annual harvest was 1,916 individual summer chum salmon. Such declines in summer chum salmon harvests were likely related to changes in the use of salmon as dog food. During the 1990s, Shageluk residents reported feeding large numbers of summer chum salmon to dogs, yet this practice apparently declined sharply during the late 1990s, from 8,946 individual summer chum salmon in 1997 to 349 by 2000 (Borba and Hamner 1998:40, 2001:45). It is possible that reductions in salmon used for dog food were influenced by the loss of a readily available supply of chum salmon carcasses derived from Yukon River commercial roe fisheries, which collapsed after 1997.

Although it is unclear to what level Shageluk residents participated in commercial chum salmon roe fisheries,[37] for other subsistence communities subsistence harvests of chum salmon from the early 1980s through 1997 were largely "driven by the commercial roe fisheries in the middle Yukon River area" (Buklis 1999:43; Lingnau and Bue 2001:5). A byproduct of the commercial chum salmon roe fisheries was large numbers of "stripped" chum salmon carcasses from which eggs had been removed for sale. Stripped carcasses were available for subsistence uses, including use for dog food (see Borba and Hamner 2000:6–7), and it is likely that Shageluk residents had access to such carcasses even if they did not participate directly in the commercial roe fishery. For example, in 1997, Shageluk reported feeding 8,946 summer chum salmon to dogs, of which 1,163 were derived from commercial (roe) harvests (Borba and Hamner 1998:40). Shageluk residents harvested substantial quantities of chum salmon on the Innoko River throughout this time period, but it is possible that with a loss of a major source of chum salmon carcasses derived from commercial roe fisheries, larger portions of the Innoko River harvest were needed for human consumption rather than dog food. In 2013, out of a total estimated harvest of 622 chum salmon, only 89 were used for dog food (tables 8-7 and 8-12), less than 1% of the estimated use for dog food in 1997.

Harvests of Chinook salmon in recent years have been affected primarily by low run strength and associated conservation measures taken throughout the Yukon River drainage that dramatically restricted Chinook salmon fishing opportunities. Although Chinook salmon are available in limited numbers within the Innoko

37. It appears that no limited entry commercial permits for this fishery were allocated to Shageluk residents in the mid-1990s (Holder and Senecal-Albrecht 1998:47, 50). However, during this time potential violations dealing with the sale of subsistence-caught salmon and salmon roe were described as "difficult to prosecute since the line defining 'limited amounts of cash,' as allowed by the subsistence regulations, is not an exact dollar amount and is subject to interpretation" (Holder and Senecal-Albrecht 1998:77).

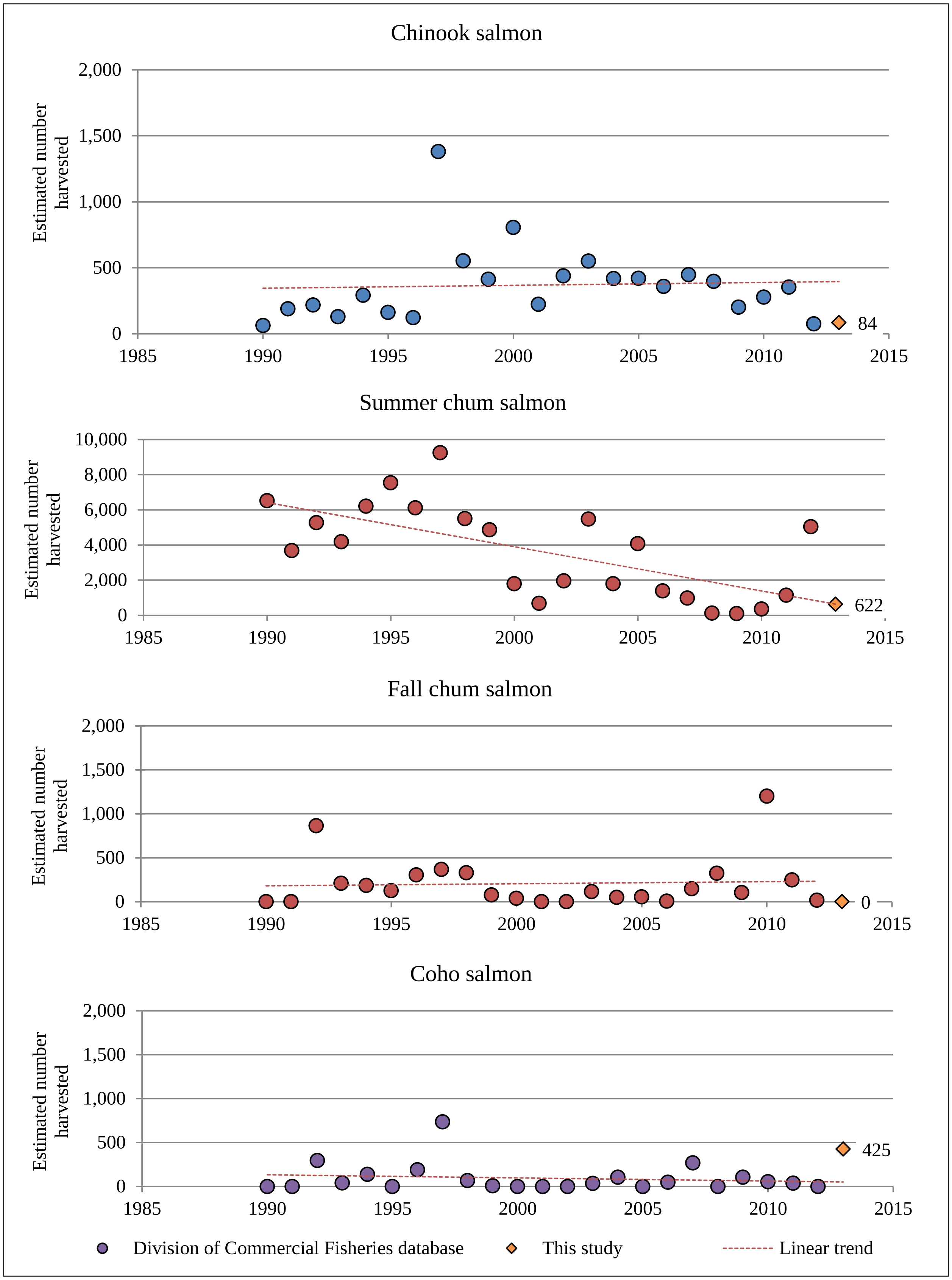


Figure 8-25.–Estimated numbers of Chinook, chum, and coho salmon harvested, 1990–2013.

River drainage, historically Chinook salmon were harvested from the mainstem Yukon River for human use coinciding with harvests of summer chum salmon that were used, sold or traded for dogfood (022114SH6, see also Community Background). During the 1990s and 2000s, some Shageluk residents traveled to the Yukon River primarily to harvest Chinook salmon for household subsistence use, and harvests between 2000 and 2011 were relatively stable (Figure 8-25). However, in 2012 and in 2013, these opportunities were affected by periodic closures along the Yukon River that at times reduced subsistence salmon fishing periods to 1 day a week (Estensen et al. 2015:65). High gas prices and limited alternatives to nonlocal summer employment during salmon fishing season for particular households[38] also limited the ability of individual households to travel to the Yukon River for Chinook salmon fishing. As a result, virtually all Chinook salmon during the study year were harvested from the Innoko River near Shageluk (Figure 8-17). Residents indicated that low Chinook salmon run sizes throughout the Yukon River drainage have also been noticed on the Innoko River. In sum, harvests of 75 individual Chinook salmon in 2012 and 84 Chinook salmon in 2013, were considerably lower than average annual harvests of 407 Chinook salmon for years 2000 through 2011 (Figure 8-25).

Relative to Chinook and summer chum salmon, coho salmon contributed relatively small amounts to total annual salmon harvests between1990–2012 and in 2013. In spite of this, it is notable that the estimated coho salmon harvest in 2013 was higher than all but 1 of the previous 22 years (Figure 8-25). This relatively high coho salmon harvest in 2013 likely resulted from conservative Chinook salmon management actions during the early summer of 2013 (Estensen et al. 2015:65). In the past, residents traveled to the Yukon River to harvest Chinook salmon in June and July. However, subsistence closures during June and July of 2013 to protect Chinook salmon likely resulted in some families choosing to postpone fishing in the Yukon River mainstem until fishing opportunities for coho salmon were opened, and therefore possibly increasing coho salmon harvests.

In addition to changes in harvest timing, species identification could introduce additional challenges. Shageluk residents maintain complex local salmon taxonomies that are often not congruous with taxonomies underlying harvest surveys.[39] During field research in Shageluk in 2014, all species of salmon with reported harvest in Shageluk had multiple local names based on a variety of factors. Such names were not necessarily used consistently throughout the community, particularly in cases where individuals had lived and fished for salmon in other communities outside of Shageluk. One experienced fisher pointed out the shortcomings of salmon names on surveys and accompanying identification guides:

> Sometimes [it's] just different, compared to what your thing [salmon identification guide] is saying. Your thing is differ—, it's totally different for us. You got this color over here should be that color…You got to see it. Go out and [see the fish]. (022214SH1)

Despite species identification concerns, it is still likely that the harvest of coho salmon in 2013 was higher than in recent prior years.

38. In 2013, at least 5 households reported employment during June and July outside of Shageluk, including firefighting and construction.

39. "Yukon" versus "Innoko" was widely used to describe salmon: for example, households differentiated between "Yukon kings" and "Innoko kings" in several ways in addition to harvest location. All types of salmon with reported harvest in Shageluk had multiple local names. Local names for Chinook salmon (in addition to "Yukon/Innoko kings") included "king salmon" (generic Chinook salmon, usually silver colored); "*gath*" (Deg Xinag generic Chinook salmon); "red fish" (prespawning coloration Innoko River Chinook salmon); "red salmon" (any Innoko or Yukon River Chinook or coho salmon with prespawning colors); and "blueback" (large Chinook salmon in the Yukon River described as having a blue coloration). Chum salmon would often be distinguished in terms of Innoko/Yukon, as well as being described as chums, silvers (if silver colored), dogs, or dogfish. "Fall" versus "summer" chum salmon was not a widely recognized taxonomic breakdown for chum salmon.

Nonsalmon Fish

For fish other than salmon, harvest estimates that are comparable to the 2013 data are included in Wheeler et al. (1992; 1998) and Brown et al. (2005). Harvest information for fish other than salmon is also available from ADF&G Division of Commercial Fisheries subsistence salmon harvest surveys. Although this latter source of data demonstrates the continuing importance of nonsalmon fish in Shageluk over the past 2 decades, methodological differences in survey format, timing, and sampling strategies preclude a direct comparison to the 2013 results in this study (see Brown et al. 2005:154). Comparisons between nonsalmon fish harvest levels in 1990, 2002, and results from this study show similar per capita harvest levels for nonsalmon fish as a resource category, ranging from 118 lb per capita in 2013 to 160 lb per capita in 2002 (Table 8-7; Brown et al. 2005:139; Wheeler 1998:150). Although harvests of individual species varied between all 3 years, the per capita harvest of whitefishes in 2013 (55 lb per capita) was noticeably less than either of the previous study years (74 lb per capita in 1990; 87 lb per capita in 2002). Indeed, more households reported "less use" for nonsalmon fish in 2013 than for any other resource category (Figure 8-23), and multiple residents commented that this was primarily related to the community's inability in the study year to install a fish fence for harvesting whitefishes due to delayed Innoko River ice formation, as described in the Seasonal Round section. Although ice formation typically allows fish fence installation in October, one respondent described that conditions were very different in 2013:

> The river actually didn't freeze until maybe December…People were actually setting nets along the banks this year. [laughs] That was kind of weird. Yeah, like people setting nets [in open water] across there, when they should have had a fish fence [under ice]. (021814SH2)

Moose

Although other large land mammal species, including caribou, have historically formed substantial portions of the subsistence harvest in Shageluk, in the past several decades moose has overwhelmingly dominated all nonfish harvests in terms of edible weight contributions from a single species. The estimated harvest of 11 moose in 2013 was clearly less than estimated harvests in 1990 (20 moose), 2002–2003 (31 moose), 2003–2004 (28 moose), and 2004–2005 (16 moose; Table 8-7; Brown and Koster 2005, 2015; Wheeler et al. 1992). Moose per capita harvests also reflect a smaller harvest in 2013 than in previous years. In spite of this seemingly major reduction, only a minority of households (24%) reported using less large land mammals in 2013, and only 12% of households reported that they did not get enough large land mammals in 2013 (figures 8-23 and 8-24). This apparent discrepancy may be partly explained through several types of sharing that brought moose into the community. For example, although the population of Shageluk residents has declined substantially over the past decade, the subsistence community of Shageluk has not experienced as complete of a decline: former Shageluk residents who have moved away may return to the Shageluk area during hunting season, contributing locally-harvested moose to family members still living in Shageluk. Alternatively, residents who have moved to and hunt in other areas of Alaska may send food such as moose to family members in Shageluk, particularly if those family members are unable to hunt in a given year. Additionally, multiple Shageluk households reported receiving moose from guided hunting clients, often referred to locally as "commercial hunters," who donated portions of meat in the community following hunting excursions on the Innoko River. Such external sources of moose acted in concert with inter-household sharing networks and events (e.g. potlatches) within Shageluk during the study year. As a result, every surveyed household in Shageluk reported using moose in 2013, and 81% of households reported receiving moose (Table 8-7).

Other Resources

For resources other than salmon, nonsalmon fish, and moose, harvest levels in 2013 were in general similar to those documented in prior years. Numbers of black bears harvested were low in all years, ranging from 0 bears in 1990 to 2 bears in 2013 (Table 8-7, Wheeler et al. 1992). Furbearer harvest estimates were similar in 1990 and 2013, the only 2 years with available furbearer harvest data by species. Major furbearer species harvested included beaver (31 in 1990, 42 in 2013) and marten (98 in 1990, 90 in 2013). Furbearer harvests during both years likely reflect a substantial decline from historical harvests (see Community Background section). Per capita harvests of birds were similar between 1990 and 2013, with 9 lb per capita in 1990 and 13 lb per capita in 2013. Vegetation harvests were also similar between years (3 lb per capita in 1990, 7 lb per capita in 2013).

Income and Cash Employment

Survey respondents were asked about both earned income (jobs held and wages earned by all household members aged 16 years and older) and income from other sources. Table 8-25 shows all reported sources of income by employment occupation and other income sources in 2013. The estimated total of earned and other income was $1,045,019 for all Shageluk households in 2013. Employment earnings accounted for $722,821 of this total. In addition, Shageluk households received $322,198 of income from sources other than employment. The average total income per household for 2013 was $36,035. This included an average earned income of $24,376 per household (69% of the average total household income) and an average unearned income of $11,110 (31% of the average total household income).

In 2013 Shageluk residents held an estimated 58 jobs (Table 8-27). These jobs were distributed among 44 individuals in 24 households. The principal income source for Shageluk in 2013 was employment from local government occupations (37% of all income for the community). Community income from local government jobs totaled an estimated $380,952; 30 people were employed in these jobs in 2013. An estimated 86% of households included at least 1 individual who was employed in local government, and 68% of all employed individuals who were employed in 2013 held a job in local government. Common local government employers in Shageluk included the Innoko River School, City of Shageluk, Shageluk Native Village, and Zho-Tse, Incorporated. Transportation, communication, and utilities jobs resulted in $233,068 of wages; an estimated 4 individuals held jobs in this field. These wages accounted for 22% of Shageluk's

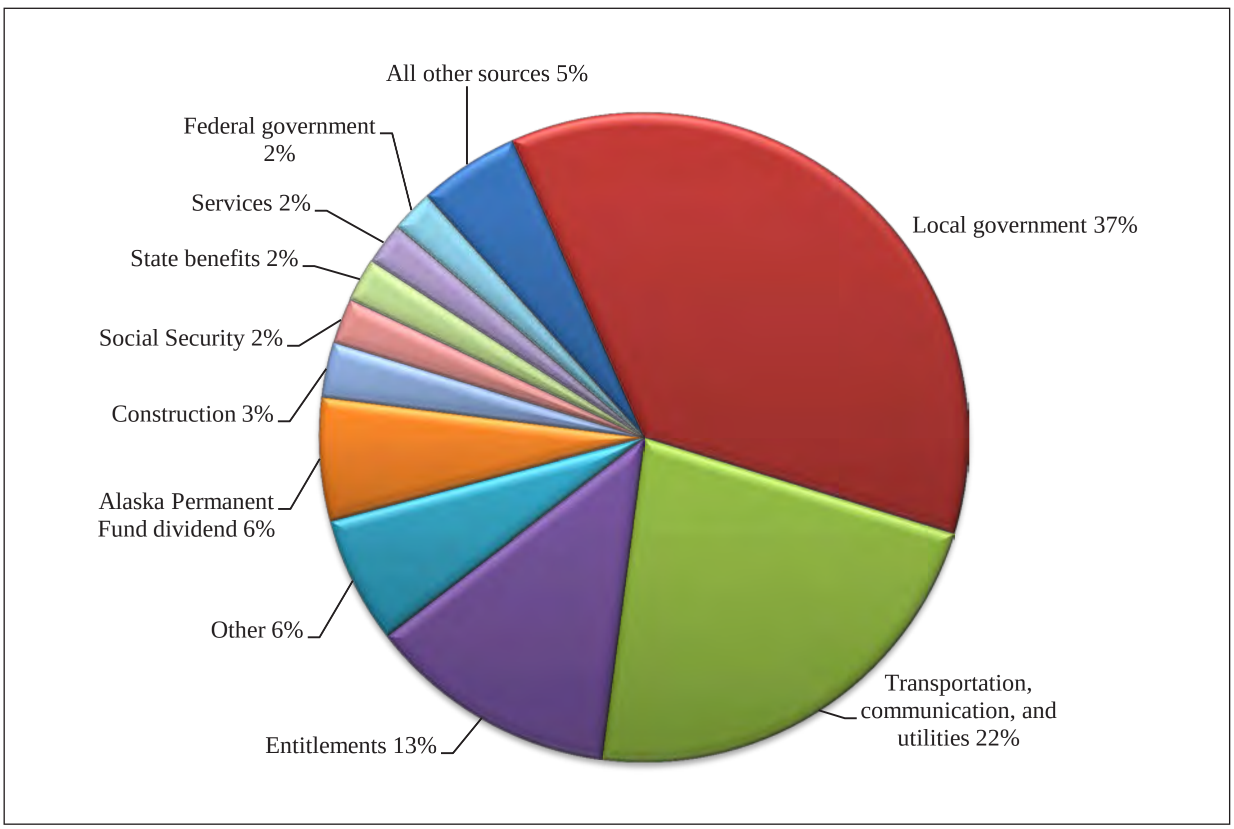


Figure 8-26.–Top income sources, Shageluk, 2013.

Table 8-25.–Estimated earned and other income, Shageluk, 2013.

Income source	Number of people	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Local government	30.2	20.9	$380,952	$203,807 – $622,611	$13,136	36.5%
Transportation, communication, and utilities	3.5	3.5	$233,068	$15,515 – $583,386	$8,037	22.3%
Construction	3.5	3.5	$28,604	$4,246 – $67,225	$986	2.7%
Services	3.5	3.5	$21,930	$3,710 – $50,957	$756	2.1%
Federal government	-	-	-	- - -	-	-
State government	4.6	4.6	$20,658	$5,164 – $46,363	$712	2.0%
Retail trade	-	-	-	- - -	- -	-
Other employment	-	-	-	- - -	- -	-
Manufacturing	-	-	-	- - -	- -	-
Agriculture, forestry, and fishing	-	-	-	- - -	- -	-
Earned income subtotal	**44.1**	**24.4**	**$722,821**	**$353,531 – $1,237,372**	**$24,925**	**69.2%**
Other income						
Food stamps		19.0	$107,865	$66,944 – $155,250	$3,719	10.3%
Alaska Permanent Fund dividend		27.9	$64,246	$48,185 – $80,308	$2,215	6.1%
Native corporation dividend		27.9	$62,495	$42,017 – $92,428	$2,155	6.0%
Social Security		-	- -	- - - -	- -	-
Heating assistance		15.6	$20,945	$12,883 – $29,338	$722	2.0%
Disability		-	- -	- - - -	- -	-
Adult public assistance (OAA, APD)		-	- -	- - - -	- -	-
Supplemental Security Income		-	- -	- - - -	- -	-
Longevity bonus		-	- -	- - - -	- -	-
Other		-	- -	- - - -	- -	-
Unemployment		-	- -	- - - -	- -	-
Meeting honoraria		-	- -	- - - -	- -	-
Child support		-	- -	- - - -	- -	-
CITGO fuel voucher		-	- -	- - - -	- -	-
TANF (Temporary Assistance for Needy Families)		0.0	$0	$0 – $0	$0	0.0%
Pension / retirement		0.0	$0	$0 – $0	$0	0.0%
Workmans comp / insurance		0.0	$0	$0 – $0	$0	0.0%
Veteran disability		0.0	$0	$0 – $0	$0	0.0%
Foster care		0.0	$0	$0 – $0	$0	0.0%
Other income subtotal		**27.9**	**$322,198**	**$248,062 – $394,536**	**$11,110**	**30.8%**
Community income total			**$1,045,019**	**$689,417 – $1,543,774**	**$36,035**	**100.0%**

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

Note For categories with 3 or fewer households responding, economic information has been omitted for confidentality. However, the information is included in the community totals.

Table 8-26.–Comparison of median income estimates, Shageluk, 2013.

Data source	Median[a]	Range[b,c]
2013 Division of Subsistence estimate	$22,046	$13,741–$31,920
2008–2012 ACS (Shageluk)	$25,000	$4,120–$45,880
2008–2012 ACS (All Alaska)	$69,014	$68,221–$69,807

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

a. Division of Subsistence 2013 estimate does not include categories of income excluded by the 2008–2012 ACS median estimate, including food stamps, housing assistance, and one-time payments.

b. Range is a 95% confidence interval of the estimated median.

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

total income (Figure 8-26). An estimated 19 households received a total of $107,865 in food stamp benefits,[40] and 28 households received a total of $64,246 from the Alaska Permanent Fund dividend.[41] Other sources of income included an estimated community total of $62,495 from Native corporation dividends, $23,557 from Social Security, and $20,945 from heating assistance programs. The estimated median income for Shageluk households in 2013 was $22,046, within a 95% confidence interval of $13,741–$31,920 (Table 8-26). This overlaps the median income of $25,000 as estimated by the American Community Survey for 2008–2012. In comparison, the 2008–2012 ACS median income for all Alaska households was $69,014.

The survey also asked about months worked and work schedules for employed residents in each household. Of the 58 jobs held by Shageluk residents in 2013, approximately 22 were on-call or occasional (38% of all jobs), 20 were full-time positions (34%), 13 were part-time (22%), and 4 (6% of all jobs) were shift positions (tables 8-28 and 8-29). Of the 44 adults who held at least 1 wage earning job at any time during 2013, approximately 19 individuals (42% of employed persons) were employed in at least 1 full-time position, 17 (40% of employed persons) held at least 1 on-call position, 10 (24%) held at least 1 part-time position, and 4 (8%) held at least 1 shift position. Employed adults in 2013 worked on average 1.3 jobs, and for some individuals up to 3 separate jobs (Table 8-29). Employed adults worked during at least 1 month and at most 12 months in 2013; the average months worked for employed adults was 7.5 months (33 weeks), and 38% of adults who were employed at any point during 2013 were employed year-round.

Twenty-four of the 29 estimated households in Shageluk (84%) included at least one household member who was employed for some time during 2013. In 13 of these households (52% of all households with an employee) at least 1 household member worked in a full-time job for all or a portion of 2013 (Table 8-28). The number of wage earning jobs per employed household ranged from 1 to 6, with an average of 2 jobs per household (Table 8-28). For employed households on average, the time that all household members worked in wage earning jobs was equivalent to 1 person working full time for 38 weeks (mean person-weeks of employment).

Food Security

Survey respondents were asked a set of questions intended to assess their household's food security, defined as, "access by all people at all times to enough food for an active, healthy life" (Coleman-Jensen et al. 2012). The food security questions were modeled after those developed by the U.S. Department of Agriculture (USDA) but modified by ADF&G to account for differences in access to subsistence and store-

40. Cash equivalent benefits for assistance with food purchases that are issued to qualifying households originate from the Supplemental Nutrition Assistance Program (SNAP), a program funded by the U.S. Department of Agriculture and administered by the State of Alaska. These benefits are commonly referred to as food stamps.

41. The Alaska Permanent Fund Dividend paid $900 to each eligible Alaska resident in 2013. (Alaska Permanent Fund Corporation, Juneau, n.d. "Annual dividend payouts." Accessed June 3, 2016. http://www.apfc.org/home/Content/dividend/dividendamounts.cfm)

Table 8-27.–Employment by industry, Shageluk, 2013.

Industry	Jobs	Households	Individuals	Percentage of wage earnings
Estimated total number	**58.0**	**24.4**	**44.0**	
Federal government	**4.0%**	**9.5%**	**5.3%**	**3.0%**
Executive, administrative, and managerial	2.0%	4.8%	2.6%	0.3%
Administrative support occupations, including clerical	2.0%	4.8%	2.6%	2.7%
State government	**8.0%**	**19.0%**	**10.5%**	**2.9%**
Service occupations	6.0%	14.3%	7.9%	2.5%
Agricultural, forestry, and fishing occupations	2.0%	4.8%	2.6%	0.4%
Local government, including tribal	**58.0%**	**85.7%**	**68.4%**	**52.7%**
Executive, administrative, and managerial	2.0%	4.8%	2.6%	6.7%
Teachers, librarians, and counselors	10.0%	19.0%	10.5%	19.7%
Administrative support occupations, including clerical	12.0%	19.0%	15.8%	15.1%
Service occupations	22.0%	38.1%	26.3%	5.4%
Construction and extractive occupations	2.0%	4.8%	2.6%	2.1%
Precision production occupations	2.0%	4.8%	2.6%	1.8%
Handlers, equipment cleaners, helpers, and laborers	8.0%	19.0%	10.5%	2.0%
Agriculture, forestry, and fishing	**2.0%**	**4.8%**	**2.6%**	**0.0%**
Agricultural, forestry, and fishing occupations	2.0%	4.8%	2.6%	0.0%
Construction	**6.0%**	**14.3%**	**7.9%**	**4.0%**
Construction and extractive occupations	4.0%	9.5%	5.3%	3.4%
Handlers, equipment cleaners, helpers, and laborers	2.0%	4.8%	2.6%	0.6%
Manufacturing	**2.0%**	**4.8%**	**2.6%**	**0.1%**
Writers, artists, entertainers, and athletes	2.0%	4.8%	2.6%	0.1%
Transportation, communication, and utilities	**8.0%**	**14.3%**	**7.9%**	**32.2%**
Executive, administrative, and managerial	2.0%	4.8%	2.6%	14.7%
Service occupations	2.0%	4.8%	2.6%	14.7%
Transportation and material moving occupations	4.0%	9.5%	5.3%	2.9%
Retail trade	**4.0%**	**9.5%**	**5.3%**	**1.5%**
Executive, administrative, and managerial	2.0%	4.8%	2.6%	0.4%
Marketing and sales occupations	2.0%	4.8%	2.6%	1.2%
Services	**6.0%**	**14.3%**	**7.9%**	**3.0%**
All occupations	6.0%	14.3%	7.9%	3.0%
Health technologists and technicians	2.0%	4.8%	2.6%	1.5%
Marketing and sales occupations	2.0%	4.8%	2.6%	0.5%
Construction and extractive occupations	2.0%	4.8%	2.6%	1.1%
Industry not indicated	**2.0%**	**4.8%**	**2.6%**	**0.5%**
Service occupations	2.0%	4.8%	2.6%	0.5%

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

Table 8-28.–Reported job schedules, Shageluk, 2013.

Schedule	Jobs		Employed persons		Employed households	
	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	19.7	34.0%	18.5	42.1%	12.8	52.4%
Part-time	12.8	22.0%	10.4	23.7%	9.3	38.1%
Shift	3.5	6.0%	3.5	7.9%	3.5	14.3%
On-call (occasional)	22.0	38.0%	17.4	39.5%	13.9	57.1%
Part-time shift	0.0	0.0%	0.0	0.0%	0.0	0.0%
Schedule not reported	0.0	0.0%	0.0	0.0%	0.0	0.0%

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

Table 8-29.–Employment characteristics, Shageluk, 2013.

