Technical Paper No. 410

The Harvest and Uses of Wild Resources in Mountain Village, Marshall, Nulato, Galena, and Ruby, Alaska, 2010

by

Caroline L. Brown

Andrew R. Brenner

Hiroko Ikuta

Elizabeth H. Mikow

Brittany Retherford

Lisa J. Slayton

Alida Trainor

Jeff Park

David Koster

and

Marylynne L. Kostick

June 2015

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

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Measures (fisheries)

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

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
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. 410

THE HARVEST AND USES OF WILD RESOURCES IN MOUNTAIN VILLAGE, MARSHALL, NULATO, GALENA, AND RUBY, ALASKA, 2010

by

Caroline L. Brown, Andrew R. Brenner, Hiroko Ikuta, Elizabeth H. Mikow,
Brittany Retherford, Lisa J. Slayton, Alida Trainor, and Jeff Park
Alaska Department of Fish and Game Division of Subsistence, Fairbanks

and

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

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

June 2015

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.

Caroline L. Brown, Andrew Brenner, Hiroko Ikuta, Elizabeth H. Mikow,
Brittany Retherford, Lisa J. Slayton, Alida Trainor, and Jeff Park
Alaska Department of Fish and Game Division of Subsistence
1300 College Road, Fairbanks, AK 99701-1551 USA

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

This document should be cited as:
Brown, C.L., A. Brenner, H. Ikuta, E.H. 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.

The Alaska Department of Fish and Game (ADF&G) administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act (ADA) of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.
If you believe you have been discriminated against in any program, activity, or facility please write:
ADF&G ADA Coordinator, P.O. Box 115526, Juneau, AK, 99811-5526
U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, MS 2042, Arlington, VA, 22203
Office of Equal Opportunity, U.S. Department of the Interior, 1849 C Street NW, MS 5230, Washington, D.C. 20240
The department's ADA Coordinator can be reached via phone at the following numbers:
(Voice) 907-465-6077, (Statewide Telecommunication Device for the Deaf) 1-800-478-3648, (Juneau TDD) 907-465-3646, or (Fax) 907-465-6078
For information on alternative formats and questions on this publication, please contact:
ADF&G Division of Subsistence at http://www.adfg.alaska.gov/index.cfm?adfg=contacts.anchorage

TABLE OF CONTENTS

List of Tables iv

List of Figures vi

List of Plates xi

List of Appendices xii

Abstract xv

1. Introduction 1
- Regional Background 1
- Regulatory Context of the Lower and Middle Yukon River Areas 2
  - Salmon 3
  - Terrestrial wildlife 5
- Project Background and Research Questions 5
- Study Objectives 6
- Rationale and Literature Review 7
- Relationships with Alaska Native Communities 7
- Report Organization 8

2. Methods 9
- General Research Design 9
- Survey Instrument 10
- Limitations and Assumptions 11
- Procedures 11
- Data Analysis 13

3. Comprehensive Survey Results Mountain Village, 2010 16
- Community Background 16
- Seasonal Round 20
- Demographics 22
- Wild Food Harvests and Uses 24
- Harvest Areas 31
- Harvest Assessments 42
- Jobs and Income 44
- Food Security 46
- Wild Food Networks 47
- Comparisons with Prior Results 49

TABLE OF CONTENTS, CONTINUED

4. Comprehensive Survey Results Marshall, 2010 55
Community Background 55
Seasonal Round 58
Demographics 60
Wild Food Harvests and Uses 60
Harvest Areas 67
Harvest Assessments 71
Jobs and Income 81
Food Security 82
Wild Food Networks 84
Comparisons with Prior Results 86

5. Comprehensive Survey Results Nulato, 2010 90
Community Background 90
Seasonal Round 94
Demographics 96
Wild Food Harvests and Uses 96
Harvest Areas 108
Harvest Assessments 113
Jobs and Income 121
Food Security 122
Wild Food Networks 125
Comparisons with Prior Results 126

6. Comprehensive Survey Results Galena, 2010 133
Community Background 133
Seasonal Round 137
Demographics 138
Wild Food Harvests and Uses 139
Harvest Areas 149
Harvest Assessments 158
Jobs and Income 160
Food Security 161
Comparisons with Prior Results 163

TABLE OF CONTENTS, CONTINUED

7. Comprehensive Survey Results Ruby, 2010 172
Community Background 172
Seasonal Round 175
Demographics 176
Wild Food Harvests and Uses 178
Harvest Areas 188
Harvest Assessments 196
Jobs and Income 198
Food Security 200
Wild Food Networks 201
Comparisons with Prior Results 203

8. Regional Discussion and Conclusion 208
Demographics 208
Regional Wild Food Harvests and Comparisons 208
Lower Yukon River 209
Harvest Comparisons by Resource 209
Moose 211
Salmon 214
Marine Mammals 216
Whitefishes 217
Middle Yukon River 217
Harvest Comparisons by Resource 221
Moose 221
Salmon 226
Nonsalmon fish 228
Conclusions 229

References **230**

LIST OF TABLES

Table

Table 2-1.–Local research assistants. 12
Table 2-2.–Survey length, 5 Yukon River communities, 2010. 12
Table 2-3.–Sample achievement, 5 Yukon River communities, 2010. 13
Table 3-1.–Resource harvest and use characteristics, Mountain Village, 2010. 17
Table 3-2.–Estimated harvest and use of fish, Mountain Village, 2010. 26
Table 3-3.–Estimated harvest and use of land and marine mammals, Mountain Village, 2010. 28
Table 3-4.–Estimated harvest and use of birds, Mountain Village, 2010. 30
Table 3-5.–Estimated harvest and use of eggs, Mountain Village, 2010. 31
Table 3-6.–Estimated harvest and use of vegetation, Mountain Village 2010. 32
Table 3-7.–Estimated harvest and use of marine invertebrates, Mountain Village, 2010. 33
Table 3-8.–Estimated earned and other income, Mountain Village, 2010. 45
Table 4-1.–Resource harvest and use characteristics, Marshall, 2010. 56
Table 4-2.–Estimated harvest and use of fish, Marshall, 2010. 64
Table 4-3.–Estimated harvest and use of land and marine mammals, Marshall, 2010. 66
Table 4-4.–Estimated harvest and use of birds, Marshall, 2010. 68
Table 4-5.–Estimated harvest and use of eggs, Marshall, 2010. 69
Table 4-6.–Estimated harvest and use of vegetation, Marshall, 2010. 70
Table 4-7.–Estimated harvest and use of marine invertebrates, Marshall, 2010. 71
Table 4-8.–Estimated earned and other income, Marshall, 2010. 81
Table 5-1.–Resource harvest and use characteristics, Nulato, 2010. 91
Table 5-2.–Estimated harvest and use of fish, Nulato, 2010. 100
Table 5-3.–Estimated harvest and use of marine invertebrates, Nulato, 2010. 104
Table 5-4.–Estimated harvest and use of land and marine mammals, Nulato, 2010. 105
Table 5-5.–Estimated harvest and use of birds, Nulato, 2010. 106
Table 5-6.–Estimated harvest and use of eggs, Nulato, 2010. 107
Table 5-7.–Estimated harvest and use of vegetation, Nulato, 2010. 108
Table 5-8.–Estimated earned and other income, Nulato, 2010. 121
Table 5-9.–Moose hunter effort, Nulato, 1996–2001, 2010. 131
Table 6-1.–Resource harvest and use characteristics, Galena, 2010. 134
Table 6-2.–Estimated harvest and use of fish, Galena, 2010. 141
Table 6-3.–Estimated harvest and use of land and marine mammals, Galena, 2010. 145
Table 6-4.–Estimated harvest and use of marine invertebrates, Galena, 2010. 146
Table 6-5.–Estimated harvest and use of birds, Galena, 2010. 147

LIST OF TABLES, CONTINUED

Table 6-6.–Estimated harvest and use of eggs, Galena, 2010. 148
Table 6-7.–Estimated harvest and use of vegetation, Galena, 2010. 149
Table 6-8.–Estimated earned and other income, Galena, 2010. 160
Table 6-9.–Moose hunter effort, Galena, 1985, 1996–2002, 2010. 169
Table 7-1.–Resource harvest and use characteristics, Ruby, 2010. 173
Table 7-2.–Estimated harvest and use of fish, Ruby, 2010. 181
Table 7-3.–Estimated harvest and use of land and marine mammals, Ruby, 2010. 183
Table 7-4.–Estimated harvest and use of birds, Ruby, 2010. 185
Table 7-5.–Estimated harvest and use of eggs, Ruby, 2010. 186
Table 7-6.–Estimated harvest and use of marine invertebrates, Ruby, 2010. 186
Table 7-7.–Estimated harvest and use of vegetation, Ruby, 2010. 187
Table 7-8.–Estimated earned and other income, Ruby, 2010. 198
Table 7-9.–Moose hunter effort, Ruby, 1996–2002, 2010. 206
Table 8-1.–Harvest surveys, lower Yukon River communities, 1977–2011. 210
Table 8-2.–Sheefish and whitefishes harvests in numbers of fish, lower Yukon River communities, 1977–2010. 218
Table 8-3.–Harvest surveys, middle Yukon River communities, 1985–2010. 219
Table 8-4.–Moose harvests and hunter effort, middle Yukon River communities, 1997–1999, 2001–2002, 2008, and 2010. 223
Table 8-5.–Sheefish and whitefishes harvests in numbers of fish, middle Yukon River communities, 1986–2010. 227

LIST OF FIGURES

Figure

Figure 3-1.–Top 10 species harvested, ranked by estimated edible weight, Mountain Village, 2010... 16
Figure 3-2.–Population history, Mountain Village, 1960–2010.....23
Figure 3-3.–Population profile, Mountain Village, 2010. 23
Figure 3-4.–Percentages of households using, attempting to harvest, or harvesting subsistence resources, by category, Mountain Village, 2010. 24
Figure 3-5.–Total estimated edible pounds harvested, by resource category, Mountain Village, 2010.....25
Figure 3-6.–Estimated fish harvests by gear type, Mountain Village, 2010. 27
Figure 3-7.–Search and harvest areas, all resources, Mountain Village, 2010. 34
Figure 3-8.–Search and harvest areas, salmon, Mountain Village, 2010. 35
Figure 3-9.–Search and harvest areas, nonsalmon fish, Mountain Village, 2010. 36
Figure 3-10.–Search and harvest areas, large land mammals, Mountain Village, 2010. 37
Figure 3-11.–Search and harvest areas, small land mammals, Mountain Village, 2010. 38
Figure 3-12.–Search and harvest areas, marine mammals, Mountain Village, 2010.....39
Figure 3-13.–Search and harvest areas, birds, Mountain Village, 2010. 40
Figure 3-14.–Search and harvest areas, vegetation, Mountain Village, 2010.....41
Figure 3-15.–Household harvest assessments, Mountain Village, 2010. Responses to the question: Did your household get enough ? 42
Figure 3-16.–Household use assessments, Mountain Village, 2010. Responses to the question: Did your household use less, more, or the same amount? 43
Figure 3-17.–Top 10 income sources, ranked by estimated amount, Mountain Village, 2010.....46
Figure 3-18.–Food insecure conditions, Mountain Village, 2010.....46
Figure 3-19.–Food security categories, Mountain Village, 2010.....47
Figure 3-20.–Food insecure conditions by month and household category, Mountain Village, 2010.....47
Figure 3-21.–Wild food harvesting and processing network, Mountain Village, 2010. 48
Figure 3-22.–Estimated per capita harvests in edible pounds, Mountain Village, 1980 and 2010....50
Figure 3-23.–Estimated salmon harvests in numbers of fish, Mountain Village, 1988–2010. 52
Figure 4-1.–Top 10 species harvested, ranked by estimated edible weight, Marshall, 2010.....55
Figure 4-2.–Population history, Marshall, 1960–2010. 61
Figure 4-3.–Population profile, Marshall, 2010. 61
Figure 4-4.–Percentages of households using, attempting to harvest, or harvesting subsistence resources, by category, Marshall, 2010. 62

LIST OF FIGURES, CONTINUED

Figure 4-5.–Total estimated edible pounds harvested, by resource category, Marshall, 2010. 63
Figure 4-6.–Estimated fish harvests by gear type, Marshall, 2010. 65
Figure 4-7.–Search and harvest areas, all resources, Marshall, 2010. 72
Figure 4-8.–Search and harvest areas, salmon, Marshall, 2010. 73
Figure 4-9.–Search and harvest areas, nonsalmon fish, Marshall, 2010. 74
Figure 4-10.–Search and harvest areas, large land mammals, Marshall, 2010. 75
Figure 4-11.–Search and harvest areas, small land mammals, Marshall, 2010. 76
Figure 4-12.–Search and harvest areas, birds, Marshall, 2010. 77
Figure 4-13.–Search and harvest areas, vegetation, Marshall, 2010. 78
Figure 4-14.–Household harvest assessments, Marshall, 2010. Responses to the question: Did your household get enough ? 79
Figure 4-15.–Household use assessments, Marshall, 2010. Responses to the question: Did your household use less, more, or the same amount? 80
Figure 4-16.–Top 10 income sources, ranked by estimated amount, Marshall, 2010. 82
Figure 4-17.–Food insecure conditions, Marshall, 2010. 83
Figure 4-18.–Food security categories, Marshall, 2010. 83
Figure 4-19.–Food insecure conditions by month and household category, Marshall, 2010. 84
Figure 4-20.–Wild food harvesting and processing network, Marshall, 2010. 85
Figure 4-21.–Estimated salmon harvests in numbers of fish, Marshall, 1998–2010. 87
Figure 5-1.–Top 10 species harvested, ranked by estimated edible weight, Nulato, 2010. 90
Figure 5-2.–Population history, Nulato, 1960–2010. 97
Figure 5-3.–Population profile, Nulato, 2010. 97
Figure 5-4.–Percentages of households using, attempting to harvest, or harvesting subsistence resources, by category, Nulato, 2010. 98
Figure 5-5.–Total estimated edible pounds harvested, by resource category, Nulato, 2010. 99
Figure 5-6.–Estimated fish harvests by gear type, Nulato, 2010. 102
Figure 5-7.–Search and harvest areas, all resources, Nulato, 2010. 110
Figure 5-8.–Search and harvest areas, salmon, Nulato, 2010. 111
Figure 5-9.–Search and harvest areas, nonsalmon fish, Nulato, 2010. 112
Figure 5-10.–Search and harvest areas, small land mammals, Nulato, 2010. 114
Figure 5-11.–Search and harvest areas, large land mammals, Nulato, 2010. 115
Figure 5-12.–Search and harvest areas, birds, Nulato, 2010. 116
Figure 5-13.–Search and harvest areas, vegetation, Nulato, 2010. 117
Figure 5-14.–Household use assessments, Nulato, 2010. Responses to the question: Did your household use less, more, or the same amount? 118

LIST OF FIGURES, CONTINUED

Figure 5-15.–Household harvest assessments, Nulato, 2010. Responses to the question: Did your household get enough?....119
Figure 5-16.–Top 10 income sources, ranked by estimated amount, Nulato, 2010....122
Figure 5-17.–Food insecure conditions, Nulato, 2010....123
Figure 5-19.–Food insecure conditions by month and household category, Nulato, 2010....124
Figure 5-18.–Food security categories, Nulato, 2010....124
Figure 5-20.–Wild food harvesting and processing network, Nulato, 2010....126
Figure 5-21.–Estimated salmon harvests in numbers of fish, Nulato, 1988–2010....128
Figure 5-22.–Estimated nonsalmon fish harvests in edible pounds, Nulato, 2006 and 2010....129
Figure 5-23.–Estimated large land mammal harvests in numbers of animals, Nulato, 1992–2010....130
Figure 6-1.–Top 10 resources harvested, ranked by estimated edible weight, Galena, 2010....133
Figure 6-2.–Population history, Galena, 1960–2010....136
Figure 6-3.–Population profile, Galena, 2010....138
Figure 6-4.–Percentages of households using, attempting to harvest, or harvesting subsistence resources, by category, Galena, 2010....139
Figure 6-5.–Total estimated edible pounds harvested, by resource category, Galena, 2010....140
Figure 6-6.–Fish harvests by gear type, Galena, 2010....143
Figure 6-7.–Search and harvest areas, all resources, Galena, 2010....150
Figure 6-8.–Search and harvest areas, salmon, Galena, 2010....151
Figure 6-9.–Search and harvest areas, nonsalmon fish, Galena, 2010....153
Figure 6-10.–Search and harvest areas, large land mammals, Galena, 2010....154
Figure 6-11.–Search and harvest areas, small land mammals, Galena, 2010....155
Figure 6-12.–Search and harvest areas, birds, Galena, 2010....156
Figure 6-13.–Search and harvest areas, vegetation, Galena, 2010....157
Figure 6-14.–Household use assessments, Galena, 2010. Responses to the question: Did your household use less, more, or the same amount?....158
Figure 6-15.–Household harvest assessments, Galena, 2010. Responses to the question: Did your household get enough ?....159
Figure 6-16.–Top 10 income sources, ranked by estimated amount, Galena, 2010....161
Figure 6-17.–Food insecure conditions, Galena, 2010....162
Figure 6-18.–Food security categories, Galena, 2010....162
Figure 6-19.–Food insecure conditions by month and household category, Galena, 2010....163
Figure 6-20.–Wild food harvesting and processing network, Galena, 2010....164
Figure 6-21.–Estimated per capita harvests in edible pounds, Galena, 1985 and 2010....165

LIST OF FIGURES, CONTINUED

Figure 6-22.–Estimated salmon harvests in numbers of fish, Galena, 1985–2010. 166
Figure 6-23.–Estimated large land mammal harvests in edible pounds, Galena, 1985–2010. 168
Figure 7-1.–Population profile, Ruby, 2010. 177
Figure 7-2.–Population history, Ruby, 1980–2010. 177
Figure 7-3.–Top 10 species harvested, ranked by estimated edible weight, Ruby, 2010. 178
Figure 7-4.–Total estimated edible pounds harvested, by resource category, Ruby, 2010. 179
Figure 7-5.–Percentages of households using, attempting to harvest, or harvesting subsistence resources, by category, Ruby, 2010. 180
Figure 7-6.–Fish harvests by gear type, Ruby, 2010. 182
Figure 7-7.–Search and harvest areas, all resources, Ruby, 2010. 189
Figure 7-8.–Search and harvest areas, salmon, Ruby, 2010. 190
Figure 7-9.–Search and harvest areas, nonsalmon fish, Ruby, 2010. 191
Figure 7-10.–Search and harvest areas, large land mammals, Ruby, 2010. 192
Figure 7-11.–Harvest locations and search areas, small land mammals, Ruby, 2010. 193
Figure 7-12.–Search and harvest areas, birds, Ruby, 2010. 194
Figure 7-13.–Harvest locations and search areas, vegetation, Ruby, 2010. 195
Figure 7-14.–Household use assessments, Ruby, 2010. Responses to the question: Did your household use less, more, or the same amount? 196
Figure 7-15.–Household harvest assessments, Ruby, 2010. Responses to the question: Did your household get enough ? 197
Figure 7-16.–Top 10 income sources, ranked by estimated amount, Ruby, 2010. 199
Figure 7-17.–Food insecure conditions, Ruby, 2010. 200
Figure 7-18.–Food security categories, Ruby, 2010. 200
Figure 7-19.–Food insecure conditions by month and household category, Ruby, 2010. 201
Figure 7-20.–Wild food harvesting and processing network, Ruby, 2010. 202
Figure 7-21.–Estimated large land mammal harvests in edible pounds, Ruby, 1995–2002. 204
Figure 7-22.–Estimated salmon harvests in numbers of fish, Ruby, 1990–2010. 205
Figure 8-1.–Top 10 resources harvested, ranked by estimated edible weight. Mountain Village, 1980 and 2010. 211
Figure 8-2.–Top 10 resources harvested, ranked by estimated edible weight, Emmonak, 1980 and 2008. 212
Figure 8-3.–Top 10 resources harvested, ranked by estimated edible weight, Alakanuk, 1980 and 2008. 213
Figure 8-4.–Estimated salmon harvests in numbers of fish, lower Yukon River region, 1990–2010. 214

LIST OF FIGURES, CONTINUED

Figure 8-5.–Composition of salmon harvests, lower Yukon River region, 1990, 2000, and 2010. 215
Figure 8-6.–Top 10 resources harvested, ranked by estimated edible weight, Tanana, 1987 and 2008. 221
Figure 8-7.–Top 10 resources harvested, ranked by estimated edible weight, Galena, 1985 and 2010. 222
Figure 8-8.–Salmon harvests in numbers of fish, middle Yukon River region, 1990–2010. 224
Figure 8-9.–Composition of salmon harvests, middle Yukon River region, 1990, 2000, and 2010. 225

LIST OF PLATES

Plate

Plate 3-1.–Mountain Village from the air, 2010. 18
Plate 3-2.–Permanent residences at the base of Azachorok Mountain, 2010. 20
Plate 3-3.–Recently harvested waterfowl, Mountain Village, 2010. 29
Plate 4-1.–View of Marshall, spring 2011. 58
Plate 4-2.–Subsistence activities such as spring fishing for nonsalmon species and bird hunting are facilitated by the use of boats after breakup. 59
Plate 5-1.–Nulato lies on the north bank of the Yukon River just north of the Innoko National Wildlife Refuge. 93
Plate 5-2.–Subsistence foods feature prominently at Stickdance 2011 in Nulato. 96
Plate 5-3.–Fish camps used to be common during the summer months. Inset: Coho and fall chum salmon caught in August while drifting with a gillnet near Nulato. 101
Plate 5-4.–Punk, a fungus that grows on birch trees, is gathered for use as a mosquito repellent. .107
Plate 5-5.–Firewood gathered via snowmachine and sled keeps homes warm and reduces fuel costs during winter months. 109
Plate 6-1.–Salmon and whitefish drying on a fishrack in Galena. 137
Plate 6-2.–Chinook (king) salmon cut with cross cuts and hung to dry on a fish rack in Galena. ..142
Plate 7-1.–An historic photo taken in the summer of 1911, the year gold was discovered and the city of Ruby was officially established. 174
Plate 7-2.–Photo of Ruby taken 100 years later, during data collection in 2011. 175
Plate 7-3.–Some Ruby households participate in the local economy by producing high-quality handicrafts, such as snowshoes. 199

LIST OF APPENDICES

Appendix

Appendix A–Survey Instrument 238

Appendix B–Conversion Factors 273

Appendix C–Additional Tables, All Study Communities 280

Table C1.–Demographic and sample characteristics, 5 Yukon River communities, 2010. 281

Table C2.–Birthplaces of household heads, 5 Yukon River communities, 2010. 282

Table C3.–Estimates of moose hunting effort, 5 Yukon River communities, 2010. 283

Table C4.–Employment characteristics, 5 Yukon River communities, 2010. 284

Appendix D–Additional Tables 285

Table D3-1.–Participation in harvesting and processing activities, Mountain Village, 2010. 286

Table D3-2.–Estimated harvest of fish for consumption by dogs, Mountain Village, 2010. 287

Table D3-3.–Estimated large land mammal and gray wolf harvest by month and sex, Mountain Village, 2010. 288

Table D3-4.–Estimated small land mammal harvest by month, Mountain Village, 2010. 289

Table D3-5.–Estimated marine mammal harvest by month, Mountain Village, 2010. 289

Table D3-6.–Estimated bird harvest by season, Mountain Village, 2010. 290

Table D3-7.–Reported impact to households responding that they did not get enough of a resource, Mountain Village, 2010. 291

Table D3-8.–Households reporting why they did not get enough of a resource, Mountain Village, 2010. 292

Table D3-9.–Households reporting doing things differently because they did not get enough of a resource, Mountain Village, 2010. 294

Table D3-10.–Things households reported doing differently because they did not get enough of a resource, Mountain Village, 2010. 294

Table D3-11.–Reasons use of resources was less than in recent years, Mountain Village, 2010. 295

Table D3-12.–Reasons use of resources was more than in recent years, Mountain Village, 2010. 296

Table D3-13.–Reported job schedules, Mountain Village, 2010. 297

Table D4-1.–Participation in harvesting and processing activities, Marshall, 2010. 298

Table D4-2.–Estimated harvest of fish for consumption by dogs, Marshall, 2010. 299

Table D4-3.–Estimated large land mammal and gray wolf harvest by month and sex, Marshall, 2010. 300

Table D4-4.–Estimated small land mammal harvest by month, Marshall, 2010. 301

LIST OF APPENDICES, CONTINUED

Table D4-5.–Estimated marine mammal harvest by month, Marshall, 2010. 301
Table D4-6.–Estimated bird harvest by season, Marshall, 2010.....302
Table D4-7.–Households reporting why they did not get enough of a resource, Marshall, 2010. ..303
Table D4-8.–Reported impact to households responding that they did not get enough of a resource, Marshall, 2010. 304
Table D4-9.–Households reporting doing things differently because they did not get enough of a resource, Marshall, 2010.....305
Table D4-10.–Things households reported doing differently because they did not get enough of a resource, Marshall, 2010.....305
Table D4-11.–Reasons use of resources was less than in recent years, Marshall, 2010.....306
Table D4-12.–Reasons use of resources was more than in recent years, Marshall, 2010.....307
Table D4-13.–Reported job schedules, Marshall, 2010.....308
Table D5-1.–Participation in harvesting and processing activities, Nulato, 2010. 309
Table D5-2.–Estimated harvest of fish for consumption by dogs, Nulato, 2010. 310
Table D5-3.–Estimated large land mammal and gray wolf harvest by month and sex, Nulato, 2010.....311
Table D5-4.–Estimated small land mammal harvest by month, Nulato, 2010. 312
Table D5-5.–Estimated bird harvest by season, Nulato, 2010.....313
Table D5-6.–Reasons use of resources was less than in recent years, Nulato, 2010. 314
Table D5-7.–Reasons use of resources was more than in recent years, Nulato, 2010.....315
Table D5-8.–Reported impact to households responding that they did not get enough of a resource, Nulato, 2010.....316
Table D5-9.–Households reporting doing things differently because they did not get enough of a resource, Nulato, 2010. 316
Table D5-10.–Things households reported doing differently because they did not get enough of a resource, Nulato, 2010. 317
Table D5-11.–Households reporting why they did not get enough of a resource, Nulato, 2010.....318
Table D5-12.–Reported job schedules, Nulato, 2010. 320
Table D6-1.–Estimated harvest of fish for consumption by dogs, Galena, 2010.....321
Table D6-2.–Participation in harvesting and processing activities, Galena, 2010.....322
Table D6-3.–Estimated large land mammal and gray wolf harvest by month and sex, Galena, 2010. 323
Table D6-4.–Estimated small land mammal harvest by month, Galena, 2010.....324
Table D6-5.–Estimated bird harvest by season, Galena, 2010.....325

LIST OF APPENDICES, CONTINUED

Table D6-6.–Reasons use of resources was less than in recent years, Galena, 2010.....326
Table D6-7.–Households reporting why they did not get enough of a resource, Galena, 2010. 327
Table D6-8.–Households reporteing doing things differently because they did not get enough of a resource, Galena, 2010.....329
Table D6-9.–Things households reported doing differently because they did not get enough of a resource, Galena, 2010.....329
Table D6-10.–Reported impact to households responding that they did not get enough of a resource, Galena, 2010. 330
Table D6-11.–Reasons use of resources was more than in recent years, Galena, 2010.....331
Table D6-12.–Reported job schedules, Galena, 2010.....332
Table D7-1.–Participation in harvesting and processing activities, Ruby, 2010.....333
Table D7-2.–Estimated harvest of fish for consumption by dogs, Ruby, 2010.....334
Table D7-3.–Estimated large land mammal and gray wolf harvest by month and sex, Ruby, 2010. 335
Table D7-4.–Estimated small land mammal harvest by month, Ruby, 2010.....336
Table D7-5.–Estimated bird harvest by season, Ruby, 2010. 337
Table D7-6.–Reasons use of resources was less than in recent years, Ruby, 2010.....338
Table D7-7.–Reasons use of resources was more than in recent years, Ruby, 2010. 339
Table D7-8.–Households reporting why they did not get enough of a resource, Ruby, 2010. 340
Table D7-9.–Households reporting doing things differently because they did not get enough of a resource, Ruby, 2010.....342
Table D7-10.–Things households reported doing differently because they did not get enough of a resource, Ruby, 2010.....342
Table D7-11.–Reported impact to households responding that they did not get enough of a resource, Ruby, 2010. 343
Table D7-12.–Reported job schedules, Ruby, 2010.....344

ABSTRACT

This report summarizes the results of research conducted in 2011 on the subsistence harvests and uses of wild foods in 5 Yukon River communities during the calendar year 2010: 2 in the lower river area (Mountain Village and Marshall) and 3 in the middle river area (Nulato, Galena, and Ruby). The principal research questions asked about the quantity of wild resources harvested for subsistence and how these harvests were distributed within and between communities. 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 in the Yukon River drainage, the sharing distribution networks for subsistence foods within and between communities, and assessments of harvests over time. These data were collected to support the development ofan "indexing" approach to subsistence harvest monitoring throughout the state. Index communities will not "stand in" for other communities; rather, statistical analyses that identify relationships between an index community and the other communities in the subgroup will allow researchers to estimate harvests for unsurveyed communities in the area represented by the index community. This study helps to fill data gaps in Yukon River region.

The communities in the lower and middle Yukon regions have experienced a great deal of change in their subsistence patterns, despite continuing their historical and traditional hunting, fishing, trapping, and gathering practices. On average, communities in both the lower and middle Yukon River areas reported smaller per capita harvests of wild resources in 2010, even as the harvests of particular resources, such as moose and Chinook salmon, became more important to these community economies. Subsistence in the lower and middle Yukon regions remains a vital part of the cultural, economic, and social aspects of community life. However, these communities also experience a great deal of pressure that can affect their subsistence practices, highlighting the need for sound management of resources and the regulatory protection of subsistence patterns.

Key words: Mountain Village, Marshall, Nulato, Galena, Ruby, subsistence fishing, subsistence hunting

1. INTRODUCTION

Prepared by Caroline L. Brown

This report summarizes the results of research conducted in 2011 on the subsistence harvests and uses of wild foods in 5 Yukon River communities during the calendar year 2010: 3 in the middle river area (Ruby, Galena, and Nulato) and 2 in the lower river area (Marshall and Mountain Village). Residents in western Alaska, and along the Yukon River, more specifically, rely 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 Yukon River are diverse due to the variety of ecosystems and habitats from the marine and delta environments of the coastal regions to the boreal forests of Interior Alaska. Further, harvests vary from community to community and also fluctuate over time in amounts and species harvested in response to different circumstances including species availability, regulations, socio-economic factors (e.g., cost of fuel), personal tastes, and many other considerations. The communities of the middle and lower river areas included in this study share common characteristics with regard to the harvest and use of large land mammals, such as moose and caribou; fish, such as salmon, whitefish species, northern pike, and burbot; geese and ducks; wild berries; and greens. Important differences exist, though. Lower river communities have access to marine resources such as beluga whales and several seal species, which can contribute many edible pounds to a community's total subsistence harvest.

Despite this heavy reliance on subsistence food sources, minimal historical quantitative data on harvest levels for lower and middle river communities exists. Indeed, this lack of information was a contributing factor in the selection of these communities for participation in the study. This study represents a significant contribution to the available data on the harvests and uses of subsistence foods in Yukon River communities. Cooperators on this project included the tribal governments of Marshall, Mountain Village, Nulato, Galena, and Ruby.

Regional Background

The lower and middle Yukon River areas roughly include all the land and waters that drain into the Yukon River mainstem from the mouth of the Yukon River upriver to the community of Tanana. The lower Yukon portion stretches roughly from the river mouth to the community of Russian Mission, and the middle Yukon portion stretches roughly from the community of Holy Cross to the community of Tanana. The lower and middle Yukon areas are primarily encompassed by Alaska Department of Fish and Game (ADF&G) Mid-Lower Yukon, Middle Yukon, and Ruby fish and game advisory committees. A variety of similar, but not always identical, political boundaries are also part of the lower and middle Yukon areas. These include service areas of Doyon, Limited (an Alaska Native corporation formed under the Alaska Native Claims Settlement Act [ANCSA]), Tanana Chiefs Conference (TCC) (a nonprofit Alaska Native corporation), Calista Corporation (an Alaska Native corporation formed under ANCSA), and the Association of Village Council Presidents (AVCP) (a nonprofit Alaska Native corporation); the communities served by the federal subsistence management program by the Yukon-Kuskokwim Delta and Western-Interior Regional Advisory Councils; and ADF&G GMUs 18, 21E, 21D, 21B, and a small portion of 20F (state hunting regulatory areas).

The project area includes both state and federal waters used for subsistence fishing, such as that portion of the Yukon River from the mouth to just upriver of Russian Mission, which is encompassed by the Yukon Delta National Wildlife Refuge, and portions of the middle Yukon River that are within or adjacent to the Nowitna, Koyukuk, and Innoko national wildlife refuges.

The lower and middle Yukon River area was historically occupied by several groups of people. Two major groups inhabited the area in 2010: Central Yup'ik in the lower river area and Athabascan in the middle river area. Archaeological evidence of cultural groups ancestral to the Central Yup'ik in the lower Yukon River area (Yukon-Kuskokwim Delta) dates to at least 3,000 years ago (Shaw 1998). Within the broader Central

Yup'ik language and cultural groups, Alaska Natives of lower Yukon communities such as Mountain Village and Marshall further described themselves in Central Yup'ik as *Kuigpagmiut*, or literally "people from the big river" (the Yukon River). The middle Yukon area was historically occupied primarily by Athabascan groups (Deg Hit'an, Holikachuk, and Koyukon). Ancestors of these groups inhabited this area for at least a few thousand years (de Laguna 1936, 1947; Nelson 1978; Osgood 1940). Middle Yukon communities such as Ruby, Nulato, and Galena are culturally and liguistically distinct Koyukon Athabascan. Historically, these Central Yup'ik and Athabascan groups were semi-nomadic groups that maintained larger winter villages consisting of several families and smaller seasonal camps usually occupied by only a few families. The joint forces of missionization and economic development, primarily fur trapping and mining, ultimately consolidated these settlements into more permanent communities in the early 1900s. Specific community histories can be found in each community's chapter.

These seasonal settlements were characterized by a long established pattern of moving around the land in pursuit of wild resources that was still followed in 2010, though modified by the existence of permanent communities and modern technology. Although some generalizations about the overall historical seasonal round of subsistence activities for the lower and middle Yukon areas can be made, specifics of the activities, species harvested, and movements from camp to camp varied significantly between groups within this vast area. In general though, the seasonal round began in spring, before breakup, when families moved to spring camps to trap, fish for various nonsalmon species, and hunt migratory birds. Summers were devoted primarily to salmon fishing at fish camps, usually along the mainstem of the Yukon River where large quantities of salmon were caught and processed for consumption by both humans and dogs. Depending on the area of the Yukon River drainage and the run timing of salmon species, subsistence salmon fishing occurred from late May through early October. Fishing activities, based either from fish camps or from home communities, varied from community to community in terms of gear, targeted species, preferred sites, and fishing social structure. Extended family groups, typically representing several households, often undertook subsistence salmon fishing together. Households and related individuals typically cooperated to harvest, process, preserve, and store salmon for subsistence uses. (For more detail on subsistence uses of Yukon River salmon, see Alaska Department of Fish and Game 1987). In the fall, families traveled to fall camps (which were sometimes the same as their spring camps) from which they fished for nonsalmon species and hunted for ducks and geese. In winter, subsistence activities took the form of moose and caribou hunting, small game trapping, and fishing under the ice. Winter was also the time for mending subsistence equipment, visiting, and storytelling. Those communities located in the lower Yukon area (Yukon-Kuskokwim Delta) had greater access to the coast; consequently, hunting for marine mammals was also a part of their seasonal round. These seasonal activities continued in 2010; although fishing was usually based out of the permanent communities, some summer fish camps were still in operation. In 2010, the inhabitants of the lower and middle Yukon continued to rely heavily on hunting, fishing, and gathering to provide for both their nutritional and their cultural needs.

Regulatory Context of the Lower and Middle Yukon River Areas

Subsistence harvests of fish and wildlife in Alaska are mainly administered by the State of Alaska under Alaska Statutes Title 16, Chapter 5 and Title 5 of the Alaska Administrative Code, and by the federal government under Title VIII of the Alaska National Interest Lands Conservation Act, certain provisions of the Migratory Bird Treaty Act, and Title 50, Parts 92 and 100, of the Code of Federal Regulations. Federal subsistence law requires that individuals practicing subsistence harvests of wildlife on federal lands, and fishing in waters adjacent to federal lands, be permanent rural residents of the area (50 CFR 100.5). For purposes of harvesting migratory birds and their eggs, subsistence users must reside in communities within eligible areas of Alaska as determined by the Alaska Migratory Bird Co-Management Council (16 USC 712). The federal government designates much of the Yukon River drainage as a rural region (50 CFR 100.23). By contrast, under Alaska law, all state residents are eligible to harvest fish and wildlife for subsistence uses, outside state nonsubsistence areas. The state has made customary and traditional use

determinations for subsistence fishing throughout 5 AAC Chapters 01 and 02, and made customary and traditional determinations for subsistence game harvests in 5 AAC 99.025. The federal government has made customary and traditional use findings of fish and game in Alaska in 50 CFR 100.24.

Salmon

Residents of the Yukon River drainage have long relied on fish for human food and other subsistence uses. Although nonsalmon fish species provide an important component of the overall fish harvest (Andersen et al. 2004; Brown et al. 2010), salmon compose the bulk of the fish harvested for subsistence. Chinook salmon, summer and fall chum salmon, and coho salmon are all harvested in the Yukon River drainage, and the number of salmon harvested for subsistence in this region is considerable. Unlike many marine and coastal fisheries in which commercial harvests predominate, subsistence salmon harvests within the Yukon drainage often exceed commercial, sport, and personal use harvests combined.

The regulation and management of Yukon River drainage subsistence salmon fishing follows the "Yukon River Drainage Subsistence Salmon Fishery Management Protocol," which provides a framework for coordinated subsistence fisheries management between ADF&G and the federal subsistence management programs in the Yukon River drainage. This protocol is applied through a Memorandum of Agreement between state and federal agencies, which formalizes the working relationships between state and federal managers and fosters cooperation between managers and other groups, such as federal regional advisory councils, state fish and game advisory committees, and fisheries interest groups. State agencies manage subsistence, commercial, sport, and personal use fisheries unless state regulations are preempted by federal regulations or special actions in federal waters. Federal agencies manage subsistence fishing by qualified rural residents in federal waters. The protocol also directs state and federal managers to solicit input from the Yukon River Drainage Fisheries Association (YRDFA), the Yukon River Coordinating Fisheries Committee, and other stakeholders during the decision-making process. Salmon management is also subject to the obligations laid out in the "Yukon Salmon Agreement" as part of the *Pacific Salmon Treaty*.[1] Among other responsibilities, managers must endeavor to pass a minimum of 42,500 Chinook salmon across the border to meet escapement goals in Canada.

Subsistence fish harvests in Alaska federal waters are administered under 50 CFR 100.27, which includes regulations that determine seasons, gear types, and bag and possession limits on all salmon and nonsalmon species. State regulations at 5 AAC 01.230 allow subsistence harvest of fish in the Yukon River without a permit except for a few locations accessible by road. Salmon fishing in the Yukon Area is allowed at any time with the exceptions of those times outlined in the Yukon River King Salmon Management Plan (5 AAC 05.360(d) and (e)), the Yukon River Summer Chum Management Plan (5 AAC 05.362), the Tanana River Salmon Management Plan (5 AAC 05.367), the Yukon River Coho Salmon Management Plan (5 AAC 05.369), and in 5 AAC 01.210, which establishes what is commonly called the "windows" schedule, and unless otherwise restricted for conservation purposes. State regulations at 5 AAC 01.220 allow 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). In most of the Yukon River, there are no federal or state bag or possession limits for subsistence salmon harvests with the exception of permitted sections of subdistricts 6-A and 6-B where fishers are limited to 60 Chinook salmon and 500 chum salmon prior to August 15 and 2,000 combined chum and coho salmon after August 15, though permits for additional salmon may be requested from the department (5 AAC 01.230(e)(4)). There are additional limitations for Toklat River fall chum stocks (5 AAC 01.249(6)). In 2010, legal subsistence fishing gear in the Yukon Area included gillnets, beach seines, hook and line, and fish wheels. Rod and reel fishing is not generally considered legal subsistence gear under state regulations; as a result, fishers using rod and reel for various species during open water seasons must adhere to Alaska personal use and sport fish regulations. However, 5 AAC 01.220(k) allows rod and reel to be used when subsistence fishing in a portion of the Yukon River drainage below the lower mouth of Paimiut Slough.

1. Treaty Between the Government of Canada and the Government of the United States of America Concerning Pacific Salmon, Canada-U.S., January 28, 1985. Text of the treaty is available at http://www. psc.org/pubs/Treaty/Treaty%20July%202014.pdf

Since 2000, depressed salmon runs have caused substantial changes in subsistence and commercial fisheries in Yukon River communities resulting in several regulatory changes. The historical baseline average of subsistence and commercial harvests together was fewer than 88,000 fish between 2004 and 2008, a steep decline from the annual harvest of about 156,000 fish between 1989 and 1998 (Howard et al. 2009:44).

Restrictions on subsistence fisheries occurred during the fall seasons in 1993, 1998, 2001, 2002, and 2009; there was a complete closure in 2000. For the first time in regulatory history, state managers closed the 2000 summer subsistence salmon fishery to protect Chinook salmon and summer chum salmon populations; state and federal managers jointly restricted the summer season fishery in 2009. Because of an inability to maintain expected yields and harvestable surpluses above escapement needs for several years, the ADF&G Board of Fisheries (BOF) classified the Yukon River Chinook salmon stock as a stock of yield concern (Lingnau and Salomone 2003).

In 2001 the BOF instituted a new subsistence schedule on the Yukon River (Brase and Hamner 2002). The schedule was intended to fulfill several goals: 1) increase the quality of escapement, 2) distribute subsistence opportunity among users during years with no commercial fishing, and 3) reduce the effect of harvest on any one stock by spreading the harvest throughout the run, thereby providing windows of time that salmon may migrate upriver with reduced exploitation. The schedule, based on past fishing schedules, is initiated each year based on the historical average time of Chinook salmon entry into the Yukon River. Once initiated, the schedule is implemented chronologically upriver. The BOF determined that the schedule provides reasonable opportunity for subsistence users to achieve their harvest goals when salmon runs are below average. Subsistence fishing is allowed 7 days per week in all areas prior to the established schedule dates. In 2003, the BOF clarified the window schedule to allow ADF&G to relax the schedule if run abundance allowed commercial fishing (Busher and Hamazaki 2004).

Despite these efforts, Yukon River Chinook salmon runs continued to decline. Since 2007, preseason outlooks have indicated an average or below average to poor run of Chinook salmon, and subsistence fishery reductions attempted to provide for adequate numbers of salmon on the spawning grounds. In 2008, restrictions included decreasing regulatory subsistence windows by one-half for 3 consecutive periods in districts 1–4 and subdistricts 5A–5C. Subdistrict 5D was reduced from 7 days per week by one-half for 2 weeks (Busher et al. 2009). Additionally, gillnet mesh size was restricted to 6-inch mesh or smaller in districts 1–2 to target chum salmon, protect Chinook salmon, and equalize subsistence restrictions throughout the river, accounting for the greater opportunity lower river fishermen had during the first pulse, because the largest aggregation of Chinook salmon pass through these districts before they are harvested or divert to spawning grounds. There were no commercial opportunities for Chinook salmon. In 2009, again, no commercial opportunities were provided for Chinook salmon, and there were no subsistence opportunities on the first pulse of Chinook salmon (Jallen and Hamazaki 2011). Remaining subsistence fishing windows were reduced by one-half throughout the Alaska portion of the river, and federal managers implemented a special action to limit the harvest of Chinook salmon in federal waters to rural subsistence users only (Holder 2009a–b). In August 2009, Alaska Governor Sean Parnell requested that U.S. Secretary of Commerce Locke declare the low Chinook salmon return a disaster to enable the appropriation of relief money to replace income from the lack of a Chinook salmon commercial fishery (Brown et al. 2015). In January 2010, the BOF instituted a reduction in the allowable mesh size in the Yukon River to a maximum of 7.5 inches to reduce the harvest of large fish; its first year of implementation was summer 2011 (Jallen et al. 2012). Finally, during the summer 2010 season, an average to below average preseason outlook prompted mangers to again eliminate any Chinook salmon-directed commercial opportunities. They also delayed the implementation of the windows schedule, but cold, wet weather and periodic high water and debris events reduced harvests of Chinook salmon throughout the season.

Since 2009, YRDFA has facilitated a series of regional teleconferences and an in-person, preseason meeting for managers, fishers and other stakeholders to discuss options and develop a preseason plan. These meetings have included local subsistence fishers in a meaningful way by providing a forum for documenting regional concerns and potential solutions, getting input from fishers on potential management actions, and providing additional information and education about the salmon runs and regulatory requirements.

Terrestrial wildlife

Variable moose densities in different parts of Interior Alaska and the Yukon River delta have led to very different hunt structures; this is discussed in more detail in the Regional Comparison and Conclusions chapter. State and federal open and closed seasons and bag and possession limits for black bears, brown bears, and caribou are relatively similar and nonrestrictive, but in the case of caribou, seasons are dependent on herd size and health (5 AAC 85; 50 CFR 100.26). Subsistence migratory waterfowl hunting and egg harvesting are permitted by federal law during the spring–summer migration, with defined seasons and bag limits (50 CFR 92). Federal law also permits a fall season for migratory waterfowl sport hunting with defined seasons and bag and possession limits (50 CFR 20.102). Trapping of furbearers in the region is regulated under Alaska state law with designated seasons and no bag limits (5 AAC 84).

Project Background and Research Questions

The principal research questions asked about the quantity of wild resources harvested for subsistence and how these harvests were distributed within and between communities. The study of these questions has provided baseline information about the contemporary subsistence uses of fish, wildlife, and plant resources in 3 of the 5 participating communities (Marshall, Nulato, and Ruby) and an update to information about Mountain Village and Galena. 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 in the Yukon River drainage, the sharing distribution networks for subsistence foods within and between communities, and assessments of harvests over time.

Most fish stocks and wildlife populations in the Yukon River drainage, although variable over time, were considered healthy at the time of the study. As of 2009, both the Board of Fisheries and the Board of Game 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 exception of Chinook salmon, which were being managed for limited subsistence uses only.

The management of fish and wildlife resources is a complicated calculus of factors. Supplies of and demand for fish and wildlife change over time, sometimes dramatically and rapidly. To manage fish and wildlife sustainably, regulatory bodies need harvest data that can account for normal variations in harvest, which for some species can mean decades of research. Matters are further complicated by climate-related changes, proposed and occurring resource extraction, and industrial development, all of which will potentially affect not only renewable natural resources through habitat alteration, but also social and economic systems by providing increased employment and dividend income to residents of the region.

Under AS 16.05.094, the Division of Subsistence is charged with quantifying subsistence harvests by conducting studies, including collecting data from subsistence users. The Alaska Board of Fisheries and the Board of Game apply this information to define nonsubsistence areas, to identify fish stocks and game populations with customary and traditional subsistence uses, and, if a portion of a stock or population can be harvested consistent with sustained yield, to establish the amounts reasonably necessary to provide for Alaskans to participate in these subsistence activities. The boards may authorize other consumptive uses only when the harvestable portion of the stock or population is sufficient to provide a reasonable opportunity for subsistence uses and other uses (AS 16.05.258).

Maintaining comprehensive and up-to-date harvest data to meet these statutory responsibilities is increasingly challenging because of the diversity of harvest patterns, the large number of communities, vast differences between communities (which are primarily off the road system), and the consequent high costs. There are approximately 263 communities outside of the Joint Boards of Fisheries and Game's 5 nonsubsistence areas.[2] From 1980 through 2012, the Division of Subsistence has conducted systematic household surveys in 214 (81%) of these, the results of which appear in the online Community Subsistence

2. 5 AAC 99.016 (a) states: "A nonsubsistence area is an area or community where dependence upon subsistence is not a principal characteristic of the economy, culture, and way of life of the area of community."

Information System (CSIS).[3] However, this coverage is uneven. At least 1 year of data is available for most communities in Southeast, Southcentral, and Southwest Alaska, due in large part to the availability of special project funds from federal sources. However, as of 2012, comprehensive data were lacking for the majority of communities in the remainder of the state, including many communities in the Interior and western regions where subsistence harvests are largest. In addition, of the 206 communities with available data in 2010, the data for 51% are at least 10 years old, and for 49%, the data are more than 20 years old.

Due to the large number of communities and high costs of conducting these studies, it is not possible to regularly update comprehensive data for all communities on a regular basis. As such, the larger purpose of this research effort is to develop and implement a program to comprehensively monitor subsistence harvests of fish and wildlife in all areas of the state through a system of index communities, which will represent areas of the state. These index communities will not "stand in" for other communities per se. However, statistical analyses that identify relationships between an index community and the other communities in the subgroup will allow researchers to estimate harvests for unsurveyed communities in the area represented by the index community. Subject to available funding, comprehensive surveys will be conducted on a regular, rotational schedule in these communities in order to provide annual estimates of statewide subsistence harvests and trends including harvest quantities, locations of harvests, and numbers of harvesters and users.

The index community research program is designed to proceed in two steps. First, because data are lacking or decades old in key regions (Interior and western), comprehensive surveys will be conducted to fill gaps and to support the development of a scientifically sound design for long-term annual monitoring with the index community approach. This report represents that effort; a second report will detail the statistical process of selecting index communities based on the western and Interior Alaska data sets once that analysis is completed.

Study Objectives

The objectives of this harvest assessment program were to:

- Estimate subsistence harvests and uses of wild fish, game, and plant resources in a 12-month study year (2010);
- 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 age composition, ethnicities, birthplaces, and lengths of residency in the study community;
- Characterize each community's involvement in the cash economy, including jobs and other sources of cash income;
- Evaluate trends in subsistence harvests; and
- Document local concerns related to subsistence hunting and fishing.

Within this harvest assessment program, the Division of Subsistence selected study communities, trained community residents in administration of the survey instruments, and administered surveys to occupied households in each study community. Results were collaboratively reviewed and interpreted with each community. Summary results are published online at the Community Subsistence Information System (CSIS) website maintained by the ADF&G Division of Subsistence.

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

Rationale and Literature Review

During the past 50 years, 2 different methods have been used to collect subsistence data in western and Interior Alaska. Both methods—mandatory reporting and voluntary surveys—have notable limitations. Since statehood, ADF&G has relied on a system of mandatory harvest reports and permits for big game species such as moose. 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, state law requires hunters to mail a postage-paid postcard to ADF&G reporting their efforts and harvest, if any. Andersen and Alexander (1992) found that, on average, mandatory reporting captured approximately 30% of the moose harvests in Interior Alaska (also see Brown and Koster 2015). It is reasonable to assume that reporting rates for big game harvests in other rural areas of the state are similar to those in the Interior, given 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.

For comprehensive estimates of subsistence harvests, ADF&G and other researchers have primarily relied on household surveys. However, survey efforts are not even across regions of the state, including Interior Alaska and the Yukon River delta. Additionally, comprehensive survey efforts often represent only 1–2 years, rather than providing longitudinal data sets for comparison. Nonetheless, household surveys do collect a wide range of data and are best suited to fulfill the multiple data needs of resource management agencies, user communities, and industries. Consequently, this program uses household survey methods.

Of the 5 participating communities, earlier comprehensive subsistence harvest studies exist only for Galena (Marcotte 1988) and Mountain Village (Wolfe 1981). The 2010 year data are the baseline for the other 3 communities. However, some quantitative harvest data resulting from survey efforts exist for each community; the data are usually focused on a resource category such as salmon or large land mammals. For example, ADF&G maintains a time series of comparable data on subsistence salmon harvests back to 1988 (data back to 1960 also exist, but were compiled using different methods), and an ethnographic study of the traditional knowledge about nonsalmon fish species in the middle Yukon River has also been conducted (Brown et al. 2010). Additionally, a 1977–1978 sheefish study documents the harvest of sheefish and other nonsalmon species in several lower river communities including Mountain Village and Marshall (Crawford 1978). Large land mammal hunting has also received some attention. Weekley et al. (2011) produced one year of harvest data for large land mammal harvest for lower Yukon River communities, including Mountain Village and Marshall, and ADF&G Division of Subsistence collected 5 years of large mammal harvest data for 10 communities on the middle Yukon and Koyukuk rivers from 1997 to 2003 including Ruby, Galena, and Nulato (Andersen et al. 1998, 2000, 2001, 2004; Brown et al. 2004a). Finally, Fienup-Riordan (1986), E.W. Nelson (1978), Pete (1991), and Wolfe (1981, 1984) contributed important anthropological analyses of the lower river area, and Carlo (1978), Clark (1981), Hart (1981), Honea (1981), Jetté (1908, 1911), Loyens (1966), and Nelson (1983) produced rich ethnographic accounts for middle river communities. These data sources and others are discussed in more detail in the community results chapters.

These limited efforts have generally been driven by data needs and funding situations of individual agencies and not by a coordinated research strategy. Mandatory harvest reporting systems do not provide sufficient data to estimate regionwide subsistence harvests of fish and wildlife with strong confidence. This study was designed specifically to fill data needs in western and Interior Alaska in order to improve the estimation of regional subsistence patterns based on voluntary community household surveys.

Relationships with Alaska Native Communities

A majority of the rural residents of western and Interior Alaska are Alaska Native or American Indian people who have maintained their subsistence practices and traditions throughout their history. This project is intended to encourage a collaborative working relationship among state and federal agencies, tribes, communities, nongovernmental organizations, and industries. The ethical conduct of all researchers met or

exceeded the principles of conduct adopted by the Alaska Federation of Natives in 1993[4] and the Interagency Arctic Research Policy Committee on June 28, 1990[5].

Report Organization

The next chapter reviews the methods used for data collection and analysis; it is followed by 5 chapters that provide research results by community, beginning downriver with Mountain Village and moving upriver to Marshall, Nulato, Galena, and Ruby. Each community chapter includes a section describing the history and contemporary character of the community, followed by examinations of survey results by demography, wild food harvest and use, harvest areas, harvest assessments, jobs and income, food security, wild food networks, and a comparison with prior research. As stated earlier, the primary objective of data collection in this study was to expand the available contemporary comprehensive data for the middle and lower Yukon River regions in order to assist in the analytical process of selecting index communities. As such, this report concludes with a consideration of the 2010 data in the context of existing regional data on harvest and use practices, and highlights select points of comparison that may become important in the process of index analysis.

4. Alaska Federation of Natives. 2013. "Alaska Federation of Natives Guidelines for Research." Alaska Native Knowledge Network. Accessed February 20, 2015. http://www.ankn.uaf.edu/IKS/afnguide.html

5. National Science Foundation Interagency Social Science Task Force. n.d. "Principles for the Conduct of Research in the Arctic." Accessed February 20, 2015. http://www.nsf.gov/od/opp/arctic/conduct.jsp

2. METHODS

Prepared by Caroline L. Brown and David S. Koster

This is the first opportunity ADF&G has had to conduct comprehensive subsistence surveys in lower and middle Yukon River communities since the 1980s (with the exception of Emmonak in 2008) when surveys were conducted in Mountain Village (Wolfe 1981) and Galena (Marcotte 1990). As mentioned earlier, other data collection efforts have focused on particular species or sets of species, while these comprehensive baseline surveys asked about all species harvested for subsistence in the respective areas, divided into 6 major resource categories (e.g., large land mammals, berries and greens). This study relies on a standard survey instrument based on a series of surveys conducted by the Division of Subsistence for similar studies in Alaska since the 1980s (Appendix A). Many survey questions are the same as or similar to questions in prior harvest assessment tools, so results of these surveys are comparable with past results as well as results from other regions.

There is a continuing need for harvest estimates for high-demand species, particularly salmon and moose. Prior to the study year, several poor runs of salmon—especially Chinook salmon—on the Yukon River raised significant concern among local subsistence users and managers alike about this important subsistence resource. Moose populations in GMU 18 near the Yukon River had increased in years prior to the study year, though moose populations in GMU 21D near the study communities of Galena and Nulato had been in decline from 1994 until they stabilized around 2005. Stakeholders, ADF&G, and the U.S. Fish and Wildlife Service (USFWS) cooperated on a moose management plan in the late 1990s through the early 2000s; many of the plan's directives still guide management decisions today (ADF&G 2006).

Maintaining a comprehensive and up-to-date database of subsistence harvests to meet statutory requirements is challenging for several reasons including the large number of communities to survey, the diversity of harvest patterns, and the costs of doing research in rural areas. Therefore, this research is part of a larger program to identify index communities to represent areas of the state. Statistical relationships between an index community and the other communities in the subgroup will allow researchers to estimate harvests for unsurveyed communities in an area which the index community represents. This section will outline the methods used to collect the data for this study; a future separate report will outline the index statistical method used to understand harvest relationships between communities.

General Research Design

The ADF&G Division of Subsistence utilizes a number of quantitative and qualitative social science research methods to fulfill its mission. As characterized by Trotter 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 are generally 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 sampled 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 was to collect information about the harvests and uses of wild resources (Appendix A). 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 sheet of paper. 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, and household incomes. Researchers also asked questions to assess household food security and networks of food sharing and to determine whether households were able to harvest sufficient wild foods.

The demography section included questions about the genders, kin relationships, ages, birthplaces, education, and ethnicity of each household member. The harvest section asked which wild resources 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.

A food security section used a standard national questionnaire, modified by ADF&G for Alaska, 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 for 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 (Coates 2004; Webb et al. 2006; Wunderlich and Norwood 2006) and have been used around the world, including in northern Burkina Faso (Frongillo and Nanama 2006), Bangladesh (Coates et al. 2006), Bolivia and the 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 insecure conditions, if any, were related to subsistence foods or store-bought foods. 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.

One of the policy objectives in Alaska subsistence management is determining the amounts reasonably necessary for subsistence uses. This is achieved primarily through reviews of historical harvests, the assumption being that people were able to harvest what they needed in the past. Historical data are not always available and sometimes harvests are limited by factors other than subsistence demand, however, so

subsistence surveys have long included a series of harvest assessment questions (e.g., "Did your household get enough salmon last year for your needs?").

To that end, a subsistence assessments section asked whether households harvested 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, if household members did not harvest them themselves. It also asked household members to document households or other communities from which they received resources or to which they gave 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, which assumed that respondents could remember their important activities during the previous year. To minimize recall problems, surveys were conducted with household heads or other knowledgeable adults on the assumption that they were most likely to be aware of all household members' activities. Respondent recall bias was not expected to change significantly over time or from community to community. Recall bias 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 often missing. However, 286 surveyed households (77% of all households surveyed) reported income information for 513 individuals in the study communities. Three hundred forty-five [345] (93%) surveyed households reported receiving income from other sources.

Data for this project were collected for the calendar year 2010. The ADF&G Division of Commercial Fisheries also collected salmon harvest data in its annual postseason survey, which was conducted in fall 2010 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; the discrepancy appears largely the result of sampling differences (census and random sample designed to address all subsistence uses versus a stratified random sample designed around salmon harvest only).

Standardization in data collection procedures was important because many different people gathered data. ADF&G staff members who acted as community leads were present throughout the administration of the surveys or 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 before data entry.

Procedures

In 2011, the principal investigators were Caroline Brown, James Magdanz, Nicole Braem, and Hiroko Ikuta, subsistence resource specialists based in Fairbanks and Kotzebue. They were assisted by 6 residents of Mountain Village, 3 residents of Marshall, 5 residents of Nulato, 6 residents of Galena, 4 residents of Ruby, and 8 Division of Subsistence employees based in Fairbanks.

Between October 2010 and February 2011, ADF&G staff traveled to all 5 communities and met with tribal councils to review survey instruments, prepare updated household lists, and obtain community approvals. From March through May 2011, research teams traveled to all 5 communities to implement the surveys. Working with the ADF&G principal investigator assigned as the lead for each community, the tribal

Table 2-1.–Local research assistants.

Community				
Mountain Village	Marshall	Nulato	Galena	Ruby
Luther Aguchak	Frances Evan	Cynthia Ekada	Andrew Attla	Anne Honea
Larry George	Mildred Fitka	Joseph Kriska	Patricia Gustofson	Maryann McCarty
Stanley George	Jack George	Eileen Madros	Sandra Scotton	Marissa McCarty
Oscar Johnson		Tawnya Peter	Danielle Thurmond	Elaine Nickoli
Justina Kokrine		Kristin Edele Stickman	Tammy Thurmond	
			Harold Warner	

Source ADF&G Division of Subsistence, 2011.

councils of each community selected local surveyors for the research in their community (Table 2-1). These community contractors were paid for their time in orientation and survey review as well as $50 for each completed survey.

In each community, an ADF&G employee acted as the community lead for the data collection and conducted an orientation and training session with community assistants. During orientation, the group verified household lists, reviewed the survey instrument, and practiced administering the survey to one another. 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.

Survey teams consisted 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. In most cases, community workers administered the surveys while ADF&G employees conducted the mapping. Table 2-2 shows the average length of a survey for each study community.

Household heads usually answered questions about the household as a whole. Sometimes, other family members would assist the respondent by providing information.

At the conclusion of the survey administration, 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.

Researchers attempted to survey all occupied households in Marshall, Ruby, and Nulato and a 60% random sample of households in Galena and Mountain Village. Across the region, surveys were completed for 372 of 580 households (64%) (Table 2-3).

Surveys were coded and reviewed for data entry by ADF&G staff during fieldwork and entered by ADF&G staff in Anchorage following fieldwork. Data were entered by Margaret Cunningham, Rebecca Fink, Malla Kukkonen, and Hollie Wynne. Data analysis was conducted by ADF&G research analysts Terri Lemons, Patricia Fox, and Marylynne Kostick and Division of Subsistence Information Management coordinator David Koster with assistance from ADF&G subsistence resource specialist Jim Magdanz. Map data were

Table 2-2.–Survey length, 5 Yukon River communities, 2010.

	Interview length (in minutes)		
Community	Average	Minimum	Maximum
Mountain Village	56	10	175
Marshall	65	17	212
Nulato	49	10	108
Galena	37	5	190
Ruby	53	15	126

Source ADF&G Division of Subsistence household surveys, 2011.

Table 2-3.–Sample achievement, 5 Yukon River communities, 2010.

	Community				
	Mountain Village[a]	Marshall	Nulato	Galena[a]	Ruby
Households in community	181	85	90	158	66
Sampled households	115	46	84	80	47
Percentage sampled	63.5%	54.1%	93.3%	50.6%	71.2%
Unable to contact	35	6	0	13	8
Refused	20	10	6	6	11
Sampled population	499.0	185.0	243.0	215.0	128.0
Estimated population	785.4	341.8	260.4	424.6	179.7

Source ADF&G Division of Subsistence household surveys, 2011.
a. The community had sampling goal of a 60% random sample.

entered into ESRI ArcGIS[1] by ADF&G staff analyst Terri Lemons. Lemons prepared the maps of subsistence use areas and harvest locations that appear in this report.

After survey data and map data had been entered, analyzed, and summarized, ADF&G community leads returned to each community between February and May 2012 to conduct community review meetings. They provided attendees with summary tables of harvest and income estimates and showed each community a Microsoft PowerPoint presentation summarizing the results, including mapped data. During these visits, community leads conducted follow-up ethnographic interviews where necessary. After these meetings, community leads prepared community chapters, which were then compiled into this report and supported by a regional discussion.

Data Analysis

Survey responses were coded following standardized codebook conventions used by the Division of Subsistence to facilitate data entry. Data were stored within a Microsoft SQL Server at ADF&G in Anchorage. Database structures included rules, constraints, and referential integrity to insure that data were entered completely and accurately. Data entry screens were available on a secure Internet site. Daily incremental backups of the database occurred, and transaction logs were backed up hourly. Full backups of the database occurred twice weekly. This ensured that no more than 1 hour of data entry would be lost in the unlikely event of a 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 20. 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 for the region (Appendix B).

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

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.

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

$$H_i = h_i S_i \tag{1}$$

where:

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

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:

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

where:

s = sample standard deviation,

n = sample size,

N = population size, and

$t_{a/2}$ = student's t statistic for alpha level (α = 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.

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.

Food security responses were analyzed following USDA procedures (Bickel et al. 2000) to provide comparability between results from lower and middle Yukon River communities and USDA results for Alaska and the nation.

3. COMPREHENSIVE SURVEY RESULTS MOUNTAIN VILLAGE, 2010

Prepared by Andrew R. Brenner

In May 2011, researchers surveyed a randomly-selected sample of 115 of 181 households (64%) in Mountain Village (Table 2-3). Expanding for the 66 unsurveyed households, Mountain Village residents harvested 207,765 edible pounds (± 15%) of wild foods between January and December 2010 (Table 3-1). The average harvest per household was 1,148 lb; the average harvest per person was 265 lb. Moose, 8 species of fish, and beluga whale made up the top 10 resources harvested by edible weight and represented 80% of all harvested wild foods in 2010 (Figure 3-1). Eighty-eight individual moose contributed the most subsistence food by edible weight from any one species, at an estimated 23% of total edible pounds. Summer chum salmon and Chinook salmon also formed a large portion of the harvest, with 9,322 summer chum salmon (23% of total harvest by edible weight) and 2,199 Chinook salmon (10% of total harvest) (Figure 3-1; Table 3-2).

This chapter summarizes findings from the 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).

Community Background

Mountain Village, Asaucaryaq in Central Yup'ik (Jacobson 1984:728), is located on the north bank of the Yukon River, 150 air miles north of Bethel, which is the regional center for the Yukon-Kuskokwim Delta (Alaska State Housing Authority Department of Planning and Technical Services 1971). Its name originates from its location at the base of Azachorok Mountain (approximate elevation 500 ft), one of the last elevated

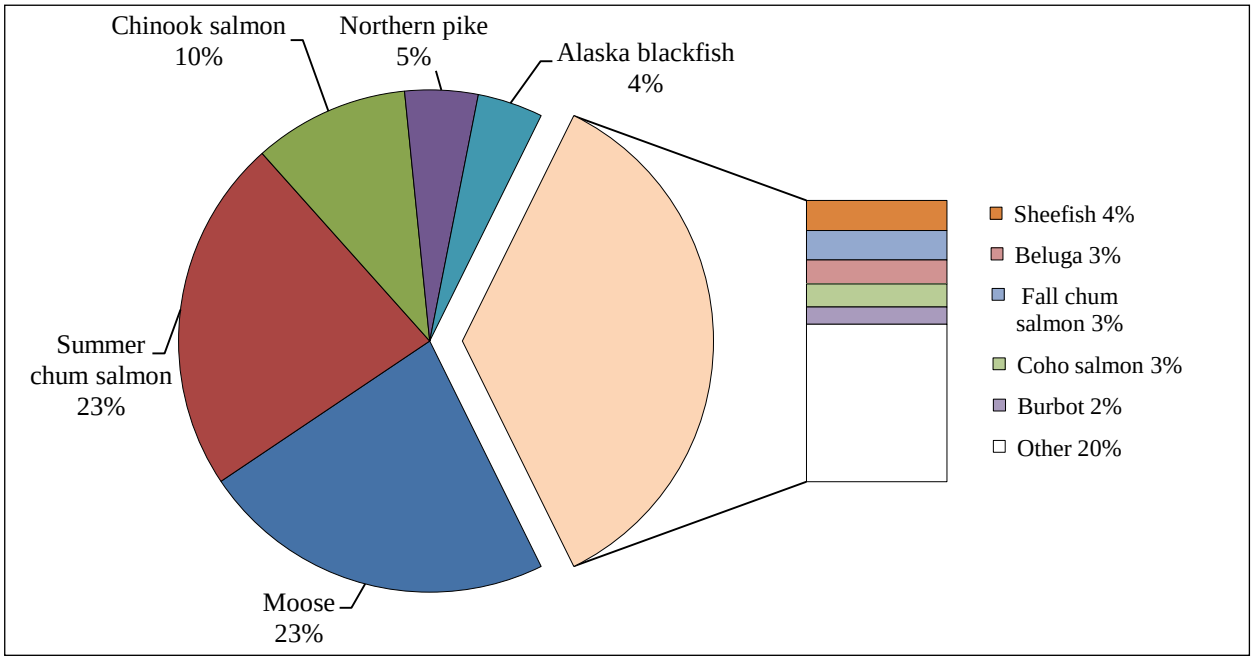


Figure 3-1.–Top 10 species harvested, ranked by estimated edible weight, Mountain Village, 2010.

Table 3-1.–Resource harvest and use characteristics, Mountain Village, 2010.

Mean number of resources used per household	
Minimum	2
Maximum	60
95% confidence limit (±)	6.3%
Mean	20
Median	20
Mean number of resources attempted to harvest per household	
Minimum	0
Maximum	60
95% confidence limit (±)	8.6%
Mean	14
Median	12
Mean number of resources harvested per household	
Minimum	0
Maximum	48
95% confidence limit (±)	8.5%
Mean	13
Median	10
Mean number of resources received per household	
Minimum	0
Maximum	49
95% confidence limit (±)	9.2%
Mean	11
Median	9
Mean number of resources given away per household	
Minimum	0
Maximum	56
95% confidence limit (±)	13.4%
Mean	8
Median	4
Household harvest (lb)	
Minimum	0.0
Maximum	10,934.5
Mean	1,147.9
Median	656.0
Total harvest weight (lb)	207,764.9
Community per capita harvest (lb)	264.5
Percentage using any resource	100%
Percentage attempting to harvest any resource	97%
Percentage harvesting any resource	97%
Percentage receiving any resource	98%
Percentage giving away any resource	83%
Number of households in sample	115
Number of resources available	133

Source ADF&G Division of Subsistence household surveys, 2011.

Alida Trainor, ADF&G

Plate 3-1.–Mountain Village from the air, 2010.

areas in the Yukon River drainage before the river reaches the low-lying delta region (Plate 3-1). The estimated population from this study's data in 2010 was 785, the majority (95%) of whom were Alaska Native and predominately Yup'ik (Table C1). Mountain Village received services through the regional for-profit Calista Corporation and the nonprofit Association of Village Council Presidents. During the study year, Mountain Village served as the headquarters for the Lower Yukon School District, a position held since 1976.[1]

Although the establishment of Mountain Village as a permanent community did not occur until 1908 (Barnhardt 1985:34), the history of the area's residents extends over a great timespan: evidence of cultural groups ancestral to Central Yup'ik people of the Yukon-Kuskokwim Delta dates to at least 3,000 years ago (Shaw 1998). Within the broader Central Yup'ik language and cultural group, residents of the Mountain Village area are *Kuigpagmiut*, "People of the Yukon River" (literally, "People from Big River") (Jacobson 1984:210), a distinct cultural group of communities and people along the lower Yukon River (Fienup-Riordan 1986; Wolfe 1981). At the time of contact with Russian settlers in the mid-19th century, *Kuigpagmiut* followed an annual pattern of traveling between seasonal settlements based on the availability of wild food and trading resources in particular areas. In summer, *Kuigpagmiut* lived in smaller groups, and in winter, they moved to larger villages which consisted of multiple families. During the pre-contact time period, people in the lower Yukon River area probably used the current location of Mountain Village as a summer fish camp site rather than a permanent winter settlement (Hart et al. 1977:88). Since Euro-American contact in the mid-19th century, people in the lower Yukon River region gradually underwent a shift in their settlement patterns from semi-nomadic to relatively permanent residency (Berardi 1999:331–335; Shaw 1998).

Prior to Mountain Village's founding, the establishment of trading posts in the mid-19th century combined with severe epidemics from the mid-19th to early 20th century strongly influenced the transition away from a semi-nomadic settlement pattern and toward the formation of permanent communities along the lower Yukon River. Russian trading posts were established at St. Michael in 1833 and Russian Mission in 1837, both close to the current location of Mountain Village. With the establishment of these trading posts, trapping and trading furbearers in exchange for goods imported from outside the region (including manufactured fishing, hunting, and trapping supplies) became increasingly integrated into the local subsistence economy

1. Lower Yukon School District, n.d. "Lower Yukon School District Communities." Accessed January 23, 2015. http://www.loweryukon.org/Communities/LYSDCommunities

in the lower Yukon River region (Calista Corporation 1989). Several episodes of epidemic disease between 1833 and 1919 led to major changes in communities throughout the lower Yukon River. Although levels of death and disease varied between different communities, the Yukon-Kuskokwim Delta region as a whole is estimated to have lost one-quarter of its population in 1900 to influenza-related deaths and another quarter in 1918–1919 to Spanish influenza. These devastating losses of life surely had many profound effects on residents of the area, including the reorganization and formation of new communities by survivors of these epidemics (Berardi 1999; Fienup-Riordan 1986:43–44; Wolfe 1982).

Mountain Village was established as a permanent community when lower Yukon River residents from the surrounding area relocated after a general store and school were opened in 1908[2] (Barnhardt 1985:34) (Plate 3-2). In the early 20th century, economic production in Mountain Village was likely limited to subsistence utilization of natural resources, small-scale commercial sale of natural resources, and reindeer herding. However, subsistence hunting, fishing, and gathering continued as the economic mainstay of Mountain Village residents, with most cash being used for subsistence-related expenses as well as supplemental food staples. "Money was scarce and there were very few stores. …At that time [early 1900s], the people on the Yukon, the main goods they bought from the store were tea, leaf tobacco, and flour" (Hart et al. 1977:17).

During the first decades after its founding, Mountain Village residents participated in the sale and barter of furs, firewood, and salmon for human or dog food, and reindeer herding took place to some extent for several decades. Cash and trade goods derived from furs were important throughout Mountain Village's early history, and the common practice of trading posts extending store credit to trappers in exchange for the coming season's furs encouraged reliance on permanent settlements with trading posts such as Mountain Village (Andersen 1993). Mountain Village residents sold firewood to steamboat crews during refueling stops (Hart et al. 1977:19) because wood-powered steamboats were the major form of shipping and transportation in summer months for the many miners traveling on the Yukon River during the early 20th century. Because dog teams were the only form of winter transportation and shipping prior to the introduction of airplanes, and later, snowmachines, into Alaska, salmon for dog food was important for personal dog teams and also as an item of trade and barter between individuals and storekeepers. Mountain Village also maintained a sizeable reindeer herd, numbering more than 3,000 animals in 1928, and the sale of reindeer meat may have made up a substantial portion of the local economy until the collapse of reindeer herding throughout the region beginning in the 1930s. Reindeer herding was virtually absent from the lower Yukon River by 1960 (Calista Professional Services 1984).

The commercial export of salmon gradually became a major component of Mountain Village's cash economy. A salmon cannery, allowing the export of salmon outside of the region, first opened on the lower Yukon River in 1918 approximately 20 miles east of Mountain Village near the mouth of the Andreafsky River (Bower 1919). Although the following years of commercial salmon fishing on the lower Yukon River were unstable, and the fishery was not consistently opened for export between 1925 and 1931, commercial salmon fishing and cannery production expanded after 1931 (Wolfe 1981:98). In 1956, a salmon saltery was constructed in Mountain Village itself, followed by a cannery in 1964[3] (Hart et al. 1977:91). In 1969, a Mountain Village resident described the cannery as "in full swing every summer with people coming to work from neighboring villages … and as far away as Nome and Sitka" (Alaska Methodist University 1969:3).

For much of the second half of the 20th century, commercial fishing for Chinook salmon (and to a lesser extent chum salmon) had come to provide the largest source of monetary income for the lower Yukon River region (Wolfe 1981:90). However, declines in Yukon River Chinook salmon stocks in the late 20th and early 21st centuries led to commercial fishing restrictions and resulted in the closure of Mountain Village's

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 December 4, 2014. http://commerce.state.alaska.us/cra/DCRAExternal/community

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 4, 2014. http://commerce.state.alaska.us/cra/DCRAExternal/community

Andrew Brenner, ADF&G

Plate 3-2.–Permanent residences at the base of Azachorok Mountain, 2010.

cannery and the loss of commercial fishing as the primary source of cash in the community. For much of the 20th century and continuing into 2010, Mountain Village residents regularly used cash obtained from commercial fishing to pay for expenses such as fuel and equipment for subsistence activities. Commercial fishing also supported subsistence activities through shared expenses, equipment, and experience. Although the decline of commercial fishing had a major impact on subsistence activities in Mountain Village, subsistence continued to play a major role in the community in 2010.

Seasonal Round

In 2010, residents of Mountain Village continued to participate in a seasonal round of subsistence hunting, fishing, and gathering activities that had developed over time. In spite of changes related to variable environmental, economic, and sociocultural conditions, many aspects of the seasonal patterns of subsistence use by Mountain Village residents in 2010 reflected a continuation of older patterns. For example, many of the patterns in the early 1980s described in Wolfe (1981)[4] were closely mirrored by Mountain Village residents' activities in 2010, and residents described that subsistence practices had remained similar across much greater time periods throughout the region's history. The following overview of Mountain Village residents' seasonal round of subsistence activities describes general patterns at the time of the study year in 2010. However, the previously mentioned continuity between historical patterns and those in 2010 suggests that the following descriptions will likely continue to reflect Mountain Village residents' seasonal round of subsistence activities beyond the time frame of the 2010 study year.

In the later 20th century and continuing into 2011 field research, subsistence activities in Mountain Village occurred year-round. In general, subsistence efforts intensified just before summer months when a wider variety of resources became available. Although summer activities often revolved around harvesting and preserving large quantities of salmon, late spring and summer also included harvests of nonsalmon fish

4. Wolfe (1981) provided a generalized overview of the *Kuigpagmiut* seasonal round in the early 1980s based on the communities of Alakanuk, Emmonak, Kotlik, Mountain Village, and Nunam Iqua (Sheldon Point). Mountain Village residents' seasonal round of subsistence activities largely reflected that of other lower Yukon River communities, other than some differences in resource utilization related to Mountain Village's more inland location (Wolfe 1981:149).

species, wild birds and eggs, berries and greens, and marine mammals corresponding to their availability near Mountain Village (MV05191101, MV05191102)[5]. Residents hunted migratory birds as they arrived in April and May prior to breakup, and this hunting generally continued until ice became unsafe for travel due to warmer weather. In later May, around the time of ice breakup on the Yukon River at Mountain Village, residents prepared for the salmon fishing season with repairs to fishing gear, other equipment, and smokehouses (Wolfe 1981:65). Some Mountain Village fishers harvested sheefish during this period. One respondent described that sheefish were used as an indicator species for Chinook salmon: when the spring run of sheefish started to diminish, Chinook salmon were not far behind. In late May, some residents gathered wild bird eggs and picked early summer greens, including wild rhubarb. In late May or early June, when Chinook salmon arrived in the lower Yukon River, many Mountain Village residents drifted with gillnets near the community, and some families traveled to summer fishing camps throughout the lower Yukon River area (Wolfe 1981:66). Chinook salmon were preserved in several ways, including salting, freezing, and drying. The process of drying and smoking Chinook salmon strips required a substantial investment of time and energy for up to three weeks in summer. In June, summer chum salmon arrived and salmon fishing continued throughout the remainder of the summer with subsequent runs of coho and fall chum salmon.

Salmon fishing in Mountain Village had changed over the century preceding the study year due to large fluctuations in returning numbers of salmon and related variability in commercial and subsistence fishing opportunities and regulations. In addition, technological developments such as metal-hulled boats, high powered boat motors, and relatively durable synthetic fish nets have led to changes in salmon fishing patterns. In 2010, fishers regularly traveled to salmon fishing locations during day or weekend trips while residing in Mountain Village. Before these technological developments, many families traveled to a defined fish camp location and stayed there for longer periods of time. The virtual replacement of dog teams with snowmachines beginning in the 1960s reduced the need for large harvests of chum salmon as dog food. These changes did not reduce the great importance of Chinook and chum salmon within the seasonal round of Mountain Village residents, and will be further discussed in “Comparison with Prior Results.” Salmon fishing for chum salmon and coho salmon continued throughout August and into September. In mid- and late summer, people gathered salmonberries, blueberries, crowberries (blackberries), and cranberries. Some people traveled considerable distances solely to access prime berry picking locations, and others harvested them while engaging in other subsistence activities. When people traveled upriver to more forested areas, they often gathered firewood as well as “punk” fungi. Driftwood was also gathered for firewood during much of the year. If a seal was seen swimming in the Yukon River, people spread the news via radio, and hunters attempted to harvest it. Some hunters also journeyed downriver to the coast to harvest seals or beluga whales.

In late August and September, harvest efforts in years recent to 2010 focused on moose, although fall chum salmon, coho salmon, whitefishes, and seals were also targeted during this time. Using set gillnets, fishers harvested broad and humpback whitefish in late August and throughout September, and also Bering cisco, northern pike, and burbot in October. Key respondents described harvesting whitefishes as the fish move out of lakes in late August. One respondent described that bearded and ringed seals sometimes congregate near the mouths of these lakes at this time to feed on migrating whitefish, and some Mountain Village residents hunt seals when this occurs (MV05191101). In October, subsistence activities were generally somewhat limited in the time around freeze-up, because unstable ice conditions made travel difficult. In late October, Arctic lampreys passed Mountain Village as they migrated on the mainstem Yukon River and were harvested with dipnets and “eel rakes” from the river ice. Unusual ice conditions such as a late freeze-up could have a large impact on the ability of fishers to access Arctic lamprey harvest areas. Some residents also hunted migratory birds in the fall.

5. The information in the following paragraphs was supplemented with information provided by 2 key respondents, both long term residents of Mountain Village.

During winter months, Mountain Village residents harvested several freshwater fish species, a variety of mammal species, and ptarmigans (primarily willow ptarmigan). When ice conditions were favorable, some residents set gillnets under the ice for Bering cisco, humpback whitefish, broad whitefish, sheefish, northern pike, and burbot. Alaska blackfish were harvested with fyke nets (traps) set under the ice, and in the past some Mountain Village residents would set similar traps for stickleback species, locally referred to as "needlefish." Fishers also jigged through the ice for northern pike and Arctic grayling in winter and spring months.

Residents hunted large land mammals, including caribou and moose, in winter months when these animals were present in the area and when regulations permitted hunting them. According to local respondents, caribou had not been present in the Mountain Village area for more than 10 years prior to the study year. Historically, moose were not abundant in the Mountain Village area; hunters often traveled relatively long distances up the Andreafsky River, Atchuelinguk River, or mainstem Yukon River to the Holy Cross area for moose hunting. Yet, the years leading to the study year saw a dramatic population increase following a moratorium on moose hunting in the lower Yukon River region (Weekley et al. 2011). During the study year, moose were abundant in the area around Mountain Village, and a winter moose hunting season in late December and early January had been opened for several years. During winter and early spring months, trapping and hunting for furbearers occurred. Changes over time in trapping intensity and furbearer species harvested probably reflect changes in fur prices and other winter economic opportunities. Hunters also harvested snowshoe hares, Alaska hares (jackrabbits), and ptarmigan throughout the winter and early spring. One respondent described that in the past, beavers and muskrats were very important food resources in the spring, with muskrats being eaten "nearly every day" during spring months. Additionally, pelts from these animals had at times provided important sources of cash income.

In early April, prior to ice breakup, some residents traveled to the coast and jigged for saffron cod, locally referred to as "tomcod." In late spring, people sometimes collected herring roe from area beaches, only found in quantity in silt-free marine waters such as those near Stuart Island northeast of the Yukon River delta, though the considerable travel required to reach suitable harvest areas likely precluded many residents from regularly harvesting this resource. Prior to ice breakup on the Yukon River, hunters sometimes traveled to locations where strong currents maintained open water areas in streams, described by one respondent as important gathering areas for the first arrivals of migratory birds.

Demographics

The 115 surveyed households included 499 people, and this study estimated the total population as 785 people for Mountain Village in 2010 (Table C1). Household sizes ranged from 1 to 14 people, with an average of 4 people per household. The average age was 28 years; the oldest person in Mountain Village was 87 at the time of data collection. On average, residents had lived in Mountain Village for 15 years, and household heads had lived in Mountain Village for an average of 21 years. The survey asked for the name of each household member's birth community (defined as an individual's parents' residence at time of birth). Approximately 3 out of 4 (76%) residents had parents that resided in Mountain Village at the time of their birth (Table C2). One percent of survey respondents were born in Bethel, 2% in Hooper Bay, 1% in Pilot Station, 2% in Saint Marys, and 2% in Saint Michael. Less than 1% of Mountain Village residents reported birthplaces in one of several other western Alaska communities including Alakanuk, Allakaket, Chevak, Emmonak, Napaskiak, Nunam Iqua, and South Naknek. Slightly more than 10% of residents had parents who resided in communities outside of Alaska at the time of their birth. Birthplaces for 2% of respondents were not collected or unknown.

The population has consistently grown since 1930, increasing by between 58 and 164 individuals each decadal census since that time (Figure 3-2). At the time of this study, the population of Mountain Village included 403 males (51%) and 382 females (49%) as depicted in Figure 3-3. An estimated 748 residents were Alaska Native (95%), and 90% of households had at least 1 Alaska Native household member (Table C1).

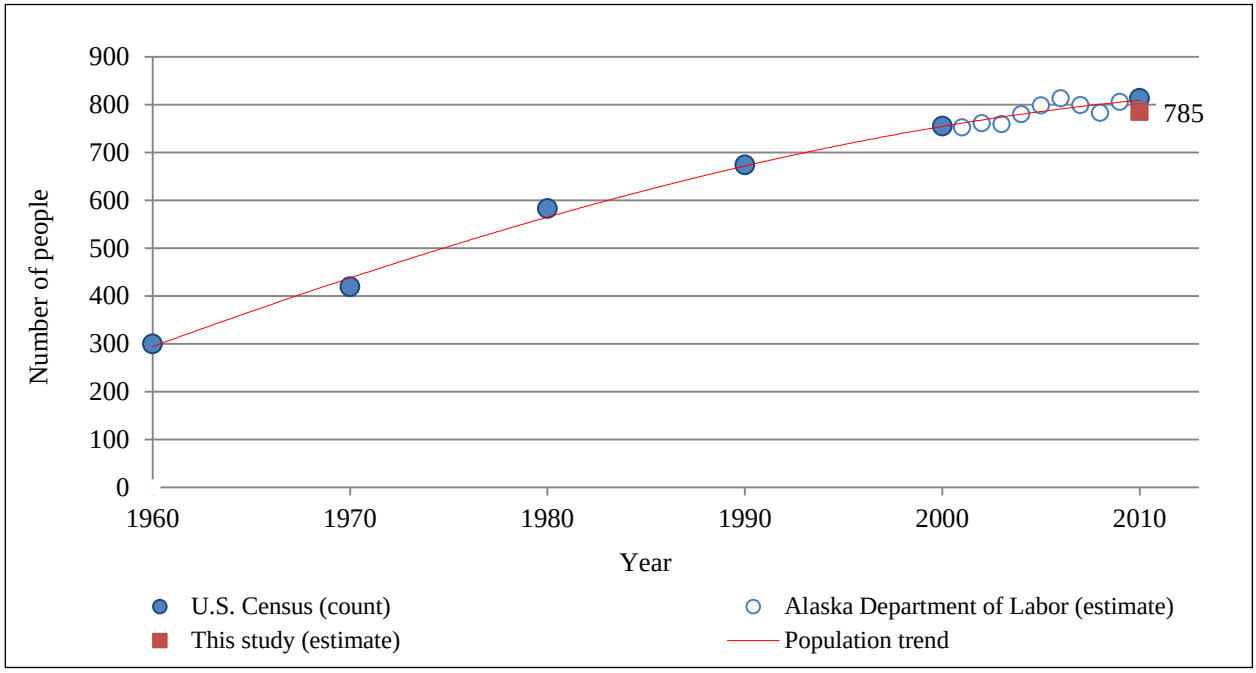


Figure 3-2.–Population history, Mountain Village, 1960–2010.

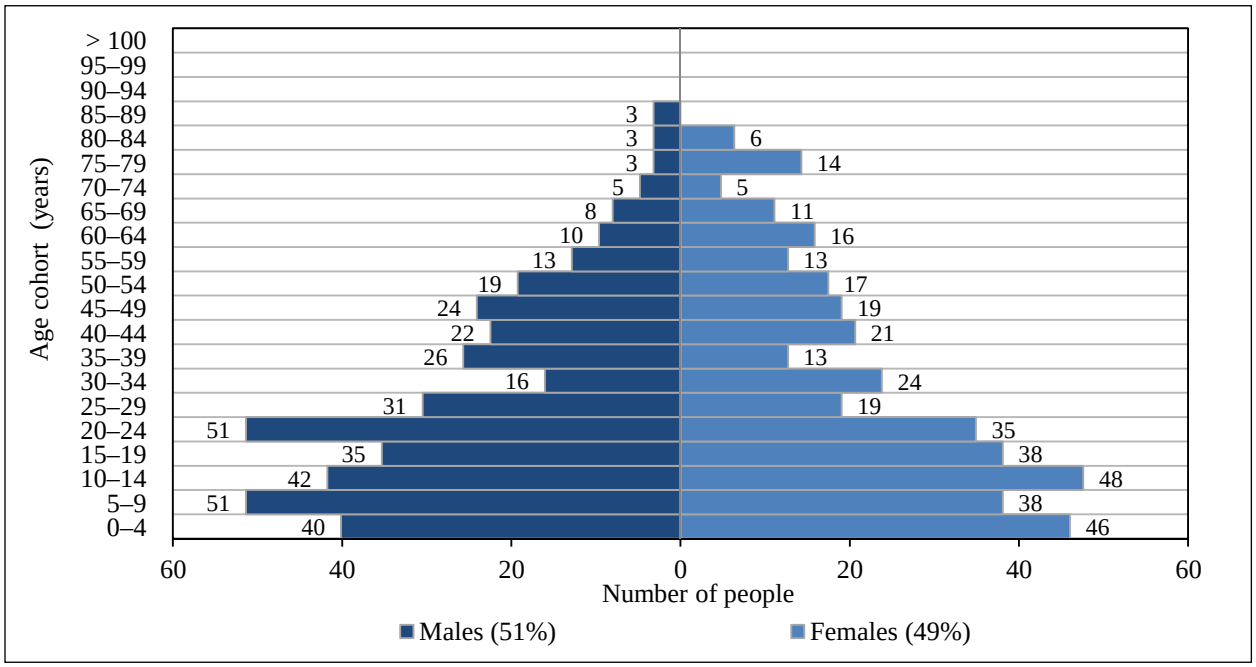


Figure 3-3.–Population profile, Mountain Village, 2010.