Characteristic	Community Shageluk
All adults	
Number	58.0
Mean weeks employed	24.8
Employed adults	
Number	44.0
Percentage	75.9%
Jobs	
Number	58.0
Mean	1.3
Minimum	1
Maximum	3
Months employed	
Mean	7.5
Minimum	1
Maximum	12
Percentage employed year-round	38.0%
Mean weeks employed	32.6
Households	
Number	29
Employed	
Number	24.4
Percentage	84.0%
Jobs per employed household	
Mean	2.0
Minimum	1
Maximum	6
Employed adults	
Mean	
Employed households	1.8
Total households	1.5
Minimum	1
Maximum	5
Mean person-weeks of employment	37.7

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

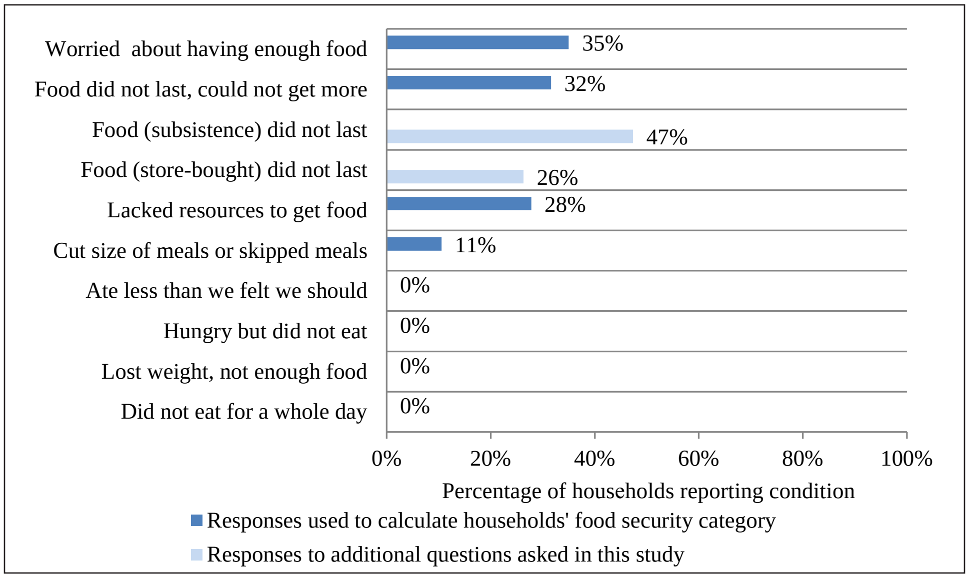


Figure 8-27.–Responses to questions about food insecure conditions, Shageluk, 2013.

bought foods. Based on their responses to these questions, households were broadly categorized as being food secure or food insecure following a USDA protocol (Bickel et al. 2000). Food secure households were broken down further into 2 subcategories—high or marginal food security. Food insecure households were divided into 2 subcategories: low food security or very low food security.

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

Researchers asked Shageluk respondents whether 10 statements regarding food-insecure conditions were ever true for their households in 2013. The 10 food-insecure conditions discussed in the survey and responses from Shageluk residents are summarized in Figure 8-27. The first food-insecure condition listed in the figure, "Worried about having enough food," corresponds to the least severe level of food insecurity. Food insecure conditions that follow are listed based on their relative severity; the final listed food insecure condition, "Did not eat for a whole day," corresponds to the most severe level of food insecurity (Figure 8-28).

Based on responses, 90% of Shageluk households in 2013 were classified as "Secure—high and marginal food security," and 10% were classified as "Insecure—low food security" (Figure 8-28). For comparison, the percentage of Shageluk households classified as "Secure—high and marginal food security" was greater than for Alaska and the United States as a whole in 2013. In contrast to state and national averages, Shageluk did not have any households classified in the most severe category, "Insecure—very low food security." Such favorable percentages relative to state and national averages are encouraging in the context of food security levels for Shageluk during the study year. However, although 90% of households were classified as being "secure" in 2013, household responses to food insecure conditions show that approximately one-third of households in 2013 worried about food or experienced food not lasting (i.e. ran out of food) and were unable to get more food; 28% of households lacked resources to get food; and 11% cut the size of meals or skipped meals (Figure 8-27).

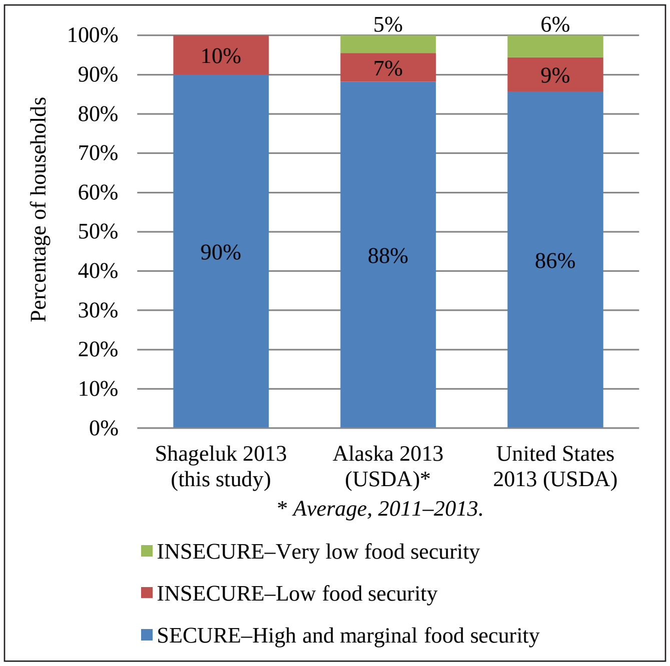


Figure 8-28.–Food security categories, Shageluk, 2013.

For each of the food insecurity conditions that were true for their households, respondents were also asked to state during which months these conditions existed. Figure 8-29 portrays the mean number of food insecure conditions reported per household by month in 2013; the figure displays conditions per month separately based on food security category. For the category "Secure—high and marginal food security," the average number of conditions per month ranged from 0.2 to 0.5 during individual months in 2013. The average number of reported food insecure conditions was larger between January and June than during the remainder of the year, with the largest average number in May. Such averages with values less than 1 do not reflect a reduced significance of food insecurity conditions for particular households. Instead, there were additional households within the "Secure—high and marginal food security" category that did not report any such conditions resulting in an average of less than 1 in some months. For the category "Insecure—low food security," the average number of food insecure conditions reported by households ranged from 2 to 3.5 each month in 2013; individual households on average reported the most food insecurity conditions during January, February, and March.

Multiple respondents described that in certain months their foods did not last in 2013 and that they could not get more; 26% of households reported this condition for store-bought foods specifically and nearly one-half (47%) of households for subsistence foods (Figure 8-27). Figure 8-30 shows the average percentages by month of Shageluk households reporting conditions in which store-bought foods, subsistence foods, or both sources of food did not last and the household could not get more. The percentage of households reporting store-bought foods not lasting remained relatively consistent throughout the year; between 20% and 25% of households reported that their store-bought food did not last in every month of 2013. There was more variation between months in the percentages of households that reported subsistence foods not lasting: 10% of households reported running out of subsistence foods from September to November, increasing to 20% to 25% of households between January and June. Although the survey did not ask respondents to explain fluctuations in their food security throughout the year, community-wide patterns of seasonal food security are likely related to timing and availability of key subsistence resources such as salmon and moose. Finally, the fact that the condition "subsistence foods did not last" was reported by more households than any of the other 9 food insecurity conditions (Figure 8-27) may indicate that for some households, running out of subsistence foods did not immediately compromise their overall levels of food security in 2013 as defined by the USDA protocol. Although 47% of households reported that their subsistence foods did not last in at least 1 month of 2013, 90% of households were categorized as food secure in 2013 (figures 8-27 and 8-28). When contextualized with qualitative information from Shageluk respondents, these results speak to potential limitations of the USDA assessment tool in rural Alaska. For example, some survey comments included a critique of the tool's emphasis on quantity over quality of food, particularly in the context of nutritional deficiencies in available store-bought food in Shageluk to which subsistence-harvested foods often provide a nutritionally valuable alternative (Verbrugge and Middaugh 2004:30, 31). One survey participant commented that "not having [subsistence harvested] fish is culturally and spiritually destructive to the community of Shageluk." This highlights that the relationships between food and health in Shageluk extend beyond measures of caloric quantity or nutritional quality.

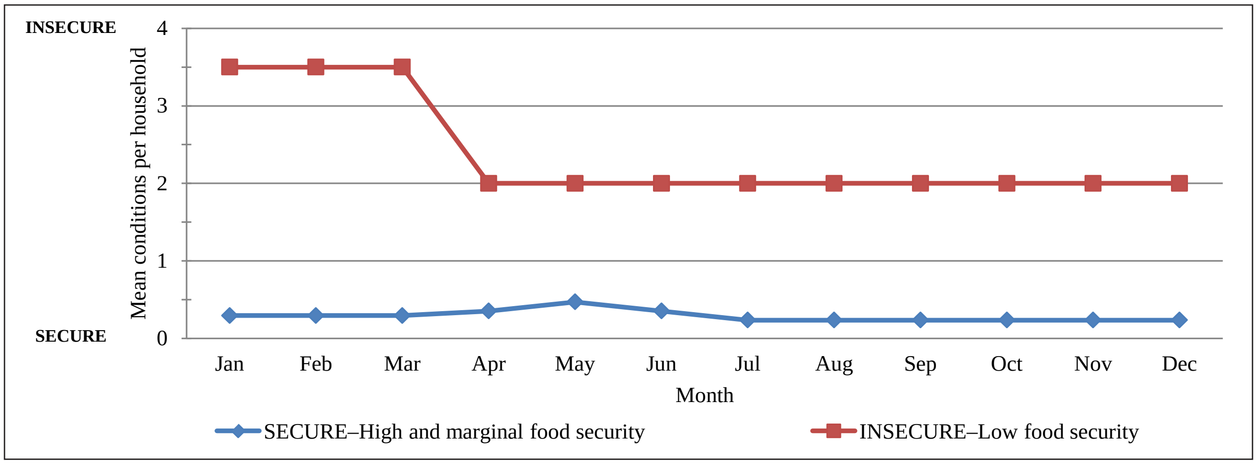


Figure 8-29.–Mean number of food insecure conditions by month and by household security category, Shageluk, 2013.

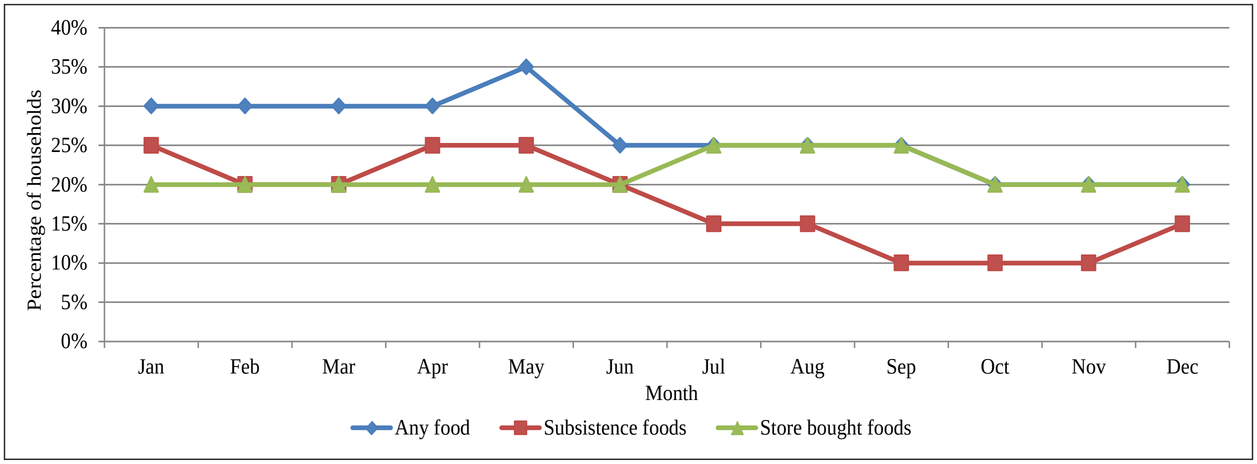


Figure 8-30.–Comparison of months when subsistence, store-bought, and any foods did not last, Shageluk, 2013.

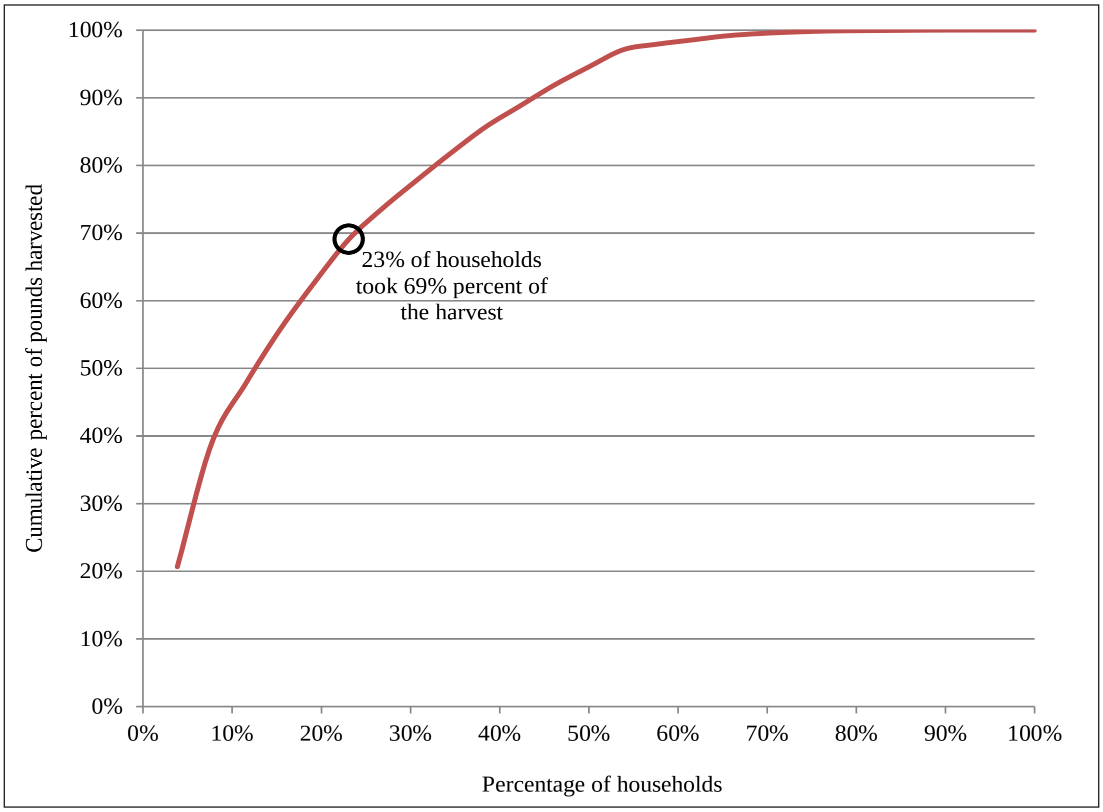


Figure 8-31.–Household harvest specialization, Shageluk, 2013.

Sharing of Wild Resources

Household Specialization in Resource Harvesting

Previous studies (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 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 8-31, in the 2013 study year in Shageluk, about 69% of the harvests of wild resources as estimated in usable pounds were harvested by 23% 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 Shageluk and the other study communities.

Wild Food Networks

Although subsistence harvest surveys collect information based on individual households, in reality, much of the production (harvest and processing) of subsistence foods occurs on a commmunity level. For many communities in rural Alaska subsisitence foods are widely distributed among households through sharing, barter, and customary trade (Charnley 1984; Kari 1983; Lonner 1980; Magdanz and Wolfe 1988; Magdanz 1988; Magdanz et al. 2007; Moncrieff 2007; Pete 1991a; Schroeder et al. 1987; Stickney 1984; Wolfe et al. 1993). Figure 7-35 shows the flow of wild foods into surveyed households from other Shageluk households and other communities in Alaska. Symbol shapes depict the type of household, colors show the age of heads of household, and sizes indicate the amount of a household's subsistence harvest in 2013 by edible weight.

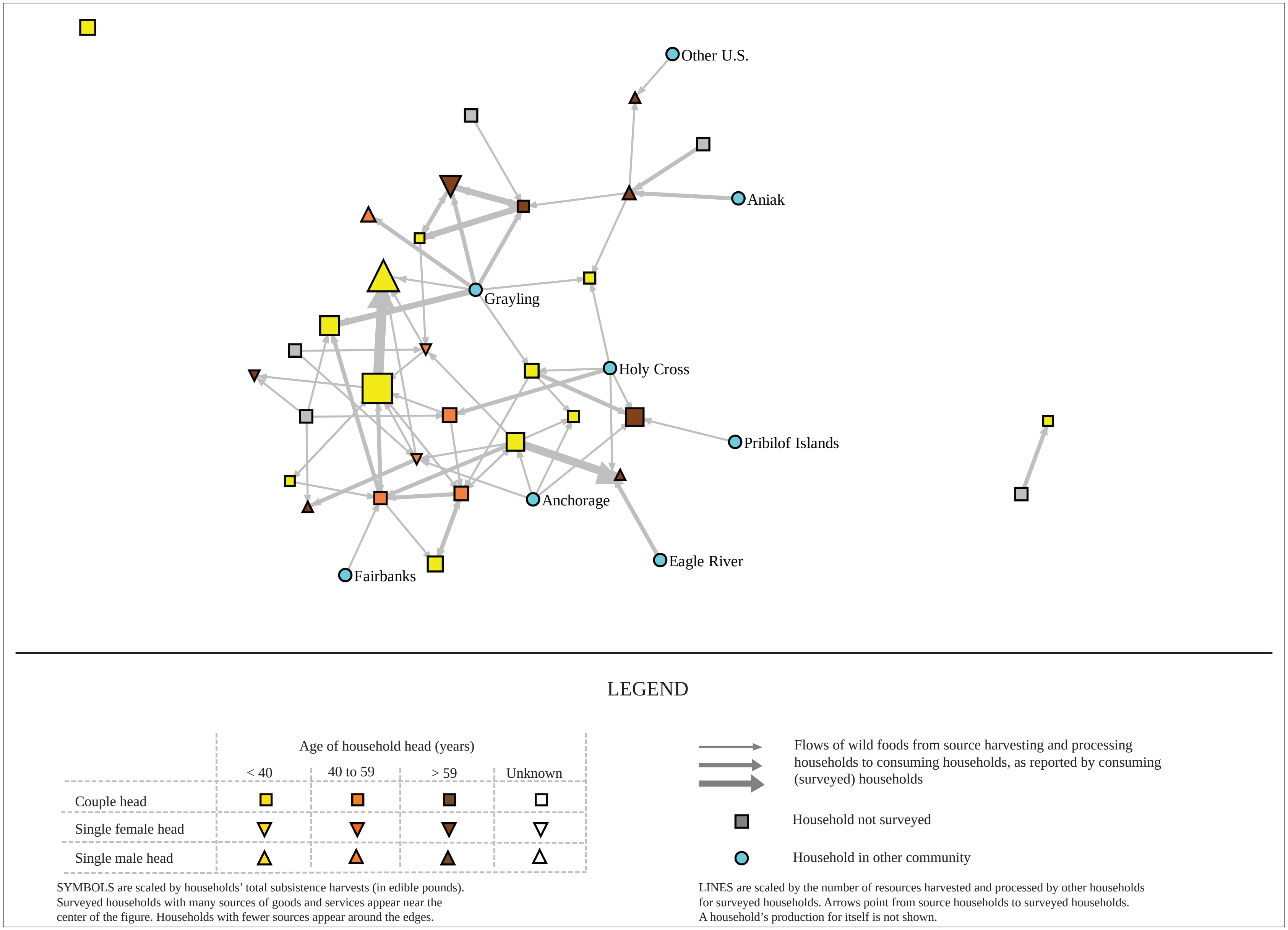


Figure 8-32.–Wild food harvesting and processing network, Shageluk, 2013.

Arrows show the direction of food from one household to another, and the weight of lines shows the number of resources. The position of a household relative to the center of the figure shows how tied it was to other households in Shageluk.

The figure is a partial representation of sharing, trade, and barter in 2013 because it only documents instances in which surveyed households received wild food from other households and communities; the survey did not directly record to whom households gave wild food.[42]

Previous studies have found a positive association between the ages of household heads and the amount of subsistence foods harvested. Household characteristics associated with higher food production include those households with multiple working-age males, involvement with commercial fishing, and higher wage incomes. Characteristics common to lower producing households included female household heads, age of elders, non-Native household heads, and single-person households (Magdanz et al. 2009; Wolfe et al. 2010). Household "developmental cycles" (i.e., the relative age or "maturity" of household heads and number of productive household members) have also been associated with harvests. Such relationships between harvest levels and household maturity categories are not immediately obvious based on the 2013 Shageluk survey data: each developmental stage included households with both relatively high and relatively low harvests. Similarly, household harvest levels do not appear to be directly related to household centrality or position within the network diagram. Nevertheless, the sharing network in Figure 7-35 demonstrates that most Shagleuk households were connected to other households through the exchange of wild foods.

Additionally, other types of sharing that are not represented in Figure 7-35 took place in Shageluk in 2013, such as individuals who are tied to the Shageluk community but lived elsewhere in 2013 (see Lee 2002). As a result, there is likely an underrepresentation of sharing between 2013 Shageluk households and households in other locations. Also, community gatherings during holidays, times of mourning, and a variety of other occasssions often coincide with community-wide distribution[43] of wild food resources. Related to Shageluk's small total population size, the entire community may be physically present in the same building or meeting space at any given time, and distribution of wild foods during such occassions can connect virtually every household. Although there were many instances during household surveys when respondents offerred examples of wild food distribution related to such community gatherings, the survey protocol only captured direct household-to-household food transfer. Related examples of sharing include cases in which households gave wild food products, such as moose, to the Shageluk tribal council for future distribution to community members, or providing subsistence meals for elders at the school. Considering these examples, the sharing network in Figure 7-35 is only a partial representation of wild food distribution patterns in 2013.

Local Comments and Concerns

Over the course of research, many Shageluk residents voiced comments and concerns[44] that were related to natural resource harvest and use patterns in 2013 as well as future years. Several themes emerged as particularly relevant to an understanding of contemporary subsistence patterns in Shageluk; the following section provides a brief overview and discussion of these topics.

Salmon

Multiple Shageluk residents voiced comments and concerns related to salmon and subsistence salmon fishing. Underlying virtually all of these comments was the context of historically low returns of Chinook salmon to the Yukon River in 2011–2013 and related management actions that had reduced subsistence salmon fishing opportunities during the study year and years prior (Estensen et al. 2015). Relatively low returns of Chinook salmon in 2013 resulted in subsistence fishing closures during the majority of each

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

43. Depending on context, such distributions may be referred to as potlatches, community feeds, or other names.

44. Comments were collected through survey comments, information from ethnographic interviews, informal discussions between Shageluk residents and project staff, and the community review process.

week in June and early July on the mainstem Yukon River; multiple survey participants commented that opportunities to harvest Chinook salmon during subsistence fishing schedules with brief 1-day open periods were not sufficient to justify the expenses related to traveling to the Yukon River. As a result, the vast majority of the Chinook salmon used by Shageluk residents during the study year was obtained from harvests on the Innoko River. These harvests were also described as minimal due to small run sizes in recent years; whereas an average Chinook salmon harvest on the Innoko in previous decades was estimated to be around 20 Chinook salmon for a resident who fished a setnet throughout the summer (022214SH1), in recent years there have been "just a few kings [on the Innoko]. You're lucky if you get 1 or 2 nowadays… There's no more" (022114SH4). As a result, Chinook salmon harvests in 2013 were minimal relative to previous years, and this affected Shageluk residents in several ways. For example, residents described needing to buy small quantities of Chinook salmon from Yukon River communities, and not being able to share Chinook salmon as in past years:

> Can't, um, give any away like how I used to you know. I cut back on that a lot. Yeah, I give my in-laws in Anchorage, I give them king salmon strips and all that. Now I can't do that anymore, because I got to think about us for the winter…And if you're going to buy fish on the Yukon, the prices went up. It's just not even worth it. (022214SH1)

Survey respondents also commented that frequent changes in salmon fishing regulations and gear requirements had been especially problematic:

> The fishing can be difficult because on the Yukon you have to use a certain net. You have to keep up with the regulations and buy new nets: if they just had 1 net that they'd let us use it would not be so bad. (Survey comment)

> They keep changing it all the summers. It doesn't matter what I tell you because the Board has all the power. (Survey comment)

> The frequent net-size changes and restrictions have affected [her household] and other Shageluk households by preventing the harvest of king salmon by those who did not have the resources of multiple mesh-size fish nets. (Survey comment)

Related to these concerns, some residents felt that there should be some sort of accommodations made for Shageluk residents related to their unique salmon fishing patterns, which often require travel and competitive conditions:

> (We) need more king salmon. We have to go to Holy Cross and drift. We need an opening just for Shageluk people because we have to travel so many miles. Holy Cross people come up here and moose hunt. We go drift by Grayling too, but it's full of Grayling people. (Survey comment)

Moose

Several households commented on topics related to moose hunting in the Shageluk area. Three households commented during harvest surveys that they supported the February federal moose hunting season and felt it should continue: "When you don't get one (a moose) in fall time, and you get one in February, that's good," and "February moose hunt should continue." One survey respondent commented that there should be additional moose hunting opportunities.

Some survey respondents indicated that they were concerned about or affected by nonlocal moose hunters in the Shageluk area: "[I] have to fight outside hunters for moose," and "Stop sending hunters out to this area." Adding complexity to these concerns, one resident commented favorably that he used more moose in 2013 because he "received a lot from commercial hunters." Key respondents indicated that Shageluk's village corporation, Zho-Tse Inc., land status prevents hunters from accessing large portions of land in the immediate vicinity of Shageluk, that nonlocal hunters must hunt far enough upriver that there is generally little competition, and that most hunters who invest substantial amounts of time are usually successful in harvesting a moose (021814SH2). In sum, concerns about competition with nonlocal moose hunters were real for some respondents, but not universal in the community.

Bison

At the time of data collection in Shageluk, the herd of wood bison that has since been introduced into the Shageluk area from Canadian herds was still being held in captivity at the Alaska Wildlife Conservation Center.[45] Several residents expressed support for the release of wood bison, felt that Shageluk people in general were supportive of the wood bison introduction, and looked forward to hunting opportunities that wood bison would bring.

Weather Effects on 2013 Subsistence Harvest

Among the most frequent comments and concerns voiced by Shageluk residents were those that involved the numerous unusual weather patterns in 2013, and related effects on subsistence harvests. Specific seasonal anomalies that respondents commented on included an unusually delayed arrival of warmer temperatures in spring and an unusually warm fall that resulted in a late freeze-up of the Innoko River.

> It was a crazy winter. Sure, things changed you know. The weather...Well, actually, I seen late freeze-ups, but not like this…Not this late, no. Uh-uh. Not in November. You could drive a boat up here in November. No kidding. (022214SH1)

Indeed, similar observations of aberrant weather patterns in 2013 were noted and recorded across Interior Alaska: Fairbanks temperatures in April were the third coldest on record, and multiple locations in Interior Alaska set new records for the warmest October.[46] As indicated by survey and interview comments, unusually cold weather in April prevented snow from melting normally; this was described by one respondent as making snowmachine travel difficult. This respondent also described that spring waterfowl did not land near Shageluk at typical harvest locations that are normally ice- and snow-free during waterfowl migration.

Comments related to the effects of a warm fall and delayed freeze-up on the Innoko River were much more pervasive: 5 households specifically commented on the fact that their household harvest of whitefishes was lower in 2013 than in previous years because of their inability to install a fish fence or under-ice setnets in the Innoko River.

Economic concerns

Several respondents voiced concerns or described the impacts of contemporary economic conditions in Shageluk. Specifically, high gas prices were described as affecting subsistence harvest activities in 2013: “Increasing costs of gas have decreased the areas of subsistence,” and “If we’re going to eat subsistence food we need gas, and [the gas price] keeps going up. Can’t go as far or as often for subsistence foods due to the price of gas.” One survey respondent additionally connected the ability to harvest subsistence foods with increased economic self-sufficiency: “Subsistence is the solution, not the problem. If you’d let people subsist, it would give them something to do and they wouldn’t have to buy store food. Less government help, more subsistence.”

Acknowledgements

All households that were present in Shageluk at the time of research participated in the household subsistence surveys, and the author would like to express sincere thanks to each of them for sharing their wealth of knowledge and information.

45. Alaska Department of Fish and Game, Juneau. 2016. “Wood bison *(Bison bison athabascae)* species profile.” Accessed March 15, 2016. http://www.adfg.alaska.gov/index.cfm?adfg=woodbison.main

46. Wendler, G., B. Moore, and K. Galloway, Alaska Climate Research Center, Fairbanks. “The Climate of Alaska for 2013.” Accessed March 15, 2016. http://akclimate.org/Summary/Statewide/Annual/2013

9. DISCUSSION

Andrew R. Brenner and David M. Runfola

The objective of the fourth phase of the Donlin Gold Subsistence Research Program was to describe the 2013 harvests and uses of fish, wildlife, and plant resources in the communities of Scammon Bay, Quinhagak, Eek, Tuntutuliak, Pilot Station, and Shageluk. The collaboration of these 6 communities enabled the continuation of a multiyear subsistence research program that involved the input of individuals in 26 communities that spanned much of Western Alaska (Figure 9-1).

Reflecting the multiyear nature of this project, the following chapter presents the 2013 community results in relation to results from previous years, using subregional patterns as a primary unit of comparative analysis. An overview of all Western Alaska subregions as defined in this research program is included as Figure 9-2. Schroeder et al (1987) also lists distinguishing characteristics that were used to define these subregions.[1] A discussion of the context and rationale behind this approach is provided in the following section.

The Phase 4 communities occupy several different subregions: coastal Yukon-Kuskokwim (Y-K) Delta, lower Kuskokwim River, lower Yukon River, and middle Yukon River.[2] This discussion will compare data from communities included in this study to available data on other communities in the same subregions. A final section provides a discussion of data gaps remaining for subsistence documentation in Western Alaska and suggestions for future research.

Subregional Subsistence Patterns

Context of Subregional Subsistence Patterns in Western Alaska

The descriptions of subregional subsistence patterns included in this and previous project reports reflect the development of this research program over multiple years and in collaboration with multiple communities. Prior to this research program, very few communities anywhere in Western Alaska, and particularly for the Kuskokwim River region, possessed recent comprehensive documentation of subsistence land use areas or harvest amounts (see Introduction chapter).

Research during the first year of the Donlin Gold Subsistence Research Program included 8 communities relatively close to the proposed Donlin Creek mine site. The inclusion of these 8 central Kuskokwim River region communities at the inception of the research program was primarily connected to practical needs stemming from the paucity of recent subsistence documentation, as well as their proximity to potential large-scale mineral development and associated activities. The universal support for this research in all of these 8 communities suggests broad public concerns regarding potential impacts to local subsistence practices in the event of any dramatic changes along the central Kuskokwim River.

Prior to this research program, comprehensive subsistence research that included multiple communities within a single year, and within a relatively unified socioeconomic and natural environment, was lacking for most of Western Alaska. As such, this research scenario provided an opportunity within this region to examine the concept that similar environmental and socioeconomic conditions across a region would likely be related to similarities in subsistence harvest and use patterns. This idea of regional affiliation and its relation to subsistence harvest and use patterns had been promoted through previous subsistence research and analysis (Endter-Wada and Robbins 1992; Stickney 1984:4; Stratton and Georgette 1984:35, 183–194; Wright et al. 1985). Also, analysis of broad regional patterns could prove useful in understanding

1. The subregional groups described throughout the remainder of the report are simplifications made in order to illustrate broad patterns specific to project results; these simplifications are not meant to diminish the complexity of individual communities throughout Western Alaska.

2. The middle Yukon River subregion is not included in the overview of Western Alaska subregions as described in Schroeder et al. (1987). This subregion, roughly corresponding to those communities located within Game Management Unit 21, is included in a broader description of Western Alaska for the purposes of this discussion.

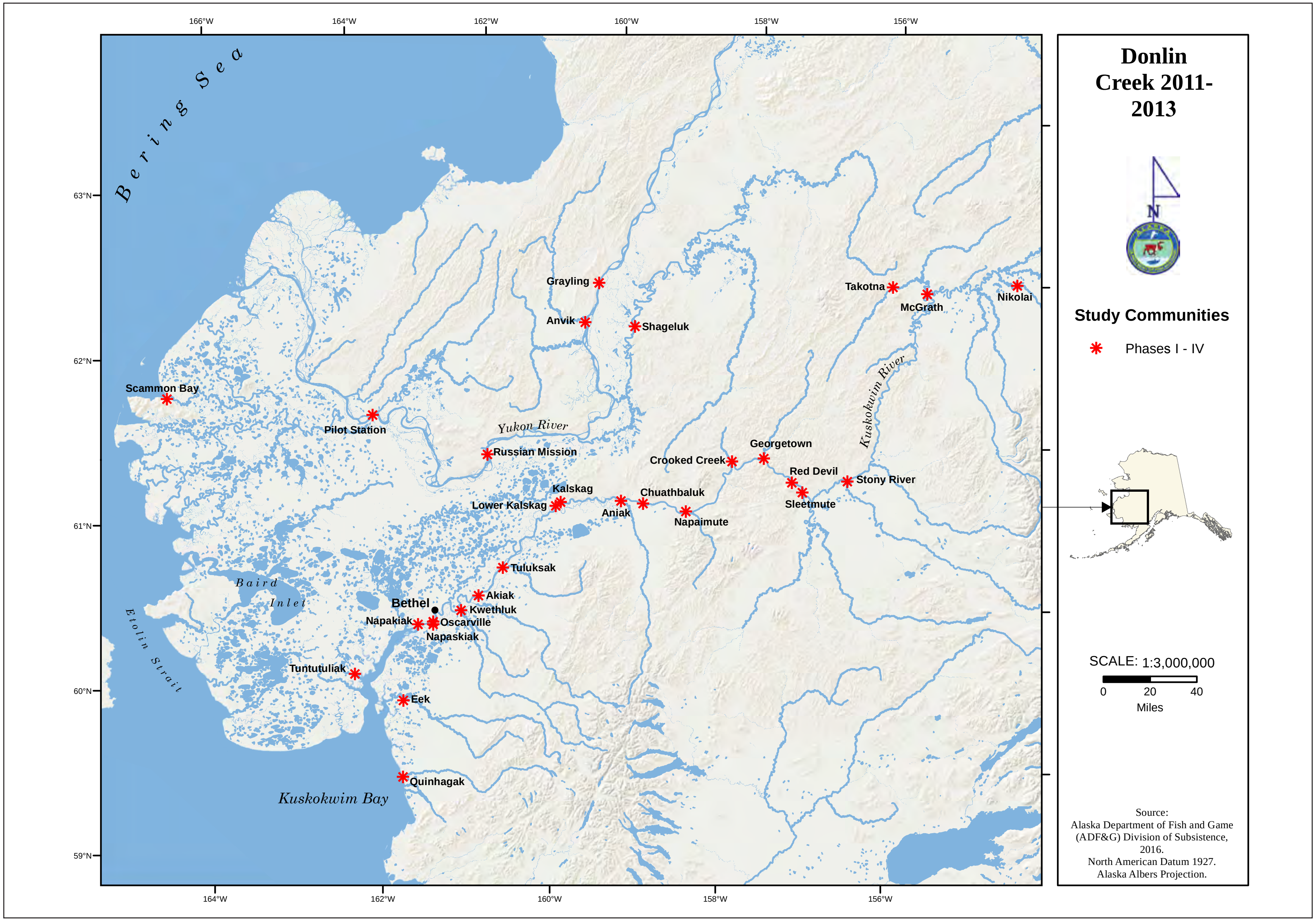
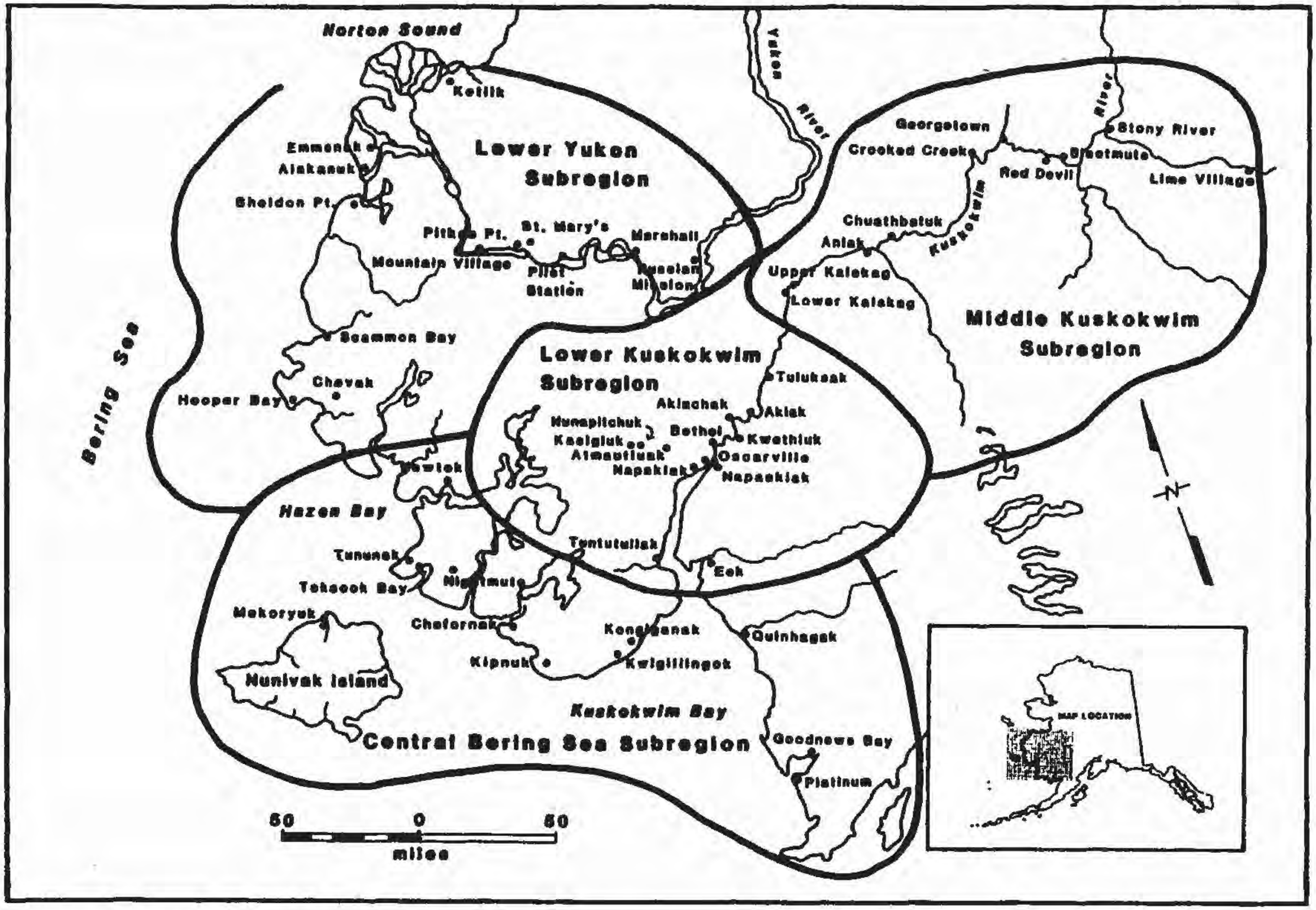


Figure 9-1.–Study communities of the Donlin Gold Subsistence Research Program, 2009–2013.



Map 11. Western Alaska subregions and communities (Haynes and Andrews 1985)

Figure 9-2.–Western Alaska subregions (Schroeder et al. 1987:217).

divergence from patterns for individual communities within specific years, as well as for entire regions between years. As an example, a community having unusually low salmon harvests in a particular year when compared to the regional average for that year would suggest that a factor unique to that community influenced the anomalous harvest. Similarly, an entire region having unusually low salmon harvests in a particular year relative to the regional average across multiple years would suggest that a factor unique to that year influenced the anomalous harvest.

Although Phase 1 results showed considerable diversity and variation between communities, similarities in subsistence harvest and use patterns across the central Kuskokwim River region did emerge as a clear theme. Area residents described relatively long-term conditions, such as reduced moose hunting opportunities, similarities in availability, abundance, and timing of salmon, and unusually low numbers of berries in the 2009 study year, among other examples (Brown et al. 2012:349–370).

In phases 2, 3, and 4, the project expanded geographically in an attempt to provide a greater breadth of subsistence documentation throughout the Y-K Delta and surrounding area. During this expansion, researchers generally attempted to follow a subregional model of data collection similar to Phase 1 through collaboration with nearby groups or clusters of communities when possible. For example, Phase 2 research documented subsistence patterns within the lower Kuskokwim River region for the communities of Akiak, Kwethluk, Oscarville, and Tuluksak (Brown et al. 2013), in addition to expanding Phase 1 research in the central Kuskokwim River region through documenting subsistence harvests and uses for Georgetown and Napaimute. However, as the scope of the project continued to expand geographically in multiple directions, this subregional approach became increasingly difficult. During phases 3 and 4 of the research program, participating communities were generally located farther from the proposed Donlin Gold mine site, and coincidentally farther from each other, than in preceding years of the project. Additionally, because factors such as weather patterns and availability of particular subsistence resources differed considerably between Phase 4 and preceding study years, relationships among individual community results are less clear than in other years. Conclusive statements about these types of patterns across multiple communities and years, particularly in terms of quantitative data, are further confounded by the general absence throughout Western Alaska of comprehensive and comparable subsistence research over multiple recent years.[3]

Despite these limitations, similarities in subsistence harvest and use patterns among nearby communities did emerge as a theme among this report's study communities, and throughout the research program as a whole. Subsistence sharing networks throughout particular subregions showed evidence of strong connections between households that exchanged wild foods or helped each other with harvesting and processing resources. Such sharing networks often reflected family ties that were deeply rooted in multiple nearby communities. Study key respondents often described subsistence harvest and use practices in terms of broad patterns common among groups of nearby communities that share similar environments and socioeconomic characteristics.

Coastal Communities

Although Scammon Bay and Quinhagak are separated by more than 300 miles of coastline, these communities bear greater similarity to each other in their patterns of wild food harvest and use than they do with other communities described in Phase 4 of the project. Due to their location on the Bering Sea coast, Scammon Bay and Quinhagak residents have access to a greater number of subsistence resources than the more inland communities discussed in this document.[4] Bering Sea coastal habitats support numerous marine resources not found in the more interior regions of the lower Yukon and Kuskokwim rivers, including various fishes, marine mammals, birds, and marine invertebrates.

3. Of the 56 communities located within the project area, multiple years of comprehensive subsistence harvest data since 2000 exist for only 1 community (Nikolai; Holen et al. 2006; Ikuta et al. 2014).

4. This chapter presents a pairing of Scammon Bay and Quinhagak in terms of similarities in the types of subsistence resources their residents harvest as a result of their location on the Bering Sea coast of the Yukon-Kuskokwim Delta. This discussion recognizes that these 2 communities also exhibit significant cultural, traditional, linguistic, and geographical differences that are beyond the scope of this discussion.

Coastal fishers harvest a number of marine fish species in great abundance. Some are caught in large quantities during short seasons, such as Pacific herring in spring or Pacific halibut following the peak of the salmon fishing season. Other marine fishes such as saffron cod may be harvested in relatively small quantities in one outing, but caught regularly by many fishers throughout the year, thus totaling a large quantity of fish annually. In addition, some anadromous fish species are present in the coast, either seasonally or throughout the year during certain life-history stages. For example, juvenile Bering cisco originating from Yukon and Kuskokwim river spawning populations are present throughout the year in estuarine habitats of the Bering Sea coast and are regularly harvested by resident fishers. Also, rainbow smelt are harvested in the lower Yukon and lower Kuskokwim rivers in a brief 1 or 2 day season during a spawning migration in early spring; however, Scammon Bay, Quinhagak, and other coastal residents catch the same species nearly year-round in salt and brackish water at the margins of their communities. Catches of all of these fishes represent a substantial portion of the annual fishing harvest of coastal households that is generally not harvested in great quantities by the majority of households living in communities not located on the coast. Although Scammon Bay and Quinhagak fishers harvested a similar variety of marine fish species[5] in 2012, Scammon Bay per capita harvests (71 lb) were triple that of Quinhagak households (25 lb per capita; tables 3-8 and 4-8). These differences occurred due to higher harvests of Pacific halibut, saffron cod, and Pacific herring in Scammon Bay as compared to those of Quinhagak.

In addition to coastal fishes, marine mammals play an equally significant role in terms of total harvests of wild foods for Bering Sea coast communities, and these resources also have great cultural value. Seals are hunted throughout the year, traditionally from ice edges and in open sea ice leads in winter and spring, as well as in open ocean, bays, and river mouths in summer and fall. Walrus are typically harvested on the ice in winter and spring; and beluga whales are pursued in summer, particularly when the species is feeding on migrating adult salmon relatively close to the shoreline. All of these marine mammal species represent a normally abundant and consistent supply of meat, oil, and—in the example of seals—hides for use year-round. Although residents of inland communities do harvest marine mammals, most do not harvest seals, walrus, and beluga whales in the same numbers and with the same frequency as coastal hunters. As such, Scammon Bay, Quinhagak, and other coastal communities not only harvest more marine mammals for local use, they also supply large quantities of meat and oil to inland communities around the Y-K Delta region and throughout Alaska. Scammon Bay and Quinhagak marine mammal harvests—85 lb and 30 lb per capita, respectively—differed primarily due to greater harvests of beluga whales in Scammon Bay where 24 were harvested in comparison to 3 in Quinhagak (Figure 9-3). In addition, Scammon Bay hunters harvested twice the per capita quantity of all seal species with 41 lb per capita versus 20 lb per capita in Quinhagak (tables 3-8 and 4-8).

Many species of birds represent additional coastal marine resources that are readily available to hunters and egg gatherers of Scammon Bay and Quinhagak, but typically unavailable to many communities not adjacent to the coast. During spring and summer breeding, Pacific black brant and, more so, emperor geese nest in the Y-K Delta primarily along the coast, making them more available to hunters and egg gatherers of coastal communities than for residents further from the coast. Snow geese also migrate along the Y-K Delta coastline and stage in large numbers in the fall in areas within the hunting ranges of coastal residents. Additional migratory birds and their eggs that are available to coastal residents include several species of sea ducks including eiders and scoters, as well as numerous species of sandpipers and other shorebirds.

As is true for coastal peoples around the world, Bering Sea coastal residents have access to many marine invertebrates that they gather from sand, mud, and tidepools along shorelines. Traditionally these have included various species of clams and mussels, as well as shrimps, and certain species of marine worms (SCM 4). Clams are also sometimes retained from walrus and bearded seal stomachs when hunters process these marine mammals following the hunt. The occasional red king crab is caught opportunistically as it

---

5. Marine species include Pacific herring (including roe), smelts, Pacific gray cod, saffron cod, flounders, Pacific halibut, and sculpin as listed in tables 3-8 and 4-8.

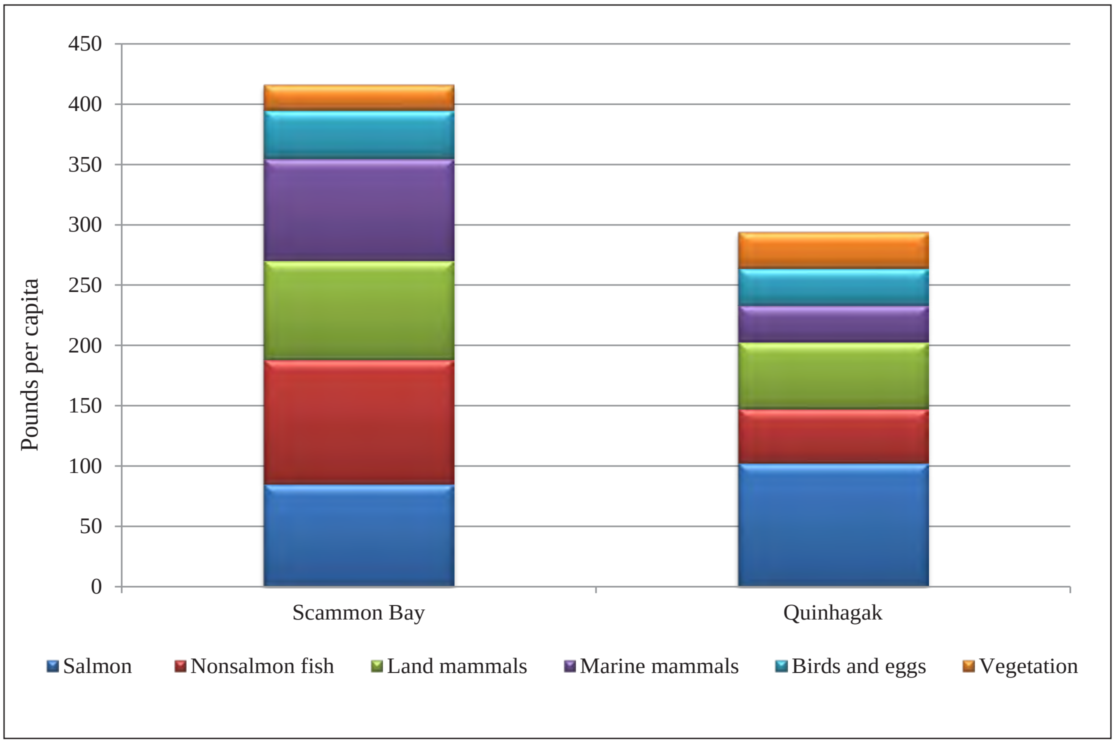


Figure 9-3.–Per capita harvests by category, Scammon Bay and Quinhagak, 2013.

clings to halibut fishing lines and herring gillnets. Although marine invertebrates do not represent a large portion of the annual subsistence harvest in Scammon Bay and Quinhagak, they are cherished seasonal foods that add to the diversity of the subsistence diets of people living on the coast.

In addition to a great diversity of animals, there are many edible plant species that grow only in coastal marine habitats. Sea lovage is gathered in large quantities from the coastal tundra in spring. Plant harvesters pick sea purslane from beaches in late spring and summer. Kelps are gathered and eaten in spring from tide pools and rocky or sandy tidal flats when they are covered with spawned herring roe. These and other coastal plant species add another facet of diversity and nutrition to the wild foods enjoyed by people of the coastal Y-K Delta.

In terms of wild food availability, the variety and abundance of marine and other coastal resources clearly distinguishes communities like Scammon Bay and Quinhagak from other locations within the Y-K Delta region. Such differences in subsistence resource availability have been previously described as related to differences in harvest composition, specifically between Quinhagak and the inland Bristol Bay community of New Stuyahok (Wolfe et al. 1984:357–358). In this case, a greater variety of harvested marine resources in Quinhagak as compared to New Stuyahok and the relatively high contribution of large land mammals to New Stuyahok's subsistence harvest were noted as reflecting inland vs. coastal subsistence harvest patterns. However, results from this study indicate that such patterns are likely flexible in response to changes in resource availability. For example, Scammon Bay has recently increased its harvest and use of large land mammals with the growing moose population of the lower Yukon River area. During much of—and likely prior to—the 20th century, fish, marine mammals, birds, and small land mammals were the predominant species harvested by hunters of the Scammon Bay area. Due to their absence in the coastal Y-K Delta region, large land mammals, moose in particular, were not taken with any frequency (Schroeder et al. 1987:235). Similar to residents of Pilot Station and other lower Yukon River communities, Scammon Bay hunters have experienced dramatic increases in their moose harvests during the first decades of the 21st century. In turn, moose constitutes a much greater portion the subsistence diets of contemporary Scammon Bay households in comparison to households until the early 1990s.

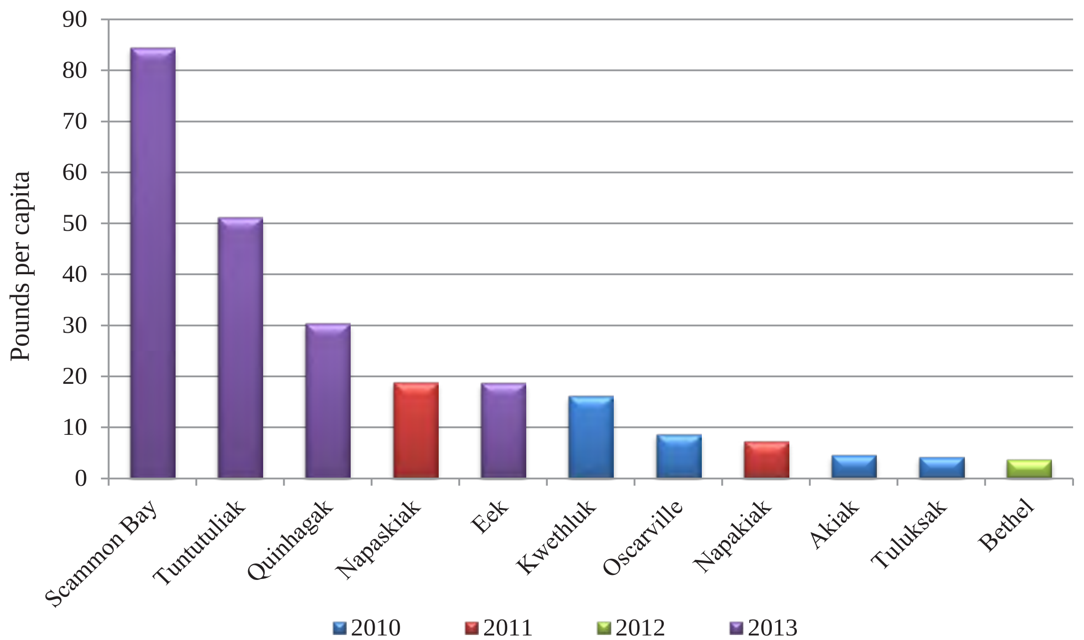
Although Scammon Bay households have increased their use of moose in recent years, their harvests of Chinook salmon have decreased significantly. This is due to a severely decreased Chinook salmon population in the Yukon River since the late 1990s and the resulting restrictions that have reduced subsistence salmon fishing opportunities in the area. A similar decrease in the Chinook salmon population has occurred in the Kuskokwim River in recent years. However, unlike in most communities of the Yukon and Kuskokwim rivers, Quinhagak households have maintained higher harvests of Chinook salmon in proportion to their harvests of other salmon species. In comparison to Scammon Bay 2012 Chinook salmon harvests (7 lb per capita) Quinhagak fishers harvested significantly more of the species with a per capita harvest of 57 lb (tables 3-8 and 4-8). In recent years, Quinhagak fishers have not experienced the severity of fishing restrictions faced by fishers in Scammon Bay or even for those a few dozen miles away in the Kuskokwim River. This is due to the community's location at the mouth of the Kanektok River. The Chinook salmon stock that spawns in the Kanektok River continues to return in abundances great enough to support both directed subsistence and incidental commercial Chinook salmon fisheries (Tiernan and Poetter 2015:9), allowing local fishers to harvest Chinook salmon both for food and for cash to support their households. Relatively low Chinook salmon harvests in Scammon Bay are likely supplemented by more abundant alternative salmon species. Scammon Bay per capita harvests of summer and fall chum, coho, and pink salmon totaled 79 lb in 2012 (Table 3-8). Possibly due to the abundance of Chinook salmon, Quinhagak harvests of other salmon species were much lower than those of Scammon Bay. Quinhagak fishers harvested a total of 46 lb per capita of chum, sockeye, coho, and pink salmon in 2012 (Table 4-8).

Although communities throughout the Yukon-Kuskokwim Delta region can be characterized by numerous geographic, cultural, and socioeconomic factors that distinguish them from each other, the coastal communities of Scammon Bay and Quinhagak differ from many others as a result of the diversity and abundance of resources locally available to their residents. People living on the Y-K Delta coast enjoy a larger variety of marine, freshwater, terrestrial, avian, and plant species than people living even just short distances away from the Bering Sea. These communities have also been able to maintain relatively high total harvests of subsistence resources due to the proximity of healthy wild populations of moose, as in Scammon Bay, and Chinook and other salmon, as in Quinhagak.

Lower Kuskokwim River Communities

Research in the communities of Tuntutuliak and Eek represents the completion of at least 1 comprehensive subsistence study in all communities along the mainstem Kuskokwim River, and nearly all communities within the Kuskokwim River drainage. The majority of Kuskokwim River communities participated in the Donlin Gold Subsistence Research Program, and results highlight that subsistence living continues to play a major role in defining and connecting the region.

Even across the distances that separate them, residents throughout the Kuskokwim area share the same river and its resources. Yet by the time the waters of small upriver tributaries reach Tuntutuliak and Eek, the Kuskokwim River spans over a mile from bank to bank. The location of these communities at the transition from the Kuskokwim River to Kuskokwim Bay differentiates their subsistence harvest and use patterns from other Kuskokwim River communities. In general, subsistence use patterns in Tuntutuliak and Eek are intermediate between those of lower Kuskokwim River communities and those of coastal communities such as Scammon Bay and Quinhagak, described in the previous section. To harvest locally-available subsistence resources, residents of Tuntutuliak and Eek require the knowledge, skills, and equipment to navigate in the open ocean as well as through the regularly shifting shallows and channels that lie out of sight beneath the silt-laden waters of the lower Kuskokwim River. This study shows that the search and harvest areas for marine mammals of residents of Tuntutuliak and Eek extend well into Kuskokwim Bay and overlap the areas of coastal communities such as Quinhagak (figures 4-18, 5-18, and 6-18). Search and harvest areas for salmon and nonsalmon fish overlap substantially with areas used by communities farther upriver such as Napakiak. An indication of these communities' marine resource orientation can be seen in Figure 9-4. Harvest results show that per capita marine mammal harvests for Tuntutuliak and Eek were higher than



Note Conversion factors used in this report (Appendix C) have been applied to all harvests.