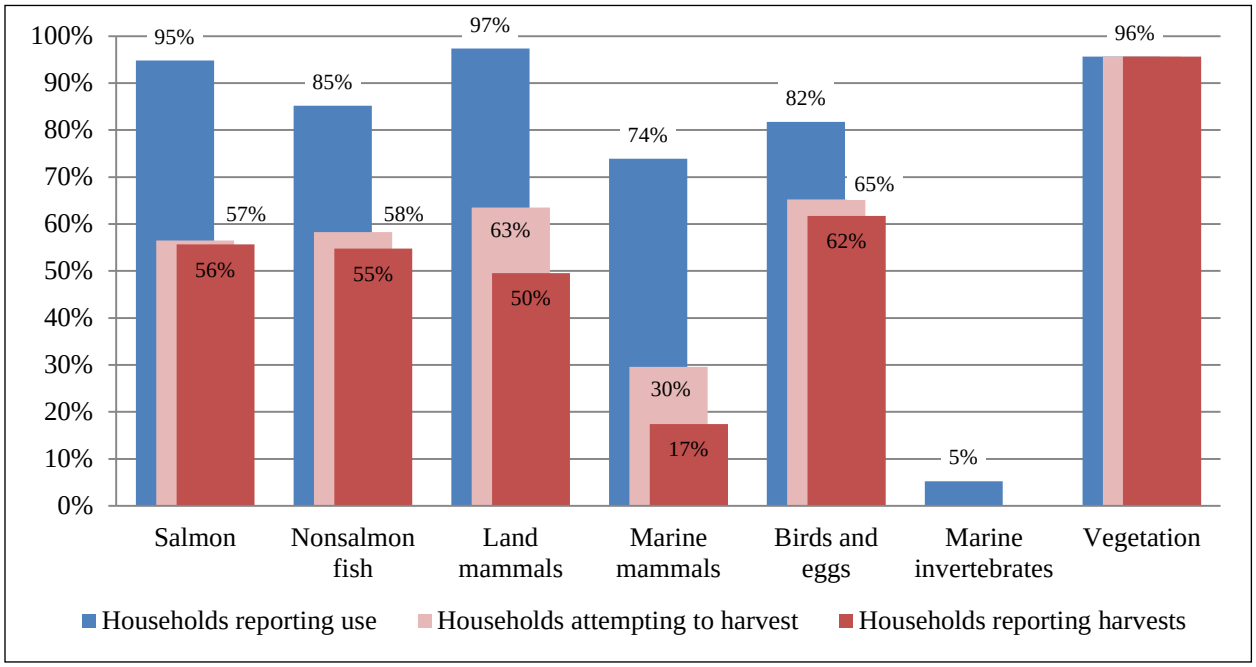


Figure 3-4.–Percentages of households using, attempting to harvest, or harvesting subsistence resources, by category, Mountain Village, 2010.

Wild Food Harvests and Uses

The primary purpose of the household survey was to collect information about the harvests and uses of wild foods. Respondents were asked whether their household used or tried to harvest each resource during the study year. If they attempted to harvest a resource, they were asked how much they harvested and for other details of the harvest, such as gear type, sex of the animal, or month of harvest.

Tables and figures in this section summarize responses to the harvest questions expanded for unsurveyed households. Every household in Mountain Village (100%) reported using subsistence resources in 2010 (Table 3-1). The most widely used resources, broadly categorized by type, were land mammals (97% of households reported use), vegetation (96%), and salmon (95%) (Figure 3-4). For these resource categories, salmon, land mammals, and nonsalmon fish contributed the most to Mountain Village residents' harvest in terms of edible pounds, followed by marine mammals, vegetation, and birds and eggs (Figure 3-5)

Mountain Village households used on average 20 specific wild resources during the study year, and attempted to harvest 14 (Table 3-1). The average Mountain Village household harvested (as opposed to used) 13 subsistence resources, with harvests by various households ranging from 0 to 48 resources. Some households did not attempt to harvest any wild resources, and the maximum number of resources that any household attempted to harvest was 60. For those households that harvested, attempted to harvest, or processed wild resources, surveys recorded how many and which household members participated in these activities. Considering the sum of these household members for the community as a whole, an estimated 75% of all individual Mountain Village residents attempted to harvest wild resources in 2010 (Table D3-1).

Fish formed the majority of Mountain Village's subsistence harvest in 2010: fish constituted an estimated 63% of all wild foods harvested by edible weight (Table 3-2). Nearly all households (97%) reported using, and most (67%) reported harvesting fish species during 2010. Salmon composed 67% of the fish harvest with 87,921 total edible pounds. Although residents harvested all 5 species of salmon present in Alaska waters, chum and Chinook salmon dominated the salmon harvest: 9,322 summer chum salmon, 2,199 Chinook salmon, and 1,515 fall chum salmon composed 86% of the total salmon harvest by edible weight. Salmon were also harvested commercially, along with Arctic lamprey and small numbers of whitefishes in small-scale experimental fisheries (Conitz 2012:15–16). The salmon retained from the commercial catch

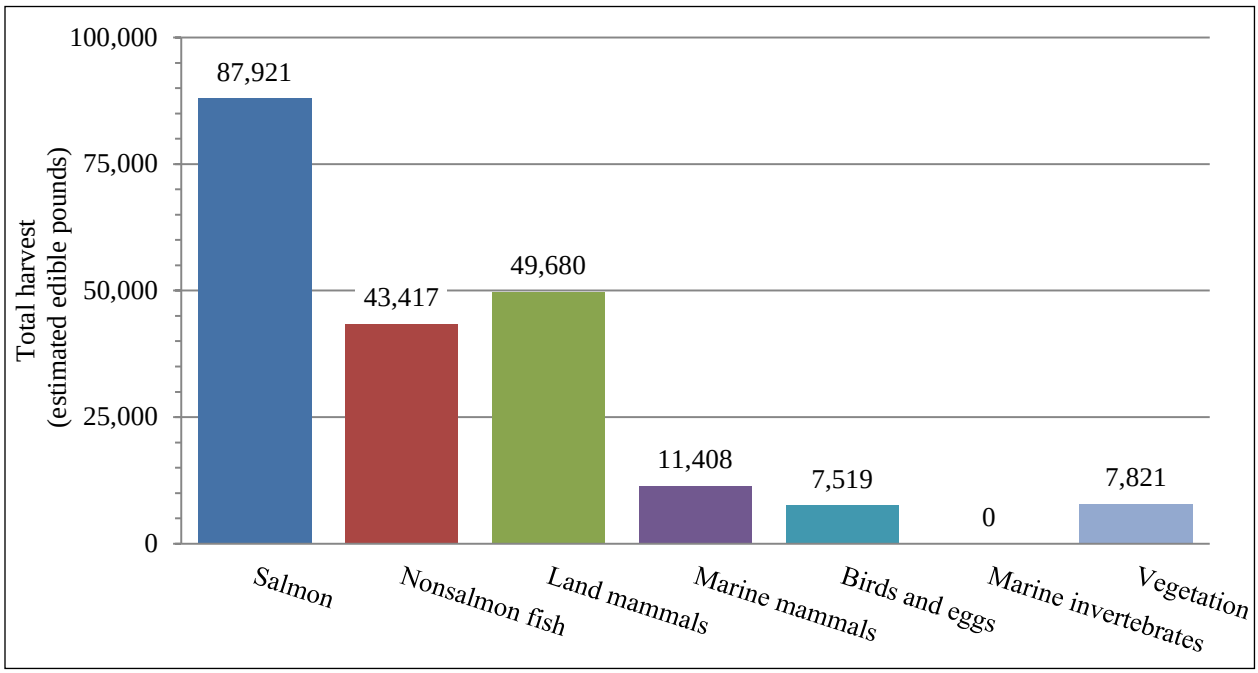


Figure 3-5.–Total estimated edible pounds harvested, by resource category, Mountain Village, 2010.

for home use represented 7% by edible weight of the total salmon harvest documented in this survey (Figure 3-6).

Residents of Mountain Village utilized a variety of nonsalmon fish species as well during the study year, with (ranked in descending order by contribution to total edible weight) 2,176 individual northern pike, 8,752 lb of Alaska blackfish, 1,307 individual sheefish, 1,892 burbot, 1,469 humpback whitefish, and 2,575 broad whitefish (Table 3-2). Arctic lamprey, Pacific tomcod, least cisco, Arctic grayling, saffron cod, Pacific halibut, unspecified stickleback species, and Dolly Varden were harvested in smaller quantities. The nonsalmon fish harvest composed 33% of the total subsistence fish harvest and 21% of the total subsistence harvest.

Respondents were asked what gear type they used to harvest fish for subsistence uses; these fish harvests came primarily from gillnets, either used as setnets or for drifting (Figure 3-6). Salmon were harvested primarily with drift gillnets, while whitefishes were harvested primarily with set gillnets. Rod and reel was used to harvest relatively small numbers of coho salmon, whitefishes, and northern pike. Other subsistence methods, including fish traps, dipnets, and jigging, were important for harvests of several fish species including Alaska blackfish, whitefishes, northern pike, Arctic lamprey, saffron cod, Arctic grayling, and stickleback species. Respondents were also asked how many fish were used exclusively to feed dogs: Mountain Village residents used an estimated 1,256 lb of fish to feed dogs. Fish used to feed dogs included whitefishes, northern pike, chum and pink salmon, burbot, Arctic lamprey, and small numbers of other fishes (Table D3-2).

Land mammal harvests made up 24% of Mountain Village households' harvest by edible weight in 2010 (Table 3-3). Moose was the only large land mammal harvested in Mountain Village in 2010, although 6% of households received caribou and 2% received black bear. The estimated 88 individual moose harvested in 2010 represented 96% of the total community harvest of all land mammals by edible weight. Ninety-seven percent of households used moose, yet only 43% of households harvested moose in 2010; this discrepancy indicates high levels of distribution throughout the community for this resource. The remainder of the land mammal harvest consisted of small mammals including 96 beavers, 264 snowshoe hares, 63 Alaska hares (jackrabbits), 94 lynx, 3 mink, 3 porcupines, and 6 muskrats.

Table 3-2.–Estimated harvest and use of fish, Mountain Village, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Fish										
Salmon										
Summer chum salmon	76.5%	47.8%	46.1%	50.4%	34.8%	47,392.9 lb	261.8 lb	60.3 lb	9,322.3 ind	± 18%
Fall chum salmon	32.2%	20.9%	18.3%	17.4%	12.2%	7,700.3 lb	42.5 lb	9.8 lb	1,514.7 ind	± 40%
Unknown chum salmon	13.9%	13.9%	13.9%	0.0%	1.7%	3,103.8 lb	17.1 lb	4.0 lb	610.5 ind	± 68%
Coho salmon	39.1%	21.7%	20.9%	22.6%	16.5%	6,000.9 lb	33.2 lb	7.6 lb	1,134.9 ind	± 32%
Chinook salmon	85.2%	53.0%	52.2%	56.5%	38.3%	20,755.8 lb	114.7 lb	26.4 lb	2,198.9 ind	± 18%
Pink salmon	17.4%	12.2%	11.3%	7.8%	2.6%	1,381.1 lb	7.6 lb	1.8 lb	590.2 ind	± 55%
Sockeye salmon	7.0%	6.1%	5.2%	2.6%	3.5%	1,586.3 lb	8.8 lb	2.0 lb	314.8 ind	± 114%
Unknown salmon	0.9%	0.0%	0.0%	0.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**94.8%**	**56.5%**	**55.7%**	**73.9%**	**45.2%**	**87,921.1 lb**	**485.8 lb**	**111.9 lb**	**15,686.3 ind**	**± 17%**
Char										
Dolly Varden	1.7%	1.7%	1.7%	0.0%	0.9%	4.2 lb	0.0 lb	0.0 lb	4.7 ind	± 89%
Lake trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown char	0.9%	0.0%	0.0%	0.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**2.6%**	**1.7%**	**1.7%**	**0.9%**	**0.9%**	**4.2 lb**	**0.0 lb**	**0.0 lb**	**4.7 ind**	**± 89%**
Whitefishes										
Sheefish	54.8%	32.2%	32.2%	37.4%	27.8%	7,843.8 lb	43.3 lb	10.0 lb	1,307.3 ind	± 27%
Broad whitefish	61.7%	36.5%	36.5%	42.6%	30.4%	3,605.0 lb	19.9 lb	4.6 lb	2,575.0 ind	± 23%
Bering cisco	37.4%	20.9%	20.9%	24.3%	16.5%	1,363.7 lb	7.5 lb	1.7 lb	974.1 ind	± 32%
Least cisco	17.4%	8.7%	8.7%	12.2%	11.3%	425.0 lb	2.3 lb	0.5 lb	425.0 ind	± 52%
Humpback whitefish	44.3%	25.2%	25.2%	27.8%	21.7%	4,405.4 lb	24.3 lb	5.6 lb	1,468.5 ind	± 30%
Round whitefish	8.7%	2.6%	2.6%	7.8%	3.5%	82.6 lb	0.5 lb	0.1 lb	165.3 ind	± 72%
Unknown whitefish	2.6%	0.0%	0.0%	2.6%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**76.5%**	**42.6%**	**42.6%**	**61.7%**	**37.4%**	**17,725.5 lb**	**97.9 lb**	**22.6 lb**	**6,915.1 ind**	**± 25%**
Anadromous/marine fishes										
Pacific herring	13.0%	0.0%	0.0%	13.0%	1.7%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Eulachon (hooligan, candlefish	1.7%	0.0%	0.0%	1.7%	1.7%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Rainbow smelt	13.0%	2.6%	0.0%	12.2%	3.5%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Pacific tomcod	6.1%	0.9%	0.9%	5.2%	1.7%	468.4 lb	2.6 lb	0.6 lb	146.4 ind	± 120%
Saffron cod	9.6%	0.9%	0.9%	9.6%	2.6%	132.2 lb	0.7 lb	0.2 lb	629.6 ind	± 120%
Pacific halibut	11.3%	0.9%	0.9%	10.4%	2.6%	59.8 lb	0.3 lb	0.1 lb	59.8 lb	± 120%
Arctic lamprey	22.6%	15.7%	12.2%	13.9%	9.6%	1,286.2 lb	7.1 lb	1.6 lb	2,143.7 ind	± 88%
Stickleback (needlefish)	0.9%	0.9%	0.9%	0.0%	0.9%	314.8 lb	1.7 lb	0.4 lb	52.5 gal	± 120%
Subtotal	**47.8%**	**18.3%**	**13.9%**	**40.9%**	**15.7%**	**2,261.4 lb**	**12.5 lb**	**2.9 lb**		**± 72%**
Other freshwater fishes										
Alaska blackfish	38.3%	11.3%	11.3%	33.0%	14.8%	8,751.5 lb	48.4 lb	11.1 lb	8,751.5 lb	± 87%
Burbot	57.4%	26.1%	26.1%	40.0%	23.5%	4,539.7 lb	25.1 lb	5.8 lb	1,891.6 ind	± 30%
Arctic grayling	18.3%	14.8%	13.0%	8.7%	7.8%	337.1 lb	1.9 lb	0.4 lb	481.6 ind	± 36%
Northern pike	62.6%	47.0%	43.5%	29.6%	20.0%	9,790.4 lb	54.1 lb	12.5 lb	2,175.6 ind	± 25%
Longnose sucker	0.9%	0.9%	0.9%	0.0%	0.9%	6.6 lb	0.0 lb	0.0 lb	9.4 ind	± 120%
Subtotal	**73.0%**	**52.2%**	**48.7%**	**58.3%**	**32.2%**	**23,425.4 lb**	**129.4 lb**	**29.8 lb**		**± 40%**
All fish	**96.5%**	**68.7%**	**67.0%**	**89.6%**	**55.7%**	**131,337.6 lb**	**725.6 lb**	**167.2 lb**		**± 19%**
All resources[b]	**100.0%**	**97.4%**	**97.4%**	**98.3%**	**82.6%**	**207,764.9 lb**	**1,147.9 lb**	**264.5 lb**		**± 15%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

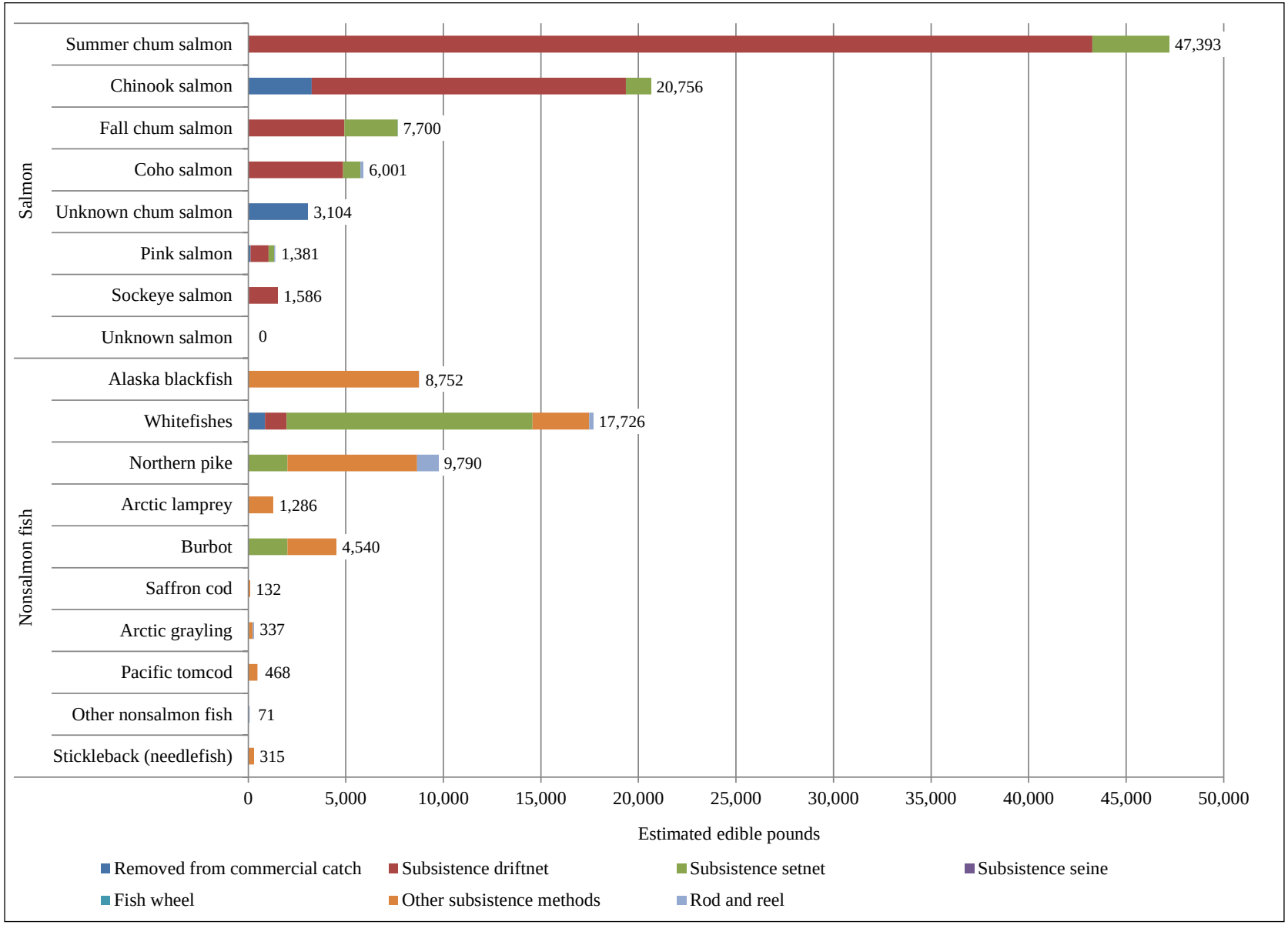


Figure 3-6.–Estimated fish harvests by gear type, Mountain Village, 2010.

Table 3-3.–Estimated harvest and use of land and marine mammals, Mountain Village, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Land mammals										
Large land mammals										
Black bear	1.7%	0.9%	0.0%	1.7%	1.7%	0.0 lb	0 lb	0.0 lb	0.0 ind	± 0.0%
Brown bear	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0 lb	0.0 lb	0.0 ind	± 0.0%
Caribou	6.1%	0.9%	0.0%	6.1%	0.0%	0.0 lb	0 lb	0.0 lb	0.0 ind	± 0.0%
Moose	96.5%	59.1%	41.7%	78.3%	47.0%	47,595.1 lb	263.0 lb	60.6 lb	88.1 ind	± 14.3%
Subtotal	**96.5%**	**59.1%**	**41.7%**	**79.1%**	**47.0%**	**47,595.1 lb**	**263.0 lb**	**60.6 lb**	**88.1 ind**	**± 14.3%**
Small land mammals										
Beaver	13.9%	9.6%	8.7%	6.1%	7.8%	1,345.7 lb	7.4 lb	1.7 lb	96.0 ind	± 73.5%
Red fox	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Snowshoe hare	27.0%	19.1%	18.3%	12.2%	9.6%	515.5 lb	2.8 lb	0.7 lb	263.6 ind	± 37.7%
Alaska hare (jackrabbit)	10.4%	10.4%	7.0%	6.1%	4.3%	149.5 lb	0.8 lb	0.2 lb	63.0 ind	± 54.9%
River (land) otter	3.5%	3.5%	2.6%	0.9%	0.9%	*Not usually eaten*			11.0 ind	± 0.0%
Lynx	6.1%	5.2%	4.3%	1.7%	0.9%	63.0 lb	0.3 lb	0.1 lb	94.4 ind	± 119.6%
Marmot	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Marten	0.0%	0.9%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Mink	1.7%	0.9%	0.9%	0.9%	0.9%	*Not usually eaten*			3.1 ind	± 0.0%
Muskrat	1.7%	1.7%	1.7%	0.0%	1.7%	4.7 lb	0.0 lb	0.0 lb	6.3 ind	± 94.3%
Porcupine	2.6%	1.7%	1.7%	1.7%	0.9%	6.3 lb	0.0 lb	0.0 lb	3.1 ind	± 119.6%
Arctic ground (parka) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Red (tree) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Weasel	0.9%	0.9%	0.9%	0.0%	0.0%	*Not usually eaten*			1.6 ind	± 0.0%
Gray wolf	1.7%	2.6%	0.9%	0.9%	0.0%	*Not usually eaten*			1.6 ind	± 0.0%
Wolverine	0.9%	1.7%	0.0%	0.9%	0.0%	*Not usually eaten*			0.0 ind	± 0.0%
Subtotal	**40.9%**	**29.6%**	**26.1%**	**20.9%**	**14.8%**	**2,084.6 lb**	**11.5 lb**	**2.7 lb**	**543.7 ind**	**± 55.6%**
Marine mammals										
Bearded seal	40.9%	20.0%	10.4%	31.3%	21.7%	3,525.6 lb	19.5 lb	4.5 lb	25.2 ind	± 38.1%
Harbor seal	0.0%	0.9%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Ringed seal	8.7%	5.2%	3.5%	7.0%	4.3%	528.8 lb	2.9 lb	0.7 lb	9.4 ind	± 62.3%
Spotted seal	23.5%	14.8%	7.0%	19.1%	9.6%	969.5 lb	5.4 lb	1.2 lb	17.3 ind	± 46.3%
Unknown seal	51.3%	5.2%	0.9%	51.3%	14.8%	88.1 lb	0.5 lb	0.1 lb	1.6 ind	± 119.6%
Walrus	3.5%	0.0%	0.0%	3.5%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Beluga	29.6%	7.0%	3.5%	27.0%	11.3%	6,295.7 lb	34.8 lb	8.0 lb	6.3 ind	± 59.0%
Bowhead	3.5%	0.0%	0.0%	3.5%	0.9%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**73.9%**	**29.6%**	**17.4%**	**70.4%**	**33.0%**	**11,407.7 lb**	**63.0 lb**	**14.5 lb**	**59.8 ind**	**± 40.2%**
All land mammals	**97.4%**	**63.5%**	**49.6%**	**80.0%**	**48.7%**	**49,679.8 lb**	**274.5 lb**	**63.3 lb**		**± 14.0%**
All marine mammals	**73.9%**	**29.6%**	**17.4%**	**70.4%**	**33.0%**	**11,407.7 lb**	**63.0 lb**	**14.5 lb**		**± 40.2%**
All resources[b]	**100.0%**	**97.4%**	**97.4%**	**98.3%**	**82.6%**	**207,764.9 lb**	**1,147.9 lb**	**264.5 lb**		**± 15.2%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

The large majority of large land mammals were harvested in August and September, during which an estimated 72 bull (male) moose were harvested (Table D3-3). The large land mammal harvest also included an estimated 5 male and 3 female moose in December, 5 male moose in January, and an estimated 2 wolves of unknown sex in January 2010. Most small land mammals were harvested from November to April, corresponding to established trapping seasons and higher fur quality during these months (Table D3-4). Beavers, snowshoe and Alaska hares, muskrats, and porcupines were harvested between April and October (in addition to winter harvests for all of these species other than muskrat). For those small land mammals that were harvested between April and October, state hunting regulations allow year-round harvest. These animals are often used primarily for food during summer months, when fur is typically in poor condition relative to winter months.

Marine mammals contributed 5% by edible weight to the total community harvest in 2010. Hunters harvested an estimated 6 beluga whales, which contributed the largest amount to the marine mammal harvest by edible weight at 6,296 edible pounds; 30% of households used beluga whale in 2010. Although Mountain Village's top 10 subsistence resource species by edible weight did not include any seal species, community members emphasized that seals are among the top 10 most important resources as defined by the community[6] (Figure 3-1). Twenty-five bearded seals (3,526 edible pounds, used by 41% of households), 17 spotted seals (970 lb, 24%), 9 ringed seals (529 lb, 9%), and 2 seals of unknown species made up the remainder of the marine mammal harvest. In addition to these species, 51% of households received and used unknown seal (likely representing seal oil that was received from other households), 4% of households received and used walrus, and 4% of households received and used bowhead whale. Most marine mammals were harvested during the late summer and autumn months (Table D3-5)

Wild birds and eggs contributed only 4% (7,519 edible pounds) to the 2010 wild food harvest by edible weight, though they were harvested by 62% of households and used by 82% of households (Table 3-4; Figure 3-4). Migratory birds, including ducks, geese, tundra swans, and sandhill cranes, formed the majority (76% by edible weight) of the wild bird and egg harvest (Table 3-4; Table 3-5). Although Mountain Village's top 10 subsistence resource species by edible weight did not include any birds, community members suggested that migratory birds considered as a whole rather than by individual species are among the top 10 most important resources as defined by the community (Figure 3-1). Indeed, when the edible weight contribution of individual migratory bird species harvested in 2010 is combined, this resource category's edible weight contribution was similar to top 10 species such as coho salmon and burbot. White-fronted geese were the most harvested migratory bird (847 individual geese) and contributed the largest portion by edible weight of any migratory bird, at 2,034 edible pounds (Table 3-4). Other birds that were harvested included 427 individual cackling geese, 275 mallards, 235 northern pintails, 202 wigeons, 149 tundra swans, 143 black scoters, 140 lesser Canada geese, 101 green-winged teals, 60 sandhill cranes, and smaller numbers of unknown Canada geese, snow geese, northern shovelers, goldeneyes, and brants (Plate 3-3). Although the harvest of tundra (whistling) swans and sandhill cranes involved fewer individual birds relative to geese and ducks, these species provided a large portion of the total edible weight from migratory birds due to the large size of individual birds. Residents of Mountain Village harvested an estimated 1,671 ptarmigans in 2010,

Andrew Brenner, ADF&G

Plate 3-3.–Recently harvested waterfowl, Mountain Village, 2010.

6. Community review meeting, May 17, 2012.

Table 3-4.–Estimated harvest and use of birds, Mountain Village, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Migratory birds										
Ducks										
Bufflehead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Canvasback	0.0%	0.9%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Common eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Goldeneye sp.	0.9%	0.9%	0.9%	0.0%	0.9%	2.5 lb	0.0 lb	0.0 lb	3.1 ind	± 119.6%
Mallard	41.7%	32.2%	27.0%	21.9%	13.9%	274.7 lb	1.5 lb	0.3 lb	274.7 ind	± 31.7%
Common merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Red-breasted merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Long-tailed duck (oldsquaw)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Northern pintail	28.7%	24.3%	20.0%	9.6%	10.4%	188.0 lb	1.0 lb	0.2 lb	235.0 ind	± 37.7%
Scaup sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Black scoter	9.6%	9.6%	7.8%	3.5%	5.2%	128.9 lb	0.7 lb	0.2 lb	143.2 ind	± 60.8%
Surf scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
White-winged scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Northern shoveler	5.2%	4.3%	3.5%	2.6%	4.3%	17.0 lb	0.1 lb	0.0 lb	28.3 ind	± 73.5%
Green-winged teal	7.0%	7.0%	7.0%	1.8%	5.2%	30.2 lb	0.2 lb	0.0 lb	100.7 ind	± 62.8%
Unknown wigeon	10.4%	8.7%	7.8%	4.3%	5.2%	141.1 lb	0.8 lb	0.2 lb	201.6 ind	± 94.2%
Unknown duck	2.6%	3.5%	0.0%	1.7%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**52.2%**	**40.9%**	**33.9%**	**28.7%**	**18.3%**	**782.4 lb**	**4.3 lb**	**1.0 lb**	**986.7 ind**	**± 40.2%**
Geese										
Brant	1.7%	0.9%	0.9%	0.9%	0.9%	1.9 lb	0.0 lb	0.0 lb	1.6 ind	± 119.6%
Cackling goose	49.6%	39.1%	35.7%	29.6%	23.5%	512.6 lb	2.8 lb	0.7 lb	427.2 ind	± 21.4%
Lesser Canada goose	18.3%	14.8%	13.0%	6.1%	11.3%	168.1 lb	0.9 lb	0.2 lb	140.1 ind	± 34.1%
Unknown Canada goose	4.3%	4.3%	4.3%	0.9%	3.5%	66.7 lb	0.4 lb	0.1 lb	55.6 ind	± 75.1%
Emperor goose	0.9%	0.0%	0.0%	0.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Snow goose	13.0%	11.3%	10.4%	4.3%	5.2%	124.2 lb	0.7 lb	0.2 lb	54.0 ind	± 46.9%
White-fronted goose	63.5%	50.4%	48.7%	33.0%	31.3%	2,033.6 lb	11.2 lb	2.6 lb	847.3 ind	± 18.4%
Unknown goose	2.6%	1.7%	0.0%	1.7%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**76.5%**	**60.9%**	**54.8%**	**41.7%**	**40.0%**	**2,907.0 lb**	**16.1 lb**	**3.7 lb**	**1,525.7 ind**	**± 17.5%**
Other migratory birds										
Tundra (whistling) swan	46.1%	33.0%	28.7%	23.5%	20.0%	1,492.5 lb	8.2 lb	1.9 lb	149.2 ind	± 22.8%
Sandhill crane	19.1%	16.5%	11.3%	9.6%	9.6%	502.4 lb	2.8 lb	0.6 lb	59.8 ind	± 40.9%
Whimbrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**47.8%**	**34.8%**	**29.6%**	**26.1%**	**21.7%**	**1,994.8 lb**	**11.0 lb**	**2.5 lb**	**209.1 ind**	**± 24.4%**
Other birds										
Spruce grouse	2.6%	2.6%	2.6%	1.7%	0.9%	5.5 lb	0.0 lb	0.0 lb	7.9 ind	± 71.2%
Ruffed grouse	2.6%	1.7%	1.7%	0.9%	0.9%	12.1 lb	0.1 lb	0.0 lb	17.3 ind	± 84.6%
Ptarmigan sp.	52.2%	40.9%	40.0%	22.6%	27.0%	1,671.0 lb	9.2 lb	2.1 lb	1,671.0 ind	± 27.3%
Subtotal	**53.9%**	**41.7%**	**40.9%**	**25.2%**	**27.8%**	**1,688.6 lb**	**9.3 lb**	**2.2 lb**	**1,696.2 ind**	**± 26.9%**
All migratory birds	**78.3%**	**62.6%**	**58.3%**	**48.7%**	**40.9%**	**5,684.3 lb**	**31.4 lb**	**7.2 lb**	**2,721.5 ind**	**± 18.9%**
All other birds	**53.9%**	**41.7%**	**40.9%**	**25.2%**	**27.8%**	**1,688.6 lb**	**9.3 lb**	**2.2 lb**	**1,696.2 ind**	**± 26.9%**
All resources[b]	**100.0%**	**97.4%**	**97.4%**	**98.3%**	**82.6%**	**207,764.9 lb**	**1,148 lb**	**264.5 lb**		**± 15.2%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

contributing 1,671 edible pounds. The majority (61%) of the bird harvest occurred during spring months, although substantial numbers of birds were harvested in fall (migratory birds and ptarmigans) and winter (ptarmigan and small numbers of grouse and swans) (Table D3-6).

An estimated 21% of households used eggs, primarily from ducks, geese, ptarmigans, swans, cranes, and gulls, during the study year, and eggs made up less than 2% of the total harvest of all birds and eggs by edible pounds (Table 3-5). In total, Mountain Village residents harvested an estimated 584 wild bird eggs in 2010.

Nearly all (96%) residents used wild plants during the study year (Table 3-6). Berries were the most used and harvested wild plant resource; the average household gathered an estimated 37 lb of wild berries in 2010,

Table 3-5.–Estimated harvest and use of eggs, Mountain Village, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Bird eggs										
Duck eggs	10.4%	7.8%	6.1%	4.3%	5.2%	40.6 lb	0.2 lb	0.1 lb	270.7 ind	± 54.9%
Goose eggs	10.4%	5.2%	3.5%	7.0%	3.5%	36.8 lb	0.2 lb	0.0 lb	122.8 ind	± 60.5%
Swan eggs	7.0%	4.3%	2.6%	3.5%	2.6%	40.7 lb	0.2 lb	0.1 lb	64.5 ind	± 81.3%
Crane eggs	2.6%	2.6%	2.6%	0.0%	1.7%	12.3 lb	0.1 lb	0.0 lb	20.5 ind	± 73.7%
Unknown shorebird eggs	0.0%	0.9%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Gull eggs	6.1%	4.3%	2.6%	3.5%	3.5%	6.2 lb	0.0 lb	0.0 lb	18.9 ind	± 74.1%
Ptarmigan eggs	3.5%	2.6%	2.6%	0.9%	1.7%	8.0 lb	0.0 lb	0.0 lb	80.3 ind	± 82.6%
Unknown eggs	0.9%	1.7%	0.9%	0.0%	0.0%	1.4 lb	0.0 lb	0.0 lb	6.3 ind	± 119.6%
Subtotal	**20.9%**	**11.3%**	**8.7%**	**12.2%**	**7.8%**	**146.0 lb**	**0.8 lb**	**0.2 lb**	**583.9 ind**	**± 57.5%**
All birds and eggs	**81.7%**	**65.2%**	**61.7%**	**53.9%**	**49.6%**	**7,519.0 lb**	**41.5 lb**	**9.6 lb**	**5,001.6 ind**	**± 19.6%**
All resources[b]	**100.0%**	**97.4%**	**97.4%**	**98.3%**	**82.6%**	**207,764.9 lb**	**1,147.9 lb**	**264.5 lb**		**± 15.2%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

and berries represented 85% of the total plant harvest by edible weight. The most harvested and used berries included salmonberries ("cloudberries," 670 gallons harvested, used by 82% of households), blueberries (503 gallons, 85%), crowberries ("blackberries," 292 gallons, 58%), and lowbush cranberries (179 gallons, 44%). The estimated amounts of harvests and percentages of use for currants and raspberries were smaller. Other wild edible plants harvested in 2010 included 239 gallons of wild rhubarb, 158 gallons of Hudson Bay tea, 11 gallons of fiddlehead ferns, and smaller quantities of wild mint, sourdock, willow leaves, and spruce tips. Residents also harvested an estimated 1,089 cords of firewood, 68 gallons of stinkweed (a plant commonly used in the region as a medicinal), and 396 gallons of punk (a polypore fungus commonly used as a chewing tobacco additive or mosquito repellent).

Finally, the survey asked respondents about their harvest and use of marine invertebrates in 2010. No households reported subsistence harvests of shellfish, yet 5% of households reported receiving and using at least one species of marine invertebrate: 3% of households reported receiving and using king crabs, and 3% of households reported receiving and using unspecified clams (Table 3-7).

Sharing, roughly measured by instances of households giving away and receiving subsistence resources, was highest for fish and land mammals, with an estimated 90% of households receiving fish and 80% of households receiving land mammals (Table 3-2; Table 3-3). The most commonly given away resource categories were vegetation and birds and eggs, both with 50% of households giving away these resources (Table 3-5; Table 3-6). For all resources, 83% of households gave subsistence resources to at least one other household, and 98% of households received subsistence resources (Table 3-1). These high levels of sharing indicate that subsistence resources are widely distributed throughout the community and are likely important even to households that do not harvest (see "Wild Food Networks" below).

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 during the study year. From these data, maps were produced for 7 subsistence resources. Figure 3-7 summarizes all the mapped data collected from 107 of 115 surveyed households in Mountain Village.

Respondents reported using a total of 4,636 square miles for subsistence in 2010. The Yukon River and its tributaries figured prominently in subsistence hunting, fishing, and gathering both as harvest locations and transportation corridors. Households reported traveling from several of the mouths of the Yukon River to areas as far upriver as Paimiut Slough, and many areas used for subsistence were located considerable

Table 3-6.–Estimated harvest and use of vegetation, Mountain Village 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Berries										
Blueberry	85.2%	83.5%	83.5%	33.9%	28.7%	2,010.4 lb	11.1 lb	2.6 lb	502.6 gal	± 10.8%
Lowbush cranberry	44.3%	40.0%	39.1%	18.3%	12.2%	714.6 lb	3.9 lb	0.9 lb	178.6 gal	± 25.9%
Highbush cranberry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Gooseberry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Currant	0.9%	0.9%	0.9%	0.9%	0.9%	18.9 lb	0.1 lb	0.0 lb	4.7 gal	± 119.6%
Raspberry	7.0%	5.2%	5.2%	2.6%	1.7%	19.7 lb	0.1 lb	0.0 lb	4.9 gal	± 58.4%
Salmonberry	81.7%	76.5%	76.5%	38.3%	24.3%	2,680.1 lb	14.8 lb	3.4 lb	670.0 gal	± 14.9%
Crowberry (blackberry)	58.3%	53.9%	53.0%	26.1%	13.0%	1,168.4 lb	6.5 lb	1.5 lb	292.1 gal	± 26.6%
Subtotal	**91.3%**	**88.7%**	**88.7%**	**47.0%**	**33.9%**	**6,612.0 lb**	**36.5 lb**	**8.4 lb**	**1,653.0 gal**	**± 12.8%**
Plants/greens/mushrooms										
Wild rhubarb	39.1%	37.4%	37.4%	13.0%	12.2%	955.2 lb	5.3 lb	1.2 lb	238.8 gal	± 34.2%
Eskimo potato	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Fiddlehead fern	3.5%	3.5%	3.5%	0.9%	0.9%	10.6 lb	0.1 lb	0.0 lb	10.6 gal	± 90.6%
Nettle	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Hudson's Bay tea	52.2%	48.7%	48.7%	14.8%	12.2%	158.2 lb	0.9 lb	0.2 lb	158.2 gal	± 17.6%
Mint	0.9%	0.9%	0.9%	0.0%	0.0%	7.9 lb	0.0 lb	0.0 lb	7.9 gal	± 119.6%
Sourdock	1.7%	1.7%	1.7%	0.0%	0.9%	4.7 lb	0.0 lb	0.0 lb	4.7 gal	± 88.8%
Spruce tips	0.9%	0.9%	0.9%	0.9%	0.9%	1.6 lb	0.0 lb	0.0 lb	1.6 gal	± 119.6%
Willow leaves	1.7%	1.7%	1.7%	0.0%	0.9%	2.4 lb	0.0 lb	0.0 lb	2.4 gal	± 88.8%
Cow parsnip (wild celery)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Wild rose hips	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Yarrow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown mushrooms	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Fireweed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Stinkweed	21.7%	19.1%	19.1%	3.5%	5.2%	68.3 lb	0.4 lb	0.1 lb	68.3 gal	± 35.9%
Punk	19.1%	16.5%	16.5%	10.4%	7.8%	0.0 lb	0.0 lb	0.0 lb	395.8 gal	± 44.5%
Puffballs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown greens from land	0.9%	0.9%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Subtotal	**67.0%**	**62.6%**	**62.6%**	**25.2%**	**22.6%**	**1,208.8 lb**	**6.7 lb**	**1.5 lb**	**888.2 gal**	**± 27.9%**
Wood										
Wood	74.8%	69.6%	69.6%	25.4%	14.9%	0.0 lb	0.0 lb	0.0 lb	1,089.2 crd	± 18.8%
Subtotal	**74.8%**	**69.6%**	**69.6%**	**25.4%**	**14.9%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**1,089.2 crd**	**± 18.8%**
All vegetation	**95.7%**	**95.7%**	**95.7%**	**53.9%**	**49.6%**	**7,820.8 lb**	**43.2 lb**	**10.0 lb**		**± 12.7%**
All resources[b]	**100.0%**	**97.4%**	**97.4%**	**98.3%**	**82.6%**	**207,764.9 lb**	**1,147.9 lb**	**264.5 lb**		**± 15.2%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

distances away from river transportation corridors. Residents used extensive areas of the Bering Sea coast for subsistence, extending from Hooper Bay in the south to Unalakleet in the north.

Salmon search and harvest areas were concentrated along the mainstem Yukon River with additional harvests areas on the Andreafsky River near St. Marys (Figure 3-8). Mapped areas included sites for family fish camps, areas where drift and set gillnetting occurred, and rod and reel harvests. Mountain Village fishers fished on the mainstem Yukon River upriver to Pitkas Point (within 15 miles of Mountain Village), but traveled considerably greater distances downriver (up to 50 miles). This may be related to avoiding competition with or encroachment on the fishing territories of upriver communities including Pitkas Point, St. Marys, Pilot Station, and Marshall, because downriver communities are much further away.

Figure 3-9 shows search and harvest areas for other fish species including burbot, northern pike, sheefish, and whitefishes. Other nonsalmon fish species were not mapped, thus this map represents a minimal description of nonsalmon fish search and harvest areas. Burbot and sheefish search and harvest areas were concentrated on the mainstem Yukon River and bordering sloughs within 20 miles of Mountain Village, while whitefishes and northern pike were harvested over a much more extensive area. Whitefishes harvest sites included the

Table 3-7.–Estimated harvest and use of marine invertebrates, Mountain Village, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Marine invertebrates										
Unknown clams	3.5%	0.0%	0.0%	3.5%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown king crab	2.6%	0.0%	0.0%	2.6%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Tanner crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Shrimp	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown marine invertebrates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Subtotal	**5.2%**	**0.0%**	**0.0%**	**5.2%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**		**± 0.0%**
All marine invertebrates	**5.2%**	**0.0%**	**0.0%**	**5.2%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**		**± 0.0%**
All resources[b]	**100.0%**	**97.4%**	**97.4%**	**98.3%**	**82.6%**	**207,764.9 lb**	**1,147.9 lb**	**264.5 lb**		**± 15.2%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

mainstem Yukon and its tributaries from the mouth of the Yukon River extending upriver to near Pilot Station, with additional harvests taking place near the mouth of Black River. Northern pike harvest areas included the mainstem Yukon River and its tributaries near Mountain Village, but also extended to relatively distant locations including Black River near Kusilvak Mountains and on the Atchuelinguk River near Pilot Station. During the Mountain Village community review, respondents described that "anywhere there's water, people go pike fishing."

Search and harvest areas for large land mammals, including caribou and moose, are depicted in Figure 3-10. No caribou were reportedly harvested in 2010, yet at least one household reported searching for caribou over an extensive area bordering the Bering Sea coast between Saint Michael and Unalakleet. Moose search and harvest areas were concentrated near the mainstem Yukon River and bordering sloughs from Head of Passes upriver to Paimiut Slough.

Search and harvest areas for small land mammals extended mainly over tundra within 40 miles of Mountain Village, reflecting the capacity for overland travel via snowmachine in these areas during winter (Figure 3-11). Additional search and harvest areas included a small portion of the Askinuk Mountains near Scammon Bay, Portage Slough near Russian Mission, and land between Poltes Slough and the mainstem Yukon River downriver from Marshall.

Residents described extensive search and harvest areas for marine mammals including seals and beluga whales. Search and harvest areas for seals extended over nearly the entire Yukon River downriver from Mountain Village, including Kwiguk, Kwikluak, Kwikpak, and Apoon passes (Figure 3-12). Additionally, marine mammal search and harvest areas in the Bering Sea, generally within 20 miles from the coast, ranged from near Kotlik to south of Nunam Iqua, and also near Hooper Bay. Beluga whale search and harvest areas were similar to those for seals, but search and harvest areas in the river did not extend as far upriver as for seals, and marine search and harvest areas were limited to coastal waters between Kotlik and Nunam Iqua.

Areas used for migratory bird hunting were confined mostly to river corridors and lakes along the mainstem Yukon River from Head of Passes to Pilot Station (Figure 3-13). Additional areas included limited areas near Marshall and Alakanuk. Grouse and ptarmigan search and harvest areas were similar to those for small land mammals and included extensive tundra areas that could only feasibly be accessed during winter months. Respondents also described that the area immediately around Kusilvak Mountain was an important area for ptarmigan hunting, and also that when residents traveled to Scammon Bay in winter they usually hunted ptarmigan along the way.

Figure 3-14 shows search and harvest areas for berries and greens. Compared to search and harvest areas for other subsistence resources, individual harvest areas were relatively small and discontinuous, and the

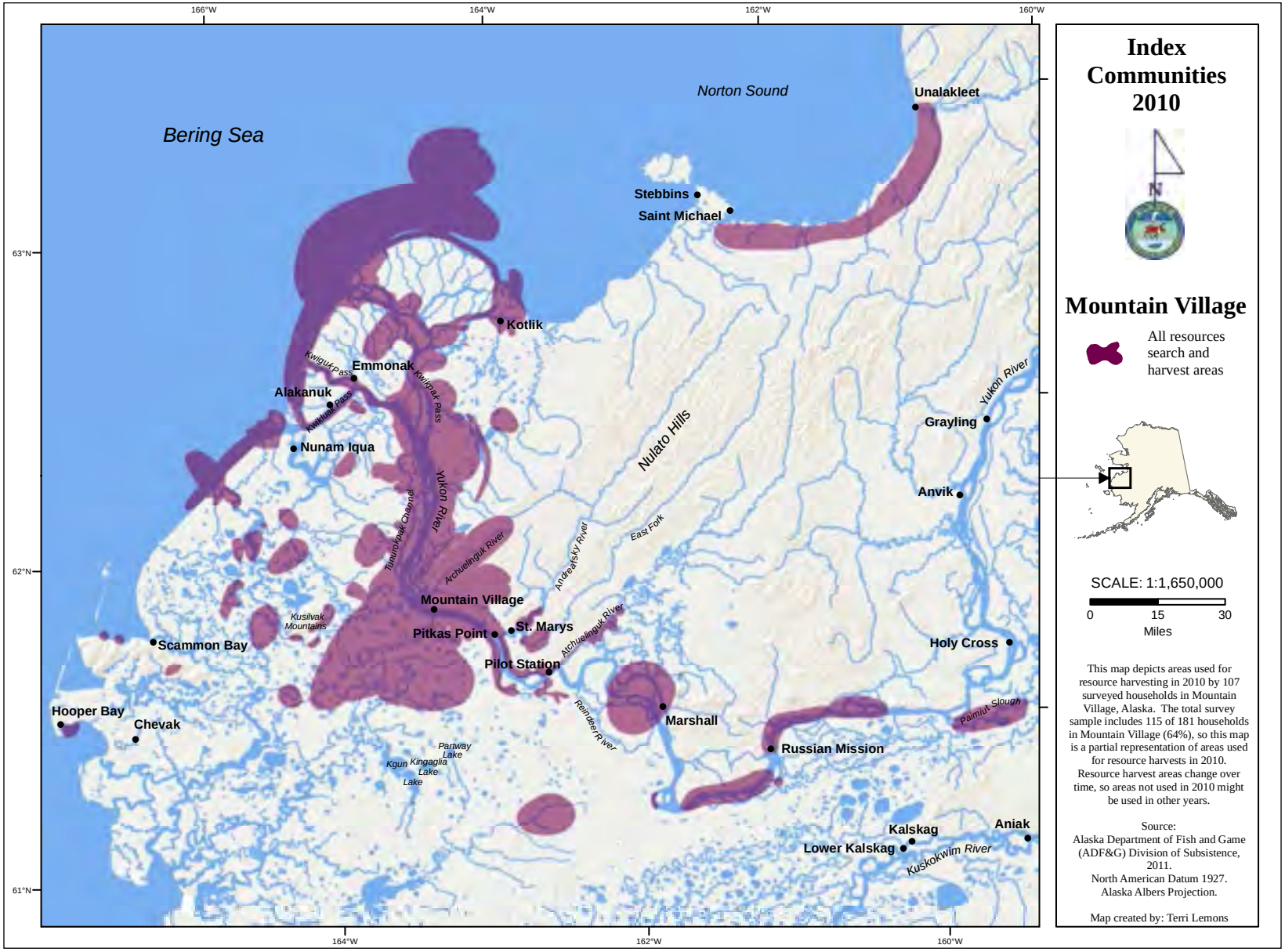


Figure 3-7.–Search and harvest areas, all resources, Mountain Village, 2010.

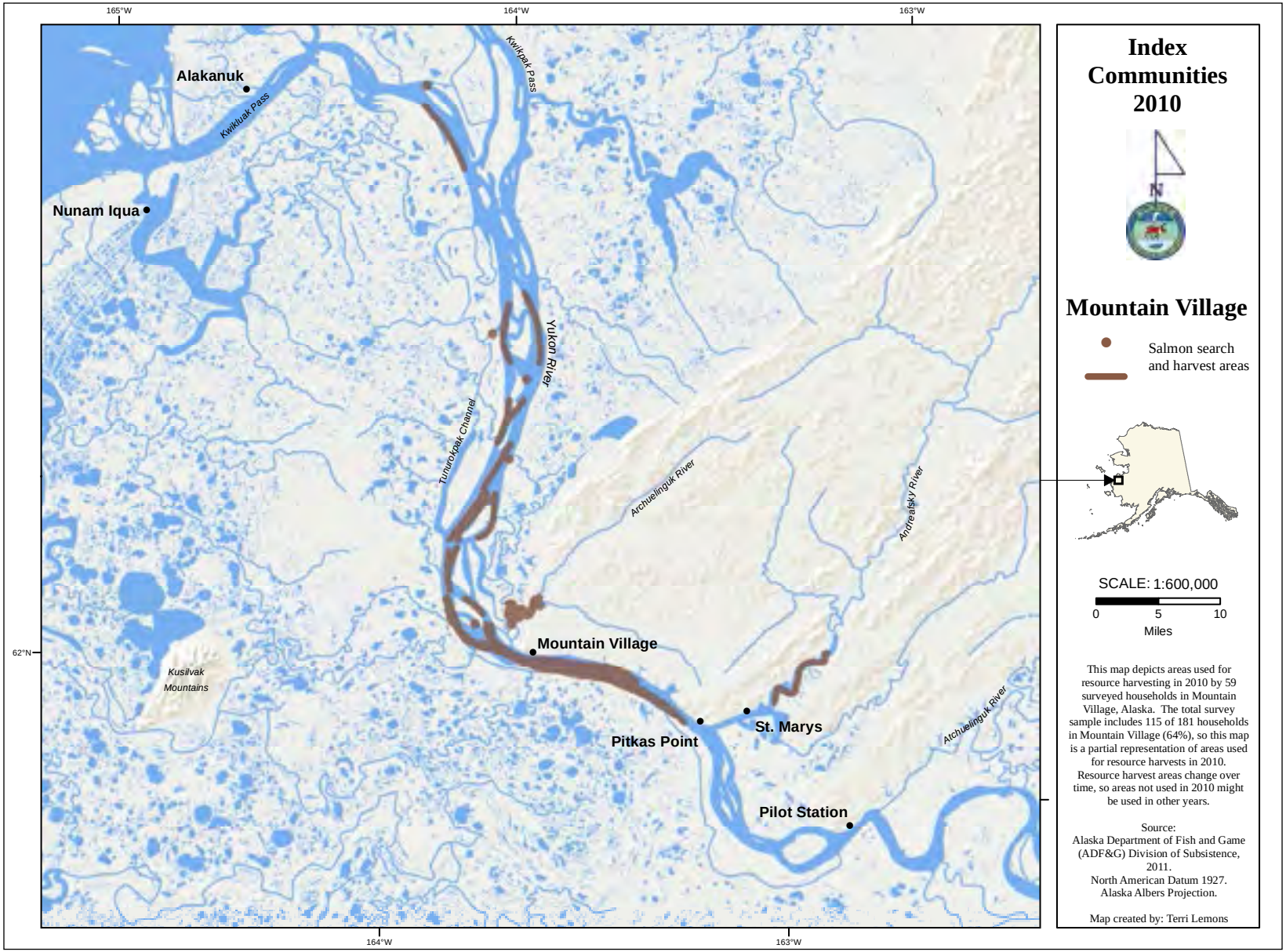


Figure 3-8.–Search and harvest areas, salmon, Mountain Village, 2010.

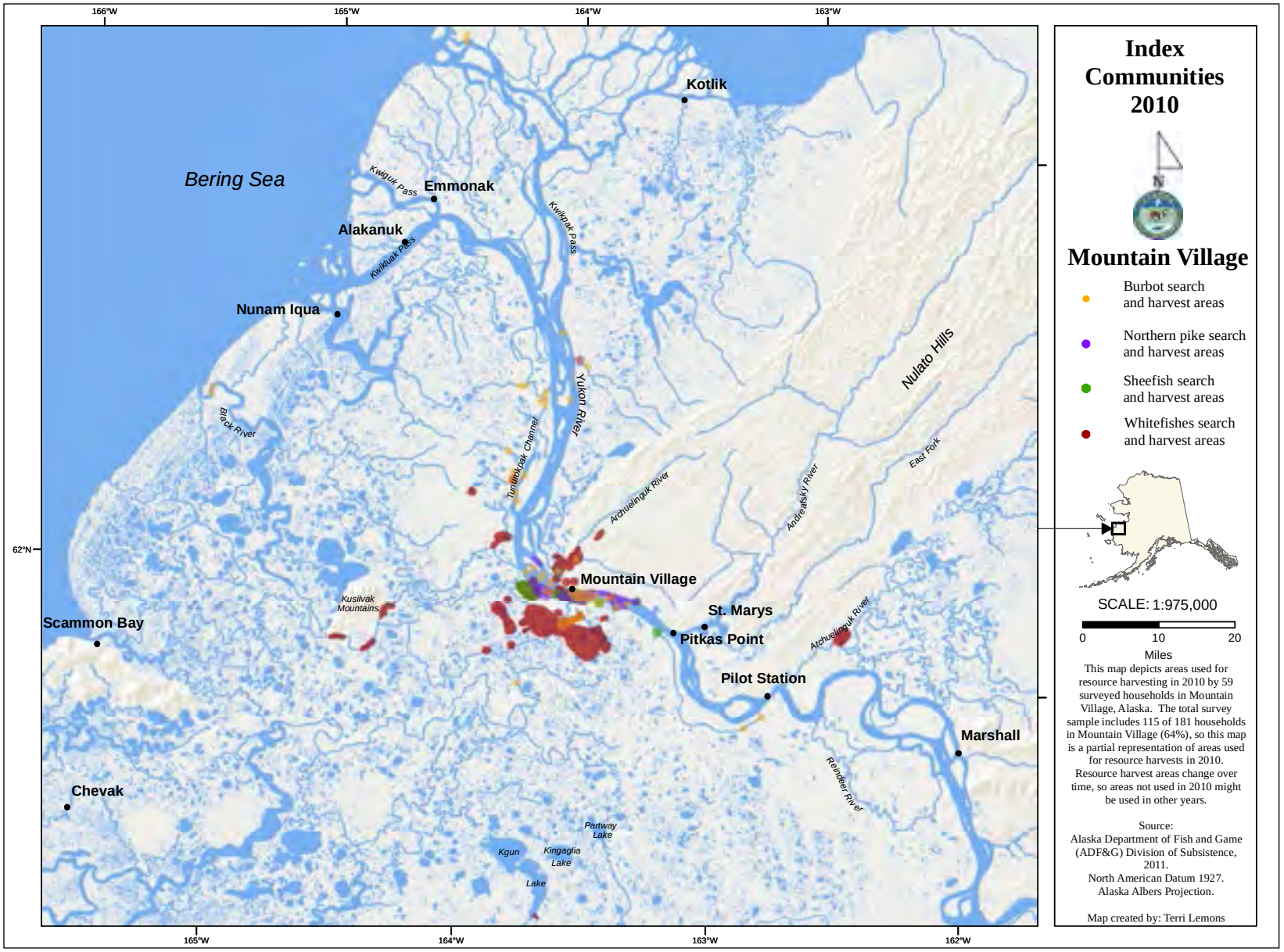


Figure 3-9.–Search and harvest areas, nonsalmon fish, Mountain Village, 2010.

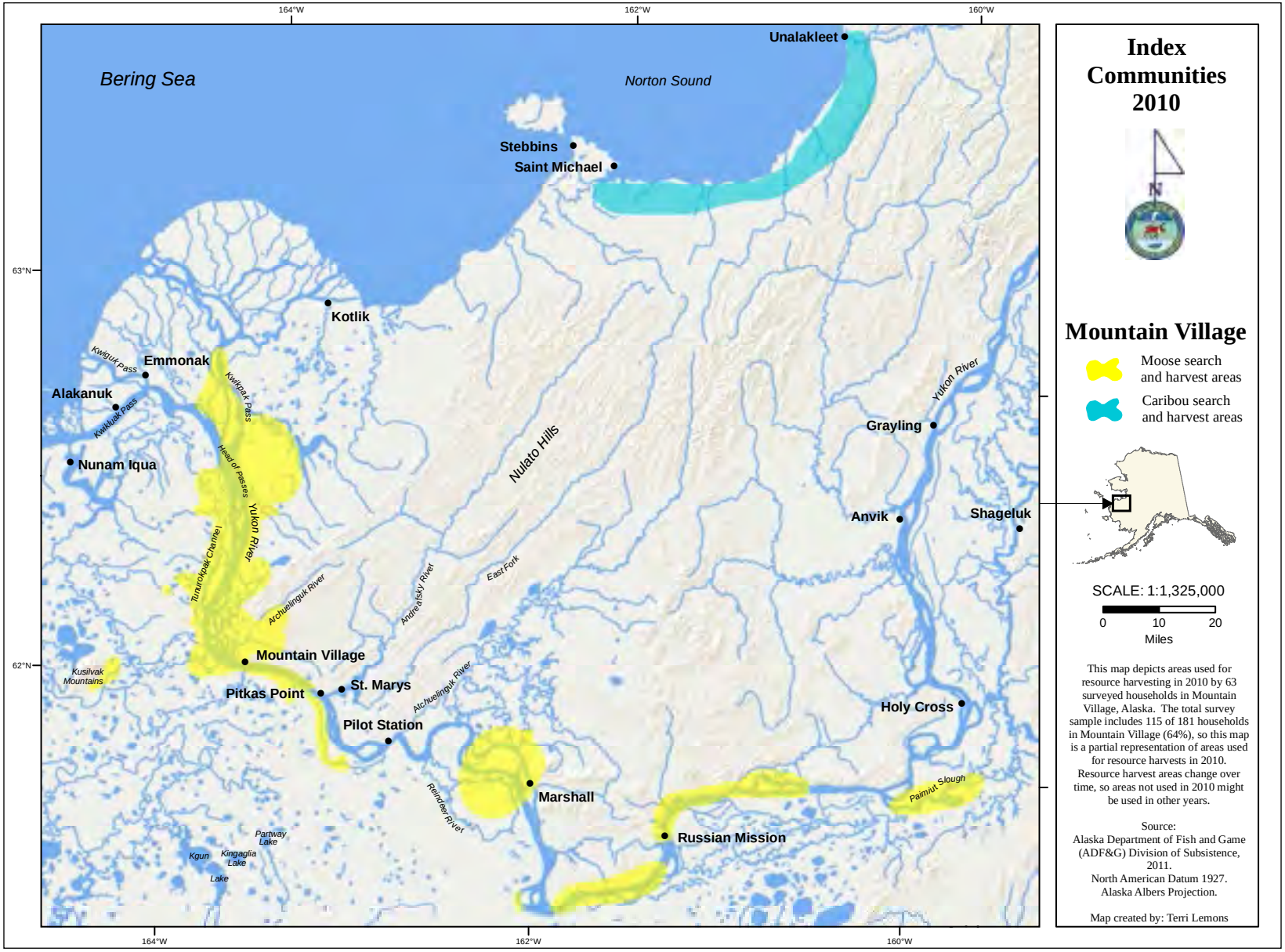


Figure 3-10.–Search and harvest areas, large land mammals, Mountain Village, 2010.

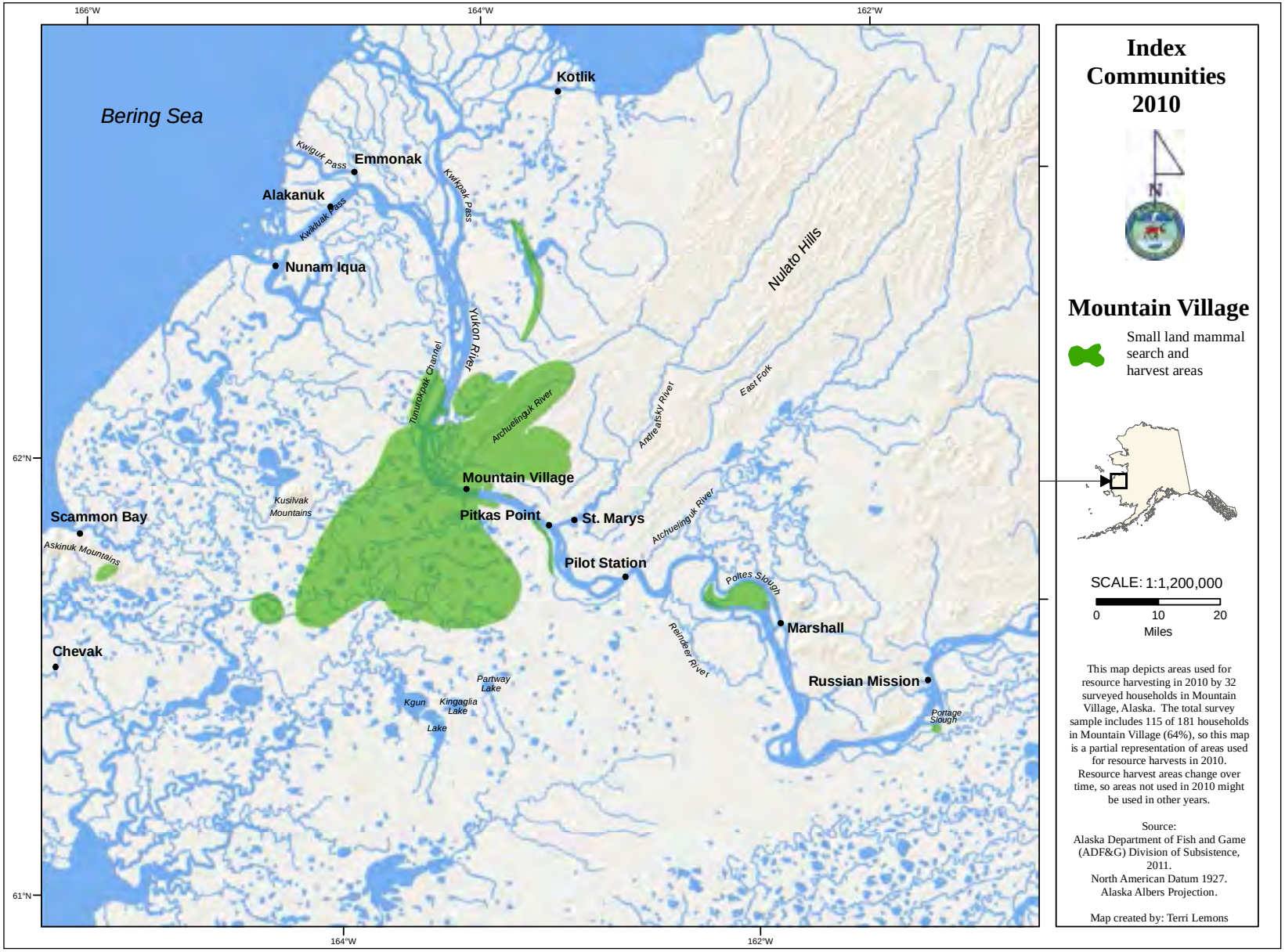


Figure 3-11.–Search and harvest areas, small land mammals, Mountain Village, 2010.

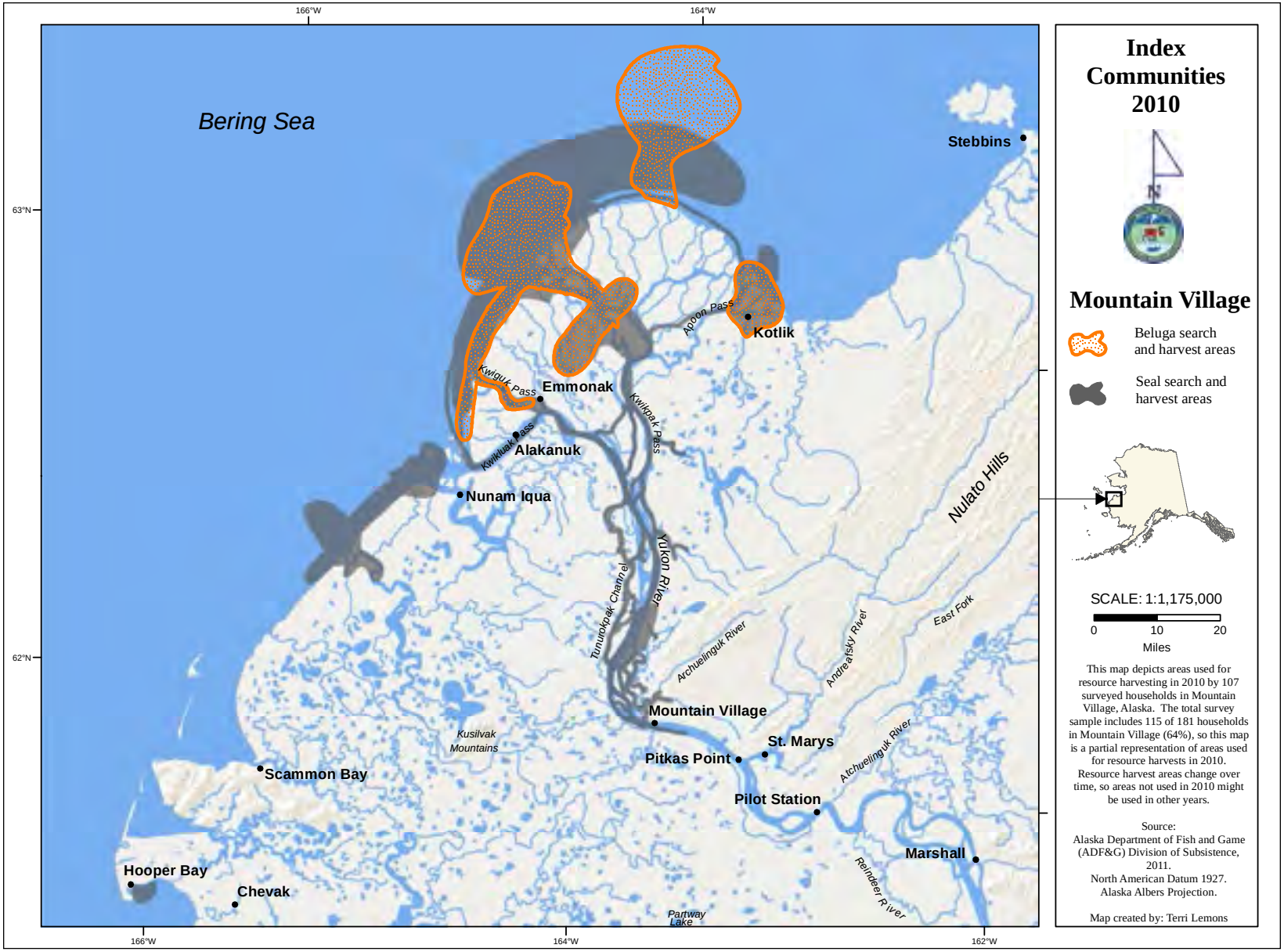


Figure 3-12.–Search and harvest areas, marine mammals, Mountain Village, 2010.

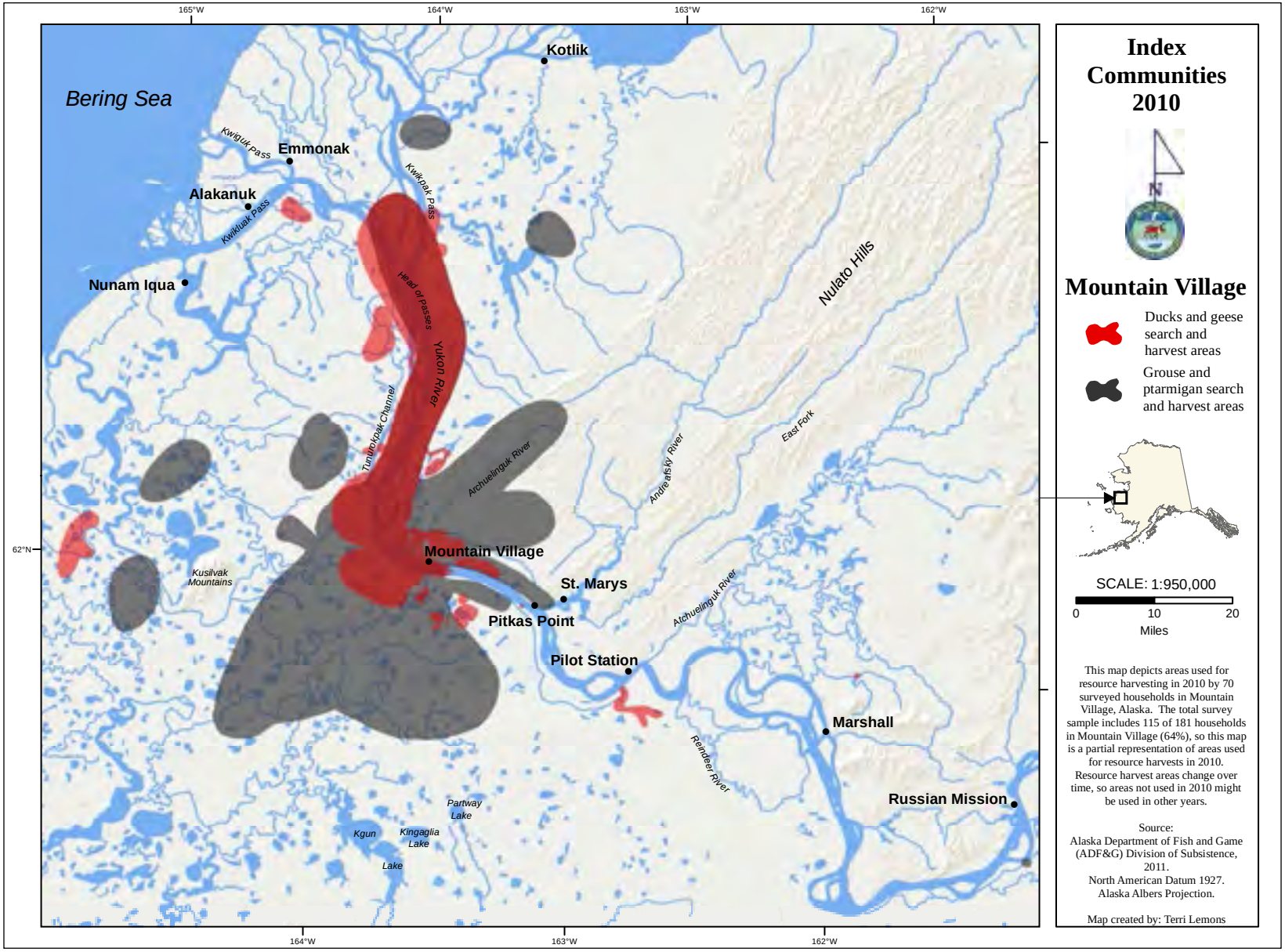


Figure 3-13.–Search and harvest areas, birds, Mountain Village, 2010.

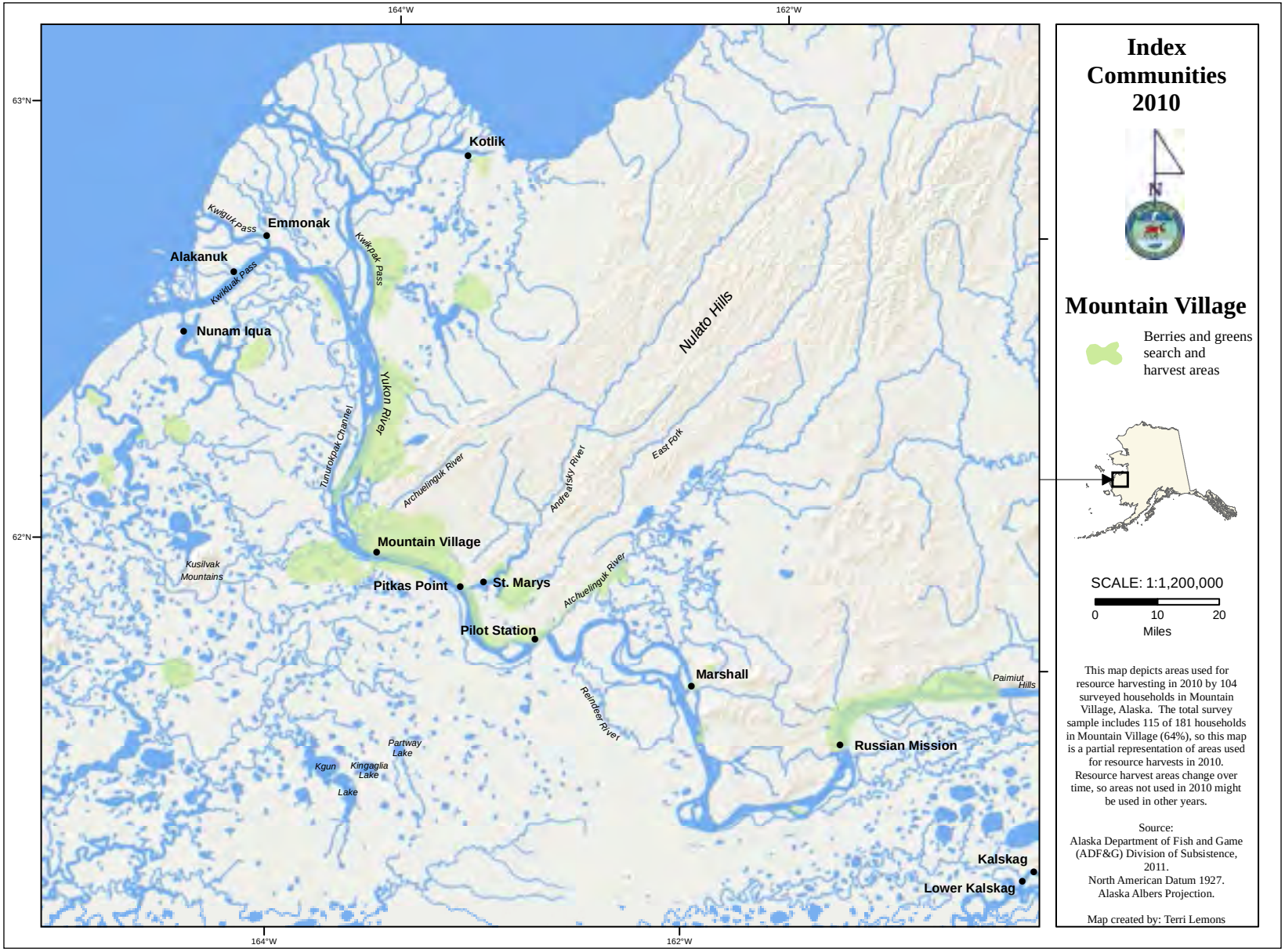


Figure 3-14.–Search and harvest areas, vegetation, Mountain Village, 2010.

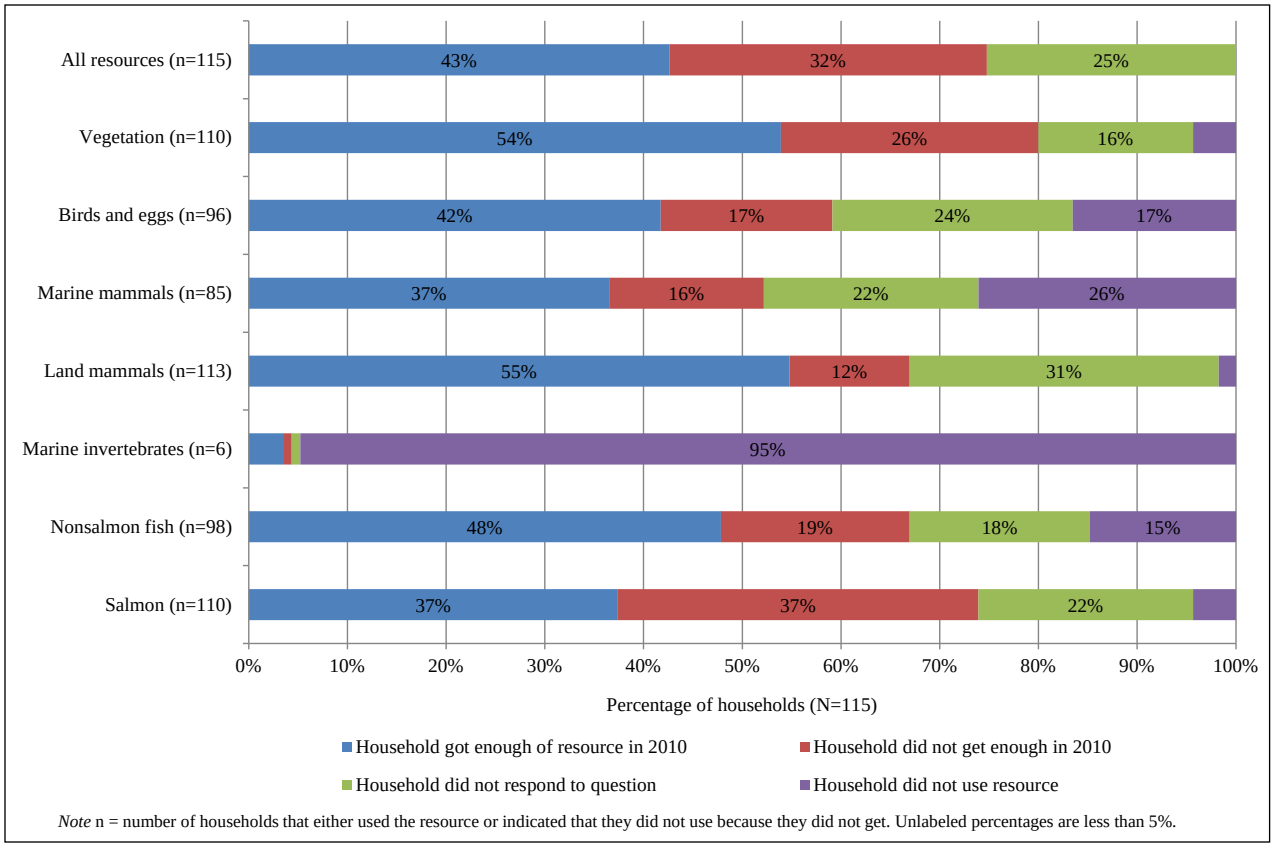


Figure 3-15.–Household harvest assessments, Mountain Village, 2010. Responses to the question: Did your household get enough ?

total search and harvest area of berries and greens was more widespread. People utilized land bordering the mainstem Yukon River from the mouth of the Yukon River near Kotlik upstream to Paimiut Hills upriver from Russian Mission, as well as several locations bordering remote lakes and rivers throughout the Yukon River delta. Respondents also described gathering berries near Scammon Bay, Saint Michael, and Nunam Iqua on a regular basis, although these locations were not mapped during the study year.

Harvest Assessments

The survey asked respondents to assess their harvests in 2 ways: whether they used less, the same amount, or more of 7 resource categories in 2010, and whether they got "enough" of each of the 7 resource categories. If households reported using less or more of a resource, they were asked the reasons why. When a household reported that it did not get enough of a resource category, it was asked which species it needed and the degree to which this impacted it. These households were also asked if they did anything differently to obtain food because they did not get enough subsistence resources, and if so, what they did. Subsistence harvest success can also be assessed by comparing current harvest estimates with past harvest estimates, which will be discussed below in "Comparison with Prior Results."

Thirty-two percent of households indicated that they did not get enough of all subsistence resources in 2010. Impacts of not getting enough were described as severe by 16% and major by 49% of these households (Table D3-7). Between 37% and 55% of households reported getting enough for each of 6 individual resource categories (Figure 3-15). For a seventh resource category, marine invertebrates, 95% of surveyed households reported not typically using this resource category, and all households that described not getting enough marine invertebrates described the impact of not getting enough as not noticeable (Figure 3-15; Table C3-7). Plants and berries and land mammals were the subsistence resource categories with the highest

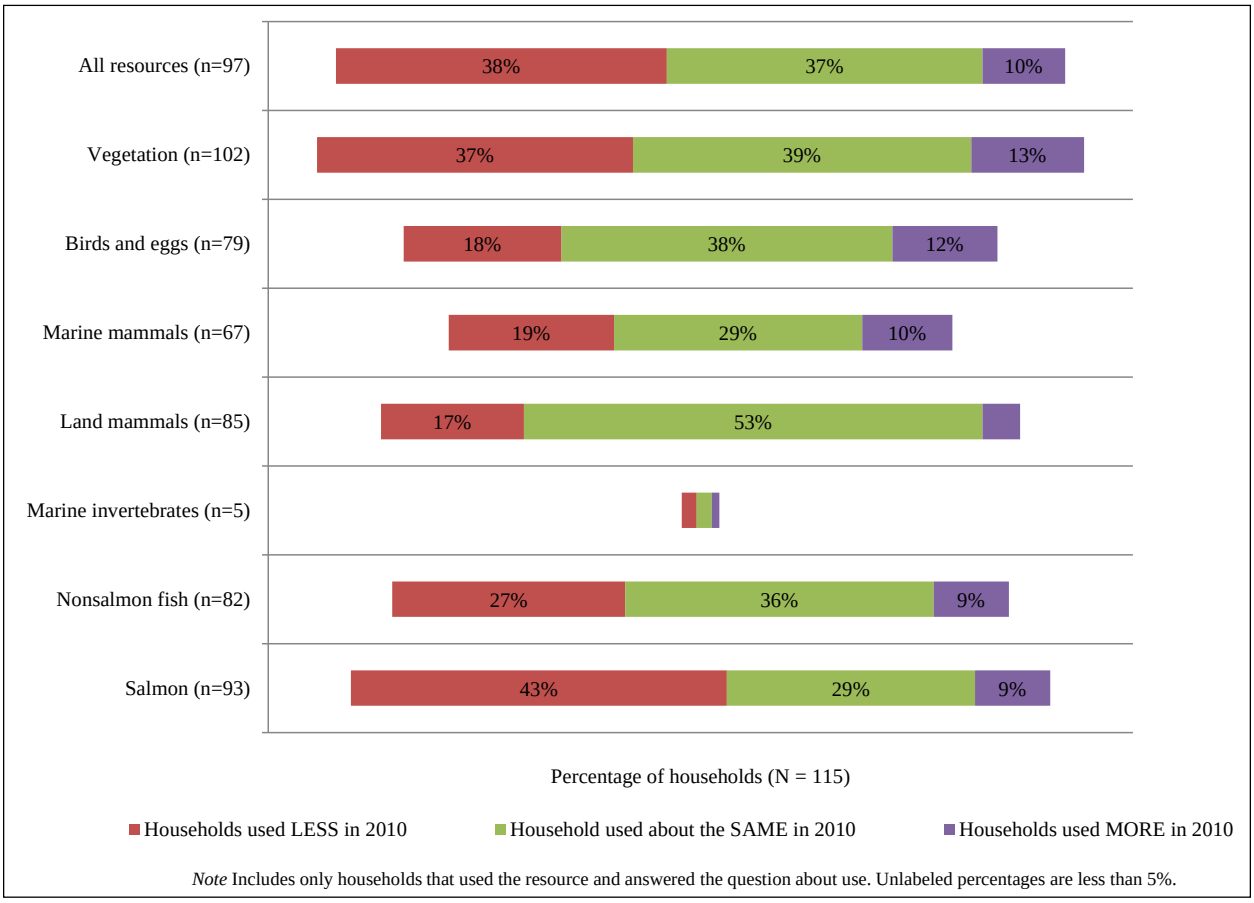


Figure 3-16.–Household use assessments, Mountain Village, 2010. Responses to the question: Did your household use less, more, or the same amount?

percentages of households reporting getting enough (54% and 55% respectively) (Figure 3-15). Salmon had the highest percentage of households (37%) reporting that they did not get enough in 2010. Seventeen percent of those households described the impact of not getting enough salmon as severe, and 45% as major (Table D3-7). Some of the most common reasons given for not getting enough of all subsistence resources included personal or family obligations that prevented harvests, that a resource was unavailable, and that a household did not receive enough of a resource obtained through sharing networks (Table D3-8). Weather appeared to cause problems for harvesting salmonberries, in particular. Some respondents mentioned that household members were working or had less time (particularly for harvesting Chinook salmon and berries), and several people pointed out that fishing or hunting regulations prevented a household from getting enough of a resource (particularly for Chinook salmon).

Households that did not get enough of a resource were also asked if they did anything differently as a result; for all resources of which households reported not getting enough, the most common action involved increased use of commercial food resources (Table D3-9; Table D3-10). Of the households that did not get enough of all subsistence resources, 75% reported doing something differently as a result; the majority of these households (73%) reported using more commercial foods. Other common actions resulting from not getting enough of a resource included replacing the resource with other subsistence resources (particularly for salmon and for berries and greens), making do without a certain resource, or asking other households for help.

Respondents were asked to describe whether they used less, the same amount, or more of 7 resource categories in 2010 relative to recent years (Figure 3-16). Households that responded consistently reported using less or the same amount of a resource rather than more of a resource. Between 17% and 43% of

households reported using less for each resource category other than marine invertebrates. The individual categories experiencing the most pronounced decreases in use in 2010 were salmon, berries and greens, and nonsalmon fish species: 44% of all households reported using less salmon in 2010, while 29% used about the same amount of salmon, and only 9% of households used more salmon than usual in 2010. When asked why they used less salmon, the most common reasons included personal reasons that resulted in reduced use (26% of responses), regulations that prevented the households from harvesting the same amount or more salmon (23%), work schedule conflicts or generally not having enough time (17%), lack of necessary equipment or having problems with fishing equipment (11%), and less effort spent trying to harvest salmon in 2010 (11%) (Table D3-11). The categories of berries and greens and nonsalmon fish species show similar but less extreme patterns of decreased use levels in 2010, with 37% of households using less berries and greens, and 27% of households using less nonsalmon fish in 2010 (Figure 3-16). Percentages of households using less of a particular resource category generally are similar to percentages of households not getting enough of that resource (Figure 3-15; Figure 3-16).

Of responding households, 45% reported using less of all subsistence resources as a whole in 2010 relative to recent years. These decreased use levels in 2010 must be taken into account when estimating subsistence uses and needs for Mountain Village in future years: 2010 may represent low levels of use compared to average years, and future years cannot be assumed to follow a trend of decreased use. Common explanations for decreased use included family or personal matters (23% of responding households); decreased resource availability (20%); low harvest effort, work obligations or lack of time, and regulatory restrictions (each 15%); and lack of equipment or equipment problems and high cost of fuel (each 13%) (Table D3-11). For those households that reported using more subsistence resources in 2010, surveys recorded why their use of particular resource categories increased in 2010 (Table D3-12). Reasons for this increased use were generally related to increases in need, effort expended, success in harvesting, or quantities received rather than environmental factors. One household described that good weather, and similarly one household described that increased availability, was related to their household's increased use of berries and greens in 2010. One household described that regulations were related to an increased use of salmon in 2010.

Jobs and Income

Respondents were asked about both earned income (jobs held and wages earned by all household members 16 years and older) and income from sources such as the Alaska Permanent Fund dividend, Social Security, and public assistance. The survey also asked about months worked and the work schedule of each job. As Table 3-8 shows, Mountain Village households earned or received an estimated $7,639,604 in 2010, of which $5,139,623 (67%) was from wage employment and $2,499,982 (33%) was from other sources. The average per household income for 2010 was an estimated $42,208; per capita income for 2010 was an estimated $9,727.

Figure 3-17 shows the percentage of community income by source, whether earned income or unearned income. Local government employed 190 people from 128 households in 2010, and this category provided 75% of earned income and 50% of total income for Mountain Village residents (Table 3-8; Figure 3-17). Local government includes work for city and tribal organizations, as well as the local public school. The large percentage of earned income derived from local government may be partially attributed to the Lower Yukon School District, which is headquartered in Mountain Village.[7] Other reported earned income came from employment in 7 other categories: construction (4% of total income); agriculture, forestry, and fishing (4%); services (4%); retail trade (2%); transportation, communication, and utilities (2%); federal government (less than 1%); and state government (less than 1%).