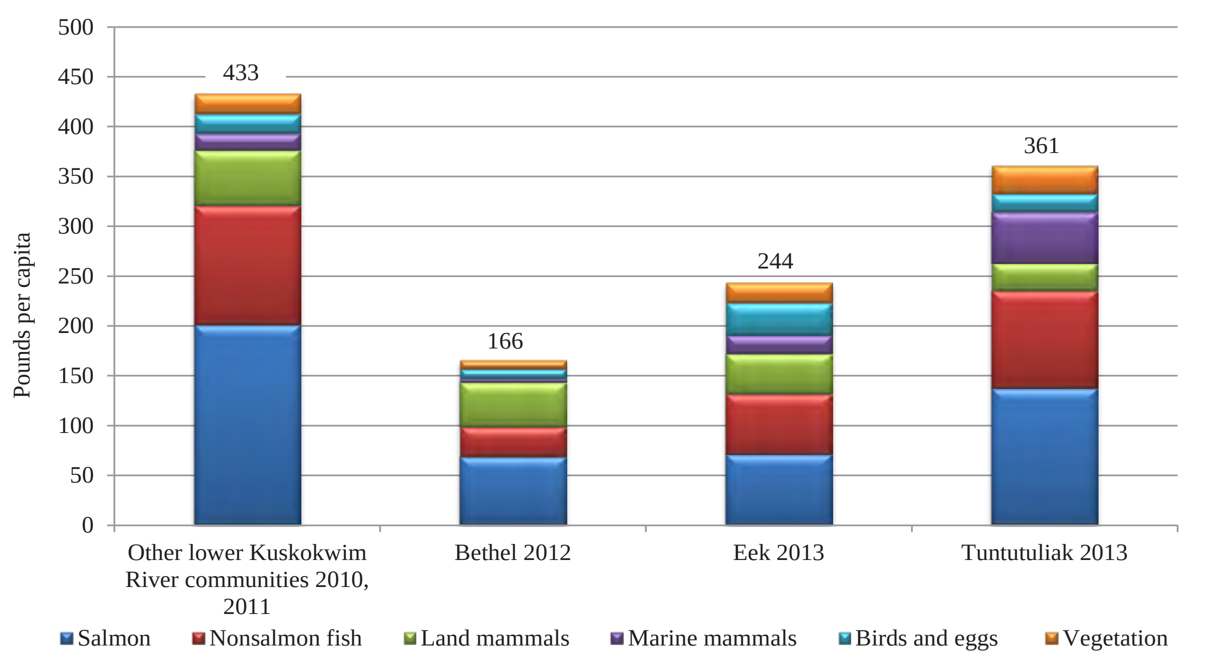
Figure 9-4.–Per capita harvests of marine mammals, lower Kuskokwim River and coastal communities, 2010–2013.

most other lower Kuskokwim River communities surveyed in 2010 and 2011; and for Tuntutuliak harvests levels were within the range of surveyed coastal communities.[6]

Per capita harvest quantities for all resources in lower Kuskokwim River communities surveyed about study year 2013 (Phase 4) were lower than for lower Kuskokwim River communities surveyed about study years 2010 and 2011 (phases 2 and 3). Much of this difference was due to larger per capita weights of fish in 2010 and 2011 relative to communities in 2013 (Figure 9-5). It is likely that low Chinook salmon abundance in 2013 had a large influence on Tuntutuliak and Eek community harvests in 2013. Although salmon fishing in 2013 was largely unrestricted in the lower Kuskokwim River while Chinook salmon were present near Tuntutuliak and Eek, the Chinook salmon run size in 2013 is estimated to have been the lowest on record, and the total estimated subsistence harvest of Chinook salmon in 2013 was 36% below the previous 10-year average (Tiernan and Poetter 2015:12). Figure 9-6 shows that for 2013 (Phase 4) communities, per capita harvests of both Chinook salmon and other species of salmon were below those estimated for previously surveyed lower Kuskokwim River communities other than Bethel. As an extreme example, the 2010 per capita harvest estimate for Chinook salmon in Oscarville in 2010 of 164 lb per capita is approximately 7 times larger than the 2013 estimated per capita harvest in Eek (Table 5-8; Brown et al. 2013).

In addition to such differences in Chinook salmon harvests, other species of salmon as well as nonsalmon fish were harvested in larger quantities in Phase 2 and Phase 3 lower Kuskokwim River communities than in Phase 4 communities (Figure 9-5). In the context of understanding differences in community harvests within the lower Kuskokwim River subregion, the presence or absence of large dog teams within a community may be significant. Figure 9-7 shows estimated per capita weights of fish used exclusively for dog food in surveyed lower Kuskokwim River communities. Quantities are negligible for 2013 communities, but represent from 2% to approximately 25% of per capita weight harvest estimates for 2010 communities.

6. Previously published estimated weights of individual marine mammals harvested (animal to edible weight conversion factors) differed in 2010 and 2011 relative to 2013. Figure 9-3 represents per capita harvest estimates standardized to those used in for 2013 communities.



Note Other lower Kuskokwim River communities include Napakiak, Napaskiak, Oscarville, Kwethluk, Akiak, and Tuluksak.

Figure 9-5.–Per capita harvests by category, Eek, Tuntutuliak, Bethel, and other lower Kuskokwim River communities, 2010–2013.

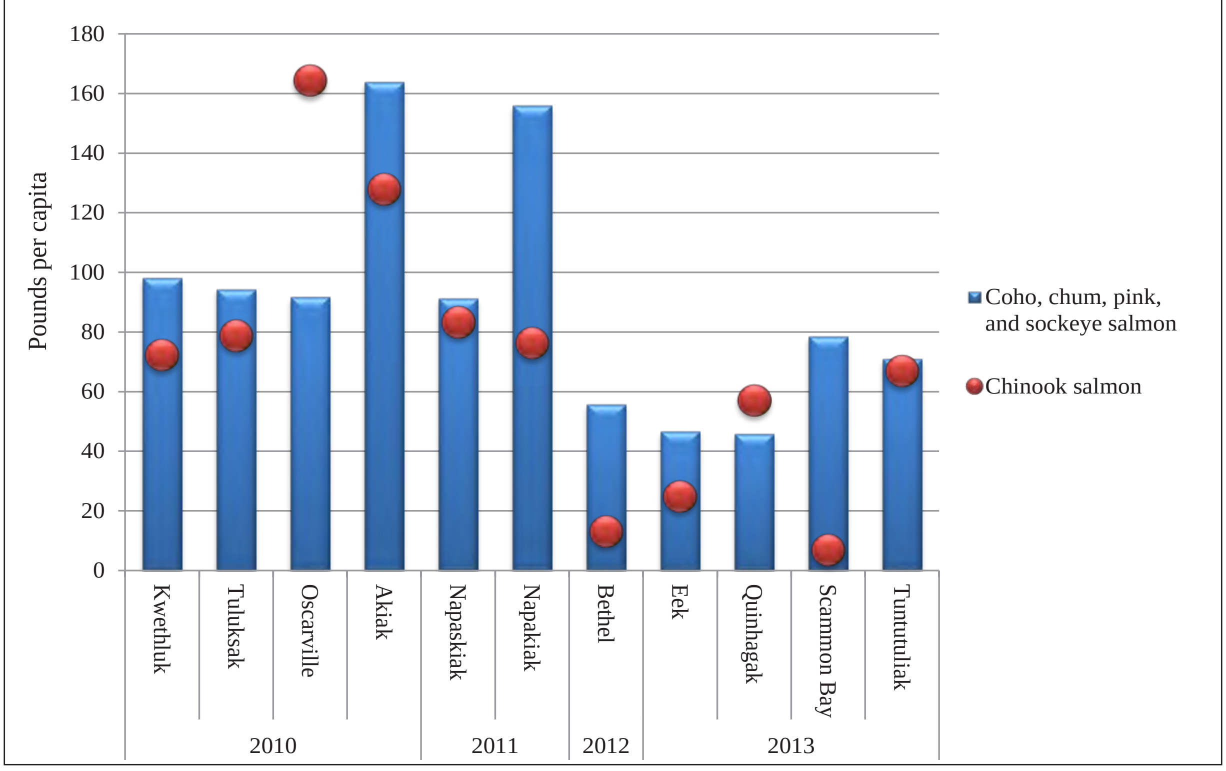


Figure 9-6.–Per capita harvests of salmon species, lower Kuskokwim River communities, 2010–2013.

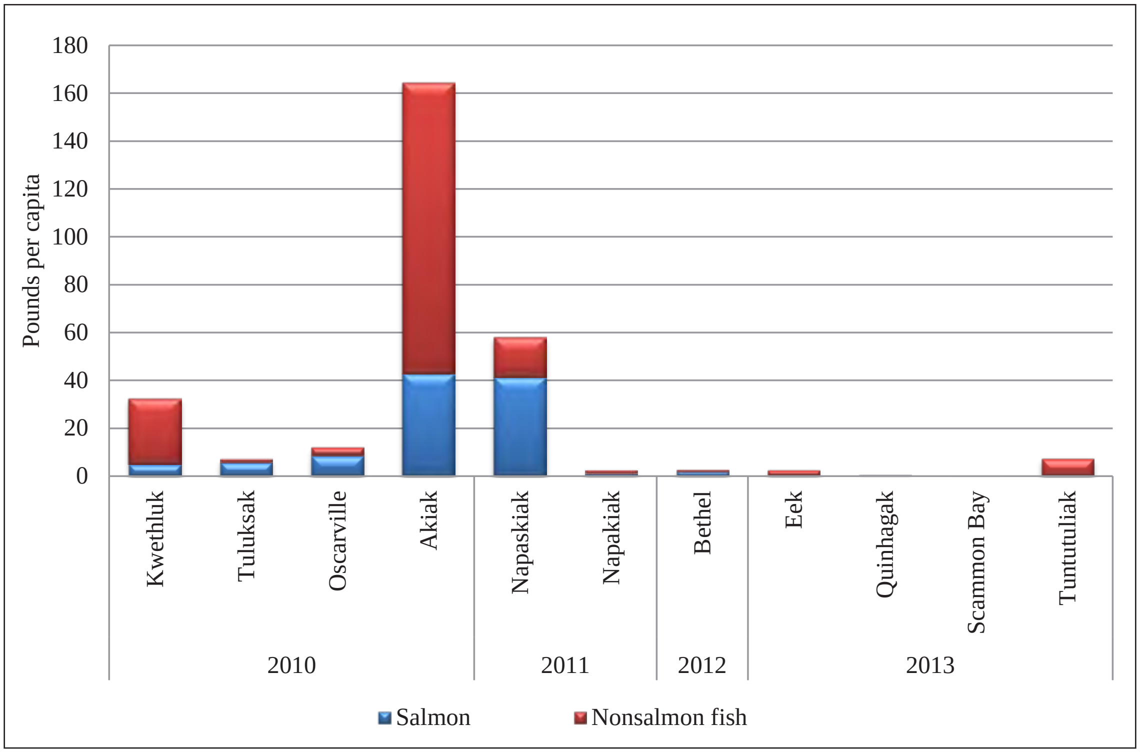


Figure 9-7.–Per capita harvests of salmon and nonsalmon fish used for dog food, lower Kuskokwim River communities, 2010–2013.

Although there are no clear explanations for this discrepancy, influential factors could include geographic differences (such as more dog mushing sporting events near the Bethel area), reduced use of fish for dog food due to lower salmon abundance in 2013, or other factors. Harvesting large quantities of fish exclusively for use as dog food has a long history in Alaska, and this is a legally recognized subsistence use. As such, there is no differentiation in cumulative harvest tables between fish consumption by humans versus dogs, although quantities of fish fed to dogs are measured and reported separately. Prior to the widespread use of snowmachines beginning in the late 1960s, individual families would often harvest thousands of chum salmon and other fish for dog food each summer out of necessity (Ikuta et al. 2013:74). Although total harvests of fish for dog food are likely much lower than in the past, recent differences in these harvests can result in substantial differences in per capita weight estimates between individual communities.

Yukon River Communities

Lower Yukon River

Pilot Station was the only community in Phase 4 of this program located within the lower Yukon River subregion. In addition to comprehensive subsistence research completed in Russian Mission in Phase 3 of this research program, other Division of Subsistence research resulted in subsistence documentation for the lower Yukon River communities of Mountain Village and Marshall for study year 2009 as well Emmonak for study year 2008 (Brown et al. 2012; Fall et al. 2012). Extensive documentation of subsistence harvest and use patterns in the Yukon Delta portion of the lower Yukon River region provides a detailed picture of a subsistence economy rooted in salmon and other fish and supported by a wide array of other marine and terrestrial resources (Wolfe 1981:67). Community subsistence harvest survey results for Pilot Station stand in stark contrast to this pattern, with overall low per capita harvests and particularly low salmon harvests relative to other lower Yukon River communities with recent subsistence documentation (Figure 9-8).

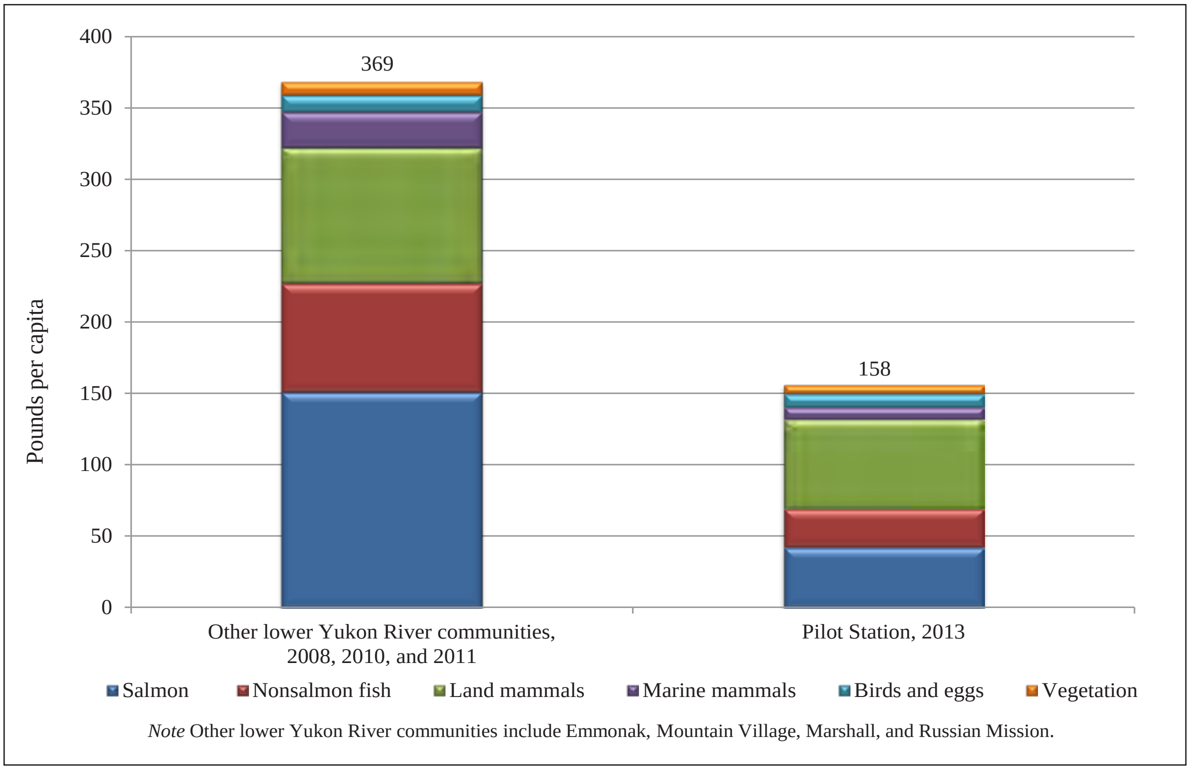


Figure 9-8.–Per capita harvests by category, Pilot Station and other lower Yukon River communities, 2008, 2010, 2011, and 2013.

As discussed in the Pilot Station chapter, salmon abundance, regulatory actions, and weather or climate patterns during the study year likely affected overall harvest levels. Additionally, Wolfe et al. (2010:4) described that harvest levels for young, newly established households are often low relative to older, more established households: this pattern may have been related to low overall harvests on a community level in Pilot Station during the study year. Specifically, a considerable percentage (38%) of adults over 20 years old in Pilot Station were young adults between 20 and 29 years of age, and respondents reported that multiple young families had recently returned to Pilot Station from urban centers (Table 7-3; Figure 7-3).

In addition to differences in overall harvests levels, the relative contribution of different resource categories to the total harvest in Pilot Station differed from other lower Yukon River communities. Although fish contributed over twice as many edible pounds per capita as land mammals for other lower Yukon River communities as a whole, the relative per capita contributions of fish (70 lb) and land mammals (63 lb) was much closer in Pilot Station (Figure 9-8). Such results are anomalous when viewed in the historical subregional context of the lower Yukon River, in which salmon formed the large bulk of the harvest (Wolfe 1981:146). When compared to historical results, the large contribution of land mammals to the total subsistence harvest in Pilot Station is likely the result of a dramatic increase in moose populations in the lower Yukon River subregion in recent years (Nedwick 2012), and harvest levels of moose are similar to those recently documented in nearby communities.[7] However, low harvest levels for fish species in particular suggest that anomalous conditions specific to Pilot Station may have influenced subsistence fishing in some way during 2013. For example, as discussed in the Pilot Station chapter, distribution of salmon harvested as part of nearby test fisheries may have been related to a reduction in salmon harvests by some households.

7. Per capita moose edible weight estimates were 59 lb in Pilot Station, and 61 and 67 lb, respectively, in the nearby communities of Mountain Village and Marshall in 2010 (Table 7-7; Brown et al. 2015).

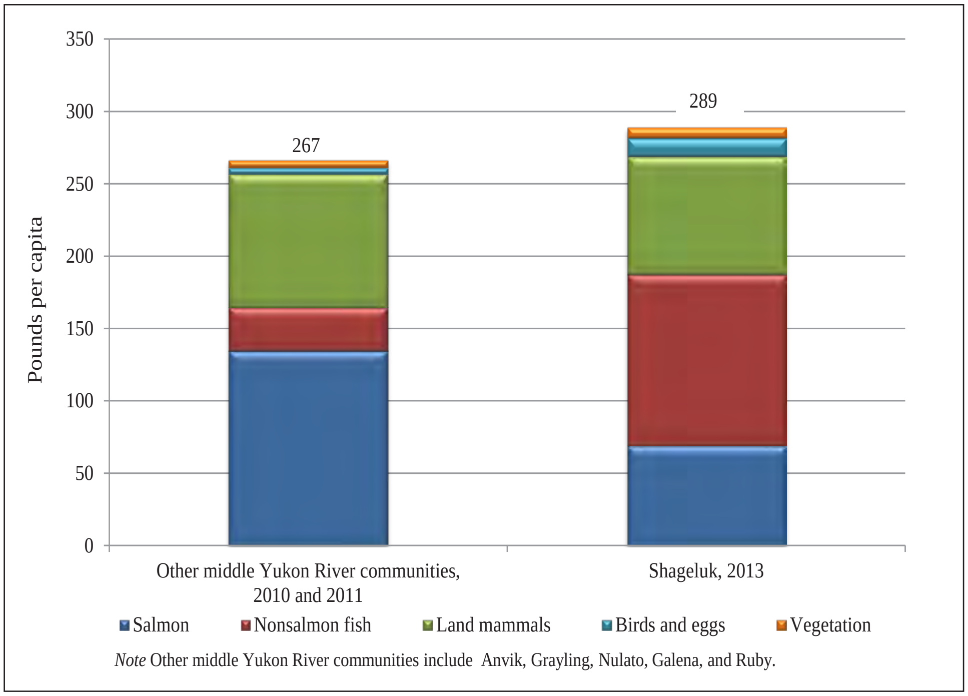


Figure 9-9.–Per capita harvests by category, Shageluk and other middle Yukon River communities, 2010, 2011, and 2013.

Middle Yukon River

Research in the middle Yukon River subregion specific to the 2013 study year was limited to the community of Shageluk. Grayling and Anvik had participated in the research program for Phase 2 (study year 2011). Other recent documentation of subsistence patterns in the area involved the collaboration of Nulato, Galena, and Ruby for study year 2010 (Brown et al. 2015). The communities that compose the middle Yukon River area represent a unique region at the westernmost boundaries of Interior Alaska. Extending approximately from Holy Cross to Tanana, the middle Yukon River area possesses considerable environmental diversity across its range, including several major Yukon River tributaries. Reflecting this diversity, area residents have developed distinct subsistence patterns directed towards localized conditions in addition to more general patterns that reflect the subregion as a whole. In particular, past research has shown that subsistence harvests in the area typically reflect the availability of Interior Alaska resources such as moose and furbearers, but often place greater emphasis on fish than in other regions of Interior Alaska (Brown et al. 2010:2–3; Snow 1981:604; Wheeler 1987:20). These communities are also connected in other ways that influence modern subsistence practices. For example, community residents are similarly affected by local resource management strategies, including federal subsistence fishing and hunting regulations within the Innoko and Nowitna National Wildlife Refuges, where many residents harvest their wild foods.

In 2013, Shageluk residents on average harvested quantities of wild food that were similar to the quantities harvested per person across other middle Yukon River communities (Figure 9-9). Shageluk residents' per capita harvests of land mammals, birds and eggs, and vegetation also were very similar to the average middle Yukon River region per capita values.

Although both the per capita quantity and percent contribution of fish as whole in Shageluk were quite similar to the subregional harvest average, the relative contribution of salmon and nonsalmon fish species shows a substantial difference, with much greater harvests of nonsalmon fish in Shageluk (118 lb compared to 30 lb in other middle Yukon River communities) and a lower contribution of salmon than the subregional average (70 lb compared to 135 lb; Figure 9-9). As noted in the Shageluk chapter, nonsalmon fish have long been a central component of Shageluk's subsistence harvest: its status as the only remaining permanent community along the Innoko River is ideal for harvesting large numbers of nonsalmon fish such as broad and humpback whitefish, sheefish, and northern pike, all of which have distinct Innoko River populations. However, even this relatively large edible weight contribution to Shageluk's 2013 harvest was described as substantially less than in most years, partially as a result of highly unusual weather conditions in 2013[8] that were reported to affect subsistence harvests throughout the Phase 4 study communities. Similarly, Shageluk residents described reduced salmon harvests in 2013 in relation to salmon fishing closures on the mainstem Yukon River: as described in the Shageluk chapter, the location of the community requires that residents invest considerable time and resources to harvest salmon from the mainstem Yukon River, and Shageluk respondents described that reductions in the length of individual salmon fishing openings have a more pronounced impact on their ability to participate in mainstem Yukon River fisheries when compared to residents of communities located directly alongside the mainstem Yukon River.

Conclusions

Subsistence harvests of wild foods in the communities presented in this study are representative of many aspects of contemporary life in Western Alaska. Differences in subsistence harvest and use patterns among study communities reflect variations in a number of geographic, cultural, and socioeconomic factors. Some of these factors are quite distinct, such as proximity to the Bering Sea as opposed to location along a large river system; or linguistic and ancestral origins that are either of the Central Yup'ik or Athabascan cultural groups. Similarities could be explained by the shared traditions of long family and community histories spent hunting, fishing, and gathering food from surrounding lands and waters.

Beyond a simple identification of community and regional comparisons, this study presents a number of potential research questions that, if investigated, might elucidate perceived changes in subsistence use patterns among Western Alaska communities. The widespread experience and perspective of many Alaskans is that the set of lifeways and traditions commonly referred to as *subsistence* are essential to the cultural, nutritional, and emotional well-being of families and communities throughout the state. Possible future research efforts will need to quantify the extent to which subsistence harvests of wild foods are changing for rural Alaskans and what the effects of these changes are on culture, nutrition, and general well-being. Refining research methods to quantify contributions of wild foods and other natural resource production to local and statewide economies will likely provide insight into the means of improving sustainability of rural Alaskan communities. For example, when paired with long-term subsistence harvest and use data sets, investigations of community demographic factors, such as changing populations within younger age cohorts, can inform projections of future demands on natural resources and the resultant effects on socioeconomic systems. Data presented in all 4 phases of the Donlin Gold Subsistence Research Program include community population profiles paired with a single year of subsistence harvest and use data, all of which indicate the need for further research into relationships between demography and harvests and uses of subsistence foods.

Additional research is also warranted to quantify changes in human interactions with geography, hydrology, and fish and wildlife populations as a result of global climate change effects on local natural systems. Mitigating these effects will also be critical in developing sustainable economic systems in rural Alaska and cannot occur without comprehensive and long-term quantifications of subsistence harvests and uses of natural resources. Data from multiple years of comprehensive subsistence research throughout Western Alaska are extremely limited, and future research would ideally include follow-up studies in at least a portion of communities investigated in all phases of the Donlin Gold Subsistence Research Program. Multiple years of comprehensive subsistence harvest and use data would provide a better understanding of the ways that changes occur between individual years within similar time periods.

8. Wendler, G., B. Moore, and K. Galloway. n.d. The Climate of Alaska for 2013. (Accessed April 28, 2016) http://akclimate.org/Summary/Statewide/Annual/2013

During the late 20th and early 21st centuries, rural Alaska communities have experienced dramatic changes in the ways in which people harvest food, travel, earn cash income, and connect with others outside their local environments. Due to a paucity of historical comprehensive data describing subsistence harvest and use patterns, it is likely impossible to define many of the changes to local economies and customary uses of natural resources with any quantitative certainty. However, data described by this and the previous 3 phases of the Donlin Gold Subsistence Research Program provide a substantial contribution to research that will attempt to define these changes in support of economic, community development, and natural resource management planning efforts.

REFERENCES

Ackerman, R.E.

1985. *Southwestern Alaska archeological survey*. National Geographic Society Research Reports 19, pages 67–82.

Alaska Department of Fish and Game

2006. *Our wealth maintained: a strategy for conserving Alaska's diverse wildlife and fish resources*. Alaska Department of Fish and Game: Juneau.

2013. 2013–2014 Alaska hunting regulations governing general, subsistence, and commercial uses of Alaska's wildlife. Alaska Department of Fish and Game: Juneau.

Alt, K.

[n.d.]. *Annual performance report for inventory and cataloging of sport fish and sport fish waters of western Alaska, Volume 22, Study G-I-P.* Department of Fish and Game, Sport Fish Division.

Andersen, D.B.

1992. *The use of dog teams and the use of subsistence-caught fish for feeding sled dogs in the Yukon River drainage, Alaska.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 210: Juneau.

1993. *Trapping in Alaska and the European Economic Community import ban on furs taken with leghold traps.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 223: Juneau.

Andersen, D.B. and C.L. Alexander

1992. *Subsistence hunting patterns and compliance with moose harvest reporting requirements in rural Interior Alaska.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 215: Juneau.

Anderson, D.D., W.W. Anderson, R. Bane, R.K. Nelson, and N.S. Towarak

1977. *Kuuvaŋmiut subsistence: traditional Eskimo life in the latter twentieth century*, First edition. U.S. Department of the Interior, National Park Service: Washington, D.C.

Andrews, E.F.

1977. "Anthropology and historic preservation" [in] *Report on the cultural resources of the Doyon region, central Alaska*. University of Alaska, Cooperative Park Studies Unit: Fairbanks.

1989. *The Akulmiut: territorial dimensions of a Yup'ik Eskimo society.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 177: Juneau.

Andrews, E. and M. Coffing

1986. *Kuskokwim River subsistence Chinook fisheries: An overview.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 146: n.p.

Andrews, E. and R. Peterson

1983. *Wild resource use of the Tuluksak River drainage by residents of Tuluksak, 1980-1983.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 87: n.p.

Arp, C.D. and B.M. Jones

2009. *Geography of Alaska lake districts: identification, description, and analysis of lake-rich regions of a diverse and dynamic state.* U.S. Geological Survey, Scientific Investigations Report 2008–5215: Reston, VA.

Barker, J.H. and R. Barker

1993. *Always getting ready: Upterrlainarluta: Yup'ik Eskimo subsistence in southwest Alaska*. University of Washington Press: Seattle.

Barnhardt, C.

1985. *Historical status of elementary schools in rural Alaskan communities: 1867–1980.* Center for Cross-Cultural Studies, College of Human and Rural Development, University of Alaska: Fairbanks.

Bickel, G., M. Nord, C. Price, W. Hamilton, and J. Cook
2000. *Guide to Measuring Household Food Security, Revised 2000.* U.S. Department of Agriculture, Food and Nutrition Service: Alexandria, VA.

Black, L.
2004. *Russians in Alaska, 1732-1867*. University of Alaska Fairbanks: Fairbanks.

Blank, R.M.
2012. *Letter to Governor Sean R. Parnell determining fishery resource disaster under the Magnuson-Stevens Fishery Conservation and Management Act of 1976 for certain Alaska Chinook salmon fisheries*.

Borba, B.M. and H.H. Hamner
1998. *Subsistence and personal use salmon harvest estimates, Yukon Area, 1997*. Alaska Department of Fish and Game Division of Commercial Fisheries: Anchorage.

2000. *Subsistence and personal use salmon harvest estimates Yukon Area, 1999*. Alaska Department of Fish and Game Division of Commercial Fisheries: Anchorage.

2001. *Subsistence and personal use salmon harvest estimates, Yukon Area, 2000*. Alaska Department of Fish and Game Division of Commercial Fisheries Regional Information Report No. 3A01-27: Anchorage.

Brabets, T.P., B. Wang, and R.H. Meade
2000. *Environmental and hydrologic overview of the Yukon River Basin, Alaska and Canada.* U.S. Geological Survey, Water Resources Investigation Report 99-4204: Anchorage.

Britton, K., R. Knecht, O. Nehlich, C. Hillerdal, R.S. Davis, and M.P. Richards
2013. *Maritime adaptations and dietary variation in prehistoric Western Alaska: Stable isotope analysis of permafrost-preserved human hair*. American Journal of Physical Anthropology 151(3), pages 448–461.

Brown, C., J. Burr, K. Elkin, and R.J. Walker
2005. *Contemporary subsistence uses and population distribution of non-salmon fish in Grayling, Anvik, Shageluk, and Holy Cross.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 289: Fairbanks.

Brown, C.L., A.R. Brenner, H. Ikuta, E. Mikow, B. Retherford, L.J. Slayton, A. Trainor, J. Park, D. Koster, and M.L. Kostick
2015. *The harvest and uses of wild resources in Mountain Village, Marshall, Nulato, Galena, and Ruby, Alaska, 2010*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 410: Fairbanks.

Brown, C.L., A. Godduhn, H. Ikuta, B. Retherford, A. Trainor, and S.J. Wilson
2015. *Socioeconomic effects of declining salmon runs on the Yukon River*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 398: Fairbanks.

Brown, C.L. and D. Koster
2005. *The 2003–2004 harvest of moose, caribou, bear and wolves in the lower–middle Yukon River communities of Grayling, Anvik, Shageluk, and Holy Cross.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 298: Juneau.

2015. The 2004–2005 harvest of moose, caribou, bear, and gray wolf in the lower-middle Yukon River communities of Grayling, Anvik, Shageluk, and Holy Cross. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 305: Fairbanks.

Brown, C.L., D. Koster, and P. Koontz
2010. *Traditional ecological knowledge and harvest survey of nonsalmon fish in the middle Yukon River region, Alaska 2005–2008*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 358: Fairbanks.

Brown, C.L., J.S. Magdanz, D.S. Koster, and N.S. Braem
2012. *Subsistence harvests in 8 communities in the central Kuskokwim River drainage, 2009*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 365: Fairbanks.

2013. *Subsistence harvests in 6 communities in the Kuskokwim River drainage, 2010*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 379: Fairbanks.

Brown, C.L., R.J. Walker, and S.B. Vanek
2004. *The 2002–2003 harvest of moose, caribou, bear and wolves in the lower–middle Yukon River communities of Grayling, Anvik, Shageluk, and Holy Cross.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 281: Juneau.

Brown, C.M.
1983. *Alaska's Kuskokwim River region: a history*. U.S. Department of the Interior,Bureau of Land Management, Alaska State Office: Anchorage.

Buklis, L.S.
1999. *A description of economic changes in commercial salmon fisheries in a region of mixed subsistence and market economies*. Arctic 52(1). ISSN 1923-1245, 0004-0843

Burch Jr., E.S.
1988. "Modes of exchange in northwest Alaska" [in] T. Ingold, D. Riches, and J. Woodburn, editors *Hunters and gatherers: volume 2, property, power and ideology*. Berg: Oxford.

2012. *Caribou herds of northwest Alaska, 1850–2000*. University of Alaska Press: Fairbanks.

Chapman, J.W.
1914. *Ten'a texts and tales*. E.J. Brill, Ltd.: Leyden, Netherlands.

Charnley, S.
1984. *Human ecology of two central Kuskokwim communities: Chuathbaluk and Sleetmute.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 81: Juneau.

Coates, Jennifer.
2004. *Experience and Expression of Food Security across Cultures: Practical Implications for Valid Measurement.* Washington, DC: Food and Nutrition Technical Assistance Project, FHI 360.

Coates, Jennifer, Parke E. Wilde, Patrick Webb, Beatrice Lorge Rogers, and Robert F. Houser.
2006. *Comparison of a Qualitative and a Quantitative Approach to Developing a Household Food Insecurity Scale for Bangladesh.* Journal of Nutrition 136 (5): 1420s–1430s.

Cochran, William G.
1977. *Sampling Techniques*. 3rd ed. New York: John Wiley & Sons.

Coffing, M., C.L. Scott, and C.J. Utermohle
1998. *The subsistence harvest of seals and sea lions by Alaska Natives in three communities of the Yukon-Kuskokwim Delta, Alaska, 1997-98.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 255: Juneau

1999. The subsistence harvest of seals and sea lions by Alaska Natives in three communities of the Yukon-Kuskokwim Delta, Alaska, 1998-99. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 257: Juneau.

Coffing, M.W.
1991. *Kwethluk subsistence: Contemporary land use patterns, wild resource harvest and use and the subsistence economy of a lower Kuskokwim River area community.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 157: Juneau.

Coffing, M.W., L. Brown, G. Jennings, and C.J. Utermohle
2001. *The subsistence harvest and use of wild resources in Akiachak, Alaska, 1998.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 258: Juneau.

Coleman-Jensen, A., M. Nord, M. Andrews, and S. Carlson
2012. *Household food security in the United States, 2011.* U.S. Department of Agriculture, Economic Research Service, Economic Research Report No. 141: Washington, DC.

Darwent, J. and C.M. Darwent
2014. "Scales of violence across the North American Arctic" [in] *Violence and Warfare among hunter-gatherers*. Left Coast Press: Walnut Creek, CA.

Dinstel, R.R. and L. Shallcross
2014. *Fireweed*. University of Alaska Fairbanks Cooperative Extension Service: Fairbanks.

Dorsey, J.
2011. *Eek River system, HUC 30502, Zone 2, Kuskokwim River region, final interim summary report.* Alaska Department of Natural Resources, Office of History and Archaeology Navigable Waters Research Report No. 19.

Doyon Limited
2015. *Shageluk, Alaska: Seward Kateel River Meridians, Unalakleet and Holy Cross Quadrangles*.

https://www.doyon.com/wp-content/uploads/2015/08/2094312.Shageluk.pdf

Dumond, D.E.
1977. *The Eskimos and Aleuts.* Thames and Hudson: London.

1984. "Prehistory of the Bering Sea region" [in] W.C. Sturtevant, editor *Handbook of North American Indians, 5: Arctic.* Smithsonian Institution Press: Washington, D.C.

Elison, T.
2013. *2013 Kuskokwim River salmon fishery news release 1, Alaska Board of Fisheries decisions on Kuskokwim Area proposals [press release]*. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/245450953.pdf

Endter-Wada, J. and L. Robbins
1992. *A comparative subregional analysis of subsistence practices in the Bristol Bay region of Alaska*. Alaska OCS Region Fourth Information Transfer Meeting Conference Proceedings , pages 199–206.

Estensen, J.L., E.J. Newland, B.M. Borba, S.N. Schmidt, D.M. Jallen, and K.M. Hilton
2015. *Annual management report Yukon Area, 2013.* Alaska Department of Fish and Game, Fishery Management Report No. 15-19: Anchorage.

Fall, J.A., N.M. Braem, S.S. Evans, L. Hutchinson-Scarbrough, B. Jones, R. La Vine, T. Lemons, M.A. Marchioni, E. Mikow, J.T. Ream, and L.A. Sill
2014. *Alaska subsistence and personal use salmon fisheries 2012 annual report*. Alaska Diepartment of Fish and Game, Division of Subsistence Technical Paper No. 406: Anchorage.

Fall, J.A., A.R. Brenner, S.S. Evans, L. Hutchinson-Scarbrough, B. Jones, R. La Vine, T. Lemons, M.A. Marchioni, E. Mikow, J.T. Ream, L.A. Sill, and A. Trainor
2013. *Alaska subsistence and personal use salmon fisheries 2011 annual report*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 387: Anchorage

Fall, J.A., C.L. Brown, N.M. Braem, L. Hutchinson-Scarborough, D.S. Koster, T.M. Krieg, and A.R. Brenner
2012. *Subsistence harvests and use in three Bering Sea communities, 2008: Akutan, Emmonak, and Togiak*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 371: Anchorage.

Fall, J.A., M. George, and B. Easley
2005. *Subsistence harvests of Pacific halibut in Alaska, 2004.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 304.

Fall, J.A., M. Kerlin, B. Easley, and R.J. Walker
2004. *Subsistence harvests of Pacific halibut in Alaska, 2003.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 288: Juneau.

Fall, J.A., D. Koster, and B. Davis
2006. *Subsistence harvests of Pacific halibut in Alaska, 2005.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 320.

Farrell, M., D. Yesner, and D. Monteith
2015. *The Moose Hill Site: the dynamic interplay of climate change, marine productivity, volcanism, and cultural transitions on the Kvichak River, Bristol Bay, Alaska*. Presented at the 80th Annual Meeting of the Society for American Archaeology: San Francisco, CA.

Fienup-Riordan, A.
1990. *Eskimo essays: Yup'ik lives and how we see them*. Rutgers University Press: New Brunswick.

1995. Boundaries and Passages: Rule and Ritual in Yup'ik Eskimo Oral Tradition. University of Oklahoma Press: Norman, OK.

1986. When our bad season comes: a cultural account of subsistence harvesting and harvest disruption on the Yukon Delta. Alaska Anthropological Association: Anchorage.

2007. *The way we genuinely live = Yuungnaqpiallerput: masterworks of Yup'ik science and survival*. University of Washington Press; in association with Anchorage Museum of History and Art and Calista Elders Council: Seattle and Anchorage.

Fienup-Riordan, A. editor.
2011. *Qaluyaarmiuni Nunamtenek Qanemciput/ Our Nelson Island stories*. University of Washington Press with Calista Elders Council: Seattle and Anchorage.

Frongillo, Edward A., and Siméon Nanama.
2006. *Development and Validation of an Experience-Based Measure of Household Food Insecurity within and across Seasons in Northern Burkina Faso.* Journal of Nutrition 136 (5): 1409s–1419s.

Funk, C.
2010. *The Bow and Arrow War days on the Yukon-Kuskokwim Delta of Alaska.* Ethnohistory 57(4), pages 523–569.

Halfman, C.M., R. Sattler, and J. Clark
2014. *Bone collagen stable isotope analysis of three prehistoric humans from the Upper Kuskokwim village of McGrath, western Interior Alaska*. Proceedings of the 41st Annual Meeting of the Alaska Anthropological Association: Fairbanks.

Hamazaki, T.
2011. *2011 reconstruction of subsistence harvests in the Kuskokwim areas, 1990–2009*. Alaska Department of Fish and Game, Fishery Manuscript No. 11-09: Juneau.

Hamazaki, T. and Z. Liller
2015. *Kuskokwim River Chinook salmon run reconstruction and model revisions, 2014*. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A15-05: Anchorage.

Heaton, J.W.
2012. *Athabascan village stores: subsistence shopping in Interior Alaska, 1850–1950*. Western Historical Quarterly 43, pages 133–155.

Himmelheber, H.
1987. *Eskimo artists (fieldwork in Alaska, June 1936 until April 1937).* [English translation of *Eskimokünstler* from the original German]. Museum Rietberg: Zürich.

Hoffecker, J.F. and S.A. Elias
2003. *Environment and archaeology in Beringia.* Evolutionary Anthropology 12, pages 34–49.

Hoffecker, J.F., S.A. Elias, and D.H. O'Rourke
2014. *Out of Beringia?* Science 343(6174), pages 979–980.

Holder, R.R. and D. Senecal-Albrecht
1998. *Yukon River comprehensive salmon plan for Alaska*. Alaska Department of Fish and Game: Fairbanks.

Holen, D.L. and T. Lemons
2010. *Subsistence harvests and uses of wild resources in Lime Village, Alaska, 2007.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 355.

Holen, D.L., W.E. Simeone, and L. Williams
2006. *Wild resource harvests and uses by residents of Lake Minchumina and Nikolai Alaska, 2001–2002*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 296.

Hosley, E.H.
1981. "Environment and culture in the Alaska plateau" [in] W.C. Sturtevant and J. Helm, editors *Handbook of North American Indian*s, 6: Subarctic. Smithsonian Institution Press: Washington, D.C.

Ikuta, H., A.R. Brenner, and A. Godduhn
2013. *Socioeconomic patterns in subsistence salmon fisheries: historical and contemporary trends in five Kuskokwim River communities and overview of the 2012 season*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 382: Fairbanks.

Ikuta, H., C.L. Brown, and D.S. Koster
2014. *Subsistence harvests in 8 communities in the Kuskokwim River drainage and lower Yukon River, 2011*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 396: Fairbanks.

Jacobson, S.A.
2012. *Yup'ik Eskimo Dictionary*, 2nd edition. Alaska Native Language Center, University of Alaska: Fairbanks.

JTC (Joint Technical Committee of the Yukon River US/Canada Panel)
2014. *Yukon River salmon 2013 season summary and 2014 season outlook*. Alaska Department of Fish and Game, Division of Commerical Fisheries, Regional Information Report No. 3A14-01: Anchorage.

Kari, P.R.
1983. *Land use and economy of Lime Village.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 80: n.p.

Keim, F.J. editor.
1984. *Edible and useful plants of Scammon Bay.* Upward Bound Program, Keggatmiut High School: Scammon Bay, AK.

Korsakovskiy, P. and I.Y. Vasilev
1988. *Russian exploration in Southwest Alaska: the travel journals of Petr Korsakovskiy (1818) and Ivan Ya. Vasilev (1829)*, v. 4 book in the The Rasmuson Library historical translation series. University of Alaska Press: Fairbanks.

Krauthoefer, T., C.L. Brown, and D. Koster
2015. *Household harvests of moose, caribou, bears, and wolves in Central Kuskokwim drainage communities, Alaska, 2003–2006*. Alaska Department of Fish and Game, Division of Subsistence.

Krauthoefer, T., J. Simon, M. Coffing, M. Kerlin, and W. Morgan
2007. *The harvest of non-salmon fish by residents of Aniak and Chuathbaluk, Alaska, 2001–2003*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 299: Juneau.

Lee, M.
2002. *The cooler ring: urban Alaska Native women and the subsistence debate*. Arctic Anthropology 39(1–2), pages 3–9.

Lingnau, T.L. and F.J. Bue
2001. *Overview of the Yukon River salmon fisheries 2001–2003: a report to the Alaska Board of Fisheries*. Alaska Department of Fish and Game Division of Commercial Fisheries Regional Informational Report No. 3A04-04: Anchorage.

Lonner, T.D.
1980. *Subsistence as an economic system in Alaska: theoretical and policy implications.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 67: Anchorage.

Loyens, W.J.
1966. *The changing culture of the Nulato Koyukon Indians*. University of Wisconsin: Madison, WI.

Magdanz, J.S.
1988. *Harvest and exchange of eulachon from the Chilkat and Chilkoot rivers, Alaska.* Alaska Department of Fish and Game Division of Subsistence, Special Publication No. SP1988-03: Juneau.

Magdanz, J.S., S. Tahbone, A. Ahmasuk, D.S. Koster, and B.L. Davis
2007. *Customary trade and barter in fish in the Seward Peninsula Area, Alaska.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 328: Juneau.

Magdanz, J.S., E. Trigg, A. Ahmasuk, P. Nanouk, D.S. Koster, and K. Kamletz
2009. *Patterns and trends in subsistence salmon harvests, Norton Sound-Port Clarence Area, Alaska, 1994–2003.* American Fisheries Society Symposium 70, pages 395–431.

Magdanz, J.S. and R.J. Wolfe
1988. *The production and exchange of seal oil in Alaska.* Alaska Department of Fish and Game Division of Subsistence, Special Publication No. SP1988-001: Juneau.

Mann, D.H., A.L. Crowell, T.D. Hamilton, and B.P. Finney
1998. *Holocene geologic and climatic history around the Gulf of Alaska*. Arctic Anthropology 35(1), pages 112–131.

Marston, M.
1972. *Men of the Tundra: Alaska Eskimos at war.* October House: New York.

Mason, O.K. and S.C. Gerlach
1995. *Chukchi hot spots, paleo-polynyas, and caribou crashes: climatic and ecological dimensions of north Alaska prehistory*. Arctic Anthropology 32(1), pages 101–130.

McFayden Clark, A.
1996. *Who lived in this house? A study of Koyukuk River semisubterranean houses*. Canadian Museum of Civilization: Hull, Quebec.

Melgar-Quinonez, Hugo R., Ana C. Zubieta, Barbara MkNelly, Anastase Nteziyaremye, Maria Filipinas D. Gerardo, and Christopher Dunford.
2006. *Household Food Insecurity and Food Expenditure in Bolivia, Burkina Faso, and the Philippines.* Journal of Nutrition 136 (5): 1431S–1437S.

Moncrieff, C.F.
2007. *Traditional ecological knowledge of customary trade of subsistence harvested salmon on the Yukon River, Final report to the Office of Subsistence Management, Fisheries Information Services, Study 04-265.* Yukon River Drainage Fisheries Association: Anchorage.

Naves, L.C.
2010a. *Alaska migratory bird subsistence harvest estimates, 2008, Alaska Migratory Bird Co-Management Council*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 353: Anchorage.

2010b. Alaska migratory bird subsistence harvest estimates, 2004–2007, Alaska Migratory Bird Co-Management Council. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 349: Anchorage.

2011. *Alaska migratory bird subsistence harvest estimates, 2009, Alaska Migratory Bird Co-Management Council*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 364: Anchorage.

2012. Alaska migratory bird subsistence harvest estimates, 2010, Alaska Migratory Bird Co-Management Council. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 376: Anchorage.

2014. Alaska subsistence harvests of birds and eggs, 2011, Alaska Migratory Bird Co-Management Council. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 395: Anchorage.

2015. *Alaska subsistence harvest of birds and eggs, 2013, Alaska Migratory Bird Co-Management Council*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 409: Anchorage.

Nedwick, M.
2012. *Moose management success in the lower Yukon*. Alaska Fish and Wildlife News (February 2012).

Nelson, E.W.
1978. *E. W. Nelson's notes on the Indians of the Yukon and Innoko Rivers, Alaska.* Field Museum of Natural History: Chicago.

Nord, Mark, Margaret Andrews, and Steven Carlson.
2008. *Household Food Security in the United States, 2007.* Washington, DC: Department of Agriculture, Economic Research Service, ERR-66.

Orth, D.J.
1971rep. [1967] *Dictionary of Alaska Place Names.* United States Government Printing Office.

Osgood, C.
1958. *Ingalik Social Culture*. Yale University Press: New Haven, Connecticut.

Oswalt, W.H.
1963. *Napaskiak: an Alaskan Eskimo community*. University of Arizona Press: Tuscon.

Peirce, J.M.
2014. "Units 21A and 21E moose" [in] P. Harper and L.A. McCarthy, editors *Moose management report of survey and inventory activities from 1 July 2011–30 June 2013*. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2014-6: Juneau.

Pennoyer, S., K.R. Middleton, and M.E. Morris, Jr.
1965. *Arctic-Yukon-Kuskokwim Area salmon fishing history*. Alaska Department of Fish and Game, Division of Commercial Fisheries Informational Leaflet 70: Juneau.

Pérez-Escamilla, Rafael, Ana Maria Segall-Corrêa, Lucia Kurdian Maranha, Maria de Fátima Archanjo Sampaio, Leticia Marín-León, and Giseli Panigassi.
2004. *An Adapted Version of the U.S. Department of Agriculture Food Insecurity Module Is a Valid Tool for Assessing Household Food Insecurity in Campinas, Brazil.* Journal of Nutrition 134 (8): 1923–28.

Perry, P.
2012. "Unit 18 moose management report" [in] P. Harper, editor *Moose management report of survey and inventory activities 1 July 2009–30 June 2011*. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2012-5: Juneau.

2013. "Unit 18 caribou management report" [in] P. Harper, editor *Caribou management report of survey and inventory activities 1 July 2010–30 June 2012*. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2013-3: Juneau.

Pete, M.C.
1984. *Subsistence use of herring in the Nelson Island Region of Alaska.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 113: Juneau.

1991a. *Contemporary patterns of wild resource use by residents of Russian Mission, Alaska*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 127: Juneau.

1991b. *Subsistence herring fishing in the Nelson and Nunivak Island districts, 1991.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 211: Juneau.

1991c. Subsistence herring fishing in the eastern Bering Sea region: Nelson Island, Nunivak Island, and Kuskokwim Bay. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 192: Fairbanks.

1992. *Subsistence herring fishing in the Nelson Island and Nunivak Island districts, 1992.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 221: Juneau.

1993. “Foreword: Always getting ready: Upterrlainarluta: Yup’ik Eskimo subsistence in southwest Alaska” [in] J.H. Barker *Always getting ready: Upterrlainarluta: Yup’ik Eskimo subsistence in southwest Alaska*. University of Washington Press: Seattle.

Pete, M.C., D.E. Albrecht, and R.E. Kreher
1987. *Subsistence herring fishing in the Nelson Island District and Northern Kuskokwim Bay, 1987.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 160: Juneau.

Pete, M.C. and R.E. Kreher
1986. *Subsistence herring fishing in the Nelson Island district, 1986*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 144: Bethel.

Pielou, E.C.
1992. *After the Ice Age: the return of life to glaciated North America.* University of Chicago Press: Chicago.

Potter, B.A.
2008a. *Exploratory models of intersite variability in mid to late Holocene central Alaska*. Arctic 64(4), pages 407–425.

2008b. Radiocarbon chronology of central Alaska: technological continuity and economic chage. Radiocarbon 50(2), pages 181–204.

Pratt, K.L.
2009
Chasing the Dark: Perspectives on place, history and Alaska Native land claims. U.S. Department of the Interior Bureau of Indian Affairs: Alaska.

Pringle, H.
2014. *Welcome to Beringia.* Science 343(6174), pages 961–963.

Raghavan, M., M. Steinrucken, K. Harris, S. Schiffels, S. Rasmussen, M. DeGiorgio, A. Albrechtsen, C. Valdiosera, M.C. Avila-Arcos, A.-S. Malaspinas, et al.
2015. *Genomic evidence for the Pleistocene and recent population history of Native Americans*. Science 349(6250), pages aab3884–aab3884. ISSN 0036-8075, 1095-9203 10.1126/science.aab3884

Ray, L., C. Brown, A. Russell, T. Krauthoefer, C. Wassillie, and J. Hooper
2010. *Local knowledge and harvest monitoring of nonsalmon fishes in the lower Kuskokwim River region, Alaska, 2005–2009. Final report to the U.S. Fish and Wildlife Service, Office of Subsistence Management, to fulfill obligations for Study No. FIS 06-351*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 356: Fairbanks.

Ream, B.A.
1986. *Old fish camp: an ethnographic and archaeological analysis of a Lower Yukon Koyukon Athabaskan winter village, Khotol River, Alaska*. Western Washington University: Bellingham, WA.

Rearden, A. and A. Fienup-Riordan
2013. *Erinaput Unguvaniartut / So our voices will live: Quinhagak history and oral traditions*. Calista Elders Council and the Alaska Native Language Center, University of Alaska, Fairbanks: Fairbanks.

Renner, L.L.
2005. *Alaskana Catholica: a history of the Catholic Church in Alaska.* Society of Jesus, Oregon Province: Portland, OR.

Ross, D.R.
[n.d.]. *Alaska plant profiles: conks/ shelf fungi*. Alaska Department of Natural Resources, Division of Agriculture: Palmer.

Runfola, D.M., A.R. Brenner, and D.S. Koster
2014. *Subsistence harvests of land mammals in Bethel, Alaska 2011*. Alaska Department of Fish and Game, Division of Subsistence Special Publication No. 2014-01: Fairbanks.

Saleeby, B.M.
2010. *Ancient footsteps in a new land: building an inventory of the earliest Alaskan sites*. Arctic Anthropology 47(2), pages 116–132.

Schmidt, J.I. and F.S. Chapin
2014. *Relationship of community characteristics to harvest reporting: comparative study of household surveys and harvest tickets in Alaska*. Human Dimensions of Wildlife 19(4), pages 334–346.

Schneider, W.
2012. *On time delivery: the dog team mail carriers*. University of Alaska Press: Fairbanks.

Schroeder, R.F., D.B. Andersen, R. Bosworth, J.M. Morris, and J.M. Wright
1987. *Subsistence in Alaska: Arctic, Interior, Southcentral, Southwest, and Western regional summaries.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 150: Juneau.

Schwatka, F.
1885. *Report of a military reconnaissance in Alaska made in 1883*. Government Printing Office: Washington.

Senecal-Albrecht, D.
1998. *"Don't wait for Boldt": building co-management from the ground up: the success of salmon fishermen's groups in western Alaska*. "Crossing Boundaries," the seventh annual conference of the International Association for the Study of Common Property. Vancouver, British Columbia, Canada, June 10–14, 1998: Vancouver, B.C.

Senecal-Albrecht, D.E.
1990. *Co-management as transaction: the Kuskokwim River Salmon Management Working Group*. McGill University: Montreal.

Shanks, A.
2013. *Yukon-Koyukuk Census Area: communities spread far across Interior*. Alaska Economic Trends, pages 9–13.

Sicoli, M.A. and G. Holton
2014. *Linguistic phylogenies support back-migration from Beringia to Asia*. PLoS ONE 9(3), page e91722.

Simon, J.
2016. *Customary and traditional use worksheet, caribou, Game Management Unit 18*. Alaska Department of Fish and Game, Division of Subsistence Special Publication No. BOG 2016-03: Fairbanks.

Simon, J.J., J. Park, and M.L. Kostick
2016. *Subsistence wildlife harvests in Nunapitchuk, Alaska, 2012*. Alaska Department of Fish and Game Division of Subsistence, Special Publication No. 2016-001: Fairbanks.

Smith, S.C., N. Foster, and T. Gotthardt
2005. *The distribution of the freshwater mussels Anodonta spp. and Margaritifera falcata in Alaska*. University of Alaska Anchorage, Alaska Natural Heritage Program: Anchorage.

Snoek, C. and M. Stang
2014. *How similar are Dene languages?* Paper presented at the 11th High Desert Linguistics Society Conference: Albuquerque.

Snow, J.H.
1981. "Ingalik" [in] W.C. Sturtevant and J. Helm, editors *Handbook of North American Indian*s, 6: Subarctic. Smithsonian Institution Press: Washington, D.C.

Stickney, A.
1984. *Coastal ecology and wild resource use in the central Bering Sea area: Hooper Bay and Kwigillingok.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 85: n.p.

Smith, E.A. and J.C. Linderman Jr.
2008. *Activities of the Kuskokwim River salmon management working group, 2007*. Alaska Department of Fish and Game, Fishery Management Report No. 08-74: Anchorage.

Stratton, L. and S. Georgette
1984. *Use of fish and game by communities in the Copper River Basin, Alaska: a report on a 1983 household survey*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 107: Anchorage.

Swindale, Anne, and Paula Bilinsky. 2006. *Development of a Universally Applicable Household Food Insecurity Measurement Tool: Process, Current Status, and Outstanding Issues.* Journal of Nutrition 136 (5): 1449S–1452S.

Tiernan, A. and A. Poetter
2015. *2013 Kuskokwim area management report*. Alaska Department of Fish and Game, Fishery Management Report No. 15-46: Anchorage.

Todd, S.K. and H.A. Jewkes
2006. *Wildland fire in Alaska: a history of organized fire suppression and management in the last frontier*. University of Alaska Fairbanks, Agricultural and Forestry Experiment Station Bulletin No. 114: Fairbanks.

Trotter II, Robert T., and Jean J. Schensul.
1998. "Methods in Applied Anthropology." [in] *Handbook of Methods in Cultural Anthropology,* edited by H.R. Bernard, 691–735. Walnut Creek, CA: AltaMira Press.

La Vine, R., M.J. Lisac, and P. Coiley-Kenner
2007. *Traditional ecological knowledge of 20th-century ecosystems and fish populations in the Kuskokwim Bay region*. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Project No. FIS 04-351: Anchorage.