An estimated 284 out of 508 adults (56%) held at least one job in 2010 (Table C4). On average, those with jobs worked approximately 8 months of the year; the average number of weeks employed was 36. Thirty-six percent of employed adults worked year round. The number of jobs held per employed household ranged from 1 to 6 with an average of 2. On average, employed adults held 1 job. Of the jobs reported by

7. Lower Yukon School District, n.d. "Lower Yukon School District." Accessed December 8, 2014. http://www.loweryukon.org

Table 3-8.–Estimated earned and other income, Mountain Village, 2010.

Income source	Number of people	Number of households	Total for community	Mean per household[a]	Percentage of total[b]
Earned income					
Local government	190.4	128.1	$3,849,955	$21,270	50.4%
Construction	9.4	9.6	$336,416	$1,859	4.4%
Agriculture, forestry, and fishing	50.4	36.8	$320,935	$1,773	4.2%
Services	26.8	24.0	$275,916	$1,524	3.6%
Retail trade	20.5	17.6	$171,601	$948	2.2%
Transportation, communication, and utilities	4.7	4.8	$133,066	$735	1.7%
Federal government	7.9	6.4	$37,579	$208	0.5%
State government	1.6	1.6	$14,156	$78	0.2%
Earned income subtotal	**284.3**	**147.4**	**$5,139,623**	**$28,396**	**67.3%**
Other income					
Alaska Permanent Fund dividend		157.4	$852,279	$4,709	11.2%
Food stamps		61.4	$523,991	$2,895	6.9%
Social Security		48.8	$381,785	$2,109	5.0%
Unemployment		37.8	$149,931	$828	2.0%
Supplemental Security Income		25.2	$101,550	$561	1.3%
Pension/retirement		15.7	$97,984	$541	1.3%
Adult public assistance		33.1	$89,475	$494	1.2%
Longevity bonus		28.3	$71,678	$396	0.9%
Native corporation dividend		136.9	$61,529	$340	0.8%
CITGO fuel voucher		124.3	$60,810	$336	0.8%
Energy assistance		70.8	$58,690	$324	0.8%
Disability		7.9	$22,258	$123	0.3%
Veterans assistance		6.3	$12,778	$71	0.2%
Child support		9.4	$8,792	$49	0.1%
Meeting honoraria		3.1	$2,858	$16	0.0%
Other		3.1	$2,381	$13	0.0%
Women, Infants and Children (WIC)		1.6	$1,215	$7	0.0%
Worker's compensation/insurance		3.1	$0	$0	0.0%
Foster care		3.1	$0	$0	0.0%
Other income subtotal		**157.4**	**$2,499,982**	**$13,812**	**32.7%**
Community income total			**$7,639,604**	**$42,208**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2011.
a. Means are based on all households in the community, not the number of households in the income category.
b. Income by category as a percentage of the total community income from all sources (wage-based income and non-wage-based income).

Mountain Village respondents, 53% were full-time positions, 19% were part-time, 27% were on-call or occasional, and less than 1% were part-time shift jobs or unreported schedule (Table D3-13).

The main contributor to other income was the Alaska Permanent Fund dividend (11% of total community income) which paid $1,281 to eligible Alaska residents in 2010[8] (Table 3-8). Food stamps (7% of total community income), Social Security (5%), unemployment (2%), Supplemental Security Income, pension and retirement, and adult public assistance (each 1%) represented other important sources of other income.

8. Alaska Department of Revenue Permanent Fund Dividend Division, Juneau, n.d. "Summary of Dividend Applications and Payments." Accessed December 8, 2014. https://pfd.alaska.gov/Division/Info/SummaryApplicationsPayments

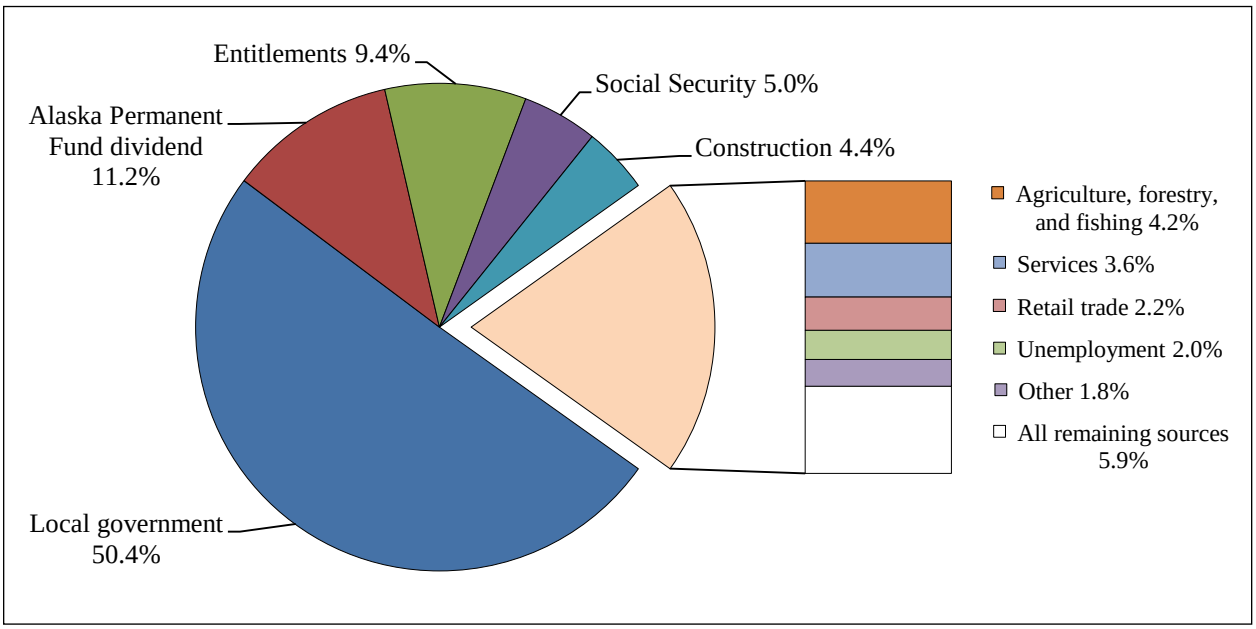


Figure 3-17.–Top 10 income sources, ranked by estimated amount, Mountain Village, 2010.

Food Security

Respondents were asked a short series of questions intended to assess their household's food security; that is, "access by all people at all times to enough food for an active, healthy life" (Nord et al. 2009:2). The food security questions were modeled on questions developed by the U.S. Department of Agriculture (USDA) and modified by ADF&G to account for differences in access to subsistence and store-bought foods. Core questions and Mountain Village responses are summarized in Figure 3-18.

Based on their responses to these questions, households were categorized as having high, marginal, low, or very low food security following a USDA protocol (Bickel et al. 2000). In Mountain Village in 2010, 91% of the surveyed households had high food security, and 9% had low food security. This analysis suggests that Mountain Village households experience higher levels of food security than Alaska statewide or United States national averages (Figure 3-19). No households fell within the most severe category of very low food security.

In spite of the relatively high levels of overall food security in Mountain Village, between 22% and 36% of all households reported specific food insecure conditions including worrying about having enough food, lacking resources to get food, not being able to get more food, and both store-bought and subsistence foods not lasting (Figure 3-18). Between 3% and 12% of households reported more severe food insecure conditions that indicate overall low or very low food security: these include cutting the size of meals or

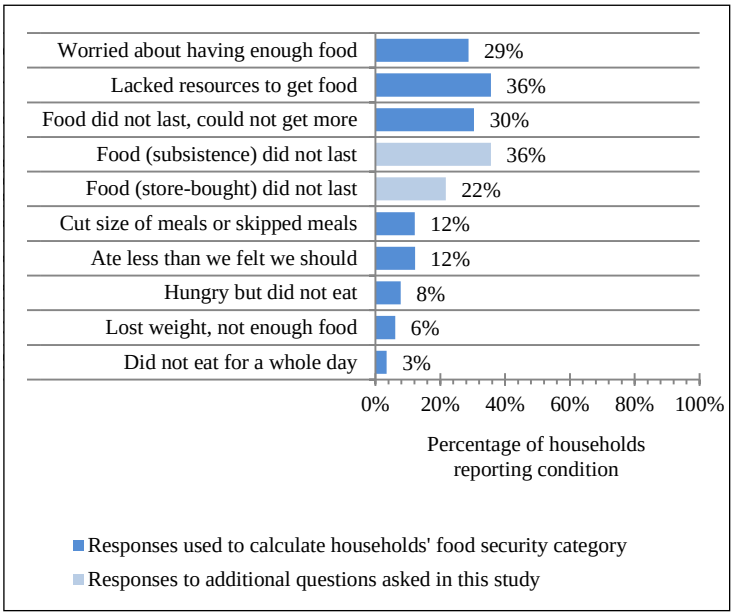


Figure 3-18.–Food insecure conditions, Mountain Village, 2010.

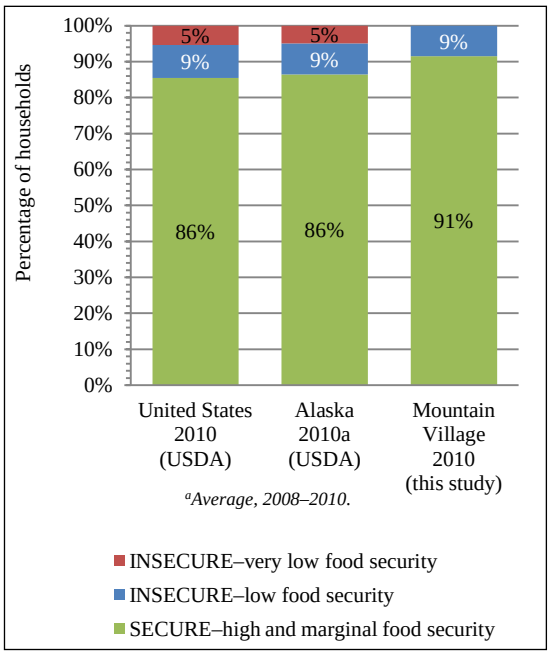


Figure 3-19.–Food security categories, Mountain Village, 2010.

skipping meals, eating "less than we felt we should," being hungry but not eating, losing weight due to lack of food, and not eating for an entire day. Households reported the most incidences of food insecurity in the winter months from November through April, although some food insecure conditions persisted throughout the year (Figure 3-20).

Wild Food Networks

For each resource category on the survey form, respondents were asked to identify households that harvested and processed the resources that the respondent household used. Figure 3-21 depicts the flow of wild foods between households within Mountain Village or received from other communities in Alaska.

Each line in the figure represents at least one instance of a reported food sharing event in a surveyed household; extensive sharing of wild foods between households is readily apparent in the figure. The high number of unsurveyed households, represented as grey squares, that surveyed households reported as sources of wild food indicates that the subsistence food network is probably more extensive and complex than the figure depicts. There is considerable diversity in the composition of individual households within the subsistence food sharing network as reported. Several patterns exist between levels of food sharing and the age, sex, and number of household heads. Households with elders (i.e., headed by individuals over 59 years of age) on average appear to receive subsistence foods from multiple households, as evidenced by the multiple arrows directed toward these households. High harvesting households, depicted by their representative shape's increased size relative to other households, are typically mature or elder households headed by a couple. Households

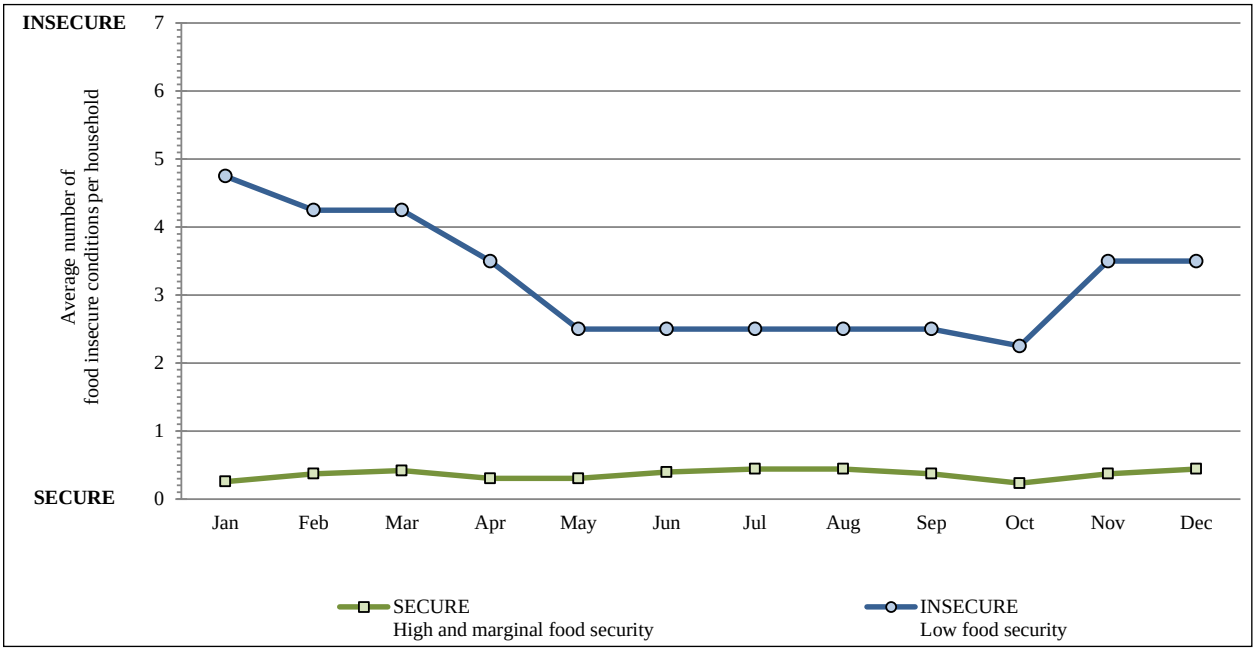


Figure 3-20.–Food insecure conditions by month and household category, Mountain Village, 2010.

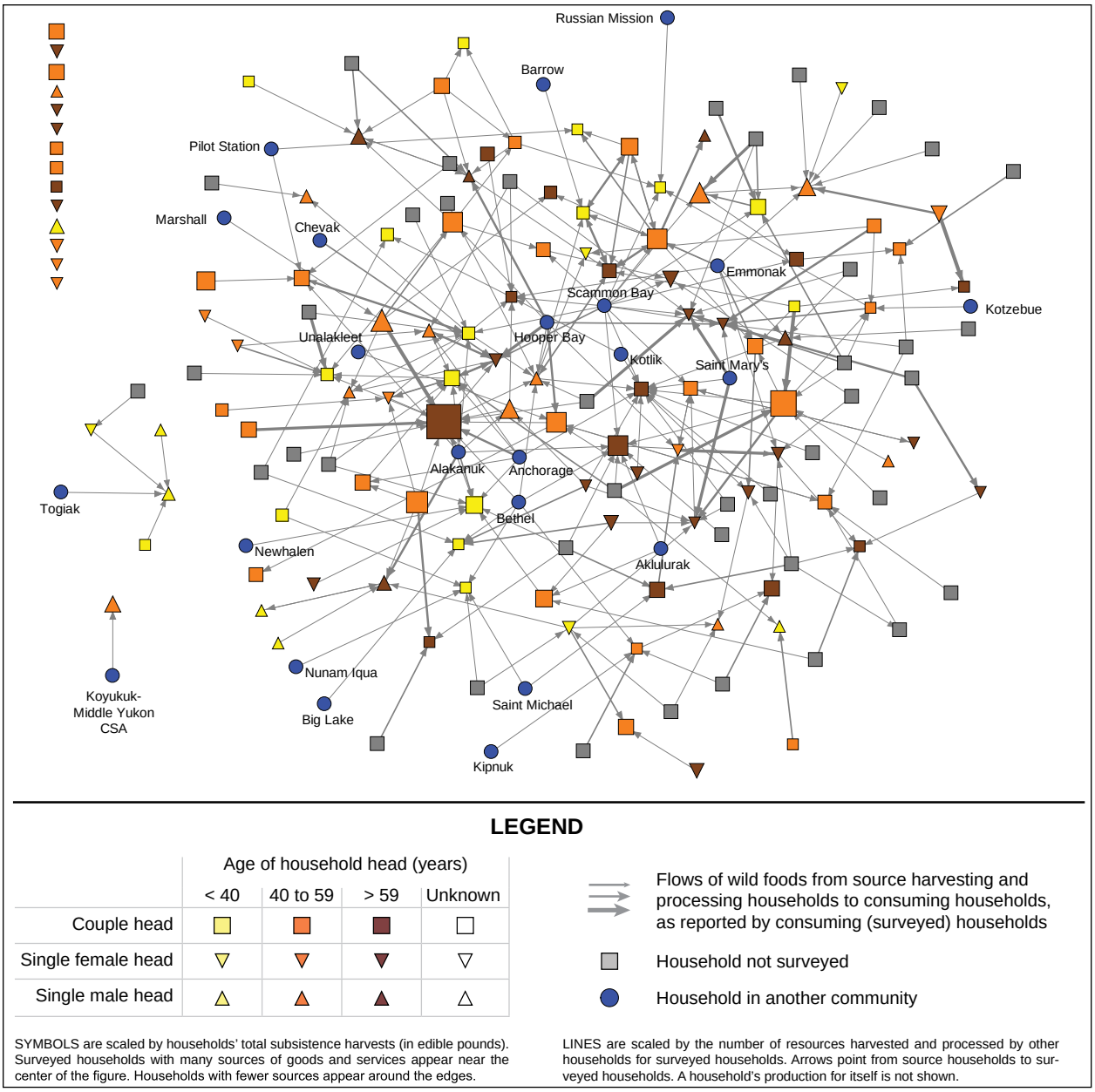


Figure 3-21.–Wild food harvesting and processing network, Mountain Village, 2010.

at the top left of the diagram that are not integrated into the food sharing network may reflect members of the community who have recently moved into the community: nearly all of these households had mature or elder heads, and it is likely that some had recently moved to Mountain Village for employment opportunities such as with the Lower Yukon School District, which is headquartered in Mountain Village.

Respondents reported at least 23 other communities as sources of wild foods, including nearly every community in the Wade Hampton Census Area (lower Yukon River and surrounding area) as well as more distant locations across the state. The central location of nearby communities including Alakanuk, Emmonak, Hooper Bay, Kotlik, Scammon Bay, and Unalakleet in the figure suggests a highly connected subregional wild food network. Similarly, the central location of the regional and statewide hub communities of Bethel and Anchorage within the figure is suggestive of these communities' importance to the distribution of wild foods to Mountain Village.

A few households (shown on the far left of the diagram) reported no instances of receiving subsistence foods and appeared to be isolated from the web of sharing and support that characterizes most subsistence economies. Some of them did harvest a considerable quantity of subsistence resources, and the fact that they did not receive subsistence resources does not exclude the possibility that these households may have shared wild food resources with unsurveyed households in Mountain Village or other communities.

Comparisons with Prior Results

This section discusses the results of the 2010 study in comparison to previously collected data. This baseline survey was the second comprehensive subsistence harvest study conducted in the community of Mountain Village; Wolfe (1981) conducted a baseline analysis of the economy and culture of the people of 6 Yukon River delta communities, including Mountain Village, over a 12-week period during the summer of 1981. Wolfe's baseline analysis serves as a point of comparison for the current ADF&G comprehensive survey. However, Wolfe's one-year sample of 17% of households, which the author described as biased toward active harvesting households (Wolfe 1981:21–22), should only be compared to the 2010 data with some caution. In addition to Wolfe (1981), ADF&G Division of Commercial Fisheries conducted salmon harvest surveys annually in Mountain Village from the mid-1970s through 2010. Weekley et al. (2011) described large land mammal subsistence harvests for 2009–2010 in 9 lower Yukon River communities including Mountain Village, and these data are also used for comparison to the 2010 data.

The population grew considerably since Wolfe's research in 1980: an estimated 785 individuals lived in Mountain Village in 2010, compared to 583 in 1980 (Table C1; Wolfe 1981). This growth may have increased pressure on resources harvested near Mountain Village for resources harvested at similar per capita rates in 2010 as in 1980. This population increase may have also resulted in a higher proportion of the population being composed of younger individuals, which can potentially affect subsistence harvest levels. Although detailed population composition information is not available for Mountain Village in 1980, the median age for the Wade Hampton Census Area that includes Mountain Village and surrounding areas is available from 1980 U.S. Census data (U.S. Census Bureau 1982). Assuming that Mountain Village's age composition reflected that of the greater Wade Hampton census area in 1980, there was a decrease from a median age of 20 years in 1980 to 15 years in 2010; an estimated 338 residents (43% of total population) were under 19 years old in 2010. Wolfe (1981:201) measured average edible pounds of food produced by hunters of differing age groups in nearby Alakanuk in 1980 and 1981 and showed that hunters under 19 years old harvested the lowest total pounds of food of any age group between 15 and 74 years. Thus, an increase in young residents since 1980 may have led to lower per capita harvest rates in 2010, and harvests may increase as younger generations mature.

Significant differences between the 1980 and 2010 studies include changes in the economic role of commercial fishing in Mountain Village and increases in fuel prices. In 1980, commercial fishing in communities in the lower Yukon River region "represented the largest and most consistent source of money … and comprised 45.8 percent of their annual monetary income, or $8,026 per household" (Wolfe 1981:92). Adjusted for inflation and for the consumer price index, this would be equivalent to around $21,239 in 2010.[9] By contrast, average commercial fishing income earned by an individual engaged in commercial salmon fishing in the lower Yukon River in 2008 totaled only $1,479 (Volk et al. 2009:24); no directed commercial fishing for Chinook salmon took place from 2008–2010 due to conservative management actions on the Yukon River, and commercial fishing had dramatically declined prior to these closures (Howard et al. 2009:3). The integration of the subsistence and commercial components of Mountain Village's economy was first described by Robert Wolfe in the early 1980s (Wolfe 1984). In 2010, much of the income from commercial sales of salmon was reinvested into expenditures such as boats, gas, nets, and guns used for subsistence activities like seal and whale hunting, moose hunting, and berry picking. In addition to the diminished role of commercially-caught salmon, increased fuel prices likely had a strong effect on subsistence in 2010 (ADCCED 2011).

9. U.S. Department of Labor, Bureau of Labor Statistics. n.d. "CPI Inflation Calculator." Accessed March 2, 2015. http://www.bls.gov/data/inflation_calculator.htm

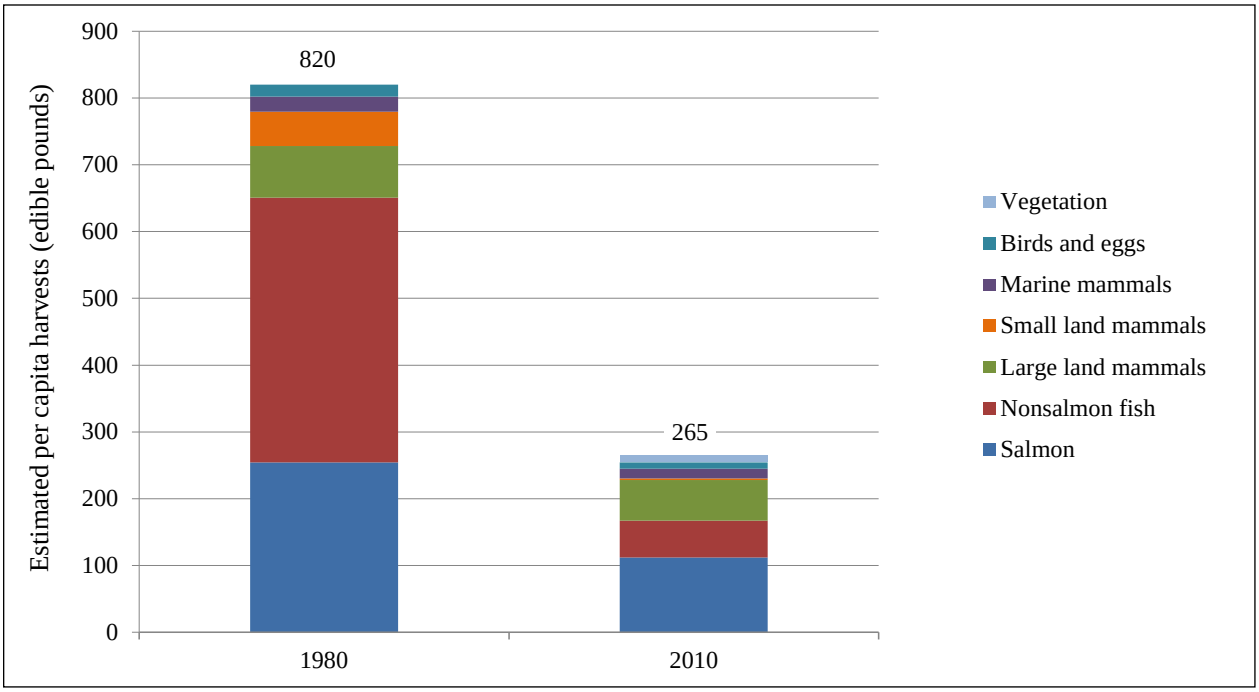


Figure 3-22.–Estimated per capita harvests in edible pounds, Mountain Village, 1980 and 2010.

Survey results indicated that the total harvest of subsistence resources by edible pounds in 2010 (207,765 lb) represented only 49% of that in 1980 (423,108 lb) (Table 3-2; Wolfe 1981). Accounting for the overall growth in population between 1980 and 2010, the per capita harvest of subsistence resources revealed a decrease from approximately 822 lb per person in 1980 to 265 lb per person in 2010 (Figure 3-22). As stated previously, this comparison must be viewed with caution due to the small size and biased nature of the sample in 1980. However, a number of factors likely influenced a decrease in subsistence harvests over the 3 decades since Wolfe's (1981) work. These included an increase in children and young adults as a percentage of the total population, increased availability (and decreased cost) of store-bought foods, changing food preferences, spiking fuel costs concurrent with decreased cash income from commercial fishing, and other social, environmental, cultural, and economic changes that have occurred since 1980. Decreased harvests of subsistence resources relative to the 1980 comprehensive survey, as well as other available data, are notable for several nonsalmon fish species, small land mammals, marine mammals, and individual salmon species.

Comparison of the 2010 estimated subsistence salmon harvest to previous harvest estimates allows greater understanding of the composition and quantity of such harvests over time and also illustrates the potential changes to harvest patterns through time. Mountain Village subsistence salmon harvest information is available for the year 1980 (Wolfe 1981), and annual subsistence salmon harvests for Mountain Village were documented from the 1970s through 2011 by ADF&G's postseason subsistence salmon harvest survey program (Jallen et al. 2012). For the purposes of this comparison, only the years from 1988, when the survey instrument was redesigned, and thereafter are used. Wolfe (1981) sampled 16 households in Mountain Village from June 1980 to May 1981 and estimated harvests of subsistence salmon species in edible pounds. In 1980, residents of Mountain Village harvested an estimated 2,322 Chinook salmon, 17,382 chum salmon (both summer and fall chum), and 1,932 coho salmon. For the years 1988–2011, the annual subsistence salmon harvest estimates by species for Mountain Village from ADF&G's postseason surveys showed relatively stable levels of total Chinook and summer chum salmon harvests, with averages of 1,828 Chinook salmon (5-year averages ranged from 1,391 to 1,952 individual salmon for 1988–1992 and 1998–2002, respectively) and 8,898 summer chum salmon (5-year averages ranged from 9,535 to 7,797 for 1988–1992 and 2008–2011, respectively) (Figure 3-23). Although these harvests of individual salmon

appeared relatively stable, the population increase from 674 Mountain Village residents in 1990 to 785 in 2010 suggested that these species were harvested at somewhat lower rates (fish per capita) in recent years. Subsistence salmon harvest estimates of 2,199 Chinook salmon and 9,322 summer chum salmon from the 2010 comprehensive survey showed a harvest that was slightly higher than the average, but within the range of the past 24 years, and less than but similar to estimates from the comprehensive subsistence survey in 1980 for Chinook salmon (Wolfe 1981).

In the 1981 study (Wolfe 1981), harvest values for summer chum, fall chum, and coho salmon were combined and reported as one resource, disallowing any direct comparison by species to the 2010 data. However, ADF&G post-season salmon harvest surveys distinguished between summer chum salmon and fall chum salmon, which allows for comparison to the 2010 survey. Data from ADF&G's postseason salmon harvest estimates since 1988 indicated that Mountain Village residents' harvests of fall chum salmon and coho salmon decreased over the past 2 decades both in terms of total individual salmon harvests and per capita harvests, although these salmon species normally formed a minor contribution to the total salmon harvest relative to Chinook salmon and summer chum salmon. The average harvest of fall chum salmon decreased from 2,122 salmon in the years 1988–1992 to 696 salmon for the years 2008–2011, and coho salmon harvests decreased overall from an average of 1,654 salmon for the years 1988–1992 to 330 salmon for the years 2008–2011. However, 2010 data from this study included higher estimated numbers of both fall chum salmon and coho salmon than those developed by ADF&G postseason salmon surveys in years recent to 2010, with estimated harvests of 1,515 fall chum salmon and 1,135 coho salmon. Although this discrepancy may be the result of different household sampling strategies, it may also reflect that postseason salmon harvest surveys took place in early September before coho salmon and fall chum fishing had definitively ended, whereas the 2010 comprehensive survey was conducted in early 2011.

Fishers harvested less nonsalmon fish in 2010 than in 1980: an estimated 204,672 edible pounds of nonsalmon fish were harvested in 1980 compared to 43,417 lb in 2010 (Table 3-2; Wolfe 1981). Reduced overall harvests combined with the higher community population in 2010 relative to 1980 resulted in a reduction in per capita harvest of nonsalmon fish species from 351 lb per capita to 55 lb per capita (Figure 3-22). All species other than burbot showed a reduced total harvest of individual fish. Residents harvested an estimated 20,010 broad whitefish in 1980, but the 2010 harvest was 2,575; a similar pattern can be seen for northern pike (15,636 in 1980 and 2,176 in 2010), sheefish (6,900 in 1980 and 1,307 in 2010), unspecified cisco (4,866 Bering or least cisco in 1980; 974 Bering cisco and 425 least cisco in 2010), Alaska blackfish (33,282 lb in 1980 and 8,752 lb in 2010), and unspecified lamprey (reported as "eel" in 1980) (5,970 in 1980 and 2,144 in 2010). Fishers harvested similar amounts of burbot in 1980 and 2010, with estimated harvests of 1,884 in 1980 and 1,892 in 2010. However, such similar overall harvests indicate a reduced per capita harvest of burbot due to Mountain Village's substantial population increase since 1980. Although the 2010 data cannot be viewed as proof of a long-term decline in nonsalmon fish harvests, such a decline could be related to reduced need for nonsalmon fish due to fewer dog teams (Andersen and Scott 2010:46), reductions in associated subsistence activities such as trapping (Seavoy 2001:241), reduced ability to access harvest locations due to economic or environmental concerns (MV05191102), changes in food preference, or potentially a decline in certain nonsalmon fish populations. Wolfe (1981) mapped locations of important nonsalmon fish harvest locations for Mountain Village and surrounding communities: in 2010, nearly all of these harvest locations were still being utilized, in addition to several areas not documented in the 1980 study (see "Harvest Areas" above).

Differences in land mammal harvests between 1980 and 2010 can be characterized by reductions in small land mammal hunting and trapping and an increase in moose harvests. With the possible exception of lynx, which were not included in the 1980 survey, data for all small land mammals showed a decreased harvest in 2010 relative to 1980 (Table 3-3; Wolfe 1981). In particular, muskrat harvests showed a drastic decline from an estimated 21,798 muskrat harvested in 1980 to only 6 in 2010. These changes probably reflect a muskrat population decline in the Mountain Village area (MV05191102) as well as reductions in trapping throughout the region due to low fur prices (Seavoy 2001:241). Similar but less extreme declines in small mammal harvests included harvest estimates for snowshoe hares (2,742 in 1980 and 264 in 2010), beavers (168 in 1980 and 96 in 2010), mink (210 in 1980 and 3 in 2010), red foxes (432 in 1980 and 0 in 2010), and

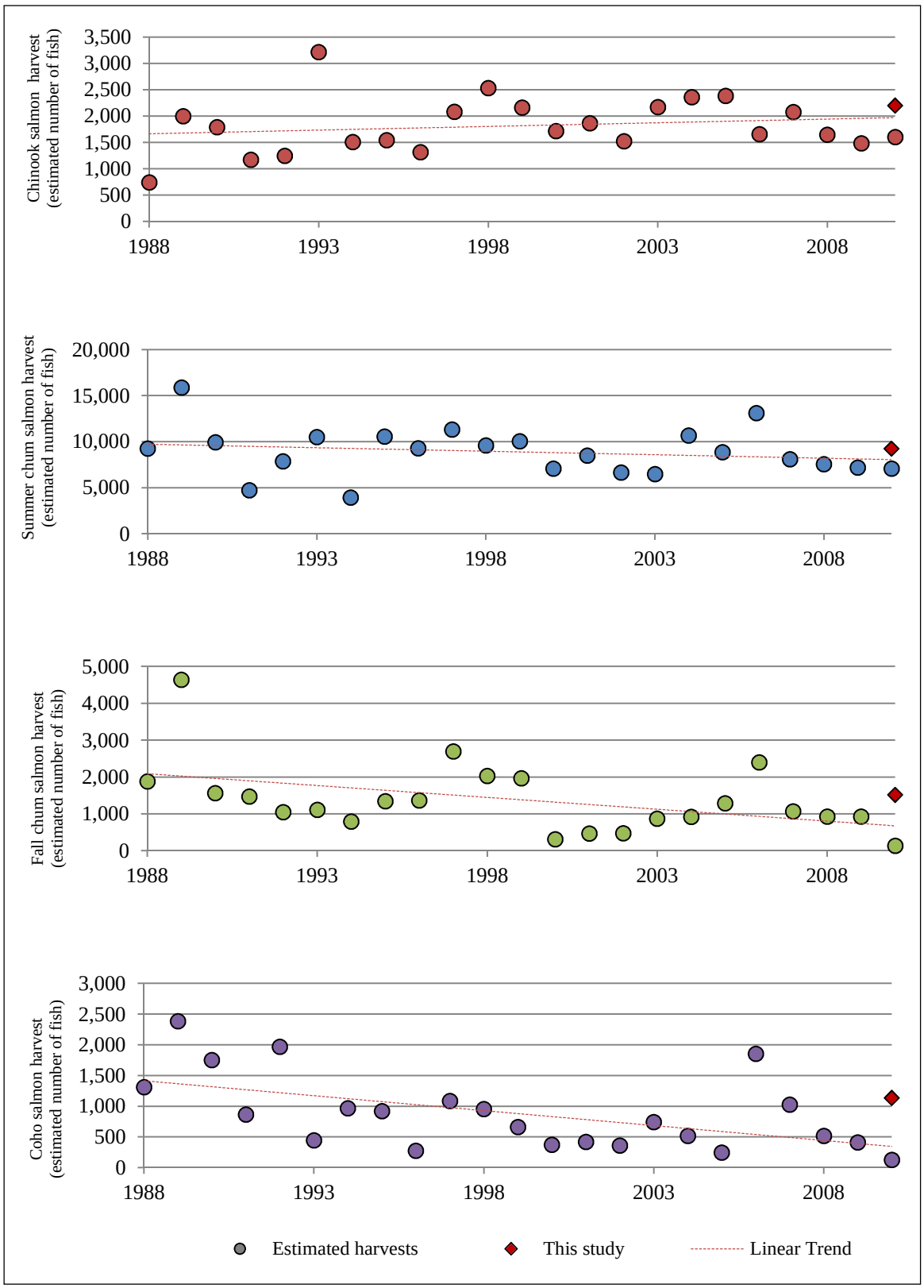


Figure 3-23.–Estimated salmon harvests in numbers of fish, Mountain Village, 1988–2010.

river (land) otters (126 in 1980 and 11 in 2010). During the Mountain Village community review of this study's data, several community members described that interest in trapping had recently been increasing, and harvest numbers and areas would likely expand for small land mammals relative to the 2010 data.

Mountain Village hunters harvested an estimated 88 moose in 2010, a modest increase relative to the 54 harvested in 1980. However, due to the population increase in Mountain Village since 1980, the per capita harvest of moose declined from 66 lb per person in 1980 to 61 lb per person in 2010 (Table 3-3; Wolfe 1981). Moose search and harvest areas were not mapped in 1980, and therefore cannot be compared to the 2010 data. A large land mammal harvest survey was also completed in lower Yukon River communities including Mountain Village in 2009, and these data provide additional comparison for the 2010 data (Table 3-3; Weekley et al. 2011). In 2009, Mountain Village harvested an estimated 110 moose, which was somewhat similar to this study's estimated 2010 harvest of 88 moose. Due to low moose numbers in the lower Yukon River area downriver from Mountain Village, ADF&G and USFWS instituted a moose hunting moratorium in this area between 1988 and 1994. The state moratorium was lifted in 1995, and federal lands were reopened for moose hunting in 2009 (Weekley et al. 2011). Since then, moose have been abundant in the lower Yukon River region near Mountain Village. Relative to 1980, community residents in 2010 had higher moose harvest rates and were able to hunt in areas closer to Mountain Village. In the past, hunters had to travel long distances up the Andreafsky River, Atchuelinguk River, or mainstem Yukon River to access moose. An estimated 6 black bears were harvested in Mountain Village in 1980, but no black bears were harvested in 2010 and only 1% of households reported attempting to harvest black bears in 2010 (Table 3-3; Wolfe 1981). Weekley et al. (2011) estimated that Mountain Village residents harvested 9 caribou and 2 black bears in 2009. According to key respondents, caribou have not been near Mountain Village for more than 10 years (MV05191101), thus it is likely that caribou hunting took place in relatively distant locations.

Mountain Village residents harvested a similar amount of marine mammals in 2010 (an estimated 11,408 lb) as in 1980 (11,742 lb), although the composition of the harvest shifted from being composed entirely of seals in 1980 to both beluga whales and seals in 2010 (Table 3-3; Wolfe 1981). An estimated 6 beluga whales were harvested in 2010, providing an estimated total of 6,296 edible pounds. No beluga whales were reportedly harvested in 1980. The 2010 harvest of seals was lower for all species than in 1980, with 48 bearded seals in 1980 and 25 in 2010, 78 spotted seals in 1980 and 17 in 2010, and 12 ringed seals in 1980 and 9 in 2010. This decreased harvest between only 2 years of data does not necessarily reflect long-term patterns. However, high fuel costs in recent years, particularly in western Alaska (ADCCED 2011) would surely have an impact on Mountain Village residents' ability to access the marine environment of the Bering Sea where seals are often hunted. Seals are also hunted in the mainstem Yukon River near Mountain Village.

Mountain Village residents harvested fewer birds and eggs by estimated total edible weight in 2010 (7,519 lb) than in 1980 (9,402 lb) (Table 3-5; Wolfe 1981). In 1980, harvest data were not collected on individual duck or goose species, thus changes in species composition of duck and goose harvests cannot be assessed. However, harvests of ducks and geese as broad categories between 1980 and 2010 can be compared. Respondents harvested fewer ducks in 2010 than in 1980, with an estimated 987 in 2010 and 1,164 ducks in 1980 (Table 3-4; Wolfe 1981). Harvests of geese were substantially higher in 2010 (1,526 individual geese) than in 1980 (582 geese). Hunters harvested similar quantities of tundra swans (138 swans in 1980 and 149 in 2010) and sandhill cranes (66 cranes in 1980 and 60 in 2010) in the 2 study years. More ptarmigan were harvested in 1980 (2,706 ptarmigan) than in 2010 (1,671).

Mountain Village was also surveyed as part of the Alaska Migratory Bird Co-Management Council's migratory bird subsistence survey in 2005 (Naves 2010). Harvest estimates from this survey are not reported by community, but rather as total harvests for various regions and subregions throughout Alaska. Mountain Village is included in the lower Yukon subregion, together with the nearby communities of Saint Marys, Pilot Station, Marshall, and Pitkas Point. Although Mountain Village harvest data from this study cannot be directly compared with harvest estimates from such an aggregate of communities, a similar pattern of migratory bird hunting that emphasizes ducks, geese, and swans exists in both data sets. Harvest estimates

for sandhill cranes and ptarmigan from the 2005 migratory bird harvest surveys reveal lower harvests for all 5 communities combined in the lower Yukon subregion (28 sandhill cranes and 129 ptarmigan) than are seen for Mountain Village alone in 2010 (60 sandhill cranes and 1,671 ptarmigan) (Table 3-4; Naves 2010). The 2005 migratory bird harvest survey harvest estimates for sandhill cranes and ptarmigan probably reflect an unusual year, because these harvests are quite low relative to comprehensive survey harvest estimates from both 1980 and 2010, as well as to migratory bird harvest survey harvest estimates for other years in the lower Yukon subregion when Mountain Village was not surveyed but other communities were. The estimated harvest of wild bird eggs was 584 in 2010, consisting of duck, goose, swan, crane, gull, and ptarmigan eggs, which is similar to the 2005 total lower Yukon subregion harvest estimates from the migratory bird harvest survey's harvest estimate of 652 eggs (Table 3-5; Naves 2010). This may indicate that Mountain Village harvested more eggs in 2010 than in 2005. No quantitative information was collected on eggs in 1980.

No quantitative information was collected on vegetation or marine invertebrate harvests in Mountain Village in 1980 or in any other year. The only information comparing the 2010 harvests comes from surveyed households' self-assessments of whether they got less, the same amount, or more of these resources than in recent years (see "Harvest Assessments" above).

Harvests and uses of subsistence resources in Mountain Village have evolved over time. Increased abundance of moose in recent years has led to this once locally scarce resource providing more food than any other species. Reductions in commercial fishing opportunities and associated income, together with increases in fuel prices, have made it difficult for many residents to pursue certain subsistence activities. Low numbers of Chinook salmon can require more effort and creativity in harvesting to fulfill a household's needs. However, subsistence clearly remains a central component of the community. One key respondent emphasized the value of subsistence to the community by describing people risking their lives for subsistence:

> Once in a while you hear of people drowning: that's how strong subsistence is…you have to get that food. People on the Yukon have drowned and gone through the ice trying to get what they eat…That's subsistence, it's so strong. You've got to have that. (MV05191102)

Although this study documents levels and patterns of subsistence harvests and uses in Mountain Village, the author of this chapter acknowledges that subsistence in this community involves aspects that cannot be adequately captured in this report.

4. COMPREHENSIVE SURVEY RESULTS MARSHALL, 2010

Prepared by Hiroko Ikuta and Elizabeth H. Mikow

In the spring of 2011, researchers surveyed 46 of 85 households (54%) in Marshall (Table C1-1). Expanding for 39 unsurveyed households, Marshall's estimated total harvest of wild foods between January and December in 2010 was 134,427 lb (±21%) (Table 4-1). The average estimated harvest per household was 1,582 lb, with an average per capita harvest of 393 lb.

During the study year, Marshall residents harvested an average of 14 different species of fish, wildlife, and plants, although some households reported harvesting no resources and others as many as 41 resources. Three of the top 10 harvested resources—Chinook salmon, moose, and summer chum salmon—composed just over one-half (56%) of the total pounds of edible wild foods harvested by community residents (Figure 4-1). Chinook salmon contributed 23% (31,186 lb) to the total subsistence harvest, followed by moose at 17% (22,950 lb), and summer chum salmon at 16% (21,014 lb). This chapter summarizes findings from the household surveys, including demographic characteristics, responses to harvest assessment questions, harvest estimates, search and harvest areas, reported employment and income, and responses to food security questions. Harvest numbers are expanded estimates. Additional tables appear in Appendix C. Results from this survey are available online in the Division of Subsistence Community Subsistence Information System (CSIS).

Community Background

Marshall is located on the north bank of the lower Yukon River, approximately 56 miles upriver from Emmonak. It is home to Central Yup'ik people, who identify themselves as *Massercullermiut*, "people of *Masserculleq*." In the Yup'ik language, the current Marshall area is called *Masserculleq*, which means "the place where salmon spawn," or *Urluvra*, "little bow" (S. Jacobson, Professor Emeritus, University

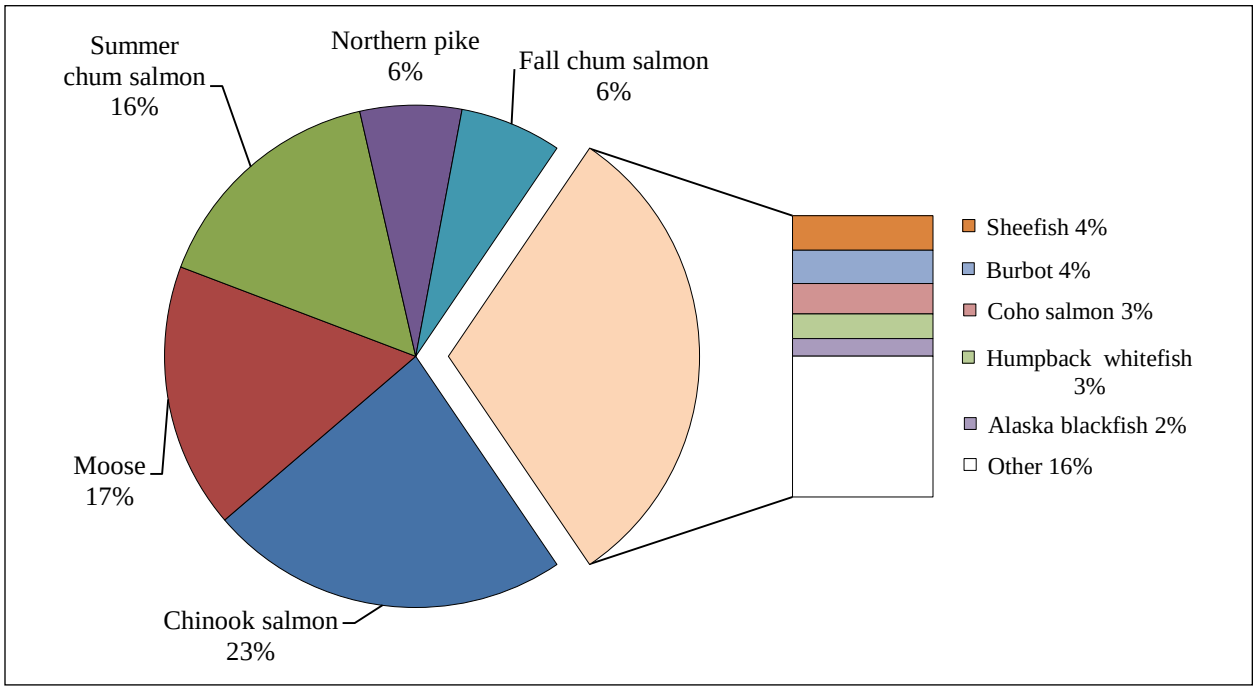


Figure 4-1.–Top 10 species harvested, ranked by estimated edible weight, Marshall, 2010.

Table 4-1.–Resource harvest and use characteristics, Marshall, 2010.

Characteristic	
Mean number of resources used per household	
Minimum	0
Maximum	56
95% confidence limit (±)	11.6%
Mean	21
Median	20
Mean number of resources attempted to harvest per household	
Minimum	0
Maximum	43
95% confidence limit (±)	14.8%
Mean	15
Median	14
Mean number of resources harvested per household	
Minimum	0
Maximum	41
95% confidence limit (±)	15.0%
Mean	14
Median	13
Mean number of resources received per household	
Minimum	0
Maximum	52
95% confidence limit (±)	20.8%
Mean	10
Median	7
Mean number of resources given away per household	
Minimum	0
Maximum	35
95% confidence limit (±)	21.5%
Mean	8
Median	5
Household harvest (lb)	
Minimum	0.0
Maximum	8,805.1
Mean	1,581.5
Median	1,356.2
Total harvest weight (lb)	134,426.5
Community per capita harvest (lb)	393.2
Percentage using any resource	96%
Percentage attempting to harvest any resource	91%
Percentage harvesting any resource	91%
Percentage receiving any resource	91%
Percentage giving away any resource	80%
Number of households in sample	46
Number of resources available	130

Source ADF&G Division of Subsistence household surveys, 2011.

of Alaska Fairbanks Alaska Native Language Center, Fairbanks, July 2011, personal communication). In November 1880, ethnologist E.W. Nelson visited *Urluvra* and documented a local festival for the deceased (Nelson 1983rev.:20). During the expedition, Nelson collected ethnographic data and material culture of indigenous peoples in the Yukon–Kuskokwim Delta for the Smithsonian Institution.

Whether local Yupiit were permanently living in the current Marshall area in the early 20th century is unknown. Historical records suggest that the community was founded by Euro-Americans as a mining camp[1] (Marshal High School journalism class 1984; Orth 1971rep.; S. Jacobson, Professor Emeritus, University of Alaska Fairbanks Alaska Native Language Center, Fairbanks, July 2011, personal communication). In 1913, E. L. Mack and Joe Mills discovered gold on Wilson Creek, which is approximately 7.5 miles northeast of the current community of Marshall. A mining camp was set up in a suitable location for a boat landing on a channel of the Yukon River. This camp developed into a community and was named Marshall after Thomas Riley Marshall, the Vice President of the United States during the period. In 1915, when a post office was first established in the community, government officials informed residents that communities with the name "Marshall" already existed in the contiguous United States, and they asked the new Alaska village to change its name. Following this communication, the local people named the post office, and thus the community, "Fortuna Ledge" after Fortuna Hunter, who was the first child born in the community. In the following decades, gold was discovered in additional creeks in the area. Fortuna Ledge was developed as a gold mining town where steamboats landed during the summer. The population exceeded 1,000 in the early 20th century.[2]

Although the community of Marshall was officially founded by gold miners, indigenous peoples in the region also heavily participated in its development. Ancestors of many current residents in Marshall migrated from two nearby Yup'ik communities: *Urr'armiut*, which was located 25 miles upriver from Marshall, and *Takcak*, 5 miles downriver (S. Jacobson, Professor Emeritus, University of Alaska Fairbanks Alaska Native Language Center, Fairbanks, July 2011, personal communication). By the 1940s, residents from both communities permanently relocated to Marshall in response to territorial laws mandating children's school education. Meanwhile, some Iñupiat migrated to Marshall from Unalakleet on Norton Sound. By the early 1950s, the amount of gold production declined when most of the mines in the region closed. As a result the settler population of Marshall dropped. In 1984, Fortuna Ledge was renamed Marshall. Plate 4-1 shows a view of the present-day community.

In 2010, people in Marshall relied heavily on subsistence production and commercial fisheries for salmon. The local economy in lower Yukon communities, including Marshall, was characterized by high production of wild food, especially salmon, and low cash income, or a "mixed, subsistence-based socioeconomic system" (Wolfe 1984:177). People in Marshall witnessed a significant shift in the salmon runs in the early 2000s. Until the mid-1990s, salmon were a stable economic resource for both subsistence and cash income, and many respondents recalled this time of abundance. Marshall is located in District Y-2 of the state management area, where the quality of salmon is highly valued by national and international markets; in 1992, for example, the estimated commercial value of Chinook salmon was $4.12 per pound in the lower Yukon River and $0.91 per pound in the upper river (Holder and Senecal-Albrecht 1998:49, 51).

In the decade preceeding the study year, the depressed salmon runs, specifically those of Chinook salmon, caused substantial changes in the subsistence and commercial fisheries of Yukon River communities. For the 10-year period beginning in 1989 and extending through 1998, the average subsistence and commercial harvests combined was 156,092 fish; that average dropped to 87,777 fish between 2003 and 2009, after 4 extremely low return years between 1998 and 2003 (Howard et al. 2009:44). In 2009, when the U.S. Secretary of Commerce declared a disaster in response to years of poor Yukon Chinook salmon returns, the total commercial harvest was 316 Chinook, all caught in the lower Yukon. This harvest stands in stark

1. Rinear, Jeanne Ostnes and E.O. Vistaunet. 1999. "Marshall, Fortuna Ledge and the Mining of Willow Creek." Accessed November 21, 2014. http://www.explorenorth.com/alaska/history/marshall-history.html

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 May 4, 2015. http://commerce.state.alaska.us/cra/DCRAExternal/community

Danielle Ringer, ADF&G

Plate 4-1.–View of Marshall, spring 2011.

contrast to the 69,562 Chinook salmon taken commercially in 1999, only a decade prior (Eggers et al. 2010:22; Moncrieff et al. 2009:77).

The Yukon Chinook salmon disaster severely impacted many households in several Yukon communities, and Marshall was not an exception. The average income for lower Yukon area fishers from commercial fishing in 2009 was $1,425 (Eggers et al. 2010:23). In comparison, the annual average gross income per fishing permit from 1977 to 1995 was $9,600 (Holder and Senecal-Albrecht 1998:48). Commercial fishing income was not the only factor affected by poor salmon runs during the decade prior to the study year: subsistence harvest levels were impacted, as well. For example, in 2010, Marshall households reported harvesting 1,201 Chinook salmon for subsistence use; this stands in stark contrast to the 2,780 Chinook salmon harvested for subsistence in 1999 (Borba and Hamner 1998; Busher et al. 2009).

Seasonal Round

Although little information has been published regarding contemporary subsistence activities in Marshall, a broad overview of the seasonal round of these activities can be gleaned through an examination of historical sources of information about the community as well as contemporary information from nearby communities. In order to gain a better understanding of the seasonal round, 2 sources were consulted. Robert Wolfe (1981) discussed both the economy and culture of 6 communities on or in proximity to the Yukon River delta and dealt with both historical and contemporary information at the time of his study. Mary Pete (1991) studied subsistence uses of fish and wildlife of residents of Russian Mission, a community that is only 25 miles southwest of Marshall. Because little modern information exists for Marshall, combining literature for nearby communities and historical information about Marshall will allow for a more comprehensive understanding of the seasonal round of the community.

In 2010, as in the 1980s and 1990s, the seasonal round of subsistence activities of lower Yukon communities, which include Mountain Village, Pitkas Point, St. Marys, Pilot Station, Marshall, and Russian Mission, began in the middle of April with the arrival of migratory birds (Wolfe 1981:39). As spring progressed and the river ice began to break up, residents of the region prepared summer fish camps as they fished for migrating sheefish. This fishing had the added benefit of allowing fishers to monitor the development of the Chinook (king) salmon run, since setnets for sheefish and those for salmon were placed in essentially the

same eddies (Pete 1991:34). Broad whitefish were also caught in the spring, and burbot were occasionally caught in the setnets used to harvest both sheefish and other whitefishes (Wolfe 1981:73). Sheefish caught in spring were either eaten fresh, or smoked, dried, and stored for later consumption (Pete 1991:93) (Plate 4-2).

Summer months found residents of the lower Yukon region at fish camps for the intensive harvest of salmon species, which composed the largest single source of subsistence foods for a majority of households. Chinook salmon generally arrived in the early part of June and were followed by successive runs of chum salmon, pink salmon, and coho salmon (Wolfe 1981:66). Fishing for Chinook salmon and summer chum salmon occurred early in the season, during the best weather conditions for drying harvested fish (Pete 1991:35). Salmon were generally air dried on fish racks prior to being slowly cured in smokehouses. Fishers utilized both setnets and driftnets for harvesting salmon species (Wolfe 1981:41). Until the early 1960s, some residents of Marshall and Russian Mission also used fish wheels (Pete 1991:36). Pink salmon generally entered the Yukon River beginning in mid- to late June, but were less important for local subsistence use than coho salmon and fall chum salmon due to relatively low abundance. Coho salmon and fall chum salmon entered the river later in the summer months and were caught until late September (Pete 1991:29).

As the summer progressed into early fall, residents of this region also harvested salmonberries, blueberries, and lowbush cranberries. These berry harvests began in early August and continued through the month of September. Hunting for migratory birds, such as ducks, geese, cranes, and swans, began in August and persisted as late as October for some species (Wolfe 1981:68–69). In the fall, fishing for sheefish with setnets continued, and the fish harvested were primarily eaten fresh (Pete 1991:91). Moose hunting was one of the primary subsistence activities taking place in the fall, and September found residents of the lower Yukon region searching for moose along rivers and in valleys in the region near Pilot Station, Russian Mission, and Paimiut (Wolfe 1981:71). Moose hunting also occurred in the late fall and into the winter months, from late November through early January and into the month of February (Pete 1991: 69).

In the late fall and early winter, intensive fishing activities took place just prior to and immediately following the freeze-up of the Yukon River. Freeze-up generally occurred in late October and early November, during runs of broad whitefish, Bering cisco, and sheefish (Wolfe 1981:71). These species were harvested by setnets under the ice, which also caught burbot. Arctic lamprey, locally known as "eels," were also harvested around this time as they migrated up the Yukon River. Fishers caught Arctic lamprey with dip nets or with homemade "rakes" consisting of long poles with protruding nails or other sharp objects attached to them (chicken wire or old saw blades); the rakes were swept through holes in the ice in order to allow the eels

Danielle Ringer, ADF&G

Plate 4-2.–Subsistence activities such as spring fishing for nonsalmon species and bird hunting are facilitated by the use of boats after breakup.

to wrap themselves around the nails. Residents harvested burbot between freeze-up and late February by jigging through the ice, a method also used to harvest northern pike, whitefishes, and sheefish (Pete 1991). Fishers also placed traps for Alaska blackfish under the ice of lakes and creeks just before and immediately after freeze-up, and they might reset the traps in different locations throughout the fall, winter, and spring months (Wolfe 1981:74).

In addition to some moose hunting effort in January and February, residents of the lower Yukon region hunted for small game, such as hares, in the winter months (Wolfe 1981:77). Hunting for both willow and rock ptarmigan also occurred during this timeframe; the most productive hunts fell in late winter as the days grew longer. Hunting and trapping for furbearers, such as beavers, river (land) otters, lynx, marten, muskrats, red foxes, gray wolves, and wolverines, also took place during the winter months. These efforts generally began in mid- to late November and continued through late April or early May depending upon travel conditions (Pete 1991:103). Wood gathering efforts occurred throughout the year (Pete 1991:121).

Demographics

This survey was completed by 46 households, which had a cumulative population of 185 people (Table C1-2). There were on average 4 individuals per household. The largest surveyed household consisted of 11 people. The mean age in Marshall was 29 years, and the oldest resident represented in the survey population was 81 years of age.

Expanding for the 39 unsurveyed households, the estimated population of Marshall at the time of this study was 342 individuals. Figure 4-2 illustrates population data from 1960 through 2010, drawn from both U.S. Census data and statistics provided by the Alaska Department of Labor. The yearly estimates provided by the Alaska Department of Labor are based on U.S. decennial population data in combination with adjusted Alaska Permanent Fund dividend application data, available for the years 2000–2010. Overall, the community has experienced a gradual increase in population over the years, peaking with a population of 414 in 2010[3]. The U.S. Census estimate differs from this study's estimated 2010 population of 342. A number of factors may contribute to this variance in estimates, including methodological differences, season of survey, definitions of residency, and sampling differences.

Figure 4-3 portrays Marshall's population profile, which was characterized by a large 0–24 age component. The population as a whole was fairly evenly distributed between both sexes: 54% of Marshall residents were male, and 46% were female. The average length of residency was 19 years, giving Marshall the second-longest average length of residency among the 5 Yukon River communities surveyed for this project (Table C1-2). An estimated 99% of residents were Alaska Native, the highest percentage among the study communities. Marshall also had the largest percentage of residents (76%) born in the community of all 5 study communities (Table C1-3).

Wild Food Harvests and Uses

The primary purpose of this household survey was to collect information about the harvest and use of wild resources in the community of Marshall. Respondents were asked whether their households used or tried to harvest each resource during the study year. If they attempted to harvest particular resources, they were asked how much they harvested as well as further details of their effort, such as gear type used, sex of the animal, or month of harvest.

Tables and figures in this section summarize responses to the harvest questions, expanded to all residents. The term "harvest" refers to resources actually harvested by any member of the surveyed household. The term "use" refers to all resources harvested or given away to others, or resources received from others following a harvest through gifting, trading, hunting partnerships, or sharing. An appreciation of sharing patterns as an integral part of Yup'ik culture is paramount to understanding the difference between use and harvest practices. Sharing along kinship and other social lines allows access to wild foods for households

3. U.S. Census Bureau. 2010. 2010 Census Interactive Population Search: Marshall city. Accessed December 1, 2014. http://www.census.gov/2010census/popmap/ipmtext.php?fl=02

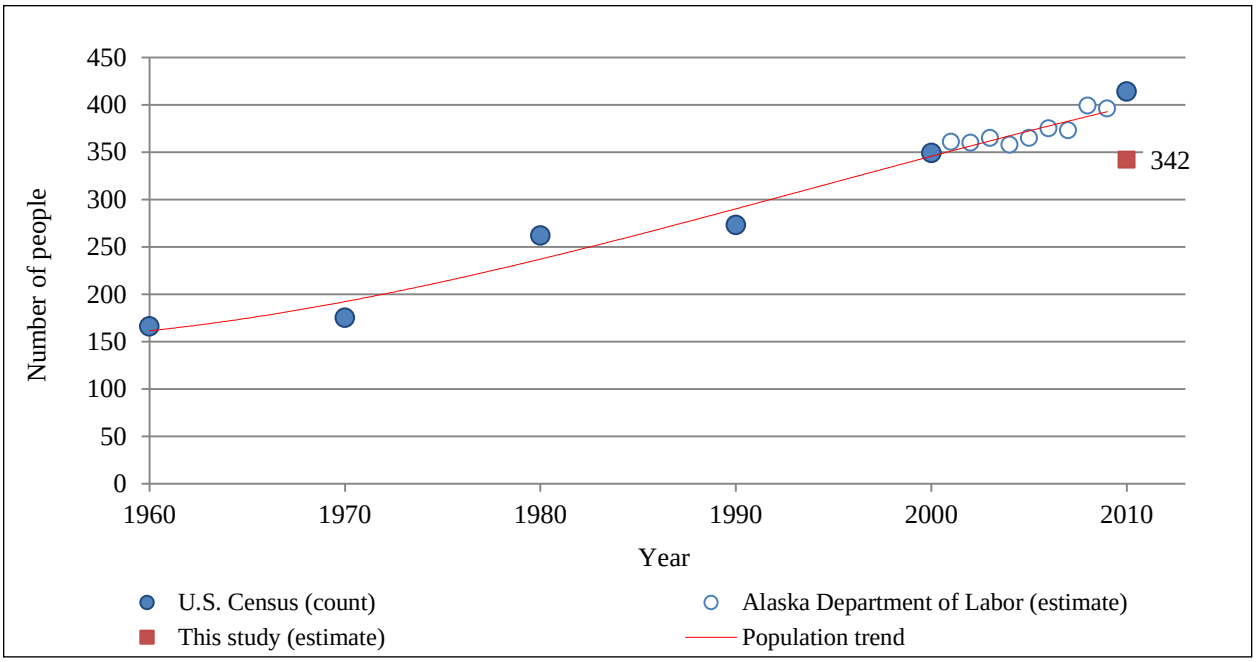


Figure 4-2.–Population history, Marshall, 1960–2010.

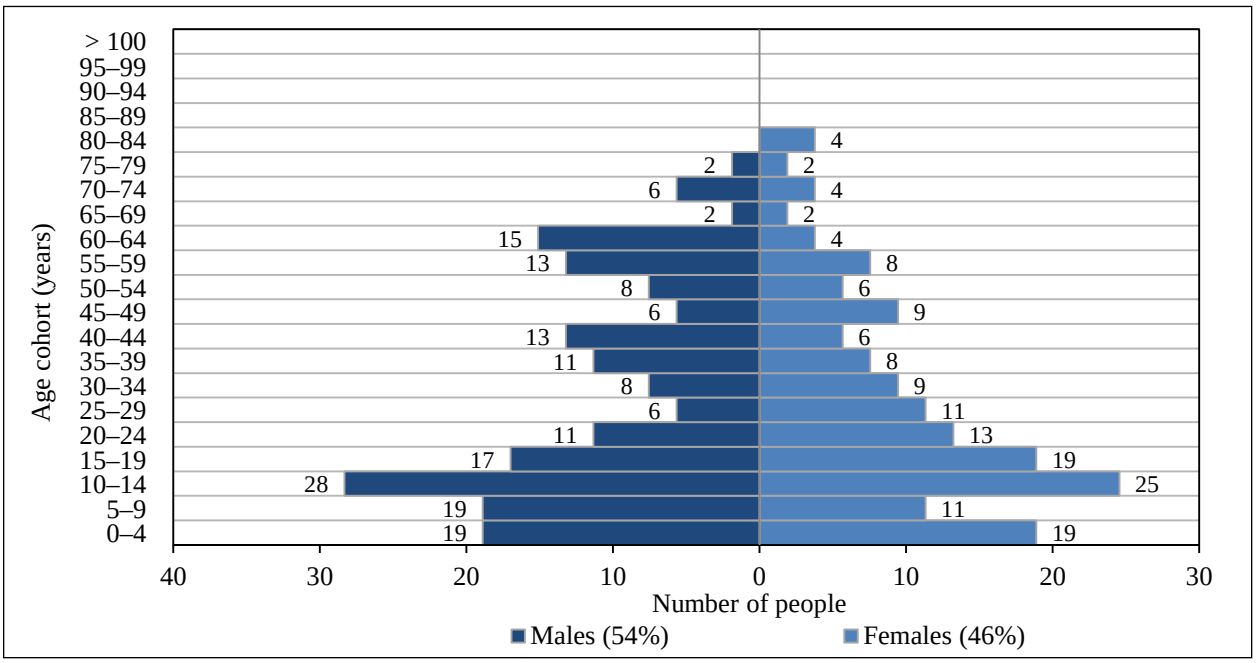


Figure 4-3.–Population profile, Marshall, 2010.

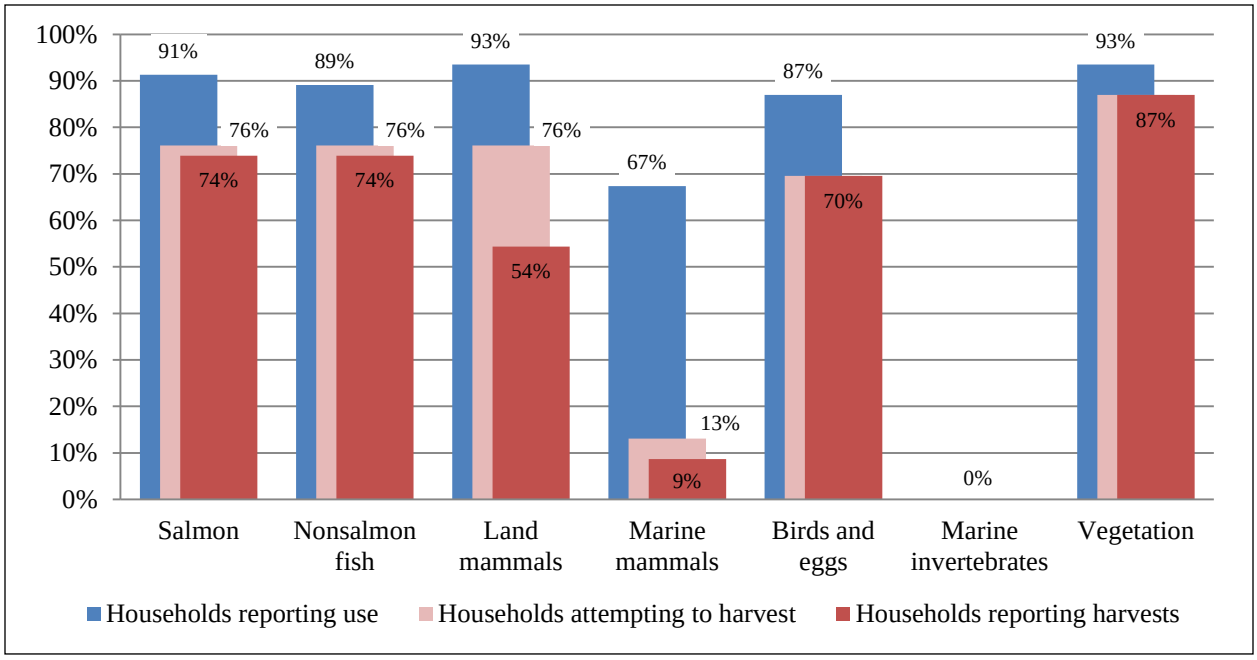


Figure 4-4.–Percentages of households using, attempting to harvest, or harvesting subsistence resources, by category, Marshall, 2010.

that lack the resources to harvest these foods themselves (Charnley 1984). Because of these sharing patterns, the percentage of households using resources is consistently higher than those harvesting resources. In 2010, 91% of households reported receiving subsistence resources, and 80% reported giving resources away (Table 4-1). These sharing networks for wild foods will be discussed later in the chapter.

Expanding for unsurveyed households, 96% of households in Marshall used at least 1 resource, and 91% reported that a member had harvested wild foods during the study year. Figure 4-4 shows that the most widely used resources were land mammals and vegetation: 93% of households reported use of both resource categories. Only 54% reported harvesting at least 1 land mammal, but 87% reported harvesting at least one type of vegetation. Use of salmon species was reported by 91% of households, and 89% of households in Marshall reported using nonsalmon fish; 74% reported successful harvests in each of these resource categories. Use of birds and eggs was reported by 87% of households, with 70% reporting harvests. Marine mammals were used by 67% of households, although only 9% reported harvests. Marshall's location on the lower Yukon River meant that marine mammals were not readily available for harvest, so a majority of these resources were likely obtained through trade, barter, or sharing with coastal communities. No households reported use or harvest of marine invertebrates in 2010. Table D4-1 reports the number of people and the percentage of the population who participated in the harvesting and processing of wild foods.

Figure 4-5 summarizes harvests by resource category in terms of estimated edible pounds harvested. Salmon contributed 66,426 lb to the community's total harvest of wild resources in 2010 followed closely by nonsalmon fish species at 31,901 lb. Land mammal harvests contributed the third-largest amount of edible pounds to the community at 26,578 lb. A portion of both salmon and nonsalmon fish harvests were fed to dogs in Marshall in 2010. Nonsalmon fish species fed to dogs were sheefish (1,996 lb), humpback whitefish (638 lb), broad whitefish (582 lb), northern pike (391 lb), and Arctic lamprey (120 lb) (Table D4-2). Only one species of salmon (pink salmon) was reportedly fed to dogs, contributing an estimated 216 lb.

Tables 4-2 to 4-7 portray harvest and use of individual resources. As indicated in Figure 4-1, the top 10 resources by edible weight composed 84% of the total harvest in Marshall. Chinook salmon (31,186 lb) and moose (22,950 lb) accounted for 40% of the total harvest in 2010 (Figure 4-1; Table 4-2; Table 4-3). The remaining top resources for the community were either salmon or nonsalmon fish species, the contributions

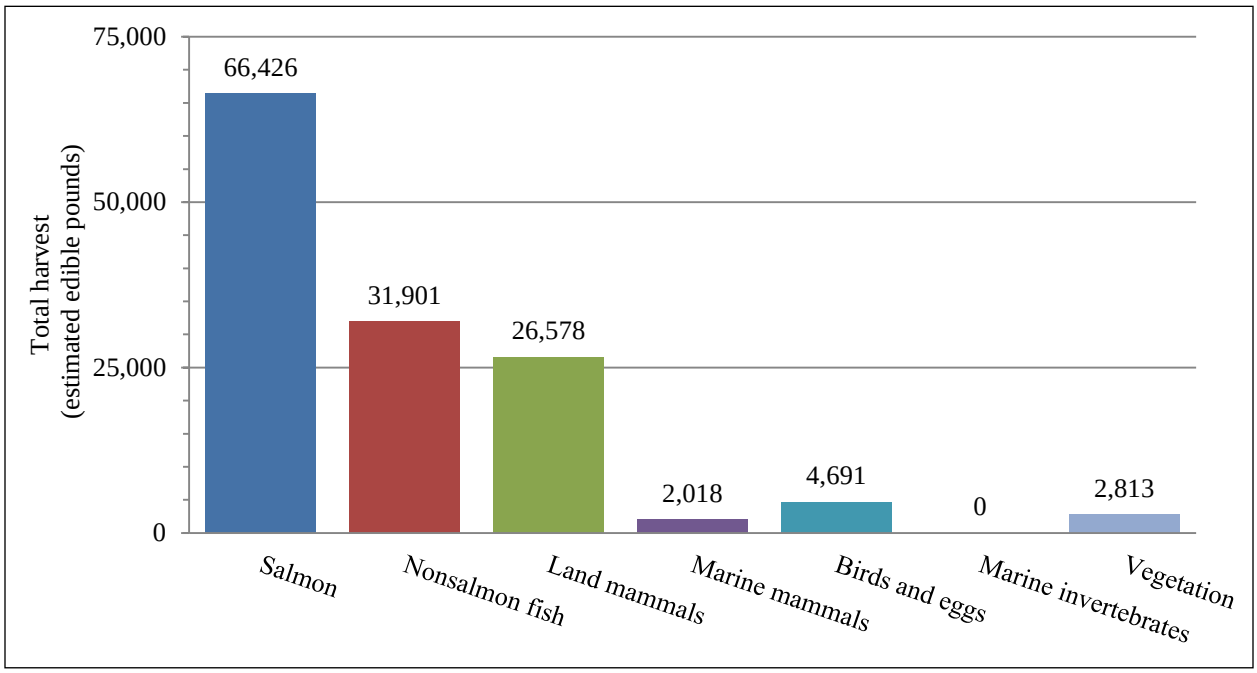


Figure 4-5.–Total estimated edible pounds harvested, by resource category, Marshall, 2010.

for which are listed in descending order: summer chum salmon 16% (21,014 lb), northern pike 6% (8,789 lb), fall chum salmon 6% (8,774 lb), sheefish 4% (5,144 lb), burbot 4% (4,941 lb), coho salmon 3% (4,465 lb), and humpback whitefish 3% (3,670 lb) (Figure 4-1; Table 4-2). Alaska blackfish also contributed 2% (2,598 lb) of the total harvest for the community.

Figure 4-6 depicts the gear types used for harvesting salmon and nonsalmon fish species. The majority of fish harvested by Marshall households were taken by gillnets, either set (subsistence setnet) or drift (subsistence driftnet). Salmon were largely harvested through the use of drift gillnets. Of the 66,426 lb of all salmon species harvested by Marshall residents, 54,236 lb (82%) were harvested by this method (Table 4-2; Figure 4-6). The majority of the remaining 12,190 lb of harvest were taken with set gillnets, with the exception of 829 lb, which was removed from commercial catches (also caught with driftnets). Whitefish species were largely harvested by set gillnet (11,497 lb or 94%). The remaining 755 lb were harvested with drift gillnets (489 lb), removed from commercial catches for home use (216 lb), or taken by rod and reel (50 lb).

Nonsalmon species excluding whitefishes were primarily harvested through other subsistence methods (14,474 lb harvested by these methods). These methods included "jigging" (a practice which involves cutting a hole in the ice and using a wooden stick and line to take fish), fyke nets (fish traps, especially for Alaska blackfish), set lines (especially for burbot), dip nets, and "eel sticks" or "rakes" described earlier. Fish taken by rod and reel include Pacific halibut, northern pike, and Arctic grayling.

Sharing of fish resources in Marshall during the 2010 baseline study year appeared to be fairly extensive. As previously mentioned, salmon species were used by 91% of households in the community, yet harvested by only 74% (Table 4-2). Whitefishes were also shared amongst households in the community: 76% of households reported use, but only 50% reported actual harvests. Other kinds of fish that appeared to be widely shared in Marshall in 2010 included Arctic lamprey (used by 52% of households, but harvested by only 26%), burbot (used by 65% of households, but harvested by only 33%), and Alaska blackfish (used by 35%, but harvested by only 9%).

Although fish species constituted the majority of the wild food harvest in Marshall, large land mammals, primarily moose, were also an important source of food in 2010. Ninety-one percent of households used moose, although only 48% of households harvested the resource (Table 4-3). This discrepancy speaks

Table 4-2.–Estimated harvest and use of fish, Marshall, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Fish										
Salmon										
Summer chum salmon	84.8%	67.4%	65.2%	34.8%	37.0%	21,014.3 lb	247.2 lb	61.5 lb	4,133.6 ind	± 26.3%
Fall chum salmon	45.7%	37.0%	37.0%	21.7%	23.9%	8,774.0 lb	103.2 lb	25.7 lb	1,725.9 ind	± 42.3%
Unknown chum salmon	13.0%	13.0%	13.0%	0.0%	4.3%	620.0 lb	7.3 lb	1.8 lb	122.0 ind	± 62.0%
Coho salmon	34.8%	30.4%	30.4%	17.4%	23.9%	4,465.1 lb	52.5 lb	13.1 lb	844.5 ind	± 45.7%
Chinook salmon	89.1%	71.7%	67.4%	39.1%	50.0%	31,186.3 lb	366.9 lb	91.2 lb	3,303.9 ind	± 22.2%
Pink salmon	8.7%	8.7%	8.7%	2.2%	2.2%	320.0 lb	3.8 lb	0.9 lb	136.7 ind	± 97.8%
Sockeye salmon	2.2%	2.2%	2.2%	0.0%	2.2%	46.6 lb	0.5 lb	0.1 lb	9.2 ind	± 136.4%
Unknown salmon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**91.3%**	**76.1%**	**73.9%**	**47.8%**	**52.2%**	**66,426.2 lb**	**781.5 lb**	**194.3 lb**	**10,275.8 ind**	**± 21.1%**
Char										
Dolly Varden	0.0%	2.2%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Lake trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown char	4.3%	2.2%	2.2%	2.2%	2.2%	27.7 lb	0.3 lb	0.1 lb	18.5 ind	± 136.4%
Subtotal	**4.3%**	**2.2%**	**2.2%**	**2.2%**	**2.2%**	**27.7 lb**	**0.3 lb**	**0.1 lb**	**18.5 ind**	**± 136.4%**
Whitefishes										
Sheefish	56.5%	37.0%	34.8%	28.3%	23.9%	5,144.3 lb	60.5 lb	15.0 lb	857.4 ind	± 62.0%
Broad whitefish	65.2%	43.5%	43.5%	32.6%	28.3%	2,436.9 lb	28.7 lb	7.1 lb	1,740.7 ind	± 39.6%
Bering cisco	21.7%	13.0%	13.0%	13.0%	6.5%	912.3 lb	10.7 lb	2.7 lb	651.7 ind	± 116.1%
Least cisco	6.5%	4.3%	4.3%	4.3%	2.2%	28.3 lb	0.3 lb	0.1 lb	28.3 ind	± 133.5%
Humpback whitefish	52.2%	32.6%	32.6%	30.4%	26.1%	3,669.8 lb	43.2 lb	10.7 lb	1,223.3 ind	± 44.8%
Round whitefish	23.9%	6.5%	6.5%	19.6%	8.7%	61.0 lb	0.7 lb	0.2 lb	122.0 ind	± 96.5%
Unknown whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**76.1%**	**50.0%**	**50.0%**	**45.7%**	**32.6%**	**12,252.7 lb**	**144.1 lb**	**35.8 lb**	**4,623.3 ind**	**± 45.3%**
Anadromous/marine fishes										
Pacific herring	6.5%	0.0%	0.0%	6.5%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Rainbow smelt	23.9%	4.3%	4.3%	23.9%	6.5%	443.5 lb	5.2 lb	1.3 lb	73.9 gal	± 107.1%
Pacific tomcod	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Saffron cod	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Pacific halibut	4.3%	2.2%	2.2%	2.2%	2.2%	524.8 lb	6.2 lb	1.5 lb	524.8 lb	± 136.4%
Arctic lamprey	52.2%	28.3%	26.1%	34.8%	17.4%	2,277.4 lb	26.8 lb	6.7 lb	3,797.0 ind	± 90.1%
Stickleback (needlefish)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**56.5%**	**30.4%**	**28.3%**	**45.7%**	**19.6%**	**3,245.7 lb**	**38.2 lb**	**9.5 lb**	**4,395.7 gal**	**± 90.1%**
Other freshwater fishes										
Alaska blackfish	34.8%	8.7%	8.7%	28.3%	8.9%	2,598.0 lb	30.6 lb	7.6 lb	2,598.0 lb	± 100.9%
Burbot	65.2%	34.8%	32.6%	43.5%	26.1%	4,941.0 lb	58.1 lb	14.5 lb	2,058.7 ind	± 75.2%
Arctic grayling	6.5%	8.7%	6.5%	2.2%	4.3%	46.6 lb	0.5 lb	0.1 lb	66.5 ind	± 114.8%
Northern pike	65.2%	58.7%	58.7%	23.9%	26.1%	8,789.2 lb	103.4 lb	25.7 lb	1,953.2 ind	± 59.1%
Longnose sucker	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**76.1%**	**65.2%**	**65.2%**	**52.2%**	**39.1%**	**16,374.7 lb**	**192.6 lb**	**47.9 lb**	**6,676.4 lb**	**± 63.4%**
All fish	**93.5%**	**84.8%**	**84.8%**	**76.1%**	**67.4%**	**98,327.1 lb**	**1,156.8 lb**	**287.6 lb**		**± 26.2%**
All resources[b]	**95.7%**	**91.3%**	**91.3%**	**91.3%**	**80.4%**	**134,426.5 lb**	**1,581.5 lb**	**393.2 lb**		**± 21.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

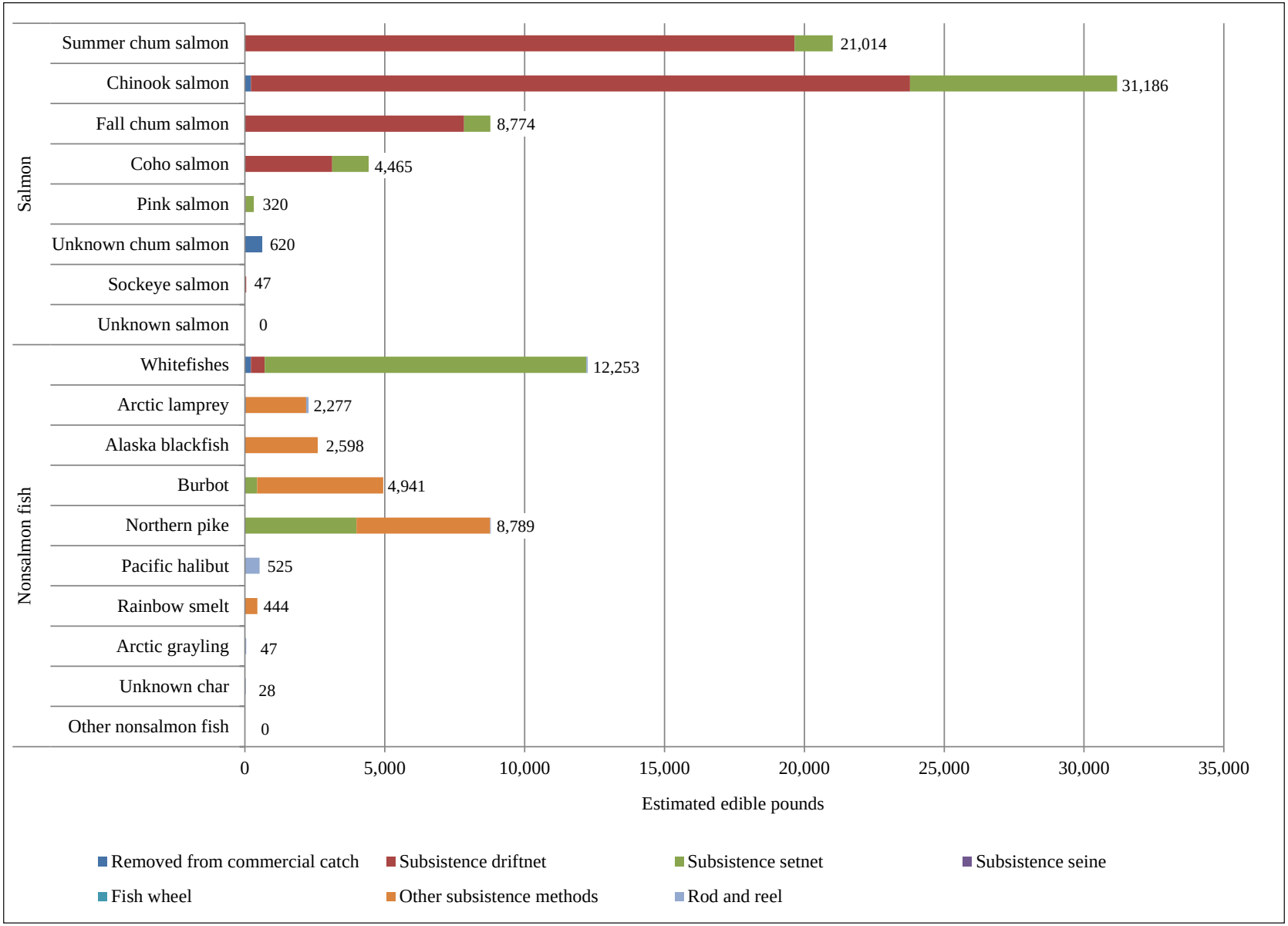


Figure 4-6.–Estimated fish harvests by gear type, Marshall, 2010.

Table 4-3.–Estimated harvest and use of land and marine mammals, Marshall, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Land mammals										
Large land mammals										
Black bear	21.7%	15.2%	8.7%	15.2%	8.7%	923.9 lb	10.9 lb	2.7 lb	9.2 ind	± 70.1%
Brown bear	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Caribou	6.5%	2.2%	2.2%	4.3%	2.2%	720.7 lb	8.5 lb	2.1 lb	5.5 ind	± 136.4%
Moose	91.3%	73.9%	47.8%	65.2%	45.7%	22,950.0 lb	270.0 lb	67.1 lb	42.5 ind	± 22.0%
Subtotal	**91.3%**	**73.9%**	**47.8%**	**67.4%**	**45.7%**	**24,594.6 lb**	**289.3 lb**	**71.9 lb**	**57.3 ind**	**± 22.9%**
Small land mammals										
Beaver	39.1%	28.3%	23.9%	19.6%	13.0%	1,801.6 lb	21.2 lb	5.3 lb	147.8 ind	± 47.3%
Red fox	4.3%	4.3%	4.3%	0.0%	0.0%	*Not usually eaten*			7.4 ind	± 95.4%
Snowshoe hare	32.6%	21.7%	21.7%	13.0%	13.0%	138.6 lb	1.6 lb	0.4 lb	99.8 ind	± 63.8%
Alaska hare (jackrabbit)	0.0%	2.2%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
River (land) otter	6.5%	4.3%	4.3%	2.2%	0.0%	5.5 lb	0.1 lb	0.0 lb	11.1 ind	± 136.4%
Lynx	10.9%	10.9%	10.9%	0.0%	2.2%	14.8 lb	0.2 lb	0.0 lb	16.6 ind	± 136.4%
Marmot	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Marten	4.3%	4.3%	4.3%	0.0%	0.0%	*Not usually eaten*			1.9 ind	± 134.9%
Mink	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Muskrat	8.7%	8.7%	8.7%	0.0%	4.3%	8.3 lb	0.1 lb	0.0 lb	38.8 ind	± 115.4%
Porcupine	2.2%	2.2%	2.2%	0.0%	2.2%	14.8 lb	0.2 lb	0.0 lb	3.7 ind	± 136.4%
Arctic ground (parka) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Red (tree) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Weasel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Gray wolf	6.5%	4.3%	4.3%	2.2%	0.0%	*Not usually eaten*			16.6 ind	± 109.7%
Wolverine	6.5%	4.3%	4.3%	2.2%	0.0%	*Not usually eaten*			11.3 ind	± 134.9%
Subtotal	**50.0%**	**39.1%**	**34.8%**	**26.1%**	**21.7%**	**1,983.6 lb**	**23.3 lb**	**5.8 lb**	**355.1 ind**	**± 45.1%**
Marine mammals										
Bearded seal	10.9%	6.5%	6.5%	4.3%	8.7%	1,293.5 lb	15.2 lb	3.8 lb	9.2 ind	± 80.2%
Ringed seal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Spotted seal	6.5%	6.5%	4.3%	2.2%	4.3%	724.3 lb	8.5 lb	2.1 lb	12.9 ind	± 118.1%
Unknown seal	52.2%	0.0%	0.0%	52.2%	10.9%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Walrus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Beluga	21.7%	2.2%	0.0%	21.7%	4.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Bowhead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**67.4%**	**13.0%**	**8.7%**	**60.9%**	**19.6%**	**2,017.8 lb**	**23.7 lb**	**5.9 lb**	**22.2 ind**	**± 85.2%**
All land mammals	**93.5%**	**76.1%**	**54.3%**	**69.6%**	**47.8%**	**26,578.2 lb**	**312.7 lb**	**77.7 lb**		**± 23.0%**
All marine mammals	**67.4%**	**13.0%**	**8.7%**	**60.9%**	**19.6%**	**2,017.8 lb**	**23.7 lb**	**5.9 lb**		**± 85.2%**
All resources[b]	**95.7%**	**91.3%**	**91.3%**	**91.3%**	**80.4%**	**134,426.5 lb**	**1,581.5 lb**	**393.2 lb**		**± 21.0%**

Source ADF&G Division of Subsistence household surveys, 2011.
a. Amount of resource harvested is in individual units, unless otherwise specified.
b. All resources include all species of fish, wildlife, and plants reported on the survey.

to extensive sharing of moose throughout the community via trading and sharing networks. The highest percentage of households (65%) reported receiving the resource during the study year. Black bear was the second-most widely used large land mammal resource (22% of households), although it was harvested by only 9% of households. Caribou do not generally range near the community, and residents harvested only 6 individual caribou, likely from the Mulchatna caribou herd. There was no reported use or harvest of brown bears during the study year. Timing for large land mammal harvests, as well as information on sex of harvested moose and caribou, can be found in Table D4-3.

Residents of Marshall also harvested small land mammals for food or fur, depending upon the species. The most used and most harvested small land mammal species was beaver (39% of households used beaver, 24% harvested). A total of 148 beavers were harvested in 2010, primarily in January (31 individuals) and May (63 individuals) (Table 4-3; Table D4-4). Snowshoe hare was the second-most used small mammal species (by 33% of households), and was harvested by 22% of households in the winter and early spring (November–April). The next most commonly used small land mammals were lynx (11% of households) and muskrats (9%), which were harvested in the months of February and March, and March and May,

respectively. Although not contributing to the edible harvest of the community, a number of small land mammals were taken for their fur, including red foxes (7 individuals), gray wolves (17), wolverines (11), and marten (2). The majority of these animals were taken in the winter and early spring months, when their fur is considered prime.

Marshall residents reported the use and limited harvest of marine mammals during the study year. Households reported both using (11%) and harvesting (7%) bearded seals, and 4% of households reported receiving them (Table 4-3). Likewise, 7% of households reported using spotted seals, 4% reported harvesting them, and 2% reported receiving the resource. Fifty-two percent of respondents reported use of "unknown seals," and all reported that the resource, likely seal oil from other communities near the coast, was given to them. Although 2% of households reported attempting to harvest beluga whales, none were successful in their attempts. Despite this, 22% of respondents reported using beluga whales, and all reported that they was given to them. Table D4-5 shows the estimated marine mammal harvest by month.

Marshall households reported the use (87%) and harvest (67%) of migratory bird species during the study year (Table 4-4). Geese was the most widely used (83% of households) category of migratory birds; the highest levels of harvest were for white-fronted geese (an estimated 432 individuals), cackling geese (276), and lesser Canada geese (196). Duck species were also widely used by community households (65%), and 48% of respondents reported harvesting these birds. The highest levels of harvest for ducks were mallards (309 individuals), northern pintails (137), and unknown wigeons (83). Marshall residents used other migratory birds in 2010, including tundra (whistling) swans (65% of households) and sandhill cranes (9%). The seasonal breakdown of migratory bird harvests was fairly evenly split between spring and fall hunting seasons (Table D4-6).

Other birds, including spruce grouse, ruffed grouse, and ptarmigans, were used by 43% of households and harvested by 35%. Ptarmigans composed a majority of the harvest of nonmigratory birds; 414 individuals were harvested in the winter and spring months (Table 4-4; Table D4-5). Residents of Marshall also reported limited use (15% of households) and harvest (9%) of bird eggs in 2010 (Table 4-5). Swan and gull eggs contributed the most edible weight to the community of this resource category (45 lb and 29 lb, respectively).

Marshall households made wide use of vegetation, such as wild plants, greens, and berries, in 2010, and this resource category contributed 2,813 lb to the overall community harvest (Table 4-6). Eighty-seven percent of households reported using vegetation, and 76% reported active harvest of plants. Berries were by far the most used and harvested plant species in Marshall in 2010, contributing 2,562 lb to the total harvest. They were used by 87% of households and harvested by 76%, and the most commonly used species was blueberries (85% using, 72% harvesting). Furthermore, blueberries (353 gal) accounted for more than one-half of the total berry harvest (640 gal). Salmonberries were the next most commonly used species (48% using, 33% harvesting), followed closely by crowberries (blackberries) (46% using, 33% harvesting). Lowbush cranberries and raspberries contributed to the berry harvest to a lesser extent in Marshall in 2010, providing 56 gal together; both berry types were used by 24% of households in the community.

Nonberry plants and greens were used by 70% of households. The most harvested species was punk (3,184 gal), which is a fungus found in birch trees. This resource is often used an additive to tobacco or as a mosquito repellent. Residents also harvested wild rhubarb (36 gal), stinkweed (26 gal), Hudson's Bay (Labrador) tea (9 gal), and fiddlehead ferns (6 gal). Firewood used to smoke fish and heat homes was both used and harvested by 63% of households in Marshall. Residents harvested 409 cords of wood overall in 2010.

Harvest Areas

As a part of the survey, households were asked to indicate on a map the areas where they searched for and harvested resources during the 2010 study year. Combining data from the household level, maps were produced for each community depicting search and harvest areas for 6 resource categories (salmon, nonsalmon fish, birds, small land mammals, large land mammals, and berries and greens). Furthermore,

Table 4-4.–Estimated harvest and use of birds, Marshall, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Migratory birds										
Ducks										
Bufflehead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Canvasback	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Common eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Goldeneye sp.	10.9%	10.9%	8.7%	4.3%	4.3%	25.1 lb	0.3 lb	0.1 lb	31.4 ind	± 89.1%
Mallard	56.5%	39.1%	39.1%	26.1%	32.6%	308.6 lb	3.6 lb	0.9 lb	308.6 ind	± 33.7%
Common merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Red-breasted merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Long-tailed duck (oldsquaw)	2.2%	2.2%	2.2%	2.2%	2.2%	14.8 lb	0.2 lb	0.0 lb	18.5 ind	± 136.4%
Northern pintail	32.6%	23.9%	23.9%	13.0%	15.2%	109.4 lb	1.3 lb	0.3 lb	136.7 ind	± 41.7%
Scaup sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Black scoter	15.2%	13.0%	13.0%	2.2%	4.3%	29.9 lb	0.4 lb	0.1 lb	33.3 ind	± 58.8%
Surf scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
White-winged scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Northern shoveler	6.5%	6.5%	6.5%	4.3%	4.3%	37.7 lb	0.4 lb	0.1 lb	62.8 ind	± 89.9%
Green-winged teal	4.3%	4.3%	4.3%	4.3%	4.3%	16.6 lb	0.2 lb	0.0 lb	55.4 ind	± 100.8%
Unknown wigeon	19.6%	13.0%	13.0%	8.7%	13.0%	58.2 lb	0.7 lb	0.2 lb	83.2 ind	± 60.9%
Unknown duck	2.2%	0.0%	0.0%	2.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**65.2%**	**47.8%**	**47.8%**	**30.4%**	**37.0%**	**600.4 lb**	**7.1 lb**	**1.8 lb**	**729.9 ind**	**± 34.8%**
Geese										
Brant	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Cackling goose	58.7%	39.1%	39.1%	30.4%	19.6%	330.9 lb	3.9 lb	1.0 lb	275.8 ind	± 40.8%
Lesser Canada goose	37.0%	28.3%	28.3%	15.2%	19.6%	235.7 lb	2.8 lb	0.7 lb	196.4 ind	± 43.1%
Unknown Canada goose	2.2%	4.3%	0.0%	2.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Emperor goose	2.2%	2.2%	0.0%	2.2%	2.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Snow goose	15.2%	13.0%	8.7%	8.7%	2.2%	59.5 lb	0.7 lb	0.2 lb	25.9 ind	± 99.4%
White-fronted goose	67.4%	56.5%	52.2%	19.6%	23.9%	1,037.7 lb	12.2 lb	3.0 lb	432.4 ind	± 28.1%
Unknown goose	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**82.6%**	**63.0%**	**60.9%**	**37.0%**	**34.8%**	**1,663.9 lb**	**19.6 lb**	**4.9 lb**	**930.5 ind**	**± 27.1%**
Other migratory birds										
Tundra (whistling) swan	65.2%	56.5%	52.2%	23.9%	28.3%	1,866.3 lb	22.0 lb	5.5 lb	186.6 ind	± 29.5%
Sandhill crane	8.7%	6.5%	4.3%	4.3%	0.0%	31.7 lb	0.4 lb	0.1 lb	3.8 ind	± 134.9%
Whimbrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**65.2%**	**56.5%**	**52.2%**	**23.9%**	**28.3%**	**1,898.0 lb**	**22.3 lb**	**5.6 lb**	**190.4 ind**	**± 29.5%**
Other birds										
Spruce grouse	6.5%	4.3%	4.3%	2.2%	2.2%	3.9 lb	0.0 lb	0.0 lb	5.5 ind	± 100.8%
Ruffed grouse	13.0%	8.7%	8.7%	6.5%	4.3%	12.9 lb	0.2 lb	0.0 lb	18.5 ind	± 77.8%
Ptarmigan sp.	41.3%	34.8%	32.6%	15.2%	19.6%	413.9 lb	4.9 lb	1.2 lb	413.9 ind	± 52.2%
Subtotal	**43.5%**	**34.8%**	**34.8%**	**15.2%**	**21.7%**	**430.7 lb**	**5.1 lb**	**1.3 lb**	**437.9 ind**	**± 50.2%**
All migratory birds	**87.0%**	**67.4%**	**67.4%**	**43.5%**	**45.7%**	**4,162.3 lb**	**49.0 lb**	**12.2 lb**	**1,850.8 ind**	**± 24.8%**
All other birds	**43.5%**	**34.8%**	**34.8%**	**15.2%**	**21.7%**	**430.7 lb**	**5.1 lb**	**1.3 lb**	**437.9 ind**	**± 50.2%**
All resources[b]	**95.7%**	**91.3%**	**91.3%**	**91.3%**	**80.4%**	**134,426.5 lb**	**1,581.5 lb**	**393.2 lb**		**± 21.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

a comprehensive map of all search and harvest areas for all resources was produced from the individual mapped data gathered from 46 of 85 households in the community of Marshall. Figure 4-7 depicts all the mapped data collected from residents for the baseline study year. In 2010, Marshall residents reported using a total of 3,601 square miles for subsistence, ranging from a 75-mile stretch of coastline on the Bering Sea approximately 100 miles northwest of the community to the area around Holy Cross approximately 80 miles east of the community.

During the 2010 survey year, Marshall respondents reported search areas and places of harvest for salmon species in various sections of the Yukon River (Figure 4-8). The majority of these search areas spanned

Table 4-5.–Estimated harvest and use of eggs, Marshall, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Bird eggs										
Duck eggs	4.3%	6.5%	4.3%	0.0%	2.2%	8.0 lb	0.1 lb	0.0 lb	53.6 ind	± 95.9%
Goose eggs	2.2%	6.5%	2.2%	0.0%	2.2%	8.9 lb	0.1 lb	0.0 lb	29.6 ind	± 136.4%
Swan eggs	8.7%	6.5%	6.5%	2.2%	2.2%	45.4 lb	0.5 lb	0.1 lb	72.1 ind	± 88.9%
Unknown shorebird eggs	2.2%	2.2%	2.2%	0.0%	0.0%	2.8 lb	0.0 lb	0.0 lb	55.4 ind	± 136.4%
Gull eggs	13.0%	8.7%	8.7%	4.3%	2.2%	28.5 lb	0.3 lb	0.1 lb	86.3 ind	± 70.3%
Arctic tern eggs	4.3%	2.2%	2.2%	2.2%	2.2%	1.5 lb	0.0 lb	0.0 lb	29.6 ind	± 136.4%
Unknown eggs	4.3%	2.2%	2.2%	2.2%	0.0%	2.8 lb	0.0 lb	0.0 lb	12.6 ind	± 136.4%
Subtotal	**15.2%**	**13.0%**	**8.7%**	**6.5%**	**2.2%**	**97.8 lb**	**1.2 lb**	**0.3 lb**	**339.1 ind**	**± 77.2%**
All birds and eggs	**87.0%**	**69.6%**	**69.6%**	**43.5%**	**45.7%**	**4,690.8 lb**	**55.2 lb**	**13.7 lb**	**2,627.8 ind**	**± 25.0%**
All resources[b]	**95.7%**	**91.3%**	**91.3%**	**91.3%**	**80.4%**	**134,426.5 lb**	**1,581.5 lb**	**393.2 lb**		**± 21.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

approximately 23 continuous miles, though additional drifting areas were reportedly used. These areas were located approximately 12 miles downstream from the community on a large bend in the mainstem of the Yukon River directly across from Center Slough and approximately 22 miles upstream near Cross Slough. Drifting also occurred on an easily accessible 2.5-mile stretch of Poltes Slough directly in front of the community. A setnet was also positioned at the mouth of Wilson Creek.

Marshall households also reported searching for and harvesting nonsalmon fish species in a variety of areas, both on the Yukon River proper as well as other waterways in the immediate vicinity (Figure 4-9). Respondents reported a large number of search areas for northern pike along a variety of waterways in the vicinity of Marshall. In fact, search areas for northern pike were the farthest afield of any other search areas for fish species in the study year, with a variety of setnet and jigging locations reported as far away as 35 miles north of the community and 20 miles to the south. A large amount of this fishing activity took place on Five Day Slough, as well as on the lakes north of the Atchuelinguk River. Search and harvest locations for whitefishes were largely centered on the stretch of Poltes Slough directly in front of the community. Two drifting areas were also reported on the mainstem of the Yukon River: one approximately one-half mile upstream of Marshall and the other 1 mile downstream near Center Slough. Both setnet and drifting search and harvest areas were also reported at the mouth of Five Day Slough, as well as a 3-mile stretch of the Atchuelinguk River to the northwest of the community. Sheefish search and harvest locations were largely confined to the mainstem of the Yukon River, with various drifting and setnet locations reported from 5 miles downstream to approximately 5 miles upstream of Marshall. Drifting areas for both sheefish and other whitefishes overlap with salmon drifting areas (Figure 4-8; Figure 4-9). Burbot search and harvest locations were largely confined to Wilson Creek, where both setnet and jigging locations were reported.

Survey respondents in Marshall reported covering a sizeable area of land during search and harvest efforts for moose in 2010 (Figure 4-10). One major search area encompassed approximately 65 miles along the Yukon River, beginning near Pilot Station downstream from Marshall and ending approximately 45 miles upstream from Marshall. Hunters also used tributary waterways, including Center Slough and Reindeer River southwest of Marshall. Respondents reported searching for moose approximately 25 miles upstream off Ickles Slough, likely utilizing feeder creeks to access the Johnson River, which is located to the south. This search area encompasses approximately 5 to 15 miles to the north and south of the Yukon River. Another search area is near the community of Russian Mission (approximately 40 miles upstream): respondents reported searching along 1 mile of the Yukon River near Johnson Island, as well as traveling approximately 15 miles up Kako Creek. A third major search area reported by residents is an approximately 35-mile stretch of the Yukon River beginning at Base Island located upstream from Russian Mission, and ending about

Table 4-6.–Estimated harvest and use of vegetation, Marshall, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Berries										
Blueberry	84.8%	71.7%	71.7%	21.7%	21.7%	1,410.4 lb	16.6 lb	4.1 lb	352.6 gal	± 21.1%
Lowbush cranberry	23.9%	15.2%	15.2%	10.9%	4.3%	77.6 lb	0.9 lb	0.2 lb	19.4 gal	± 60.0%
Highbush cranberry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Gooseberry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Currant	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Raspberry	23.9%	19.6%	19.6%	6.5%	4.3%	146.0 lb	1.7 lb	0.4 lb	36.5 gal	± 47.7%
Salmonberry	47.8%	32.6%	32.6%	19.6%	8.7%	528.5 lb	6.2 lb	1.5 lb	132.1 gal	± 49.1%
Crowberry (blackberry)	45.7%	32.6%	32.6%	17.4%	15.2%	399.1 lb	4.7 lb	1.2 lb	99.8 gal	± 36.4%
Subtotal	**87.0%**	**76.1%**	**76.1%**	**37.0%**	**28.3%**	**2,561.5 lb**	**30.1 lb**	**7.5 lb**	**640.4 gal**	**± 21.2%**
Plants/greens/mushrooms										
Wild rhubarb	37.0%	34.8%	34.8%	6.5%	4.3%	145.4 lb	1.7 lb	0.4 lb	36.4 gal	± 36.7%
Eskimo potato	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Fiddlehead fern	17.4%	13.0%	13.0%	6.5%	2.2%	6.1 lb	0.1 lb	0.0 lb	6.1 gal	± 64.1%
Nettle	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Hudson's Bay tea	21.7%	17.4%	17.4%	4.3%	4.3%	8.8 lb	0.1 lb	0.0 lb	8.8 gal	± 62.9%
Mint	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Sourdock	4.3%	2.2%	2.2%	2.2%	0.0%	0.5 lb	0.0 lb	0.0 lb	0.5 gal	± 136.4%
Spruce tips	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Willow leaves	2.2%	2.2%	2.2%	0.0%	0.0%	0.5 lb	0.0 lb	0.0 lb	0.5 gal	± 136.4%
Cow parsnip (wild celery)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Wild rose hips	2.2%	0.0%	0.0%	2.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Yarrow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown mushrooms	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Fireweed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Stinkweed	23.9%	21.7%	21.7%	4.3%	6.5%	26.4 lb	0.3 lb	0.1 lb	26.4 gal	± 63.9%
Punk	43.5%	37.0%	37.0%	17.4%	10.9%	0.0 lb	0.0 lb	0.0 lb	3,183.7 gal	± 44.6%
Puffballs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown greens from land	6.5%	6.5%	6.5%	4.3%	0.0%	63.3 lb	0.7 lb	0.2 lb	63.3 gal	± 131.4%
Subtotal	**69.6%**	**63.0%**	**63.0%**	**28.3%**	**15.2%**	**251.0 lb**	**3.0 lb**	**0.7 lb**	**3,325.7 gal**	**± 40.1%**
Wood										
Wood	63.0%	63.0%	63.0%	8.7%	17.4%	0.0 lb	0.0 lb	0.0 lb	409 crd	± 64.9%
Subtotal	**63.0%**	**63.0%**	**63.0%**	**8.7%**	**17.4%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**409 crd**	± 0.0%
All vegetation	**87.0%**	**76.1%**	**76.1%**	**37.0%**	**28.3%**	**2,812.6 lb**	**33.1 lb**	**8.2 lb**		**± 19.5%**
All resources[b]	**95.7%**	**91.3%**	**91.3%**	**91.3%**	**80.4%**	**134,426.5 lb**	**1,581.5 lb**	**393.2 lb**		**± 21.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

2 miles before the community of Holy Cross. Hunters also traveled on other tributary waterways during search efforts in this area, including Paimiut Slough, Twelvemile Slough, and Crooked Lake.

Marshall residents reported varied locations for the search and harvest of small land mammals in 2010 (Figure 4-11). Easily accessible areas nearby the community itself included a 6-mile stretch along Poltes Slough, as well as a 10-mile search area along Five Day Slough to the northwest of the community. Residents also reported searching along approximately 7 miles of Owl Creek to the south of the community and an area extending 4 miles north and 1 mile south of Wilson Creek. Farther to the north of Marshall, households reported searching for and harvesting small animal species in the vicinity of the Kuyukutuk and Nageethluk rivers, as well as just to the west of the confluence of the Stuyahok and Bonasila rivers. The farthest search and harvest area for small land mammals reported by Marshall residents in 2010 was an assortment of small tributaries and lakes near Paimiut Slough (approximately 80 miles east of Marshall).

Survey respondents principally reported two major search and harvest areas for ducks and geese for the 2010 study year (Figure 4-12). The vast majority of these areas overlapped, stretching approximately 35 miles along the Yukon River and its immediate tributaries. Residents reported searching along the Yukon

Table 4-7.–Estimated harvest and use of marine invertebrates, Marshall, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Marine invertebrates										
Unknown clams	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown king crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Tanner crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Shrimp	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown marine invertebrates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Subtotal	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**		**± 0.0%**
All marine invertebrates	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**		**± 0.0%**
All resources[b]	**95.7%**	**91.3%**	**91.3%**	**91.3%**	**80.4%**	**134,426.5 lb**	**1,581.5 lb**	**393.2 lb**		**± 21.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

River as far as 13 miles downstream along the mainstem of the Yukon River, Poltes Slough, and Owl Creek, and up to 25 miles upstream including islands such as Arbor Island and Blade Island. Although a majority of the search and harvest areas were within 10 miles to the north and south of the community along the Yukon River, search areas for ducks and geese also extended approximately 12 miles north of Marshall along Five Day Slough. Another smaller search and harvest area was located approximately 15 miles north of Marshall and concentrated around the lakes in the Kuyukutuk River region.

Marshall households also reported various search and harvest areas for berries and greens during the 2010 baseline study year, during which residents traveled as far as the community of St. Marys to the west and Holy Cross to the east (Figure 4-13). The largest search area reported by households was in the general vicinity of Marshall and upstream along the Yukon River to the area around Blade Island (a distance of approximately 25 miles). Search and harvest areas along the Yukon River also stretched into immediate tributary waterways, including Engineer Creek, Engineer Lake, and Wilson Creek. Residents also reported traveling along Five Day Slough to the north of the community. Residents also reported search and harvest areas for berries and greens in 2010 on Horse Island, near the community of Holy Cross.

Harvest Assessments

Questions on the survey asked respondents to assess their own harvests in 2 ways: whether they felt that they got sufficient amounts, or "enough," of each kind of resource, and whether they had used more, less, or about the same amount of the 7 resource categories in 2010 as they had in prior years. When a household reported not getting enough of a particular resource category, they were asked why this was the case. Follow-up questions asked which kind of resource they needed more and how much the lack of this resource impacted their household. These households were also asked if they did anything differently as a result of not getting enough. Subsistence harvest success can also be assessed by comparing current harvest estimates with prior harvest estimates, discussed in a later section of this chapter.

The majority of households in Marshall that provided survey responses indicated that they harvested or received enough of the resource for each category, excluding the marine invertebrates category, which was not used by households in Marshall (Figure 4-14). Percentages of households reporting getting enough were highest for 3 of the 7 resource categories: birds and eggs, land mammals, and nonsalmon fish; between 72% and 74% of respondents reported getting sufficient amounts of these resources. Although more than half of respondents reported getting enough plants and berries and salmon, the percentages were significantly lower than the previous categories: 61% and 54% reported getting enough, respectively. Nearly 40% of households indicated wanting more Chinook salmon, while only 13% of responding households reported wanting more salmon in general (Table D4-7). A vast majority of respondents indicated that regulations

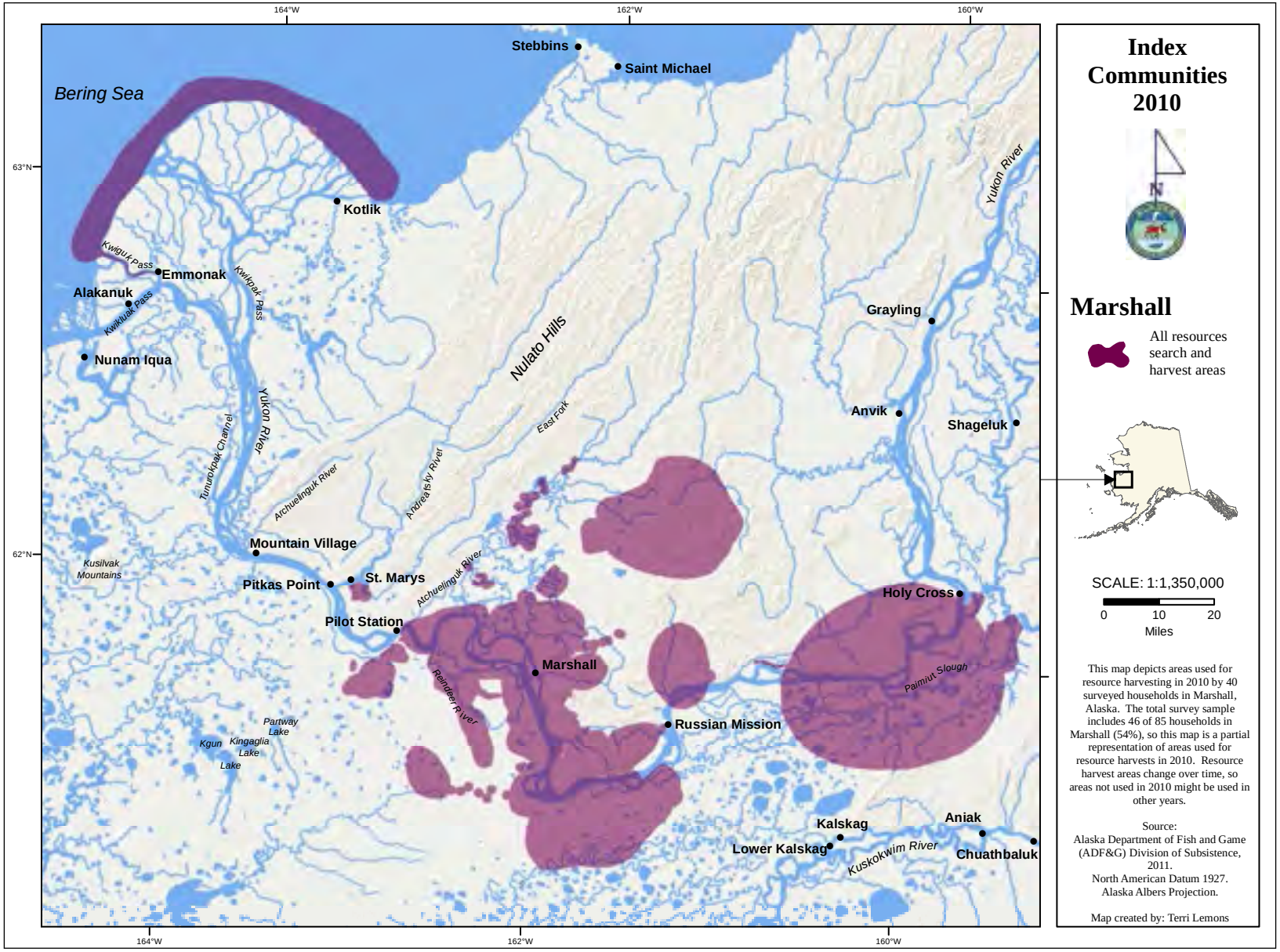


Figure 4-7.–Search and harvest areas, all resources, Marshall, 2010.

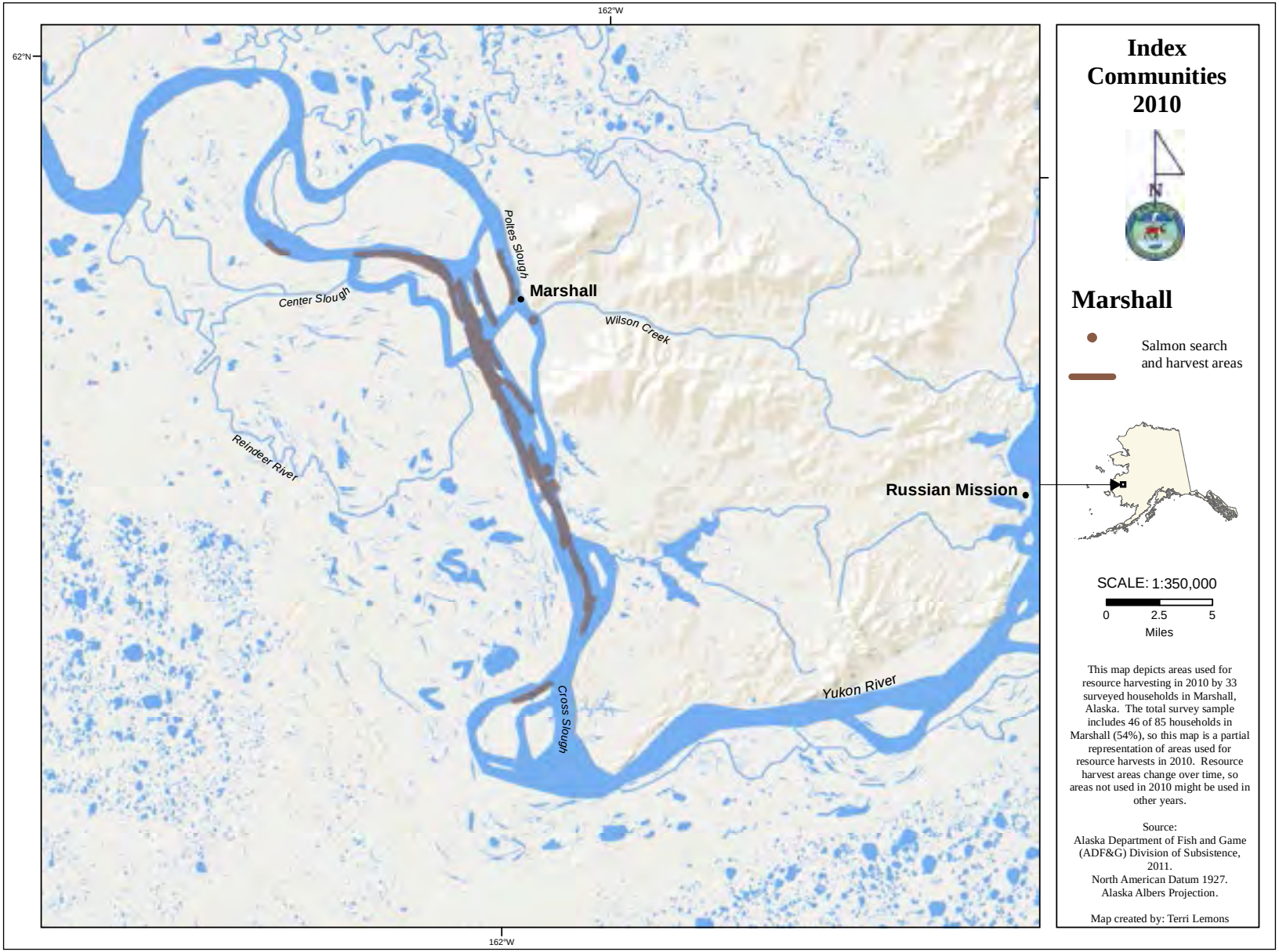


Figure 4-8.–Search and harvest areas, salmon, Marshall, 2010.

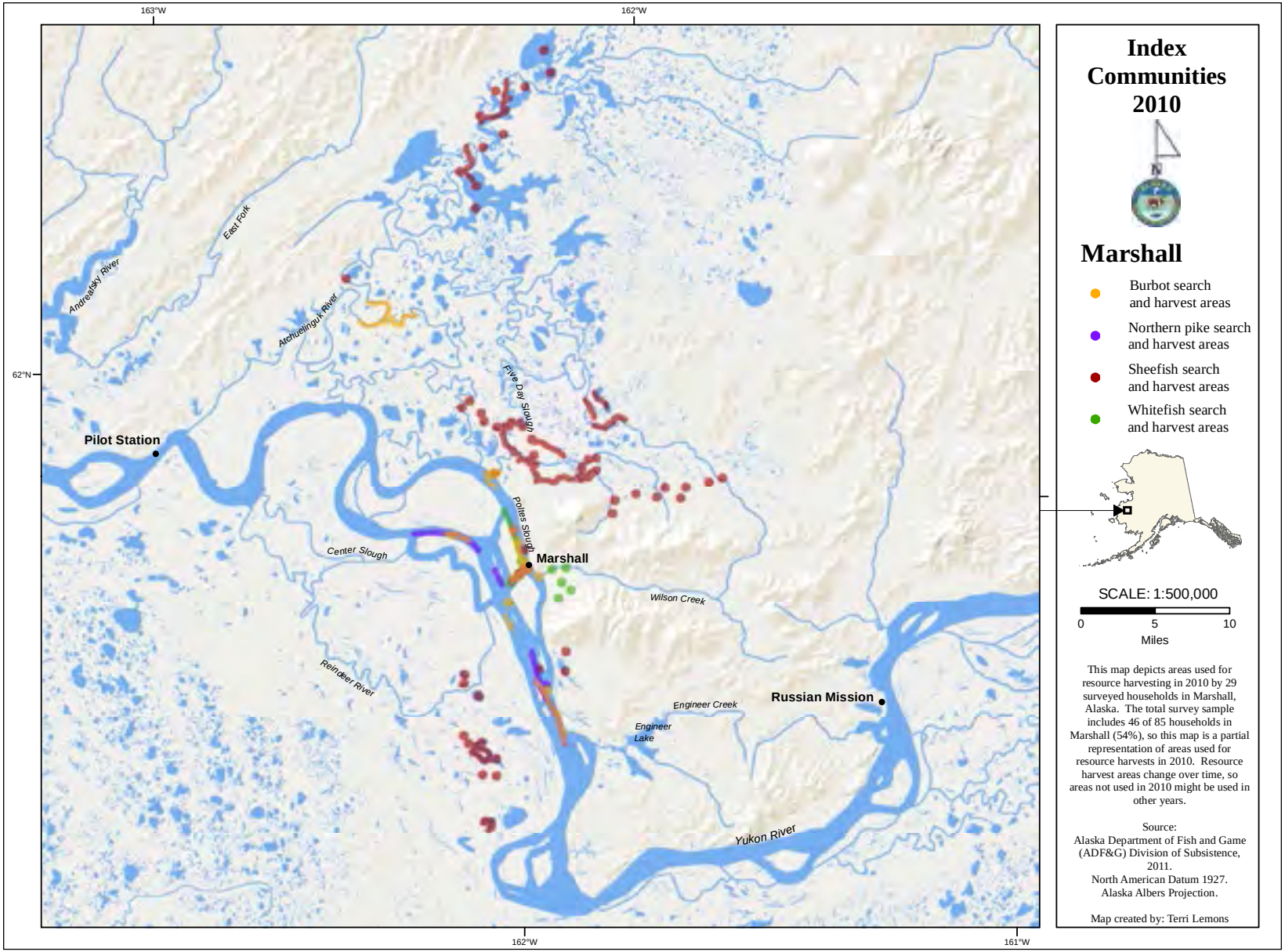


Figure 4-9.–Search and harvest areas, nonsalmon fish, Marshall, 2010.

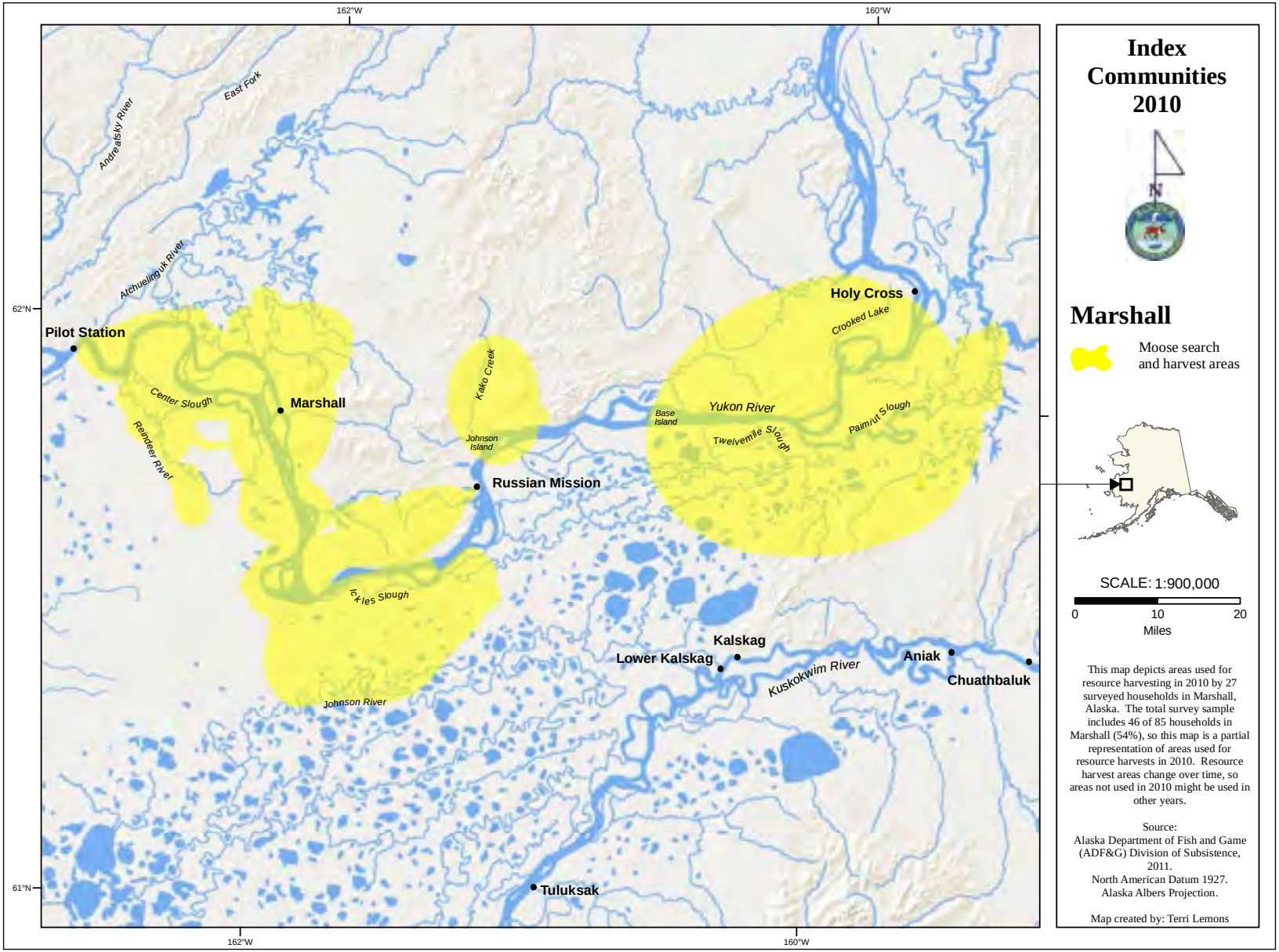


Figure 4-10.–Search and harvest areas, large land mammals, Marshall, 2010.

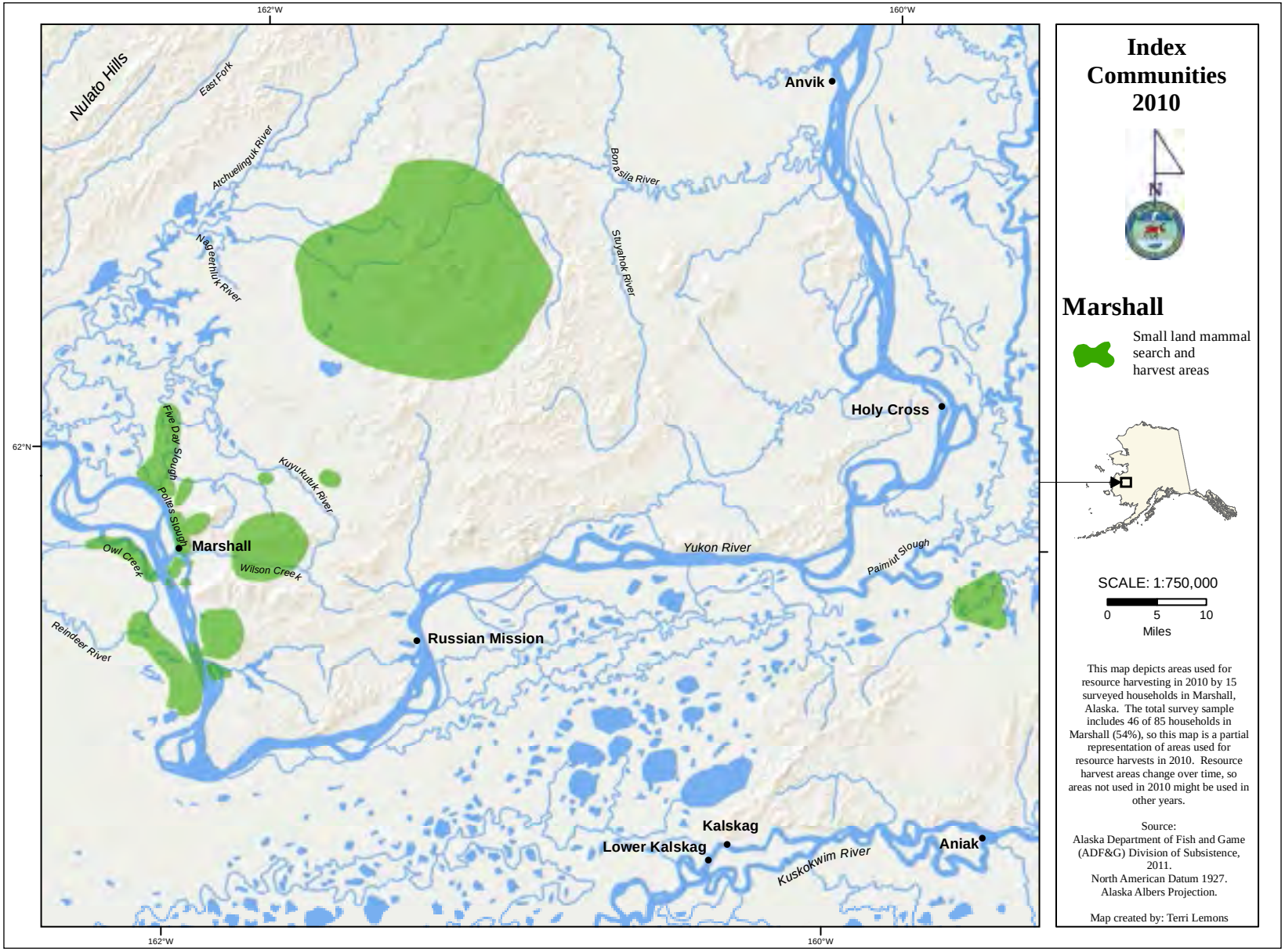


Figure 4-11.–Search and harvest areas, small land mammals, Marshall, 2010.

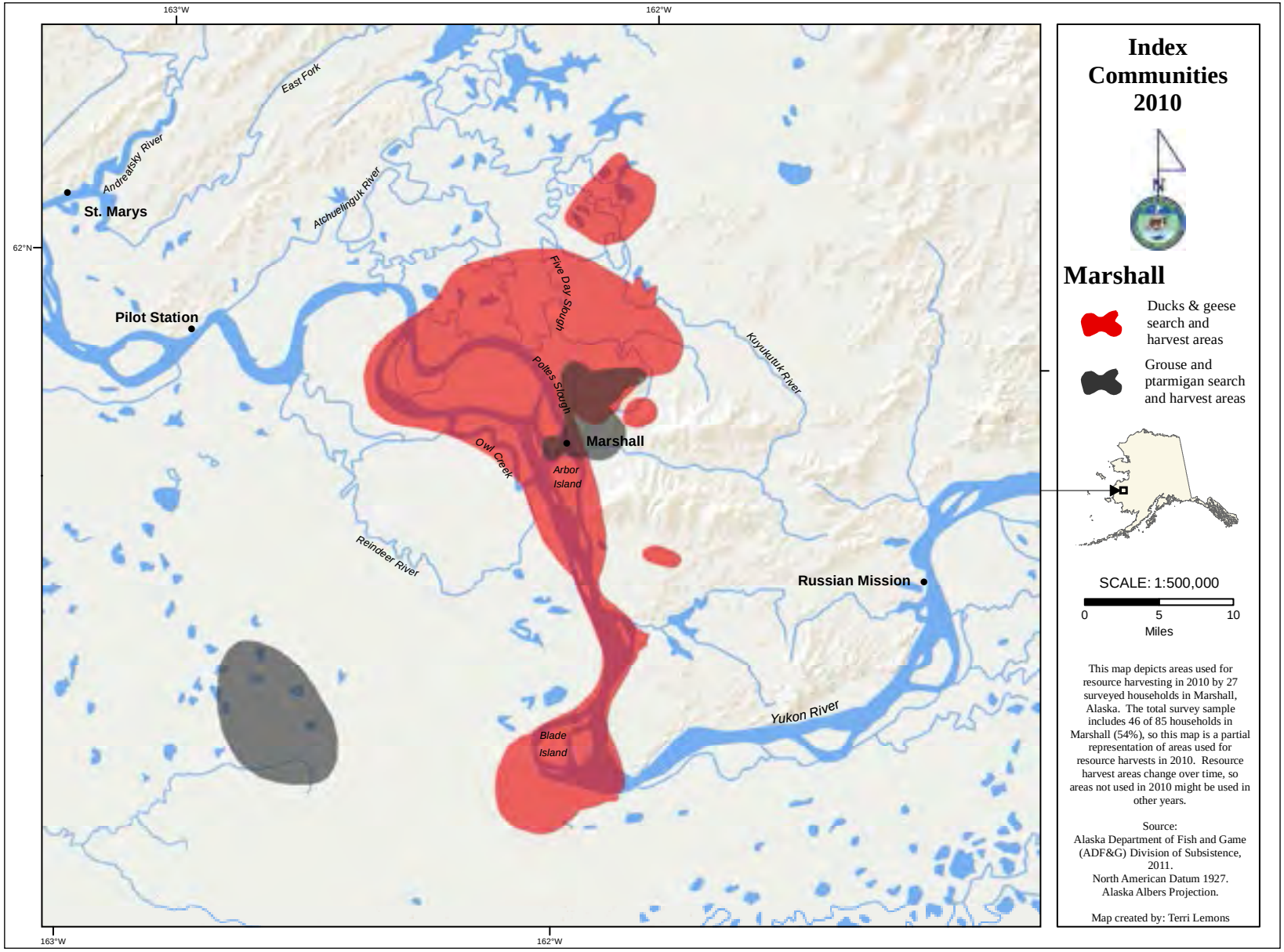


Figure 4-12.–Search and harvest areas, birds, Marshall, 2010.

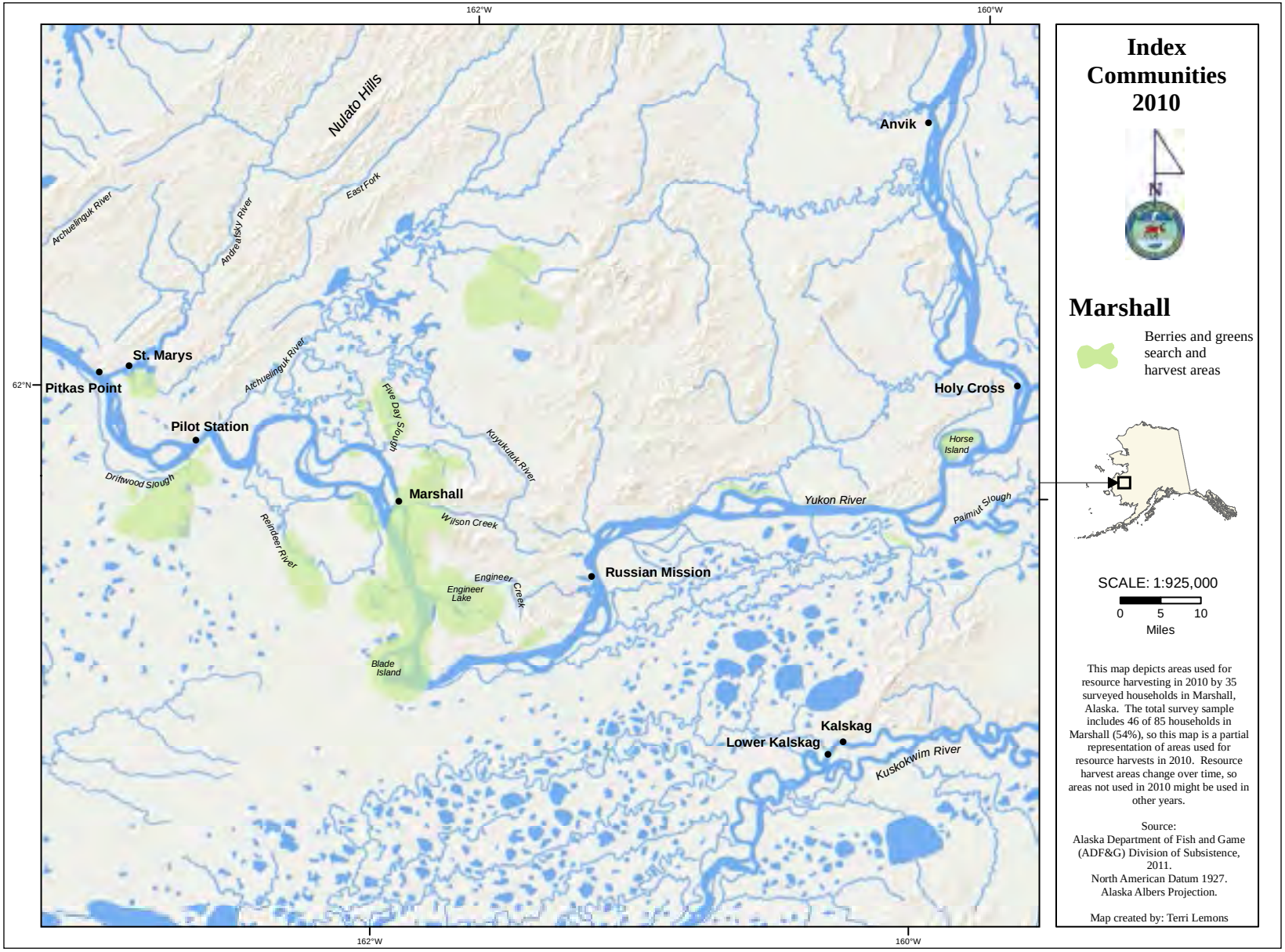
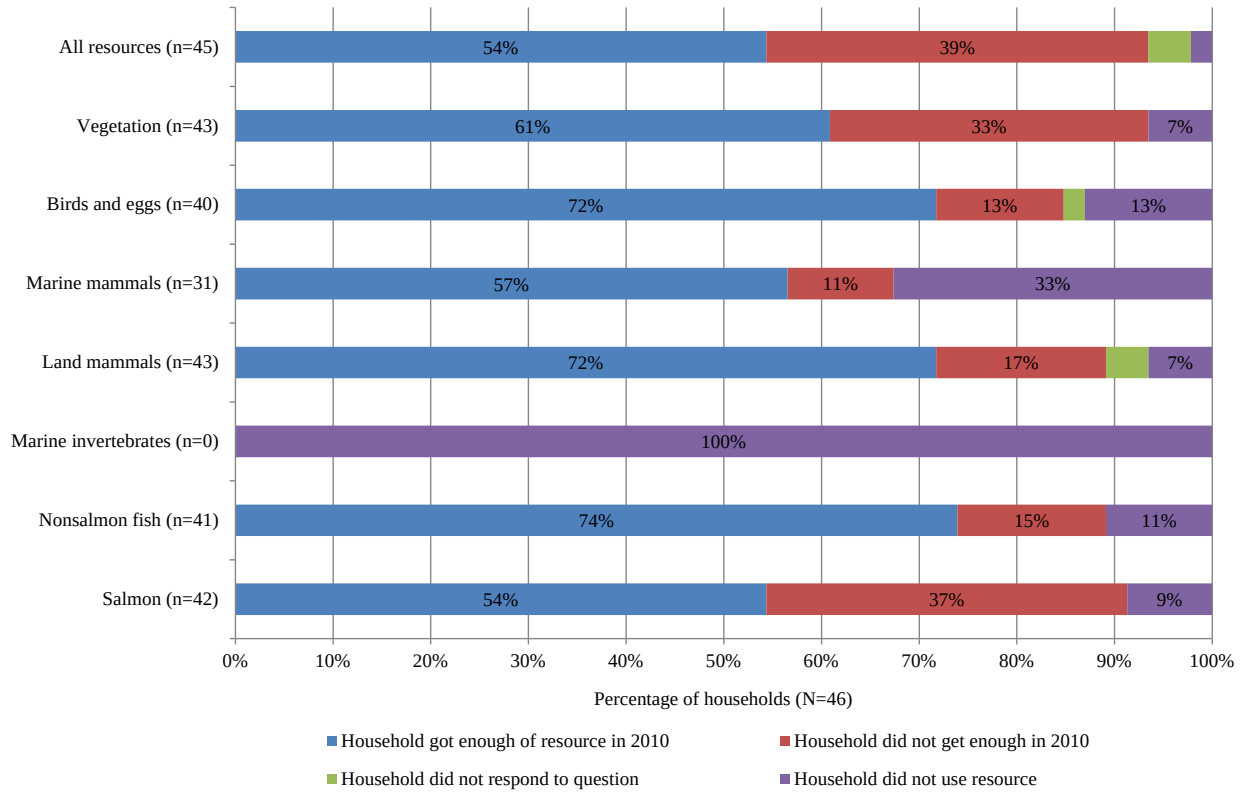


Figure 4-13.–Search and harvest areas, vegetation, Marshall, 2010.



Note n = number of households that either used the resource or indicated that they did not use because they did not get. Unlabeled percentages are less than 5%.

Figure 4-14.–Household harvest assessments, Marshall, 2010. Responses to the question: Did your household get enough ?

limiting harvest of Chinook salmon were the main reason they did not get enough of this resource, and the second-most common reason was the high price of fuel. For plants and berries, a majority of respondents who said they did not get enough also indicated wanting more of a particular species, with 17% reported wanting more blueberries. Reasons given for not getting enough berries varied among respondents and included personal or family reasons, a lack of availability of the resource, and minimal harvesting effort. Marine mammals as a resource category also had fewer households responding that they got enough (57%), although a significantly higher number of households reported not using the resource (33%) and only 11% reported that they did not get enough in 2010 (Figure 4-14).

The impacts to households that did not get enough varied by category. Of households that reported not getting enough salmon, 18% said this lack of resource availability had a severe impact on their household; 41% described this as having a major impact; 35% described the impact as being minor; and 6% reported this situation left no noticeable impact on the household (Table D4-8). The salmon resource category had the highest percentage of households reporting not getting enough supply, and the highest percentage of households reporting a “severe” impact. The impact of not having enough of a resource was expressed by Marshall residents for other resource categories. For land mammals, 17% reported that not having enough had impact levels of severe (13%), major (25%), and minor (50%). For berries and edible plants, 33% reported that not having enough had impact levels of severe (7%), major (33%), and minor (47%). For marine mammals, 16% of Marshall households reported that not having enough had impact levels of major (40%), minor (20%), and not noticeable (40%).

Only a portion of those who did not get enough subsistence foods reported doing things differently, and the most common adaptation was to use more store-bought foods (Table D4-9; Table D4-10). For the salmon resource category, 71% of households that did not get enough salmon responded by doing something

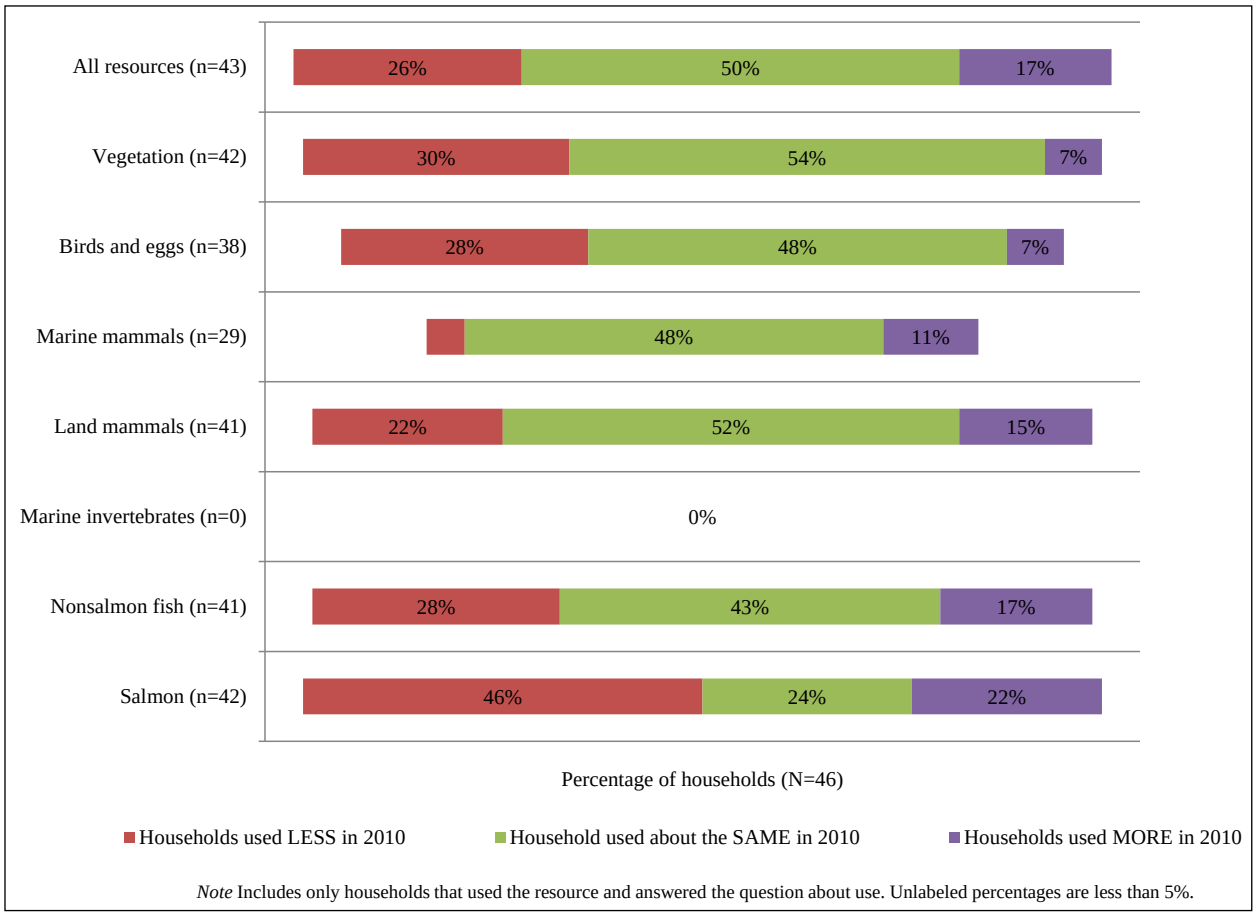


Figure 4-15.–Household use assessments, Marshall, 2010. Responses to the question: Did your household use less, more, or the same amount?

differently. These households replaced the resource with other subsistence foods (39%), used more store-bought food (31%), made do without (31%), or obtained public assistance for food (15%). For the berries and greens resource category, 60% of households that did not get enough did something differently. They responded by purchasing more store-bought food (55%) or coping without an alternative (18%). For the land mammals category, 88% of households responded by doing something differently. They purchased more store-bought food (67%) or replaced the resource with other subsistence food (33%). For the marine mammals category, 60% of households that did not get enough did something differently; all of these responded by purchasing more store-bought food (100%). For nonsalmon fish resources, 57% of households that did not get enough responded by purchasing more store-bought foods (100%).

Corresponding to these responses, salmon and vegetation were the categories with the highest percentage of respondents saying that they used less in 2010 than in previous years (Figure 4-15). Forty-six percent of Marshall households said they used less salmon and 30% said they used less berries and greens. For households reporting use that had remained about the same as previous years, the category with the highest percentage was berries and greens (54%): 7% of households reported using more of this resource. In contrast, only 24% of households reported using the same amount of salmon, although 22% of households indicated they used more. Behind berries and greens, the land mammals category was second (52%) for reportedly being used at about the same rate as in previous years; meanwhile, 22% of respondents indicated they used less of this resource compared to previous years. An equal percentage of respondents (28%) said they used fewer birds and eggs and nonsalmon fish in 2010. Respondents answers to reasons that they used less or more of a resource can be found in Table D4-11 and Table D4-12.

Table 4-8.–Estimated earned and other income, Marshall, 2010.

Income source	Number of people	Number of households	Total for community	Mean per household[a]	Percentage of total[b]
Earned income					
Local government	55.4	48.9	$909,720	$10,703	30.5%
Services	14.8	17.0	$378,719	$4,456	12.7%
Retail trade	11.1	10.6	$292,683	$3,443	9.8%
Construction	7.4	8.5	$244,776	$2,880	8.2%
Agriculture, forestry, and fishing	14.8	17.0	$76,778	$903	2.6%
Other employment	1.8	2.1	$63,994	$753	2.1%
Federal government	5.5	6.4	$29,437	$346	1.0%
Transportation, communications, and utilities	5.5	6.4	$26,709	$314	0.9%
State government	1.8	2.1	$1,920	$23	0.1%
Earned income subtotal	**111.2**	**63.8**	**$2,024,735**	**$23,820**	**67.9%**
Other income					
Alaska Permanent Fund dividend		70.2	$360,173	$4,237	12.1%
Food stamps		33.3	$175,785	$2,068	5.9%
Social Security		16.6	$166,060	$1,954	5.6%
Pension/retirement		12.9	$101,763	$1,197	3.4%
Unemployment		14.8	$37,792	$445	1.3%
Adult public assistance		9.2	$19,107	$225	0.6%
CITGO fuel voucher		38.8	$18,008	$212	0.6%
Energy assistance		29.6	$17,130	$202	0.6%
Alaska Longevity Bonus		9.2	$15,623	$184	0.5%
Meeting honoraria		12.9	$14,829	$174	0.5%
Native corporation dividend		35.1	$11,583	$136	0.4%
Disability		3.7	$10,407	$122	0.3%
Supplemental Security Income		1.8	$5,987	$70	0.2%
Veterans assistance		1.8	$2,727	$32	0.1%
Worker's compensation/insurance		0.0	$0	$0	0.0%
Child support		0.0	$0	$0	0.0%
Other		0.0	$0	$0	0.0%
Foster care		0.0	$0	$0	0.0%
Other income subtotal		**70.2**	**$956,974**	**$11,259**	**32.1%**
Community income total			**$2,981,709**	**$35,079**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2011

a. Means are based on all households in the community, not the number of households in the income category.

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

Jobs and Income

Respondents were asked both about sources of earned income (jobs held and wages earned by all household members age 16 years old and older) and other sources of income (Alaska Permanent Fund dividend, Social Security, public assistance, etc.). For 2010, households in Marshall earned or received an estimated $2,981,709, of which $2,024,735 (68%) was earned income through wage employment and $956,974 (32%) was income derived from other sources (Table 4-8).

Figure 4-16 shows a breakdown of the top 10 estimated sources of income in Marshall by percentage. Local government jobs were clearly the primary source of income; the category includes teachers, administrators, and laborers. Overall, this category accounted for 30% of all income for the community; its revenue totaled $909,720 in 2010 (Table 4-8; Figure 4-16). Services, including health and social services, provided the next highest source of income for residents of Marshall, contributing $378,719 (13%); the Alaska Permanent Fund dividend and retail trade also supplied a significant amount of income, $360,173 (12%) and $292,683 (10%), respectively. The average household income in Marshall from all sources was $35,079 in 2010, with a per capita income of $8,718.

Employment opportunities in Marshall, as in other rural communities in Alaska, differ with the time of year. In 2010, 111 (50%) people over the age of 16 were employed (Table C1-5). Of those residents, 44% were employed year-round. On average, households in Marshall held 2.4 jobs. The maximum number of jobs

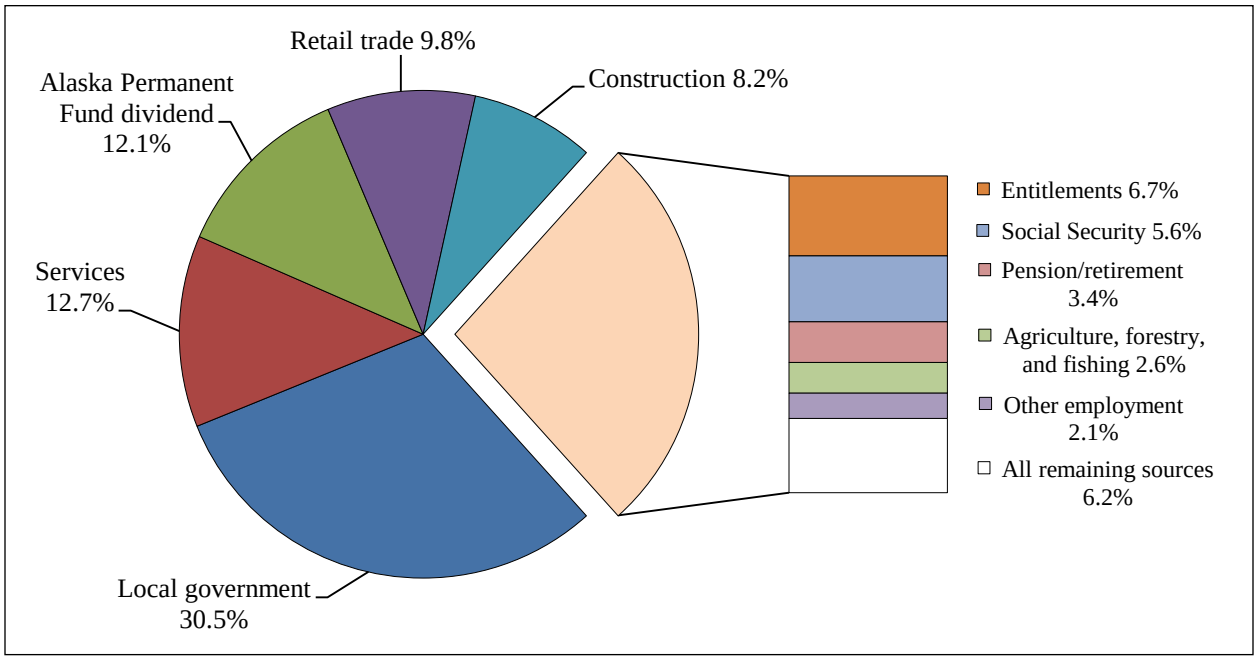


Figure 4-16.–Top 10 income sources, ranked by estimated amount, Marshall, 2010.

held by 1 household was 7. Although employed adults averaged more than one job during the calendar year, the mean number of weeks employed was only 36; this statistic indicates a prevalence of seasonal employment. More information on job schedules can be found in Table D4-13.

Food Security

Respondents were asked a short series of questions intended to assess their household's food security; that is, "access by all people at all times to enough food for an active, healthy life" (Nord et al. 2009:2). The food security questions were modeled on questions developed by the U.S. Department of Agriculture (USDA) and modified by ADF&G to account for differences in access to subsistence and store-bought foods. The questions are ordered to ask about increasing levels of food insecurity. The survey questions and Marshall residents' responses are summarized in Figure 4-17.

More than one-half of responding households in Marshall (52%) reported that they could not get the kinds of food they wanted to because of a lack of resources; in other words, households did not have what they needed to hunt, fish, gather, or buy food. Nearly one-half of Marshall households (48%) further reported that either subsistence or store-bought foods did not last and they could not get more.

Based on their responses to these questions, households were generally categorized as being food secure or food insecure following a USDA protocol (Bickel et al. 2000). Food secure households were further divided into 2 subcategories: high or marginal food security. Food insecure households were likewise broken down into 2 subcategories: low or very low food security. Households with high food security did not report any problems or limitations in accessing the food they needed. Households categorized as having marginal food security were those that reported 1 or 2 instances of problems and limitations in accessing food, typically anxiety over food sufficiency and shortages. Marginally food secure households gave little indication that diets among members had been altered or food intake reduced in response to these problems and limitations. Households categorized as low food security were those that reported that members experienced reduced quality, variety, or desirability of their diet, but did not report lowered food intake in response to problems and limitations in accessing food. Those households characterized as having very low food security were those that reported multiple instances of disrupted eating patterns and reduction of food intake.[4]

4. U.S. Department of Agriculture (USDA), 2014. "Definitions of Food Security." Accessed December 2, 2014. http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us.aspx

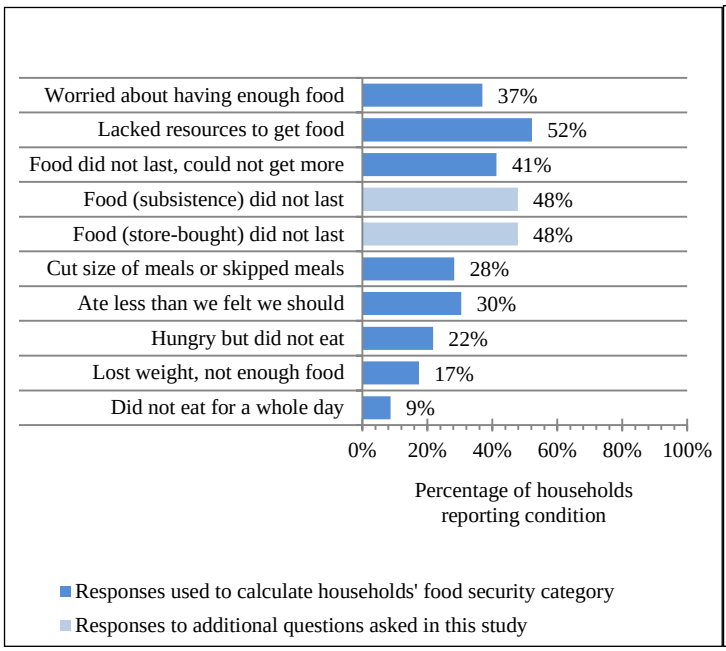


Figure 4-17.–Food insecure conditions, Marshall, 2010.

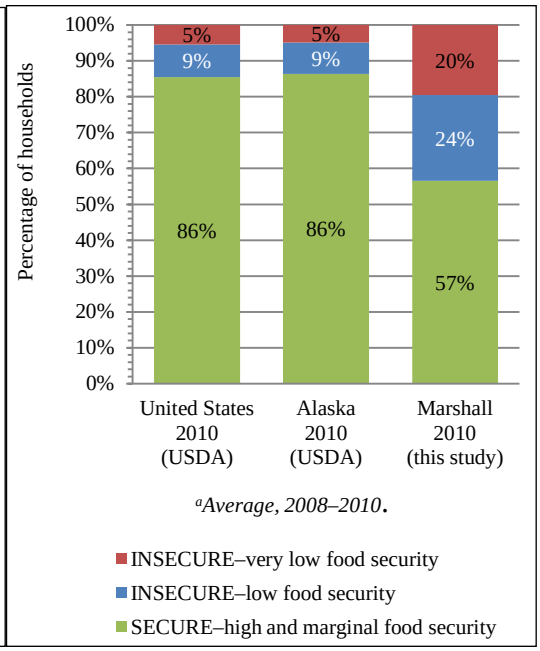


Figure 4-18.–Food security categories, Marshall, 2010.

Of the households that answered the questions, 57% were food secure, and 44% were considered food insecure (24% had low food security and 20% had very low food security (Figure 4-18). These percentages stand in contrast to the USDA figures for Alaska in 2010, in which 86% of the population had high or marginal food security, 9% had low food security, and 5% had very low food security. The Alaska figures echo those of the United States at large, with the USDA reporting 86% of the population had high or marginal food security, 9% had low food security, and 5% had very low food security. Marshall food security percentages fall well below the state and national figures.

Incidences of food insecurity appear to have a seasonal aspect. When households reported a food insecure condition (e.g. “ate less than we thought we should”), they were also asked about the timeframe in which this condition occurred. Food insecure conditions were reported least often in September and October for the “low” food security households; “very low” food security households reported fewer food insecure conditions in February and May (Figure 4-19). For households in the “low” food security category, instances of food insecurity gradually decreased from January to September and began to increase in November and December. Households with “very low” food security reported a similar pattern, although food insecure conditions did increase in June and July after a slight decline through the spring months. Households in every category reported the most food insecure conditions in January.

The gradual decrease in reported food insecure conditions throughout the spring and into September for those households characterized as having “low” food security may be due to a heavy harvest effort and the harvest of subsistence foods by many households, particularly fish species and moose; subsistence resources may be more available to many households as spring progresses into the summer months thus augmenting use of store-bought goods. However, households with “very low” food security reported an increase in food insecurity conditions in June and July. It is possible that the most impoverished households did not have the financial resources to engage in heavy harvest of salmon and other fish during this timeframe. The rapid increase of food insecure conditions in the fall and winter months for both “low” and “very low” food security households is not explained by the availability of food alone: one explanation may be that the fall season brings the onset of cooler temperatures and associated increased heating expenses that reduce monetary resources for purchasing store-bought foods during the coldest months of the year.

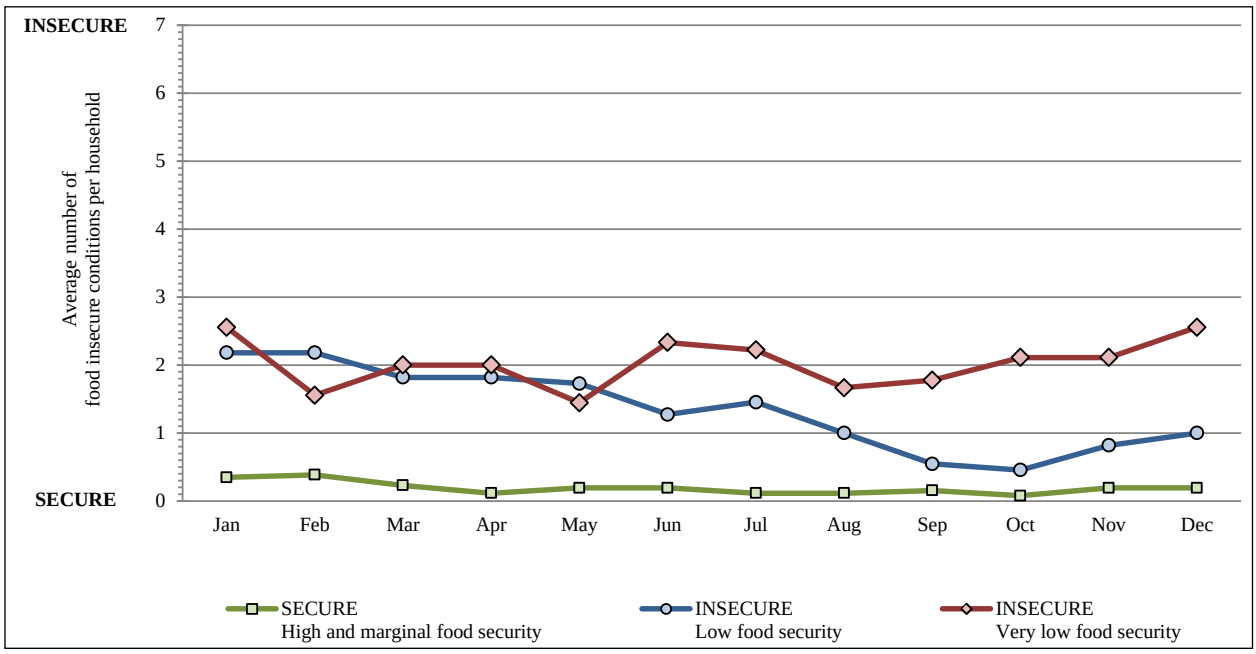


Figure 4-19.–Food insecure conditions by month and household category, Marshall, 2010.

Wild Food Networks

Many households in rural Alaska are active in harvesting and processing wild resources, and few are without connections to networks of sharing, barter, and trade, which serve to distribute subsistence foods across the state. Networks between communities, especially those which are predominately Alaska Native, are common (Wolfe 1981). These networks also occur within individual communities and illustrate sharing connections between households. On the Yukon–Kuskokwim Delta, as in other places in Alaska, traditional modes of sharing and exchange are a feature of local communities, and this redistribution of wild resources occurs through lines of kinship and other social connections (Wolfe 1981). Cooperation between households also occurs in joint harvesting and processing ventures, which are often organized between related family units.

Figure 4-20 depicts the cooperative pattern of harvesting and processing activities between respondent households in Marshall. Respondents were asked who harvested and processed each resource their household used during the study year. However, only unidirectional relationships were measured: the network diagram cannot imply patterns of reciprocity. Likewise, Figure 4-20 does not illustrate other relationships or services common in subsistence sharing networks such as providing cash to participate in harvesting, or receiving food from an intermediary rather than a harvester or processor.

In Marshall in 2010, 33% of households harvested 69% of subsistence resources, suggesting that there was a core group of households specializing in the harvesting of wild resources who distributed the resources they harvested throughout the community. In Figure 4-20, these specialized harvesting households are depicted by the larger nodes. Magdanz et al. (2002) showed that the age of heads of households has a positive correlation with harvesting levels. The highest producers generally are active elder households, mature couples, and single active males.

There were several high-harvesting households in Marshall during the study year, indicated by the large nodes in the diagram. The highest producing household during the study was headed by a single mature male: this family received resources from more than 4 households and helped to support two elder households. A large majority of the other high-producing households were mature couples, and all had multiple household members. Household size and maturity tend to be statistically significant factors in high-harvesting levels as discussed by Magdanz et al. (2002): these households have a number of members which ensure a large

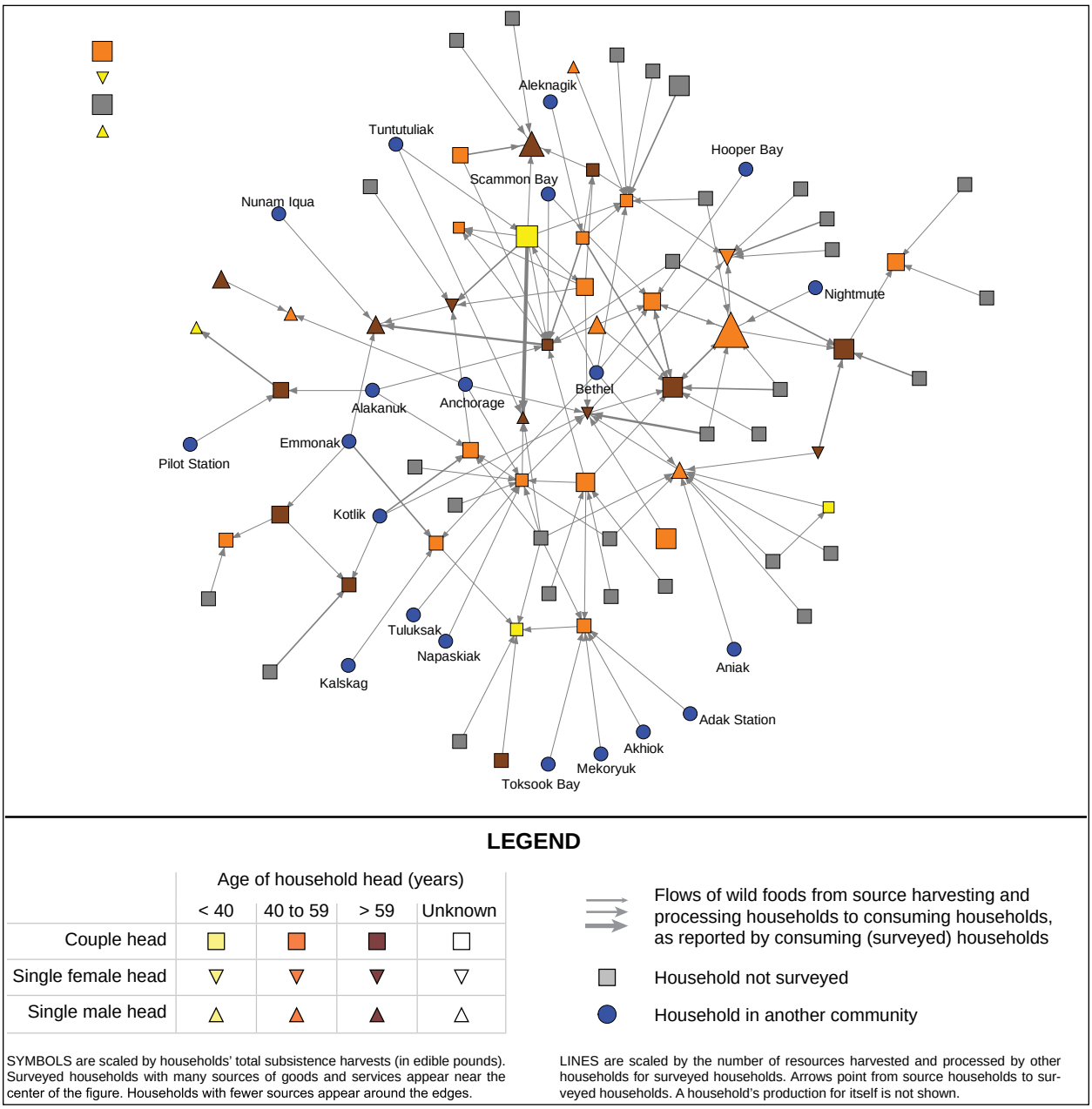


Figure 4-20.–Wild food harvesting and processing network, Marshall, 2010.

base of subsistence labor. A number of elder households, indicated by the brown node color, are located in the center of the diagram. These households received subsistence resources from at least 5 separate sources in Marshall or from other communities, and their placement in the diagram suggests that they are very well connected in the sharing network. In Figure 4-20, the thickness of the lines connecting households denotes the number of resources flowing into a household; thicker lines indicate more resources. Only 4 households reported no ties to other Marshall households; these isolates were not a part of the sharing web which characterizes the community.

Marshall households also reported receiving subsistence resources from households in more than 20 other communities, including Bethel, Scammon Bay, Anchorage, and Tuntutuliak.

Comparisons with Prior Results

Although this was the first comprehensive subsistence harvest survey conducted by ADF&G in Marshall, a number of previous studies have included Marshall in their subsistence surveys. ADF&G completed subsistence salmon surveys in the community in most years from1960–2010, though only survey data since 1988 are comparable with this survey. The U.S. Fish and Wildlife Service has also produced a 2009–2010 large mammal subsistence harvest survey in 9 lower Yukon communities, including Marshall (Weekley et al. 2011). Migratory bird surveys were conducted by ADF&G in 2004 through 2008; Marshall was surveyed 4 out of the 5 years of the project. This section compares current results from the comprehensive survey to previous studies.

Figure 4-21 portrays the total harvest of 4 species of salmon from 2000–2010 (Borba and Hamner 1998; Busher et al. 2009; Jallen et al. 2012). Summer chum salmon, fall chum salmon, and coho salmon harvests over the last decade, though not without fluctuation, have largely remained stable. The linear trend for Chinook salmon harvests, in contrast, shows a decline. The unusually low harvest numbers in 2009 may have skewed the trend line, however. The decline in harvests of Chinook salmon portrayed in Figure 4-21 reflects the overall decline of the Yukon River Chinook salmon total run size and increasing restrictions on subsistence harvests. This trend began in 1998, and Chinook salmon returns since 2007 have been largely lower than expected (Howard et al. 2009).

Chinook salmon harvests gradually declined between 1998 and 2010: the average number of Chinook salmon caught by Marshall residents from 2001 to 2005 was 2,528 individuals, decreasing to 2,209 individuals on average from 2006 to 2010 (Jallen et al. 2012). For the subsistence fishery overall, harvests were not within amounts reasonably necessary for subsistence in 2000, 2002, or 2008–2010 (Howard et al. 2009; JTC 2010). Although harvests in 2008 were only slightly below amounts reasonably necessary for subsistence, escapement goals were not met for Canada-bound Chinook salmon.

The fact that escapement goals were not met for Chinook salmon in 2008 led to unprecedented restrictions on subsistence fishing in 2009: subsistence fishing time was reduced to approximately one-half the regularly scheduled fishing time and subsistence fishing was closed for one week to protect the first pulse of Chinook salmon throughout the Alaska portion of the Yukon River (Howard et al. 2009). Managers also assessed fall chum runs as weak on the Yukon River in 2009, which led to reductions in subsistence fishing times in order to provide for escapement. Fishers' reports inseason suggested that most subsistence fishing households on the Yukon River did not meet their subsistence needs for salmon in 2009 (JTC 2010). These factors account for the particularly low harvest numbers in 2009 for both Chinook salmon and fall chum salmon in Marshall. Residents of the community harvested only 1,201 Chinook salmon in that year, 845 fewer fish than the average harvest from 1990–1999 (2,046) (Borba and Hamner 1998; Busher et al. 2009). Fall chum salmon numbers were also dramatically lower for Marshall households in 2009, with only 190 individuals harvested; in 2008, households harvested 789 fall chum salmon. Although the 2009 season had dramatically different harvest numbers largely due to management requirements and the accompanying restrictions on subsistence fishing, other fluctuations in harvests throughout the decade may have been influenced by a number of factors. Changing survey conditions and different levels of successful contacts with households can impact survey results, and fishing activity by residents can also vary with employment concerns, financial considerations, and environmental factors. Upon the request of the State of Alaska Legislature, ADF&G has collected further information regarding the socioeconomic effects of poor salmon returns on Marshall and 4 other communities representing the upper, middle, and lower Yukon River (Brown et al. 2015).

In 2010, both comprehensive survey and postseason subsistence salmon surveys indicated higher harvests of Chinook salmon compared to the significantly lower harvests in 2009. Although there were differences in reported harvests of all species of salmon between this survey and postseason salmon surveys in 2010, the largest variance was reported in fall chum salmon and coho salmon harvests. In postseason salmon surveys, harvests of 56 fall chum salmon and 33 coho salmon were estimated (Jallen et al. 2012); this comprehensive survey estimated harvests of 1,726 (± 42%) fall chum salmon and 846 (± 46%) coho salmon. Taking into account confidence limits, this still indicates a sizeable difference in harvest levels. This difference may be

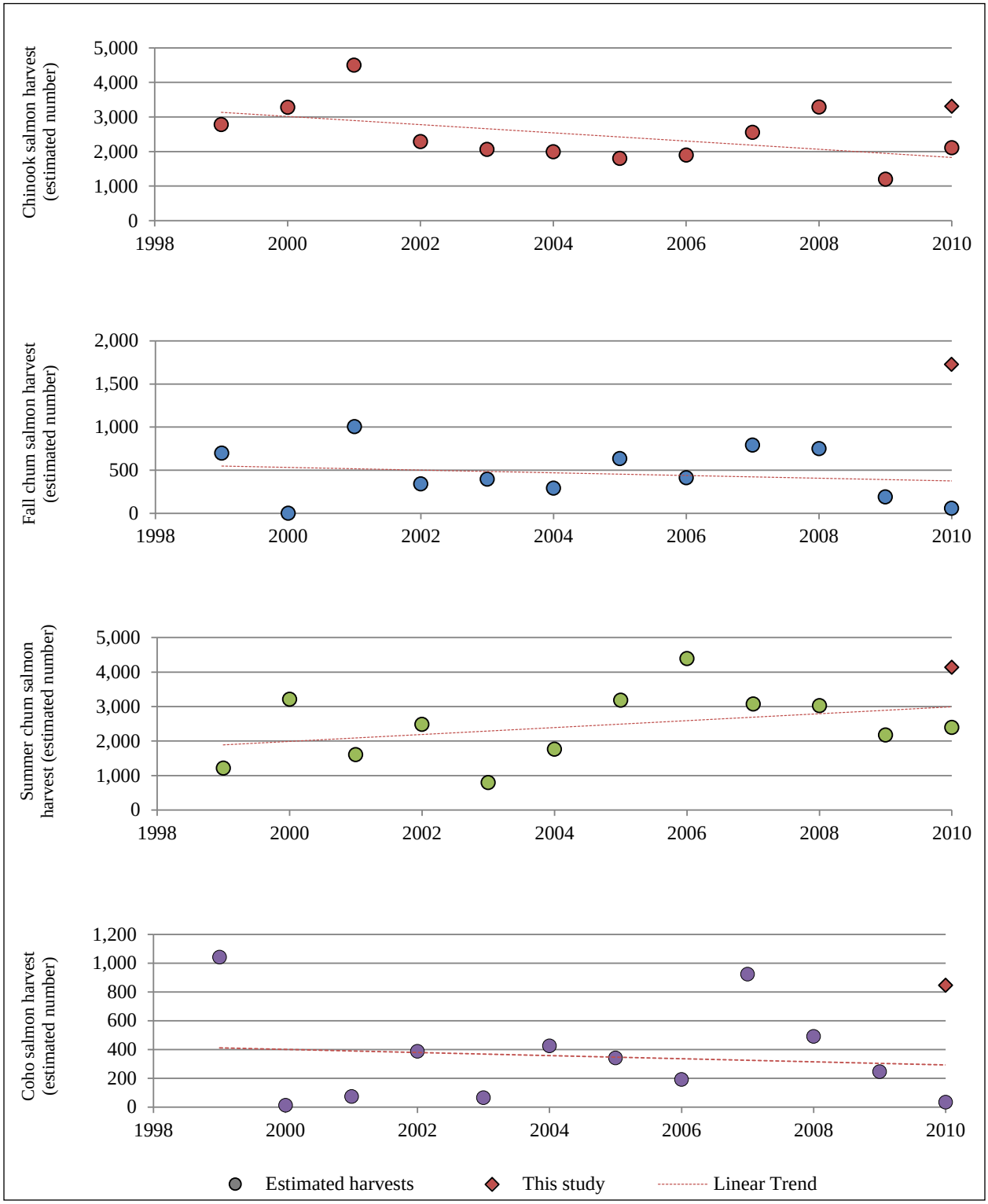


Figure 4-21.–Estimated salmon harvests in numbers of fish, Marshall, 1998–2010.

due in part to the timing of postseason subsistence salmon surveys since households may be continuing to fish for fall chum salmon and coho salmon during and after the survey period. Differences in this survey's results and postseason surveys may also be due to different sampling strategies and other methodological differences.

For the category of large land mammals, one point of comparison exists in the 2009–2010 report of subsistence harvests of moose, caribou, muskoxen, bears, wolverines, and gray wolves in 9 lower Yukon communities (Weekley et al. 2011). This survey was similar in form to this baseline survey in that it collected information on hunter effort, use of large land mammals, and networks of sharing these resources between households. The timeframe of the lower Yukon study was from February 2009 through January 2010. For moose, the lower Yukon survey estimated that Marshall residents harvested 44 individuals, a similar figure to the estimate of 43 moose harvested by the community in 2010. For caribou, the 1ower Yukon survey estimated that community residents harvested 6, which mirrors the 6 individuals that this study estimated for 2010. Similar harvest numbers of black bears were indicated in both studies: the large land mammal survey estimated a harvest of 12 individuals, and this comprehensive survey estimated a harvest of 9 black bears taken by Marshall residents. Additionally, both studies indicated no use or harvest of brown bears during the respective study years. The 2009–2010 large land mammal survey estimated a harvest of 2 muskoxen by Marshall residents, while this comprehensive baseline did not inquire about muskox harvests in 2010. Estimated harvests of wolverines were significantly lower in the lower Yukon survey; that study estimated that 2 individuals were harvested during 2009–2010 in comparison with the 11 individuals estimated in this 2010 study. Gray wolf harvest levels were also lower in the lower Yukon big game survey: that study estimated that Marshall residents harvested 9 individuals in comparison to the 17 individuals estimated for this study. The discrepancy between reported harvests of wolves and wolverines between the 2 studies may be due to differences in methodology and sampling in the respective surveys. Because harvests for these species are lower and often undertaken by households that specialize in the harvest of furbearers, not including a harvesting household within survey efforts could underestimate the harvest of these species.