U.S. Fish and Wildlife Service, Alaska Region
2008. *Revised comprehensive conservation plan for the Innoko National Wildlife Refuge*. U.S. Fish and Wildlife Service: Anchorage.

United States Department of Commerce, Bureau of the Census
1940. *Sixteenth census of the United States. Population–Alaska*: Fourth Judicial Division, Otter Recording District, Enumeration District 4-25, Shageluk (village).

Valkenburg, P., R.A. Sellers, R.C. Squibb, J.D. Woolington, A.R. Aderman, and B.W. Dale
2003. *Population dynamics of caribou herds in southwestern Alaska*. Rangifer 23(5). ISSN 1890-6729 10.7557/2.23.5.1694

VanLanen, J.M., D. Runfola, and D. Koster
2015. *Whitefish trends on the Upper Kuskokwim River: Ethnographic overview and 2012–2013 nonsalmon fish harvests, Nicolai and Lime Village, Alaska*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 407: Anchorage.

VanStone, J.W.
1974. *Athapaskan adaptations: hunters and fisherman of the subarctic forests*. Aldine Publishing Company: Chicago.

1976. The Yukon River Ingalik: subsistence, the fur trade, and a changing resource base. Ethnohistory 23(3), pages 199–212.

1979a. Historic Ingalik Settlements Along the Yukon, Innoko, and Anvik Rivers, Alaska. Field Museum of Natural History: Chicago.

1979b. Ingalik contact ecology: an ethnohistory of the lower–middle Yukon, 1790–1935. Field Museum of Natural History: Chicago.

1984. "Mainland Southwest Alaska Eskimo" [in] W.C. Sturtevant, editor *Handbook of North American Indians, 5: Arctic.* Smithsonian Institution Press: Washington, D.C.

VanStone, J.W. and I. Goddard
1981. "Territorial groups of west central Alaska before 1898" [in] W.C. Sturtevant, editor *Handbook of North American Indians, 6: Subarctic.* Smithsonian Institution: Washington D.C.

Verbrugge, L.A. and J.P. Middaugh
2004. “Volume 1. Polychlorinated biphenyls (PCBs) and related compounds” [in] *Use of traditional foods in a healthy diet in Alaska: risks in perspective*, Second Edition edition. Alaska Department of Health and Social Services, Section of Epidemiology, State of Alaska Epidemiology Bulletin Volume 8 No. 8: Anchorage.

Viereck, L.A. and E.L. Little Jr.
1972. *Alaska trees and shrubs.* U.S. Department of Agriculture, U.S. Forest Service, Agriculture Handbook No. 410: Washington, D.C.

Walker, R.J. and M.W. Coffing
1993. *Subsistence salmon harvests in the Kuskokwim area during 1989*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 189: Juneau.

Webb, Patrick, Jennifer Coates, Edward A. Frongillo, Betty Lorge Rogers, Anne Swindale, and Paula Bilinsky. 2006. *Measuring Household Food Insecurity: Why It’s so Important and yet so Difficult to Do.* Journal of Nutrition 136 (5): 1404s–1408s.

Weekley, G., B. Brettschneider, A. Brettschneider, O. Ramirez, and T. Haynes
2011. *Lower Yukon large mammal subsistence harvest survey: the 2010 harvest of moose, caribou, muskox, bear, wolverine, and wolf in nine lower Yukon communities, Alaska*. U.S. Fish and Wildlife Service, Office of Subsistence Management and the Yukon Delta National Wildlife Refuge.

Wheeler, P.C.
1987. *Salmon fishing patterns along the middle Yukon River at Kaltag, Alaska*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 156.

1998. The role of cash in northern economies: a case study of four Alaskan Athabascan villages. University of Alberta, Department of Anthropology: Edmonton.

Wiles, G.C., R.D. D’Arrigo, R. Villalba, P.E. Calkin, and D.J. Barclay
2004. *Century-scale solar variability and Alaskan temperature change over the past millennium*. Geophysical Research Letters 31(L15203).

Wolfe, R.J.
1981. *Norton Sound/Yukon Delta sociocultural systems baseline analysis.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 59: n.p.

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.

1989. *Subsistence-recreational conflicts along the Togiak, Kanektok, and Goodnews rivers: a summary.* Alaska Department of Fish and Game, Division of Subsistence Special Publication No. 1989-01: Juneau.

2006. Playing with fish and other lessons from the North. University of Arizona Press: Tucson.

Wolfe, R.J., J.J. Gross, S.J. Langdon, J.M. Wright, G.K. Sherrod, L.J. Ellanna, and V. Sumida
1984. *Subsistence-based economies in coastal communities of Southwest Alaska*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 89; Minerals Management Service, Alaska Region, U.S. Department of the Interior.

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

Wolfe, R.J., W.E. Simeone, C.J. Utermohle, M.C. Pete, and National Science Foundation
1993. *The sharing, distribution, and exchange of wild resources in Alaska: a compendium of materials presented to the Alaska Board of Fisheries.* Alaska Department of Fish and Game Division of Subsistence: Juneau.

Wright, J.M., J.M. Morris, and R. Schroeder
1985. *Bristol Bay regional subsistence profile.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 114: Dillingham.

Wunderlich, G. S., and J. L. Norwood.
2006. Food Insecurity and Hunger in the United States: An Assessment of the Measure. Panel to Review the U.S. Department of Agriculture's Measurement of Food Insecurity and Hunger. Washington, D.C.: Committee on National Statistics, Division of Behavioral and Social Sciences and Education, the National Academies Press.

Zagoskin, L.
1967. *Lieutenant Zagoskin's travels in Russian America, 1842–1844: the first ethnographic and geographic investigations in the Yukon and Kuskokwim valleys of Alaska*, Arctic Institute of North America, Anthropology of the North: Translations from Russian Sources No. 7. University of Toronto Press: Toronto, Ont.

APPENDIX A.–SURVEY INSTRUMENT

COMPREHENSIVE SUBSISTENCE SURVEY

SCAMMON BAY, ALASKA

From January 1, 2013 to December 31, 2013

DONLIN CREEK
PHASE 4

PRINTED
2014-02-10

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

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

HOUSEHOLD ID:		
STRATUM ID:		
COMMUNITY ID:	SCAMMON BAY	302
INTERVIEWER:		
INTERVIEW DATE:		
START TIME:		
STOP TIME:		
	DATA CODED BY:	
	DATA ENTERED BY:	
	SUPERVISOR:	

PHOTO BY DAVID RUNFOLA

COOPERATING ORGANIZATIONS

SCAMMON BAY TRADITIONAL COUNCIL
PO BOX 110
SCAMMON BAY, AK 99662

(907) 558-5425

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

907-459-7320

HOUSEHOLD MEMBERS

HOUSEHOLD ID

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

Last year, that is, between January 1, 2013, and December 31, 2013, WHO were the head or heads of this household?

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

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

PERMANENT HH MEMBERS: 01 **SCAMMON BAY: 302**

HOUSEHOLD PARTICIPATION

HOUSEHOLD ID

This page asks about your household members' participation in subsistence activities, such as fishing, hunting, gathering, or processing subsistence foods.

Starting with the first head of household, and thinking just about LAST YEAR, did this person...

Repeat for each person in the household. Responses should be on the same row on the left and right pages.

ID #	Fish		Big Game		Marine Mammals		Birds & Eggs		Plants & Berries		Hunting Effort
	…try to fish or shellfish?	…process fish or shellfish?	...hunt for or try to trap land animals?	…process land animals?	…hunt for marine mammals?	…process marine mammals?	…hunt for birds or gather eggs?	…process birds or eggs?	…gather berries or plants?	…process berries or plants?	How many days did this person hunt MOOSE in 2013?
	circle each activity reported for each person, make no mark in other cells										
HEAD 1	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
NEXT, enter participation for spouse or partner. If household has a SINGLE HEAD, leave HEAD 2 row BLANK.											
HEAD 2	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
BELOW, enter participation for children, grandchildren, grandparents, or anyone else living full-time in this household.											
PERSON 3 / 3	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
PERSON 4 / 4	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
PERSON 5 / 5	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
PERSON 6 / 6	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
PERSON 7 / 7	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
PERSON 8 / 8	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
PERSON 9 / 9	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
PERSON 10 / 10	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
PERSON 11 / 11	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
PERSON 12 / 12	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
PERSON 13 / 13	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS
PERSON 14 / 14	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process marine mmls	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants	DAYS

PERMANENT HH MEMBERS: 01 **SCAMMON BAY: 302**

EMPLOYMENT STATUS

HOUSEHOLD ID

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

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

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

For each member of this household born before 1998, list EACH JOB held last year. For household members who did not have a job, write: RETIRED, UNEMPLOYED, STUDENT, HOMEMAKER, DISABLED, etc. There should be AT LEAST one row for each member of this household born before 1998 (this includes anyone who is 16 years old or older).

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

* If a person FISHES COMMERCIALLY or is otherwise SELF-EMPLOYED, list that as a separate job. For job title, enter COMMERCIAL FISHER, CARVER, SEWER, BAKER, etc. Work schedule usually will be ON CALL. For gross income from self-employment, enter revenue minus expenses.

If a person does not earn money from any kind of work, enter RETIRED, UNEMPLOYED, DISABLED, STUDENT, or HOMEMAKER or other appropriate description as the job title. Leave employer, months worked, schedule, and gross income blank.

** WORK SCHEDULE

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

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

EMPLOYMENT: 23 **SCAMMON BAY: 302**

OTHER INCOME

THIS PAGE IS ONLY FOR INCOME THAT IS NOT EARNED FROM WORKING **HOUSEHOLD ID**

Between JANUARY 1, 2013, and DECEMBER 31, 2013…
…Did any members of your household receive a dividend from the Permanent Fund or a Native Corporation?.. Y N

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

		Did anyone in your household receive income from ______ in 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*
Calista	*$ 3.25*
Calista Elder	*$325*
Village Corporation(s)	***Dividend***

Between JANUARY 1, 2013, and DECEMBER 31, 2013…
…Did any members of your household receive OTHER income such as SENIOR BENEFITS or UNEMPLOYMENT?................................. Y N

IF NO, go to the next page.
If YES, continue below…

		Received?	Total Amount?
		circle one	*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 BENEFITS	ENERGY ASSISTANCE	Y N	$ /YR
	9		
	ALASKA SENIOR BENEFITS (LONGEVITY)	Y N	$ /YR
	6		

		Received?	Total Amount?
		circle one	*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 **SCAMMON BAY: 302**

RETAINED COMMERCIAL HARVESTS

HOUSEHOLD ID

1. Do you or members of your household USUALLY participate in commercial fisheries?.. Y N

2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household PARTICIPATE in a commercial fishery?... Y N

IF the answer to QUESTION 2 is NO, go to the subsistence harvests section.

IF the answer is YES, continue on this page…

During the last year,[1]

did you or members of your household….

A …FISH commercially for ________?

B …KEEP any _______ from your commercial catch for your own use[2] or to share?

C Was the ________ that you kept INCIDENTAL[4] catch?

If KEEP is "yes"

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

Include COMMERCIALLY HARVESTED fish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If helping others, report ONLY THIS HOUSEHOLD'S share.

Read names below in blanks above	*A COM FISH?*	*B KEEP?*	*C INCI?*	How many were removed for your OWN USE?[5] *number*	How many were removed for your CREW?[5] *number*	How many were removed to give to OTHERS? *number*	Units[3] *specify*	*comments*
CHINOOK SALMON *KING SALMON*	Y N	Y N	Y N					
113,000,001								
CHUM SALMON *DOG SALMON*	Y N	Y N	Y N					
111,000,001								
COHO SALMON *SILVER SALMON*	Y N	Y N	Y N					
112,000,001								
PINK SALMON *HUMPY*	Y N	Y N	Y N					
114,000,001								
SOCKEYE SALMON *RED SALMON*	Y N	Y N	Y N					
115,000,001								
HERRING	Y N	Y N	Y N					
120,200,001								
HALIBUT	Y N	Y N	Y N					
121,800,001								
CLAMS	Y N	Y N	Y N					
500,600,001								
CRABS	Y N	Y N	Y N					
501,000,001								
	Y N	Y N	Y N					

RETAINED COMMERCIAL HARVESTS continued on next page…

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*
4 *"INCIDENTAL CATCH" means the fish kept was not being commercially fished. For example, a king salmon kept from a chum commerical fisher*
5 *Double counting (captains' removals for crew members and crew members' removal for own uses) is fixed in analysis. Collect both.*

COMMERCIALLY HARVESTED RESOURCES: 03 **SCAMMON BAY: 302**

RETAINED COMMERCIAL HARVESTS

HOUSEHOLD ID

Fish on this page are fished for commercial and subsistence purposes at the same time, and subsistence permits are not required.

...RETAINED COMMERCIAL HARVESTS continued from previous page.

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

A …FISH commercially for ________?
B …KEEP any _______ from your commercial catch for your own use[2] or to share?
C Was the ________ that you kept INCIDENTAL catch?

If KEEP is "yes"

Read names below in blanks above	*A COM FISH?*	*B KEEP?*	*C INCI?*	*Report retained harvest on SUBSISTENCE HARVEST pages.* comments
LAMPREY *EEL*	Y N	Y N	Y N	
122,000,001				
SHEEFISH	Y N	Y N	Y N	
125,600,001				
BROAD WHITEFISH *QAURTUQ*	Y N	Y N	Y N	
126,404,001				
HUMPBPACK WHITEFISH *CINGIKEGGLIQ*	Y N	Y N	Y N	
126,408,001				
BERING CISCO *IMARPINRAQ*	Y N	Y N	Y N	
126,406,041				
LEAST CISCO *IITULIQ*	Y N	Y N	Y N	
126,406,061				
	Y N	Y N	Y N	
	Y N	Y N	Y N	
	Y N	Y N	Y N	

During the last year, did your household fish COMMERCIALLY for any other kind of fish?... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*
4 *"INCIDENTAL CATCH" means the fish kept was not being commercially fished. For example, a king salmon kept from a chum commerical fisher*

SUBSISTENCE HARVESTS: SALMON

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for salmon for subsistence?.. Y N

2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO FISH FOR salmon?.. Y N

IF the answer to QUESTION 2 is NO, go to the SALMON summary page.

IF the answer is YES, continue on this page…

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

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many salmon ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many were...

INCLUDE salmon that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	Caught with a SET NET	Caught with a DRIFT NET	Caught with a SEINE NET	Caught with a FISH WHEEL	Caught with a ROD & REEL[3]	Caught with OTHER GEAR *(specify type)*	Units[4]	How many of THOSE were used for dog food?
						number harvested by each gear type					*amount / type*	*specify*	*dogfood*
CHINOOK SALMON *KING SALMON*	Y N	Y N	Y N	Y N	Y N						/		
113,000,000													
SUMMER CHUM	Y N	Y N	Y N	Y N	Y N						/		
111,010,000													
FALL CHUM	Y N	Y N	Y N	Y N	Y N						/		
111,020,000													
COHO SALMON *SILVER SALMON*	Y N	Y N	Y N	Y N	Y N						/		
112,000,000													
PINK SALMON *HUMPY*	Y N	Y N	Y N	Y N	Y N						/		
114,000,000													
SOCKEYE *RED SALMON*	Y N	Y N	Y N	Y N	Y N						/		
115,000,000													
SALMON - UNKNOWN	Y N	Y N	Y N	Y N	Y N						/		
119,000,000													
	Y N	Y N	Y N	Y N	Y N						/		
	Y N	Y N	Y N	Y N	Y N						/		

During the last year, did your household use any other kind of salmon?.. Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *"ROD AND REEL" includes fish caught in open water with a hook and and a line attached to a rod or a pole. Jigging through the ice is "other ge*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

NON-COMMERCIAL SALMON: 04 **SCAMMON BAY: 302**

SUBSISTENCE SUMMARY: CHINOOK SALMON

HOUSEHOLD ID

If this household did NOT USE or HARVEST chinook salmon last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

MAPPING — *Refer to data collection maps and mapping instructions to map chinook salmon...*

NETWORKS — *...then ask the network and assessment questions below*

During the last year[1], ...who HARVESTED (GOT) the CHINOOK SALMON your household used? (Enter most important sources first.) 113,000,000

role	People in THIS household (enter person ID# from page 2)						People in OTHER HOUSEHOLDS (Enter Household ID# of other households)						People in OTHER COMMUNITIES (Write in name of other communities)		
HARVESTED (GOT) CHINOOK SALMON															
1															

During the last year[1], ...who PROCESSED the CHINOOK SALMON your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)						People in OTHER HOUSEHOLDS (Enter Household ID# of other households)						People in OTHER COMMUNITIES (Write in name of other communities)		
PROCESSED CHINOOK SALMON															
2															

During the last year[1], ...who else (not yet named) GAVE CHINOOK SALMON to your household? (Enter most important sources first.)

role	People in OTHER HOUSEHOLDS						People in OTHER COMMUNITIES		
GAVE CHINOOK SALMON TO US									
3									

ASSESSMENTS: CHINOOK SALMON 113,000,000

During the last year[1],
...did your household use LESS, SAME, or MORE chinook salmon than in recent years?.. X L S M
If LESS or MORE... *X = do not use*
WHY was your use different?............................. 1 ______ 2 ______

During the last year[1],
...did your household GET ENOUGH chinook salmon?.. Y N
If NO...

WHY did your household NOT get enough chinook salmon?.................................. 1 ______ 2 ______

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

Did your household do anything DIFFERENTLY because you did NOT get enough chinook salmon?....................... Y N
IF YES...
What did your household do differently?... 1 ______ 2 ______

SUBSISTENCE SUMMARY: OTHER SALMON

HOUSEHOLD ID

If this household did NOT USE or HARVEST other salmon last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

NETWORKS ***…then ask the network and assessment questions below***

During the last year[1], …who HARVESTED (GOT) the OTHER SALMON your household used? (Enter most important sources first.) 110,000,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
HARVESTED (GOT) 1			

During the last year[1], …who PROCESSED the OTHER SALMON your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED OTHER SALMON 2			

During the last year[1], …who else not yet named GAVE OTHER SALMON to your household? (Enter most important households or communities first.)

role		
GAVE OTHER SALMON TO US 3		

ASSESSMENTS: OTHER SALMON 110,000,000

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

During the last year[1],
…did your household use LESS, SAME, or MORE other salmon than in recent years?.. X L S M
If LESS or MORE… *X = do not use*
WHY was your use different?............................. 1 2

During the last year[1],
…did your household GET ENOUGH other salmon?.. Y N
If NO…
What KIND of other salmon did you need?...
WHY did your household NOT get enough other salmon?....................................... 1 2

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

Did your household do anything DIFFERENTLY because you did NOT get enough other salmon?........................... Y N
IF YES…
What did your household do differently?.. 1 2

SUBSISTENCE HARVESTS: WHITEFISH

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for whitefish for subsistence?.. Y N

2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO FISH FOR whitefish?.. Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

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

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- D …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many whitefish ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many

INCLUDE whitefish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	Caught with a SET NET	Caught with a DRIFT NET	Caught with a SEINE NET	Caught with a FISH WHEEL	Caught with a ROD & REEL[3]	Caught with OTHER GEAR *(specify type)*	Units[4]	How many of THOSE were used for dog food?
						number harvested by each gear type					*amount / type*	*specify*	*dogfood*
SHEEFISH	Y N	Y N	Y N	Y N	Y N						/	IND	
125,600,000													
HUMPBACK WHITEFISH *CINGIKEGGLIQ*	Y N	Y N	Y N	Y N	Y N						/	IND	
126,408,000													
BROAD WHITEFISH *QAURTUQ*	Y N	Y N	Y N	Y N	Y N						/	IND	
126,404,000													
BERING CISCO *IMARPINRAQ*	Y N	Y N	Y N	Y N	Y N						/	IND	
126,406,040													
LEAST CISCO *IITULIQ*	Y N	Y N	Y N	Y N	Y N						/	IND	
126,406,060													
ROUND WHITEFISH *CEV'EQ*	Y N	Y N	Y N	Y N	Y N						/	IND	
126,412,000													
UNKNOWN WHITEFISH	Y N	Y N	Y N	Y N	Y N						/	IND	
126,499,000													
	Y N	Y N	Y N	Y N	Y N						/		
	Y N	Y N	Y N	Y N	Y N						/		

During the last year, did your household use any other kind of whitefish?.. Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *"ROD AND REEL" includes fish caught in open water with a hook and and a line attached to a rod or a pole. Jigging through the ice is "other ge*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVESTS: OTHER FISH

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for other fish for subsistence, such as SAFFRON COD (TOMCOD), BLACKFISH, , or any other other fish?.. Y N
2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO FISH FOR other fish?.. Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

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

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many

INCLUDE other fish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	Caught with a SET NET	Caught with a DRIFT NET	Caught with a SEINE NET	Caught with a FISH WHEEL	Caught with a ROD & REEL[3]	Caught with OTHER GEAR *(specify type)*	Units[4]	How many of THOSE were used for dog food?
						number harvested by each gear type					*amount / type*	*specify*	*dogfood*
SAFFRON COD *TOMCOD*	Y N	Y N	Y N	Y N	Y N						/	GAL	
121,010,000													
SMELTS	Y N	Y N	Y N	Y N	Y N						/	GAL	
120,400,000													
BLACKFISH	Y N	Y N	Y N	Y N	Y N						/	GAL	
124,600,000													
PIKE	Y N	Y N	Y N	Y N	Y N						/	IND	
125,500,000													
LUSH *MANIGGNAQ*	Y N	Y N	Y N	Y N	Y N						/	GAL	
124,800,000													
HERRING	Y N	Y N	Y N	Y N	Y N						/	GAL	
120,200,000													
HERRING EGGS	Y N	Y N	Y N	Y N	Y N						/	LBS	
120,306,000													
HALIBUT	Y N	Y N	Y N	Y N	Y N						/	IND	
121,800,000													
NEEDLEFISH *QUARUQ*	Y N	Y N	Y N	Y N	Y N						/	GAL	
123,800,000													
SCULPINS *DEVILFISH*	Y N	Y N	Y N	Y N	Y N						/	IND	
123,000,000													

1 "LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.
2 "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.
3 "ROD AND REEL" includes fish caught in open water with a hook and and a line attached to a rod or a pole. Jigging through the ice is "other ge
4 UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.

HARVESTS: OTHER FISH

HOUSEHOLD ID

OTHER FISH continued from previous page…

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

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- E …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many

INCLUDE other fish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	Caught with a SET NET	Caught with a DRIFT NET	Caught with a SEINE NET	Caught with a FISH WHEEL	Caught with a ROD & REEL[3]	Caught with OTHER GEAR *(specify type)*		Units[4]	How many of THOSE were used for dog food?
						number harvested by each gear type					*amount / type*		*specify*	*dogfood*
LAMPREY *EEL*	Y N	Y N	Y N	Y N	Y N						/		IND	
122,000,000														
FLOUNDER *FLATFISH*	Y N	Y N	Y N	Y N	Y N						/		IND	
121,400,000														
POLLOCK	Y N	Y N	Y N	Y N	Y N						/		IND	
121,012,000														
DOLLY VARDEN	Y N	Y N	Y N	Y N	Y N						/		IND	
125,006,000														
GRAYLING	Y N	Y N	Y N	Y N	Y N						/		IND	
125,200,000														
RAINBOW TROUT	Y N	Y N	Y N	Y N	Y N						/		IND	
126,204,000														
	Y N	Y N	Y N	Y N	Y N						/			
	Y N	Y N	Y N	Y N	Y N						/			
	Y N	Y N	Y N	Y N	Y N						/			
	Y N	Y N	Y N	Y N	Y N						/			
	Y N	Y N	Y N	Y N	Y N						/			

During the last year, did your household use any other kind of other fish?.. Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *"ROD AND REEL" includes fish caught in open water with a hook and and a line attached to a rod or a pole. Jigging through the ice is "other ge*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

SUBSISTENCE SUMMARY: FISH OTHER THAN SALMON

HOUSEHOLD ID

If this household did NOT USE or HARVEST last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

MAPPING — ***Refer to data collection maps and mapping instructions to map ...***

NETWORKS — ***…then ask the network and assessment questions below***

During the last year …who CAUGHT the WHITEFISH your household used? (Enter most important sources first.) 126,400,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
CAUGHT WHITEFISH 1			

During the last year …who PROCESSED the WHITEFISH your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED WHITEFISH 2			

During the last year …who else (not yet named) GAVE WHITEFISH to your household? (Enter most important sources first.)

role		People in OTHER HOUSEHOLDS	People in OTHER COMMUNITIES
GAVE WHITEFISH TO US 3			

During the last year …who CAUGHT the OTHER FISH your household used? (Enter most important sources first.) 100,000,002

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
CAUGHT OTHER FISH 1			

During the last year …who PROCESSED the OTHER FISH your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED OTHER FISH 2			

During the last year …who else not yet named GAVE OTHER FISH to your household? (Enter most important households or communities first.)

role		People in OTHER HOUSEHOLDS	People in OTHER COMMUNITIES
GAVE TO US 3			

ASSESSMENTS: 100,000,002

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

During the last year[1],
…did your household use LESS, SAME, or MORE fish other than salmon than in recent years?.................................... X L S M
If LESS or MORE… *X = do not use*
WHY was your use different?......................... 1 2

During the last year[1],
…did your household GET ENOUGH fish other than salmon?... Y N
If NO…
What KIND of fish other than salmon did you need?...
WHY did your household NOT get enough fish other than salmon?.................... 1 2

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

Did your household do anything DIFFERENTLY because you did NOT get enough fish other than salmon?........ Y N
IF YES…
What did your household do differently?....................................... 1 2

NETWORKS & ASSESSMENTS OF FISH OTHER THAN SALMON: 66, 67 **SCAMMON BAY: 302**

SUBSISTENCE HARVESTS: MARINE INVERTEBRATES

HOUSEHOLD ID

1. Do you or members of your household USUALLY get marine invertebrates for subsistence, such as KING CRAB, , or any other marine invertebrates?........ Y N
2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO GET marine invertebrates?........ Y N

IF the answer to QUESTION 2 is NO, go to the MARINE INVERTEBRATES summary page.

IF the answer is YES, continue on this page…

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

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- D …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many marine invertebrates ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE marine invertebrates that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If harvest with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	How many did your HH get? *amount*	Units[3] *specify*	*comments*
KING CRAB 501,008,000	Y N	Y N	Y N	Y N	Y N		IND	
TANNER CRAB 501,012,000	Y N	Y N	Y N	Y N	Y N		IND	
MUSSELS 502,099,000	Y N	Y N	Y N	Y N	Y N		GAL	
CLAMS 500,600,000	Y N	Y N	Y N	Y N	Y N		GAL	
SHRIMP 503,400,000	Y N	Y N	Y N	Y N	Y N		GAL	
OTHER INVERTEBRATES 509,900,000	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	

During the last year, did your household use any other kind of marine invertebrates?........ Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*

2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*

3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

SUBSISTENCE SUMMARY: MARINE INVERTEBRATES

HOUSEHOLD ID

If this household did NOT USE or HARVEST marine invertebrates last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

MAPPING ***Refer to data collection maps and mapping instructions to map marine invertebrates...***

NETWORKS ***…then ask the network and assessment questions below***

During the last year[1],
…who HARVESTED (GOT) the INVERTEBRATES your household used? (Enter most important sources first.) 500,000,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
HARVESTED (GOT) INVERTEBRATES 1			

…who PROCESSED the INVERTEBRATES your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED INVERTEBRATES 2			

…who else (not yet named) GAVE INVERTEBRATES to your household? (Enter most important sources first.)

role			
GAVE TO US 3			

ASSESSMENTS: 500,000,000

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

During the last year[1],
…did your household use LESS, SAME, or MORE marine invertebrates than in recent years?....................................... X L S M
If LESS or MORE… *X = do not use*
WHY was your use different?.......................... ____ 1 2

During the last year[1],
…did your household GET ENOUGH marine invertebrates?.. Y N
If NO…
What KIND of marine invertebrates did you need?... ____
WHY did your household NOT get enough marine invertebrates?...................... ____ 1 2

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

Did your household do anything DIFFERENTLY because you did NOT get enough marine invertebrates?........... Y N
IF YES…
What did your household do differently?....................................... ____ 1 2

NETWORKS & ASSESSMENTS OF MARINE INVERTEBRATES: 66, 67 **SCAMMON BAY: 302**

SUBSISTENCE HARVESTS: LARGE LAND ANIMALS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt large land animals for subsistence, such as MOOSE, , or any other large land animals?.. Y N
2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO HUNT large land animals?.. Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

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

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many large land animals ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE large land animals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	SEX	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units[3]
							number killed in each month													*specify*
MOOSE	Y N	Y N	Y N	Y N	Y N	BULL														IND
						COW														IND
211,800,000						UNKNOWN														IND
211,800,001																				
211,800,002																				
211,800,009																				
CARIBOU	Y N	Y N	Y N	Y N	Y N	BULL														IND
						COW														IND
211,000,000						UNKNOWN														IND
211,000,001																				
211,000,002																				
211,000,009																				
BLACK BEAR	Y N	Y N	Y N	Y N	Y N															IND
210,600,000																				
BROWN BEAR	Y N	Y N	Y N	Y N	Y N															IND
210,800,000																				
MUSKOX	Y N	Y N	Y N	Y N	Y N															IND
212,000,000																				
DALL SHEEP	Y N	Y N	Y N	Y N	Y N															IND
212,200,000																				
BISON	Y N	Y N	Y N	Y N	Y N															IND
210,400,000																				
	Y N	Y N	Y N	Y N	Y N															IND

During the last year, did your household use any other kind of large land animals?.. Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

LAND MAMMALS: 10 **SCAMMON BAY: 302**

SUBSISTENCE HARVESTS: SMALL LAND ANIMALS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt small land animals for subsistence, such as BEAVER, , or any other small land animals?.......... Y N
2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO HUNT small land animals?.......... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

During the last year[1],

did you or members of your household….