The lower Yukon large mammal survey also estimated hunting effort, which offers a point of comparison to moose hunting effort estimated in this comprehensive baseline study. Similar levels of harvest reported in studies undertaken in different years do not necessarily indicate a similar level of hunter effort. Hunters may increase effort during periods of low moose abundance, and less hunter effort may be required in the presence of an abundant moose population. The moose population in the lower Yukon River drainage increased from a minimal population in the early 1980s to an estimated population of approximately 3,000 moose, based on 2009 composition surveys (Weekley et al. 2011). The average time necessary to harvest a moose was similar in both this year's baseline study and the lower Yukon survey undertaken the year before: hunters took an average of 12 days to successfully harvest this resource in each study (Table C1-4; Weekley et al. 2011). The lower Yukon survey and this study offer a further point of comparison in harvest success rates. In this comprehensive study, 35 hunters out of 125 (28%) were successful in their harvesting efforts; while 50 out of 94 hunters (53%) reported success in the lower Yukon in 2009–2010.

Klein (1966) offers annual estimates of waterfowl usage by communities on the Yukon–Kuskokwim Delta based on data gathered by the Alaska Cooperative Wildlife Research Unit from April to June 1964 and February 1965. The methods used for the survey in the 1960s were quite different from the approach taken by the comprehensive study in 2010. In the former, researchers acquired harvest data at a single community meeting and then estimated the total harvest of ducks and geese. It is difficult to draw any concrete conclusions from comparison of contemporary results with data gathered in this 1964–1965 study, because the methods used between the two studies differed widely. Likewise, the number of individuals living in Marshall has increased significantly: the U.S. Census recorded 166 residents living in the community in 1960 according to the U.S. Census, while this study estimates a population of 342 people in 2010. Despite this, it is interesting to note some aspects of similarity and difference between 2 reports from very different time periods.

In Klein's study, Marshall hunters reported harvesting 2,720 total geese in the spring and fall. Hunters ranked different species as to relative importance: listed in order of importance were black brant, white-

fronted geese, and Canada geese. This study recorded no harvests of brant in 2010, despite importance of this species in the 1964–1965 study. White-fronted geese were the most harvested goose by Marshall residents during the 2010 study year. Total harvest numbers for geese in 2010 were estimated to be 931 birds, a 66% decrease from the 1964–1965 study year.

The 1964–1965 study also recorded harvests of ducks by Marshall households, indicating that 480 birds were taken in the fall and spring. The two most important duck species for the community, according to Klein's report, were mallards and northern pintails. Harvest numbers for only mallards and northern pintails for the 2010 study year were estimated to be 446 birds, which is similar to the 1964–1965 figure; however, it is unclear from the 1964–1965 data whether the total harvest was composed solely of mallards and northern pintails, or if the total included other species. For the 2010 comprehensive survey, Marshall residents harvested an estimated 730 ducks. The 1964–1965 survey also recorded 128 swans harvested by Marshall residents over the course of the year; in 2010, the community harvested an estimated 187 swans. Although the differences in harvest levels appear similar, the population of Marshall has increased significantly since the 1964–1965 study. This survey estimates a 2010 population of 348; in contrast, the authors of the earlier study estimated the 1963 population of Marshall to be 201. Per capita harvests provide a more meaningful comparison. Using this metric, duck harvests appear to be somewhat similar across the studies: in 2010, the per capita harvest of ducks was 1.8 lb per individual, and the per capita harvest in 1964–1965 was 2 lb. Likewise, per capita harvests of swans and cranes were comparable across the two studies—in 2010, the per capita harvests of each species were 5.5 lb and 0.4 lb, respectively, while in 1964–1965 they were 6.4 lb and 0.4 lb, respectively. Goose per capita harvests, however, were vastly different between the two studies. The per capita harvest of all species of geese in 2010 was 5 lb per individual, but in 1964–1965 this figure was 24 lb.

Migratory bird harvests have been estimated annually by the Alaska Migratory Bird Co-Management Council (AMBCC) since 2004, and results are available from the years 2004 to 2009 (Naves 2011). These harvests, however, are reported on the subregional level, and community specific figures are not available. Marshall was surveyed every year except 2006 and 2009 for the 6 years of the study. Although Marshall's specific harvest of migratory birds cannot be readily distinguished from the AMBCC findings, the lower Yukon region, of which Marshall is a part, harvested fewer birds in 2007 and 2008. In 2009, however, harvests were higher for the region compared to the lower numbers noted the previous 2 years.

Over the years, Marshall residents have faced changing social and economic circumstances, as well as fluctuations to resource populations that are vitally important for residents. The population crash of Chinook salmon in the Yukon River in 2009 and the poor runs leading up to it was one such challenge. Respondent comments on this study's surveys indicate that this challenge is ongoing and had negatively impacted salmon harvests in 2010. The harvest of large land mammals, such as moose, are also prone to fluctuation due to factors including distance of animal populations from the community, animal population numbers, availability of financial and equipment resources, and competition with other hunters. As patterns of sharing discussed in this study illustrate, subsistence resources are distributed throughout the community to those who were not able to harvest wild foods themselves. The importance of sharing with others may be a key adaptation during times of resource fluctuation and scarcity. Overall, the continued high use of subsistence resources in Marshall further underlines the importance of wild foods to the residents who depend upon them.

5. COMPREHENSIVE SURVEY RESULTS NULATO, 2010

Prepared by Brittany Retherford and Caroline Brown

In April 2011, ADF&G Division of Subsistence staff surveyed 84 of 90 households (93%) in the community of Nulato (Table 2-3). Expanding for 6 unsurveyed households, Nulato's estimated total harvest of wild foods between January and December 2010 was 62,140 lb (±6%) (Table 5-1). The average harvest per household was 690 lb; the average harvest per person was 239 lb.

Three species—moose, Chinook salmon, and coho salmon—contributed 72% to the total community harvest in 2010 (Figure 5-1). In terms of edible pounds, moose contributed more than any other single species to the total community harvest. In 2010, Nulato residents harvested an estimated 21,407 lb of moose, accounting for approximately 35% of the total community harvest of wild foods. Chinook salmon harvests accounted for a comparable percentage of 30% of the total community harvest with 18,878 lb.

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

Community Background

Nulato is a Koyukon Athabascan community located on the west bank of the Yukon River and nestled in the Nulato Hills east of the Nulato River (Plate 5-1). The community is about 35 miles west of Galena and fewer than 80 air miles east of Norton Sound. The Innoko National Wildlife Refuge is situated on the opposite bank of the Yukon River and includes the Kaiyuh Flats, the home of Koyukon Athabascans and a 289-square-mile floodplain consisting of a complex of streams, lakes, and wetlands. This area is referred to locally as "Kaiyuh" and is important for subsistence hunting, fishing, and other activities. The weather

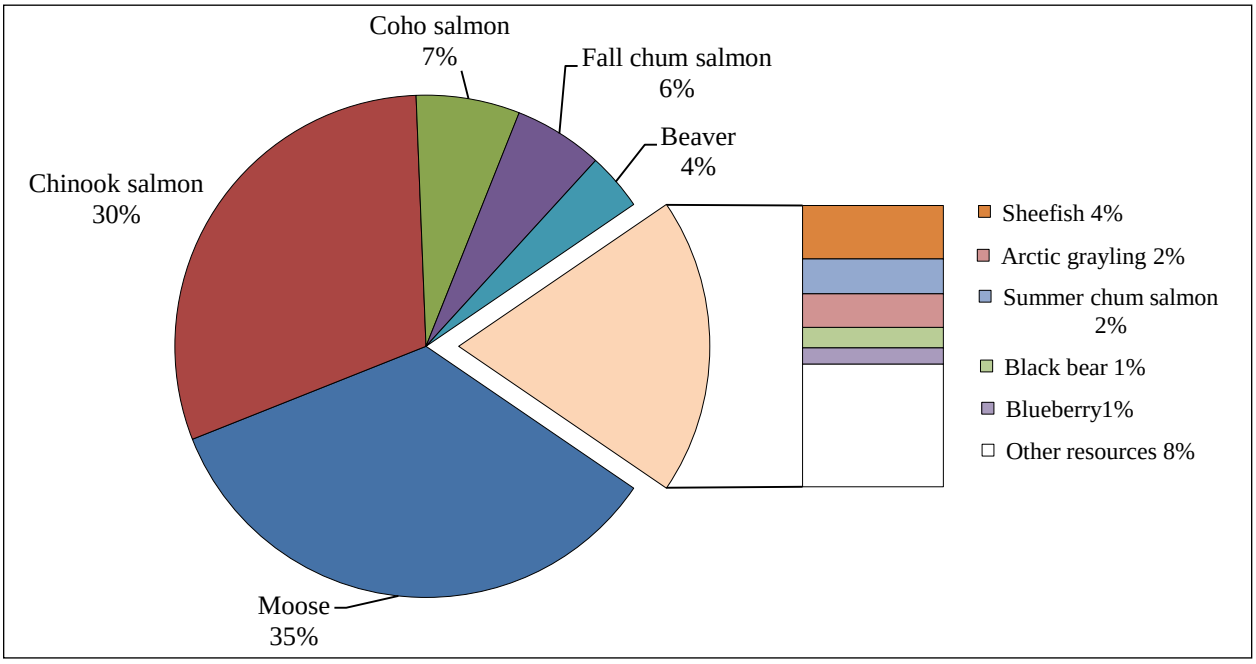


Figure 5-1.–Top 10 species harvested, ranked by estimated edible weight, Nulato, 2010.

Table 5-1.–Resource harvest and use characteristics, Nulato, 2010.

Characteristic	
Mean number of resources used per household	
Minimum	1
Maximum	58
95% confidence limit (±)	3.7%
Mean	14
Median	12
Mean number of resources attempted to harvest per household	
Minimum	0
Maximum	32
95% confidence limit (±)	4.3%
Mean	9
Median	8
Mean number of resources harvested per household	
Minimum	0
Maximum	29
95% confidence limit (±)	4.1%
Mean	8
Median	7
Mean number of resources received per household	
Minimum	0
Maximum	40
95% confidence limit (±)	6.1%
Mean	6
Median	5
Mean number of resources given away per household	
Minimum	0
Maximum	34
95% confidence limit (±)	6.7%
Mean	4
Median	3
Household harvest (lb)	
Minimum	0.0
Maximum	3,015.1
Mean	690.4
Median	540.0
Total harvest weight (lb)	62,140.2
Community per capita harvest (lb)	238.7
Percentage using any resource	100%
Percentage attempting to harvest any resource	92%
Percentage harvesting any resource	90%
Percentage receiving any resource	92%
Percentage giving away any resource	81%
Number of households in sample	84
Number of resources available	137

Source ADF&G Division of Subsistence household surveys, 2011.

warms to above 70˚ F in the summer and drops to lows of -40˚ F in winter.[1] The landscape around Nulato is typical of Alaska's Interior and is dominated by spruce, birch, and aspen forest, along with expanses of alder and muskeg.

Several studies have explored various facets of cultural and historical events and activities in Nulato, including extensive documentation of the importance of subsistence foods and subsistence activities in the everyday life of Nulato residents. Literature about Koyukon people includes works of Jules Jetté, a Jesuit missionary who lived in the Koyukon area in the early 1900s (1908, 1911, 1913), as well as de Laguna (1947), Clark (1981), Huntington (1993), Sullivan (1942), Robert (1984), and VanStone (1974). In 1966, anthropologist William John Loyens published an ethnography about the changing culture of Nulato (Loyens 1966).

Nulato has long been important as a trading or meeting place and as a fishing area. It was established as a Russian trading post in 1838 by Pëtr Vasil'evich Malakhov of the Russian-American Company (Clark 1981:584). Nulato was also historically a summer fish camp, as the meaning of its name in Athabascan language connotes: Nulato, or "Noolaaghadoh," means "the main place to catch dog salmon in the summertime" (Joe 1987; Loyens 1966:20). Nulato was surrounded by fur-rich areas and historically used as a meeting area for trading between Interior Athabascans and Iñupiaq Eskimos from the Kobuk area of the Seward Peninsula, thus making it central in the Interior fur trade (Joe 1987; Loyens 1966; Moncrieff and Klein 2003). Prior to Malakhov's arrival, Lower Koyukon Athabascans had attempted to keep a portage route between Kaltag and Unalakleet hidden from Russian fur traders, but to no avail. This local route had already been widely known by area residents and used to funnel items such as western clothing, iron pots and kettles, glass beads, and tobacco to the Nulato area prior to Russian contact (Loyens 1966:9).

The establishment of a trading post increased competition among Lower Koyukon groups for control over a coastal-to-interior trading route for manufactured items and furs. Miranda Wright identified 3 groups or "families" in the Lower Koyukon at the time, which were organized by the geographical area they predominantly inhabited: the Kaiyuh Flats group, the Kaltag Portage group, and the Koyukuk River group.[2] Historically, the Koyukuk River group controlled a route from Kotzebue to the Interior via the Koyukuk River, and the Kaltag Portage group controlled the route between Kaltag and Unalakleet. The Kaiyuh Flats group had trade and family relationships with both groups and used the Nulato area as a summer fish camp. However, it was the people of the Kaltag Portage group who began moving to the Russian fur trade fort in Nulato during the 1840s, working primarily as traders or middlemen. In 1851, a series of raids between Lower Koyukon groups culminated in a large massacre at Nulato. Some sources say as many as 100 people were killed (Joe 1987; Loyens 1966, Wright 1995). Motives behind the massacre have been debated by scholars, but the predominant views were described by Loyens (1966) and Wright (1995). Loyens (1966) attributed the attack to a trade rivalry: the Koyukuk River group targeted the Kaltag Portage group who were living at the Nulato trading post. Wright described the motivating cause of the massacre as a "shaman's war" between the powerful shamans of those same 2 groups (Wright 1995). However, it is possible that those 2 perspectives are related.

After the United States acquired Alaska from Russia in 1867, some Russian traders continued to live in the middle Yukon and were joined by a new population: missionaries and gold miners. Meanwhile, semi-nomadic Koyukon Athabascans of the area adapted to changes by adopting a mixed cash-subsistence economy characterized by seasonal cycles. In 1884, a gold rush along the Yukon River heightened activity throughout the river drainage and brought with it more people, new diseases, and an increased presence of missionaries. In 1887, Catholic missionaries established a mission school and Our Lady of Snows Roman Catholic Church, precursors to what would become a constant and influential church presence. At the turn of the 20th century, steamboat traffic along the Yukon River peaked, with 2 boats per day stopping in

1. 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 10, 2014. http://commerce.alaska.gov/cra/DCRAExternal/community

2. Wright, M.H. The last great Indian war (Nulato 1851). Unpublished M.A. thesis, 1995. University of Alaska Fairbanks, Department of Anthropology, Fairbanks. Hereinafter referred to in text as (Wright 1995).

Brittany Retherford, ADF&G

Plate 5-1.–Nulato lies on the north bank of the Yukon River just north of the Innoko National Wildlife Refuge. This photo shows the old section of town, but most people live in the hills behind town and away from the threat of spring flooding.

Nulato to purchase firewood. In 1900, there was a widespread outbreak of measles which, combined with food shortages, reduced the area population by one-third. In the Nulato area alone, 66 people died (Loyens 1966:140). That summer and fall, most people were either ill or caring for the sick, and food became scarce, because people were unable to fish or put away food for winter (Loyens 1966:139–140). Residents of nearby settlements began moving to the village of Nulato to weather the difficult times and be closer to supplies available at the trading station and a health facility, established by the new Bureau of Education in 1907 (Loyens 1966:143). Lead mining activity in Galena and a constant demand for furs further spurred economic development of the area beginning in 1919.

The 1930s were hard times for Nulato residents and other residents of the Middle Yukon. This time period was characterized by additional epidemics of influenza and measles, combined with a sharp decline in the fur market. Job opportunities in the area did not become available until the 1940s, when the U.S. Air Force began constructing an airfield in Galena. Several families (especially younger ones) migrated from Nulato to Galena to take advantage of these opportunities (Loyens 1966:146). In the 1950s, compulsory school requirements tied families to the community for much of the year instead of traveling the land in pursuit of seasonal resources (Brown et al. 2010:59). This shift towards sedentarization was also supported by technology: gasoline engines began to be used in boats beginning in the 1920s, allowing people to live greater distances from traditional hunting and fishing areas. They began to live in settlements where they were closer to trading posts, schools, missions, and health care facilities (Loyens 1966:147). These changes did not diminish the importance of Kaiyuh to Nulato people, however. Many families continued to spend large portions of the spring, fall, and winter months at camps in Kaiyuh, returning to Nulato for holidays, church, family visits, to exchange furs for cash, and to resupply for their next camp (Brown et al. 2015; Brown et al. 2010:59).

Nulato was incorporated as a city in 1963. Local government in Nulato included a municipal government ("city") and a traditional village council. A devastating flood in 1979 prompted a decision to move the village from the bank of the Yukon River to the Nulato Hills about 2 miles away (Plate 5-1). This section of town was known as "uptown," and in 2010, the majority of residents lived here. Two stores, a washeteria, a post office, city office, tribal office, an armory, and teen and adult recreation centers were located in this part of town. In summer, some residents relocated to "old town" or "downtown" to be nearer to their smokehouses and fishing on the Yukon River. In 2010, old town still included the school, a second washeteria, the Catholic church, a community hall, and several houses (only a few of which are occupied year-round). Kaiyuh Flats could be reached in a day either via snowmachine (in winter) or by boat (in summer). Residents had cabins and Native allotments scattered throughout the network of sloughs and lakes that characterize Kaiyuh. During the 5 years preceding this study, low water in Kaiyuh Slough prevented many residents from traveling to the area during open water months unless they traveled down the Yukon River to the mouth of the Khotol River (locally referred to as "22 Mile Slough" because of its outlet 22 miles below Kaltag) into the Kaiyuh Flats. Because of the distance from Nulato and the fuel required to get there, this was a long and expensive route.

Seasonal Round

Traditionally, Nulato residents participated in a seasonal round of subsistence harvesting activities largely characterized by movement between the Yukon River and Kaiyuh Flats. This movement allowed residents to take advantage of the availability of the variety of resources that inhabit and grow in the region (Loyens 1966). They spent summers fishing on the Yukon River and traveled and camped in and around Kaiyuh for fall hunting and winter and spring trapping. In 2010, the seasonal round was similarly distinct between seasons, but the pattern of traveling on the land in pursuit of various resources had shifted to accommodate a community-based lifestyle. According to Loyens (1966), this shift actually enhanced and heightened some traditional modes of living because it increased access to camps such as summer fish camps on the Yukon River. The following description of the typical seasonal round focuses on present customs, but past practices are also mentioned to illustrate major shifts over time.

In 2010, salmon fishing in the Yukon River was one of the most important parts of the Nulato subsistence cycle. Salmon fishing typically began in June, after break-up, and with the arrival of salmon bound for upriver spawning grounds. Salmon fishing in May (and October) was highly dependent on Yukon River ice conditions. Chinook salmon and summer chum salmon were harvested in early summer (June and July), followed by coho salmon and fall chum salmon in late July and August. Fishers also commonly harvested whitefish species such as sheefish and broad whitefish in their driftnets and setnets during the summer months. Historically, people dispersed to family fish camps along the Yukon River for salmon harvesting-related activities, but in 2010, people based their operations out of Nulato. In 2010, 2 families maintained fish camps near Nulato. Fish camps had largely disappeared in Nulato following the collapse of the commercial chum salmon roe fishery in the 1990s. They were replaced by the seasonal occupation of cabins in old town near the bank of the Yukon River. Even households that did not seasonally relocate utilized smokehouses and other infrastructure in old town built for salmon harvesting activities. These buildings were typically shared by an extended family, comprising 2 or more households and including family members who may live in other parts of the state but return to Nulato during the summer salmon season to share the duties of harvesting salmon. Tasks could include fishing, mending nets, cutting fish, preserving, gathering wood, and cooking food for family members.

Though fishing was the primary focus during summer, households were also participating in other subsistence activities during this warm time of year. Berry picking was a popular activity, beginning with the harvest of ripened blueberries in July and followed by salmonberries, highbush cranberries, lowbush cranberries, and raspberries. Residents also harvested other plants, such as Hudson's Bay tea and wild rhubarb. Seasonal wage employment was also incorporated in the seasonal round of activities, including firefighting and commercial fishing jobs that could make subsistence activities more difficult to pursue but were important for injections of cash to fund subsistence activities.

Fall time, beginning in September, marked the start of a new focus of subsistence activities in Nulato. Nulato hunters traveled in small hunting parties to search the vast network of lakes and sloughs along the Yukon and Koyukuk rivers and in the Kaiyuh Flats for moose. Waterways at this time of year were still ice-free and navigable by motor boat. Often, hunters opportunistically harvested migratory birds or even a black bear while searching for moose. Nulato hunters historically engaged in the risky harvest practice of "denning" bears, or taking bears that have begun hibernation for winter. Poldine Carlo, a respected elder, recalled that when she was growing up, it was not uncommon for Nulato hunters to harvest 20 bears using this method, primarily in November (Carlo 1978:60).

In October and November, many Nulato fishers traveled the short distance to the Nulato River to harvest Arctic grayling, whitefish species, and Dolly Varden with rod and reel. This was both a social and solitary activity; some people who participated in this fishery would bring lunch or snacks such as dried meat and tea, build a fire on the bank of the river, and spend several hours trying to catch fish to freeze whole.

Traditionally, people would move to Kaiyuh Flats in the fall both to hunt and fish for resources that would help to ward off starvation during the cold and dark winter months (Loyens 1966). With the introduction of the Evinrude® motor to the area in the second decade of the 20th century, trapping became more lucrative for area residents (Loyens 1966:153). The increased mobility and increased ties to community life meant that Nulato people traveled between Kaiyuh and Nulato throughout the fall, winter, and spring months. Loyens explains:

> They would leave by boat to hunt and trap in the Kaiyuh region in October; they returned to Nulato by dog team in late November. They then spent December and part of January at Nulato celebrating the mortuary feast, attending the Christmas celebrations and visiting both at Kaltag and Koyukuk to assist at feasts for the dead. They would leave the village again in time for the beaver and muskrat season and return to Nulato, by boat, in time to prepare for the salmon fishing on the Yukon. (Loyens 1966:153)

The close relationship to Kaiyuh during the nonsummer months persisted through 2010. As will be shown in the "Wild Food Harvests and Uses" section below, trapping remained an important practice for many Nulato households. Marten were highly sought during November, with lesser effort in December, January, and February. Trappers and hunters also targeted beavers, snowshoe hares, lynx, weasels, gray wolves, and wolverines. Later, during the spring months beginning in April or May, residents harvested muskrats; hunting them was historically a popular activity that was referred to as "rat" hunting. Trapping muskrats was a source of income for Nulato residents during the 1930s and 1940s. At the time, 1 skin could sell for 50 to 60 cents, which was also the price of 1 pound of coffee (Yarber 1986:65). Springtime also brought variety to the available wild species. Beginning in April, hunters were harvesting migratory waterfowl that inhabited the vast Kaiyuh wetlands. Mallard, northern pintail, goldeneye, and wigeon ducks, as well as lesser Canada, white-fronted, and cackling geese were among the many varieties of ducks and geese that migrated through Kaiyuh in their annual migration.

In March or April, Nulato and Kaltag residents were also typically preoccupied with preparations for and celebration of Stickdance or *hiyo*, a week-long memorial potlatch, dance, and ceremonial event that alternated between the two communities. Stickdance is a memorial that honors family and loved ones who have passed away and is "a time to repay people for what they have done for you at a time of death" (Carlo 1978:63). Preparations for a Stickdance could last years, though a more focused effort during the year immediately prior to a Stickdance was common as family members harvested foods such as berries and moose, jarred fish, trapped wolverines and gray wolves, and prepared other subsistence resources that were important parts of the event. Nulato hosted Stickdance in March 2011, and several respondents indicated that during the study year, a large share of their harvest effort was dedicated to preparing for the coming year (Plate 5-2).

Brittany Retherford, ADF&G

Plate 5-2.–Subsistence foods feature prominently at Stickdance 2011 in Nulato. At the community hall, food ready to share is displayed before being distributed. During the study year, many households were busy hunting, fishing, and gathering berries to prepare for the memorial.

Demographics

The 84 surveyed households included 243 people (Table C1). Expanding for unsurveyed households, Nulato's estimated population was 260 people and included 140 males (54%) and 120 females (46%); 252 people were Alaska Native (97%). Household sizes ranged from 1 to 7 people, with an average of 3 people per household. The population history and population profile for Nulato is depicted in Figures 5-2 and 5-3. The population of Nulato has been relatively stable since the 1960s with a more recent, slight decline since 2000. In 2010, the average age was 37 years old, and the oldest person was 90 years old (Table C1). Nulato had the oldest average population of the 5 communities surveyed; the community had a sizable elder population. Many Nulato elders still actively participated in subsistence activities throughout the year, providing an invaluable traditional knowledge resource for younger residents (Brown et al. 2010).

Of survey respondents, 73% reported that when they were born, their parents' place of residence was Nulato (Table C2). Expectant mothers in rural communities commonly travel to hub communities such as Bethel, Fairbanks, and Anchorage to give birth at medical facilities. The survey form asked respondents to identify where their parents were living when they were born as a more meaningful record of Nulato residents' birth homes. Other respondents reported Kaltag (7%), Tanana (3%), and other parts of the United States (6%), as well as numerous other Alaskan communities as birth homes.

Wild Food Harvests and Uses

The primary purpose of the household survey was to collect information about the harvest and uses of wild resources. Respondents were asked whether their household used or tried to harvest each resource during the study year. If members of a household tried to harvest a resource, they were asked how much they harvested and other details of the harvest such as gear type, sex of the animal, or month of harvest. Tables and figures in this section summarize responses to the harvest questions. They display estimated

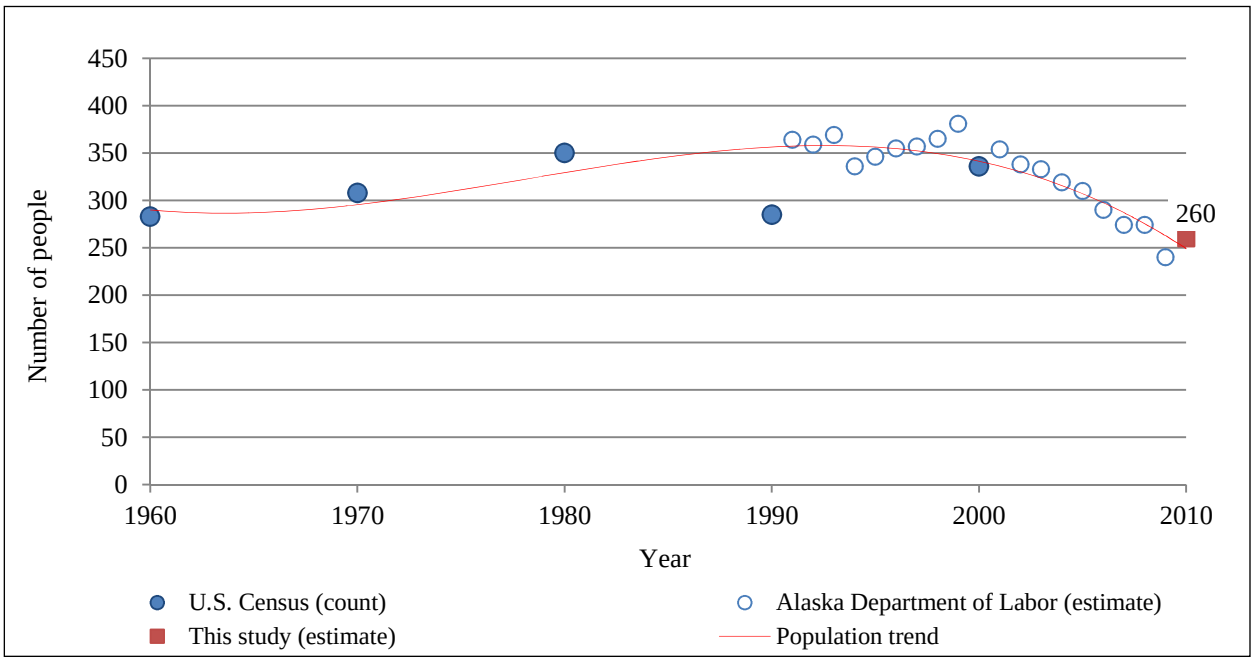


Figure 5-2.–Population history, Nulato, 1960–2010.

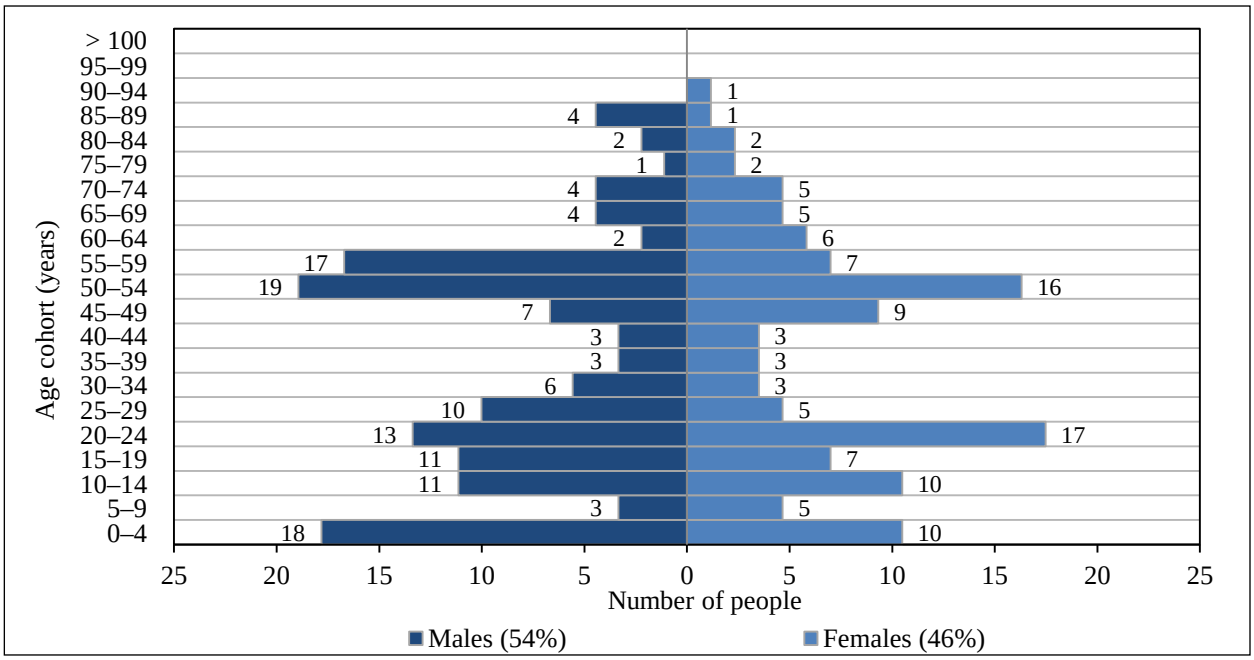


Figure 5-3.–Population profile, Nulato, 2010.

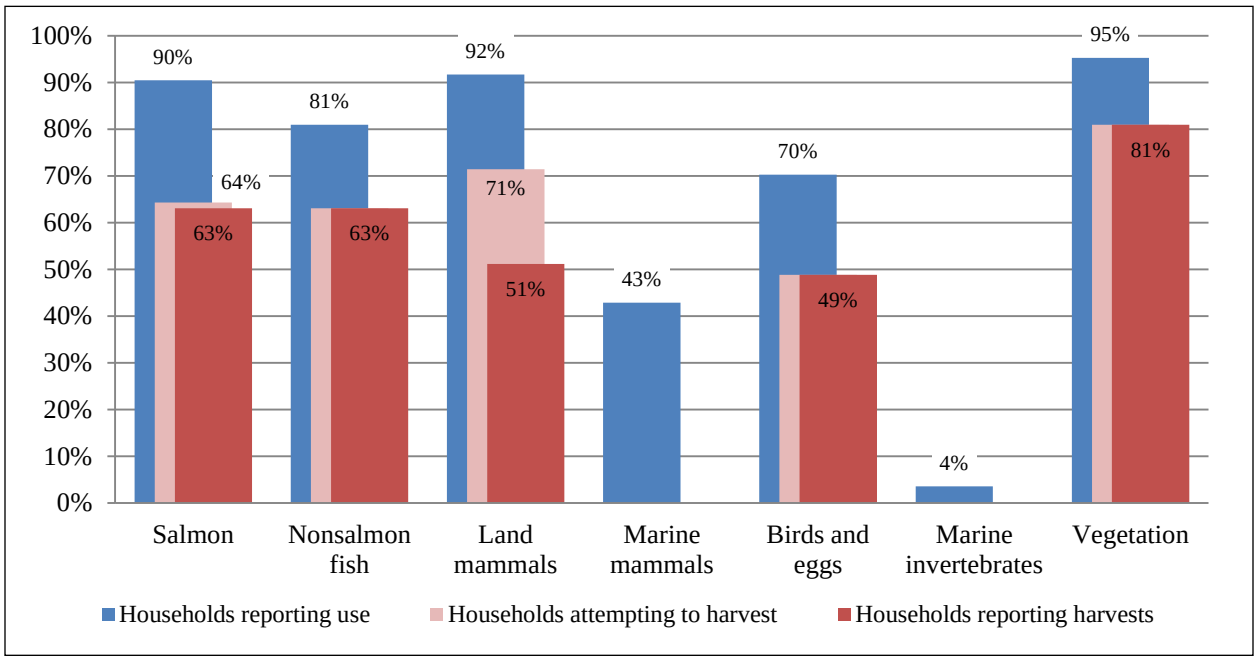


Figure 5-4.–Percentages of households using, attempting to harvest, or harvesting subsistence resources, by category, Nulato, 2010.

total harvests by resource, which includes successful harvest activities by Nulato residents that occurred throughout the state of Alaska.

Every Nulato household surveyed said that in 2010, it used at least 1 subsistence resource (Table 5-1). At least 1 household reported using as many as 58 different resources, but the average number of wild food types used per household was 14. The most widely used resource categories were salmon (used by 90% of households), land mammals (92%), and vegetation (95%) (Figure 5-4). A breakdown of Nulato residents' harvest by edible weight is depicted in Figure 5-5. The percentage of households using a resource category does not always translate into high harvests. Fish, including salmon and nonsalmon fish species, made up the largest share of the community's total subsistence harvest (34,907 lb of the total 62,140 lb), while vegetation, used by the greatest percentage of households, composed only 1,913 lb of the total harvest. Land mammal harvests totaled 24,687 lb of the total community harvest. Fish included 5 species of salmon, whitefishes, and other fish such as Dolly Varden, Arctic lamprey, and northern pike. Vegetation included a variety of plants, berries, and firewood. Land mammals included furbearers and other small mammals such as beavers, snowshoe hares, and porcupines, as well as larger species such as moose and black bears.

The survey also collected information about whether respondents participated in hunting, fishing, and vegetation gathering activities (Figure 5-4; Table D5-1). Opportunities to harvest wild foods were available year-round, and Nulato residents were actively engaged in subsistence activities in every season. For example, 92% percent of households said they attempted to harvest at least 1 subsistence resource during the study year (Table 5-1). More households were involved in subsistence activities related to gathering vegetation (81%) than any other resource (Figure 5-4). Plants and berries are widely available near Nulato and all age groups are able to participate in activities such as berry picking during summer and fall months. The second-most common activity was fishing (74%), followed by hunting land mammals (71%) (Table 5-2; Figure 5-4). Both hunting and fishing activities can require not only particular gear and tools (which can be expensive to buy or operate), but also refined skills and knowledge of fish and animal behavior and habitat.

The survey asked respondents both whether they tried to harvest and whether they actually did harvest a resource. The comparison of the 3 data sets (attempt to harvest, successful harvest, and use) can highlight issues of abundance, availability, and effort exerted to harvest. The comparison can also demonstrate the

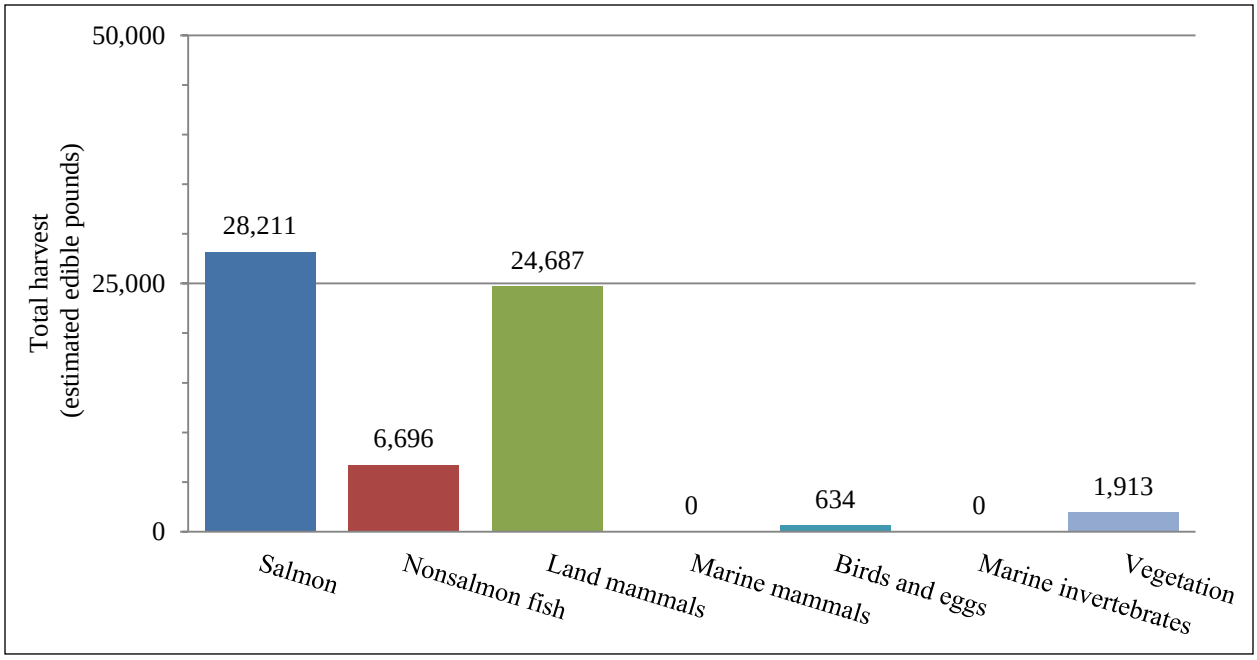


Figure 5-5.–Total estimated edible pounds harvested, by resource category, Nulato, 2010.

importance of traditional patterns of sharing resources as a way to redistribute wild foods throughout a community to those who may not have had a successful harvest, were unable to go hunting or fishing, or who were perhaps too elderly or sick to participate in subsistence activities that year. For example, 71% of households reported attempting to harvest land mammals and 51% reported a successful harvest, but 92% of households reported using land mammals (Figure 5-4). This suggests that nearly one-half of the community's households received land mammals from those who harvested them. Sharing subsistence foods is important for a variety of reasons, including cultural, nutritional, and economical. An elder who lives alone or a single parent might rely on neighbors and family members to provide him or her with moose meat, fish, berries, and other wild foods. In Nulato, 92% of households said they received at least 1 wild food resource from someone else, and 81% of households reported giving away at least 1 wild food (Table 5-1). Fish were the most commonly received resource (69%), followed by land mammals (68%) (Table 5-2; Table 5-4).

Of all fish species available to Nulato residents, Chinook salmon were the most commonly harvested and were also the most used for human consumption in 2010 (Table 5-2). Five species of salmon (Chinook, coho, chum, pink, and sockeye, though the latter in very small numbers) are found in the Yukon River watershed, but Chinook salmon had a unique significance to Nulato residents. More households (61%) participate in the Chinook salmon fishery than any other single fishery, indicating the importance of that fishery to residents. In 2010, Chinook salmon composed 67% (or 18,879 lb) of the total 28,211 lb of salmon harvested and 30% of the estimated total subsistence harvest, followed by coho salmon (15% of the salmon harvest or 4,153 lb), fall chum salmon (13% or 3,563 lb), and summer chum salmon (5% or 1,476 lb).

In the past, families would travel to fish camps that dotted the shoreline along the Yukon River, where they used fish wheels. In 2010, some fishing families would move temporarily to summer homes and cabins at the old town site on the bank of the Yukon River. Only 2 families still maintained summer fish camps in 2010 (Plate 5-3). Extended family groups, which often included multiple households and several generations, would typically work together to catch, process, and put away salmon for use during the winter months (Moncrieff and Klein 2003). The old town location was preferential for access to smokehouses and fishing boats, which were used by most salmon fishers (Brown et al. 2015).

Table 5-2.–Estimated harvest and use of fish, Nulato, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Fish										
Salmon										
Summer chum salmon	17.9%	16.7%	14.3%	4.8%	3.6%	1,476.1 lb	16.4 lb	5.7 lb	290.4 ind	± 18.8%
Fall chum salmon	27.4%	20.2%	19.0%	13.1%	10.7%	3,562.7 lb	39.6 lb	13.7 lb	700.8 ind	± 21.9%
Unknown chum slamon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Coho salmon	31.0%	23.8%	23.8%	7.1%	11.9%	4,152.6 lb	46.1 lb	15.9 lb	785.4 ind	± 18.9%
Chinook salmon	86.9%	60.7%	59.5%	45.2%	35.7%	18,877.8 lb	209.8 lb	72.5 lb	1,999.9 ind	± 7.8%
Pink salmon	1.2%	1.2%	1.2%	0.0%	1.2%	5.0 lb	0.1 lb	0.0 lb	2.1 ind	± 51.4%
Sockeye salmon	7.1%	6.0%	3.6%	2.4%	1.2%	136.6 lb	1.5 lb	0.5 lb	27.1 ind	± 36.4%
Unknown salmon	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**90.5%**	**64.3%**	**63.1%**	**47.6%**	**39.3%**	**28,210.8 lb**	**313.5 lb**	**108.4 lb**	**3,805.7 ind**	**± 8.2%**
Char										
Dolly Varden	40.5%	33.3%	31.0%	13.1%	10.7%	270.5 lb	3.0 lb	1.0 lb	300.5 ind	± 14.8%
Lake trout	2.4%	0.0%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown char	17.9%	15.5%	14.3%	4.8%	7.1%	658.9 lb	7.3 lb	2.5 lb	439.3 ind	± 28.2%
Subtotal	**51.2%**	**39.3%**	**36.9%**	**19.0%**	**14.3%**	**929.4 lb**	**10.3 lb**	**3.6 lb**	**739.8 ind**	**± 22.5%**
Whitefishes										
Sheefish	42.9%	29.8%	28.6%	19.0%	10.7%	2,237.1 lb	24.9 lb	8.6 lb	372.9 ind	± 13.3%
Broad whitefish	28.6%	23.8%	21.4%	8.3%	6.0%	411.0 lb	4.6 lb	1.6 lb	293.6 ind	± 16.6%
Bering cisco	2.4%	2.4%	2.4%	0.0%	0.0%	16.5 lb	0.2 lb	0.1 lb	11.8 ind	± 36.2%
Least cisco	6.0%	4.8%	4.8%	1.2%	1.2%	444.6 lb	4.9 lb	1.7 lb	444.6 ind	± 38.0%
Humpback whitefish	21.4%	14.3%	11.9%	10.7%	2.4%	450.0 lb	5.0 lb	1.7 lb	150.0 ind	± 22.9%
Round whitefish	4.8%	4.8%	4.8%	0.0%	0.0%	40.2 lb	0.4 lb	0.2 lb	80.4 ind	± 41.6%
Unknown whitefish	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**53.6%**	**36.9%**	**35.7%**	**26.2%**	**14.3%**	**3,599.5 lb**	**40.0 lb**	**13.8 lb**	**1,353.2 ind**	**± 13.8%**
Anadromous/marine fishes										
Pacific herring	10.7%	0.0%	0.0%	10.7%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Pacific herring roe	2.4%	0.0%	0.0%	2.4%	1.2%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Rainbow smelt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Pacific tomcod	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Saffron cod	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown cod	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Pacific halibut	6.0%	0.0%	0.0%	6.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 lb	± 0.0%
Arctic lamprey	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Stickleback (needlefish)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Bering wolffish	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**14.3%**	**0.0%**	**0.0%**	**14.3%**	**1.2%**	**0.0 lb**	**0.0 lb**	**0.0 lb**		**± 0.0%**
Other freshwater fishes										
Alaska blackfish	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 lb	± 0.0%
Burbot	16.7%	8.3%	7.1%	9.5%	3.6%	174.9 lb	1.9 lb	0.7 lb	72.9 ind	± 28.8%
Arctic grayling	64.3%	46.4%	46.4%	23.8%	19.0%	1,416.8 lb	15.7 lb	5.4 lb	2,024.1 ind	± 17.5%
Northern pike	28.6%	17.9%	17.9%	13.1%	9.5%	573.8 lb	6.4 lb	2.2 lb	127.5 ind	± 18.4%
Longnose sucker	1.2%	1.2%	1.2%	0.0%	0.0%	1.5 lb	0.0 lb	0.0 lb	2.1 ind	± 51.4%
Subtotal	**73.8%**	**54.8%**	**54.8%**	**32.1%**	**23.8%**	**2,167.0 lb**	**24.1 lb**	**8.3 lb**		**± 14.3%**
All fish	**95.2%**	**73.8%**	**73.8%**	**69.0%**	**53.6%**	**34,906.6 lb**	**387.9 lb**	**134.1 lb**		**± 8.1%**
All resources[b]	**100.0%**	**91.7%**	**90.5%**	**91.7%**	**81.0%**	**62,140.2 lb**	**690.4 lb**	**238.7 lb**		**± 6.1%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

Brittany Retherford, ADF&G

Plate 5-3.–Fish camps used to be common during the summer months. In 2010, they were a rare sight. This fish camp is located just a few miles downriver from Nulato. Fall chum salmon are drying on the racks. Inset: Coho and fall chum salmon caught in August while drifting with a gillnet near Nulato. Fall chum salmon are locally referred to as "silvers" because of their bright, silvery color.

In 2010, Nulato fishers primarily used drift gillnets and set gillnets to harvest salmon, but 1 household still used a fish wheel (primarily for commercial fishing). Harvests by gear type are depicted in Figure 5-6. Drifting is by far the most common method of harvesting any species of salmon by Nulato residents. A total 14,104 lb of Chinook salmon were caught with drift gillnets (subsistence driftnet), 3,793 lb were caught with beach seine nets (subsistence seine), and 657 lb were caught with set gillnets (subsistence setnet). It is likely that the households that identified seine net as their gear type were actually using gillnets, because Nulato residents use the terms "seining" and "drifting" somewhat interchangeably. In 1981, the Board of Fisheries extended the legal use of drift gillnets for subsistence salmon fishing to the part of Subdistrict 4A downriver of Cone Point (near Bishop Mountain, 16 miles downriver of Galena) for limited periods of time, targeting the Chinook salmon and chum salmon runs (Wheeler 1987). In response to growing local concerns regarding the declining size and abundance of Chinook salmon in the Yukon River, the Board of Fisheries restricted fishers to a maximum 7.5-inch mesh gillnet for drifting in 2010, though the regulation did not go into effect until 2011. Subsistence fishers have observed that a smaller mesh size was actually more productive for catching all species of salmon, including Chinook salmon (Brown et al. 2015).

Nonsalmon fish also played an important role in the subsistence diet of Nulato residents (Table 5-2). Harvests of many nonsalmon species during fall, winter, and spring months complemented the summer salmon harvests, providing fresh fish year-round. In terms of pounds, the most heavily harvested nonsalmon fish was sheefish (2,237 lb), followed by Arctic grayling (1,417 lb) and northern pike (574 lb). However, in terms of numbers of fish caught, Arctic grayling exceeded any other fish species. In 2010, Nulato residents

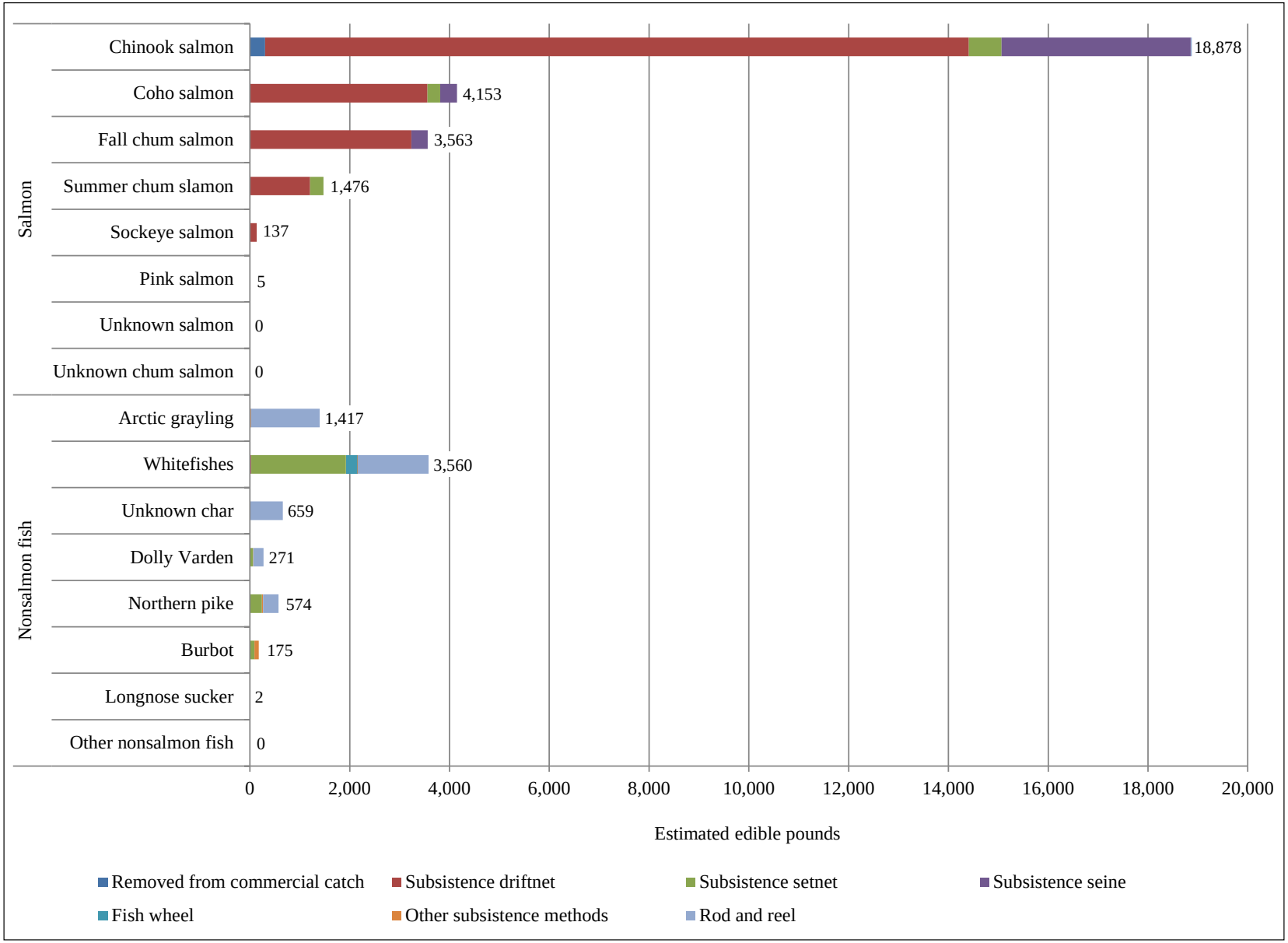


Figure 5-6.–Estimated fish harvests by gear type, Nulato, 2010.

caught 2,024 Arctic grayling, 98% of those with rod and reel[3] (Table 5-2; Figure 5-6). Sharing of nonsalmon fish species was common, but less common than it was for salmon species (especially Chinook salmon). A total of 19% of households reported giving away Arctic grayling, and 24% said they received Arctic grayling (Table 5-2). In comparison, 11% of households reported giving away sheefish, and 19% said they received sheefish. The high percentages of sharing of Arctic grayling likely correspond to the facts that residents caught more individual Arctic grayling than any other fish; many households were actively participating in the fishery (46% of households harvested Arctic grayling in 2010, more than any other fish except Chinook salmon); and residents prefer to eat Arctic grayling fresh.

Nonsalmon fish were caught using a variety of gear types (Figure 5-6). During fall months, as the Nulato River began to freeze, many residents rod and reel fished for Arctic grayling and Dolly Varden (often called trout). Whitefishes (primarily humpback whitefish, broad whitefish, sheefish, and least cisco) were commonly harvested using a setnet or with rod and reel, though a small amount of sheefish (225 lb) was caught using a fish wheel. Northern pike were mostly harvested using rod and reel or with a setnet.

Historically, both salmon and nonsalmon fish were harvested and used as dog food to sustain dogs that were critical for transportation in winter months. With the advent of the snowmachine, harvests of fish for dog food have sharply declined (Andersen 1992). In 2010, an estimated 3,972 lb of fish were harvested for consumption by dogs (Table D5-2). Of this amount, fall chum (1,471 lb) and coho salmon (1,462 lb) composed the largest share. Traditionally, salmon harvested for dogs were cut and dried, but less effort was taken to wash the fish. Fish for human consumption, or "eating-fish," were carefully processed. They were kept protected from rain, sun, and flies (Yarber 1986). Because there was a larger portion of actively fishing elders in Nulato in 2010, older methods of processing fish were more common here than in other middle Yukon communities, according to a traditional ecological knowledge study about nonsalmon fish (Brown et al. 2010). Brown and her colleagues observed that the "flat fish" method of drying fish was still used by some Nulato households: "The flat fish method, usually used on northern pike and whitefishes, involved splitting the fish along the ventral, or belly, side, removing the back bone, and using 2 sticks to hold the fish open so that it would dry in the sun" (Brown et al. 2010:11).

Households in Nulato said they used marine invertebrates, but no household participated in harvesting any of the species that fall into this resource category (Table 5-3). Only 4% of households reported using marine invertebrates, including abalone, clams, and king crab. All these households received these resources through sharing networks.

After fish, land mammals comprised the second largest share (40%) of Nulato's wild food harvest in 2010 (Table 5-4). Nulato hunters harvested a total 24,687 lb. Of that amount, 21,407 lb were derived from moose. Moose is a highly valued subsistence resource by middle Yukon communities: 89% of all Nulato households used it in 2010. Not all households have the gear or skills necessary to harvest moose, which accounts for the fact that only 68% of households attempted to harvest moose. Of those households, 39% were successful. As discussed earlier, sharing was common among Nulato households, especially sharing of moose meat. In 2010, 39% of households said they gave moose away, and 61% said they received moose from another household or another community. An estimated total of 40 moose were harvested by Nulato residents in 2010, primarily during the month of September (Table D5-3). All harvested moose were male.

Survey respondents who tried to go moose hunting in 2010 were also asked the number of days spent hunting in order to evaluate "hunter effort" (Table C3). In 2010, there were 108 hunters in Nulato who spent a combined estimated total of 1,059 days hunting for moose. The average Nulato hunter spent 10 days hunting, but those who were successful spent more time hunting (15 days). A total of 14 hunter-days were expended for every moose harvested by Nulato hunters in 2010. This suggests that Nulato hunters spent more time hunting than Galena or Ruby, where harvest data were also collected (10 and 9 days, respectively;

3. The BOF does not currently recognize hook and line attached to a rod or pole in open water as a legal subsistence gear type upriver of the lower mouth of Paimiut Slough on the Yukon River; rod and reel fishing occurs under sport fishing regulations.

Table 5-3.–Estimated harvest and use of marine invertebrates, Nulato, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Marine invertebrates										
Pinto abalone	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown clams	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown king crab	2.4%	0.0%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Tanner crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown crab	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Shrimp	2.4%	0.0%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown marine invertebrates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Subtotal	**3.6%**	**0.0%**	**0.0%**	**3.6%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**		**± 0.0%**
All marine invertebrates	**3.6%**	**0.0%**	**0.0%**	**3.6%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**		**± 0.0%**
All resources[b]	**100.0%**	**91.7%**	**90.5%**	**91.7%**	**81.0%**	**62,140.2 lb**	**690.4 lb**	**238.7 lb**		**± 6.1%**

Source ADF&G Division of Subsistence household surveys, 2011.
a. Amount of resource harvested is in individual units, unless otherwise specified.
b. All resources include all species of fish, wildlife, and plants reported on the survey.

Table 6-9; Table 7-9), to successfully harvest a moose, likely because they had to travel farther to access moose as a result of low water restricting the upriver inlet to Kaiyuh Slough.

Other large land mammal harvests were minimal in comparison to moose harvests. After moose, the most significant harvested resource in terms of pounds harvested was black bear (Table 5-4). Approximately 10% of Nulato households reported harvesting an estimated 9 black bears, or 857 lb. The 9 black bears were all harvested in September, most likely opportunistically while hunting for moose. In 2010, 17% of Nulato households said they used black bears. The caribou harvests in this area have varied widely depending on the movement of caribou (thought to be mostly from the Western Arctic caribou herd) and their proximity to communities (Andersen et al. 2004). No Nulato households reported attempting to harvest or harvesting caribou in 2010, though 2% of households reported receiving and using caribou. Nulato households also did not report using or harvesting brown bears during the study year; many Koyukon people follow strict rules regarding the harvest and use of brown bears because of their cultural beliefs about brown bears (Nelson 1983).

Trapping and hunting of small land mammals has long been an important activity in the Nulato area (Robert 1984). An estimated total 2,423 lb of small land mammals were harvested by Nulato households in 2010; however, this amount does not include animals that are typically not eaten (red foxes, martens, weasels, gray wolves, and wolverines) (Table 5-4). Of the edible amount, 95% were beavers. Beavers were the most widely used small land mammal: 35% of households said they used beavers, and 17% of households harvested this resource in 2010. A total 175 individual beavers were harvested by Nulato households during the study year, with the bulk of the harvest (117) occurring in February and March (Table D5-4). The number of beavers harvested is only slightly less than the number of martens (176) harvested by households in 2010. Since martens are not typically eaten, this harvest is not included in the total estimated pounds harvested for the community. Nulato residents also harvested snowshoe hares (86 lb), porcupines (26 lb), and lynx (9 lb), all of which are usually eaten (Table 5-4). Snowshoe hares were primarily harvested in December (24 hares), but were also taken in November, January, March, and April (Table D5-4). Porcupine harvests occurred during open water months, from May through October. A total of 6 gray wolves, 3 wolverines, 6 lynx, and 176 martens were taken during the winter trapping season. Nulato trappers primarily targeted martens in November: they harvested 122 martens during this month.

Households in Nulato said they used marine mammals, but no household participated in harvesting any of the species that fall into this resource category (Table 5-4). Marine mammal resources are harvested by communities closer to the coast, but established trading networks between coastal and interior communities allow for a wider distribution of marine mammals through sharing and trade. In Nulato, both unknown seals (primarily seal oil) and beluga whales each were reported used by 27% of households. All these households

Table 5-4.–Estimated harvest and use of land and marine mammals, Nulato, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Land mammals										
Large land mammals										
Black bear	16.7%	14.3%	9.5%	8.3%	6.0%	857.1 lb	9.5 lb	3.3 lb	8.6 ind	± 17.4%
Brown bear	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Caribou	2.4%	0.0%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Moose	89.3%	67.9%	39.3%	60.7%	39.3%	21,407.1 lb	237.9 lb	82.2 lb	39.6 ind	± 7.5%
Subtotal	**90.5%**	**69.0%**	**42.9%**	**65.5%**	**40.5%**	**22,264.3 lb**	**247.4 lb**	**85.5 lb**	**48.2 ind**	**± 7.4%**
Small land mammals										
Beaver	34.5%	20.2%	16.7%	20.2%	15.5%	2,298.2 lb	25.5 lb	8.8 lb	174.6 ind	± 20.6%
Red fox	3.6%	2.4%	2.4%	2.4%	0.0%	*Not usually eaten*			2.1 ind	± 0.0%
Snowshoe hare	9.5%	9.5%	7.1%	2.4%	3.6%	85.7 lb	1.0 lb	0.3 lb	35.4 ind	± 33.6%
Alaska hare (jackrabbit)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
River (land) otter	1.2%	1.2%	1.2%	0.0%	0.0%	*Not usually eaten*			1.1 ind	± 0.0%
Lynx	4.8%	4.8%	4.8%	0.0%	1.2%	8.6 lb	0.1 lb	0.0 lb	6.4 ind	± 51.4%
Marmot	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Marten	8.3%	9.5%	8.3%	1.2%	1.2%	*Not usually eaten*			175.7 ind	± 0.0%
Mink	1.2%	1.2%	1.2%	0.0%	0.0%	*Not usually eaten*			1.1 ind	± 0.0%
Muskrat	1.2%	1.2%	1.2%	0.0%	0.0%	4.8 lb	0.1 lb	0.0 lb	6.4 ind	± 51.4%
Porcupine	7.1%	6.0%	6.0%	1.2%	1.2%	25.7 lb	0.3 lb	0.1 lb	8.6 ind	± 31.7%
Arctic ground (parka) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Red (tree) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Weasel	1.2%	1.2%	1.2%	0.0%	0.0%	*Not usually eaten*			4.3 ind	± 0.0%
Gray wolf	3.6%	3.6%	3.6%	0.0%	0.0%	*Not usually eaten*			6.4 ind	± 0.0%
Wolverine	1.2%	1.2%	1.2%	0.0%	0.0%	*Not usually eaten*			3.2 ind	± 0.0%
Subtotal	**40.5%**	**28.6%**	**25.0%**	**21.4%**	**17.9%**	**2,423.0 lb**	**26.9 lb**	**9.3 lb**	**425.4 ind**	**± 19.9%**
Feral mammals										
Reindeer, feral	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**1.2%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0.0%**
Marine mammals										
Bearded seal	3.6%	0.0%	0.0%	3.6%	1.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Ringed seal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Spotted seal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown seal	27.4%	0.0%	0.0%	27.4%	2.4%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Walrus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Beluga	27.4%	0.0%	0.0%	27.4%	3.6%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Bowhead	17.9%	0.0%	0.0%	17.9%	4.8%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**42.9%**	**0.0%**	**0.0%**	**42.9%**	**8.3%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0.0%**
All land mammals	**91.7%**	**71.4%**	**51.2%**	**67.9%**	**48.8%**	**24,687.3 lb**	**274.3 lb**	**94.8 lb**		**± 7.2%**
All marine mammals	**42.9%**	**0.0%**	**0.0%**	**42.9%**	**8.3%**	**0.0 lb**	**0.0 lb**	**0.0 lb**		**± 0.0%**
All resources[b]	**100.0%**	**91.7%**	**90.5%**	**91.7%**	**81.0%**	**62,140.2 lb**	**690.4 lb**	**238.7 lb**		**± 6.1%**

Source ADF&G Division of Subsistence household surveys, 2011.
a. Amount of resource harvested is individual units, unless otherwise specified.
b. All resources include all species of fish, wildlife, and plants reported on the survey.

said they received these resources. Other species used included bowhead whales (18%) and bearded seals (4%). Households that reported giving away a marine mammal resource (for example, 5% of households reported giving away bowhead whales) demonstrates another layer of the sharing patterns in communities such as Nulato. Some households that receive a resource may then give some or all of it away either as a gift or through trade, expanding the sharing network and more widely distributing resources within a community.

Bird hunting provides another food resource to Nulato households, and several households reported hunting birds during the study year (Table 5-5). A total estimated 698 birds were harvested in 2010 by Nulato households. One-half of households reported using migratory birds such as ducks and geese (51%), and other birds such as grouse and ptarmigan (50%). In terms of edible pounds harvested, harvests of "other"

Table 5-5.–Estimated harvest and use of birds, Nulato, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Migratory birds										
Ducks										
Bufflehead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Canvasback	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Common eider	0.0%	1.2%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown eider	2.4%	2.4%	1.2%	1.2%	1.2%	4.7 lb	0.1 lb	0.0 lb	2.1 ind	± 51.4%
Goldeneye sp.	1.2%	1.2%	1.2%	0.0%	0.0%	1.7 lb	0.0 lb	0.0 lb	2.1 ind	± 51.4%
Mallard	15.5%	14.3%	11.9%	4.8%	2.4%	48.2 lb	0.5 lb	0.2 lb	48.2 ind	± 19.4%
Common merganser	0.0%	1.2%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Red-breasted merganser	0.0%	1.2%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown merganser	0.0%	1.2%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Long-tailed duck (oldsquaw)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Northern pintail	13.1%	9.5%	8.3%	6.0%	1.2%	30.0 lb	0.3 lb	0.1 lb	37.5 ind	± 21.6%
Scaup sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Black scoter	4.8%	4.8%	3.6%	1.2%	2.4%	7.7 lb	0.1 lb	0.0 lb	8.6 ind	± 31.1%
Surf scoter	0.0%	1.2%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
White-winged scoter	0.0%	1.2%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Northern shoveler	1.2%	0.0%	0.0%	1.2%	1.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Green-winged teal	2.4%	2.4%	1.2%	1.2%	0.0%	1.9 lb	0.0 lb	0.0 lb	6.4 ind	± 51.4%
Unknown wigeon	4.8%	3.6%	3.6%	1.2%	0.0%	9.0 lb	0.1 lb	0.0 lb	12.9 ind	± 31.7%
Unknown duck	1.2%	1.2%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**22.6%**	**15.5%**	**13.1%**	**10.7%**	**4.8%**	**103.3 lb**	**1.1 lb**	**0.4 lb**	**117.9 ind**	**± 19.3%**
Geese										
Brant	2.4%	1.2%	0.0%	2.4%	1.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Cackling goose	19.0%	9.5%	9.5%	10.7%	4.8%	37.3 lb	0.4 lb	0.1 lb	31.1 ind	± 21.0%
Lesser Canada goose	19.0%	13.1%	9.5%	9.5%	4.8%	56.6 lb	0.6 lb	0.2 lb	47.1 ind	± 20.3%
Unknown Canada goose	4.8%	1.2%	0.0%	4.8%	1.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Emperor goose	0.0%	1.2%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Snow goose	2.4%	2.4%	1.2%	1.2%	2.4%	4.9 lb	0.1 lb	0.0 lb	2.1 ind	± 51.4%
White-fronted goose	7.1%	6.0%	4.8%	2.4%	2.4%	72.0 lb	0.8 lb	0.3 lb	30.0 ind	± 32.1%
Unknown goose	2.4%	1.2%	0.0%	2.4%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**45.2%**	**21.4%**	**19.0%**	**27.4%**	**11.9%**	**170.8 lb**	**1.9 lb**	**0.7 lb**	**110.4 ind**	**± 17.5%**
Other migratory birds										
Tundra (whistling) swan	1.2%	0.0%	0.0%	1.2%	1.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Sandhill crane	1.2%	0.0%	0.0%	1.2%	1.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Whimbrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**1.2%**	**0.0%**	**0.0%**	**1.2%**	**1.2%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0.0%**
Other birds										
Spruce grouse	42.9%	33.3%	33.3%	11.9%	19.0%	219.8 lb	2.4 lb	0.8 lb	313.9 ind	± 10.5%
Ruffed grouse	16.7%	10.7%	9.5%	8.3%	4.8%	36.0 lb	0.4 lb	0.1 lb	51.4 ind	± 25.0%
Ptarmigan sp.	20.2%	16.7%	14.3%	8.3%	8.3%	103.9 lb	1.2 lb	0.4 lb	103.9 ind	± 18.1%
Subtotal	**50.0%**	**38.1%**	**38.1%**	**16.7%**	**21.4%**	**359.7 lb**	**4.0 lb**	**1.4 lb**	**469.3 ind**	**± 9.6%**
All migratory birds	**51.2%**	**28.6%**	**26.2%**	**29.8%**	**14.3%**	**274.1 lb**	**3.0 lb**	**1.1 lb**	**228.2 ind**	**± 14.1%**
All other birds	**50.0%**	**38.1%**	**38.1%**	**16.7%**	**21.4%**	**359.7 lb**	**4.0 lb**	**1.4 lb**	**469.3 ind**	**± 9.6%**
All resources[b]	**100.0%**	**91.7%**	**90.5%**	**91.7%**	**81.0%**	**62,140.2 lb**	**690.4 lb**	**238.7 lb**		**± 6.1%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

birds surpassed harvests of migratory birds. In 2010, Nulato households harvested 360 lb of ptarmigan, spruce grouse, and ruffed grouse, compared with 274 lb of migratory birds. More households used (43%) or harvested (33%) spruce grouse than any other bird species. The most commonly harvested geese were lesser Canada (47 individual), cackling (31), and white-fronted geese (30). The most commonly harvested duck species were mallards (48 individual) and northern pintails (38). Most ducks and geese were harvested during spring months (Table D5-5). Spring hunting for migratory waterfowl is an Alaska Native traditional practice—a way to replenish food stores that have been diminished throughout the winter (Wheeler 1987). Fall hunters were generally opportunistic, whereas spring hunters specifically targeted waterfowl.

Table 5-6.–Estimated harvest and use of eggs, Nulato, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Bird eggs										
Duck eggs	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Goose eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Swan eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown shorebird eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Gull eggs	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Murre eggs	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**1.2%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0.0%**
All birds and eggs	**70.2%**	**48.8%**	**48.8%**	**34.5%**	**29.8%**	**633.8 lb**	**7.0 lb**	**2.4 lb**	**697.5 ind**	**± 9.6%**
All resources[b]	**100.0%**	**91.7%**	**90.5%**	**91.7%**	**81.0%**	**62,140.2 lb**	**690.4 lb**	**238.7 lb**		**± 6.1%**

Source ADF&G Division of Subsistence household surveys, 2011.
a. Amount of resource harvested is in individual units, unless otherwise specified.
b. All resources include all species of fish, wildlife, and plants reported on the survey.

Historically, gathering eggs was an additional subsistence activity that provided diversity to the subsistence diet, but this activity is much less common today. Only 1% of Nulato households reported using eggs (duck, gull, or murre eggs). However, all of those were received from other households, and no household attempted to gather eggs in 2010 (Table 5-6).

Many Nulato households participated in gathering various species of plants and berries, especially during summer and fall months (Table 5-7). Several varieties of berries grew in the Nulato area and were commonly harvested and frozen, eaten fresh, or made into dishes such as jams. Berries were harvested when ripe, beginning with blueberries in early July and August, followed by raspberries, salmonberries, lowbush cranberries, and highbush cranberries. A total of 1,721 lb of berries were harvested in 2010, which equals an average of about 6.6 lb per person. The most commonly harvested berry was blueberry. In 2010, Nulato households harvested 689 lb of blueberries, 343 lb of crowberries (blackberries), 296 lb of highbush cranberries, and 181 lb of salmonberries. Smaller amounts of lowbush cranberries and raspberries were also harvested. Seventy-five percent of households reported using blueberries, while only 61% of households reported harvesting them. However, 32% of households said they gave blueberries away. Similar sharing patterns existed for other types of berries. Nulato households reported harvesting a smaller amount of other greens such as Hudson's Bay tea (150 lb), wild rose hips (32 lb), wild rhubarb (6 lb) and spruce tips (3 lb). Also, Nulato households harvested 583 gallons of punk and 151 cords of wood. Punk is a fungus that grows on birch trees (Plate 5-4). It emits smoke when it is burned, and residents throughout the Yukon River sometimes use this as a mosquito repellent. The white ash is also sometimes mixed with tobacco. Wood was the most commonly used vegetation resource—85% of households reported using wood. Many households supplement home heating oil with wood-burning stoves to reduce fuel costs (Plate 5-5).

Brittany Retherford

Plate 5-4.–Punk, a fungus that grows on birch trees, is gathered for use as a mosquito repellent.

Table 5-7.–Estimated harvest and use of vegetation, Nulato, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Berries										
Blueberry	75.0%	63.1%	60.7%	20.2%	32.1%	688.6 lb	7.7 lb	2.6 lb	172.1 gal	± 8.4%
Lowbush cranberry	36.9%	25.0%	25.0%	15.5%	10.7%	136.6 lb	1.5 lb	0.5 lb	34.2 gal	± 12.5%
Highbush cranberry	21.4%	17.9%	16.7%	4.8%	7.1%	295.7 lb	3.3 lb	1.1 lb	73.9 gal	± 30.4%
Gooseberry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Currant	1.2%	1.2%	1.2%	0.0%	0.0%	0.5 lb	0.0 lb	0.0 lb	0.1 gal	± 51.4%
Raspberry	17.9%	17.9%	15.5%	4.8%	6.0%	75.5 lb	0.8 lb	0.3 lb	18.9 gal	± 18.8%
Salmonberry		32.1%	28.6%	20.2%	15.5%	180.5 lb	2.0 lb	0.7 lb	45.1 gal	± 11.6%
Crowberry (blackberry)	39.3%	26.2%	25.0%	16.7%	11.9%	343.4 lb	3.8 lb	1.3 lb	85.8 gal	± 26.6%
Other wild berry	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Subtotal	**77.4%**	**64.3%**	**61.9%**	**35.7%**	**38.1%**	**1,720.9 lb**	**19.1 lb**	**6.6 lb**	**430.2 gal**	**± 13.3%**
Plants/greens/mushrooms										
Wild rhubarb	6.0%	3.6%	3.6%	3.6%	1.2%	6.4 lb	0.1 lb	0.0 lb	1.6 gal	± 36.1%
Eskimo potato	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Fiddlehead fern	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Nettle	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Hudson's Bay tea	52.4%	47.6%	47.6%	11.9%	4.8%	150.4 lb	1.7 lb	0.6 lb	150.4 gal	± 18.7%
Mint	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Sourdock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Spruce tips	3.6%	3.6%	3.6%	1.2%	2.4%	3.2 lb	0.0 lb	0.0 lb	3.2 gal	± 29.3%
Willow leaves	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Cow parsnip (wild celery)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Wild rose hips	7.1%	7.1%	7.1%	0.0%	2.4%	31.6 lb	0.4 lb	0.1 lb	7.9 gal	± 24.7%
Yarrow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown mushrooms	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Fireweed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Stinkweed	1.2%	0.0%	0.0%	1.2%	1.2%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Punk	21.4%	16.7%	16.7%	8.3%	11.9%	0.0 lb	0.0 lb	0.0 lb	583.0 gal	± 39.5%
Puffballs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown greens from land	1.2%	0.0%	0.0%	1.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Subtotal	**57.1%**	**50.0%**	**50.0%**	**22.6%**	**16.7%**	**191.7 lb**	**2.1 lb**	**0.7 lb**	**746.1 gal**	± 16.1%
Wood										
Wood	84.5%	47.6%	47.6%	42.9%	8.3%	0.0 lb	0.0 lb	0.0 lb	151.3 crd	± 8.4%
Subtotal	**84.5%**	**47.6%**	**47.6%**	**42.9%**	**8.3%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**151.3 crd**	± 8.4%
All vegetation	**95.2%**	**81.0%**	**81.0%**	**61.9%**	**44.0%**	**1,912.5 lb**	**21.3 lb**	**7.3 lb**		**± 12.3%**
All resources[b]	**100.0%**	**91.7%**	**90.5%**	**91.7%**	**81.0%**	**62,140.2 lb**	**690.4 lb**	**238.7 lb**		**± 6.1%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

Harvest Areas

For 16 different subsistence resources (e.g. Chinook salmon, northern pike, caribou, and moose) and for 6 different resource categories (salmon, whitefishes, large land animals, small land animals, ducks and geese, and plants), households were asked to locate on a map the areas in which they had hunted or fished for the resource and the locations at which they had actually harvested the resource. For each resource and category, all households' search areas and harvest locations were combined to create a series of maps depicting Nulato's subsistence use areas in 2010. Figure 5-7 summarizes all the mapped data collected from Nulato for 2010.

Nulato residents reported using a total of 3,513 square miles in the Yukon River drainage for subsistence activities in 2010. Environmental, wildlife, and human factors can contribute to determining the breadth of the harvest use area. Areas can vary from year to year depending on species abundance, regulatory regime, population shifts, personal preferences, and socioeconomic factors such as gas prices or wage employment

Brittany Retherford, ADF&G

Plate 5-5.–Firewood gathered via snowmachine and sled keeps homes warm and reduces fuel costs during winter months.

in construction. Most subsistence activities in 2010 were focused around 2 major river corridors, the mainstem of the Yukon River and the Koyukuk River to the north of Koyukuk, as well as the lakes and sloughs of the Kaiyuh Flats located across the Yukon River southeast of the community. Besides the major rivers, several lakes and sloughs served as important transportation corridors for residents traveling to and from hunting, fishing, and gathering areas. Households reported traveling along the Yukon River as far north of Nulato as Galena and as far south of Nulato as Blackburn Island (about 20 miles south of Kaltag). Households also reported traveling on the Koyukuk River as far north as Huslia.

Fishing activities in Nulato were focused on the mainstem of the Yukon River and in the lakes and sloughs of Kaiyuh Flats. Salmon search and harvest areas were concentrated all within the mainstem of the Yukon River as far north as Koyukuk and as far south as the northern end of Halfway Island (Figure 5-8). Some households also reported fishing in the mainstem of the Yukon River near the vicinity of Kaltag. Areas mapped included all gear types used to harvest the various species of salmon throughout the summer including drift gillnet, beach seine, fish wheel, and rod and reel.

Search and harvest areas for other fish, including whitefishes, northern pike, burbot, and sheefish, were concentrated in the immediate vicinity of Nulato on the mainstem of the Yukon River and on the Nulato River, which flows just west of the community (Figure 5-9). Fall fishing for Arctic grayling and Dolly Varden was a popular activity on the Nulato River, but these species were not systematically mapped by Nulato households. Households also reported search and harvest areas for northern pike on the southern end of Ninemile Island, in Ninemile Slough, in Patsy Slough, and on the north side of Big Island. Whitefish species were commonly harvested in the lakes and sloughs of the wetlands area to the east of Nulato. This area is primarily accessed via Kaiyuh Slough. Kaiyuh Flats, the vast wetlands area extending south of Nulato from the south bank of the Yukon River, has been historically important for subsistence practices to Nulato residents. As Brown et al. (2010) and Robert (1984) both have noted, there has been a strong historical link between trapping and fishing practices in Kaiyuh (especially fishing for nonsalmon species).

Search and harvest areas for small land mammals show extensive use of the Kaiyuh Flats area during the study year (Figure 5-10). Households also reported hunting and trapping for small land mammals in the vicinity of Nulato, on the mainstem of the Nulato River, on the north fork of the Nulato River, and on Mukluk Creek (also a tributary of the Nulato River).

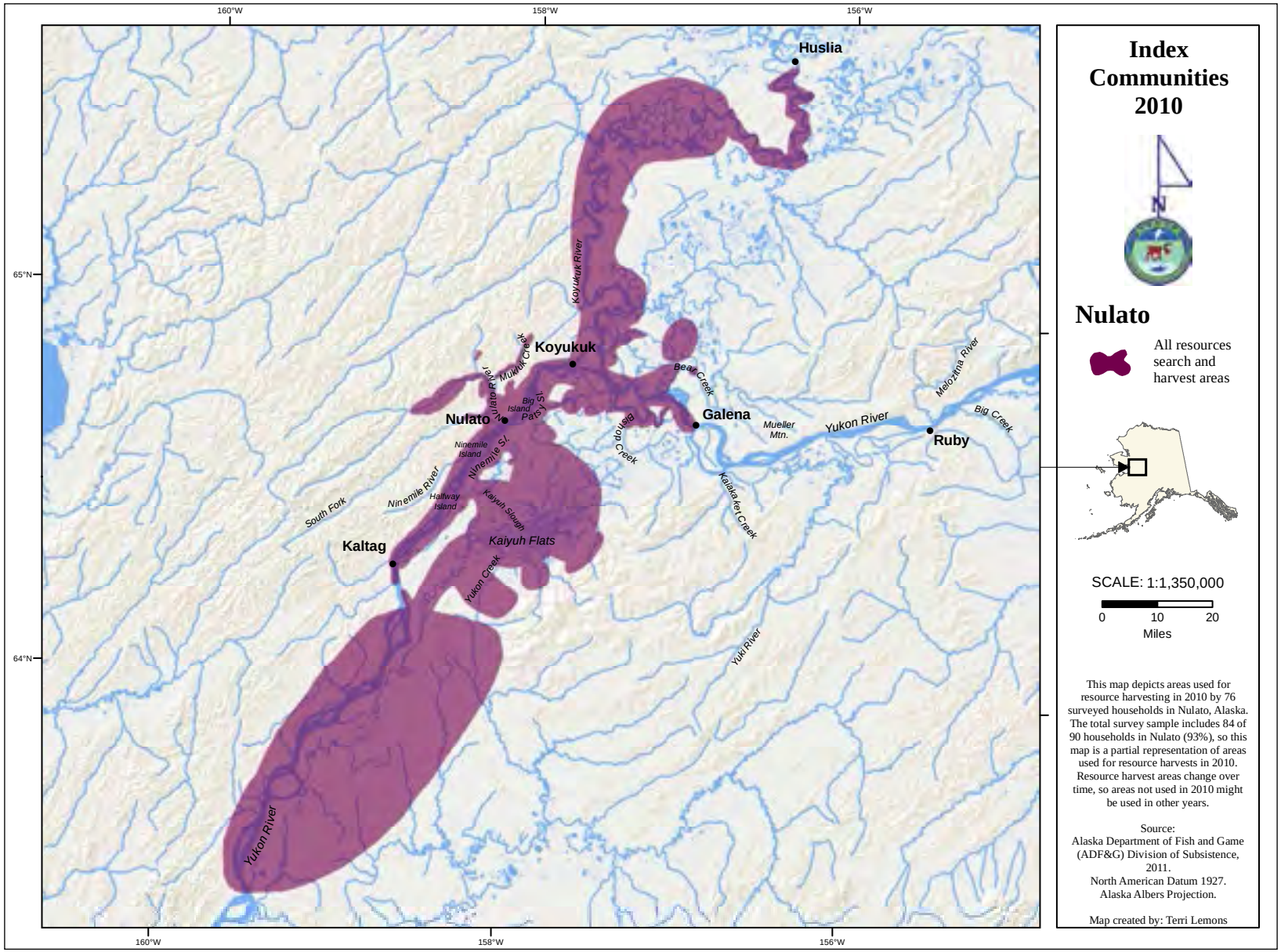


Figure 5-7.–Search and harvest areas, all resources, Nulato, 2010.

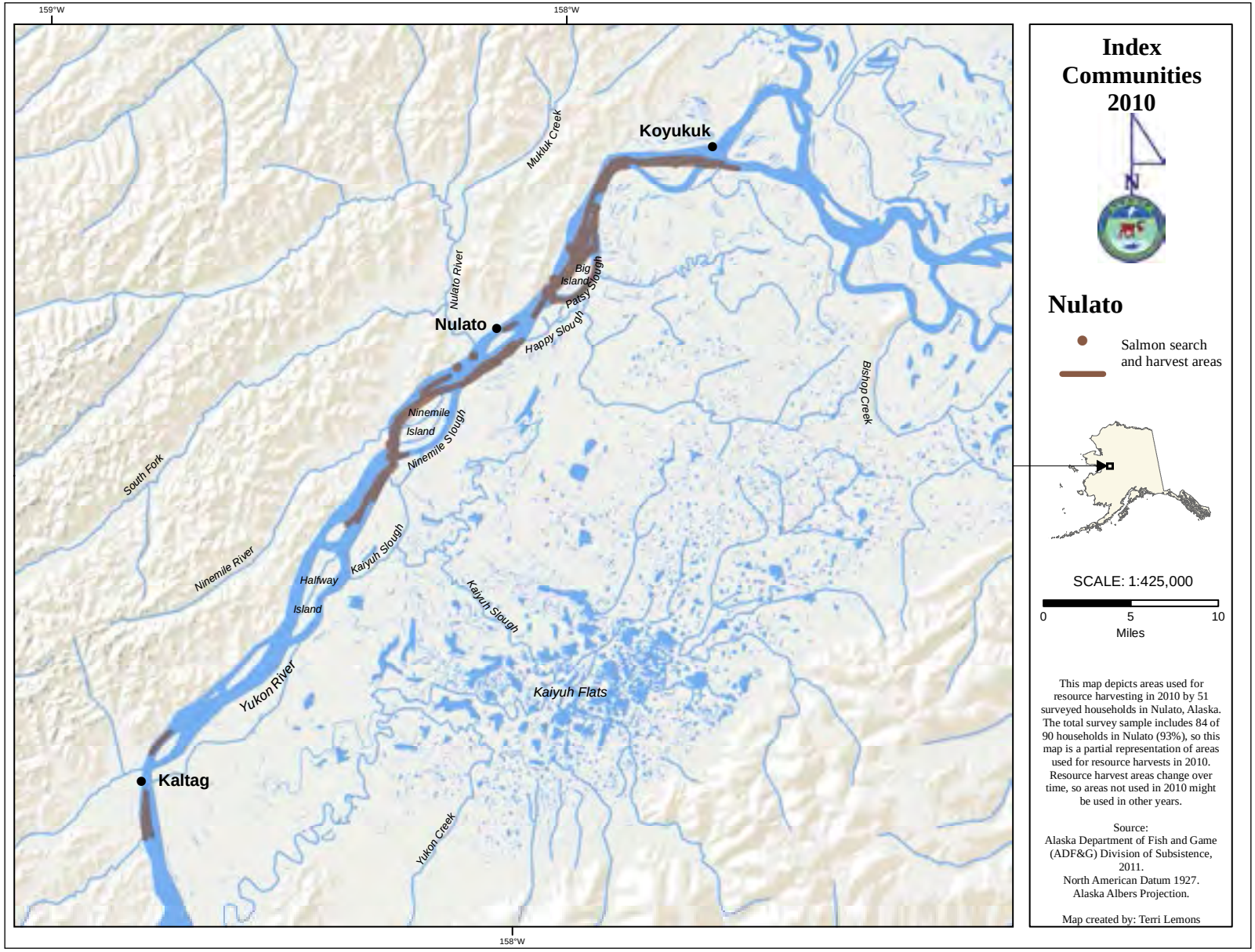


Figure 5-8.–Search and harvest areas, salmon, Nulato, 2010.

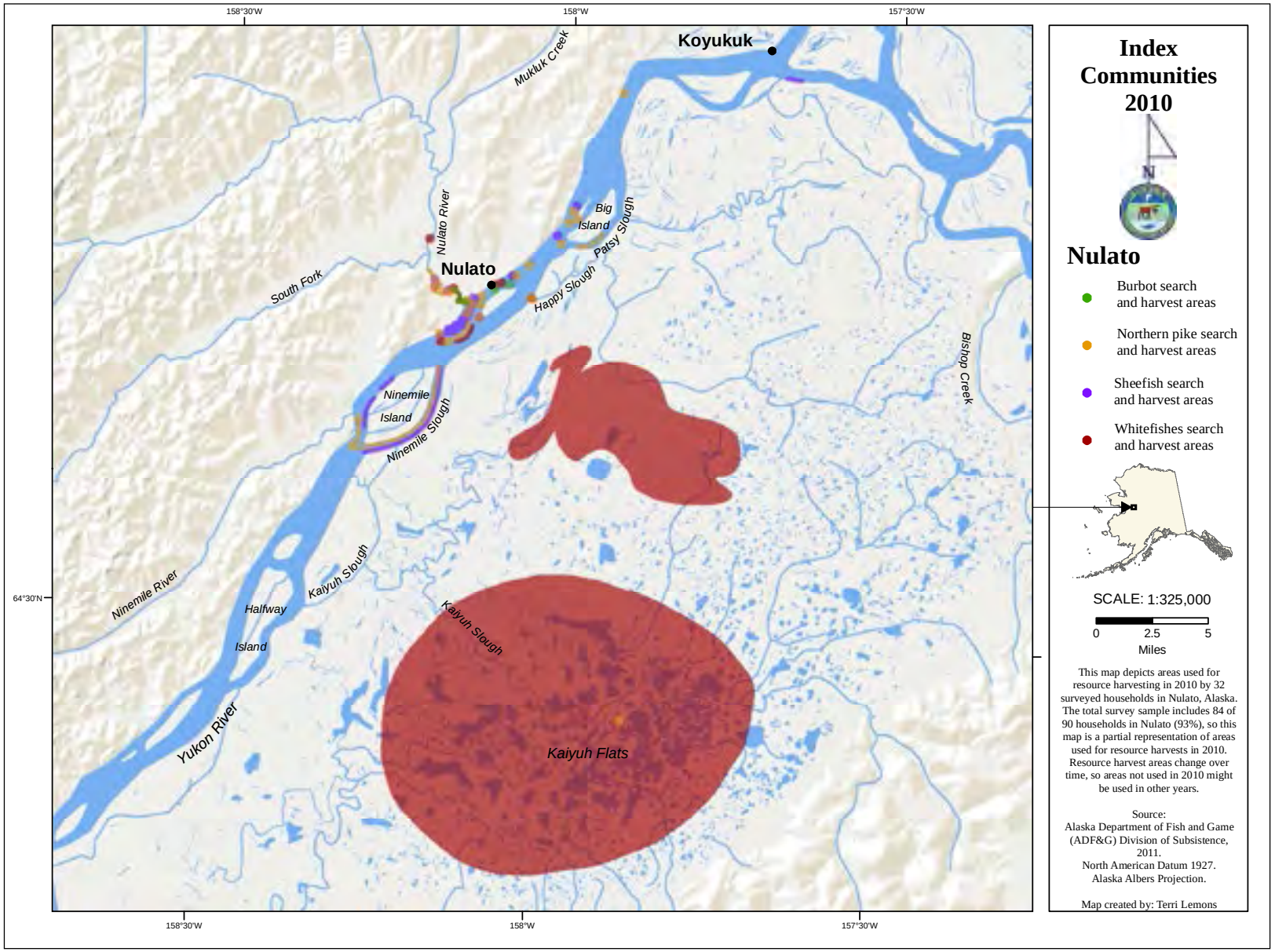


Figure 5-9.–Search and harvest areas, nonsalmon fish, Nulato, 2010.

Search and harvest areas for large land mammals were much more expansive than those for any other wild resource used by Nulato households (Figure 5-11). Nulato lies within Game Management Unit (GMU) 21D, though some households reported also traveling to the Koyukuk Controlled Use Area on the Koyukuk River to search for moose. The Koyukuk River was easily accessible by boat for Nulato households. In typical years, the Kaiyuh Slough was also accessible and a preferred moose hunting area for Nulato households, but boat access has become more difficult because of low water in recent years.

Nulato households also traveled to Kaiyuh Flats to harvest migratory bird species in both spring and fall months (Figure 5-12). Ducks and geese were hunted in the near vicinity of Nulato, including on the Nulato River, on the mainstem of the Yukon River a few miles north and south of the village, on Happy Slough, an area on the opposite bank of the river from Last Chance, and along the bank of the Koyukuk River just upriver of the village of Koyukuk to Koyukuk Mountain. Households also reported searching for ducks and geese on the west side of Halfway Island. Harvest and search areas for ptarmigan and grouse were more concentrated, occurring in the very near vicinity of the village of Nulato and along the Nulato River from the mouth to just past where the river forks (locally referred to as "the forks").

Nulato households also reported a rather large harvest area for vegetation (Figure 5-13), including berries and greens (not including firewood). Households often harvested berries and greens while also participating in other subsistence activities, such as hunting for moose in the fall. Harvest areas for berries and greens extended along the banks of the Koyukuk River, in the Nulato Hills and by the Nulato River close to the community, and in the Kaiyuh Flats.

Harvest Assessments

The survey asked respondents to assess their own harvests in 2 ways: whether they used more, less, or about the same amount of 6 resource categories in 2010 as in past years and whether they got "enough" of each of the 6 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 also asked to evaluate the severity of the impact to their household from not getting enough and whether their household did anything differently (such as supplemented with store-bought food) because they did not get enough. This section discusses responses to those questions. Figure 5-14 and Figure 5-15 depict the percentage of all household responses, including households that did not respond to the question or reported that they do not use the resource, requiring some care in analyzing these percentages. For example, 36% of Nulato households reported getting enough marine mammals (seal oil, etc.) in 2010; however, 56% of households (47 total) reported that they "do not use the resource" (Figure 5-15). Of the 37 households who do use marine mammals and responded to the question, 82% said that they got enough in 2010, which suggests that a much higher percentage of households for whom this resource matters actually got enough. This section discusses results as they appear in the figure, but also will point out situations in which the discrepancy in what those numbers mean is significant.

Salmon fishing sustained most Nulato households. Of the 84 Nulato households surveyed, 78 said they used salmon in 2010 (Figure 5-15). Less than one-half (44%) of responding households reported that they got enough salmon in 2010, and 48% said they did not get enough. One-half (50%) of households also reported that they used less salmon, 24% reported using the same amount, and 15% reported using more than in recent years (Figure 5-14). Households provided a variety of reasons as to why their use differed from recent years. For households who used less in 2010 than in recent years, the major contributing factors were resource availability (27%), regulations (22%), work conflicts (15%), or did not receive through sharing networks (15%) (Table D5-6). Households who used more listed reasons such as "needed more," "increased effort," and "increased availability" (Table D5-7). Several of these responses were linked to a concerted effort to harvest enough salmon that would be eaten and given away during the 2011 Stickdance ceremony. Households that are memorializing a friend or family member in this important cultural event spend substantial time and money to put away enough resources to feed guests and to prepare food for community dinners, dances, potlatches, and other events held throughout the week. Because of the effort involved, extended family members and friends can spend years putting away enough wild foods for this one

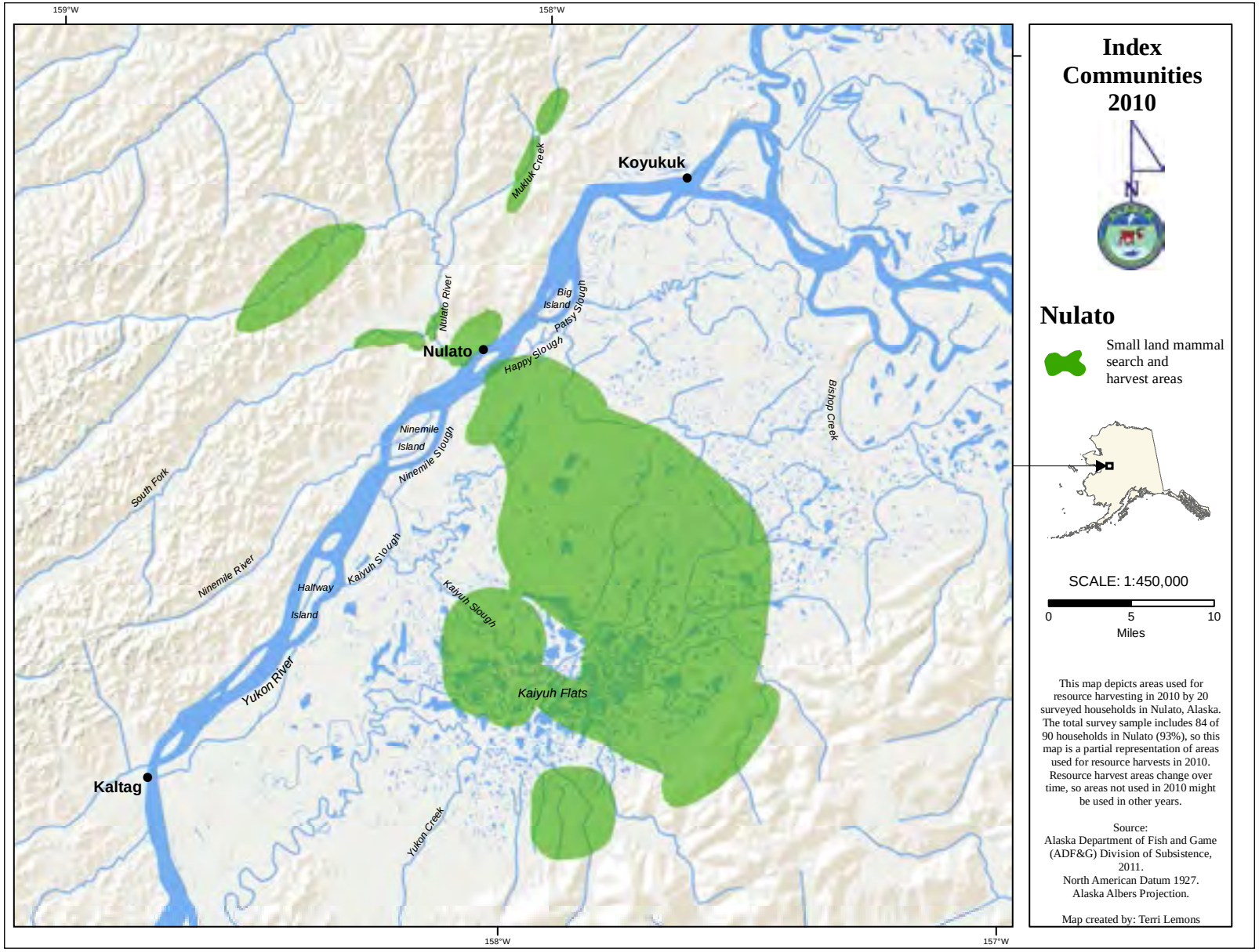


Figure 5-10.–Search and harvest areas, small land mammals, Nulato, 2010.

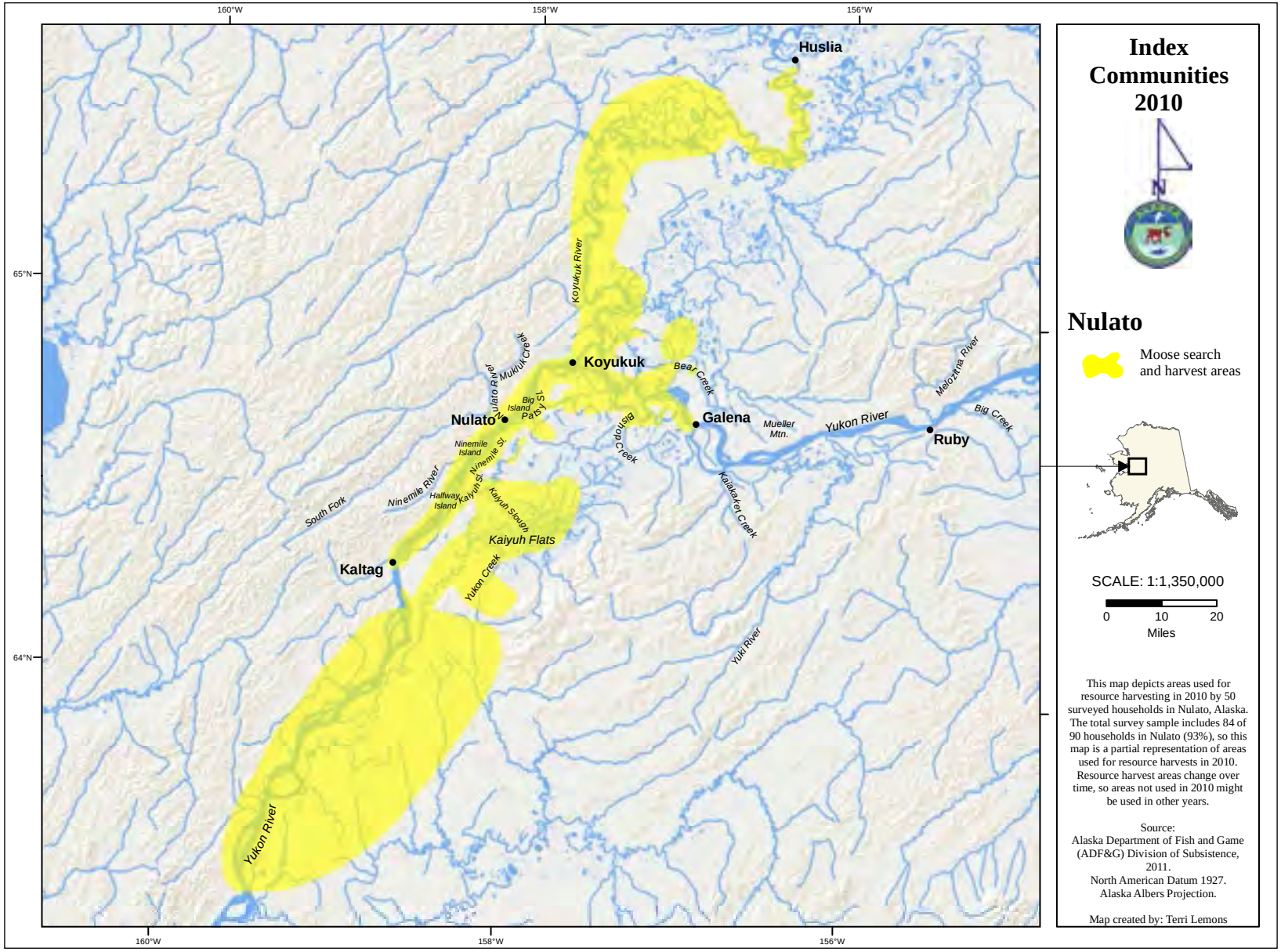


Figure 5-11.–Search and harvest areas, large land mammals, Nulato, 2010.

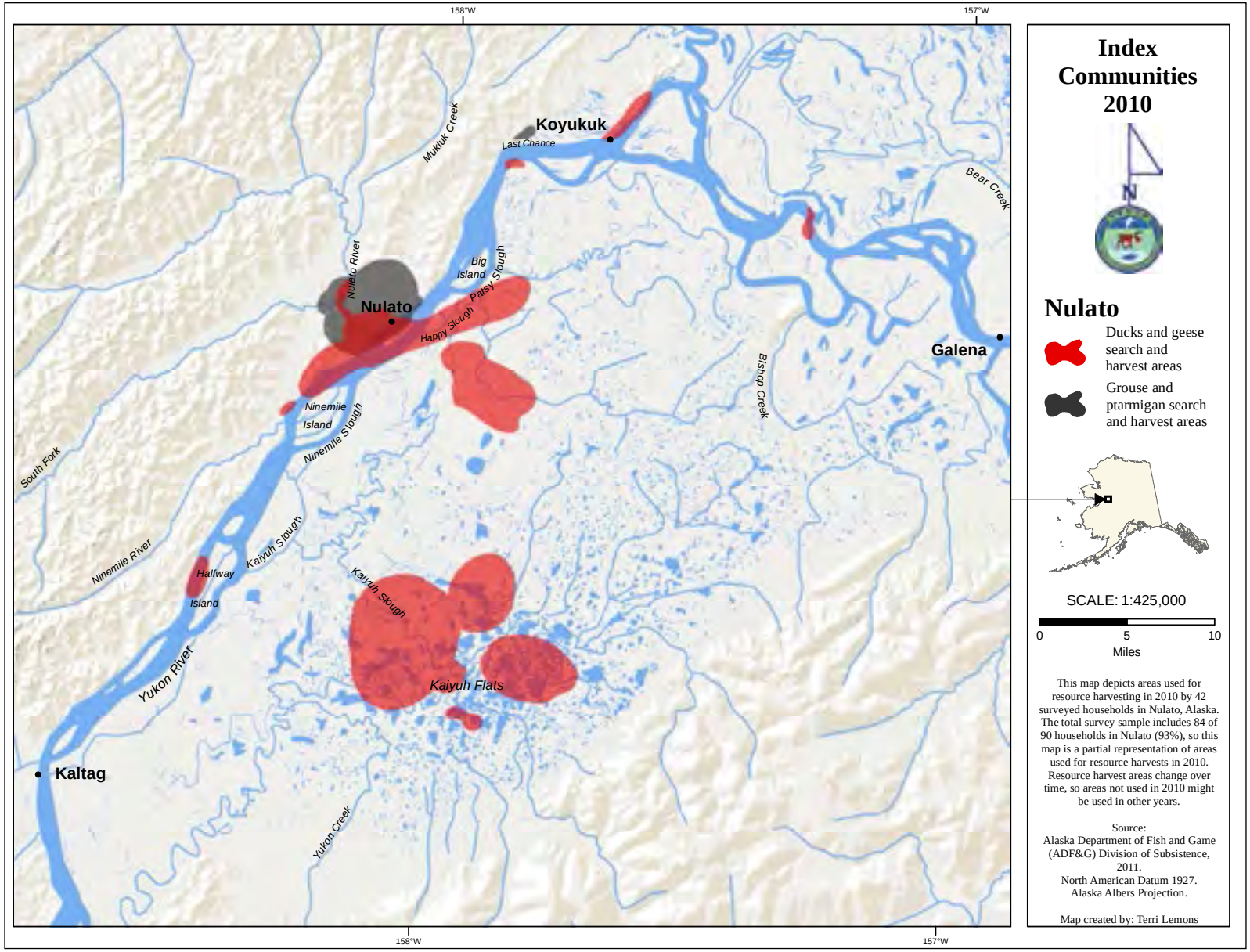


Figure 5-12.–Search and harvest areas, birds, Nulato, 2010.

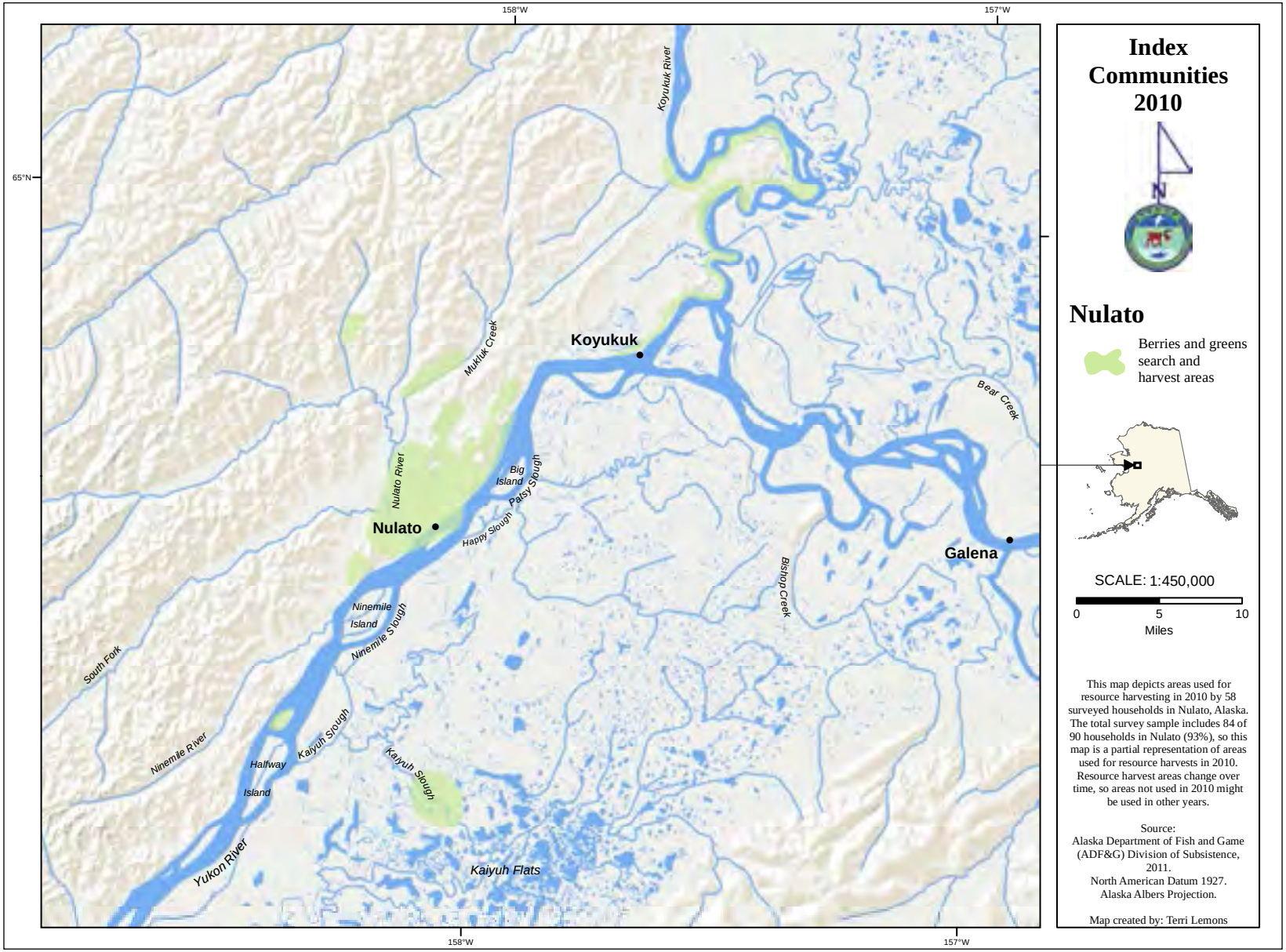


Figure 5-13.–Search and harvest areas, vegetation, Nulato, 2010.

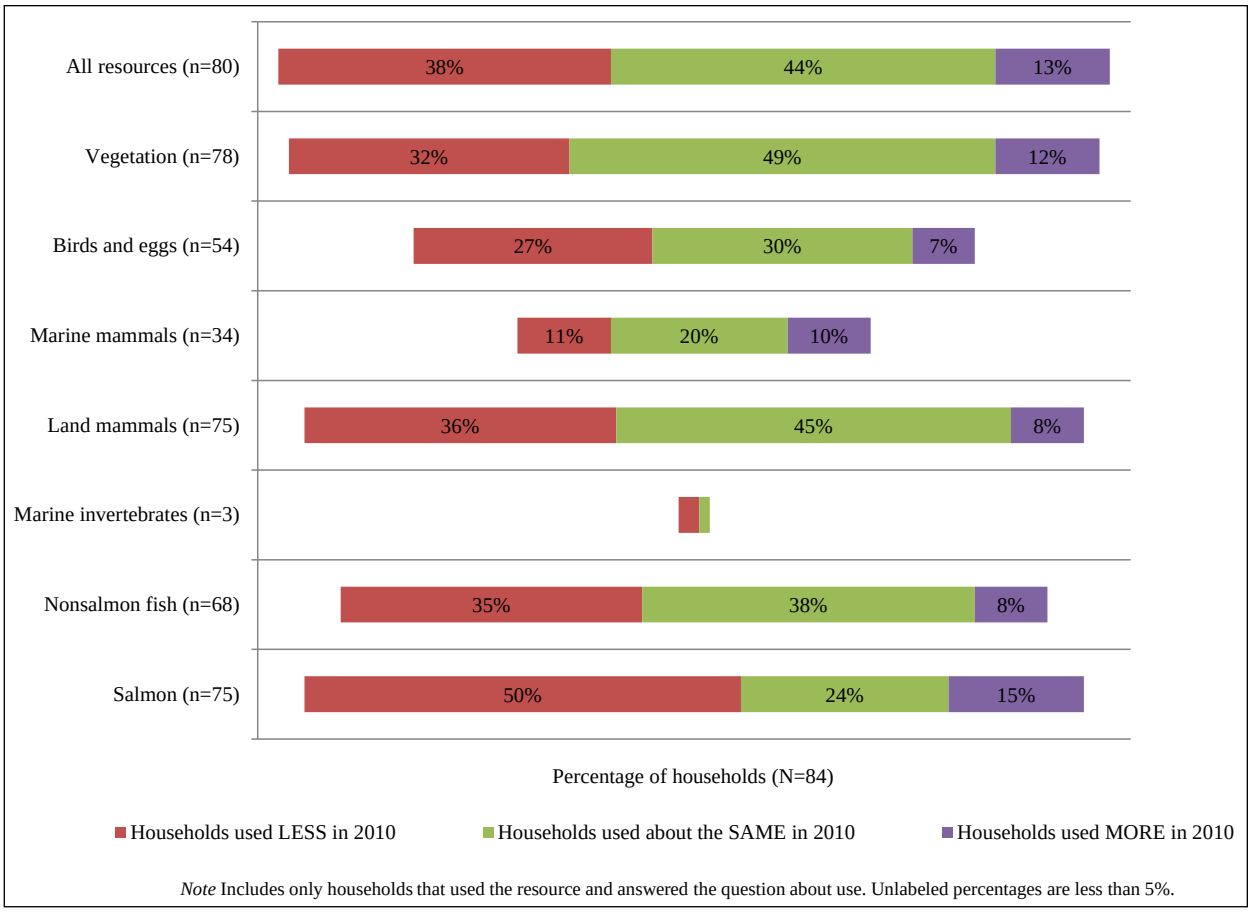


Figure 5-14.–Household use assessments, Nulato, 2010. Responses to the question: Did your household use less, more, or the same amount?

week, and there is a concerted effort during the salmon season prior to the spring in which the Stickdance is held to harvest the necessary amount of fish. When asked to evaluate the impact to their households from not getting enough salmon to meet their needs (on a scale from "not noticeable" to "severe"), 43% of households rated the impact as "minor," 35% rated it as "major," and 18% as "severe" (Table D5-8). Because they were unable to get enough to meet their needs, 56% of households said they used more commercial foods, used another subsistence food, or did something else to meet their food needs for the year (Table D5-9; Table D5-10; Table D5-11).

Nonsalmon fish species were also important contributors to the diets of Nulato residents, especially during the months when fresh salmon were not available. Fifty-seven percent of Nulato households reported that they got enough nonsalmon fish during the study year (Figure 5-15). This percentage is higher than respondents' assessment of salmon species. Nulato households may have been better able to meet their nonsalmon fish needs than their salmon fish needs because of the more conservative management actions during the salmon fishery on the Yukon River in 2010. Out of the 84 surveyed households, 35% said they used less nonsalmon fish in 2010 than in recent years, 38% said they used the same, and 8% said they used more (the remaining 19% of households either did not answer the question or did not use nonsalmon fish species) (Figure 5-14). Households listed 3 primary reasons for using less, including not receiving as much through sharing networks (22%), work conflicts (22%), and less effort (19%) (Table D5-6). Households who did not get enough nonsalmon fish said that the impact to their household was either minor (35%), major (26%), or severe (26%) (Table D5-8). Over 75% of households said that they used more commercial foods, or replaced nonsalmon fish with another subsistence resource, or simply made do without as a result of not having enough to meet their needs (Table D5-9; Table D5-10).

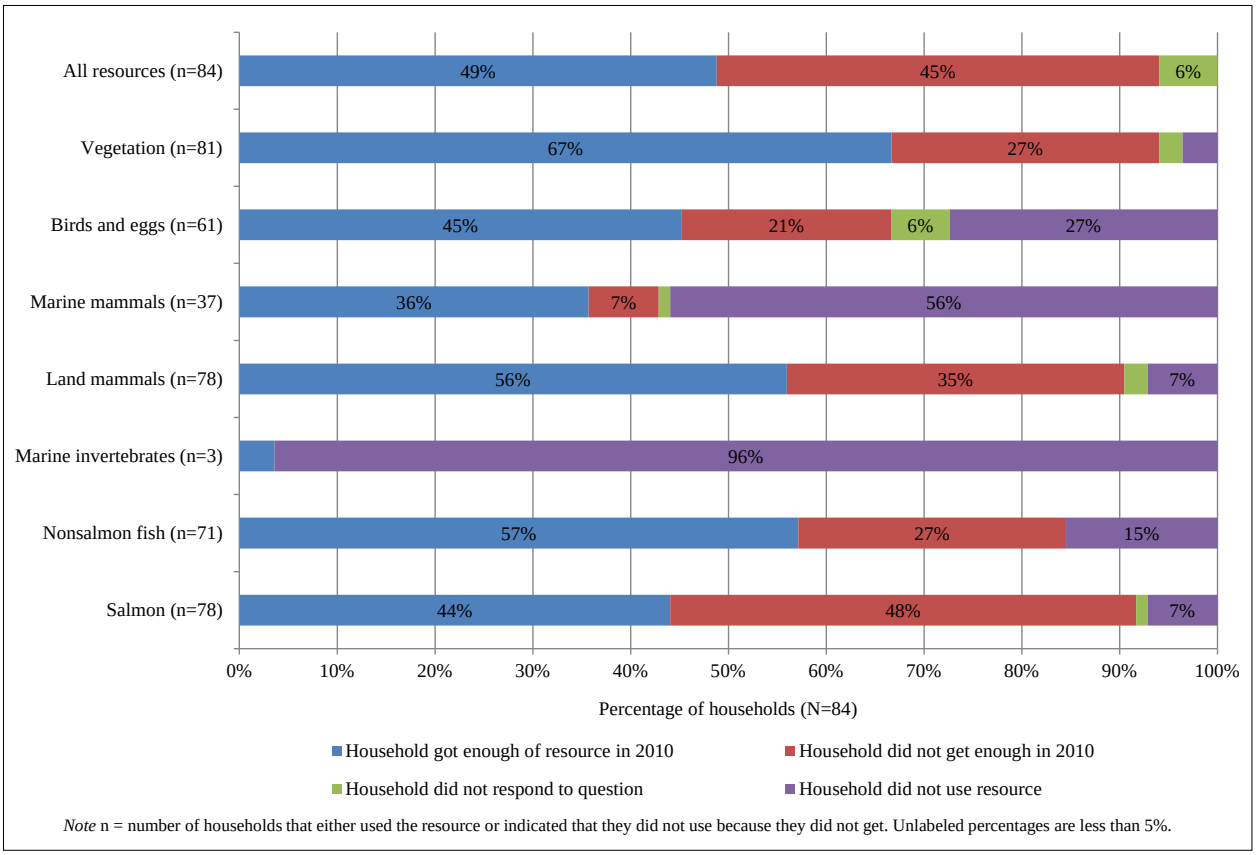


Figure 5-15.–Household harvest assessments, Nulato, 2010. Responses to the question: Did your household get enough?

Few households used marine invertebrates (such as clams or shrimp) in Nulato due to lack of local availability (Table 5-3). The 3 households that reported using the resource also said they got enough and that they used either less or the same as in recent years (Figure 5-14; Figure 5-15).

Like fish, land mammals such as moose and beavers were important sources of sustenance for Nulato households. Seventy-eight of the 84 households said they use land mammals (Figure 5-14). In 2010, 56% of 84 households said they got enough, and 35% said they did not get enough (Figure 5-15). Few households (8%) reported using more land mammals in 2010 than in recent years; more commonly households said they either used less (36%) or the same amount (45%) in 2010 (Figure 5-14). The primary reason households said they used less land mammals in 2010 than in recent years was because they were not successful when they tried to go hunting (9 households) (Table D5-6). Other households reported family or other personal issues (5 households), or less effort (3 households), or simply that they did not get enough (3 households). This latter answer demonstrates that sometimes even if a household was successful at harvesting land mammals (primarily moose), the amount might not be adequate because they also needed enough to share the resource, an important custom in Nulato. Like salmon and nonsalmon fish, not getting enough land mammals can be a critical problem for Nulato households. For households that did not get enough land mammals, responses were mixed: 45% called it a minor impact to the household, while 48% said it was either a major or severe impact for their households (Table D5-8). Eighty-two percent of households who said they did not get enough land mammals said that they had to do something different to secure food: namely, buy more commercial foods (Table C5-9; Table C5-10). This high percentage of households having to replace their subsistence food with store-bought food is significant, especially considering the lack of availability and the high cost of food sold in rural Alaska.

Marine mammals and marine mammal products (such as seal oil) are commonly used by Nulato households even though the community is not located on the coast. Long-standing trade relationships with coastal communities and other factors contribute to the redistribution of such resources to Interior communities such as Nulato. Of the 84 households surveyed, 34 said they use marine mammals or marine mammal products (Figure 5-14). As noted previously, 36% of all 84 responding Nulato households reported getting enough marine mammals in 2010; however, 56% of households reported that they did not use the resource (Figure 5-15) More often than not, households that used marine mammals said they used about the same (20%) in 2010 as in recent years, compared with 11% that said they used less and 10% who said they used more in 2010 (Figure 5-14). Nearly every household that said it used either less or more marine mammals said this was because they received a different amount, again highlighting the importance of trade relationships between Nulato and other communities for Nulato residents in securing these resources (Table D5-6; Table D5-7). The impact of not getting enough of these resources was ranked as less severe than other resources (Table D5-8). Only 1 household said that its inability to get the marine mammals they needed resulted in that household doing something different to obtain resources in 2010 (i.e., purchase commercial foods) (Table D5-9; Table D5-10).

Nulato households who said they use the species that fall into the "birds and eggs" resource category were primarily referring to birds rather than eggs. Of the 61 households that said they used birds and eggs, 45% said they got enough of that resource category, and 21% said they did not get enough (Figure 5-15). The remainder (33%) either did not respond to the question or did not use birds and eggs. If these households are excluded from the calculations, 68% of households in Nulato who say they used birds and eggs said they got enough of this resource category in 2010. When asked to compare their use to recent years, however, only 7% of the total 84 responding Nulato households said they used more in 2010 (Figure 5-14). More commonly, households said they either used the same amount (30%) or less (27%) in 2010 (36% of households either did not respond to the question or do not use the resource). The reason most often cited by households for using less birds and eggs in 2010 was because they did not receive this resource (Table D5-6). This suggests that bird hunting is a rather specialized activity, and when the hunters in the community are unsuccessful or unable to harvest enough, several households in the community are affected. Most households who did not get enough birds and eggs ranked the impact to their household as minor (61%); however, 22% said the impact was either major or severe (Table D5-8). Again, households who said they did something differently as a result of this impact reported buying food from the store to replace subsistence harvested birds and eggs.

Berries and greens (including firewood) were the most widely used resource category by Nulato households (Figure 5-15). Of the 84 surveyed households, 67% said they got enough berries and greens in 2010, while 27% did not get enough. Nearly one-half, or 49%, of responding households reported using the same amount of berries and greens in 2010 as in recent years (Figure 5-14). Only 12% said they used more, while 32% said they used less than in recent years. Households that reported less use than in recent years said this occurred because of diminished resource availability (9 households), because they did not receive any (5 households), or because they were working (5 households) (Table D5-6; Table D5-11). Those who said they used more cited reasons such as "needed more" (2 households) or "increased effort" (2 households) (Table D5-7). Three households' reasons fell into the "other" category; however, all three of the specified reasons are linked to the overall increased concentration on harvesting resources by many Nulato families who were preparing for Stickdance in spring 2011. Most Nulato households considered not getting enough berries and greens to have a minor (61%) impact on their households (Table D5-8). Twenty-two percent said that this shortage was either major or severe to their household, and they often purchased more groceries to accommodate their needs (Table D5-8; Table D5-10).

In addition to providing their assessments of each resource category, households were asked the same questions in regard to all their subsistence resources. This assessment question was asked as a summary at the end of the survey. For all resource categories, nearly one-half (49%) of Nulato households said they got enough in 2010; the remainder of the households either did not get enough (45%) or did not respond to the question (6%) (Figure 5-15). All 84 responding households indicated that they used "all resources;" however, 5 households did not respond to this question (Table 5-2; Figure 5-15). The impact to households

Table 5-8.–Estimated earned and other income, Nulato, 2010.

Income source	Number of people	Number of households	Total for community	Mean per household[a]	Percentage of total[b]
Earned income					
Local government	83.6	59.3	$1,734,718	$19,275	46.4%
Construction	9.6	7.7	$161,183	$1,791	4.3%
Federal government	20.4	15.4	$133,455	$1,483	3.6%
Services	6.4	6.6	$121,765	$1,353	3.3%
Retail trade	7.5	7.7	$103,768	$1,153	2.8%
Mining	3.2	3.3	$82,303	$914	2.2%
State government	4.3	4.4	$40,960	$455	1.1%
Transportation, communications, and utilities	3.2	3.3	$36,523	$406	1.0%
Other employment	2.1	2.2	$18,744	$208	0.5%
Earned income subtotal	**119.9**	**70.2**	**$2,433,418**	**$27,038**	**65.1%**
Other income					
Alaska Permanent Fund dividend		83.6	$304,695	$3,386	8.2%
Pension/retirement		16.1	$274,459	$3,050	7.3%
Social Security		22.5	$235,697	$2,619	6.3%
Food stamps		26.8	$141,305	$1,570	3.8%
Native corporation dividend		81.4	$119,572	$1,329	3.2%
Unemployment		17.1	$49,559	$551	1.3%
Energy assistance		53.6	$45,092	$501	1.2%
CITGO fuel voucher		53.6	$26,152	$291	0.7%
Supplemental Security Income		7.5	$25,526	$284	0.7%
Adult public assistance		6.4	$18,218	$202	0.5%
Alaska Longevity Bonus		6.4	$16,116	$179	0.4%
Disability		4.3	$13,140	$146	0.4%
Foster care		1.1	$12,857	$143	0.3%
Other		2.1	$8,717	$97	0.2%
Veterans assistance		1.1	$7,029	$78	0.2%
Child support		3.2	$5,803	$64	0.2%
Meeting honoraria		1.1	$1,071	$12	0.0%
Worker's compensation/insurance		0.0	$0	$0	0.0%
Meeting honoraria		0.0	$0	$0	0.0%
Other income subtotal		**85.7**	**$1,305,009**	**$14,500**	**34.9%**
Community income total			**$3,738,427**	**$41,538**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

a. Means are based on all households in the community, not the number of households in the income category.

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

of not getting enough of a certain resource varied from household to household. Overall, the impact to those households that did not get enough wild foods in 2010 was considered to be a fairly significant concern: 34% said the impact was minor, whereas 53% said it was either a major or severe impact to their households (Table D5-8). Of the households not getting enough, 65% did something different to obtain food, including buying more food at the grocery stores, asking others for assistance, or making do without the wild foods that they believed that they needed that year (Table D5-9; Table D5-10).

Jobs and Income

Respondents were asked about both earned income (jobs held and wages earned by all household members 16 years old and older) and other income (Alaska Permanent Fund dividend, Social Security, public assistance, etc.) For 2010, Nulato households earned or received an estimated $3,738,427, of which $2,433,418 (65%) was from wage employment and $1,305,009 (35%) was from other sources (Table 5-8).

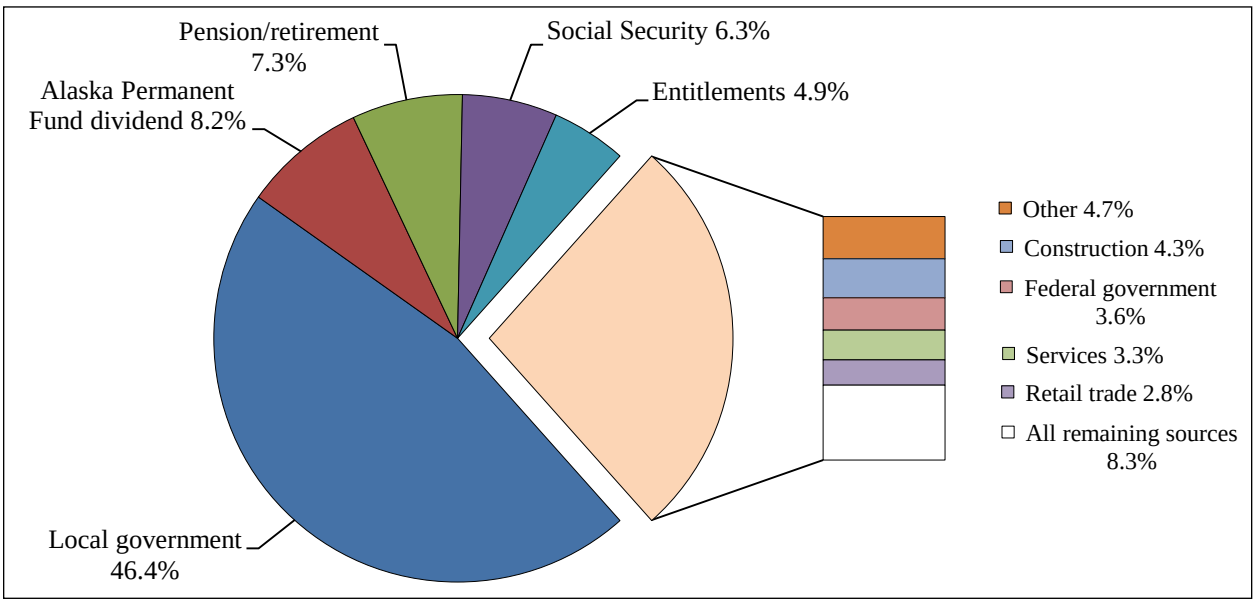


Figure 5-16.–Top 10 income sources, ranked by estimated amount, Nulato, 2010.

Average household income was $41,538 and per capita income was $14,379. The top 3 sources of income for Nulato households were local government (46%), Alaska Permanent Fund dividend (8%), and pension or retirement payments (7%) (Figure 5-16). Nulato is governed by both city and tribal councils, which provide numerous services to the residents. Local government also includes teachers and other school district personnel.

Fifty-nine percent of adults held some form of employment during 2010, with an average of 7 months (Table C4). Additionally, 33% of residents had year-round employment, which was the lowest of the 5 Yukon River communities surveyed. For example, in Galena, more than one-half (55%) of employed adults were employed year-round—one indication of Galena's status as a sub-regional hub community with associated increased opportunities for wage employment. The survey also asked respondents whether the jobs they held were full-time, part-time, shift, on-call (occasional), or part-time shift. In Nulato, 64% of employed adults had full-time jobs, and 41% reported having part-time jobs; 11% reported having on-call type positions (Table D5-12).

Nulato residents experienced numerous changes in the local wage economy over the 20th and early 21st centuries. Employment opportunities have included trapping and selling furbearers, cutting and selling firewood for home heating and use on wood-burning steamboats, salmon fishing, and salmon-associated opportunities including cannery jobs. In the 1970s, some residents applied for and were granted commercial fishing permits (Wheeler 1987). In the early 1980s, 16 Nulato residents held Commercial Fisheries Entry Commission "limited entry" permits for commercial fishing, primarily for the chum salmon roe fishery near Nulato (Robert 1984). This opportunity allowed residents to stay near Nulato during the summer months. With the discontinuance of the roe fishery in the mid-1990s, commercial fishing opportunities in Nulato declined dramatically. In 2011, only 1 Nulato resident operated a fish wheel commercially (Brown et al. 2015).

Food Security

Because Nulato is a rural Alaskan community, it is heavily dependent on subsistence resources as a food source. However, all households relied on a combination of store-bought and subsistence foods for sustenance. Many Nulato residents frequented the 2 small stores, but they expressed concern about high prices and lack of variety. Some Nulato families commonly traveled to Fairbanks to grocery shop (while visiting family or the doctor) or place orders for shipping; either way, getting store-bought food to rural Alaska was expensive.

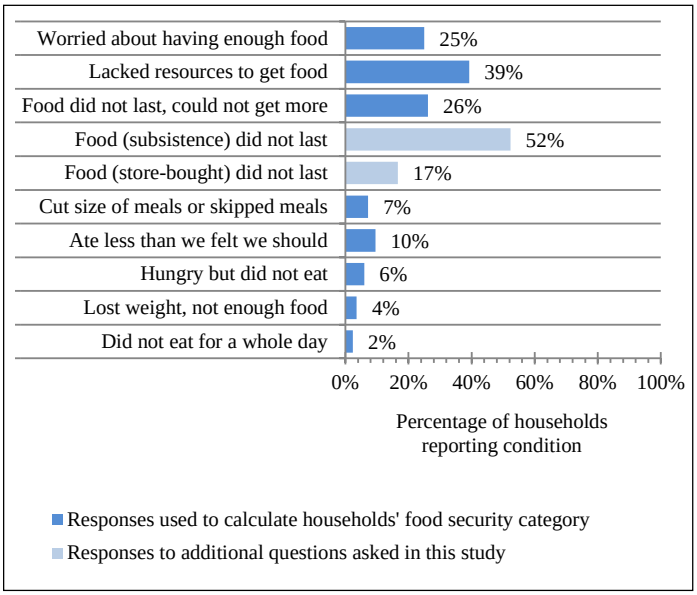


Figure 5-17.–Food insecure conditions, Nulato, 2010.

The challenges and expense of procuring food raise questions about food security, that is, "access by all people at all times to enough food for an active, healthy life" (Nord et al. 2009:2). Core questions designed to assess household food security and Nulato responses are summarized in Figure 5-17.

The food security questions were modeled on questions developed by the U.S. Department of Agriculture (USDA) and modified by ADF&G to account for differences in access to subsistence and store-bought foods. Based on their responses to various food conditions (e.g., whether a household worried about having enough food, whether food that the household had lasted), households were categorized as being either food secure or food insecure (Bickel et al. 2000). Food secure households were broken down further into 2 subcategories—either high food security or marginal food security. Food insecure households were also divided into 2 subcategories: low food security or very low food security. Households with high food security did not report any indications of food access problems or other limitations, such as anxiety over food availability or sufficiency in the household, and they gave little to no indication of diet or food intake changes taking place as a result of anxiety. Households with marginal food security reported 1 or 2 instances of food access problems or other limitations. Households with low food security were those that reported reduced quality, variety, or desirability of their diet. Households characterized as having very low food security were those that reported multiple instances of disrupted eating patterns and reduced food intake or change in diet.[4]

In Nulato, 85% of surveyed households had high or marginal food security (Figure 5-18). Eleven percent of households had low food security and 4% had very low food security. The USDA considers households with high or marginal food security to be "food secure" households, which means that the percentage of Nulato households reporting as food secure was similar to levels of food security in the rest of Alaska and the United States in 2010. Because the sources of food for rural Alaska residents differs from those of the greater United States' population, it is important to explore the conditions that exist in Nulato households concerning food availability, quality, sufficiency, and the corresponding relationship to changes in food intake or diet.

In 2010, an estimated 25% of households in Nulato worried that they did not have enough food at some point during the previous 12 months, and 39% of households said they lacked the resources they needed to get food (including resources they needed to hunt, fish, gather, or buy food) (Figure 5-17). Slightly more than one-quarter (26%) of households felt that the food they had did not last and they were unable to get more food. In Nulato, subsistence foods seemed to be lacking more than commercial foods: 52% of households said that their subsistence foods ran out and they were unable to get more, while 17% of households said their store-bought food ran out and they were unable to get more.

To evaluate the severity of the food insecure conditions, household respondents were asked various statements about whether they were forced to change their food intake as a result of food shortage. In Nulato, 10% or fewer households said that in 2010 there was at least one occasion when they ate less than

4. U.S. Department of Agriculture (USDA) Economic Research Service, Washington D.C., 2014. "Definitions of Food Security." Accessed November 7, 2014. http://www.ers.usda.gov/topics/food-nutrition-assistance/

they felt they should, were hungry but did not eat, or did not eat for a whole day because there was not enough food in the household.

Households were also asked the months during the year that food shortages or other insecure conditions persisted for them. Figure 5-19 depicts the seasonal variations in food security. In Nulato, households that were food secure in 2010 experienced minimal food insecure conditions all year round. However, food insecure households experienced a seasonal shift in their security. Households with very low food security identified January and February as the months when they had the greatest anxiety about their food situation. This anxiety declined somewhat during the spring months and leveled off for the summer and into the fall. This coincided with the availability of subsistence resources; the 2 may be connected. As noted previously in the "Seasonal Round" section, Nulato households typically began harvesting species such as whitefishes and migratory waterfowl in the spring months; this fresh meat was considered to be a welcome change to the winter diet and allowed families to replenish food caches. Salmon runs in the summer provided a steady supply of nutritious food, while in early fall (September) hunters provided a bounty of fresh moose meat to their families. Nulato households that reported low food security also experienced fluctuations throughout the year in regard to their anxiety about food conditions. However, while they experienced fewer instances of food insecurity in February and May than those households characterized as having very low food security, they actually experienced a higher level of food insecurity than very low food security households during the time of rich wild food availability (after June). One explanation for this difference could be that low food security households experienced anxiety about

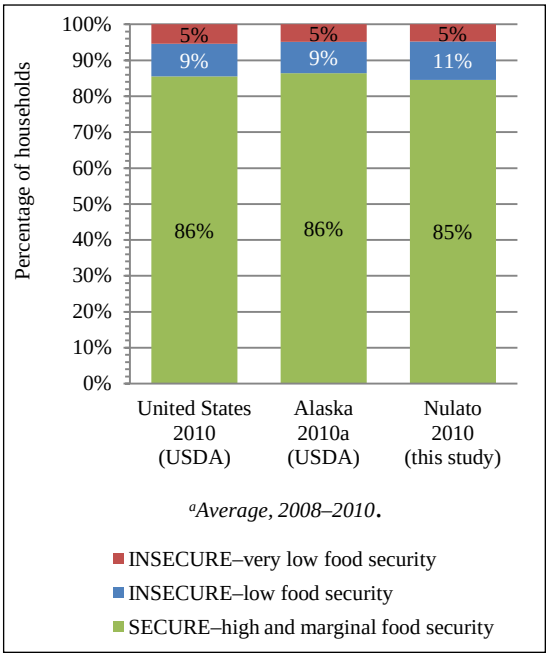


Figure 5-18.–Food security categories, Nulato, 2010.

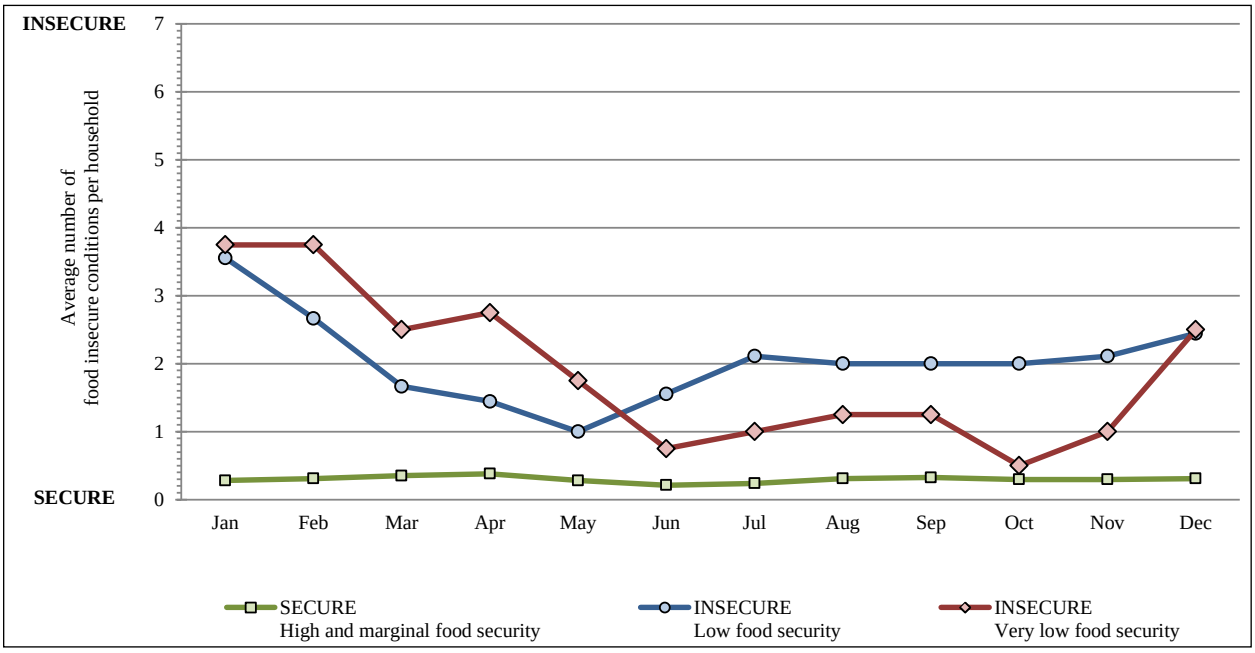


Figure 5-19.–Food insecure conditions by month and household category, Nulato, 2010.

food year-round as a result of consistently high prices associated with both purchasing store-bought food and purchasing gas or other products needed to harvest wild foods. Also, while most households in Nulato shared wild foods as a way to redistribute subsistence harvests (see "Wild Food Networks"), those with very low food security conditions might have considered themselves to benefit more from sharing networks (such as elders or working families), especially during those times of high food production. Additionally, some very low food security households might have had more access to summer fishing and fall moose hunting, but little access to the cash needed for store bought food during the late winter and spring when subsistence stores are low.

Wild Food Networks

Distribution of subsistence foods among community members and neighboring communities is an important traditional practice in middle Yukon communities and is guided by customary and traditional systems and rules (Wolfe and Ellanna 1983). These wild food networks are not only important as a means to distribute resources within the community; they also have strong cultural and social implications. Missionary Jules Jetté observed certain customs involved with group hunting activities (Loyens 1966:51). For example, the first caribou or moose of the season was shared by the entire community, and an animal shot or caught with another's weapon or traps was shared with the owner of the tools or gear (Loyens 1966:52–53). Additionally, when a group of hunters worked together to harvest a large game animal, the hunter who killed the animal never received the major share. Instead, he received either an insignificant share or nothing at all. Further, if an elder man was in the group, custom dictated he would receive the prime parts, such as the rump and the breast. "The disadvantaged killer, however, had an equal share in the kill of the other hunters in the group, so that in a lucky hunt everyone returned with meat" (Loyens 1966:51).

This survey collected quantitative data to determine the rates of giving away and receiving foods, as well as patterns of sharing among households. For every single resource, survey respondents were asked whether their household gave away or received that resource. If a resource was received by a household, the respondent was also asked which household in the community shared or traded that resource with them. Confidentiality was preserved by allocating each household a random identification number. If a household lived in another community, the name of the community was recorded. Data are displayed in Figure 5-20. Each triangle or square shape, or "node," denotes 1 household. The blue circle nodes denote a household or households in another community. The various colors depict ages of household heads, and the size of the shape corresponds with the pounds of subsistence resources harvested. Arrows depict the flow of wild foods, and the thickness of the arrow depicts the number of resources shared—or the number of links with another household.

The location of the node is also important. Households with many sources of goods and services appear closer to the center of the diagram while households with fewer sources migrate to the periphery. Typically, households in other communities will fall to the outside of the network, which happens for the Nulato network as well. Communities such as Kaktovik, King Cove, Nightmute, and Nunapitchuk all fall on the edge of the diagram. Fairbanks and Unalakleet are positioned closest to the center. Fairbanks is the nearest urban center to Nulato, and many Nulato residents share family ties with people in Fairbanks. The positioning of Unalakleet near the center is possibly an indication of long term historical trading ties to that coastal community via the Kaltag Portage. Unalakleet was more often named as a source of subsistence resources than the neighboring communities closest to Nulato—Kaltag and Koyukuk, or even Galena.

Nearly every household surveyed in Nulato reported harvesting some type of wild resource; however, a few households were particularly high harvesters. These high harvesters are often the source for a significant amount of wild resources used by the entire community (Wolfe 1987; Wolfe et al. 2010). This pattern of "small group high harvest," known as the 30/70 rule, is true for many mixed cash-subsistence economy communities. For Nulato, 29% of households harvested 70% of the subsistence resources in 2010. Since 93% of households in Nulato were surveyed, most households are accounted for in the network diagram, including the unsurveyed households that were identified by at least one other household as a source of wild food (Table 2-3; Figure 5-20). Only 1 household had no link to any other household. The heaviest

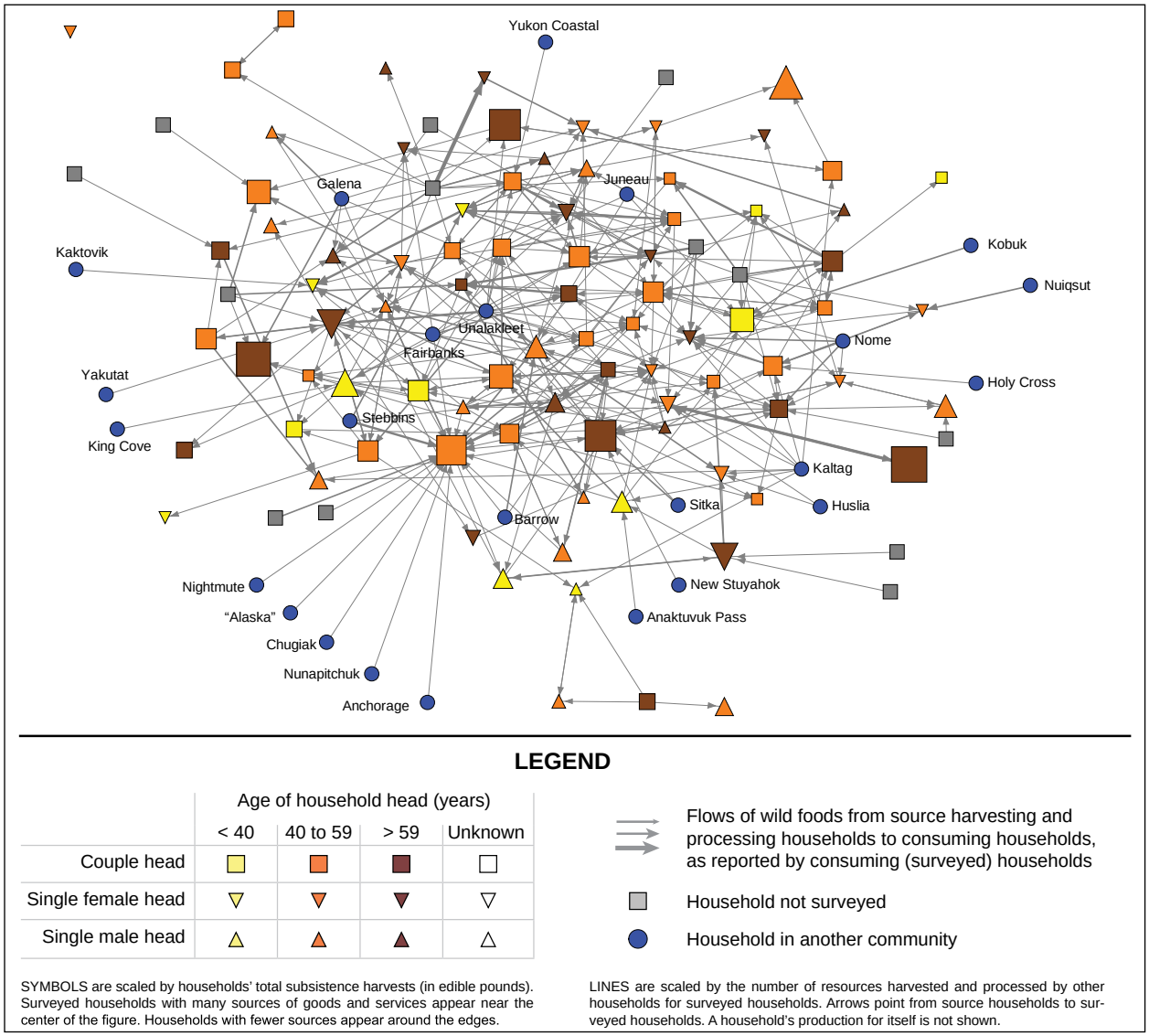


Figure 5-20.–Wild food harvesting and processing network, Nulato, 2010.

harvesters were primarily households headed by couples, including residents who are over age 59 (elders). The households with the most links to other households appear to be households headed by mature couples, as well as a few elder, single- and dual-headed households of both genders.

Comparisons with Prior Results

Seasonal and annual subsistence harvest patterns can fluctuate over time as a result of a variety of factors, including environmental, technological, economic, and social changes and influences within a community. This section looks at past studies, both qualitative and quantitative, and compares them with the 2010 comprehensive subsistence harvest and demographic data collected as part of this study. No similar comprehensive baseline study has been conducted in Nulato; however, historical quantitative harvest information for particular subsistence species by Nulato residents is available. Research has been conducted on resource categories, such as salmon, nonsalmon fish, and large game animals. This section summarizes past and ongoing studies conducted in Nulato, highlighting particular studies for comparative purposes.

Salmon harvest patterns have varied over time as a result of technological advances or species abundance, though other factors have also played roles. For example, in the 1930s, airplanes began replacing sled dogs as the primary mail and supply carrier, which contributed to a gradual reduction in the need for subsistence salmon because of decreased demand for salmon used to feed dog teams. Introduction of the snowmachine in the early to mid-1960s further accelerated the decline (Andersen 1992). Beginning in the early 1970s, commercial fishing opportunities became available to Nulato residents: from 1974 through 1977, the sale of subsistence-caught summer chum salmon was allowed, resulting in a slight increase in subsistence harvests during those years (Borba and Hamner 1998). Beginning in 1978, in response to unfavorable chum salmon market conditions, the commercial fishery became primarily a roe fishery (Whitmore et al. 1990). Other major changes have included a regulatory shift in allowable gear types used to harvest salmon, which can have an effect on the species harvested. Fish wheels were introduced to Nulato sometime between 1910 and 1922; this technology targeted large quantities of chum salmon (Loyens 1966:151). Nulato fishers primarily harvested Chinook salmon with setnets and drift gillnets, but between 1974 and 1981 drifting was prohibited by regulation in Nulato, which impacted the quantity of Chinook salmon harvested during those years (Marcotte 1982). In 2011, ADF&G implemented a regulation that limited the mesh size of gillnets to 7.5 inches. As noted earlier, this shift was greeted initially with skepticism by Nulato fishermen, but postseason observations of the new mesh size regulations were positive (Brown et al. 2015).

Between 1988 and 2010, salmon harvest levels in Nulato fluctuated, varying species by species. Postseason subsistence salmon fishery and harvest information has been collected by ADF&G since 1961; however, data collected since 1988 are most comparable with the 2010 data because of similarities in data collection methods. Figure 5-21 depicts the harvest trends for 3 salmon species from 1988 to 2010. The trend line for Chinook salmon since 1988 appears stable, hovering around an annual harvest of 2,000 individual fish. There are a few notable variations. Peak years were 1998 (4,447 fish), and 2004 (5,531 fish); exceptionally low harvest years were 2000 (1,083 fish), 2008 (1,250 fish), and 2009 (1,259 fish). These years of low harvest correspond with federal fishery disaster declarations in 2000 and 2009 (Brown et al. 2015). The poor returns have led to more conservative management through restrictions and closures. In 2010, the harvest was 2,000 individual fish. Although harvest estimates have been relatively stable with some exceptions, these estimates do not measure the increased amount of time and resources spent to maintain these harvest levels.

The summer chum ("dog") salmon trend line shows a dramatic decline in harvests after 1988, with relatively stable harvests since then. Though not shown on the figure, harvests of summer chum salmon in the 1980s were overall much higher than any year during the 1990s or after 2000 (peak years were 29,657 fish in 1980 and 19,740 fish in 1982). For much of the 1980s, the subsistence surveys in Nulato counted the summer chum carcasses resulting from the commercial roe fishery as part of the subsistence harvest (Holder and Hamner 1998:3). This method was not employed in 1984; that year subsistence harvests of summer chum salmon were 232 fish. The 1988 harvest of 10,201 fish dropped to 200 fish harvested in 1989 and since then, harvests have rarely exceeded 1,000 fish (Figure 5-21). Although some of this decline in harvest may be explained by methodological differences in the harvest survey, it is likely due either to changes in the commercial summer chum roe fishery or to problems with the area processing plant in Kaltag during that time. The commercial chum salmon roe fishery closed in the late 1990s, also affecting the subsistence harvests (Bergstrom et al. 2001). High harvests in 1998 (3,519 fish) and 1999 (1,945 fish) may have corresponded with an increased effort as a result of low Chinook salmon runs. In the years 2000–2010, summer chum harvests did not exceed 900 fish. In 2010, 290 summer chum salmon were harvested in Nulato.

Fall chum salmon harvest numbers have steadily declined since 1988. In 2000, 2001, and 2002, fall chum salmon harvest numbers were at or near 0, which corresponds with a crash in fall chum salmon throughout the Yukon River (Bue et al. 2006). The 2000 subsistence fishing season in the Yukon River was an extremely bad year for runs of all salmon species and was the worst fall chum salmon run on record (Bue et al. 2006:2). These poor returns led to more conservative management through restrictions and closures for the next several years (Bue et al. 2006).

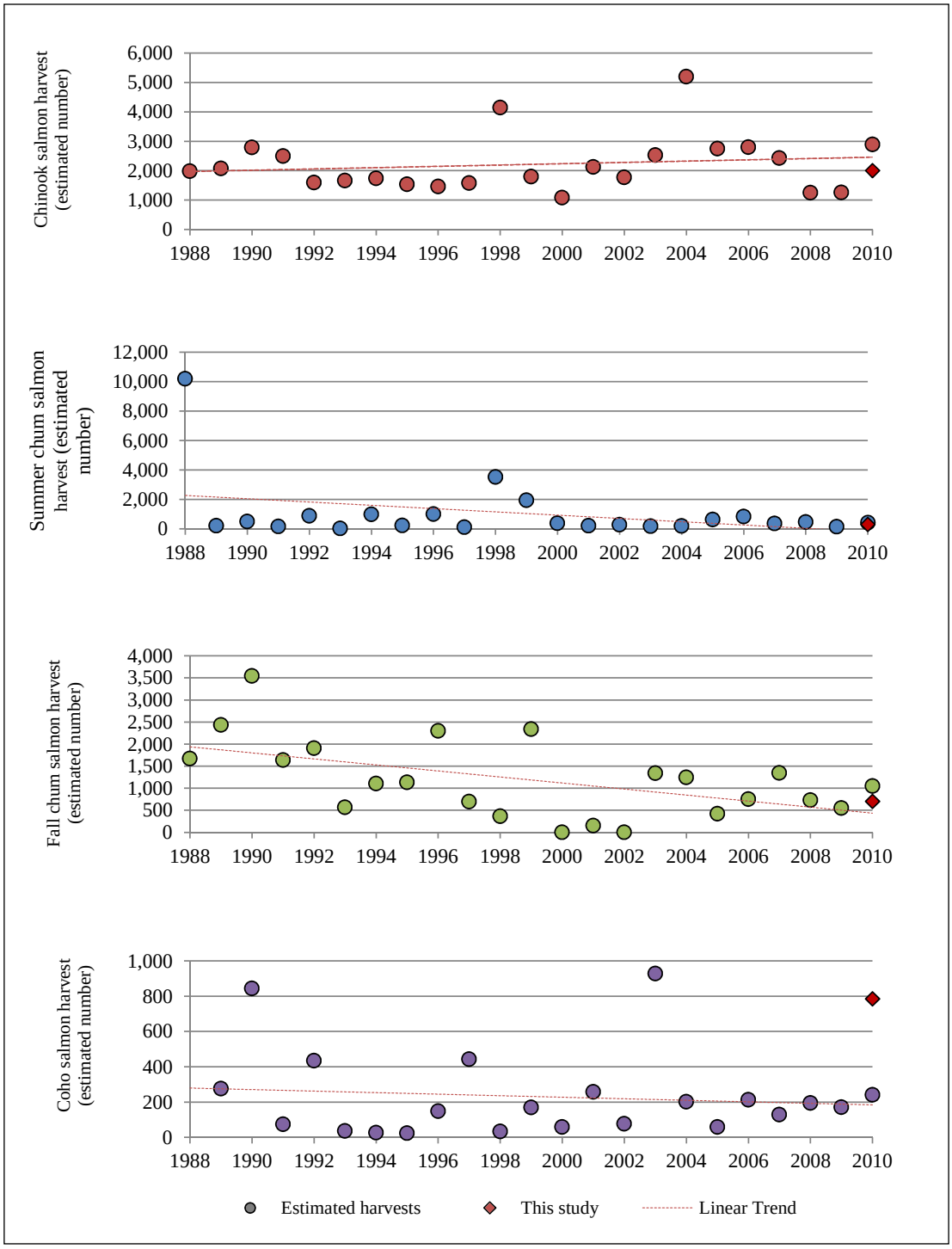


Figure 5-21.–Estimated salmon harvests in numbers of fish, Nulato, 1988–2010.

Coho salmon harvests remained relatively stable from 1988 through 2010, according to the harvest data (Figure 5-21). Harvests experienced sharp year-to-year fluctuations, but coho salmon harvests in Nulato did not exceed 1,000 fish in the 30 years prior to 2010 and averaged 230 fish annually during that time. The 2010 harvest estimate of 785 coho caught by Nulato residents was higher than this average. This increase might be attributed to confusion over the local terminology, or a result of an increased effort to harvest fall chum salmon (which comigrate) to replace Chinook salmon harvests earlier in the season.

Fishing for nonsalmon fish sustained Nulato households throughout the year. In 2006, ADF&G conducted a study collecting traditional ecological knowledge and harvest information for nonsalmon fish species in the middle Yukon, including Nulato (Brown et al. 2010). Overall, Nulato fishermen reported higher harvests in 2006 than in 2010 (Figure 5-22). A total of 11,447 lb were harvested in 2006, or 135 lb per household and 42 lb per person. In 2010 residents harvested only 6,696 lb of nonsalmon fish, or about 74 lb per household and 26 lb per person. The most significant discrepancy was in harvest of broad whitefish: in 2006, 3,143 lb (786 fish) were harvested, while in 2010, 411 lb (294 fish) were harvested. Harvests of northern pike also declined from 1,158 lb (257 fish) in 2006 to 574 lb (128 fish) in 2010. Sheefish harvests declined from 3,356 lb (559 fish) to 2,237 lb (373 fish). Harvests of Arctic grayling increased from 976 lb (1,395 fish) to 1,417 lb (2,024 fish). The primary reason for these decreased harvests was likely the low water limiting access to Kaiyuh Flats, the area where these species were commonly harvested.

Nulato's reliance on subsistence harvests of land mammals is characterized primarily by two notable factors: an ability to adapt to changes in abundance and availability and an increased reliance on moose since the 1930s (though moose harvests have declined more recently). Some elder Nulato residents remember when harvesting a moose was a notable event, because moose were rare. In 1998, elder Eddie Hildebrand recalled a moose hunt in the 1930s in Kaiyuh that was unique because moose were not abundant at the time: typically hunters had to travel far to harvest a moose.[5] Successful hunters had to debone moose in order to reduce weight before packing it back to Nulato, recalled elder Pauline Peters.[6] Instead of moose, small land animals such as rabbits, ptarmigan, and spruce grouse provided people with fresh meat. In her biography, respected Nulato resident Martha Joe recalled that when she was growing up in Kaiyuh, "there was no

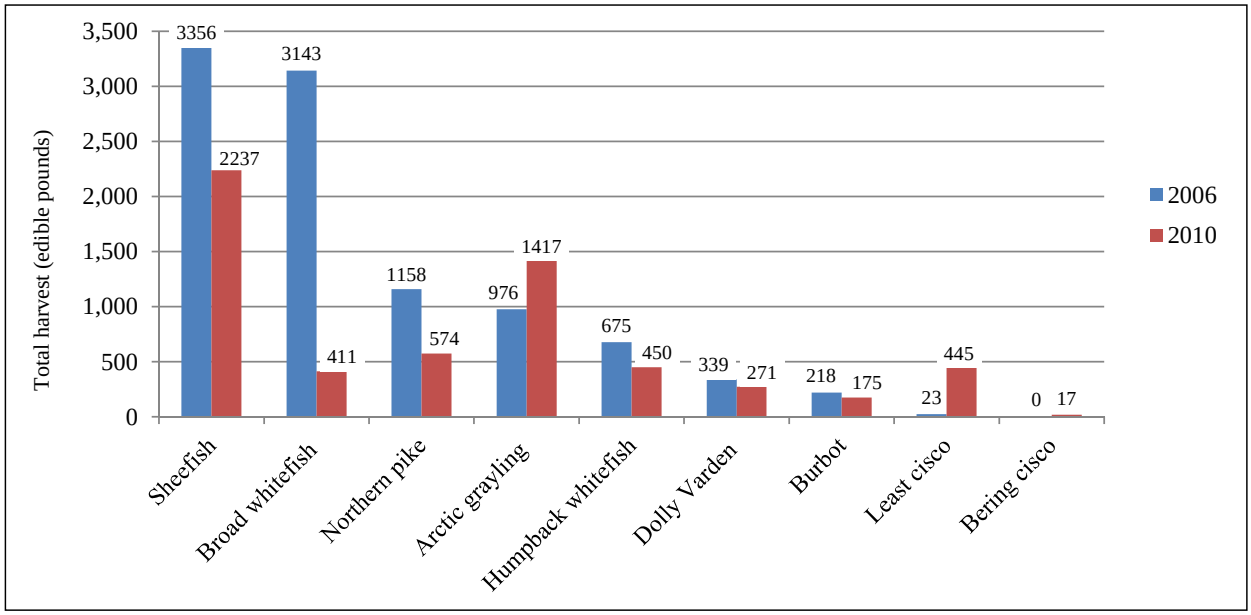


Figure 5-22.–Estimated nonsalmon fish harvests in edible pounds, Nulato, 2006 and 2010.

5.Eddie Hildebrand, interview by Mike Spindler, Raven's Story, KIYU-AM, April 1, 1998. http://jukebox.uaf.edu/RavenStory/htm/eh.htm.

6.Pauline Peter, interview by Mike Spindler, Raven's Story, KIYU-AM, April 1, 1998. http://jukebox.uaf.edu/RavenStory/htm/pp.htm

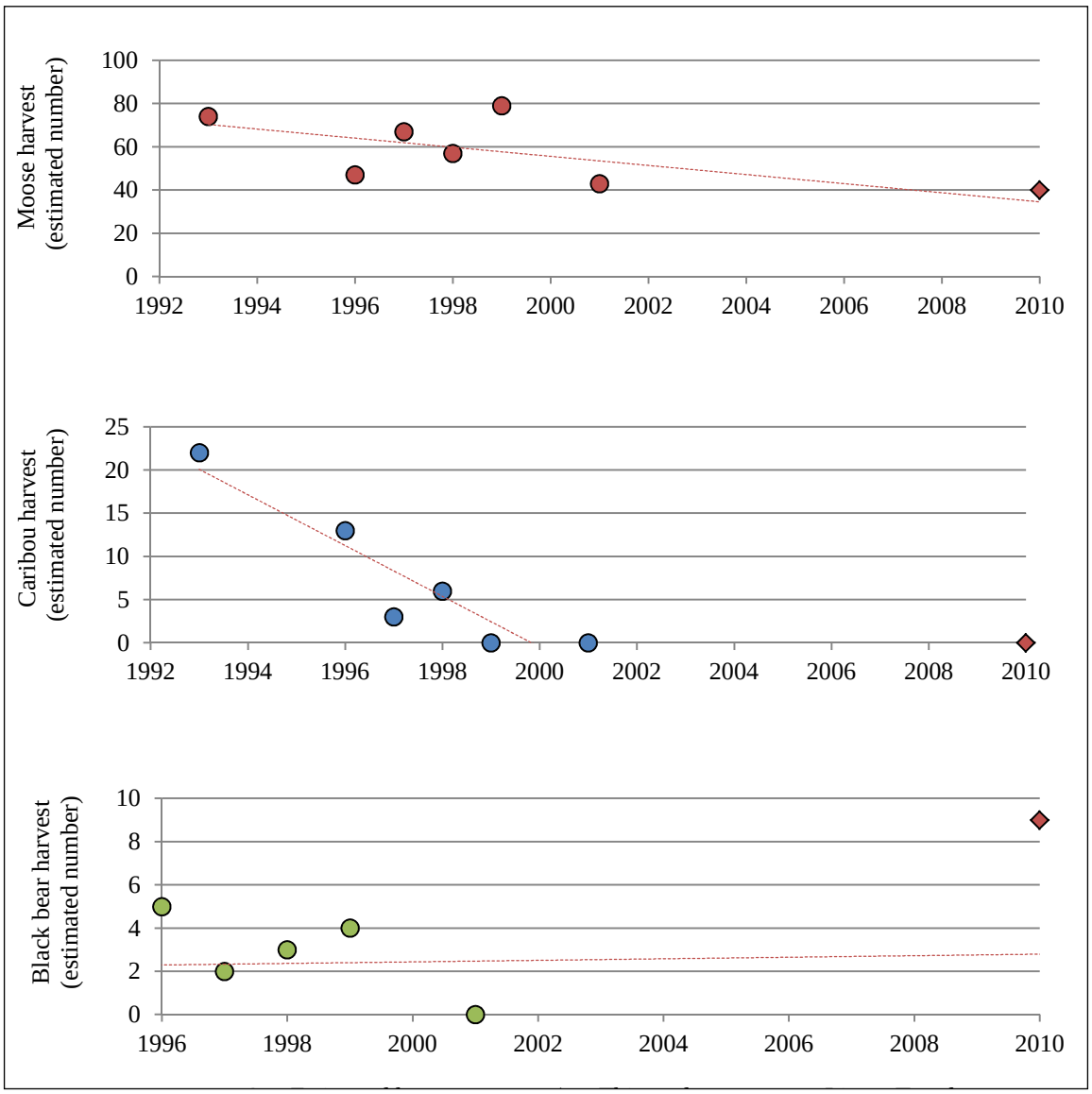


Figure 5-23.–Estimated large land mammal harvests in numbers of animals, Nulato, 1992–2010.

moose and no beaver. Just ducks and bears and porcupines. We enjoyed the food, because it was nice" (Joe 1987:28). Moose populations in Kaiyuh and surrounding area increased during the 1940s (Huntington 1993).

Several studies trace the recent history of land mammal harvests by Nulato residents. A large land mammal study was conducted in 1993 by Tanana Chiefs Conference in 11 Athabascan communities, including Nulato.[7] The Division of Subsistence conducted research documenting the importance of trapping activities in Kaiyuh Flats as part of land use planning for the newly established Innoko National Wildlife Refuge (Robert 1984). Finally, from 1996 to 2002, Nulato residents were surveyed about their harvests of caribou, moose, bears, and wolves as part of a big game survey program on the middle Yukon and Koyukuk rivers (Andersen et al. 2004). Figure 5-23 depicts the estimated harvests for large land mammal species from 1992 through 2010 derived from these sources. The Tanana Chiefs Conference big game project estimated

7. Sativa Quinn, Big game harvest information for 11 Athabascan villages studied from December 1992–November 1993, Cooperative Agreement #1448-0007-92-7774, Submitted to U.S. Fish and Wildlife Service and Tanana Chiefs Conference, 1994.

Table 5-9.–Moose hunter effort, Nulato, 1996–2001, 2010.

	Year					
	1996	1997	1998	1999	2001	2010
Estimated harvest[a]	47	67.2	56.9	79	42.3	39.6
Harvest per household		0.78	0.81	1.01	0.53	0.44
Hunter effort[b]				9.00	9.8	13.9

a. Harvest in number of animals.
b. Hunter effort in days per moose harvested.
Source ADF&G Division of Subsistence, Community Subsistence Information System (CSIS) https://www.adfg.alaska.gov/sb/CSIS

that in 1993, an estimated 74 moose were harvested by Nulato residents.[8] Nulato showed consistently high rates of harvest until the 2001–2002 survey, when it decreased from 1 moose per household in 1999–2000 to 0.5 moose per household in 2001–2002. The estimated harvest of moose by Nulato hunters in 2002 was 42 moose, compared with 79 moose just 2 years before (Andersen et al. 2004; Figure 5-23). In 2010, an estimated 40 moose were harvested by Nulato households (Figure 5-23).

The decline in harvest can be attributed to 2 factors: a decrease in opportunities to hunt and an increase in difficulties associated with harvesting moose. Up until 2001, Nulato households were able to participate in both a fall hunt (in September) and an antlerless winter hunt (in February). The bulk of the harvest occurred in the fall hunt, but there was a large share taken in winter as well (between 16% and 26% of the harvest from 1997–2001) (Andersen et al. 1998, 2001, 2004). The harvest effort was divided between fall and winter hunts. For example in 2001, 26 moose were killed in September, 1 in August, and 15 moose in February. The majority of moose harvested in any year have historically been bulls. Though the overall harvests in fall were higher, the winter hunt typically yielded more opportunity for harvesting cow moose: in 1997, all 3 cow moose harvested that year were harvested in winter. In 1999 and 2001, more cow moose were harvested in winter than fall (14 of 23 cows in 1999; 9 of 14 in 2001).

The 1996–2002 survey also included data regarding "hunter-days," or the effort hunters spent to harvest moose. Although harvest estimates provides 1 metric of hunter success, hunter-days was added to capture the possibility of increased or decreased effort expended to harvest moose in the area. Beginning in 2001, the hunter-days data have showed that hunters were spending more time in the field to harvest similar levels of moose, leading researchers to believe that "This is a testament to the prominence of moose as a food resource in this region and the importance local hunters place on meeting subsistence needs with traditional foods" (Andersen et al. 2004:26). During the study year, the hunter effort measured by days hunted was similar to that measured in 2001 (Table 5-9). Higher hunter effort likely resulted from limited access to hunting in Kaiyuh because of low water, which forced hunters to travel past Kaltag and up Khotol River (locally referred to as "22 Mile Slough") to enter their traditional hunting grounds. Other hunters traveled up the Koyukuk River.

Nulato residents typically hunted for moose in GMU Unit 21D. By regulation, residents of GMU 21 were allowed to take 3 moose per regulatory year for the celebration known as the Kaltag/Nulato Stickdance, under permits issued by ADF&G (5 AAC 92.055) and under the terms of a federal registration permit issued by the manager of the Koyukuk/Nowitna National Wildlife Refuge. Nulato residents have also harvested moose in the Koyukuk River drainage, which is part of GMU 21D and GMU 24 (including the Koyukuk Controlled Use Area). Moose in the lower portion of the Koyukuk River were unusually abundant during the late 1980s and 1990s, attracting many hunters and resulting in the implementation of the Koyukuk Moose Management Plan in 2000 (Alaska Department of Fish and Game Division of Wildlife Conservation 2001).

8. Sativa Quinn, Big game harvest information for 11 Athabascan villages studied from December 1992–November 1993, Cooperative Agreement #1448-0007-92-7774, Submitted to U.S. Fish and Wildlife Service and Tanana Chiefs Conference, 1994.

People in Nulato were at one time referred to as “the caribou people,” suggesting that there was a time when caribou were available for harvest (Brown et al. 2015). According to Loyens (1966), the presence of caribou in the area was variable year-to-year, but seemed to be more regularly available prior to the 1960s. Loyens (1966) blamed the decline in caribou in the area on technology: “The decrease in meat which resulted from the gradual disappearance of caribou after the rifle became universally owned, only placed more emphasis upon fish as the staple food” (Loyens 1966:148). The Tanana Chiefs Conference big game project estimated that in 1993, Nulato residents harvested 22 caribou (Figure 5-23).[9] In 1996, 13 caribou (1,642 lb) were harvested, but this declined to 0 in 1999 (Figure 5-23). The migratory route of the Western Arctic caribou herd shifted during this time frame, making caribou less available (Dau 2001).

From the available history of subsistence practices in Nulato and the current research, it is clear that subsistence continues to be one of the predominant characteristics of the way of life in the community, similar to most other rural communities in Alaska. As the state faces changes in its environmental, political, and social spheres, Nulato residents will also be adapting to accommodate those changes. High gas prices, crises over resource abundance, competition for limited wild resources, and concerns about access issues in a changing environment will continue to be some of the most important issues facing Nulato residents.

9. Sativa Quinn, Big game harvest information for 11 Athabascan villages studied from December 1992–November 1993, Cooperative Agreement #1448-0007-92-7774, Submitted to U.S. Fish and Wildlife Service and Tanana Chiefs Conference, 1994.

6. COMPREHENSIVE SURVEY RESULTS GALENA, 2010

Prepared by Lisa J. Slayton

In March 2011, researchers surveyed a randomly-selected sample of 80 of 158 households (51%) in Galena (Table 2-3). Expanding for 78 unsurveyed households, the estimated total harvest of wild foods by residents of Galena between January and December 2010 was 107,644 lb (±28%) (Table 6-1). The average harvest per household was 683 lb; the average harvest per person was 254 lb. During the study year, Galena residents locally harvested a total of 59 different species of fish, wildlife, and plants.

Five resources—moose, Chinook salmon, summer chum salmon, fall chum salmon, and coho salmon—accounted for 79% of the subsistence harvest in 2010 (Figure 6-1). In edible pounds, moose contributed more than any other single species to the total community harvest. In 2010, an estimated total harvest of 36,261 lb, or 34% of the total community harvest of wilds foods, was contributed by moose.

This chapter summarizes findings from the 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. Additional tables appear in Appendix D. Results from this survey are available online in the Division of Subsistence CSIS. Historical background information and past studies are presented throughout the chapter.

Community Background

Galena is located on the north bank of the Yukon River 45 mi east of Nulato, 270 air miles west of Fairbanks, and 350 air miles northwest of Anchorage.[1] Galena serves as a sub-regional hub for western Interior Alaska

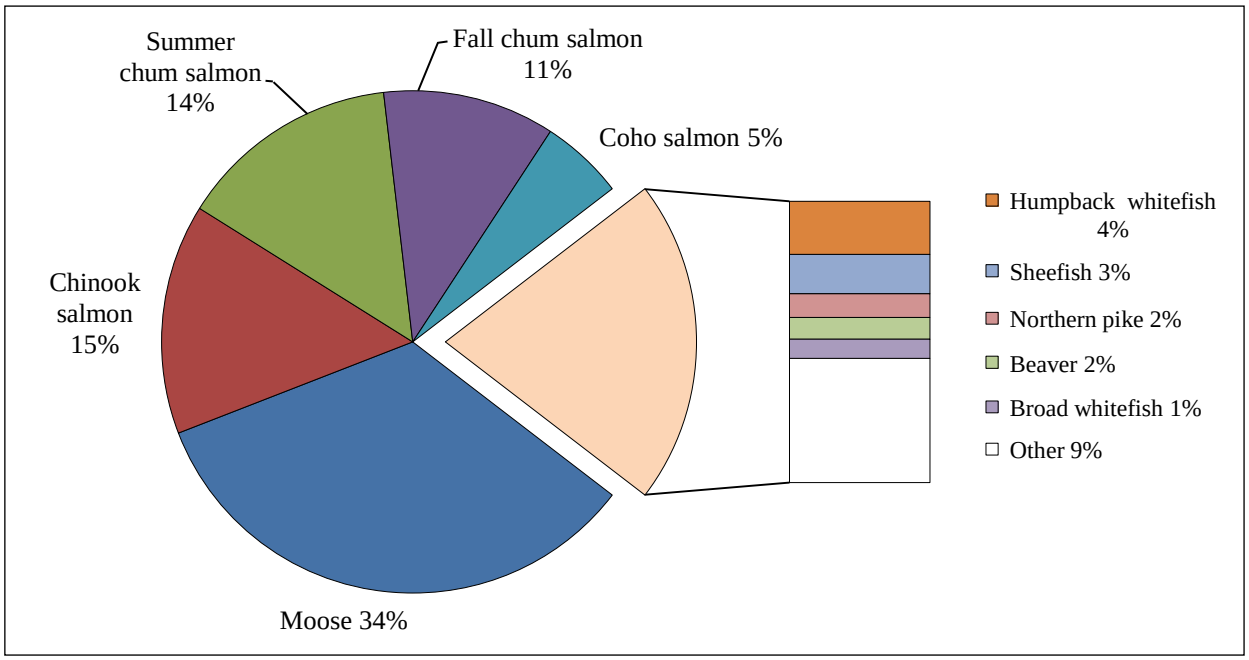


Figure 6-1.–Top 10 resources harvested, ranked by estimated edible weight, Galena, 2010.

1. 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 October 27, 2014. http://commerce.alaska.gov/cra/DCRAExternal/community

Table 6-1.–Resource harvest and use characteristics, Galena, 2010.

Characteristic	
Mean number of resources used per household	
Minimum	0
Maximum	37
95% confidence limit (±)	13.8%
Mean	10
Median	8
Mean number of resources attempted to harvest per household	
Minimum	0
Maximum	34
95% confidence limit (±)	15.8%
Mean	8
Median	6
Mean number of resources harvested per household	
Minimum	0
Maximum	31
95% confidence limit (±)	16.7%
Mean	7
Median	5
Mean number of resources received per household	
Minimum	0
Maximum	14
95% confidence limit (±)	14.7%
Mean	3
Median	3
Mean number of resources given away per household	
Minimum	0
Maximum	22
95% confidence limit (±)	19.7%
Mean	3
Median	2
Household harvest (lb)	
Minimum	0.0
Maximum	7,949.9
Mean	683.1
Median	340.6
Total harvest weight (lb)	107,643.6
Community per capita harvest (lb)	253.5
Percentage using any resource	91%
Percentage attempting to harvest any resource	85%
Percentage harvesting any resource	81%
Percentage receiving any resource	78%
Percentage giving away any resource	69%
Number of households in sample	80
Number of resources available	138

Source ADF&G Division of Subsistence household surveys, 2011.

and is a staging community for outdoor adventures in the Nowitna, Koyukuk (to the north), and the upper Innoko (across the Yukon to the south) national wildlife refuges. The mean temperature for the summer month of July is 60˚ F (Valencia et al. 2005). The mean temperature in the winter month of January is -12˚ F, though extreme temperatures of -64˚ F to 92 F have been recorded. The Yukon River is ice-free from mid-May through mid-October.

Koyukon Athabascans who currently live in the region were a semi-nomadic people until approximately the early 1900s. They hunted and fished in the area by following seasonally available food resources. Koyukon Athabascans fished primarily along the Yukon River in fish camps, one of which became known as Henry's Point. It was near this fish camp that the community of Galena was established in 1918. Although fish camps are still in use today in the summer months, most Athabascans in the Galena area live in the community or elsewhere in the region year-round.[2]

During 1919 and 1920, Galena became a supply center for the region when Athabascans from the upriver community of Louden began to haul wood there to sell as fuel for steamboats shipping lead ore (galena) from nearby mines out of state via the Yukon River. Some found work there as freight haulers for the mines as well (Marcotte 1988:14). A school was established in 1928 and a post office in 1932 (Marcotte 1988:15; Orth 1971rep.:358). During the early part of World War II in the 1940s, an airfield was established, later becoming a part of the Galena Air Force Station. This station was expanded in the 1950s with the building of additional military facilities and other general improvement projects, all of which bolstered Galena economically. By 1986, 300 military personnel were assigned to the station (Marcotte 1988). The Galena Air Force Station was realigned in 1994, soon after the end of the Cold War in 1991, causing a significant decline in population (Galena Economic Development Council 2007). During the study year the station infrastructure housed a boarding school—the Galena Interior Learning Academy. The population history of Galena from 1960 through 2010 is shown in Figure 6-2.