A …use[2] _____?

B …receive _____ from another HH or community?

C …give _____ to another HH or community?

D …try[2] to harvest _____?

E ...actually harvest any _____?

IF harvest is YES

Please estimate how many small land animals ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE small land animals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units[3] *specify*	Number Used For Food or for Food & Fur
						number killed in each month														
BEAVER 220,200,000	Y N	Y N	Y N	Y N	Y N														IND	
SNOWSHOE HARE 221,004,000	Y N	Y N	Y N	Y N	Y N														IND	
JACKRABBIT 221,006,000	Y N	Y N	Y N	Y N	Y N														IND	
PORCUPINE 222,600,000	Y N	Y N	Y N	Y N	Y N														IND	
MUSKRAT 222,400,000	Y N	Y N	Y N	Y N	Y N														IND	
GROUND SQUIRREL 222,802,000	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	

During the last year, did your household use any other kind of small land animals?.......... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*

2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*

3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

LAND MAMMALS: 10 **SCAMMON BAY: 302**

SUBSISTENCE HARVESTS: FUR ANIMALS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt or trap for fur animals for subsistence, such as RED FOX, , or any other fur animals?................ Y N
2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO HUNT OR TRAP FOR fur animals?................ Y N

IF the answer to QUESTION 2 is NO, go to the LAND ANIMALS summary page.

IF the answer is YES, continue on this page…

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

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- D …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many fur animals ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE fur animals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting or trapping with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units[3] specify	Number Used For Food or for Food & Fur
						number caught in each month														
RED FOX 220,804,000	Y N	Y N	Y N	Y N	Y N														IND	
LYNX 221,600,000	Y N	Y N	Y N	Y N	Y N														IND	
RIVER OTTER 221,200,000	Y N	Y N	Y N	Y N	Y N														IND	
MINK 222,200,000	Y N	Y N	Y N	Y N	Y N														IND	
ARCTIC FOX 220,802,000	Y N	Y N	Y N	Y N	Y N														IND	
WOLF 223,200,000	Y N	Y N	Y N	Y N	Y N														IND	
WOLVERINE 223,400,000	Y N	Y N	Y N	Y N	Y N														IND	
COYOTE 220,400,000	Y N	Y N	Y N	Y N	Y N														IND	
MARTEN 222,000,000	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	

During the last year, did your household use any other kind of fur animals?................ Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

FURBEARERS: 14 **SCAMMON BAY: 302**

SUBSISTENCE SUMMARY: LAND ANIMALS

HOUSEHOLD ID

If this household did NOT USE or HARVEST land animals last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

MAPPING — ***Refer to data collection maps and mapping instructions to map land animals...***

NETWORKS — ***…then ask the network and assessment questions below***

During the last year[1], …who HARVESTED (GOT) the MOOSE your household used? (Enter most important sources first.) 211,800,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
HARVESTED CARIBOU 1			

During the last year[1], …who PROCESSED the MOOSE your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED MOOSE 2			

During the last year[1], …who else GAVE MOOSE to your household? (Enter most important households or communities first.)

role			
GAVE MOOSE TO US 3			

During the last year[1], …who HARVESTED (GOT) the CARIBOU your household used? (Enter most important sources first.) 211,000,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
HARVESTED (GOT) CARIBOU 1			

During the last year[1], …who PROCESSED the CARIBOU your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED CARIBOU 2			

During the last year[1], …who else not yet named GAVE CARIBOU to your household? (Enter most important households or communities first.)

role			
GAVE CARIBOU TO US 3			

ASSESSMENTS: 200,000,000

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

During the last year[1],
…did your household use LESS, SAME, or MORE land animals than in recent years?.. X L S M
If LESS or MORE… *X = do not use*
WHY was your use different?.......................... 1 2

During the last year[1],
…did your household GET ENOUGH land animals?.. Y N
If NO…
What KIND of land animals did you need?...
WHY did your household NOT get enough land animals?................................... 1 2

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

Did your household do anything DIFFERENTLY because you did NOT get enough land animals?...................... Y N
IF YES…
What did your household do differently?....................................... 1 2

NETWORKS & ASSESSMENTS OF LAND ANIMALS: 66, 67 **SCAMMON BAY: 302**

SUBSISTENCE HARVESTS: MARINE MAMMALS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt marine mammals for subsistence?.. Y N

2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO HUNT marine mammals?... Y N

IF the answer to QUESTION 2 is NO, go to the MARINE MAMMALS summary page.

IF the answer is YES, continue on this page…

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

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- D …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many marine mammals ALL MEMBERS OF YOUR HOUSEHOLD killed for subsistence uses during the last year.

INCLUDE marine mammals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units[3] *specify*	*comments*
						number killed in each month														
BEARDED SEAL *MAKLAK* 300,802,000	Y N	Y N	Y N	Y N	Y N														IND	
RINGED SEAL *NAYIQ* 300,810,000	Y N	Y N	Y N	Y N	Y N														IND	
SPOTTED SEAL *ISSURIQ* 300,812,000	Y N	Y N	Y N	Y N	Y N														IND	
RIBBON SEAL *QASRULEK* 300,808,000	Y N	Y N	Y N	Y N	Y N														IND	
SEAL OIL *OR OTHER SEAL PRODUCTS* 300,899,000	Y N	Y N	Y N	Y N	Y N															
BELUGA WHALE 301,602,000	Y N	Y N	Y N	Y N	Y N														IND	
BOWHEAD WHALE 301,606,000	Y N	Y N	Y N	Y N	Y N														IND	
OTHER MARINE MAMMALS *(SPECIFY)* 300,000,000	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	

During the last year, did your household use any other kind of marine mammals?... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

MARINE MAMMALS: 12 **SCAMMON BAY: 302**

SUBSISTENCE SUMMARY: MARINE MAMMALS

HOUSEHOLD ID

If this household did NOT USE or HARVEST marine mammals last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping, network, and assessment sections...

MAPPING ***Refer to data collection maps and mapping instructions to map marine mammals...***

NETWORKS ***…then ask the network and assessment questions below***

During the last year …who HARVESTED (GOT) the SEALS your household used? (Enter most important sources first.) 300,800,009

role	*People in THIS household* *(enter person ID# from page 2)*	*People in OTHER Ambler HOUSEHOLDS* *(Enter Household ID# of other households)*	*People in OTHER COMMUNITIES* *(Write in name of other communities)*
HARVESTED (GOT) SEALS 1			

During the last year …who PROCESSED the SEALS your household used? (Enter most important sources first.)

role	*People in THIS household* *(enter person ID# from page 2)*	*People in OTHER HOUSEHOLDS* *(Enter Household ID# of other households)*	*People in OTHER COMMUNITIES* *(Write in name of other communities)*
PROCESSED SEALS 2			

During the last year …who else (not yet named) GAVE SEALS to your household? (Enter most important sources first.)

GAVE SEALS TO US

3

During the last year …who HARVESTED (GOT) the WHALES your household used? (Enter most important sources first.) 301,600,009

role	*People in THIS household* *(enter person ID# from page 2)*	*People in OTHER HOUSEHOLDS* *(Enter Household ID# of other households)*	*People in OTHER COMMUNITIES* *(Write in name of other communities)*
HARVESTED (GOT) WHALES 1			

During the last year …who PROCESSED the WHALES your household used? (Enter most important sources first.)

role	*People in THIS household* *(enter person ID# from page 2)*	*People in OTHER HOUSEHOLDS* *(Enter Household ID# of other households)*	*People in OTHER COMMUNITIES* *(Write in name of other communities)*
PROCESSED WHALES 2			

During the last year …who else not yet named GAVE WHALES to your household? (Enter most important households or communities first.)

GAVE WHALES TO US

3

ASSESSMENTS: 300,000,000

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

During the last year[1],

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

If LESS or MORE… *X = do not use*

WHY was your use different?.......................... 1 2

During the last year[1],

…did your household GET ENOUGH marine mammals?.. Y N

If NO…

What KIND of marine mammals did you need?..

WHY did your household NOT get enough marine mammals?........................... 1 2

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

Did your household do anything DIFFERENTLY because you did NOT get enough marine mammals?................ Y N

IF YES…

What did your household do differently?....................................... 1 2

NETWORKS & ASSESSMENTS OF MARINE MAMMALS: 66, 67 **SCAMMON BAY: 302**

HARVESTS: DUCKS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt ducks for subsistence, such as PINTAIL, , or any other ducks?........ Y N
2. During the last year (between JANUARY 1, 2009, AND DECEMBER 31, 2009), did you or members of your household USE or TRY TO HUNT ducks?........ Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

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

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- D …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many ducks ALL MEMBERS OF YOUR HOUSEHOLD killed for subsistence uses during the last year.

INCLUDE ducks that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January February March November December WINTER	April May June SPRING	July August SUMMER	September October FALL	Season of harvest unknown	Units[3]
						number killed in each season				*number*	*specify*
PINTAIL	Y N	Y N	Y N	Y N	Y N						IND
410,220,000											
MALLARD	Y N	Y N	Y N	Y N	Y N						IND
410,214,000											
SHOVELER *SPOONBILL*	Y N	Y N	Y N	Y N	Y N						IND
410,230,000											
AMERICAN WIGEON *KATKEGGLIQ*	Y N	Y N	Y N	Y N	Y N						IND
410,236,020											
SCAUP *BLUEBILL KEP'ALEK*	Y N	Y N	Y N	Y N	Y N						IND
410,226,990											
TEAL/POCKET DUCK *TENGESQAAQ*	Y N	Y N	Y N	Y N	Y N						IND
410,232,060											
BLACK SCOTER *KUKUMYARAK*	Y N	Y N	Y N	Y N	Y N						IND
410,228,020											
SURF SCOTER	Y N	Y N	Y N	Y N	Y N						IND
410,228,040											
WHITE-WINGED SCOTER	Y N	Y N	Y N	Y N	Y N						IND
410,228,060											
LONG-TAILED DUCK *AARRAANGIIQ*	Y N	Y N	Y N	Y N	Y N						IND
410,218,000											

DUCKS continued on next page…

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

HARVESTS: DUCKS

HOUSEHOLD ID

DUCKS continued from previous page…

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

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- E …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many ducks ALL MEMBERS OF YOUR HOUSEHOLD killed for subsistence uses during the last year.

INCLUDE ducks that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January February March November December WINTER	April May June SPRING	July August SUMMER	September October FALL	Season of harvest unknown	Units[3]
						number killed in each season				*number*	*specify*
HARLEQUIN *CETUSKARAK*	Y N	Y N	Y N	Y N	Y N						IND
410,212,000											
KING EIDER *QENGALLEK*	Y N	Y N	Y N	Y N	Y N						IND
410,206,040											
COMMON EIDER *METRAQ*	Y N	Y N	Y N	Y N	Y N						IND
410,206,020											
STELLER'S EIDER *CAQAIRAQ*	Y N	Y N	Y N	Y N	Y N						IND
410,206,080											
SPECTACLED EIDER *QAUGEQ/ACKILEK*	Y N	Y N	Y N	Y N	Y N						IND
410,206,060											
OTHER DUCKS (SPECIFY)	Y N	Y N	Y N	Y N	Y N						IND
410,200,000											
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND

During the last year, did your household use any other kind of ducks?.. Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

** "LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*

*** "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*

**** UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

BIRDS AND EGGS: 15 **SCAMMON BAY: 302**

SUBSISTENCE HARVESTS: GEESE

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt geese for subsistence, such as CACKLING/CANADA GEESE (TUUTANGAYAK), EMPEROR GEESE (NACAULLEK), or any other geese?................ Y N
2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO HUNT geese?... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

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

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- D …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many geese ALL MEMBERS OF YOUR HOUSEHOLD killed for subsistence uses during the last year.

INCLUDE geese that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January February March November December WINTER	April May June SPRING	July August SUMMER	September October FALL	Season of harvest unknown	Units[3]
						number killed in each season				*number*	*specify*
CACKLING/CANADA GEESE *TUUTANGAYAK*	Y N	Y N	Y N	Y N	Y N						IND
410,404,990											
WHITE-FRONTED GEESE *NEQLEQ*	Y N	Y N	Y N	Y N	Y N						IND
410,410,000											
BRANT *NEQLERNAQ*	Y N	Y N	Y N	Y N	Y N						IND
410,402,000											
EMPEROR GEESE *NACAULLEK*	Y N	Y N	Y N	Y N	Y N						IND
410,406,000											
SNOW GEESE *KANGUQ*	Y N	Y N	Y N	Y N	Y N						IND
410,408,000											
UNKNOWN GEESE	Y N	Y N	Y N	Y N	Y N						IND
410,499,000											
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND

During the last year, did your household use any other kind of geese?.. Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

SUBSISTENCE HARVESTS: OTHER BIRDS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt other birds for subsistence, such as PTARMIGAN, , or any other other birds?........ Y N
2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO HUNT other birds?........ Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

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

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many other birds ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE other birds that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January February March November December WINTER	April May June SPRING	July August SUMMER	September October FALL	Season of harvest unknown	Units[3]
						number got in each season				*number*	*specify*
PTARMIGAN	Y N	Y N	Y N	Y N	Y N						IND
421,804,000											
GROUSE (SPECIFY)	Y N	Y N	Y N	Y N	Y N						IND
421,802,000											
SANDHILL CRANE	Y N	Y N	Y N	Y N	Y N						IND
410,802,000											
TUNDRA SWAN	Y N	Y N	Y N	Y N	Y N						IND
410,604,000											
SNOWY OWL	Y N	Y N	Y N	Y N	Y N						IND
422,002,000											
SHOREBIRDS (SPECIFY)	Y N	Y N	Y N	Y N	Y N						IND
411,000,000											
SEABIRDS (SPECIFY)	Y N	Y N	Y N	Y N	Y N						IND
411,200,000											
LOONS (SPECIFY)	Y N	Y N	Y N	Y N	Y N						IND
411,216,000											
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND

During the last year, did your household use any other kind of other birds?........ Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

BIRDS AND EGGS: 15 **SCAMMON BAY: 302**

SUBSISTENCE HARVESTS: EGGS

HOUSEHOLD ID

1. Do you or members of your household USUALLY gather eggs for subsistence, such as DUCK EGGS, , or any other eggs?........ Y N
2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO GATHER eggs?........ Y N

IF the answer to QUESTION 2 is NO, go to the BIRD & EGG summary page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household…

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- D …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many eggs ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE eggs that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If gathering with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	How many did you gather? *amount*	Units[3] *specify*	*comments*
DUCK EGGS	Y N	Y N	Y N	Y N	Y N			
430,200,000								
GEESE EGGS	Y N	Y N	Y N	Y N	Y N			
430,400,000								
TERN EGGS	Y N	Y N	Y N	Y N	Y N			
431,226,000								
GULL EGGS	Y N	Y N	Y N	Y N	Y N			
431,212,000								
SHOREBIRD EGGS	Y N	Y N	Y N	Y N	Y N			
431,000,000								
SWAN EGGS	Y N	Y N	Y N	Y N	Y N			
430,600,000								
LOON EGGS	Y N	Y N	Y N	Y N	Y N			
431,216,000								
UNKNOWN EGGS	Y N	Y N	Y N	Y N	Y N			
439,900,000								
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			IND

During the last year, did your household use any other kind of eggs?........ Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*

2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*

3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, et*

BIRDS AND EGGS: 15 **SCAMMON BAY: 302**

SUBSISTENCE SUMMARY: BIRDS & EGGS

HOUSEHOLD ID

If this household did NOT USE or HARVEST birds & eggs last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

MAPPING ***Refer to data collection maps and mapping instructions to map birds & eggs...***

NETWORKS ***…then ask the network and assessment questions below***

During the last year[1],

…who HARVESTED (GOT) the BIRDS your household used? (Enter most important sources first.) 430,000,000

role	People in THIS household *(enter person ID# from page 2)*	People in OTHER HOUSEHOLDS *(Enter Household ID# of other households)*	People in OTHER COMMUNITIES *(Write in name of other communities)*
HARVESTED (GOT) BIRDS			
1			

…who PROCESSED the BIRDS your household used? (Enter most important sources first.)

role	People in THIS household *(enter person ID# from page 2)*	People in OTHER HOUSEHOLDS *(Enter Household ID# of other households)*	People in OTHER COMMUNITIES *(Write in name of other communities)*
PROCESSED BIRDS			
2			

…who else (not yet named) GAVE BIRDS to your household? (Enter most important households or communities first.)

GAVE TO US			
3			

…who HARVESTED (GOT) the EGGS your household used? (Enter most important sources first.) 121,200,002

role	People in THIS household *(enter person ID# from page 2)*	People in OTHER HOUSEHOLDS *(Enter Household ID# of other households)*	People in OTHER COMMUNITIES *(Write in name of other communities)*
GATHERED EGGS			
1			

…who PROCESSED the EGGS your household used? (Enter most important sources first.)

role	People in THIS household *(enter person ID# from page 2)*	People in OTHER HOUSEHOLDS *(Enter Household ID# of other households)*	People in OTHER COMMUNITIES *(Write in name of other communities)*
PROCESSED EGGS			
2			

…who else (not yet named) GAVE EGGS to your household? (Enter most important households or communities first.)

GAVE EGGS TO US			
3			

ASSESSMENTS: 400,000,000

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

During the last year[1],

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

If LESS or MORE… *X = do not use*

WHY was your use different?.......................... ____________ 1 2

During the last year[1],

…did your household GET ENOUGH birds & eggs?... Y N

If NO…

What KIND of birds & eggs did you need?.. ____________

WHY did your household NOT get enough birds & eggs?.................................. ____________ 1 2

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

Did your household do anything DIFFERENTLY because you did NOT get enough birds & eggs?....................... Y N

IF YES…

What did your household do differently?....................................... ____________ 1 2

NETWORKS & ASSESSMENTS OF BIRDS & EGGS: 66, 67 **SCAMMON BAY: 302**

SUBSISTENCE HARVESTS: BERRIES

HOUSEHOLD ID

1. Do you or members of your household USUALLY pick berries for subsistence, such as SALMONBERRY (ATSAQ), CROWBERRY (BLACKBERRY), or any other berries?... Y N
2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO PICK berries?... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

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

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- D …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many berries ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE berries that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If picking with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	How many did you pick? *amount*	Units[3] *specify*	*comments*
SALMONBERRY *ATSAQ* 601,022,000	Y N	Y N	Y N	Y N	Y N		GAL	
BLUEBERRY *CURAQ* 601,002,000	Y N	Y N	Y N	Y N	Y N		GAL	
CROWBERRY *BLACKBERRY* 601,007,000	Y N	Y N	Y N	Y N	Y N		GAL	
LOW-BUSH CRANBERRIES *RED BERRIES/TUMAGGLIQ* 601,004,000	Y N	Y N	Y N	Y N	Y N		GAL	
NAGOONBERRY *PUYURAQ* 601,018,000	Y N	Y N	Y N	Y N	Y N		GAL	
HIGH BUSHCRANBERRY 601,006,000	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	

During the last year, did your household use any other kind of berries?.. Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

PLANTS: 17 **SCAMMON BAY: 302**

SUBSISTENCE HARVESTS: GREENS

HOUSEHOLD ID

1. Do you or members of your household USUALLY pick greens for subsistence, such as LABRADOR TEA (AYUK), WILD RHUBARB (ANGUKAQ), or any other greens?.. Y N
2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO PICK greens?.. Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

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

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- D …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many greens ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE greens that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If picking with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	How many did you pick? *amount*	Units[3] *specify*	*comments*
LABRADOR TEA *AYUK*	Y N	Y N	Y N	Y N	Y N		GAL	
602,018,000								
STINKWEED *CAIGGLUK*	Y N	Y N	Y N	Y N	Y N		GAL	
602,044,000								
SOURDOCK *KUAGGCIQ*	Y N	Y N	Y N	Y N	Y N		GAL	
602,028,000								
WILD RHUBARB *ANGUKAQ*	Y N	Y N	Y N	Y N	Y N		GAL	
602,006,000								
WILD PARSLEY *MECUQELUGGAQ*	Y N	Y N	Y N	Y N	Y N		GAL	
602,034,000								
COW PARSNIP *TARNAQ*	Y N	Y N	Y N	Y N	Y N		GAL	
602,032,000								
FIDDLEHEAD FERNS *CETUGUAQ*	Y N	Y N	Y N	Y N	Y N		GAL	
602,014,000								
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	

During the last year, did your household use any other kind of greens?.. Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

SUBSISTENCE HARVESTS: OTHER PLANTS

HOUSEHOLD ID

1. Do you or members of your household USUALLY get other plants for subsistence, such as MUSHROOMS, , or any other other plants?.......... Y N
2. During the last year (between JANUARY 1, 2013, AND DECEMBER 31, 2013), did you or members of your household USE or TRY TO GET other plants?.......... Y N

IF the answer to QUESTION 2 is NO, go to the next BERRIES & GREENS summary page.

IF the answer is YES, continue on this page…

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

- A ...use[2] _____?
- B ...receive _____ from another HH or community?
- C ...give _____ to another HH or community?
- D ...try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many other plants ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE other plants that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If harvest with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	How much did you get? *amount*	Units[3] *specify*	*comments*
MUSHROOMS	Y N	Y N	Y N	Y N	Y N		GAL	
602,040,000								
PUNK	Y N	Y N	Y N	Y N	Y N		GAL	
602,046,010								
MOUSEFOOD *ANLLAQ*	Y N	Y N	Y N	Y N	Y N		GAL	
602,060,000								
OTHER BEACH GREENS	Y N	Y N	Y N	Y N	Y N		GAL	
602,010,000								
OTHER WILD GREENS	Y N	Y N	Y N	Y N	Y N		GAL	
602,038,000								
	Y N	Y N	Y N	Y N	Y N		GAL	

During the last year, did your household use any other kind of other plants?.......... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

	USE	REC	GIVE	TRY	HAR	Please estimate the percentage of your household's heating needs in 2013 that came from firewood.
FIREWOOD	Y N	Y N	Y N	Y N	Y N	0% (0) · 1-25% (1) · 26-50% (2) · 51-75% (3) · 76-99% (4) · *100%* (5)
604,000,000						*(circle one)*

1 *"LAST YEAR" means between JANUARY 1, 2013, and DECEMBER 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

SUBSISTENCE SUMMARY: BERRIES & GREENS

HOUSEHOLD ID

If this household did NOT USE or HARVEST berries & greens last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

MAPPING ***Refer to data collection maps and mapping instructions to map berries & greens...***

NETWORKS ***…then ask the network and assessment questions below***

During the last year[1], …who PICKED the PLANTS your household used? (Enter most important sources first.) 602,043,002

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PICKED PLANTS 1			

During the last year[1], …who PROCESSED the PLANTS your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED PLANTS 2			

During the last year[1], …who else GAVE PLANTS to your household? (Enter most important households or communities first.)

role		People in OTHER HOUSEHOLDS	People in OTHER COMMUNITIES
GAVE PLANTS TO US 3			

During the last year[1], …who CUT the other FIREWOOD your household used? (Enter most important sources first.) 602,042,002

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
CUT FIREWOOD 1			

During the last year[1], …who PROCESSED the other FIREWOOD your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED FIREWOOD 2			

…who else not yet named GAVE FIREWOOD to your household? (Enter most important households or communities first.)

role		People in OTHER HOUSEHOLDS	People in OTHER COMMUNITIES
GAVE FIREWOOD TO US 3			

ASSESSMENTS: 601,000,000

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

During the last year[1],
…did your household use LESS, SAME, or MORE berries & greens than in recent years?... X L S M
If LESS or MORE… *X = do not use*
WHY was your use different?......................... ________ 1 2

During the last year[1],
…did your household GET ENOUGH berries & greens?.. Y N
If NO…
What KIND of berries & greens did you need?.. ________
WHY did your household NOT get enough berries & greens?............................ ________ 1 2

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

Did your household do anything DIFFERENTLY because you did NOT get enough berries & greens?................ Y N
IF YES…
What did your household do differently?....................................... ________ 1 2

NETWORKS & ASSESSMENTS OF BERRIES & GREENS: 66, 67 **SCAMMON BAY: 302**

ASSESMENTS

HOUSEHOLD ID

SUBSISTENCE ASSESSMENTS: ALL RESOURCES

0

To conclude our subsistence harvest section, I am going to ask a few general questions about ALL SUBSISTENCE RESOURCES.

Last year…

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

If LESS or MORE… *X = do not use*

WHY was your use different?........... 1 2

Last year…

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

If NO…

What KIND of subsistence resources did you need?......................

WHY did your household NOT get enough all resources?.............. 1 2

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

Did your household do anything DIFFERENTLY because you did NOT get enough all resources?.. Y N

IF YES…

What did your household do differently?............................ 1 2

HEALTH IMPACT ASSESSMENTS

Now I am going to ask about the foods members of your household EAT. In this section, we are interested in all foods: subsistence foods you harvested, foods you received from others, and foods you purchased at a store. We want to...

…determine how often subsistence foods are eaten,

…identify the most important subsistence foods in your community, AND

…identify foods that substitute for subsistence foods, when subsistence foods are not available.

In a normal week, how often are subsistence foods such as salmon, non-salmon fish, moose, caribou, birds, etc. served in your household?	NONE Don't use (0)	LESS than once a day (?)	About ONCE a day (?)	2 OR 3 times a day (?)	3 OR MORE times a day (?)

(circle ONE response)

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

Otherwise, continue below…

Please list the TOP FIVE SUBSISTENCE FOODS members of your household eat every year. Include subsistence foods that may not be available now, but are important at other times of the year. Please list most important foods first.

	Subsistence Food 1	*Subsistence Food 2*	*Subsistence Food 3*	*Subsistence Food 4*	*Subsistence Food 5*
TOP FIVE SUBSISTENCE FOODS					

If your household CANNOT GET SUBSISTENCE FOODS, what do members of your household eat instead? Include alternate foods that may not be available now, but are important at other times of the year. Please list most important foods first.

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

FOOD SECURITY

HOUSEHOLD ID

The questions on this page have been asked all over the United States to find out if Americans have enough to eat. We would like to know if people in your community have enough to eat. I am going to read you FIVE statements about different food situations. Please tell me whether EACH statement was true for your household (HH) in the last 12 months.

Think about all your household's food, both subsistence and store-bought…

STATEMENT 1. We WORRIED that our household would not have ENOUGH FOOD. HH2

In the last 12 months, was this ever true for your household?.. N Y ? if Y

If YES…

…in which months did this happen?.. J F M A M J J A S O N D

…did this happen because your HH couldn't get SUBSISTENCE foods, your HH couldn't get STORE-BOUGHT foods, or your HH couldn't get BOTH KINDS of food?.. SUB STOR BOTH

STATEMENT 2. We could not get the kinds of foods we wanted to eat because of a LACK OF RESOURCES. HH4

By "lack of resources," we mean your household (HH) did NOT have what you needed to hunt, fish, gather, or buy food.

In the last 12 months, was this ever true for your household?.. N Y ? if Y

If YES…

…in which months did this happen?.. J F M A M J J A S O N D

…did this happen because your HH couldn't get SUBSISTENCE foods,your HH couldn't get STORE-BOUGHT foods, or your HH couldn't get BOTH KINDS of food?.. SUB STOR BOTH

STATEMENT 3. The food we had JUST DID NOT LAST, and we could not get more. HH3

In the last 12 months, was this ever true for your household?.. N Y ? if Y

If YES, in which months did this happen?.. J F M A M J J A S O N D

Now, think just about your household's SUBSISTENCE food…

STATEMENT 4. The SUBSISTENCE food we had just did not last, and we could not get more.

In the last 12 months, was this ever true for your household?.. N Y ?

If YES, in which months did this happen?... J F M A M J J A S O N D

Now, think just about your household's STORE-BOUGHT food…

STATEMENT 5. The STORE-BOUGHT food we had just did not last, and we could not get more.