A major flood in 1971 eventually led to the creation of "New Town." This new community was relocated on higher ground about 1.5 miles east of the original site. "New Town" included city offices, a store, schools, and a health clinic.[3] Galena was officially incorporated at the "New Town" site in 1971. In 2010 Galena was a major trading and transportation center in the region (Nelson 1983:4). The airport was open year-round with direct flights to Fairbanks.[4] In the winter, frozen rivers and sloughs allowed travel to other communities via snowmachine and dog sled. An overland winter trail to Huslia was also available. One cell phone tower in Galena existed for cell phone use in the area. Taxi service was available within the community. Autos and boats could be rented, and a variety of fuel and repair services were also present. Educational institutions in Galena included the Galena Interior Learning Academy and a public K–12 school.[5]

Galena hosts a number of statewide, regional, and local events every year. In March of 2010, as it does every 2 years, Galena once again served as a checkpoint on the Iditarod Trail Sled Dog Race, an annual long-distance sled dog race from Anchorage to Nome (Valencia et al. 2005). During years when the race travels through Galena, it brings an average of 50 mushers racing 16-dog teams into town for a brief stop to check in with race officials. Also in mid-March, the town holds its annual Spring Carnival celebration. Carnival events included ice hole chopping contests, dog sled races, snowshoe races, and other competitions. The

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 October 27, 2014. http://commerce.alaska.gov/cra/DCRAExternal/community

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 October 27, 2014. http://commerce.alaska.gov/cra/DCRAExternal/community

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 October 27, 2014. http://commerce.alaska.gov/cra/DCRAExternal/community

5. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed October 27, 2014. http://commerce.alaska.gov/cra/DCRAExternal/community

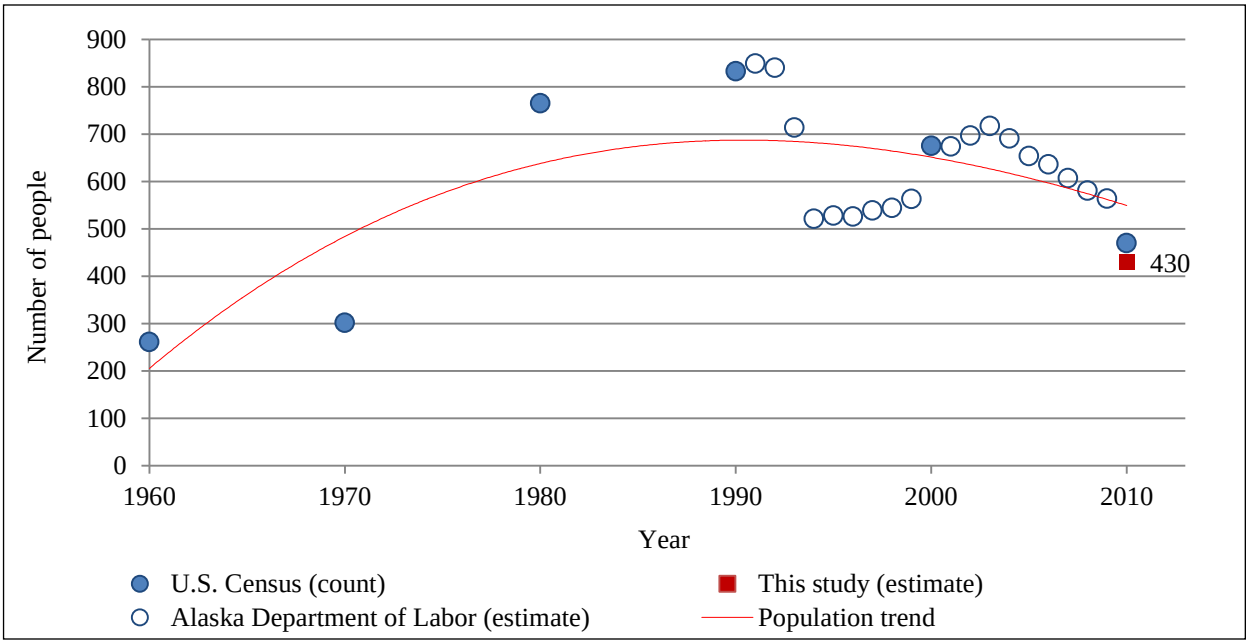


Figure 6-2.–Population history, Galena, 1960–2010.

Spring Carnival is an important springtime event in the region because most residents and many people from surrounding communities attend and participate. Galena also hosts the annual Iron Dog snowmachine race. In the summer, the community holds its annual Fourth of July softball tournament. In June 2010, Galena once again served as the turnaround point for the Yukon 800 Marathon speed riverboat race that starts in Fairbanks. In the fall of 2010, the annual Native arts and crafts bazaar was held on Thanksgiving Day.

An ongoing problem that Galena residents continued to face in 2010 was the high cost of fuel for heat and electricity due to high shipping costs. The Yukon River is ice-free for approximately only 4 or 5 months of the year, and fuel for the town's heat and power can only be shipped during this brief time, and at great expense to the residents of Galena.

In Galena, there was a sense that subsistence activities increasingly have to be practiced around other commitments. Some people work, attend school, or have other responsibilities in daily life. Although Koyukon Athabascans here strive to adhere to traditional beliefs and practices regarding subsistence, few residents live off subsistence only; rather they practice a "mixed" cash and subsistence economy. Trapping continues to be a common practice in the area; however, the price of fuel and the time expenditure, coupled with low fur prices, make extensive trapping, as practiced in the past, prohibitive. On the other hand, high fuel prices have driven many residents to once again harvest wood, according to some survey respondents. One resident utilized a crane in 2010 to gather driftwood at the bend in the Yukon River just before the river flows past Galena. This large-scale wood harvesting and splitting operation was considered a lucrative business, but it was also reported that the owner frequently gave wood to elders in the community. Wood harvesting has a prominent history in Galena: as noted earlier, several families moved to Galena in the early years of the 20th century to cut and sell wood for steamships.

Galena respondents shared several subsistence-related concerns with ADF&G researchers during the 2011 surveys. Many residents expressed frustration at having to travel downriver toward the confluence of the Yukon and the Koyukon rivers to drift gillnet for salmon. Many could not understand why subsistence fishing by drift gillnet was not open on the Yukon River closer to Galena. In addition, the Yukon River subsistence salmon fisheries were undergoing net mesh size restrictions. Residents were worried about the time and effort it would take to exchange their existing nets with nets of the new legal mesh size (7.5 in). They also expressed concerns about moose hunters coming from outside the community. Nonlocal

Michelle Gilette, ADF&G

Plate 6-1.–Salmon and whitefish drying on a fishrack in Galena.

hunters have long used the area, but tension over their presence is felt by many of the local residents. Some residents reported that these "outside" hunters illegally hunt at night using night-vision goggles. Residents also commonly reported that nonlocal or nonresident hunters killed only for the moose racks as trophies and left the actual meat to rot, or waited too long to give it to people before it spoiled. To Koyukon Athabascan people, "… subsistence is more than just an economic pursuit—it is manifestly bound to religious ideology and ritual practice. In the traditional milieu, nature is approached as a sacred realm that provides tangible sustenance" (Nelson 1983:226). The alleged wanton waste of resources by nonlocal hunters is distinctly contrary to Koyukon Athabascan beliefs and continues to fuel the disagreement between sport hunters and subsistence hunters, according to Galena residents.

Seasonal Round

Subsistence resource harvesting by Galena residents is a pattern of recurring use in specific seasons each year (Marcotte 1988:41). According to survey respondents, the seasonal round in Galena for 2010 and other recent years began in January with ice fishing for whitefishes, sheefish, and burbot as well as trapping of hares, beavers, martens, river (land) otters, and other fur-bearing land mammals. Households also hunted ptarmigan during this time period. Fishing, and hunting and trapping of small mammals continued until April, with an intense harvest period from early- to mid-March. A caribou hunting period occurred in January and February and ended along with the cessation of ice fishing in March. Galena residents began hunting black bears in February 2010 and continued through November. Waterfowl harvests began in late winter or early spring and continued until early June. The Yukon River ice melted by mid-May, and people began fishing for whitefishes, sheefish, northern pike, and Arctic grayling with driftnets and setnets. Occasionally, these fish species are caught with rod and reel, but this is not the usual method. These resources were harvested from mid-May through the middle part of October, when the ice began to return to the Yukon River. By mid-June, the Chinook (locally known as "king") salmon began to arrive in the river. This run of Chinook salmon was followed by summer chum salmon in July and fall chum (locally known as "silvers") in the later part of July (Plate 6-1).

In 2010, in addition to fishing in Galena itself, residents also fished at summer fish camps. These camps continued to be an important aspect of the lives of residents. Marcotte (1988:57) stated that fish camps had been and continued to be an important cultural activity and were important places for younger people to acquire knowledge, fishing and processing skills, and values from the older generation. Currently,

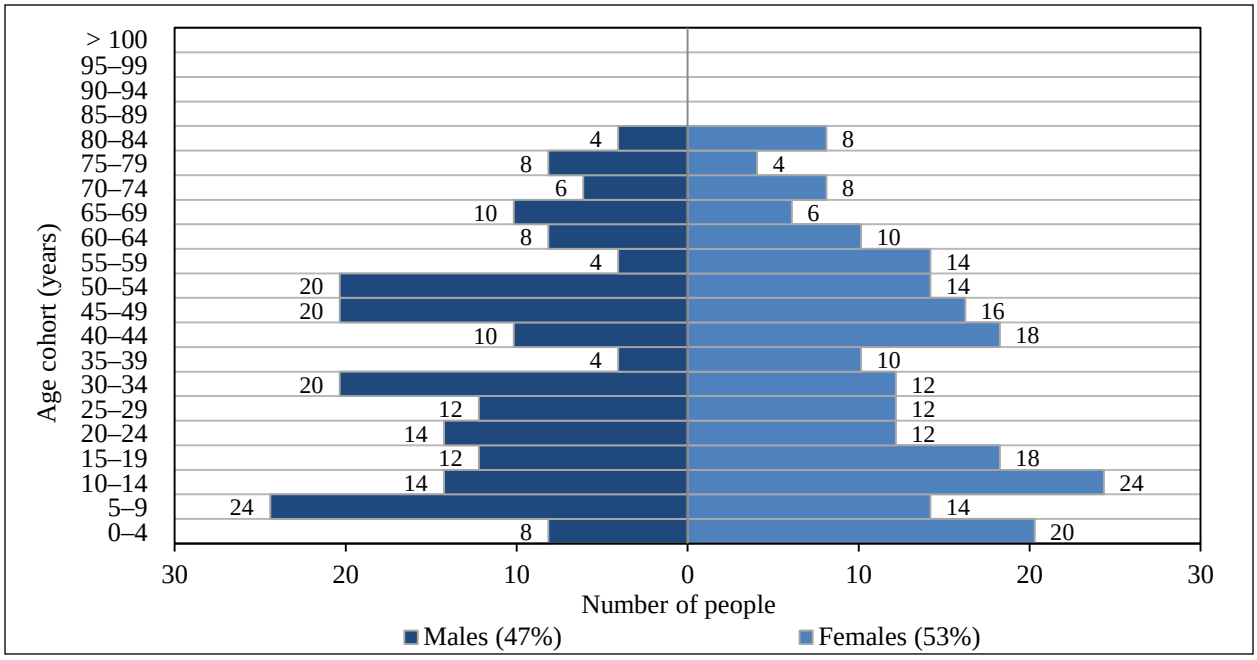


Figure 6-3.–Population profile, Galena, 2010.

most Galena respondents spend at least some part of their summer in fish camp. According to Marcotte (1988:58), locations of fish camps in 1986 ranged from 50 mi upriver from Galena to 143 mi downriver, with an average distance of 22 mi upriver and 50 mi downriver.

Fall brings with it a variety of subsistence activities. In 2010, Galena households harvested berries mainly in August and September. Fall waterfowl harvesting occurred from August through September. Residents began to harvest grouse around August and continued until November. Hares were the earliest small game animal harvested in the fall, followed by ptarmigan, beavers, martens, river (land) otters, and other furbearers. Galena households continued to harvest these resources throughout the winter, and some of these species were a source of much-needed variety in the winter diet. Wood for heating homes and smoking fish was harvested year-round with the intense harvests occurring in winter, early spring, and late fall. Although caribou hunting did occur, moose hunting was the major large land mammal activity in the fall.

Demographics

A random sample of 80 (of a total 158) households were surveyed in Galena for this baseline study (Table 2-3). The average household size was 2.7 people, with an average age of 35 (Table C1). There were no elders in the community over the age of 84. On average, residents had lived in Galena approximately 17 years. A total of 42% of surveyed household heads were born in Galena. Twenty-eight percent were born outside of Alaska (Table C2). Expanding for the unsurveyed households, the overall estimated population for Galena in 2010 was 425 residents (47% male, 53% female), as shown in Figure 6-3. Of those 425 residents, 290 (68%) were Alaska Native. In comparison, the 2010 U.S. Census estimated a total population of 470 residents for Galena, 64% of whom were Alaska Native.[6] The average household size was 2.5 (Table C1). The population and demographic characteristics of Galena have fluctuated through time due to several factors, including community relocation due to flooding and the opening and later closure of the Galena and Campion Air Force stations. Due to the locations of these stations in Galena, many non-Native people relocated to the community, some of whom stayed and made their homes there after the station closures. As a consequence, Galena continued to have a higher non-Native population in 2010 than most rural Interior communities.

6. U.S. Census Bureau, Washington, D.C., n.d. "American FactFinder: Galena city, Alaska." Accessed January 26, 2015. http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

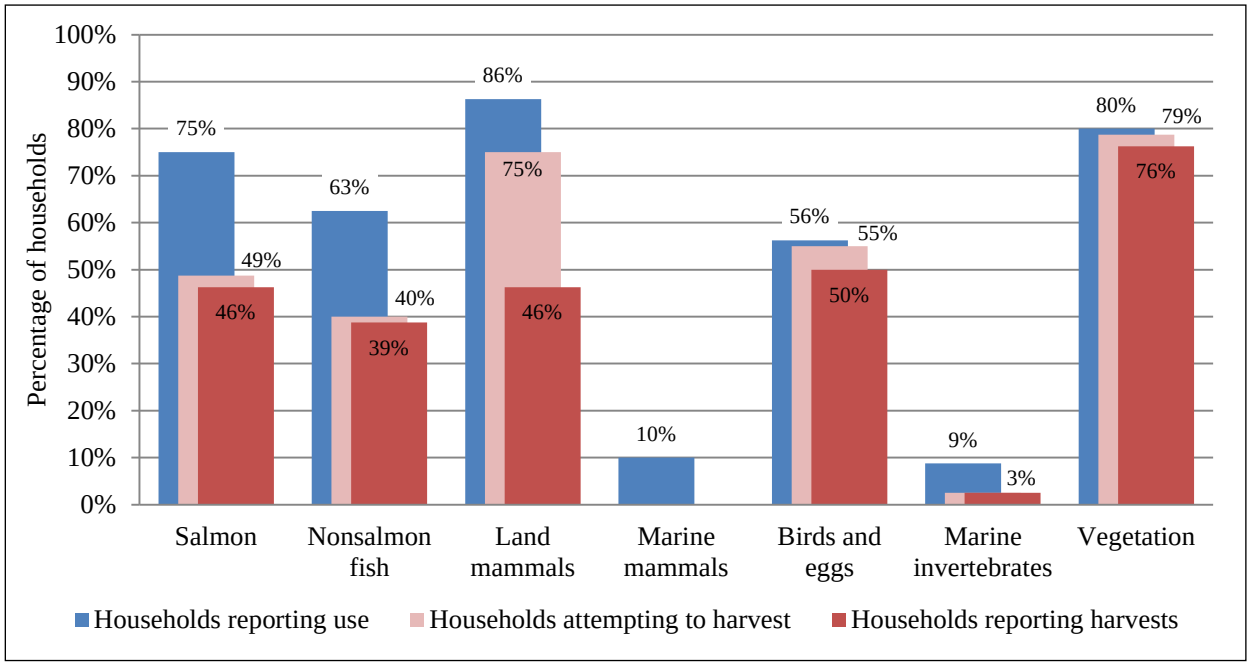


Figure 6-4.–Percentages of households using, attempting to harvest, or harvesting subsistence resources, by category, Galena, 2010.

Wild Food Harvests and Uses

The primary purpose of the household survey was to collect information about the harvest and use of wild foods. Respondents were asked whether their households used or attempted to harvest each resource during the study year. If the respondents attempted to harvest a resource, they were asked how much they harvested and for additional details of the harvest, such as gear type used, sex of the animal, month of harvest, and use of resources harvested.

Tables and figures in this section summarize responses to the harvest and use questions. The term "harvest" refers to resources actually harvested by any member of the surveyed household. The term "use" refers to all resources harvested and utilized or given away, or resources acquired after a harvest as gifts received, bartered, or used as dog food. Of the surveyed households, 91% of Galena households used some kind of wild resource, and 81% of households reported that a member had harvested wild resources in 2010 (Table 6-1). In most Yukon River communities, households engage in distribution networks to obtain and use wild foods harvested by others, so the percentages of households harvesting a wild resource are usually lower than the percentages of households using wild foods. This was the case in Galena as well. Wild food networks of distribution will be discussed in more detail in the "Wild Food Networks" section below.

Large land mammals were the most widely used resource category (by 86% of households), followed by vegetation such as berries, plants, and wood (80%). Salmon species were used by 75% of Galena households; nonsalmon fish species were used by 63% of households; birds were used by 56% of households; marine mammals were used by 10%; and marine invertebrates were used by 9% of Galena households (Figure 6-4).

In Galena, 69% of households reported giving or sharing at least one type of wild resource and 78% reported receiving at least one wild resource (Table 6-1). Sharing of subsistence harvests in Galena has always been vitally important for maintaining kinship ties, culture, and physical well-being. However, the level of sharing depends on each household's success, since the household must take care of its own needs in addition to sharing (Stickney 1981).

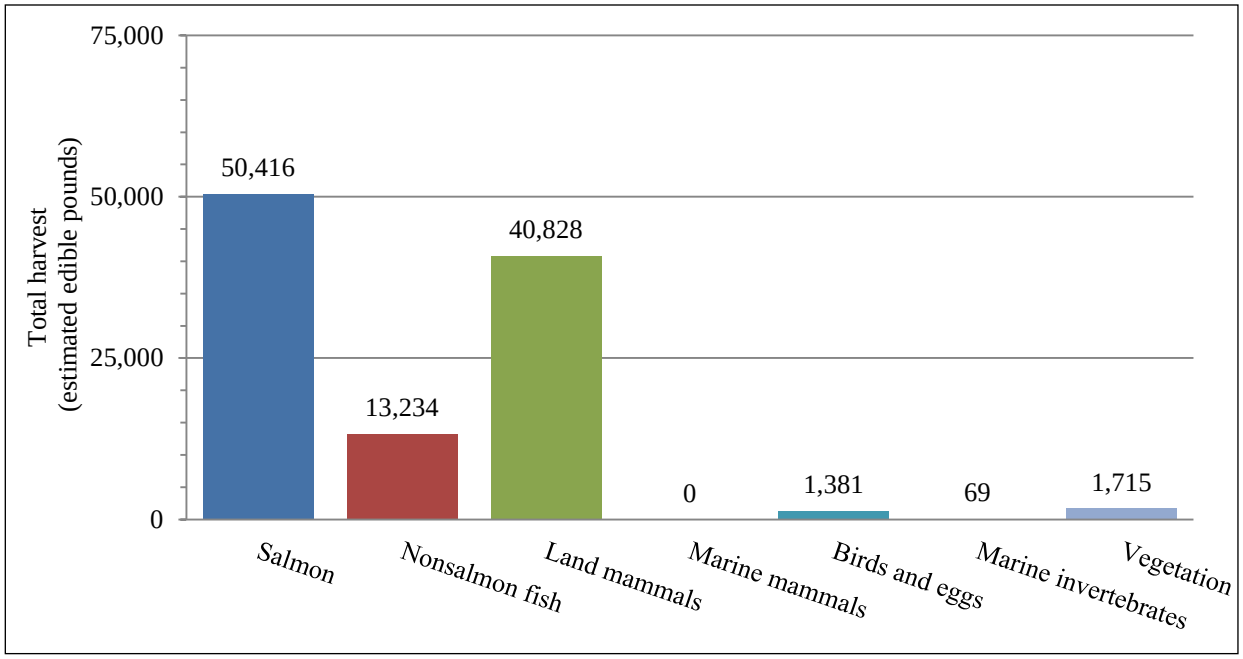


Figure 6-5.–Total estimated edible pounds harvested, by resource category, Galena, 2010.

Figure 6-5 summarizes harvests by resource category in terms of estimated edible pounds harvested for consumption. Salmon contributed 50,416 lb to the community in 2010, followed closely by 40,828 lb of land mammals (primarily moose). Nonsalmon fish species contributed 13,234 lb, while vegetation and birds contributed 1,715 lb and 1,381 lb, respectively.

Tables 6-2 through 6-7 summarize use levels and harvests for all reported resources. In addition to moose (36,261 lb harvested) and Chinook salmon (15,938 lb harvested), 8 other individual resources contributed 91% of the wild foods by edible weight (Figure 6-1; Table 6-2; Table 6-3). They were summer chum salmon (15,322 lb), fall chum salmon (11,928 lb), coho salmon (5,775 lb), humpback whitefish (4,231 lb), sheefish (3,140 lb), northern pike (1,884 lb), beavers (1,748 lb), and broad whitefish (1,529 lb).

The most widely used resource of all wild foods was moose, which was used by 85% of households (Table 6-3). Moose was, and has been traditionally, an important subsistence resource for the community of Galena (Marcotte 1988:83). Chinook salmon was the second-most used resource (68%), followed by blueberries (54%) and fall chum salmon (35%) (Table 6-2; Table 6-7). Several survey respondents stated that 2010 was not a good year for Chinook salmon. Some reported switching focus to summer chum salmon as a result. Respondents cited bad weather during the peak season and fishing closures as the reasons for poor Chinook salmon harvests in 2010. One respondent explained:

> Bad weather last year, during peak season and the closures. Lucky to get what we needed. Less fish, more meat, more berries, bad gardening. Poor king [Chinook] fish quality, lots of white bad ones. Getting hard to do subsistence, inconvenient. I need 40 fish [Chinook] for the year and we only got 27 kings.

Of the total fish species harvested by Galena households, 6,708 lb or 1,807 individual fish, both salmon and nonsalmon species, were used for dog food (Table D6-1). Of these, fall chum salmon (3,514 lb, or 691 individual fish) and whitefishes (2,481 lb, or 922 individual fish) were the resources most frequently used as dog food. Other fish species used to a lesser degree for dog food were burbot (213 lb), northern pike (400 lb), and coho salmon (63 lb). Most summer chum salmon is normally reserved for dog food, while fall chum salmon is used primarily for human consumption; however, due to the poor Chinook salmon run in 2010, summer chum salmon was used for human consumption to a larger degree than usual. Household

Table 6-2.–Estimated harvest and use of fish, Galena, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Fish										
Salmon										
Summer chum salmon	13.8%	10.0%	10.0%	6.3%	3.8%	15,321.8 lb	97.0 lb	36.1 lb	3,013.9 ind	± 110.9%
Fall chum salmon	35.0%	20.0%	20.0%	16.3%	15.0%	11,928.1 lb	75.5 lb	28.1 lb	2,346.3 ind	± 54.0%
Unknown chum salmon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Coho salmon	12.5%	11.3%	11.3%	1.3%	7.5%	5,774.9 lb	36.5 lb	13.6 lb	1,092.2 ind	± 82.0%
Chinook salmon	67.5%	41.3%	38.8%	40.0%	30.0%	15,938.1 lb	100.9 lb	37.5 lb	1,688.5 ind	± 30.0%
Pink salmon	1.3%	0.0%	0.0%	1.3%	1.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Sockeye salmon	13.8%	6.3%	6.3%	7.5%	3.8%	1,453.1 lb	9.2 lb	3.4 lb	288.4 ind	± 82.4%
Unknown salmon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**75.0%**	**48.8%**	**46.3%**	**48.8%**	**38.8%**	**50,416.0 lb**	**319.1 lb**	**118.7 lb**	**8,429 ind**	**± 43.9%**
Char										
Dolly Varden	2.5%	1.3%	1.3%	1.3%	1.3%	8.9 lb	0.1 lb	0.0 lb	9.9 ind	± 139.9%
Lake trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown char	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**2.5%**	**1.3%**	**1.3%**	**1.3%**	**1.3%**	**8.9 lb**	**0.1 lb**	**0.0 lb**	**10 ind**	**± 139.9%**
Whitefishes										
Sheefish	31.3%	21.3%	21.3%	11.3%	15.0%	3,140.3 lb	19.9 lb	7.4 lb	523.4 ind	± 56.6%
Broad whitefish	17.5%	13.8%	13.8%	5.0%	11.3%	1,529.0 lb	9.7 lb	3.6 lb	1,092.2 ind	± 73.0%
Bering cisco	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Least cisco	6.3%	3.8%	3.8%	3.8%	1.3%	223.2 lb	1.4 lb	0.5 lb	223.2 ind	± 124.2%
Humpback whitefish	18.8%	15.0%	15.0%	5.0%	10.0%	4,230.5 lb	26.8 lb	10.0 lb	1,410.2 ind	± 61.0%
Round whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown whitefish	2.5%	0.0%	0.0%	2.5%	1.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**43.8%**	**27.5%**	**27.5%**	**18.8%**	**21.3%**	**9,122.9 lb**	**57.7 lb**	**21.5 lb**	**3,249 ind**	**± 57.8%**
Anadromous/marine fishes										
Pacific herring	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Rainbow smelt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Pacific tomcod	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Saffron cod	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Lingcod	2.5%	2.5%	2.5%	0.0%	1.3%	63.2 lb	0.4 lb	0.1 lb	15.8 ind	± 110.1%
Pacific halibut	20.0%	2.5%	2.5%	17.5%	2.5%	448.3 lb	2.8 lb	1.1 lb	448.3 lb	± 103.6%
Arctic lamprey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown rockfish	1.3%	1.3%	1.3%	0.0%	1.3%	47.4 lb	0.3 lb	0.1 lb	11.9 ind	± 139.9%
Stickleback (needlefish)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Subtotal	**20.0%**	**2.5%**	**2.5%**	**17.5%**	**2.5%**	**558.9 lb**	**3.5 lb**	**1.3 lb**		**± 101.0%**
Other freshwater fishes										
Alaska blackfish	3.8%	2.5%	2.5%	1.3%	2.5%	888.8 lb	5.6 lb	2.1 lb	888.8 lb	± 98.3%
Burbot	20.0%	17.5%	16.3%	5.0%	8.8%	725.2 lb	4.6 lb	1.7 lb	302.2 ind	± 61.7%
Arctic grayling	7.5%	3.8%	3.8%	5.0%	0.0%	45.6 lb	0.3 lb	0.1 lb	65.2 ind	± 92.6%
Northern pike	23.8%	22.5%	21.3%	3.8%	10.0%	1,884.2 lb	11.9 lb	4.4 lb	418.7 ind	± 48.8%
Longnose sucker	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**41.3%**	**33.8%**	**32.5%**	**13.8%**	**16.3%**	**3,543.7 lb**	**22.4 lb**	**8.3 lb**		**± 41.7%**
All fish	**78.8%**	**55.0%**	**52.5%**	**63.8%**	**46.3%**	**63,650.5 lb**	**402.9 lb**	**149.9 lb**		**± 41.4%**
All resources[b]	**91.3%**	**85.0%**	**81.3%**	**77.5%**	**68.8%**	**107,643.6 lb**	**683.1 lb**	**253.5 lb**		**± 27.8%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

processors hung summer chum salmon from outdoor drying racks and lightly smoked them from a nearby fire as they air dried. Households ate them fresh, or half-dried and then cooked.

Households processing Chinook salmon cut it into long strips or cross cuts with the skin left intact (Plate 6-2). The salmon is then air dried and smoked for human consumption. Chinook salmon are also frozen whole. The bellies are sometimes salted, placed in jars, and stored for winter. Salmon strips are also stored in this manner. Galena residents preserve coho salmon and fall chum salmon by drying and smoking, or freezing. Table D6-2 shows harvesting and processing activities by various household members in 2010.

Michelle Gilette, ADF&G

Plate 6-2.–Chinook (king) salmon cut with cross cuts and hung to dry on a fish rack in Galena.

Galena households used a variety of gear types for harvesting fish species in 2010 (Figure 6-6). The majority of fish (28,882 lb) were harvested with set gillnets. Salmon accounted for 20,790 lb of this majority number, and whitefish accounted for 7,139 lb. Galena households harvested 14,111 lb of fish using fish wheels, 13,282 lb of which were salmon and 830 lb of which were whitefish. Summer chum salmon (12,049 lb) was the primary salmon species harvested using fish wheels in 2010. The harvest of fish by residents using drift gillnets was 13,666 lb, of which 13,228 lb were salmon species, and 420 lb were whitefish species. Rod and reel gear accounted for 2,626 lb of fish. Coho and Chinook salmon accounted for 141 lb of the rod and reel harvest, while sheefish accounted for 735 lb. Northern pike composed the largest component of the rod and reel harvest at 1,147 lb. Although northern pike is harvested with both rod and reel and by "jigging" with line and hook through the ice, all northern pike fishing in Galena for 2010[7] was recorded as "rod and reel" with no distinction made between the 2 gear types. Galena residents used "other subsistence methods" to harvest 2,734 lb of fish, of which 1,344 lb were salmon species.

Of the nonsalmon fish, excluding whitefish species, 953 lb were harvested with set gillnets, 18 lb were harvested with drift gillnets, 1,750 lb were harvested with rod and reel, and 1,390 lb were harvested using "other subsistence methods." The category of "other subsistence methods" consisted mainly of traditional jigging and the use of fyke nets (fish traps) for Alaska blackfish. Galena residents harvested 889 lb of Alaska

7. The BOF does not currently recognize hook and line attached to a rod or pole as legal subsistence gear in open water upriver of the lower mouth of the Paimiut Slough on the Yukon River; fishing with a rod and reel is usually conducted under sport fishing regulations.

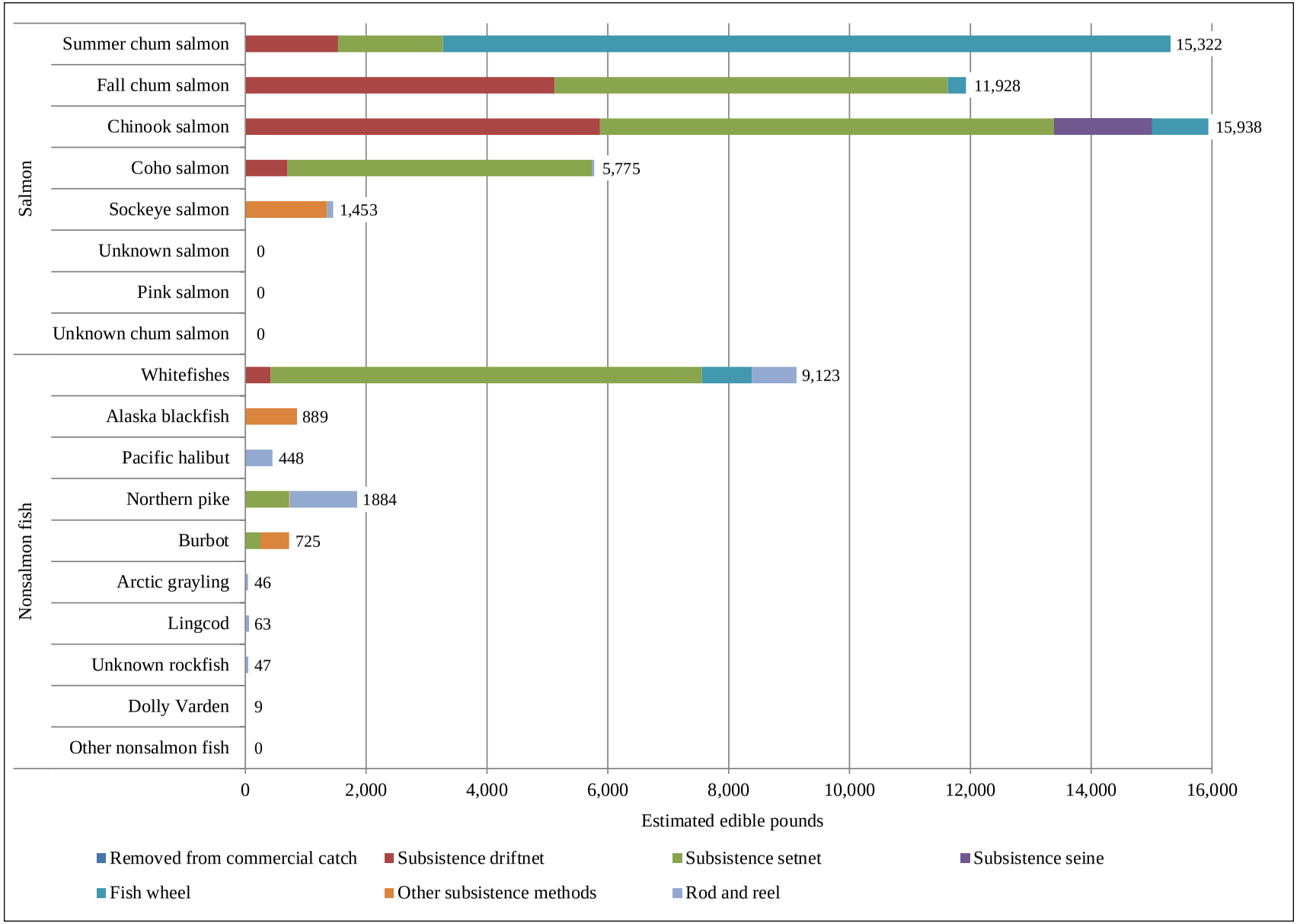


Figure 6-6.–Fish harvests by gear type, Galena, 2010.

blackfish using fish traps in 2010. Although 12 commercial fishing permits were issued to Galena residents in 2010[8], no fish were retained from commercial fishing harvests.

During the 2010 study year, Galena households harvested primarily fish and large land mammals. Of the fish species, salmon species were harvested by 46% of Galena households, yet used by 75% of households (Table 6-2). These percentages speak to the high degree of sharing of salmon species that took place in 2010. Chinook salmon were the most harvested (by 39% of households) and used (68%), followed by fall chum salmon (20% harvesting, 35% using). As always, the months of mid-June through early September were the most intense salmon fishing months, according to residents. Nonsalmon fish species were harvested by 39% and used by 63% of Galena households (Figure 6-4). Sheefish were the most heavily harvested of the nonsalmon fish species: 21% of households harvested sheefish, and 31% of households used it (Table 6-2). Next was northern pike, with 21% of households harvesting the resource and 24% using it. Nonsalmon fish species such as whitefishes, sheefish, and northern pike can be harvested locally throughout almost the entire year, often when other sources of fresh food are unavailable (Marcotte 1988:75). Whitefishes—mainly broad and humpback whitefish—are usually eaten fresh; they are also processed by drying and smoking or by freezing. Additionally, Galena households use whitefishes to make *binot hoolaanee* (Indian ice cream made with fish), and they often fry the eggs for human consumption. A portion of the whitefish harvest is used for dog food. Alaska blackfish are historically important as a food source during times of food shortage; these fish are prepared by baking or frying whole. They are also used as bait (Marcotte 1988:81).

Large land mammals are an important part of the subsistence diet. Of the large land mammals, moose were harvested by 41% of households and used by 85% of households (Table 6-3). Again, these numbers indicate a high degree of sharing. Moose was by far the most used subsistence resource overall in Galena in 2010. Moose hunting effort for 2010 is shown in Table C3. Galena households harvested 67 moose in 2010—4 in August and 63 in September (Table D6-3). Marcotte (1988:97) reported that Galena residents utilize nearly the entire moose, including the head, most entrails, and forelimbs. Waste of any subsistence resource is kept to an absolute minimum. Black bears were the second-most harvested large land mammal in 2010 (by 5% of households, and used by 13%) (Table 6-3). Marcotte (1988:97) states that black bear meat was commonly served at potlatches and thus shared with the community at large as well as through direct sharing networks with family and friends. Galena hunters harvested a total of 10 black bears during the months of February, April, June, and November in 2010 (Table D6-3). In contrast, brown bears were neither harvested nor used to the same extent as black bears. Brown bears were used by only 1% of households, and no harvests were reported for 2010 (Table 6-3). Caribou were harvested by only 1% and used by 8% of Galena households. Households harvested 6 caribou, all in the month of September (Table D6-3). Caribou availability in the vicinity of Galena is generally unpredictable from year to year, according to residents. An unusual addition to the harvest of wild foods by Galena residents in 2010 was muskoxen. Muskoxen, which are located on the Seward Peninsula in GMU 22 and north in GMU 23, were harvested by 1% and used by 3% of Galena households (Table 6-3). One muskox harvested in January contributed 295 lb of wild food to the community total (Table 6-3; Table D6-3) It is likely that the muskox was harvested in either GMU 22 or 23 during a legal season in those areas and brought back to the Galena area for sharing.

In 2010, Galena households harvested small land mammals both for food and for fur, depending on the species. Snowshoe hares were the most widely harvested (18%) and used (20%) small mammal by households; the community harvested a total of 207 snowshoe hares (Table 6-3). Harvests occurred from September to April (Table D6-4). The second-most harvested and used small mammal were beavers (14% harvesting, 19% using) (Table 6-3). Households harvested a total of 132 beavers during the same months as hares with the addition of the month of May, and the exception of the month of October (Table D6-4). Beavers and snowshoe hares are used both for food and for their fur. Lynx and martens (15% harvesting, 15% using for each) were tied for the third-most harvested and used small mammal; although martens

8. 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 October 27, 2014. http://commerce.alaska.gov/cra/DCRAExternal/community

Table 6-3.–Estimated harvest and use of land and marine mammals, Galena, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Land mammals										
Large land mammals										
Black bear	12.5%	11.3%	5.0%	8.8%	3.8%	987.5 lb	6 lb	2.3 lb	9.9 ind	± 72.8%
Brown bear	1.3%	5.0%	0.0%	1.3%	0.0%	0.0 lb	0 lb	0.0 lb	0.0 ind	± 0.0%
Caribou	7.5%	2.5%	1.3%	6.3%	1.3%	770.3 lb	5 lb	1.8 lb	5.9 ind	± 139.9%
Moose	85.0%	72.5%	41.3%	58.8%	37.5%	36,261.0 lb	230 lb	85.4 lb	67.2 ind	± 19.2%
Muskox	2.5%	1.3%	1.3%	1.3%	1.3%	295.0 lb	3.7 lb	0.7 lb	1.0 ind	± 139.9%
Subtotal	**85.0%**	**72.5%**	**42.5%**	**61.3%**	**40.0%**	**38,313.8 lb**	**244.3 lb**	**90.2 lb**	**84.0 ind**	**± 19.7%**
Small land mammals										
Beaver	18.8%	15.0%	13.8%	6.3%	8.8%	1,747.9 lb	11.1 lb	4.1 lb	132.3 ind	± 59.2%
Red fox	6.3%	7.5%	6.3%	0.0%	0.0%	*Not usually eaten*			63.2 ind	± 0.0%
Snowshoe hare	20.0%	18.8%	17.5%	5.0%	3.8%	474.0 lb	3.0 lb	1.1 lb	207.4 ind	± 51.5%
Alaska hare (jackrabbit)	1.3%	1.3%	1.3%	0.0%	0.0%	*None reported as eaten*			4.0 ind	± 0.0%
River (land) otter	5.0%	6.3%	5.0%	0.0%	0.0%	*Not usually eaten*			15.8 ind	± 0.0%
Lynx	15.0%	16.3%	15.0%	0.0%	1.3%	237.0 lb	1.5 lb	0.6 lb	179.7 ind	± 55.7%
Marmot	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Marten	15.0%	16.3%	15.0%	0.0%	1.3%	*Not usually eaten*			507.6 ind	± 67.1%
Mink	5.0%	6.3%	5.0%	0.0%	1.3%	7.9 lb	0.1 lb	0.0 lb	13.8 ind	± 139.9%
Muskrat	5.0%	5.0%	5.0%	0.0%	1.3%	23.7 lb	0.2 lb	0.1 lb	37.5 ind	± 83.8%
Porcupine	3.8%	3.8%	3.8%	0.0%	0.0%	23.7 lb	0.2 lb	0.1 lb	7.9 ind	± 103.7%
Arctic ground (parka) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Red (tree) squirrel	2.5%	2.5%	2.5%	1.3%	0.0%	*None reported as eaten*			20.0 ind	± 0.0%
Weasel	3.8%	6.3%	3.8%	0.0%	0.0%	*Not usually eaten*			15.8 ind	± 84.7%
Gray wolf	6.3%	7.5%	5.0%	1.3%	1.3%	*Not usually eaten*			47.4 ind	± 89.1%
Wolverine	2.5%	6.3%	2.5%	0.0%	0.0%	*Not usually eaten*			13.8 ind	± 99.3%
Subtotal	**35.0%**	**28.8%**	**28.8%**	**11.3%**	**12.5%**	**2,514.2 lb**	**15.9 lb**	**5.9 lb**	**1,266.2 ind**	**± 47.9%**
Marine mammals										
Bearded seal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Ringed seal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Spotted seal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown seal	5.0%	0.0%	0.0%	5.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Walrus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Beluga	6.3%	0.0%	0.0%	6.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Bowhead	2.5%	0.0%	0.0%	2.5%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**10.0%**	**0.0%**	**0.0%**	**10.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0.0%**
All land mammals	**86.3%**	**75.0%**	**46.3%**	**65.0%**	**41.3%**	**40,827.9 lb**	**260.2 lb**	**96.2 lb**		**± 19.9%**
All marine mammals	**10.0%**	**0.0%**	**0.0%**	**10.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**		**± 0.0%**
All resources[b]	**91.3%**	**85.0%**	**81.3%**	**77.5%**	**68.8%**	**107,643.6 lb**	**683.1 lb**	**253.5 lb**		**± 27.8%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

are generally used only for their fur, lynx may be used only for fur, or for both food and fur (Table 6-3). Galena households harvested a total of 180 lynx during the months of November through March; the largest component of the harvest occurred in December (Table D6-4). Households harvested a total of 508 martens in the winter months of November through February. Although fur-bearing small mammals are harvested year-round, they are primarily harvested in the winter months (November to March) when their fur is considered prime (Marcotte 1988:42). According to respondents, trapping is less important now than it once was, though it continues to play an important role in the lives of some Galena households. Additional small mammals harvested for fur only in 2010 were red foxes (63 individuals), gray wolves (47), muskrats (38), weasels (16), and mink (14) (Table 6-3). Galena residents harvested these species primarily in the winter months with the exception of muskrats, which were harvested in April and May of 2010 (Table D6-4).

Table 6-4.–Estimated harvest and use of marine invertebrates, Galena, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Marine invertebrates										
Razor clams	1.3%	1.3%	1.3%	0.0%	0.0%	39.5 lb	0.3 lb	0.1 lb	158.0 gal	± 139.9%
Unknown clams	1.3%	1.3%	1.3%	0.0%	1.3%	29.6 lb	0.2 lb	0.1 lb	9.9 gal	± 139.9%
Dungeness crab	1.3%	0.0%	0.0%	1.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Blue king crab	1.3%	0.0%	0.0%	1.3%	1.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown king crab	2.5%	0.0%	0.0%	2.5%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Tanner crab	2.5%	0.0%	0.0%	2.5%	1.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Shrimp	1.3%	0.0%	0.0%	1.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown marine invertebrates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Subtotal	**8.8%**	**2.5%**	**2.5%**	**6.3%**	**2.5%**	**69.1 lb**	**0.4 lb**	**0.2 lb**		**± 99.3%**
All marine invertebrates	**8.8%**	**2.5%**	**2.5%**	**6.3%**	**2.5%**	**69.1 lb**	**0.4 lb**	**0.2 lb**		**± 99.3%**
All resources[b]	**91.3%**	**85.0%**	**81.3%**	**77.5%**	**68.8%**	**107,643.6 lb**	**683.1 lb**	**253.5 lb**		**± 27.8%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

Households did not report the harvest of any marine mammals for 2010 (Table 6-3); Galena is located in the middle Yukon River region, far from marine environments. They did, however, report receiving and using seals (probably seal oil) of unknown species, as well as beluga and bowhead whales via sharing networks with friends and families from coastal areas. Marine mammals were received and used by 10% of households.

The harvest and use of marine invertebrates was minimal in 2010, contributing just 69 lb of wild food to the community. The only reported harvest of marine invertebrates was that of razor clams and unknown clams, most likely from outside the local area (Table 6-4). Just 3% of respondents reported harvesting some type of clams in 2010, and 2% reported that they used clams. Households reported receiving and using shrimp and crab via sharing networks with family and friends in coastal areas. Only 9% of households used marine invertebrates in 2010.

Galena households harvested upland game birds such as grouse and ptarmigan (harvested by 45% and used by 46%) to a great extent (Table 6-5). Although these birds were often available in winter and spring when stores of other subsistence foods have become depleted, the majority in 2010 were harvested in the fall (Table D6-5). Of these birds, spruce grouse were the most targeted species with 35% of respondents attempting harvest, 33% harvesting, and 33% using spruce grouse (Table 6-5). Marcotte (1988) reported that grouse hunting was one of the most common small game hunting activities in Galena, and spruce grouse were the primary species harvested. The second-most targeted bird species in 2010 was ruffed grouse with 33% of households attempting harvest, 31% harvesting, and 33% using ruffed grouse.

Migratory birds such as ducks and geese were harvested by 26% of households and used by 36%. The most targeted migratory species by Galena households in 2010 was the mallard duck, with 18% attempting harvest, 15% harvesting, and 19% using mallards. Although mallards were harvested in the summer and fall, the majority of mallards (65 individuals) were harvested during the spring months (Table D6-5). Traditionally, waterfowl harvests during the spring and summer months supplied a source of fresh meat otherwise not available (Nelson et al. 1982:52). Although Galena households harvested some waterfowl (83 individuals) in the fall, they harvested the vast majority (307) of waterfowl in the spring of 2010; 30 additional migratory birds were harvested during the summer. Galena households harvested unknown Canada geese and greater white-fronted geese at an estimated rate of 9% each (Table 6-5). Cackling geese were harvested by 8% of households. The unknown Canada geese were harvested in the spring and fall (Table D6-5). Galena households harvested both greater white-fronted and cackling geese primarily in summer and spring. No households in Galena reported harvesting or using eggs (Table 6-6).

Table 6-5.–Estimated harvest and use of birds, Galena, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Migratory birds										
Ducks										
Bufflehead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Canvasback	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Common eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Goldeneye sp.	1.3%	2.5%	1.3%	0.0%	1.3%	7.9 lb	0.1 lb	0.0 lb	9.9 ind	± 139.9%
Mallard	18.8%	17.5%	15.0%	5.0%	7.5%	98.8 lb	0.6 lb	0.2 lb	98.8 ind	± 49.0%
Common merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Red-breasted merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Long-tailed duck (oldsquaw)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Northern pintail	8.8%	11.3%	8.8%	0.0%	5.0%	27.2 lb	0.2 lb	0.1 lb	34.0 ind	± 67.5%
Ring-necked duck	2.5%	2.5%	2.5%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	4.0 ind	± 0.0%
Scaup sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Black scoter	2.5%	2.5%	2.5%	0.0%	0.0%	3.6 lb	0.0 lb	0.0 lb	4.0 ind	± 139.0%
Surf scoter	1.3%	1.3%	1.3%	0.0%	1.3%	8.9 lb	0.1 lb	0.0 lb	9.9 ind	± 139.9%
White-winged scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Northern shoveler	1.3%	2.5%	1.3%	0.0%	0.0%	2.4 lb	0.0 lb	0.0 lb	4.0 ind	± 139.9%
Green-winged teal	2.5%	3.8%	2.5%	0.0%	0.0%	2.4 lb	0.0 lb	0.0 lb	7.9 ind	± 110.1%
Unknown wigeon	10.0%	11.3%	10.0%	1.3%	1.3%	34.6 lb	0.2 lb	0.1 lb	49.4 ind	± 64.5%
Unknown duck	5.0%	3.8%	3.8%	1.3%	1.3%	8.4 lb	0.1 lb	0.0 lb	9.9 ind	± 83.0%
Subtotal	**26.3%**	**23.8%**	**21.3%**	**6.3%**	**10.0%**	**194.1 lb**	**1.2 lb**	**0.5 lb**	**231.6 ind**	**± 0.0%**
Geese										
Brant	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Cackling goose	8.8%	10.0%	7.5%	1.3%	3.8%	56.9 lb	0.4 lb	0.1 lb	47.4 ind	± 59.5%
Lesser Canada goose	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown Canada goose	12.5%	12.5%	8.8%	5.0%	3.8%	61.6 lb	0.4 lb	0.1 lb	51.4 ind	± 60.2%
Emperor goose	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Snow goose	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
White-fronted goose	8.8%	8.8%	8.8%	1.3%	5.0%	213.3 lb	1.4 lb	0.5 lb	88.9 ind	± 59.6%
Unknown goose	2.5%	1.3%	0.0%	2.5%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**25.0%**	**25.0%**	**18.8%**	**8.8%**	**8.8%**	**331.8 lb**	**2.1 lb**	**0.8 lb**	**187.6 ind**	**± 45.9%**
Other migratory birds										
Tundra swan (whistling)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Sandhill crane	0.0%	1.3%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Whimbrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown grebe	1.3%	1.3%	1.3%	0.0%	0.0%	3.0 lb	0.0 lb	0.0 lb	2.0 ind	± 139.9%
Subtotal	**1.3%**	**1.3%**	**1.3%**	**0.0%**	**0.0%**	**3.0 lb**	**0.0 lb**	**0.0 lb**	**2.0 ind**	**± 139.9%**
Other birds										
Spruce grouse	32.5%	35.0%	32.5%	1.3%	10.0%	355.6 lb	2.3 lb	0.8 lb	508.0 ind	± 29.3%
Ruffed grouse	32.5%	32.5%	31.3%	2.5%	15.0%	319.2 lb	2.0 lb	0.8 lb	456.0 ind	± 40.0%
Ptarmigan sp.	11.3%	12.5%	10.0%	1.3%	1.3%	177.8 lb	1.1 lb	0.4 lb	177.8 ind	± 69.2%
Subtotal	**46.3%**	**48.8%**	**45.0%**	**5.0%**	**16.3%**	**852.6 lb**	**5.4 lb**	**2.0 lb**	**1,141.8 ind**	**± 30.1%**
All migratory birds	**36.3%**	**30.0%**	**26.3%**	**13.8%**	**11.3%**	**528.8 lb**	**3.3 lb**	**1.2 lb**	**421.2 ind**	**± 41.2%**
All other birds	**46.3%**	**48.8%**	**45.0%**	**5.0%**	**16.3%**	**852.6 lb**	**5.4 lb**	**2.0 lb**	**1,141.8 ind**	**± 30.1%**
All resources[b]	**91.3%**	**85.0%**	**81.3%**	**77.5%**	**68.8%**	**107,643.6 lb**	**683.1 lb**	**253.5 lb**		**± 27.8%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

Table 6-6.–Estimated harvest and use of eggs, Galena, 2010.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Bird eggs										
Duck eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Goose eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Swan eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown shorebird eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Gull eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0.0%**
All birds and eggs	**56.3%**	**55.0%**	**50.0%**	**17.5%**	**20.0%**	**1,381.4 lb**	**8.7 lb**	**3.3 lb**	**1,562.9 ind**	**± 27.3%**
All resources[b]	**91.3%**	**85.0%**	**81.3%**	**77.5%**	**68.8%**	**107,643.6 lb**	**683.1 lb**	**253.5 lb**		**± 27.8%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

Vegetation such as wild plants, greens, and berries made a sizeable contribution to Galena's wild food harvest (1,715 lb) (Table 6-7). Galena households harvested a total of 396 gallons of berries in 2010. Of the berries, 46% of Galena households harvested blueberries, and 54% used them. Lowbush cranberries were harvested by 28% and used by 29% of households. Highbush cranberries were harvested by 20% of Galena households and used by 23%. Salmonberries were harvested by 15% and used by 18%. Raspberries were harvested by 15% and used by 16%. A small amount of crowberries (blackberries) and currants were harvested in 2010, and each was used by 1% of households.

Plants and greens were gathered by 25% of households and used by 29%. Galena residents harvested a variety of plants (other than berries) including wild rose hips (harvested by 15% and used by 15% of households) and wild rhubarb (5% and 6%); fireweed and unknown species of mushrooms were each harvested by 4% and used by 5%. In addition, Galena households harvested (8%) and used (8%) punk, a woody fungus found on birch trees. Respondents noted that punk was mostly used in the past as an additive to tobacco. Community members also commonly used punk as a mosquito repellent. Punk is gathered and allowed to dry, and then it is placed in coffee cans or other metal containers and lit on fire. The smoke produced is a very effective mosquito deterrent. Punk is most often used at fish camps during the summer months. According to Marcotte (1988:117), wild rose hips and Hudson's Bay (Labrador) tea were sought-after plants for some Galena households. As stated above, 15% of households harvested wild rose hips in 2010, making it the most harvested plant. Rose hips also contributed the most edible pounds of food (81 lb), and were the most shared (3%) of the plants. Punk (see description above) was the second-most harvested and used plant by Galena households in 2010, followed by wild rhubarb. Some Galena households also used fiddlehead ferns, nettles, Hudson's Bay tea, mint, stinkweed, and puffballs in 2010. Households reported using plants and greens for food, tea, and medicinal remedies.

Fifty-nine percent of Galena households reported harvesting wood, mainly for heating and for smoking fish: 63% of households used wood for these purposes. One survey respondent stated, "Wood is like gold, $250–$500 a cord nowadays. People can make a lot of money. It is better with subsistence; barely stay alive with store-bought food. Nobody shared subsistence [with us] last year, we had to buy some." Galena residents cut firewood both for family use and for sale. Marcotte (1988:117) reported that households used both spruce and birch trees for firewood to heat homes. However, the preferred wood for home heating was dry spruce. Dry standing cottonwood was the most sought-after wood to use in smoking fish. Large spruce cut from upriver and floated down the river to Galena was used for home construction. Community residents harvested an estimated 718 cords of wood in 2010.

Table 6-7.–Estimated harvest and use of vegetation, Galena, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Berries										
Blueberry	53.8%	51.3%	46.3%	15.0%	11.3%	508.6 lb	3.2 lb	1.2 lb	127.1 gal	± 25.0%
Lowbush cranberry	28.8%	28.8%	27.5%	7.5%	16.3%	517.5 lb	3.3 lb	1.2 lb	129.4 gal	± 41.2%
Highbush cranberry	22.5%	20.0%	20.0%	5.0%	12.5%	256.8 lb	1.6 lb	0.6 lb	64.2 gal	± 47.0%
Gooseberry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Currant	1.3%	1.3%	1.3%	0.0%	1.3%	31.6 lb	0.2 lb	0.1 lb	7.9 gal	± 139.9%
Raspberry	16.3%	15.0%	15.0%	5.0%	3.8%	141.2 lb	0.9 lb	0.3 lb	35.3 gal	± 50.4%
Salmonberry	17.5%	15.0%	15.0%	5.0%	2.5%	127.4 lb	0.8 lb	0.3 lb	31.8 gal	± 56.2%
Crowberry (blackberry)	1.3%	0.0%	0.0%	1.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Other wild berry	1.3%	1.3%	1.3%	0.0%	0.0%	0.5 lb	0.0 lb	0.0 lb	0.1 gal	± 139.9%
Subtotal	**63.8%**	**61.3%**	**57.5%**	**20.0%**	**23.8%**	**1,583.5 lb**	**10.0 lb**	**3.7 lb**	**395.9 gal**	**± 29.3%**
Plants/greens/mushrooms										
Wild rhubarb	6.3%	5.0%	5.0%	1.3%	0.0%	24.0 lb	0.2 lb	0.1 lb	6.0 gal	± 97.6%
Eskimo potato	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Fiddlehead fern	1.3%	1.3%	1.3%	0.0%	0.0%	0.5 lb	0.0 lb	0.0 lb	0.5 gal	± 139.9%
Nettle	1.3%	1.3%	1.3%	0.0%	0.0%	2.0 lb	0.0 lb	0.0 lb	2.0 gal	± 139.9%
Hudson's Bay (Labrador) tea	3.8%	3.8%	3.8%	0.0%	0.0%	1.2 lb	0.0 lb	0.0 lb	1.2 gal	± 83.0%
Mint	2.5%	2.5%	2.5%	0.0%	1.3%	4.4 lb	0.0 lb	0.0 lb	4.4 gal	± 125.1%
Sourdock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Spruce tips	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Willow leaves	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Cow parsnip (wild celery)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Wild rose hips	15.0%	15.0%	15.0%	0.0%	2.5%	81.0 lb	0.5 lb	0.2 lb	20.3 gal	± 52.1%
Yarrow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown mushrooms	5.0%	3.8%	3.8%	1.3%	1.3%	3.5 lb	0.0 lb	0.0 lb	3.5 gal	± 90.8%
Fireweed	5.0%	3.8%	3.8%	1.3%	0.0%	10.1 lb	0.1 lb	0.0 lb	10.1 gal	± 97.8%
Stinkweed	1.3%	1.3%	1.3%	0.0%	0.0%	2.0 lb	0.0 lb	0.0 lb	2.0 gal	± 139.9%
Punk	7.5%	7.5%	7.5%	0.0%	1.3%	0.0 lb	0.0 lb	0.0 lb	448.3 gal	± 97.3%
Puffballs	1.3%	1.3%	1.3%	0.0%	1.3%	0.5 lb	0.0 lb	0.0 lb	0.5 gal	± 139.9%
Unknown greens from land	1.3%	1.3%	1.3%	0.0%	0.0%	2.0 lb	0.0 lb	0.0 lb	2.0 gal	± 139.9%
Subtotal	**28.8%**	**25.0%**	**25.0%**	**3.8%**	**6.3%**	**131.2 lb**	**0.8 lb**	**0.3 lb**	**500.8 gal**	**± 38.0%**
Wood										
Wood	62.5%	58.8%	58.8%	13.8%	21.3%	0.0 lb	0.0 lb	0.0 lb	718.4 crd	± 21.5%
Subtotal	**62.5%**	**58.8%**	**58.8%**	**13.8%**	**21.3%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**718.4 crd**	**± 21.5%**
All vegetation	**80.0%**	**78.8%**	**76.3%**	**31.3%**	**38.8%**	**1,714.7 lb**	**10.9 lb**	**4.0 lb**		**± 28.8%**
All resources[b]	**91.3%**	**85.0%**	**81.3%**	**77.5%**	**68.8%**	**107,643.6 lb**	**683.1 lb**	**253.5 lb**		**± 27.8%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

b. All Resources include all species of fish, wildlife, and plants reported on the survey.

Harvest Areas

For 10 different subsistence resources (e.g., salmon, moose) and for 4 different resource categories (e.g., small land mammals, vegetation), households were asked to locate on a map the areas in which they had hunted or fished for the resource, and the locations at which they had actually harvested the resource. For each resource and category, all households' search areas and harvest locations were combined to create a series of maps depicting Galena's subsistence use areas in 2010. Figure 6-7 summarizes all the mapped data collected from Galena households. For 2010, Galena's residents reported using a total of 2,352 square miles for subsistence. Circumstances such as regulatory changes, environmental changes, technological advances, and economic considerations have continuously affected areas of use in Galena over time.

For 2010, Galena survey respondents reported searching for and harvesting salmon species in various sections of the Yukon River from as far downstream as the community of Nulato to as far upstream as 5 mi above Fish Island (approximately 20 mi total) (Figure 6-8). The most contiguous section of the

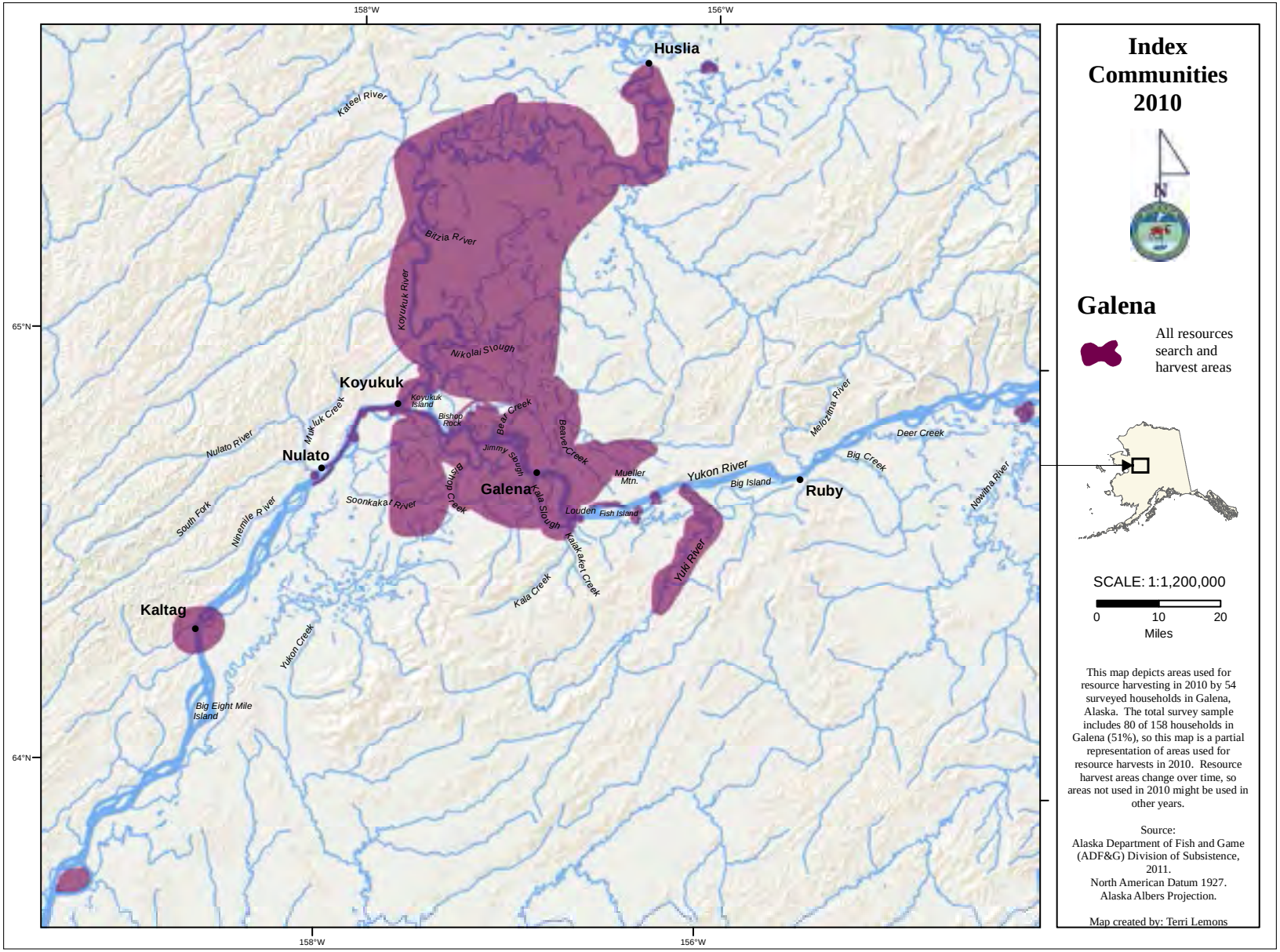


Figure 6-7.–Search and harvest areas, all resources, Galena, 2010.

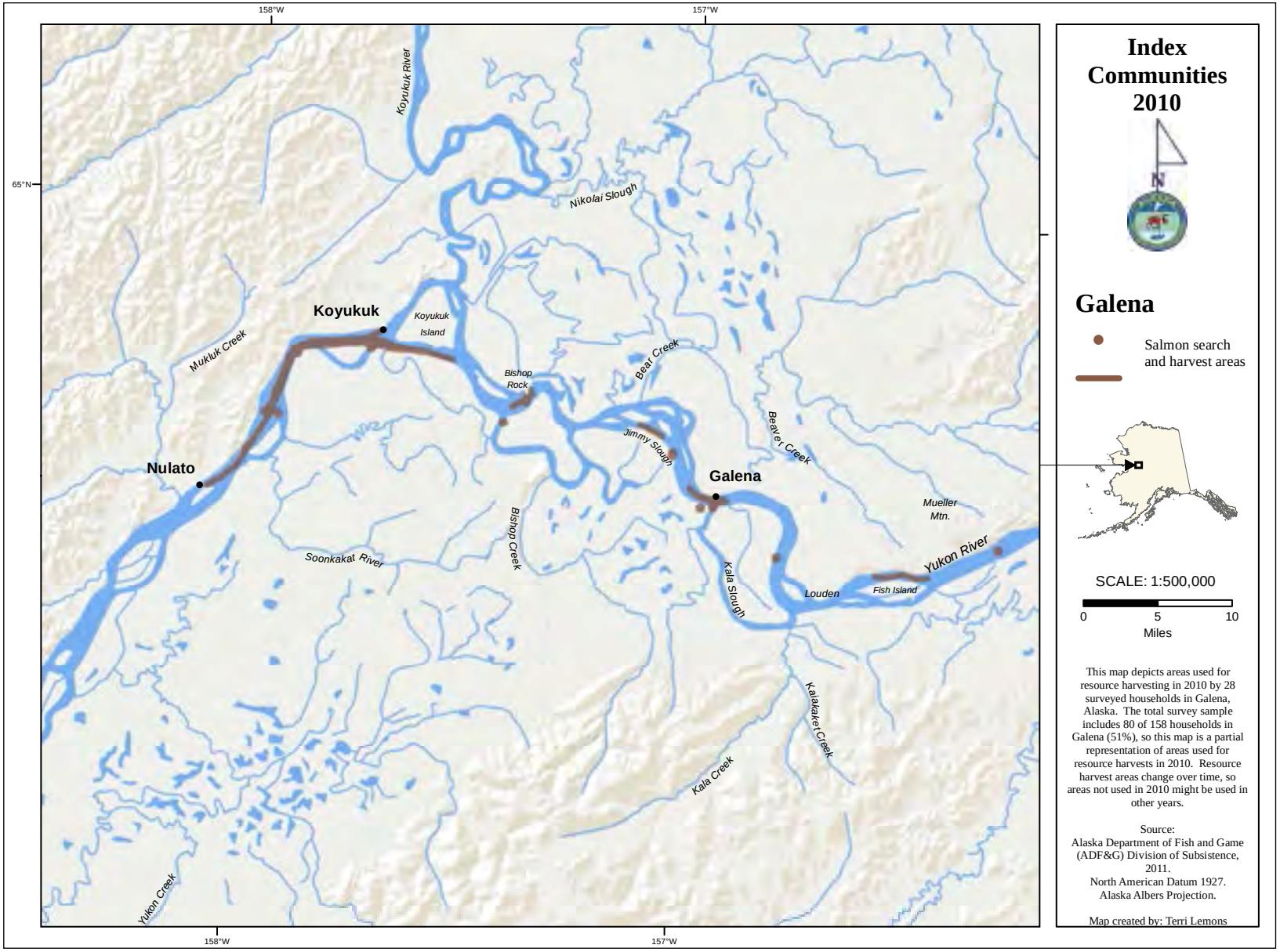


Figure 6-8.–Search and harvest areas, salmon, Galena, 2010.

river used was a stretch starting approximately 5 miles above the community of Koyukuk and continuing downriver to the community of Nulato. A federal drift gillnet area extended from just downriver of Galena for approximately 30 miles; a subsistence drift gillnet permit was required. This section of the Yukon River is federally managed as part of the Innoko National Wildlife Refuge. A 5-mile stretch of the river extending in either direction directly in front of Galena was the most easily accessible search and harvest area for salmon species. Fish camps dotted this area. Two other areas of note were the Jimmy Slough and Bishop Rock (also known as Yistletaw) areas downstream of Galena. According to Marcotte (1988:60–61), these and additional areas were also used as search and harvest areas for salmon species during the 1985–1986 study year. Marcotte (1988:62) reported that the Bishop Rock location had been in continuous use as a fish camp as far back as people could remember.

Galena households searched for and harvested nonsalmon fish species in a variety of areas in 2010 (Figure 6-9). Similarly to salmon, whitefish were mostly targeted in the 5-mile stretch of the river extending both upstream and downstream directly in front of Galena. In addition, whitefishes were harvested along the length of Jimmy Slough and along a 5-mile stretch in the mainstem of the Yukon River, including the section of river directly across from the community of Nulato.

Survey respondents reported searching for and harvesting moose over a large expanse of land. One of the major search and harvest areas extended up the Koyukuk River to its intersection with the Kateel River, west along the Kateel River for approximately 10 miles, and inland north of the Kateel River approximately 5 miles. Another major search and harvest area extended both north and south of the Yukon River approximately 5–30 miles and along the river corridor itself. The third major moose search and harvest area spanned approximately 20–30 miles along the Yuki River and extended back from the river approximately 5 miles on either side. All of the community's search and harvest areas for moose in 2010 were located within GMU 21D (Figure 6-10).

The search and harvest areas used by Galena households for small mammals encompassed a large area along the majority of the length of the Koyukuk River to its intersection with the Kateel River, along the Kateel River to the community of Huslia, east from the Koyukuk River extending out for approximately 40 miles, and south from the Kateel River toward the Yukon River for approximately 70 mi to Galena. Another major search and harvest area for small mammals was approximately 20–30 miles along the length of the Yuki River starting from its intersection with the Yukon River. Galena households also searched for and harvested small mammals as far away as the community of Kaltag. Due to its closeness to the community, Kala Slough, immediately upriver from Galena, was the most accessible area utilized by Galena households for the search and harvest of small mammals in 2010 (Figure 6-11)

Galena households primarily searched for and harvested ducks and geese in 5 distinct areas. Those areas closest to Galena were the Bear Creek and Beaver Creek areas, which overlapped to the north and northwest of Galena, and the wetlands area behind Mueller Mountain to the east of Galena. Search and harvest areas farther away from Galena included a stretch along the length of the Yuki River for approximately 30–35 miles (extending away from the river for approximately 5 miles on both sides), and the Nikolai Slough area on the Koyukuk River. The farthest search and harvest area from Galena for ducks and geese was located in the Bitzia River area along the Koyukuk River. Ptarmigan and grouse were mostly harvested in and around the community of Galena and while pursuing other resources (Figure 6-12).

Berries and greens were harvested in a variety of areas, including both sides of the Yukon River close to the community. The Bear Creek and Beaver Creek areas to the north and northwest of Galena were also heavily utilized. Households also searched for and harvested berries and greens as far away as the mouth of the Nowitna River at its intersection with the Yukon River near the community of Ruby, at Bitzia River (possibly in conjunction with other subsistence activities such as waterfowl hunting) off of the Koyukuk River, and in the wetlands area to the east of the community of Huslia. The areas that lie farthest away from Galena could represent cooperative search and harvest of berries and greens by Galena residents with family and friends from Huslia (Figure 6-13).

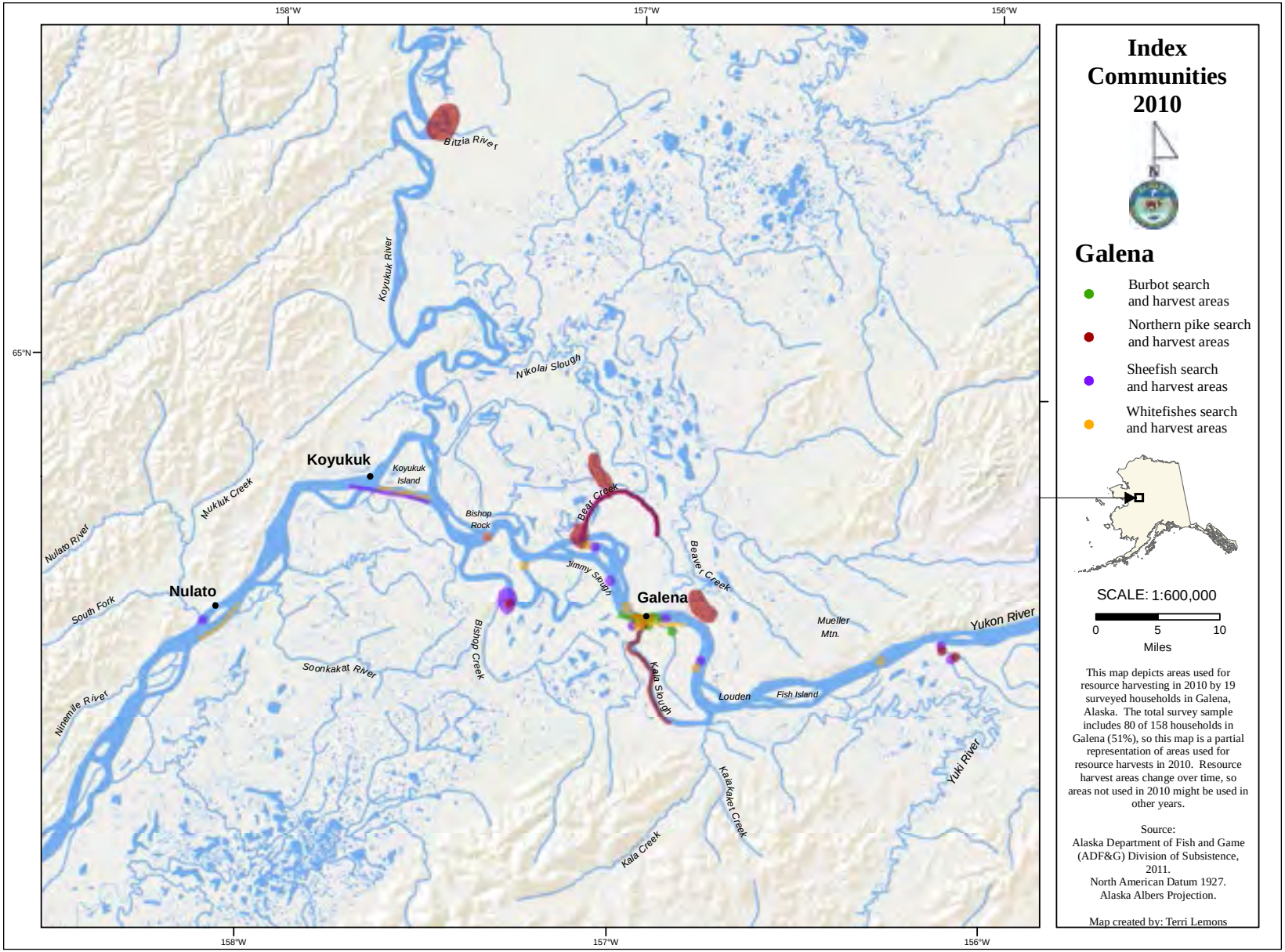


Figure 6-9.–Search and harvest areas, nonsalmon fish, Galena, 2010.

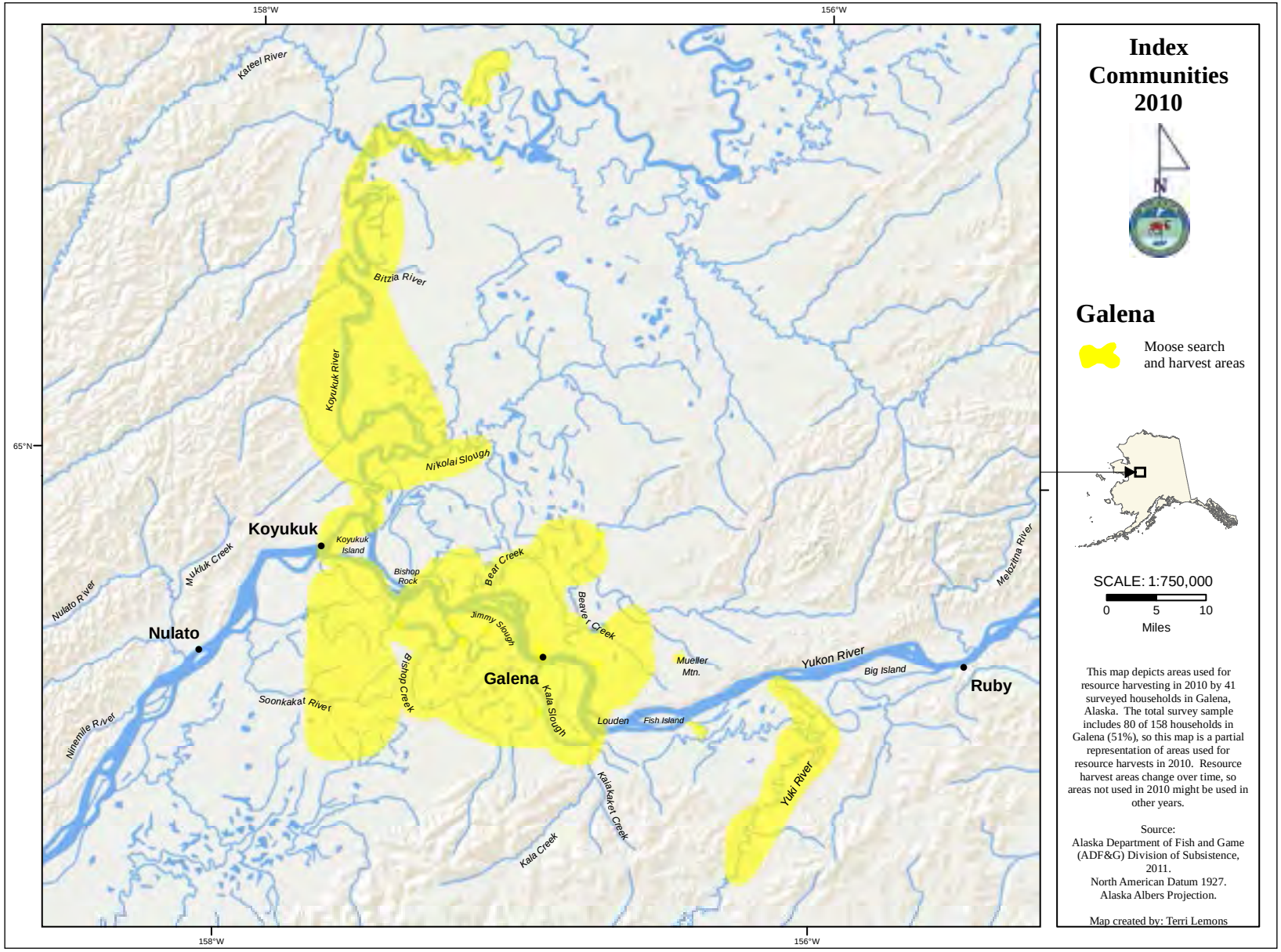


Figure 6-10.–Search and harvest areas, large land mammals, Galena, 2010.

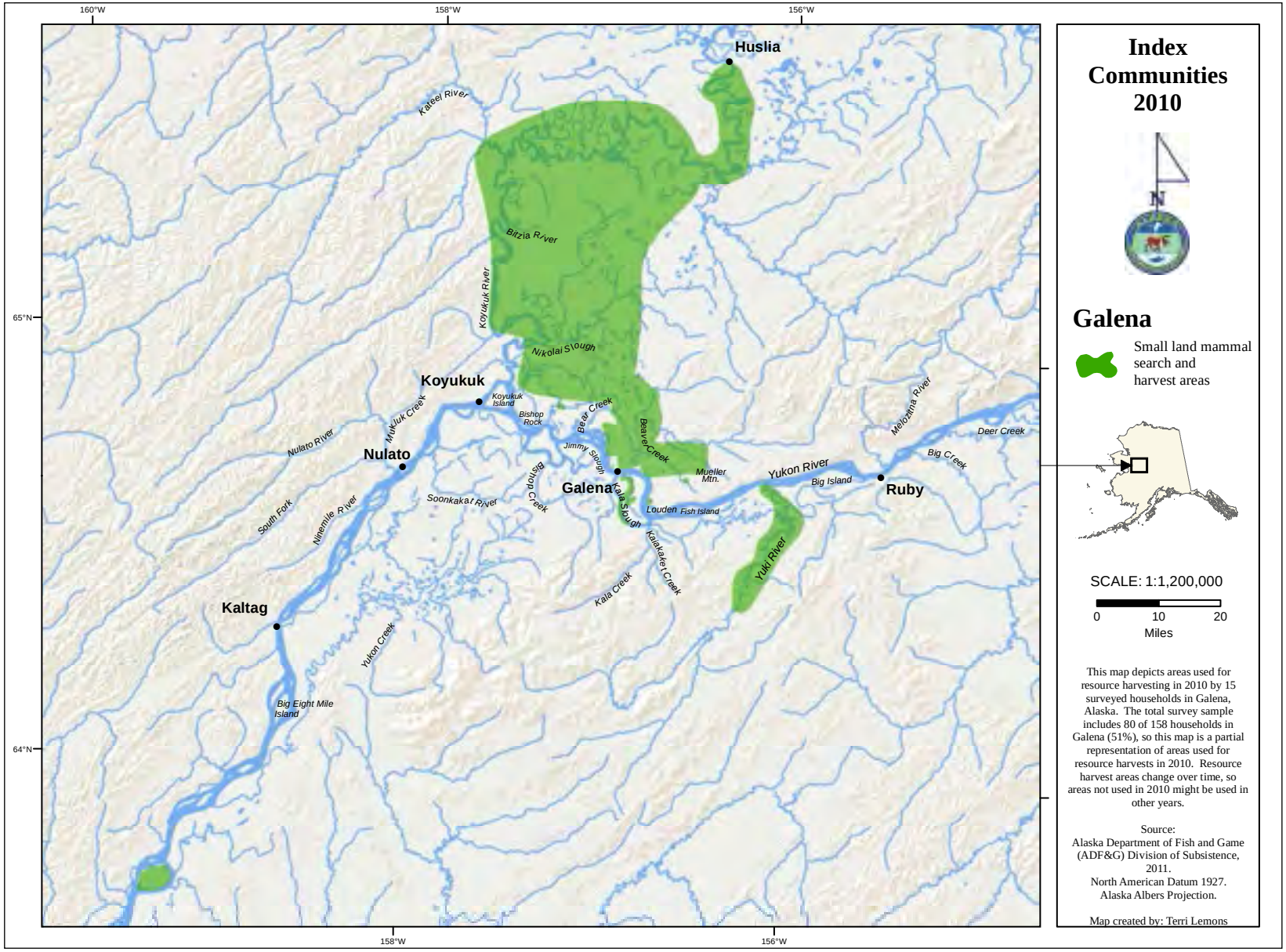


Figure 6-11.–Search and harvest areas, small land mammals, Galena, 2010.

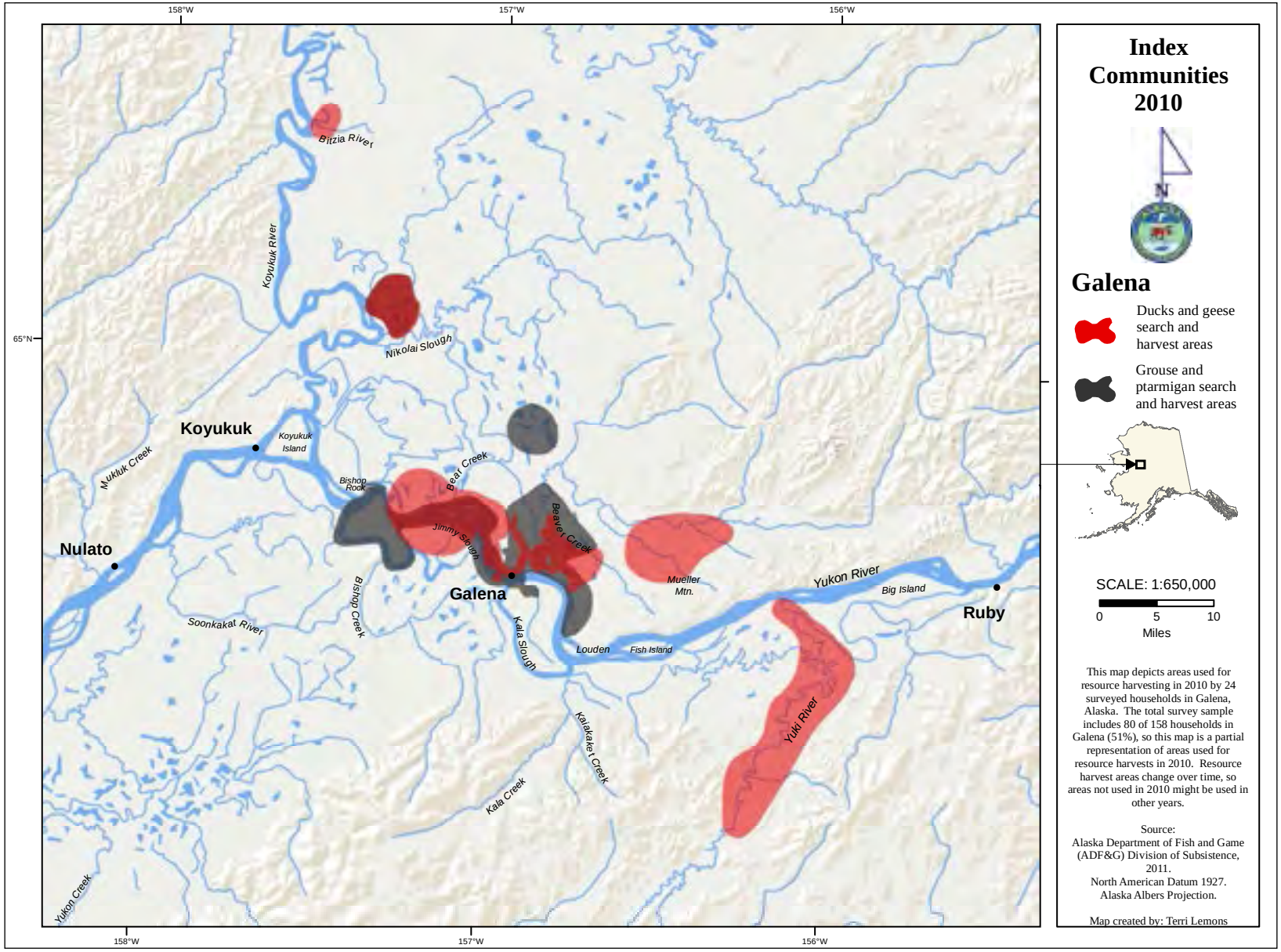


Figure 6-12.–Search and harvest areas, birds, Galena, 2010.

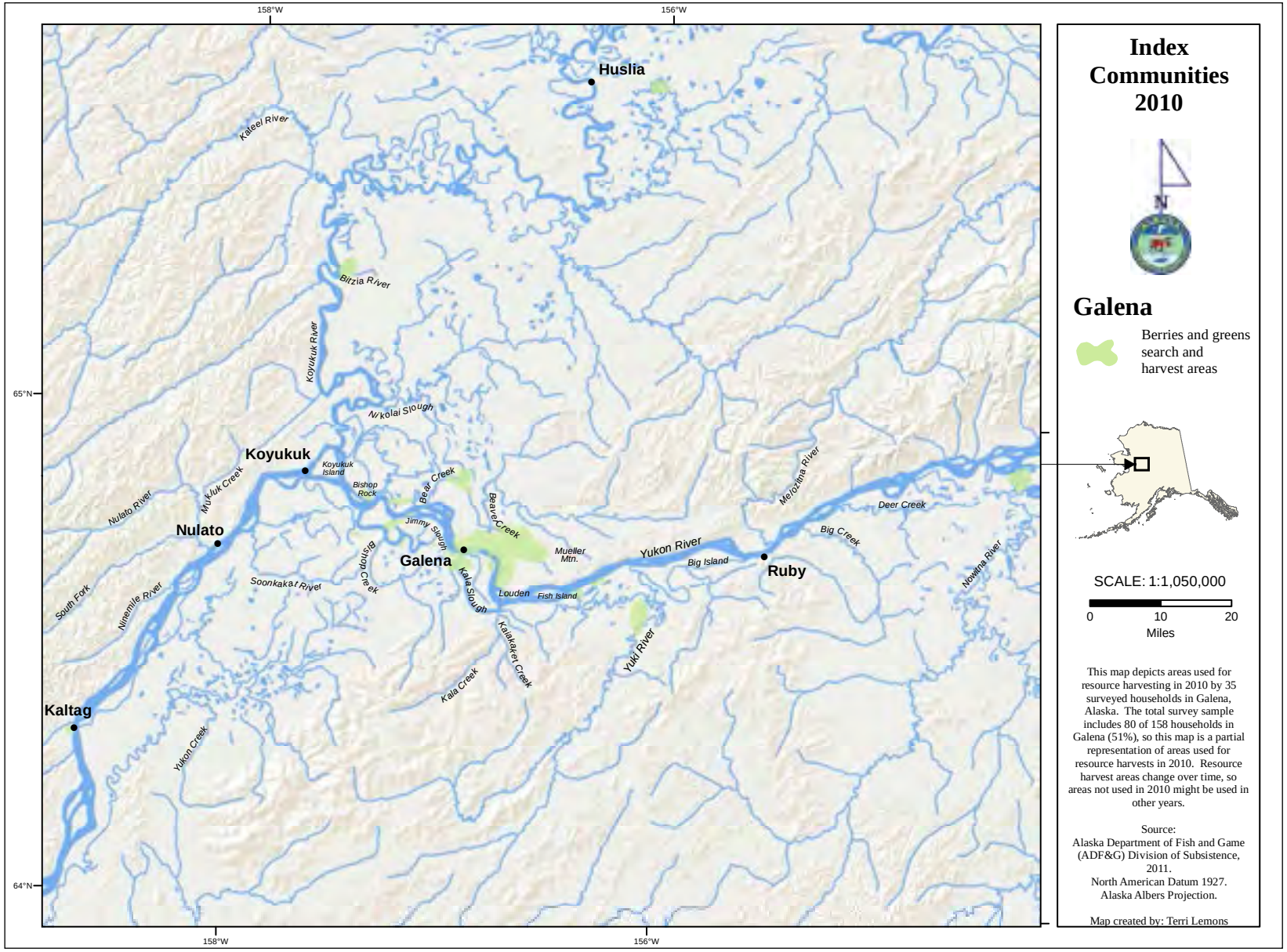


Figure 6-13.–Search and harvest areas, vegetation, Galena, 2010.