In the last 12 months, was this ever true for your household?.. N Y ?

If YES, in which months did this happen?... J F M A M J J A S O N D

If Statements 1, 2, AND 3 were ALL "NO," go to the next page.

If any ONE of Statements 1, 2, OR 3 was "YES," continue on this page…

In the last 12 months, did you or other adults in your household ever CUT THE SIZE OF YOUR MEALS OR SKIP MEALS because the HH could not get the food that was needed?... N Y ? AD1

If YES, in which months did this happen?... J F M A M J J A S O N D

In the last 12 months, did you or other adults in your household ever EAT LESS THAN YOU FELT YOU SHOULD because the HH could not get the food that was needed?.. N Y ? AD2

In the last 12 months, were adults in the HH ever HUNGRY BUT DID NOT EAT because there was not enough food?.. N Y ? AD3

In the last 12 months, did adults in the HH LOSE WEIGHT because there was not enough food?......................... N Y ? AD4

In the last 12 months, did you or other adults in your household ever NOT EAT FOR A WHOLE DAY because there was not enough food?... N Y ? AD5

If YES, in which months did this happen?... J F M A M J J A S O N D

FOOD SECURITY: 201 SCAMMON BAY: 302

COMMENTS & SUMMARY

HOUSEHOLD ID

QUESTIONS, COMMENTS, CONCERNS

Do you have any questions, comments, or concerns?

INTERVIEW SUMMARY

Use this space for interviewer's comments about survey, especially factors that might have affected the household's responses.

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

APPENDIX B.–ETHNOGRAPHIC INTERVIEW PROTOCOL

Donlin 4 Comprehensive Survey Project

Ethnographic Interview Protocol

***BEFORE YOU BEGIN RECODING* be sure you are in a quiet place. If not (e.g. TV or radio are on), ask respondent(s) or other people in the room to turn off anything making noises OR ask if you could conduct the interview somewhere else or at a better time when there is less activity in the room**

ALWAYS START recording by stating the following information:

- **YOUR NAME**
- **YOUR POSITION**
- **DATE**
- **TIME**
- **YOUR LOCATION**
- **NAME OF RESPONDENT(S)**
- **NAME OF PROJECT**
- **YOUR PURPOSE**
- **NAME(S) OF OTHER PERSONS IN THE ROOM (If anyone present is under the age of 18, ask their guardian if they give consent to their voice being recorded. DO NOT interview a minor or identify them on the recording.)**

If you reach a point in the interview when you need to restart the recording, state the same information once more. This will be helpful in the event that your recording device started a new mp3 file after the break.

EXAMPLE: *"This is Jane Smith, Subsistence Resource Specialist with the Alaska Department of Fish and Game Subsistence Division. It's Friday January 14, 2014 at 2 PM. I'm in Scammon Bay, Alaska, in the home of Mary and John Williams. I'm here for the Donlin 4 Comprehensive Subsistence Survey Project and I will be talking with them about their experiences hunting, fishing, and gathering in the area. Assisting me is our community liaison, Michael Ayalik."*

1. Demographic Information

In the beginning of each interview, I recommend asking some basic demographic questions:

1. name
2. year/location born
3. parents names and where from?
4. how long has respondent been hunting/fishing?

Then, it is often useful to take the seasonal round approach when doing interviews and let people answer the questions below through the structure of a description of the parts of the seasonal round that they participate in. That way, you can also document seasonal camps used in the past or currently used by respondent. **[Keep in mind that you do not have to do it this way, but the species sections below are ordered by a seasonal round. Skip around if that works better for you and your respondent.]**

Part 2. Migratory Bird hunting

1. Please describe your current migratory bird hunting practices:

a. what are the primary species you try to get every year? Do you collect eggs (which kinds?)

b. who do you hunt with year to year? How is this determined?

c. if you are successful, what do you do with the birds – how do you distribute/share it?

d. How do you preserve/process your harvest?

e. how do you feel the different bird populations are doing right now? Why do you think the population is declining/increasing? Are the different bird species healthy?

f. Are there environmental factors that contribute to changes in bird migrations and hunting? (changing weather patterns, changing habitat, etc)

g. are younger people learning to hunt birds? If so, how do they do that? How did you learn?

h. can you show us where you hunt now (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?

i. are there any rules about hunting or the treatment of birds during hunting/harvest?

j. native names for birds or other aspects of bird hunting? Do you remember any traditional stories about birds or bird hunting in your village?

k. are there any natural seasonal indicators that you use to know when the birds will come?

Part 3. Non-salmon fishing – ask questions for each species (households are likely to harvest multiple species. While we want to document all species they harvest, the most important species to cover will be: whitefish [differentiate species if possible], sheefish, and pike. If a household heavily harvests another species, document that as much as possible.**)**

1. Please describe your current non-salmon fishing practices:

a. which species do you harvest? Timing of that harvest (for each species)?

b. do you fish with other people? How is this determined?

c. what are the primary means you use to harvest different species of non-salmon? (gear type by species?)

d. what do you do with the non-salmon you harvest – how do you distribute/share it?

e. are younger people learning to fish? If so, how do they do that? How did you learn?

f. how do you feel the non-salmon population is doing right now? Why do you think the population is declining/increasing? Are the non- salmon healthy?

g. Have your fishing areas changed at all? (map changes in area – currently and 10-20 years ago)

h. if there are changes to your fishing areas, what explains those changes? (environmental conditions, personal circumstances, traditional areas, changes in the fish population, regulations, etc)

i. Are there environmental factors that contribute to changes in non-salmon fishing? (weather, river conditions, etc)

g. which parts of the fish do you use? How do you preserve/process these parts?

h. are there any rules about fishing or the treatment of fish/nets during fishing?

i. native names for non- salmon species or other aspects of fishing? Do you remember any traditional stories about non-salmon species or fishing in your village?

Part 4. Salmon fishing

1. Please describe your current salmon fishing practices:

a. do you fish with other people? How is this determined?

b. which species do you harvest? Timing of that harvest?

c. what are the primary means you use to harvest salmon? (gear type by species?)

d. what do you do with the salmon you harvest – how do you distribute/share it?

e. which parts of the salmon do you use? How do you preserve/process these parts?

f. how do you feel the salmon population is doing right now? Why do you think the population is declining/increasing? Are the salmon healthy?

g. Have your fishing areas changed at all? (map changes in area – currently and 10-20 years ago)

h. if there are changes to your fishing areas, what explains those changes? (environmental conditions, personal circumstances, traditional areas, changes in the fish population, regulations, etc)

i. Are there environmental factors that contribute to changes in salmon fishing? (weather, river conditions, etc)

j. many people say that the elders used observations of the environment (changes in the land or water, weather, other animals' behavior) to know when salmon were coming and how many might come. Do you remember any of these 'natural indicators'?

k. are younger people learning to fish? If so, how do they do that? How did you learn?

l. are there any rules about fishing or the treatment of fish/nets during fishing?

m. native names for salmon species or other aspects of fishing? Do you remember any traditional stories about salmon or fishing in your village?

Part 5. Moose hunting

1. Please describe your current moose hunting practices

a. who do you hunt with year to year? How is this determined?

b. if you are successful, what do you do with the moose – how do you distribute/share it?

c. which parts of the moose do you use? How do you preserve/process these parts?

d. how do you feel the moose population is doing right now? Why do you think the population is declining/increasing (e.g. predation concerns, hard winters, good habitat, etc?)? Are the moose healthy?

e. Are there environmental factors that contribute to changes in moose hunting? (weather, river conditions, etc)

f. are younger people learning to hunt? If so, how do they do that? How did you learn?

g. can you show us where you hunt now (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?

h. are there any rules about hunting or the treatment of moose or other animals during moose hunting/harvest?

i. native names for moose or other aspects of moose hunting? Do you remember any traditional stories about moose or moose hunting in your village?

Part 6. Other large game hunting (brown bear, black bear, caribou)

1. Please describe your current big game hunting practices (for each…)

a. who do you hunt with year to year? How is this determined?

b. if you are successful, what do you do with the bear/caribou – how do you distribute/share it?

c. which parts of the bear/caribou do you use? How do you preserve/process these parts?

d. how do you feel the bear/caribou population is doing right now? Why do you think the population is declining/increasing? Are they healthy?

e. can you show us where you hunt now (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?

f. Are there environmental factors that contribute to changes in bear/caribou hunting? (weather, river conditions, winter conditions, migratory routes (caribou), etc)

g. are younger people learning to hunt? If so, how do they do that? How did you learn?

h. are there any rules about hunting or the treatment of bear/caribou or other animals during moose hunting/harvest?

i. native names for bear/caribou or other aspects of bear/caribou hunting? Do you remember any traditional stories about bear/caribou or bear/caribou hunting in your village?

Part 7. Trapping

1. Please describe your current trapping practices:

a. do you trap with anyone else? How is this determined?

b. how do you 'hold' your trapline? From whom (if anyone) did you get it/take it over?

c. are younger people learning to trap? If so, how do they do that? How did you learn?

d. what species do you trap? Why?

e. how do you feel the population of the animals you trap is doing right now? Why do you think the population is declining/increasing? Are the species you trap healthy?

f. can you show us where you trap now (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?

g. Are there environmental factors that contribute to changes in trapping? (changing weather, snow pack, river conditions, etc)

APPENDIX C.–CONVERSION FACTORS

Appendix C.–Conversion factors, study communities, 2013.

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
Quinhagak, Tuntutuliak, and Eek salmon conversion factors		
Chum salmon	individual	4.9100
Chum salmon	individual	4.9100
Summer chum salmon	individual	4.9100
Summer chum salmon	individual	4.9100
Fall chum salmon	individual	4.9100
Fall chum salmon	individual	4.9100
Unknown chum salmon	individual	4.9100
Unknown chum salmon [CF retention]	individual	4.9100
Coho salmon	individual	4.5900
Coho salmon [CF retention]	individual	4.5900
Chinook salmon	individual	10.9900
Chinook salmon [CF retention]	individual	10.9900
Pink salmon	individual	2.7000
Pink salmon [CF retention]	individual	2.7000
Sockeye salmon	individual	5.0000
Sockeye salmon [CF retention]	individual	5.0000
Unknown salmon	individual	10.9900
Unknown salmon	individual	10.9900
Shageluk, Scammon Bay, and Pilot Station salmon conversion factors		
Chum salmon	individual	4.6300
Chum salmon	individual	4.6300
Summer chum salmon	individual	4.6300
Summer chum salmon	individual	4.6300
Fall chum salmon	individual	4.6300
Fall chum salmon	individual	4.6300
Unknown chum salmon	individual	4.6300
Unknown chum salmon [CF retention]	individual	4.6300
Coho salmon	individual	4.5900
Coho salmon [CF retention]	individual	4.5900
Chinook salmon	individual	9.5800
Chinook salmon [CF retention]	individual	9.5800
Pink salmon	individual	2.7000
Pink salmon [CF retention]	individual	2.7000
Sockeye salmon	individual	4.4400
Sockeye salmon [CF retention]	individual	4.4400
Unknown salmon	individual	9.5800
Unknown salmon	individual	9.5800

-continued-

Resource name	Reported units	Conversion factor
Pacific herring	individual	0.4000
Pacific herring	pounds	1.0000
Pacific herring	gallons	6.0000
Pacific herring [CF retention]	individual	0.4000
Pacific herring [CF retention]	gallons	6.0000
Pacific herring roe	individual	0.0010
Pacific herring roe	pounds	1.0000
Pacific herring roe	gallons	5.5000
Smelt	individual	0.2500
Smelt	pounds	1.0000
Smelt	5-gal bucket	30.0000
Smelt	gallons	6.0000
Smelt	quarts	1.5000
Eulachon (hooligan, candlefish)	gallons	3.2500
Pacific (gray) cod	individual	0.5000
Pacific tomcod	individual	0.5000
Saffron cod	individual	0.7500
Saffron cod	pounds	1.0000
Saffron cod	gallons	6.0000
Walleye pollock (whiting)	individual	1.4000
Flounder	individual	1.1000
Starry flounder	individual	1.1000
Pacific halibut	individual	21.2000
Pacific halibut	pounds	1.0000
Pacific halibut [CF retention]	individual	21.2000
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	1.5000
Sculpin	individual	0.5000
Sculpin	pounds	1.0000
Stickleback (needlefish)	individual	0.2000
Stickleback (needlefish)	gallons	6.0000
Alaska blackfish	individual	0.7500
Alaska blackfish	pounds	1.0000
Alaska blackfish	gallons	6.0000
Alaska blackfish	quarts	1.5000
Burbot	individual	2.4000
Burbot	gallons	6.0000
Char	individual	2.8000
Char	individual	2.8000
Arctic char	individual	0.9000
Brook trout	individual	1.4000
Dolly Varden	individual	0.9000
Dolly Varden	individual	0.9000
Dolly Varden	gallons	6.0000
Dolly Varden [CF retention]	individual	0.9000

-continued-

Appendix C.–Page 3 of 8.

Resource name	Reported units	Conversion factor
Lake trout	individual	2.0000
Unknown char	individual	1.5000
Arctic grayling	individual	1.0000
Northern pike	individual	4.5000
Northern pike	gallons	6.0000
Sheefish	individual	6.0000
Sheefish [CF retention]	individual	6.0000
Longnose sucker	individual	2.0000
Rainbow trout	individual	1.4000
Rainbow trout	individual	1.4000
Rainbow trout [CF retention]	individual	1.4000
Unknown trout	individual	3.0000
Unknown trout [CF retention]	individual	3.0000
Broad whitefish	individual	4.0000
Broad whitefish	gallons	6.0000
Broad whitefish [CF retention]	individual	4.0000
Broad whitefish [CF retention]	pounds	1.0000
Bering cisco	individual	1.4000
Bering cisco	gallons	6.0000
Bering cisco [CF retention]	individual	1.4000
Least cisco	individual	1.0000
Least cisco	gallons	6.0000
Least cisco [CF retention]	individual	1.0000
Unknown cisco	individual	0.7000
Humpback whitefish	individual	3.0000
Humpback whitefish	gallons	6.0000
Humpback whitefish [CF retention]	individual	3.0000
Humpback whitefish [CF retention]	gallons	6.0000
Round whitefish	individual	0.5000
Unknown whitefishes	individual	3.7700
Bison	individual	450.0000
Black bear	individual	100.0000
Brown bear	individual	141.0000
Caribou	individual	130.0000
Moose	individual	540.0000
Muskox	individual	295.0000
Dall sheep	individual	65.0000
Beaver	individual	15.0000
Coyote	individual	0.0000
Arctic fox	individual	0.0000
Red fox	individual	0.0000
Small Alaska hare	individual	2.0000
Snowshoe hare	individual	2.0000
Large Alaska hare	individual	3.0000
River (land) otter	individual	3.0000
Lynx	individual	4.0000
Marmot	individual	5.0000
Marten	individual	0.0000

-continued-

Appendix C.–Page 4 of 8.

Resource name	Reported units	Conversion factor
Mink	individual	2.0000
Muskrat	individual	0.7500
Porcupine	individual	5.0000
Arctic ground (parka) squirrel	individual	0.5000
Least weasel	individual	0.0000
Gray wolf	individual	0.0000
Wolverine	individual	0.0000
Reindeer–feral	individual	62.5000
Harbor seal	individual	56.0000
Bearded seal	individual	140.0000
Ribbon seal	individual	89.0000
Ringed seal	individual	56.0000
Spotted seal	individual	56.0000
Unknown seal oil	individual	0.0000
Unknown seal	individual	56.0000
Walrus	individual	770.0000
Beluga whale	individual	1,000.0000
Bowhead whale	individual	28,677.0000
Unknown marine mammals	individual	0.0000
Bufflehead	individual	0.4000
Canvasback	individual	1.9000
Common eider	individual	2.2100
King eider	individual	1.4300
Spectacled eider	individual	2.4300
Steller's eider	individual	1.0000
Unknown eider	individual	2.2100
Gadwall	individual	0.8000
Goldeneye	individual	1.5400
Harlequin duck	individual	0.5000
Mallard	individual	1.9500
Common merganser	individual	1.2700
Red-breasted merganser	individual	0.6200
Unknown merganser	individual	0.9500
Long-tailed duck	individual	1.5000
Northern pintail	individual	1.5000
Scaup	individual	0.9000
Black scoter	individual	0.9000
Surf scoter	individual	0.9000
White-winged scoter	individual	2.2900
Northern shoveler	individual	1.0900
Teal	individual	0.5200
Green-winged teal	individual	0.5200
American wigeon	individual	1.3100
Unknown ducks	individual	1.4800
Brant	individual	6.0000
Cackling goose	individual	1.2000
Canada goose	individual	1.2000
Emperor goose	individual	2.5000

-continued-

Resource name	Reported units	Conversion factor
Snow goose	individual	3.9900
White-fronted goose	individual	4.2400
Unknown goose	individual	3.2400
Tundra (whistling) swan	individual	11.2100
Sandhill crane	individual	8.4000
Shorebirds	individual	0.1000
Whimbrel	individual	0.1000
Seabirds, loons, grebes	individual	5.4400
Loon	individual	5.4400
Unknown seabirds	individual	5.4400
Grouse	individual	0.7000
Spruce grouse	individual	0.7000
Sharp-tailed grouse	individual	0.7000
Ruffed grouse	individual	0.7000
Ptarmigan	individual	0.7000
Snowy owl	individual	3.0000
Duck eggs	individual	0.1500
Duck eggs	gallons	6.0000
Duck eggs	dozen	1.8000
Eider eggs	individual	0.1500
Goose eggs	individual	0.3000
Goose eggs	gallons	6.0000
Goose eggs	dozen	3.0000
Goose eggs	plastic bag (shopping bag)	15.0000
White-fronted goose eggs	individual	0.2500
Swan eggs	individual	0.6300
Crane eggs	individual	0.6300
Sandhill crane eggs	individual	0.6300
Shorebird eggs	individual	0.0500
Shorebird eggs	gallons	7.5000
Common snipe eggs	individual	0.0500
Plover eggs	individual	0.0700
Whimbrel eggs	individual	0.0500
Godwit eggs	individual	0.5000
Unknown shorebird eggs	individual	0.0400
Seabird and loon eggs	individual	0.1600
Gull eggs	individual	0.3000
Gull eggs	gallons	6.0000
Loon eggs	individual	0.1800
Murre eggs	individual	0.2200
Murre eggs	gallons	7.5000
Tern eggs	individual	0.0500
Tern eggs	gallons	6.0000
Unknown seabird eggs	individual	0.3000
Ptarmigan eggs	individual	0.1000
Unknown eggs	individual	0.2200
Unknown eggs	individual	0.2200
Unknown eggs	gallons	6.0000

-continued-

Resource name	Reported units	Conversion factor
Clams	individual	0.1000
Clams	pounds	1.0000
Clams	gallons	3.0000
Clams [CF retention]	individual	0.1000
Clams [CF retention]	gallons	3.0000
Butter clams	gallons	3.0000
King crab	individual	2.1000
Tanner crab	individual	1.6000
Unknown crabs [CF retention]	individual	2.1000
Mussels	individual	0.0050
Mussels	pounds	1.0000
Mussels	gallons	1.5000
Shrimp	individual	0.0100
Shrimp	gallons	2.0000
Shrimp	cup	0.1250
Unknown marine invertebrates	gallons	2.1300
Unknown marine invertebrates	gallons	2.1300
Blueberry	pounds	1.0000
Blueberry	gallons	4.0000
Blueberry	quarts	1.0000
Blueberry	cup	0.2500
Lowbush cranberry	gallons	4.0000
Lowbush cranberry	quarts	1.0000
Lowbush cranberry	cup	0.2500
Highbush cranberry	gallons	4.0000
Crowberry	gallons	4.0000
Crowberry	quarts	1.0000
Crowberry	cup	0.2500
Currants	individual	0.0100
Currants	gallons	4.0000
Cloudberry	gallons	4.0000
Cloudberry	quarts	1.0000
Cloudberry	cup	0.2500
Nagoonberry	gallons	4.0000
Nagoonberry	quarts	1.0000
Nagoonberry	pints	0.5000
Nagoonberry	cup	0.2500
Raspberry	gallons	4.0000
Raspberry	quarts	1.0000
Raspberry	cup	0.2500
Salmonberry	gallons	4.0000
Salmonberry	quarts	1.0000
Bearberry	quarts	1.0000
Other wild berry	gallons	4.0000
Other wild berry	quarts	1.0000

-continued-

Resource name	Reported units	Conversion factor
Wild rhubarb	individual	0.3000
Wild rhubarb	pounds	1.0000
Wild rhubarb	gallons	1.0000
Wild rhubarb	quarts	0.2500
Wild rhubarb	cup	0.0625
Eskimo potato	gallons	4.0000
Other beach greens	gallons	1.0000
Other beach greens	plastic bag (shopping bag)	2.0000
Fiddlehead ferns	gallons	1.0000
Fiddlehead ferns	quarts	0.2500
Fiddlehead ferns	pints	0.1300
Fiddlehead ferns	cup	0.0625
Nettle	gallons	1.0000
Hudson's Bay (Labrador) tea	pounds	1.0000
Hudson's Bay (Labrador) tea	gallons	1.0000
Hudson's Bay (Labrador) tea	quarts	0.2500
Hudson's Bay (Labrador) tea	plastic bag (shopping bag)	2.0000
Hudson's Bay (Labrador) tea	cup	0.0600
Sourdock	pounds	1.0000
Sourdock	gallons	1.0000
Sourdock	quarts	0.2500
Sourdock	plastic bag (shopping bag)	2.0000
Sourdock	pints	0.1300
Sourdock	cup	0.0600
Pallas buttercup	pounds	1.0000
Pallas buttercup	gallons	1.0000
Pallas buttercup	quarts	0.2500
Pallas buttercup	plastic bag (shopping bag)	2.0000
Pallas buttercup	cup	0.0600
Spruce tips	gallons	1.0000
Willow leaves	gallons	1.0000
Willow leaves	quarts	0.2500
Wild celery	individual	0.0100
Wild celery	pounds	1.0000
Wild celery	gallons	1.0000
Wild celery	quarts	0.2500
Wild celery	pints	0.1300
Beach rye grass	pounds	1.0000
Wild parsley	gallons	1.0000
Wild parsley	quarts	0.2500
Wild parsley	pints	0.1300
Wild rose hips	gallons	4.0000
Yarrow	gallons	1.0000

-continued-

Appendix C.–Page 8 of 8.

Resource name	Reported units	Conversion factor
Other wild greens	pounds	1.0000
Other wild greens	gallons	1.0000
Other wild greens	quarts	0.2500
Other wild greens	plastic bag (shopping bag)	2.0000
Other wild greens	pints	0.1300
Other wild greens	cup	0.0600
Unknown mushrooms	individual	0.0100
Unknown mushrooms	gallons	1.0000
Unknown mushrooms	quarts	0.2500
Fireweed	gallons	1.0000
Stinkweed	individual	0.0100
Stinkweed	pounds	1.0000
Stinkweed	gallons	1.0000
Stinkweed	quarts	0.2500
Stinkweed	plastic bag (shopping bag)	2.0000
Stinkweed	pints	0.1300
Stinkweed	cup	0.0600
Punk	pounds	0.0000
Punk	gallons	0.0000
Punk	plastic bag (shopping bag)	0.0000
Puffballs	gallons	1.0000
Mousefoods	gallons	1.0000
Mousefoods	quarts	0.2500
Mousefoods	pints	0.1300
Sea chickweed	gallons	1.0000
Wood	amount not collected	0.0000
Unknown vegetation	gallons	1.0000

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

APPENDIX D.–ADDITIONAL TABLES

Table D-1.–Individual participation in subsistence harvesting and processing activities, Scammon Bay, 2013.

Total number of people	**627.9**
Fish	
Fish	
Number	210.2
Percentage	35.2%
Process	
Number	177.3
Percentage	29.7%
Land mammals	
Hunt	
Number	94.4
Percentage	15.9%
Process	
Number	188.8
Percentage	31.6%
Marine Mammals	
Hunt	
Number	70.1
Percentage	12.0%
Process	
Number	118.7
Percentage	20.0%
Birds and eggs	
Hunt	
Number	187.4
Percentage	31.6%
Process	
Number	161.6
Percentage	27.2%
Plants	
Gather	
Number	316.1
Percentage	53.3%
Process	
Number	198.8
Percentage	33.5%
Any resource	
Attempt	
Number	431.9
Percentage	68.8%
Process	
Number	360.4
Percentage	57.4%

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

Table D-2.–Individual participation in subsistence harvesting and processing activities, Quinhagak, 2013.

Total number of people	**732.7**
Fish	
Fish	
Number	233.3
Percentage	45.4%
Process	
Number	214.0
Percentage	41.6%
Land mammals	
Hunt	
Number	77.3
Percentage	15.3%
Process	
Number	148.6
Percentage	29.6%
Marine Mammals	
Hunt	
Number	53.5
Percentage	10.7%
Process	
Number	95.1
Percentage	18.9%
Birds and eggs	
Hunt	
Number	173.9
Percentage	35.5%
Process	
Number	175.4
Percentage	35.8%
Plants	
Gather	
Number	316.6
Percentage	63.0%
Process	
Number	237.8
Percentage	47.6%
Any resource	
Attempt	
Number	396.8
Percentage	54.2%
Process	
Number	331.4
Percentage	45.2%

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

Table D-3.–Individual participation in subsistence harvesting and processing activities, Eek, 2013.

Total number of people	**347.3**
Fish	
Fish	
Number	98.4
Percentage	33.0%
Process	
Number	92.8
Percentage	31.1%
Land mammals	
Hunt	
Number	50.6
Percentage	17.1%
Process	
Number	64.7
Percentage	21.7%
Marine Mammals	
Hunt	
Number	36.6
Percentage	11.9%
Process	
Number	43.6
Percentage	14.2%
Birds and eggs	
Hunt	
Number	106.9
Percentage	35.8%
Process	
Number	88.6
Percentage	30.1%
Plants	
Gather	
Number	165.9
Percentage	55.7%
Process	
Number	129.4
Percentage	43.4%
Any resource	
Attempt	
Number	185.6
Percentage	53.4%
Process	
Number	168.8
Percentage	48.6%

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

Table D-4.–Individual participation in subsistence harvesting and processing activities, Tuntutuliak, 2013.

Total number of people	**412.9**
Fish	
Fish	
Number	124.2
Percentage	38.3%
Process	
Number	102.4
Percentage	31.6%
Land mammals	
Hunt	
Number	68.3
Percentage	20.9%
Process	
Number	76.1
Percentage	23.2%
Marine Mammals	
Hunt	
Number	40.4
Percentage	12.3%
Process	
Number	82.3
Percentage	25.1%
Birds and eggs	
Hunt	
Number	144.4
Percentage	44.1%
Process	
Number	121.1
Percentage	36.8%
Plants	
Gather	
Number	223.5
Percentage	69.2%
Process	
Number	173.9
Percentage	53.8%
Any resource	
Attempt	
Number	249.9
Percentage	60.5%
Process	
Number	201.8
Percentage	48.9%

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

Table D-5.–Individual participation in subsistence harvesting and processing activities, Pilot Station, 2013.

Total number of people	**633.1**
Fish	
Fish	
Number	132.1
Percentage	24.1%
Process	
Number	212.0
Percentage	40.0%
Land mammals	
Hunt	
Number	158.3
Percentage	28.8%
Process	
Number	218.8
Percentage	39.8%
Marine Mammals	
Hunt	
Number	15.1
Percentage	2.8%
Process	
Number	33.0
Percentage	6.0%
Birds and eggs	
Hunt	
Number	112.9
Percentage	20.6%
Process	
Number	122.5
Percentage	22.7%
Plants	
Gather	
Number	346.8
Percentage	65.8%
Process	
Number	276.6
Percentage	52.5%
Any resource	
Attempt	
Number	374.4
Percentage	59.1%
Process	
Number	370.2
Percentage	58.5%

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

Table D-6.–Individual participation in subsistence harvesting and processing activities, Shageluk, 2013.

Total number of people	**84.8**
Fish	
Fish	
Number	37.9
Percentage	48.6%
Process	
Number	34.6
Percentage	46.3%
Land mammals	
Hunt	
Number	20.1
Percentage	25.7%
Process	
Number	27.9
Percentage	37.3%
Marine Mammals	
Hunt	
Number	0.0
Percentage	0.0%
Process	
Number	0.0
Percentage	0.0%
Birds and eggs	
Hunt	
Number	17.8
Percentage	22.9%
Process	
Number	21.2
Percentage	28.4%
Plants	
Gather	
Number	51.3
Percentage	65.7%
Process	
Number	49.1
Percentage	62.9%
Any resource	
Attempt	
Number	65.8
Percentage	77.6%
Process	
Number	61.3
Percentage	72.4%

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