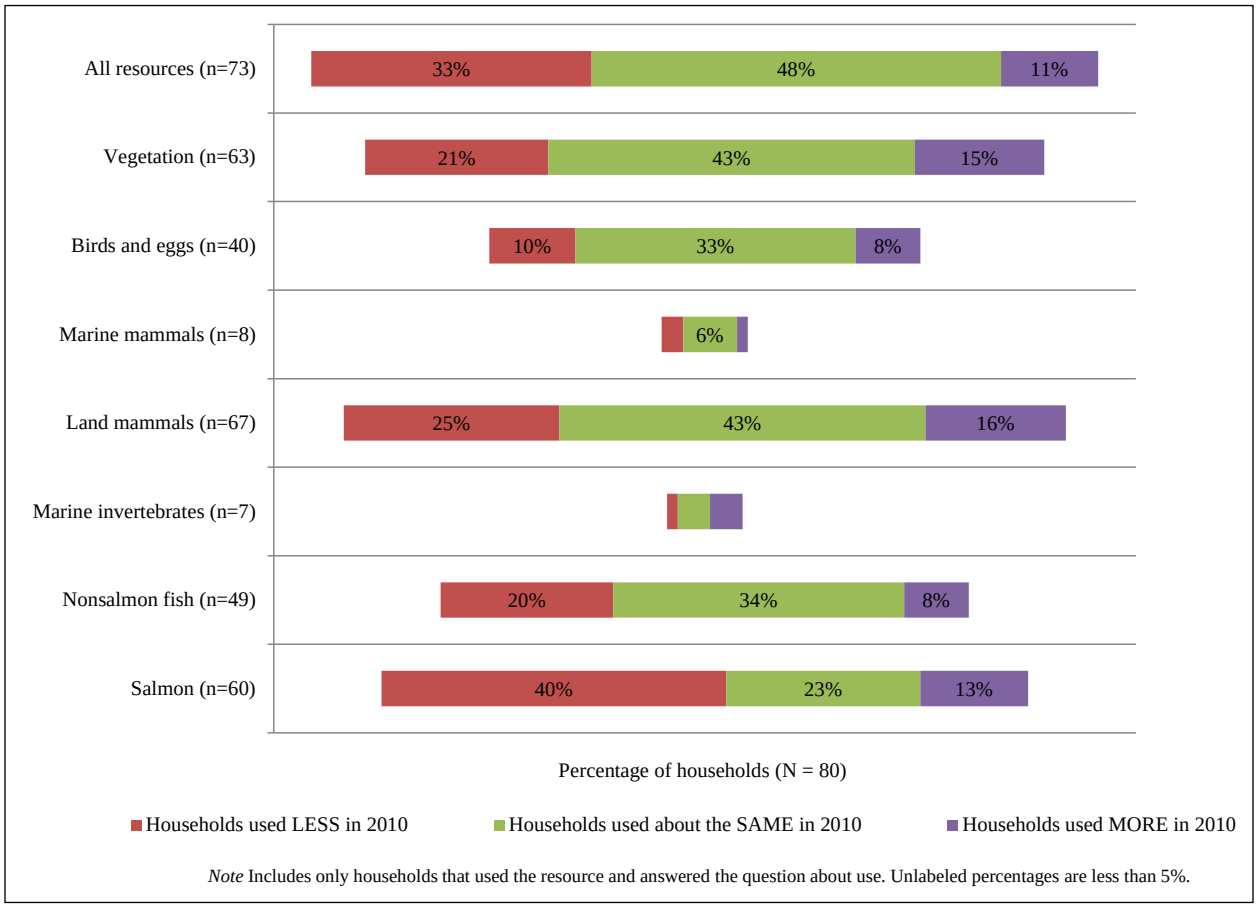
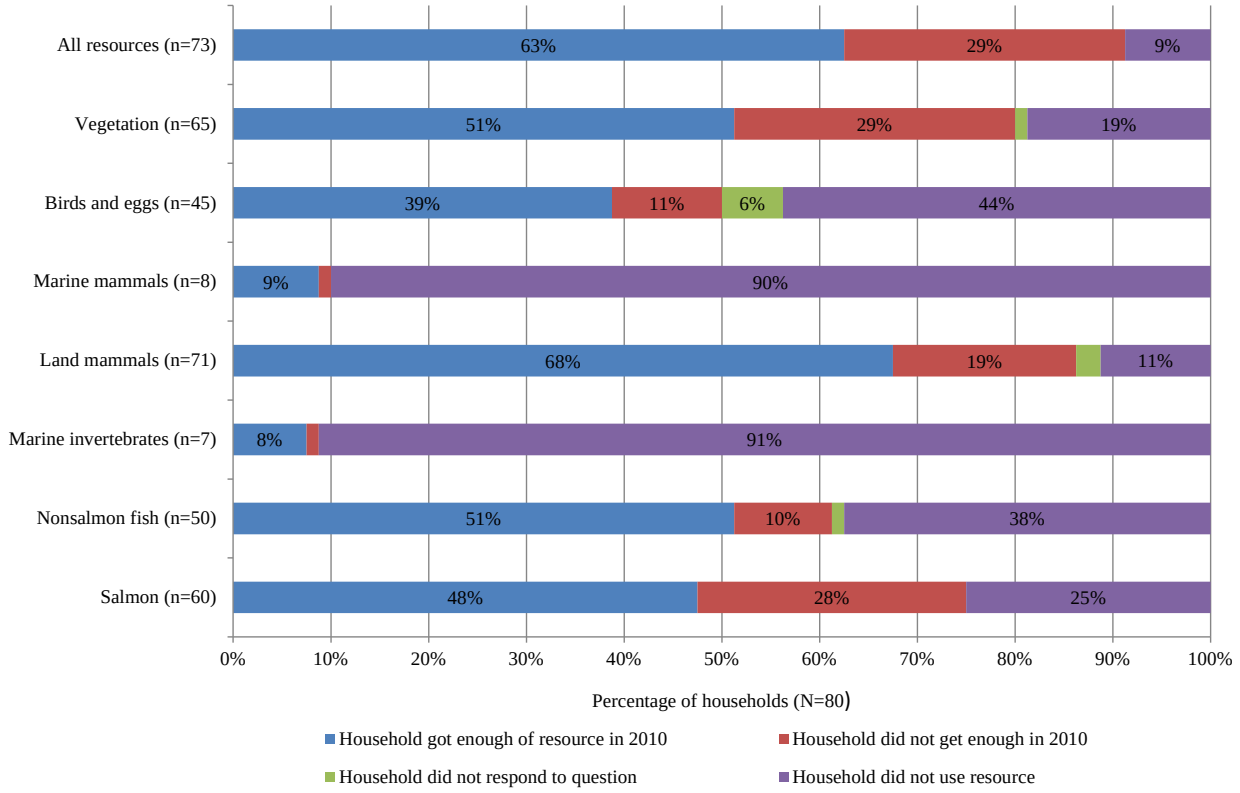


Figure 6-14.–Household use assessments, Galena, 2010. Responses to the question: Did your household use less, more, or the same amount?

Harvest Assessments

The survey 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 2010 as in past years, and whether they got "enough" of each of the 7 resource categories. This section discusses responses to those questions. Percentages do not include households that did not respond to the question or reported that they never harvested the resource. Subsistence harvest success also can be assessed by comparing current harvest estimates with past harvest estimates; that will be discussed in a later section.

Figure 6-14 represents respondents' estimated harvest assessments for 2010. For the category of salmon, 40% of households reported that they used less in 2010, while 23% reported using the same amount. Only 13% of Galena households reported that they used more salmon in 2010. A greater percentage of households reported using less salmon than any other resource category, attesting to the significant declines in salmon abundance and increase in fishing restrictions over the several years prior to the study. Some Galena respondents cited a lower harvest as the cause for using less salmon in 2010; respondents cited the impact of bycatch from commercial ocean fishing and shorter openings for subsistence fishing as causes for lowered harvest (Table D6-6). For the categories of berries and greens and land mammals, the same percentage of households used the same amount (43%) as they did in recent years; only 21% used less vegetation, and 25% used less land mammals. Birds and eggs, and nonsalmon fish were used about by about the same percentages of households as in previous years (33% and 34% respectively); 10% used less birds and eggs, and 20% used less nonsalmon fish in 2010.



Note n = number of households that either used the resource or indicated that they did not use because they did not get. Unlabeled percentages are less than 5%.

Figure 6-15.–Household harvest assessments, Galena, 2010. Responses to the question: Did your household get enough ?

Responses to the question, "Did your household get enough?" varied by resource. Respondents frequently reported shortages of salmon—28% of households reported not getting "enough" of this resource, which attests to the importance of this resource (Figure 6-15). When asked why they did not get enough, several respondents cited a lack of salmon due to shorter openings for subsistence fishing. (Table CD6-7). Another frequent response as to why households did not get enough salmon was that there was a lack of cash due in part to high prices for gas, boat motor repairs, and replacement nets. During the surveys, some respondents also said that a lack of personal time to harvest caused them to reduce their consumption of salmon. During the summer months, which correspond with salmon season, employment rates were at their highest. Residents often left the community for wage labor, leaving little time for subsistence pursuits. The households that reported not getting enough of subsistence foods in general used more commercial foods as a replacement (Table D6-8, D6-9). Some respondents were concerned about the lack of cash to purchase commercial food. Most of those who said that they did not get enough salmon reported that the impact to their household was minor (55%), although some reported a major impact (32%) (Table D6-10).

Another resource category for which households often reported shortages was plants and berries (29%) (Figure 6-15). During their surveys, several respondents cited a changing environment (e.g., recent warming trends) for the lower plant productivity in 2010 (Table D6-7). During their surveys several respondents stated that they got fewer land mammals in 2010 because they felt that hunters from "outside" the area used spotting planes for moose and then wasted the meat after the hunt. The majority of respondents reported getting enough land mammals (Figure 6-15). The land mammals category had the highest percentage of "more use" than any other category in 2010 (Figure 6-14). Respondents provided several reasons for why they used more land mammals in 2010. Some said they used more because they needed more; others said that they had better success in hunting, or that they received more (Table C6-11).

Table 6-8.–Estimated earned and other income, Galena, 2010.

Income source	Number of people	Number of households	Total for community	Mean per household[a]	Percentage of total[b]
Earned income					
Local government	132.3	94.8	$4,672,293	$29,571	48.3%
Services	29.6	25.7	$1,119,084	$7,083	11.6%
Transportation, communication, and utilities	21.7	21.7	$706,656	$4,473	7.3%
State government	11.9	11.9	$536,439	$3,395	5.5%
Federal government	9.9	9.9	$528,120	$3,343	5.5%
Retail trade	23.7	17.8	$475,896	$3,012	4.9%
Agriculture, forestry, and fishing	9.9	9.9	$88,928	$563	0.9%
Construction	2.0	2.0	$71,716	$454	0.7%
Other employment	2.0	2.0	$42,074	$266	0.4%
Earned income subtotal	**220.2**	**122.5**	**$8,241,206**	**$52,160**	**85.1%**
Other income					
Alaska Permanent Fund dividend		154.1	$507,836	$3,214	5.2%
Pension/retirement		17.8	$299,608	$1,896	3.1%
Social Security		29.6	$287,403	$1,819	3.0%
Native corporation dividend		114.6	$98,625	$624	1.0%
CITGO fuel voucher		130.4	$66,314	$420	0.7%
Alaska Longevity Bonus		2.0	$59,250	$375	0.6%
Food stamps		7.9	$40,302	$255	0.4%
Worker's compensation/insurance		4.0	$29,755	$188	0.3%
Unemployment		9.9	$21,997	$139	0.2%
Rental income		4.0	$16,985	$108	0.2%
Child support		2.0	$7,110	$45	0.1%
Energy assistance		7.9	$3,441	$22	0.0%
Adult public assistance		0.0	$0	$0	0.0%
Supplemental Security Income		0.0	$0	$0	0.0%
Disability		0.0	$0	$0	0.0%
Veterans assistance		0.0	$0	$0	0.0%
Other		0.0	$0	$0	0.0%
Foster care		0.0	$0	$0	0.0%
Meeting honoraria		0.0	$0	$0	0.0%
Other income subtotal		**156.0**	**$1,438,625**	**$9,105**	**14.9%**
Community income total			**$9,679,832**	**$61,265**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

a. Means are based on all households in the community, not the number of households in the income category.

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

For the combined category of birds and eggs, 44% said that they did not use these resources, and 39% said that they got enough in 2010 (Figure 6-15). Eleven percent of respondents said they did not get enough birds and eggs in 2010. No household reported harvesting or using eggs for the study year (Table 6-6). This is perhaps due to the large distance between Galena and coastal areas where there is an abundance of seabirds and egg gathering opportunities.

Of the categories of marine mammals and marine invertebrates, about 90% of respondents stated that they did not use marine mammals, while 91% did not use marine invertebrates. Nine percent (9%) of respondents said they got enough of the former and 8% said they got enough of the latter (Figure 6-15).

Jobs and Income

For the 2010 study year, survey respondents were asked about both earned income (jobs held and wages earned by all household members 16 years old and older) and other income (Alaska Permanent Fund dividend, Social Security, public assistance, etc.). In the community of Galena the employment rate is high, and the average number of people per household is low. In 2010, 90% of Galena households had at least one member working full time, while the rate of full-time employment in the other study communities did not surpass 74% of households (Tables D3-13, D4-13, D5-12, D6-12, D7-12). As result, Galena tended to have higher mean household incomes and average per capita incomes than the other middle Yukon River communities included in this study: $61,265 and $22,798, respectively.

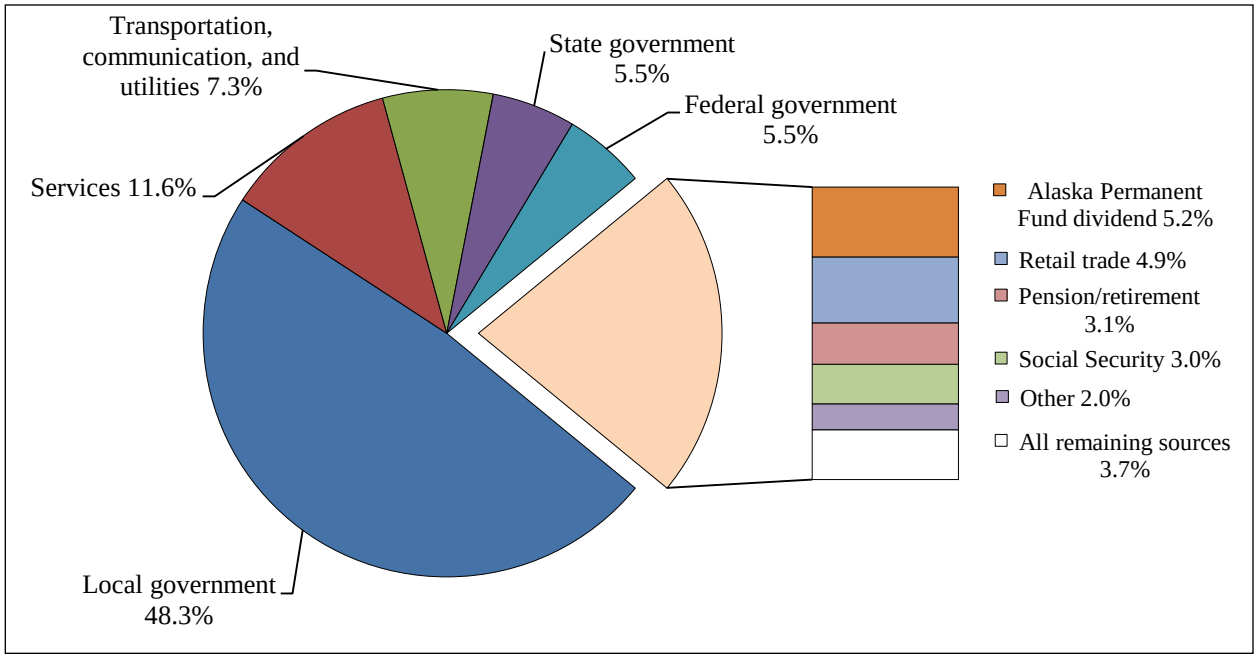


Figure 6-16.–Top 10 income sources, ranked by estimated amount, Galena, 2010.

In 2010, Galena households earned or received an estimated total of $9,679,832, of which $8,241,206 was from wage employment and $1,438,625 was from other income sources (Table 6-8). In 2010, 220 residents (69%) were employed (Table C4). Of those, 55% were employed year-round. The average number of jobs per employed household was 2. Seasonal employment such as construction work, commercial fishing, and Bureau of Land Management firefighting provided some income, according to survey respondents. Local artisans sold arts and crafts including birch-bark baskets, beadwork, skin moccasins, fur hats, and ivory work.

Figure 6-16 shows the percentages of estimated earned and other income in 2010 by source. Community government jobs (including local schools and the tribal government) were the single largest source of earned income, contributing an estimated 48% of the total. Figure 6-16 also shows the top income sources ranked by estimated contribution. Other income (e.g., pension, Social Security, Alaska Permanent Fund dividend) was the second-largest source of income, contributing 22% of the total community income. The next largest contribution to community income was services (12%). The retail trade in Galena in 2010 was represented by 2 village stores, which together contributed 5% of the total income.

Food Security

Respondents were asked a short series of questions intended to assess their household's food security status, that is, "access by all people at all times to enough food for an active, healthy life" (Nord et al. 2009:2). The food security questions were modeled on questions developed by the U.S. Department of Agriculture (USDA), and modified by ADF&G to account for differences in access to subsistence and store-bought foods (Figure 6-17). Based on their responses to these questions, households were categorized as having high, marginal, low, or very low overall food security following a USDA protocol (Bickel et al. 2000). In Galena for 2010, 89% of the surveyed households reported high and marginal food security; USDA considers households in both categories to be "food secure." This percentage is higher than 2010 USDA estimates for both Alaska and the U.S. (86%). Of the remaining Galena households, 10% had low food security and 1% had very low food security (Figure 6-18).

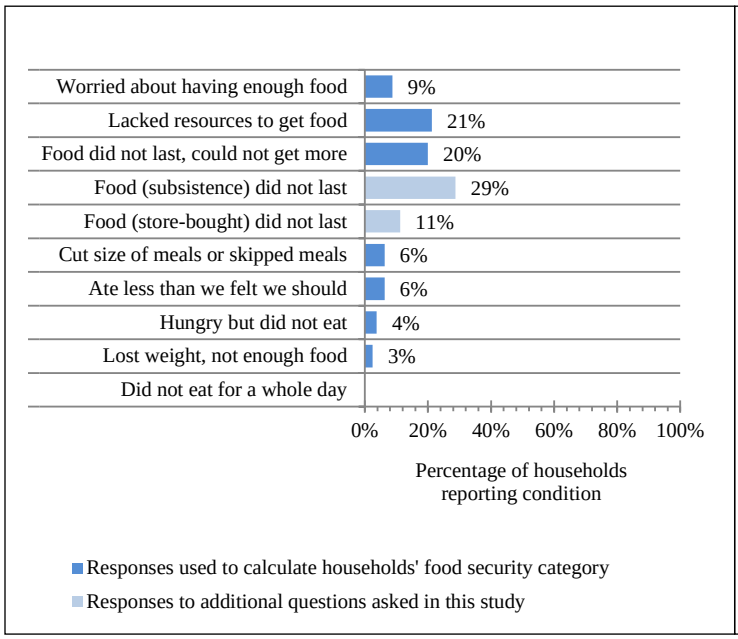


Figure 6-17.–Food insecure conditions, Galena, 2010.

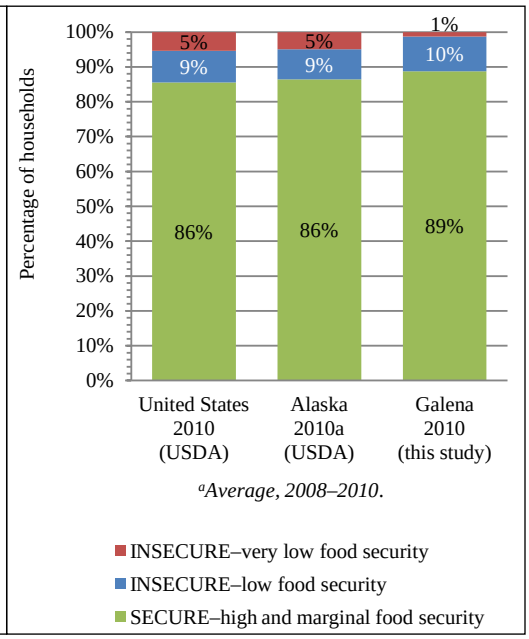


Figure 6-18.–Food security categories, Galena, 2010.

According to several respondents, the lack of resources (e.g., cash, gas, boats, motors, and other fishing and hunting gear) was the major factor affecting the acquisition of the types of food residents wanted. In response to the statement, "We could not get the kinds of food we wanted because of lack of resources," several households reported during their surveys that this was a major concern beginning in the month of November as they headed into the winter, with concern peaking in January. With the rising cost of heating fuel, cash for subsistence gear or for store-bought foods is scarce at this time of the year in most Alaska communities. Some survey respondents also felt that restrictive subsistence regulations prevented them from acquiring the types of foods that they wanted. In response to the statement, "The subsistence food we had just did not last and we could not get more," 29% of households that answered this question reported this as a major concern (Figure 6-17). Only 9% of those who responded to the statement "We worried about having enough food" reported this as a major concern.

Food security varied by season (Figure 6-19). Food security concerns rose in the month of November. Households characterized as having low food security worried about lack of food in the month of April, as well as the months of June, July, and August. Conversely, the number of low food security households with subsistence food concerns dropped during the month of May and during the months of September and October. It was also low in December through March. Those households characterized as having high or marginal food security reported fewer concerns about food availability during May through October. These were times when fish resources were more accessible during the summer months, and when peak moose hunting occurred in September.

Wild Food Networks

Sharing is a significant means of redistributing resources throughout rural Alaskan communities. Sharing with elders who may not be able to provide subsistence foods for themselves is of paramount importance in most Alaskan communities. Sharing (in addition to barter and customary trade) is also a major means of redistributing resources throughout a broader network of other communities via family and friends. Distribution of subsistence foods is guided by customary and traditional systems and rules (Wolfe and Ellanna 1983). The complex connections that structure wild food networks in Galena are illustrated in Figure 6-20. Although every household surveyed reported harvesting some type of wild resource, a small group of high producing households shared the bulk of total harvests with the entire community. This

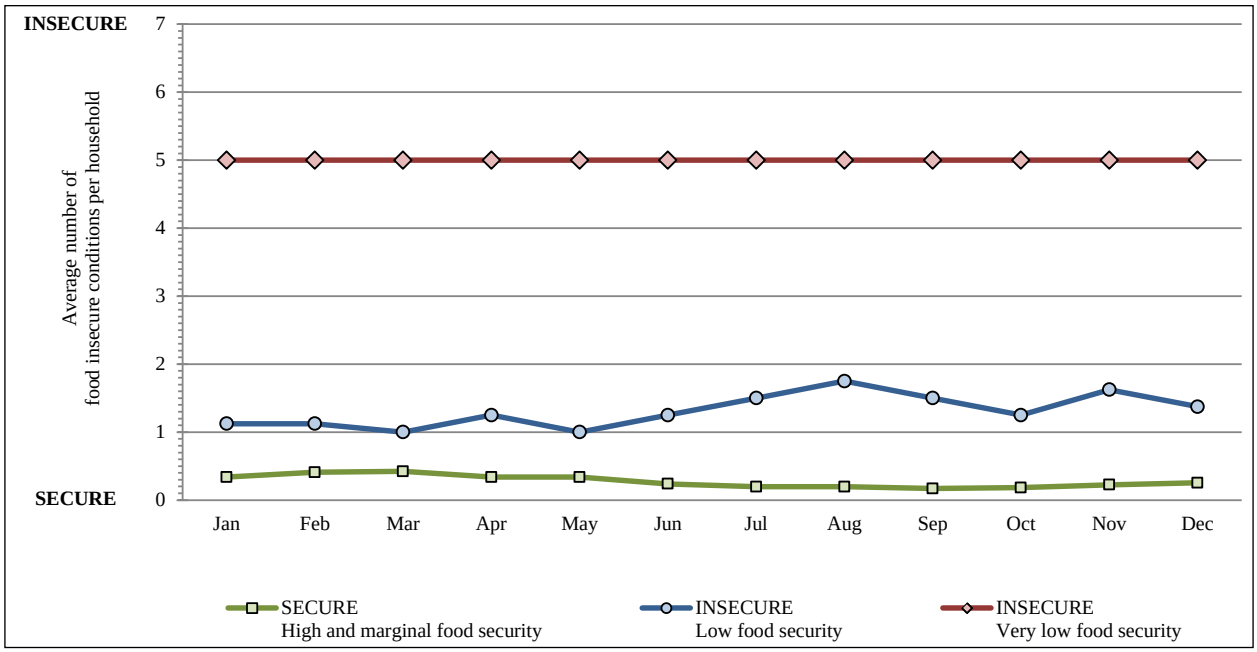


Figure 6-19.–Food insecure conditions by month and household category, Galena, 2010.

pattern of "small group high harvest," known as the 30/70 rule, is true for most Yukon River communities surveyed (Wolfe et al. 2010). For Galena, 20% of households harvested 70% of the subsistence resources in 2010.

Households located closer to the center of the network diagram have stronger ties to other households in the community in terms of receiving resources. Those that are nearer the edges of the diagram have fewer ties. Thick lines connecting households indicate that several resources were received. Thin lines indicate that only a few resources flow between the connected households. Single female household heads and elders often reported receiving multiple resources from other households in the community or from households in other communities. Galena households reported connections with rural communities (e.g., Nulato, Ruby, Koyukuk, and Ambler), urban communities (e.g., Fairbanks, Palmer, Eagle River), and coastal communities (e.g., Point Hope, Dillingham, Barrow, Ninilchik). In most cases, close familial ties link these communities to Galena in a food network. As a hub community for the region, there are many residents not originally from Galena who maintain ties with the communities of their birth, creating many links to other communities in the overall subsistence food network for Galena. Marcotte (1988) observed that Galena served as a clearing house for resources distributed to family members in many surrounding communities at the time of his study as well.

Marcotte (1988:68) reported that, "A large number of households obtained salmon by receiving fish from other households or purchasing fish from others in the community." According to some survey respondents, several families used marine mammal products that are usually traded for moose meat or king salmon strips with Eskimo peoples farther down the Yukon River or with Deg Hit'an or Holikachuk Athabascan people from the Grayling, Anvik, Shageluk, and Holy Cross (GASH) region.

Comparisons with Prior Results

This section discusses the 2010 comprehensive subsistence harvest results and compares them with prior study results. This subsistence survey was the second comprehensive subsistence harvest survey conducted by ADF&G in Galena. The first ADF&G baseline was conducted in 1985–1986 (Marcotte 1988). Although this study represents the first comprehensive update for Galena in 25 years, several other studies have resulted in data useful for understanding subsistence in Galena over time. This section will compare results from the current study to those of the 1985–1986 study (Marcotte 1988); ADF&G large land mammal

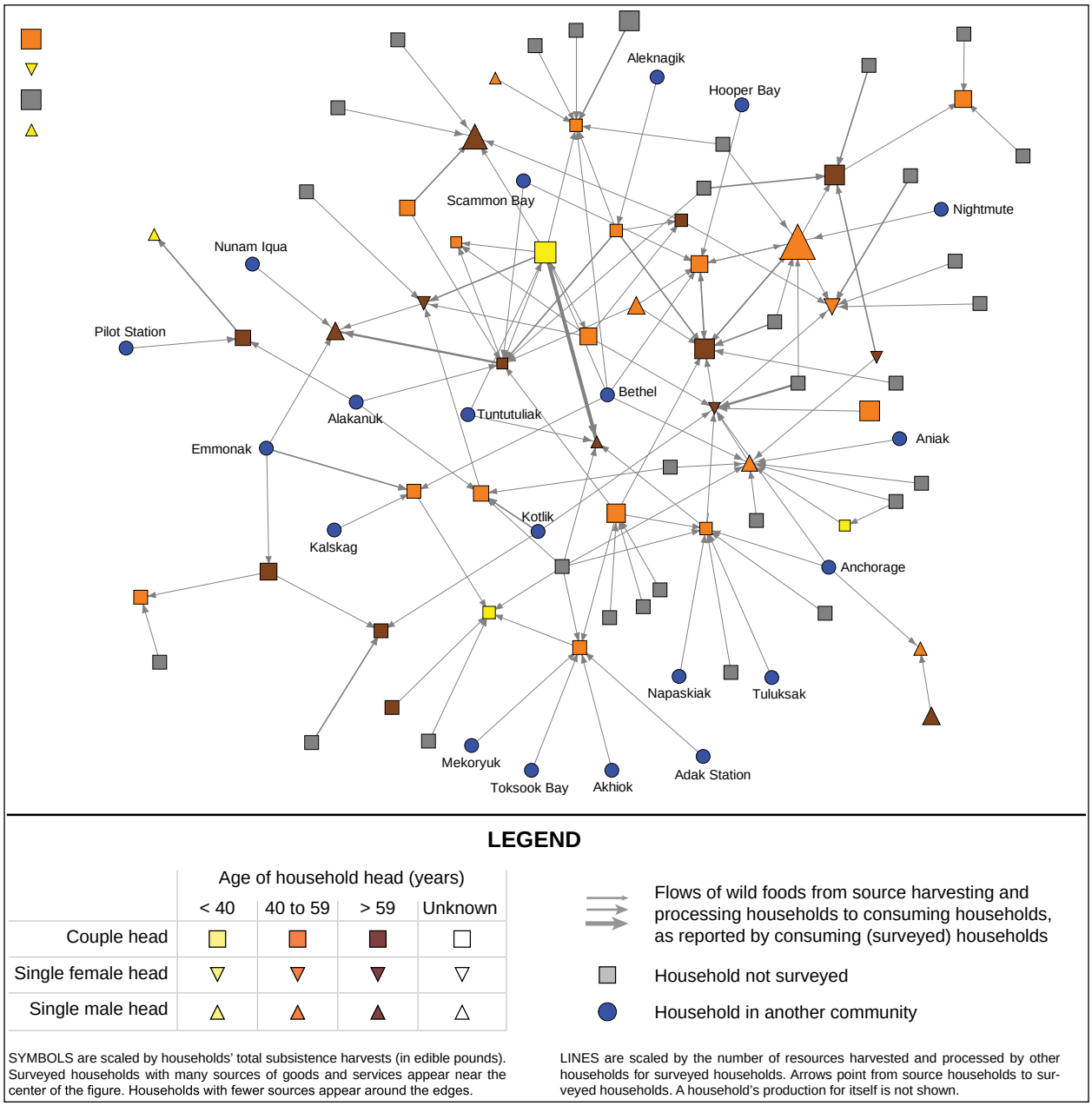


Figure 6-20.–Wild food harvesting and processing network, Galena, 2010.

surveys from 1997 to 1999 (Andersen et al. 1998, 2000, 2001) and 2001 to 2002 (Andersen et al. 2004); a 2005 to 2008 nonsalmon harvest profile for Galena in a traditional ecological knowledge study of nonsalmon fish species in the middle Yukon River region (Brown et al. 2010); and ADF&G Division of Commercial Fish postseason salmon surveys from 1988 to 2010.

The U.S. Census reported a total population of 470 residents for Galena for 2010 (Figure 6-2). This subsistence survey estimated a total population of 425 residents for the same year (Table C1). In his study, Marcotte (1990) surveyed (through a random sample) 74 of 211 households (242 people or 35%). Most households consisted of 4 or fewer people, and 19% of household heads were born in Galena or Louden (Marcotte 1988:23–25). For comparison, the 2010 survey was a random sample of 80 of 158 households (51%) (Table 2-3). The average household size was 3 people, and 42% of household heads were born in Galena (Table C1; Table C2).

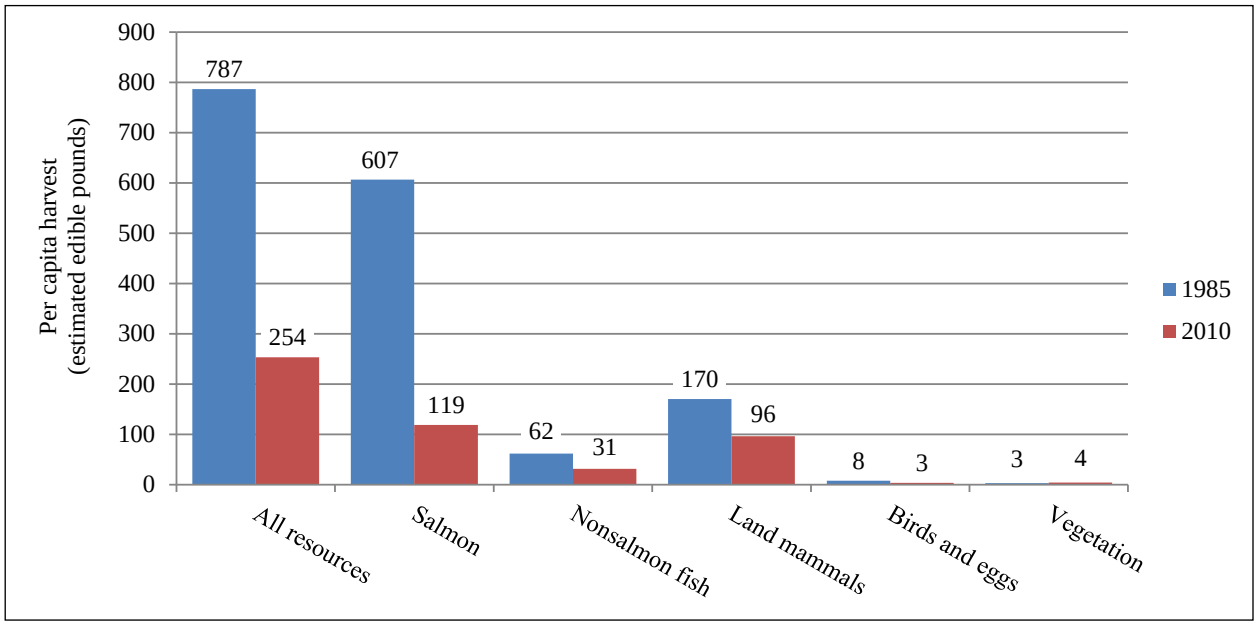


Figure 6-21.–Estimated per capita harvests in edible pounds, Galena, 1985 and 2010.

Marcotte (1988) provided an excellent opportunity to compare harvest and use of subsistence resources in Galena between 2 distinct points in time approximately 25 years apart. A broad comparison of the subsistence picture between 1985–1986 and 2010 shows that harvests per person have fallen significantly (Figure 6-21). Marcotte (1988) reports that respondents used an average of 787 edible pounds of wild foods per person for that time period, whereas respondents for the 2010 survey harvested an average of 254 lb of wild foods per person (Figure 6-21). Of specific subsistence resources, moose and salmon species have continued to be the most important resources used by Galena residents for at least the past 25 years.

Then, as in 2010, residents harvested 4 types of salmon: Chinook (king), coho salmon, summer chum salmon (locally called dog salmon), and fall chum salmon (locally called silvers). Summer chum salmon were harvested in much greater amounts in 1985–1986 (16,212 individual fish) than in 2010 (3,014) (Marcotte 1988; Table 6-2). This disparity is mostly due to the commercial harvest for summer chum salmon roe in operation during 1985–86. The roe was stripped and sold, and the carcasses were included in the subsistence harvest. These fish were dried and then traded, bartered, or shared within Galena and with other communities for use as dog food. "Thus, much of the summer chum salmon used for subsistence purposes were actually a by-product of a commercial enterprise" (Marcotte 1988:69). The use of fish wheels made the harvest of large numbers of summer chum salmon possible. In 2010, fish wheels continued to be the main gear type used to harvest summer chum in Galena; however, the fish were not sold commercially. Summer chum salmon continued to be the preferred salmon used for dog food, the 2010 season notwithstanding (Table D6-1). Chinook salmon, summer chum salmon and sockeye salmon, fall chum salmon, and coho salmon (in that order) were the primary salmon types used for human consumption in 2010 (Table 6-2).

By comparison, Marcotte (1988) reportd that Chinook (king) salmon, fall chum salmon, and coho salmon (in that order) were the primary salmon used for human consumption in 1985–1986. As stated previously, summer chum salmon were used more for dog food during the time of the Marcotte study, whereas summer chum salmon were used for human consumption to a greater degree in 2010, due to a poor Chinook salmon run. The overall preferred salmon species for human consumption as reported for both the Marcotte (1988) baseline and this study was Chinook salmon.

Figure 6-22 depicts the harvest trends for salmon species for Galena from 1985 through 2010. According to ADF&G postseason salmon surveys, Chinook salmon harvests in Galena in the past 25 years have fluctuated through a series of peaks and valleys, from a high of 3,134 individual fish in 1990 to a low of

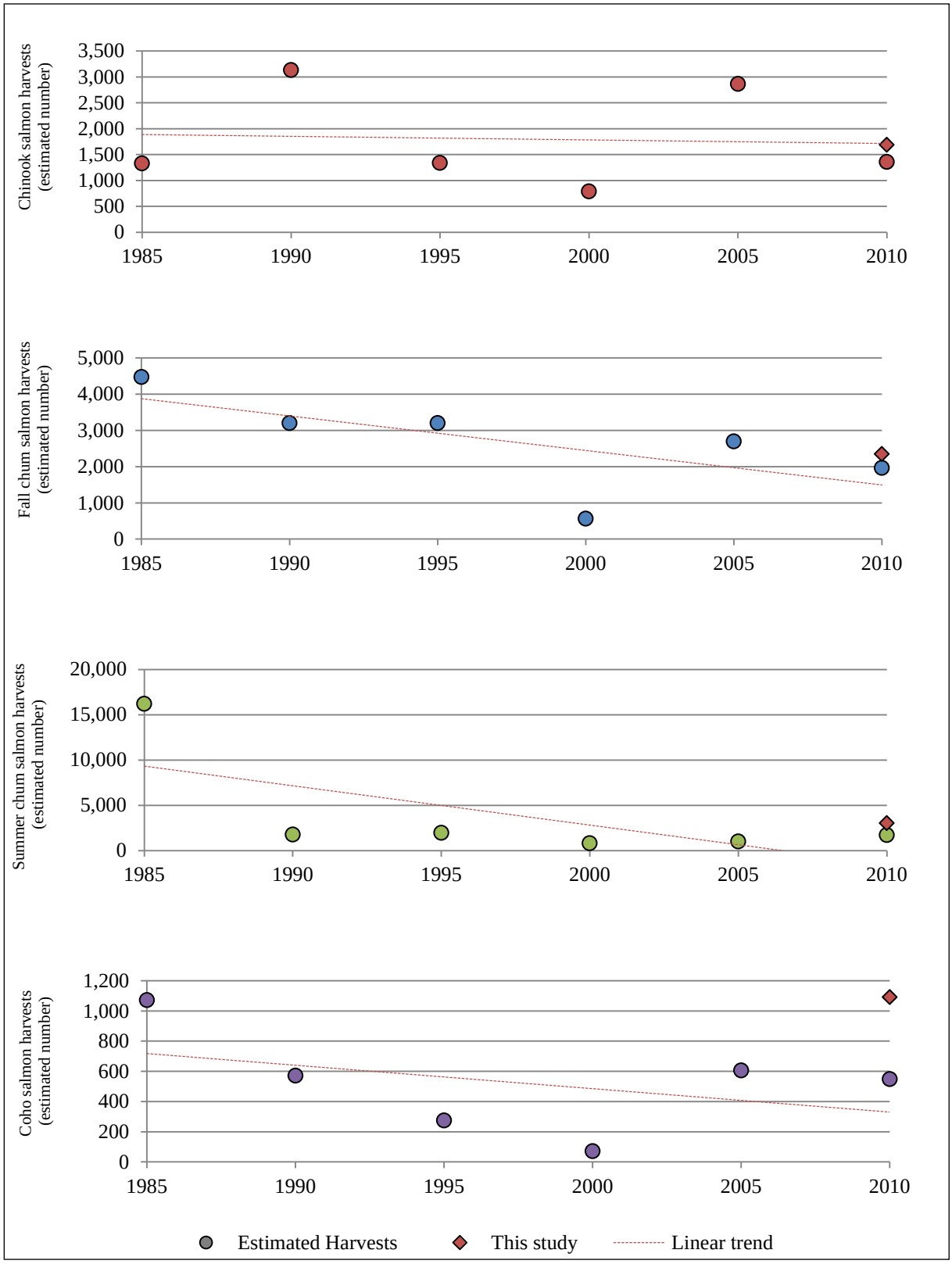


Figure 6-22.–Estimated salmon harvests in numbers of fish, Galena, 1985–2010.

788 in 2000. The Chinook salmon harvest for 2010 was just 360 individual fish more than the 1985 harvest of 1,329, as reported in Marcotte (1988). The overall trend line for Chinook salmon over the past 25 years has remained steady. There has been a downward trend in fall chum salmon harvests between 1985 and 2010, with a severe plunge in harvest numbers (564) in 2000. The highest harvest during those years came in 1987 with a harvest of 10,509 individual fall chum salmon. The 2010 harvest was slightly lower than in 2005. Summer chum salmon during this time period also showed a decline in harvest numbers from a high in the early 1980s of more than 20,000 individual summer chum salmon to a low of 53 in 2001. In more recent years however, the summer chum salmon harvest has begun to slightly increase once again. Galena's 2010 harvest shows this continuing upward trend. Coho salmon harvest numbers decreased from 1985 to 2000, culminating in a low of 171 individual fish in 2000. In the years since then, the harvests for coho salmon have been increasing. The 2010 harvest of 1,092 individual fish is the second-highest harvest of coho salmon in the past 25 years.

The 2000 subsistence fishing season in most areas of the Yukon River was an extremely bad year for returns of all salmon species. These low returns led to increased ADF&G management actions of restrictions and closures for the next several years (Fall et al. 2002). Most salmon species for Galena in 2010 had rebounded to various degrees from the crash of 2000, with Chinook salmon showing the most volatility.

Nonsalmon fish species continue to be an important subsistence resource for the residents of Galena. Northern pike harvest and use has fluctuated somewhat over the years, but they still remain one of the most harvested and used nonsalmon fish species (Marcotte 1988; Table 6-2). Marcotte (1988) reported that northern pike fishing was "One of the most common fishing activities in Galena and equal to the level of participation in salmon fishing." In 1985–1986, Galena residents harvested an average of 5 lb per capita of northern pike. In 2010, the harvest was 4 lb per capita (Table 6-2). Brown et al. (2010) reported a per capita harvest of 9 lb for 2006.

Although the harvest and use of northern pike for subsistence has remained relatively constant with just minor fluctuations through the years, some changes in the harvest and use of other nonsalmon fish species have occurred. One change between the 1985 and 2010 studies is in the use of burbot. Burbot is a favorite food for many residents: the large livers are considered a special delicacy, especially in the fall. In the past, burbot were used for human consumption only (Marcotte 1988:79). By contrast, Galena households in 2010 used 213 lb of a total 725 lb of burbot for dog food (29%) (Table D6-1). Another change is in the percentage of respondents who harvest burbot. Marcotte (1988) stated that 20% of Galena respondents reported harvesting burbot in 1985–1986. Both Brown et al. (2010) and this study found that 16% of Galena households harvested burbot. However, the percentage of those using burbot (whether for consumption by humans or by dogs) has remained much the same over the years. Both Brown et al. (2010) and this study show that burbot were used by the same percentage (20%) of Galena respondents. Even though the specific uses of burbot have changed somewhat over the years, they remain an important subsistence resource.

Sheefish and whitefish species, specifically broad whitefish and humpback whitefish, have also remained consistent and important resources for the community. Whitefishes, including sheefish, provided the largest volume of subsistence fish after salmon in both 1985–1986 and in 2010 (Marcotte 1988; Table C6-1). Humpback whitefish, sheefish, and broad whitefish were 3 of the top 10 subsistence resources harvested in 2010 (Figure 6-1). A comparison between the Marcotte (1988) study and the current study shows that the percentage of Galena households using whitefish species has changed very little in the past 25 years. Marcotte (1988) reported that 45% of households used whitefishes during the year of his study, and the current study shows that 44% of Galena households used whitefishes in 2010 (Table D6-1). Whitefish species were used both for human consumption and dog food at the time of the 1985–1986 baseline and at the time of this study.

Galena's harvest of most nonsalmon fish species has decreased in recent years. According to Brown et al. (2010:56), the overall subsistence harvest of nonsalmon fish in 2006 was an estimated 110,587 edible pounds; a much larger harvest when compared with Galena's estimated total 13,235 edible pounds for 2010. The larger harvest could be the result of some combination of the number of fish harvested and used as dog food, changes in sampling methods, differences in species harvested, or other reasons. The 2006 estimated

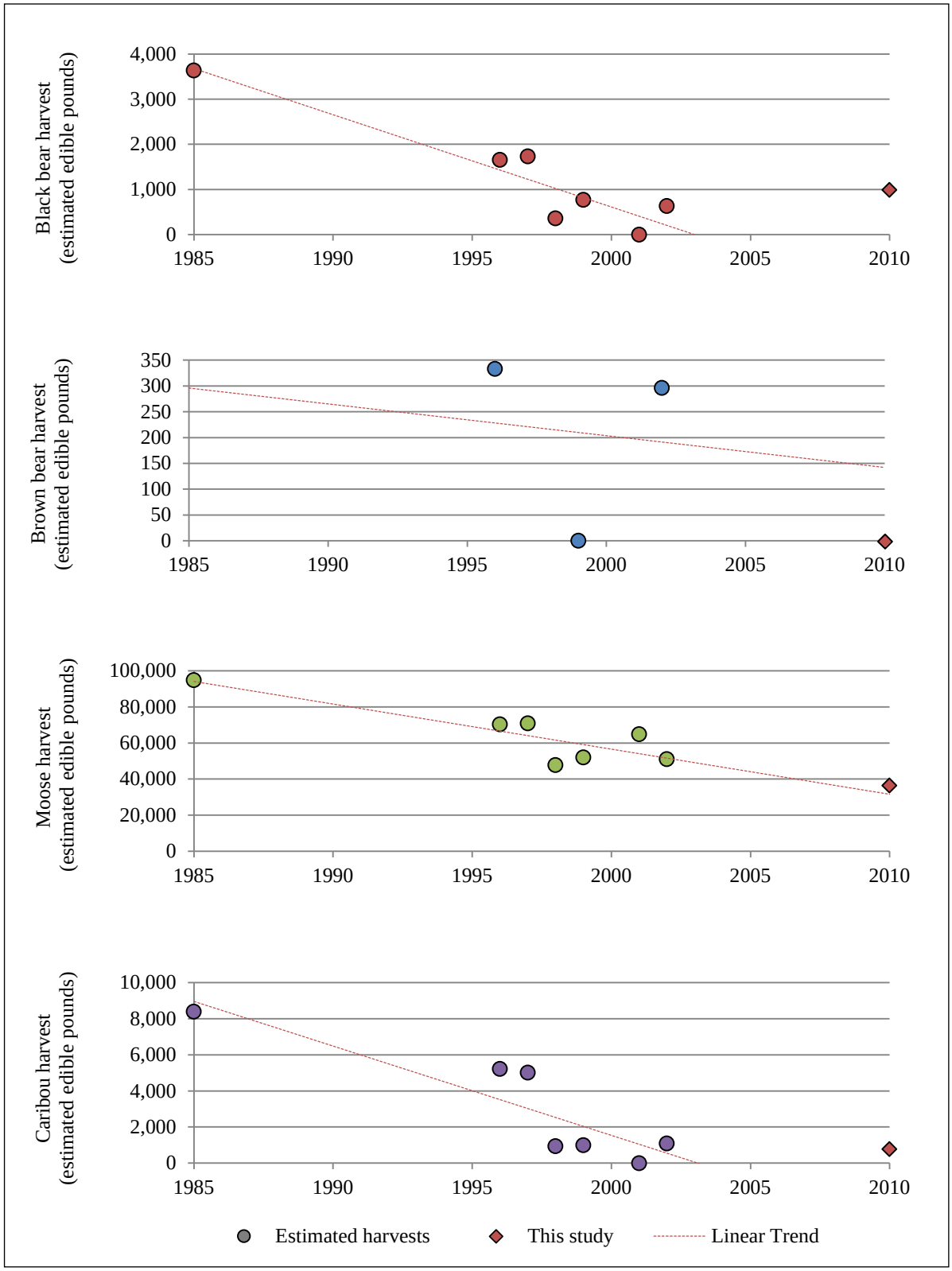


Figure 6-23.–Estimated large land mammal harvests in edible pounds, Galena, 1985–2010.

Table 6-9.–Moose hunter effort, Galena, 1985, 1996–2002, 2010.

	Year							
	1985	1996	1997	1998	1999	2001	2002	2010
Estimated harvest[a]	121	130	131	88	96	120	94	67
Harvest per household	0.57	0.71	0.72	0.51	0.49	0.55	0.44	0.42
Hunter effort[b]					9.8	7.4	9.8	9.8

a. Harvest in number of animals.
b. Hunting effort in days per moose harvested.
Source ADF&G Division of Subsistence, Community Subsistence Information System (CSIS) https://www.adfg.alaska.gov/sb/CSIS

harvest of whitefish species for Galena households (including sheefish) by edible weight was 101,621 lb. For Galena households in 2010, that number was only 9,123 lb. Galena's estimated total edible weight of northern pike in 2010 was 1,884 lb, but in 2006 it was 5,176 lb. Galena households also harvested 1,118 fewer pounds of burbot in 2010 than in 2006. The 1 important subsistence fish species that was harvested in greater abundance in 2010 than in 2006 was Alaska blackfish. Galena households harvested an estimated additional 750 lb of Alaska blackfish in 2010 than in 2006.

Although both salmon and nonsalmon fish species played a significant role in both the diet and culture of the community, moose was, and continued to be in 2010, the most important subsistence resource to Galena households. Marcotte (1988:88) reported that moose hunting was one of the most common subsistence activities in Galena. According to Marcotte (1988), 50% of the households that were surveyed reported harvesting moose between June 1985 and May 1986. During the 2010 study year, 41% of households reported harvesting moose, and 85% of households used it (Table 6-3). As stated earlier in the chapter, moose was the most harvested subsistence resource for Galena in 2010. Moose was also the most shared subsistence resource by percentage of households in both 2010 (59%) and during the year of Marcotte's study (66%).

Moose hunting in the Galena area has been subject to many regulatory changes through the years. For the most part, it has been managed by the State of Alaska primarily through restrictions on hunting times and harvest quotas (Marcotte 1988:91). For a more in-depth discussion of the regulatory history and a listing of regulations and designated GMUs from 1964 to 1990, see Marcotte (1988). In 2010, Alaska resident moose hunting opportunity was provided through state and federal general hunts and registration hunts in the area surrounding Galena (GMU 21B, 21C, and 21D). In 2010, some survey respondents cited regulations concerning hunting and guiding as a highly problematic situation. Nearly all survey respondents stated that finding large bull moose, "like in the past," was becoming nearly impossible due to moose hunting by nonlocal and nonresident hunters. As stated previously, all of the community's search and harvest areas for moose in 2010 were located within GMU 21D. Marcotte (1988:86) states that in addition to GMU 21D, Galena residents hunted moose in GMU 21B, 21C, and GMU 24 in 1985–1986.

ADF&G middle Yukon–Koyukuk big game studies documented the harvests of moose, caribou, black bears, and brown bears in Galena from 1996 through 1999, and 2001 through 2002 (Figure 6-23). For those years and the current survey year, the highest harvest of moose was in 1997 when Galena residents harvested 131 moose (Figure 6-23; Table 6-9). The lowest harvest of moose for these years was 67 in 2010. The lowest number of moose per household (0.42) also occurred in 2010. The ADF&G middle Yukon–Koyukuk big game harvest data for moose are presented in Table 6-9 which also includes the 2010 survey data. No data were collected for the year 2000. Hunter effort (hunter-days per moose harvested) was only recorded for 1999, 2001, 2002, and 2010. Galena hunters expended more effort for fewer moose in 2010 than in the other 2 years of recorded data. Moose was one of the most important subsistence resources used by most households in Galena in 2010, and it was commonly shared between households and other communities to a great extent.

In addition to moose, other large land mammals utilized by Galena households included caribou, black bears, and brown bears. Because of migratory patterns, caribou availability in the Galena area is unpredictable from year to year (Marcotte 1988:95). Although this resource adds variety to the diet, it has not been a large contributor to the overall subsistence picture for Galena households due in part to the unpredictable availability. A few Galena households harvested only 6 (770 lb) caribou in 2010 compared with a total estimated harvest of 40 (5,224 lb) caribou in 1996, the first year of the large land mammals survey (Table 6-3; Figure 6-23).

Galena households harvest and use black bears to a greater extent than brown bears. Marcotte (1988) states that black bear meat was a common item served at potlatches and was used for human consumption at home as well. Black bear harvest and use has declined somewhat since Marcotte's study. Thirteen black bears were harvested by Galena households in 1996 compared with a harvest of 10 black bears by Galena households in 2010 (Table 6-3). Reported brown bear harvests in Galena have remained negligible. There were no reported harvests of brown bears in 1985–1986 (Marcotte 1988) or in 2010.

Small land mammals, particularly furbearers, continued to play an important role in the annual harvest cycle for most Galena households, although there has been a decline in harvesting of furbearers through the years due to a decrease in the price and demand for furs. The small land mammals that were used for both food and fur, such as snowshoe hares and beavers, continued to be harvested and used by a good portion of households in 2010. According to Marcotte (1988:111), beavers composed 9% of all subsistence meat consumed by Galena residents, surpassing that of black bears and caribou. In 2010 beaver was one of the top 10 resources harvested by Galena households (Figure 6-1). Martens was one of the most harvested small mammals used solely for their fur by Galena households (Table 6-3), although as stated above, the percentages of harvest and use of both martens and lynx has declined with the overall decline in trapping for marketable fur.

Waterfowl, grouse, and ptarmigans were a source of fresh meat when other sources of meat were unavailable or scarce. Spring and fall remained the main harvesting seasons for various waterfowl (e.g., ducks and geese) that passed through the Galena area during their annual migrations. According to Marcotte (1988), the majority of harvests took place in the spring. This proved true in 2010 as well (Table 6-5). Marcotte (1988:99–100) reported that spring hunting for waterfowl was part of Alaska Native traditional practice, while fall harvesting was more often a non-Native practice. In 2010, Galena averaged 3 lb of waterfowl per household, with a per capita consumption of 1 lb of waterfowl. Marcotte (1990:100) reported an average household consumption of 19 lb and a per capita rate of 6 lb of waterfowl in 1985–1986. In 2010, spruce grouse and ruffed grouse were harvested and used in equal amounts. Marcotte (1990:98) reports that spruce grouse was the primary species of grouse harvested in 1985–1986. Both Marcotte (1988) and this study show that grouse harvesting occurred mostly in the spring. Willow ptarmigan by contrast were harvested primarily in the winter both in 1985–1986 and in 2010. Galena residents harvested and used fewer ptarmigans per household in 2010 than reported by Marcotte (1988) for the year 1985–1986. Traditionally ptarmigans, along with porcupines, were known as "survival food" (Marcotte 1988) and were harvested in the winter and early spring when other types of food were not available. The increased availability of other types of food, such as store-bought foods, may be one reason for the decreased harvest and use of ptarmigans in 2010.

The harvesting of vegetation (e.g., berries, plants, and wood) continued to be an important subsistence activity for Galena households; berry picking and wood harvesting held particular significance. Berry picking can include everyone from young children to the elderly, making it a family or group activity that functions not only as a subsistence activity but also as an important social interaction. Marcotte (1988:117) spoke of whole families or groups of women with their children harvesting berries together with friends and families. In 2010, berry harvesting continued to be an important subsistence activity and a means for passing on traditional knowledge. For both Marcotte's (1988) baseline and this study (2010), well over one-half of households surveyed reported harvesting and using berries (Table 6-7).

Except for berries, the only harvested plants mentioned by Marcotte (1988) were wild rose hips and Hudson's Bay (Labrador) tea. In 2010, wild rose hips were the most harvested of all the plants, suggesting that their importance did not wane through the years. Hudson's Bay (Labrador) tea was also harvested and used in 2010. The harvesting of wood for fuel remained an important subsistence activity in Galena, although other fuel types are now used in greater amounts than in the past. Spruce and birch continued to be the tree types of choice for firewood along with various types of driftwood. Spruce logs also continued to be harvested for construction of log buildings. Cottonwood continued to be the most preferred wood used for smoking and drying fish.

In light of the growing crisis over fuel costs, dwindling salmon returns, and the conflicts between user groups in the region, Galena residents feel that there are many obstacles yet to overcome. The community has already undergone many changes through the years and faced many challenges. However, the residents of Galena continue to respect and hold fast to the enduring legacy of their ancestors—subsistence from the land and waters.

7. COMPREHENSIVE SURVEY RESULTS RUBY, 2010

Prepared by Alida Trainor

In April 2011, researchers surveyed 47 of 66 households (71%) in Ruby (Table 2-3). Households in Ruby harvested 54,107 edible pounds of wild foods between January 1 and December 31 of 2010 (Table 7-1). The average harvest per household was 820 lb; the average harvest per person was 301 lb.

This chapter summarizes findings from the 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).

This chapter also presents results from the community mapping component of this study. Researchers collected mapped data from respondents to represent harvest areas for the harvests of 6 resource categories (salmon, nonsalmon species, large land mammals, small land mammals, birds and berries and greens). Additionally a comprehensive map was produced depicting harvest and search areas for all resource categories. Note that not every surveyed household completed a harvest area map because not every household harvested wild resources. No ethnographic interviews were conducted for this study.

Community Background

Surrounded by rolling blue hills, dense spruce forests, and clear running creeks, Ruby is a community known to many as "the gem of the Yukon." Along with the discovery of gold in the area, early miners mistakenly took the red stones and sands of local creeks for rubies, leading to the community's name. Ruby is located on the south bank of the Yukon River about 50 air miles east of Galena and about 230 air miles west of Fairbanks.[1] The community lies at 64° N latitude, along the northwestern edge of the Nowitna National Wildlife Refuge. Temperatures in Ruby vary greatly: they average in the mid-70s during July and below 0° F in January, often plunging to -40° F for sustained periods of time. The Yukon River, a main route of transportation during both winter and summer months, is ice-free from mid-May to mid-October. Athabascans have inhabited the middle Yukon area for millennia and witnessed the establishment of Ruby, the fur trade, a frenzied gold rush, and a rapid population decline following the beginning of World War II.

Prior to contact with European traders and explorers, most Natives moved seasonally between camps close to productive hunting and fishing areas. In 1843, Lieutenant Lavrentiy Zagoskin, a Russian naval officer sent to assess the fur trading post in Nulato (roughly 100 miles downstream from present-day Ruby), became the first Caucasian to reach the Nowitna River, locally referred to as the Novi (Hart 1981). Taking detailed notes, Zagoskin recorded 5 semi-permanent settlements ranging from the Koyukuk River roughly 50 miles downstream of Ruby to the Nowitna River about 45 miles upstream. Some of these settlements served as central fish camps for multiple families. At the commencement of the Russian explorer's journey up the Yukon, he estimated about 300 Koyukon Athabascans lived in the area from Nulato to the mouth of the Nowitna River. Thirty-seven years later, in 1880, Ivan Petroff, a U.S. census worker of Russian decent, followed a similar route as Zagoskin and counted 12 Natives living in a year-round settlement at Junekaket Creek, about 30 miles upriver from present-day Ruby. Hart (1981) reports that by the turn of the 20th century, "most of the native people who spent most of their year hunting and trapping back in the tributaries of the Yukon, such as up the Novi River, the Yuki, the Melozitna or Big Creek, chose to move into more permanent villages near a trading post."

1. 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 4, 2014. http://commerce.alaska.gov/cra/DCRAExternal/community

Table 7-1.–Resource harvest and use characteristics, Ruby, 2010.

Characteristic	
Mean number of resources used per household	
Minimum	0
Maximum	44
95% confidence limit (±)	10.4%
Mean	11
Median	11
Mean number of resources attempted to harvest per household	
Minimum	0
Maximum	45
95% confidence limit (±)	14.0%
Mean	9
Median	7
Mean number of resources harvested per household	
Minimum	0
Maximum	43
95% confidence limit (±)	15.6%
Mean	8
Median	6
Mean number of resources received per household	
Minimum	0
Maximum	12
95% confidence limit (±)	12.3%
Mean	4
Median	4
Mean number of resources given away per household	
Minimum	0
Maximum	10
95% confidence limit (±)	14.1%
Mean	3
Median	2
Household harvest (lb)	
Minimum	0.0
Maximum	8,309.6
Mean	819.8
Median	452.5
Total harvest weight (lb)	54,107.1
Community per capita harvest (lb)	301.0
Percentage using any resource	96%
Percentage attempting to harvest any resource	94%
Percentage harvesting any resource	91%
Percentage receiving any resource	85%
Percentage giving away any resource	83%
Number of households in sample	47
Number of resources available	132

Source ADF&G Division of Subsistence household surveys, 2011.

UAF-1986-109-8 University of Alaska Fairbanks Alaska and Polar Regions Collections

Plate 7-1.–An historic photo taken in the summer of 1911, the year gold was discovered and the city of Ruby was officially established. Although not a mining town, Ruby became a port city for miners and traders in the area.

Even before Zagoskin and other white men came to the area, trade for European goods was common (Albert 1995:20). Prior to Yukon exploration, Athabascans in the Interior used goods that originated from a Russian trading post near present-day Aniak on the Kuskokwim River (Hart 1981:3). A handful of Native fur buyers who traveled by boat up and down the Yukon and Kuskokwim rivers acted as middlemen. Trade increased in 1838 when a Russian trading post in Nulato opened. It became the primary trading establishment in the area, and exchanged commodities such as flour, sugar, beads, tobacco, and tools for local furs (Loyens 1966:100). Athabascans in the Ruby area had additional trade opportunities with other companies. British fur traders stationed in Fort Yukon by the Hudson Bay Company traveled as far downriver as Tanana, roughly 100 miles from Ruby (Albert 1995:21). In 1869, Hakorcins, a Native man, opened a trading post 14 miles upriver from Kokrines, a semi-permanent Native settlement that likely drew more residents with the arrival of more convenient trading posts. Some of the elders surveyed at Ruby were born at Kokrines, which is now uninhabited.

The actual settlement of Ruby was not established until the discovery of gold in 1907. The establishment of Ruby offered employment opportunities on steam boats, in mining camps, and in the reindeer herding business (Hart 1981:19).

The first discovery of gold in the Ruby area occurred in 1907 on Ruby Creek adjacent to the town's present-day location. Although hundreds of miners rushed to the area in the summer of 1907, additional claims were unproductive, and only 30 stayed through the winter (Hart 1981:18). By the summer of 1908, only one claim remained. Two years later, in the summer of 1910, 2 prospectors, Fernando and Johnson, officially discovered gold on Long Creek, located roughly 20 miles south of the Yukon River (Albert 1995:60). Unlike the discovery on Ruby Creek, Long Creek proved to be a fruitful location. News of the discovery at Long Creek spread quickly throughout Alaska and elsewhere. Before long, a full-blown gold rush moved into the area.

Hudson Stuck, an Episcopalian archdeacon traveler, recorded that, "Ruby sprang up in the early summer of 1911, as a mushroom springs up in a night … I passed by on the winter trail in March of that year and camped on the bank opposite the place and the hillside was void of any human existence" (Albert 1995:61). However, by the time Stuck passed by 4 months later, the riverfront was "swarming" with men, the beach was lined with boats, and white tents covered the hillside. Indigenous people in the region began settling in Ruby to pursue employment and join the growing city (Plate 7-1).

Although Ruby was not a mining town, it became a convenient port city where miners from surrounding camps came to receive mail, buy food and supplies, and, after a saw mill was built in 1912, acquire valuable lumber. At its peak, approximately 5,000 people lived in Ruby or at mining camps in the area (Honea 1981:21). In essence, Ruby became a support hub for the economic activity in the area (Plate 7-1). By 1913, 41 mines spread over 14 different creeks in the Ruby area employed 230 men (Mobley 2005:5). The peak of the Ruby gold rush lasted 6 years (1911–1917). Many miners left their camps when World War I

Alida Trainor, ADF&G

Plate 7-2.–Photo of Ruby taken 100 years later, during data collection in 2011.

began; so many, in fact, that in 1918 the Bank of Ruby was forced to shut its doors, thus greatly changing the economic viability of gold mining in the area (Hart 1981:43).

By 1940, mining in the area was still active, but the population had declined to roughly 135 people. Less than one-third of the population was Native (Hart 1981:55). In 1941, however, the demographics and defining economic activities in Ruby changed forever. After the attacks on Pearl Harbor, the War Production Board confiscated all mining equipment in order to build and maintain new U.S. Army bases (Hart 1981:55). Workers were also leaving to join the war effort and the mining activity that remained from Ruby's heyday nearly ceased completely, thus creating a lasting demographic shift, especially in ethnicity. Originally established as one of the first Euro-American towns in Alaska, in 2010 it was primarily a Native community (Plate 7-2).

Seasonal Round

The harvest patterns of wild foods can vary with fluctuations in animal populations, increased employment opportunities, changes in local climate, and an array of other factors. Prior to the mining boom in the early 1900s, families in the Ruby area traveled to seasonal camps throughout the year. In 2010, with the exception of summer fish camps, all but a few families lived in Ruby year-round. Despite the shift to permanent and stationary residency, fishing, hunting, trapping, and other subsistence activities in Ruby continued to occur according to a seasonal round. Between 2005 and 2008, Ruby residents participated in a study to document their traditional knowledge of nonsalmon fishing (Brown et al. 2010). Seasonal round information was collected at this time. Ruby residents discussed their spring fishing for nonsalmon species. Some elders remembered that after a long winter of trapping, families traveled down the Novi River in the spring and met at its mouth. They would gather there and wait for the icy Yukon River to break up. In the meantime, they would fish with nets or hooks for sheefish, northern pike, and whitefishes, drying and storing some for later. This was also a time to cook some of the foods they gathered over the course of the winter. Moose, muskrats, and beavers were smoked in the spring.

Similar to the past, the coming of spring signaled the arrival of migratory bird species, including various ducks and geese. Open river water and rising temperatures put salmon fishing, a principal subsistence activity, back on the minds of locals.

Just as in the past when families gathered in larger settlements along the Yukon River, fishing continued to be a family affair and a time for visiting. Relatives who had moved away often returned to Ruby during the summer to help their families put away fish for the winter and to enjoy the company of friends and family. The summer months of June through September brought a variety of salmon including summer chum salmon, Chinook salmon, coho salmon, and fall chum salmon. Setnets and fish wheels were the primary gear types used to catch salmon in the Ruby area. Families worked together to process the fish, putting considerable effort into cutting, stripping, smoking, canning, and drying the salmon for later consumption.

Fall is a short season, strongly associated with moose hunting. It was only a matter of weeks between the conclusion of salmon fishing and the open moose-hunting season in September. Ruby falls in Game Management Unit 21B, and hunting is usually open the last week in August to the last week in September. The 2010 hunting season followed this schedule. In the winter, Ruby residents relied on their summer salmon harvests and their fall moose harvests. Food stores usually begin running thin in the spring, and families sought out other wild foods, including nonsalmon fish species, to compensate for any shortages before salmon and moose hunting seasons begin again.

During the fur trade of the late 1800s and early 1900s, winter nonsalmon fishing occurred simultaneously with trapping season. Muskrat trapping in Ruby dominated winter subsistence activities (Brown et al. 2010:36). With the decline in demand for muskrat, trapping effort decreased. During the 1950s when the remaining Kokrines residents moved to Ruby, the relationship between trapping and other winter activities began to change. During interviews for a nonsalmon ethnography project, Ruby residents reported that without seasonal residence at winter camps or in settlements like Kokrines, they stayed closer to town and harvested fewer fish in the winter (Brown et al. 2010). However, sheefish, burbot, whitefishes, and northern pike continued to be targeted with under-the-ice setnets or by jigging in locations close to town.

Demographics

Subsistence staff surveyed 47 households with 128 occupants (Table C1). Household sizes ranged from 1 to 7 people, with an average of 3 people per household. The average age was 36 years; the oldest person was 91. On average, residents had spent 19 years in Ruby. One respondent had lived in Ruby for 70 years, the longest occupancy documented in this study. The survey asked respondents to identify their birth communities: fewer than one-half (47%) of the respondents were born in Ruby (Table C2). The second-largest group of residents (21%) was born in states outside Alaska. With the exception of one foreign-born individual, the remaining 27% of surveyed residents were born in other Alaska cities. In particular, Ruby residents frequently identified their birth home locations in the other Yukon River communities of Galena (3%), Kokrines (4%), Nulato (5%), and Tanana (1%). Regionally, 25% of Ruby residents were born in other Interior Alaska communities.

As depicted in Figure 7-1, 80 individuals (44% of the population) were under the age of 30, and 43 people were aged 55 or older (24%). The hourglass shape of Ruby's population profile illustrates a population with little growth. Other study communities had larger youth populations with fewer adults over the age of 30, creating a profile which resembles a pyramid. In comparison to Ruby, the lower Yukon River community of Mountain Village has a population with a higher concentration of young people (72% under the age of 30) and a much smaller concentration of adults over the age of 55 (16%) demonstrating rapid population growth (Figure 3-3). In Ruby a high proportion of men (58%) in comparison to women (42%) make up the majority of people between the ages of 45 and 65 (Figure 7-1). The highest cohort of women (10 individuals) falls in a much younger bracket between the ages of 10 and 14. Ruby's population profile is unique among other study communities because it is noticeably missing a male cohort between the ages of 30 and 45. In rural Alaska communities, the male population between these years is generally responsible for the bulk of harvest. Wolfe et al. (2010:15) found that households with at least one working-age man above the age of 15 had higher subsistence harvests than households without; these males represented a "potent pool of labor

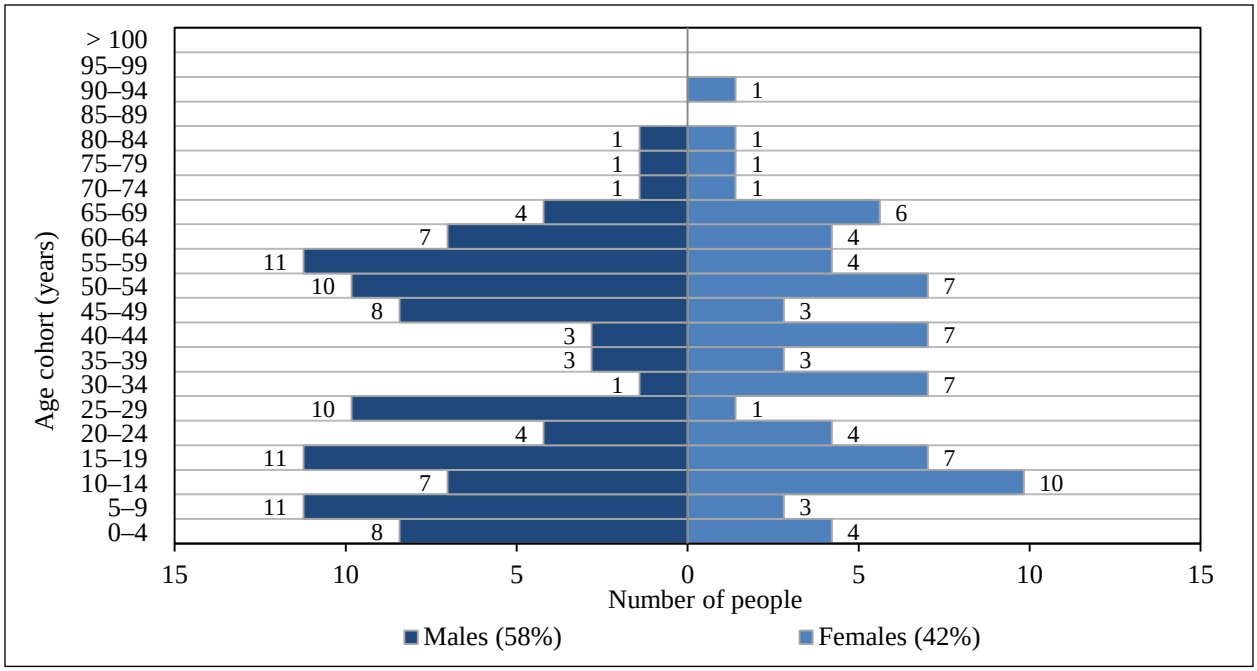


Figure 7-1.–Population profile, Ruby, 2010.

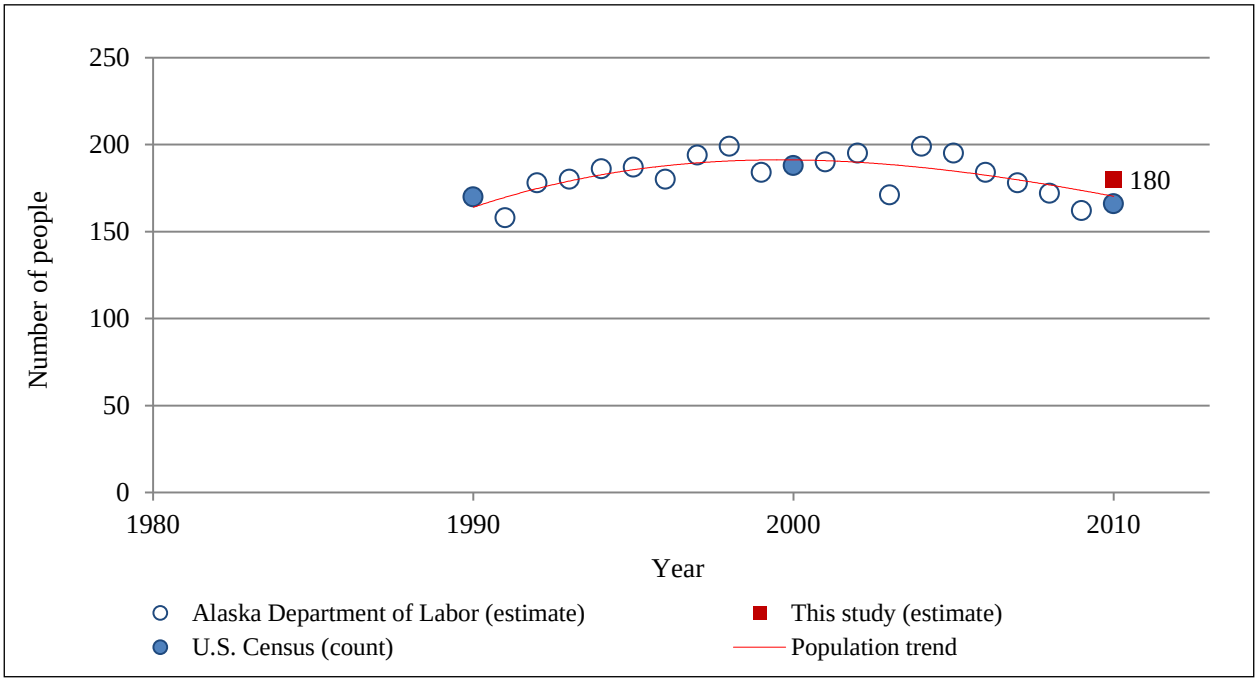


Figure 7-2.–Population history, Ruby, 1980–2010.

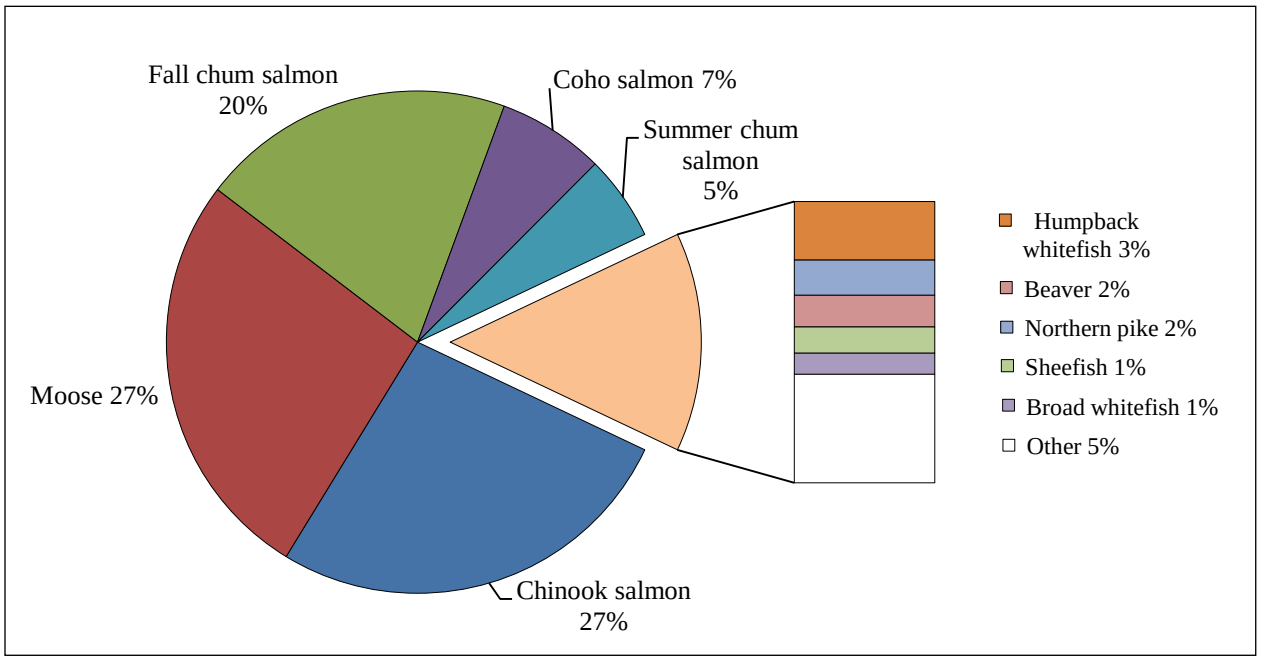


Figure 7-3.–Top 10 species harvested, ranked by estimated edible weight, Ruby, 2010.

for hunting and fishing, working singly or in partnerships." The study found that the harvests of working-age men increased as they grew older, suggesting that the low numbers of Ruby men in the 30- to 45-year-old cohort could lower the community's overall harvest.

The 2010 U.S. Census estimated that 166 people were living in Ruby.[2] Figure 7-2 shows the historical population estimates from the Alaska Department of Labor, the U.S. Census, and this study. Expanding for the 19 unsurveyed households, the estimated 2010 population in Ruby was 180 people, including 104 men (58%) and 76 women (42%); 79% of the estimated population identified themselves as Alaska Native. In comparison, the 2010 U.S. Census reported an Alaska Native population of 83%. The population ethnicity breakdowns estimated in this study and in the 2010 U.S. Census illustrate the reversal that has taken place since the end of the heavy mining era.

Wild Food Harvests and Uses

The primary purpose of the household survey was to collect information about the harvests and uses of wild resources. Respondents were asked whether their household used, harvested, or tried to harvest each resource during the study year. If a household did try to harvest a resource, then the respondent was asked for other details including whether they were successful, the quantity of harvest, the type of gear used, the sex of the animal, and the month of harvest. Table D7-1 reports the number of people and the percentage of the population who participated in the harvesting and processing of wild foods.

Tables and figures in this section summarize responses to the harvest questions and are expanded for unsurveyed households. Figure 7-3 shows the 10 most harvested resources by Ruby households in 2011 in terms of edible pounds. Figure 7-4 presents the total estimated edible pounds harvested for each resource category. Together, these 2 figures illustrate the harvest patterns of Ruby households. The most widely harvested resource category by Ruby households was fish (reported by 66% of households). Specifically, Chinook salmon added 14,448 edible pounds to Ruby's total harvest (27%), the highest of any fish harvest (Table 7-2; Figure 7-3). Fall chum salmon followed Chinook salmon by contributing 10,944 lb to the total

2. U.S. Census Bureau, Washington, D.C., n.d. "American FactFinder: Ruby city, Alaska." Accessed November 5, 2014. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

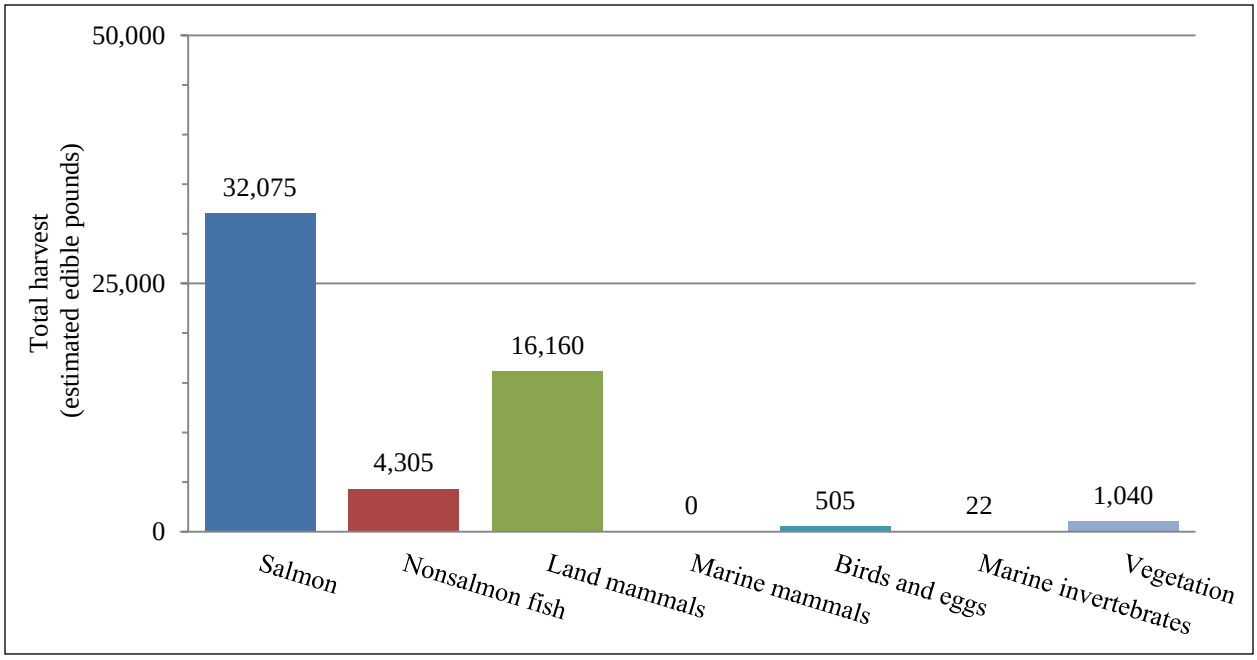


Figure 7-4.–Total estimated edible pounds harvested, by resource category, Ruby, 2010.

harvest. Moose (27%) was the second-most harvested resource and the only large land mammal in the top 10, contributing 14,408 edible pounds to Ruby residents.

Although 92% of households reported the harvest of at least 1 wild food, 96% reported actual use of at least 1 wild food resource (Table 7-2). The difference between the percentage of households harvesting and the percentage using wild resources is attributed to the common practice of sharing. Eighty-five percent of households reported receiving at least one wild food from another household, while 83% gave portions of their harvests to others. Moose, noted above as the second-most commonly harvested resource, illustrates a potential relationship between low rates of harvest and high rates of sharing. Figure 7-5 shows the percentage of surveyed households that use, attempt to harvest and harvest each resource category. Although 85% of Ruby households hunted moose, only 36% were able to harvest them (Table 7-3). Large land mammal harvests, dominated by moose, led to higher attempt, harvest, and use rates than found with salmon species, Ruby residents' most heavily harvested resource category (Figure 7-5). More than half of all Ruby households surveyed (54%) gave moose away, such that 89% of households reported using moose (Table 7-3). In other words, 66% of Ruby households received moose from other households either through sharing or other exchange methods: the highest receiving rate in all resource categories. These numbers demonstrate the importance of and reliance on moose as a resource in Ruby. Despite shortages, moose meat or other moose parts still make their way to the majority of Ruby households.

Harvest and use of other resource categories varied. Similar to land mammals, vegetation (berries and plants, greens, mushrooms, and wood) showed a high percentage of use (91%), as depicted in Figure 7-5. Although nearly the same percentage of households that attempted to harvest land animals attempted to harvest vegetation of some kind (85% and 87% respectively), the success rate was much higher for vegetation. One hundred percent of households reporting an attempt to harvest did actually harvest some vegetation. For the birds and eggs resource category, 505 lb were harvested by 43% of households in Ruby during the 2010 study year (Table 7-4; Table 7-5; Figure 7-5). Sixty percent of households reported use of birds or eggs. Roughly one-quarter (26%) of households gave some away to others (Table 7-4). Marine mammals represented the lowest level of resource category use (Figure 7-5). No surveyed households reported attempting to harvest marine mammals, due to the community's inland location. The small percentage of households (2%) that reported using marine mammals or other related products like seal oil received them from other

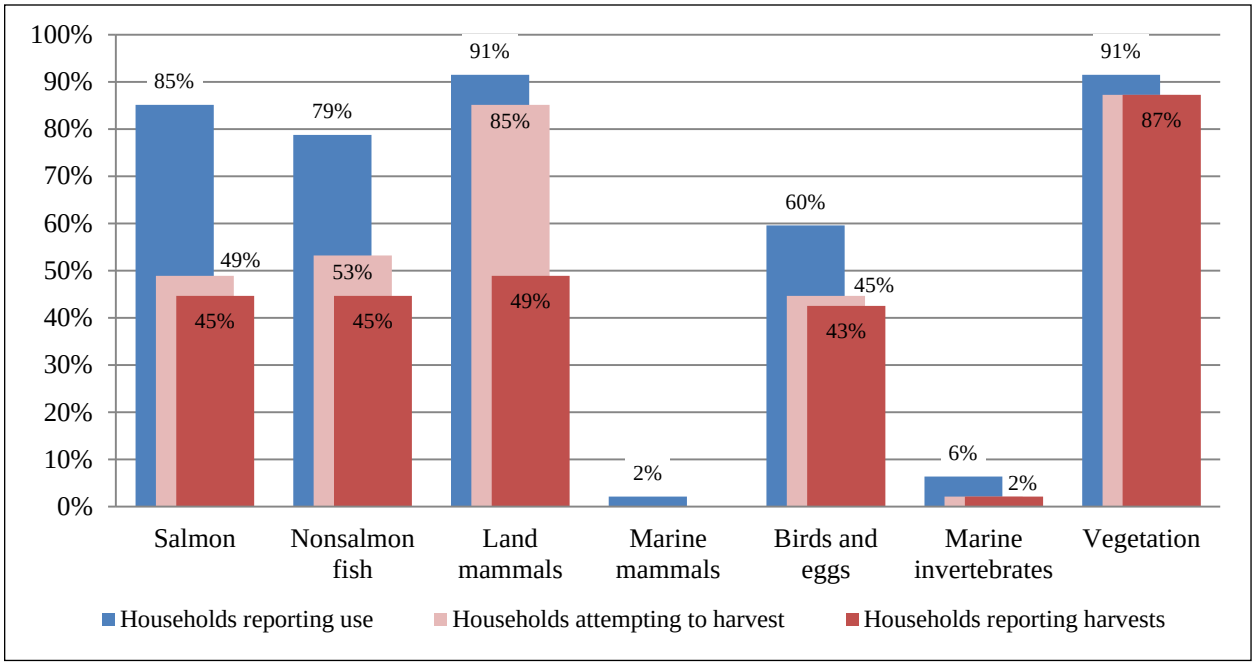


Figure 7-5.–Percentages of households using, attempting to harvest, or harvesting subsistence resources, by category, Ruby, 2010.

households or communities (Table 7-3). Only 2 percent of Ruby residents harvested marine invertebrates, again reflecting the long distance to the coast (Table 7-6). Six percent of residents used marine invertebrates including king crab and tanner crab. These resources were likely shared between households.

Although attempt and harvest rates can indicate overall community effort and identify species of significance, observing the contributions of each resource category to the entire community's subsistence harvest can illustrate the comparative volumes of food provided to the community. Salmon species provided nearly twice as much edible weight as land mammals did (32,075 lb versus 16,160 lb from land mammals) (Figure 7-4). These numbers suggest that access to salmon is greater than access to land mammals.

Table 7-2 outlines the harvest of fish in terms of edible pounds harvested. Fish composed the largest portion of Ruby's subsistence harvest: 36,380 lb (67%) of the community's total harvest. On average, each household in Ruby harvested 551 lb of fish, or 202 lb per person. Primarily harvested in the summer months, salmon species composed the bulk of Ruby's fish harvest. In particular, Ruby's Chinook salmon harvest had the highest harvest rates in the salmon category. Seventy-seven percent of households in Ruby used Chinook salmon; 40% of Ruby households reported harvest; and Ruby households collected approximately 1,531 individual fish (14,448 lb). Ruby residents only used a few different gear types to harvest fish (Figure 7-6). Subsistence setnets and fish wheels were the most common gear types; rod and reel were used to a much lesser extent. Subsistence setnet and fish wheel efforts caught the most Chinook salmon, 7,476 lb and 6,230 lb respectively. During the summer chum salmon commercial fishery, Ruby households harvested 663 incidentally-caught Chinook salmon; these Chinook salmon were used for subsistence. Households harvested an average of 166 lb of fall chum salmon from both subsistence setnets and fish wheels, resulting in a total community harvest of 10,944 lb (Table 7-2; Figure 7-6). Table D7-2 documents the amount of fish harvested to feed dogs. Of the 2,642 fish caught for dogs, 1,904 were fall chum salmon (72%). In comparison to the percentage of households using salmon (85%), 64% of households used whitefishes, the most commonly used nonsalmon fish species (Table 7-2). Less than one-half (43%) of all Ruby households attempted to harvest whitefishes, and only 36% were successful. Twenty-six percent of households caught humpback whitefish, the most harvested whitefish species, and 17% of all households gave some away to others. Approximately one-quarter of households harvested sheefish (23%) and broad whitefish (26%), and their use levels were also comparable (43% and 45%, respectively). However, sheefish contributed

Table 7-2.–Estimated harvest and use of fish, Ruby, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Fish										
Salmon										
Summer chum salmon	27.7%	19.1%	19.1%	14.9%	12.8%	2,962.7 lb	44.9 lb	16.5 lb	582.8 ind	± 70.2%
Fall chum salmon	34.0%	27.7%	25.5%	10.6%	6.4%	10,944.0 lb	165.8 lb	60.9 lb	2,152.7 ind	± 71.5%
Unknown chum salmon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Coho salmon	36.2%	21.3%	21.3%	14.9%	12.8%	3,719.9 lb	56.4 lb	20.7 lb	703.5 ind	± 44.0%
Chinook salmon	76.6%	44.7%	40.4%	46.8%	31.9%	14,448.0 lb	218.9 lb	80.4 lb	1,530.6 ind	± 36.0%
Pink salmon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Sockeye salmon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown salmon	0.0%	2.1%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**85.1%**	**48.9%**	**44.7%**	**55.3%**	**40.4%**	**32,074.6 lb**	**486.0 lb**	**178.4 lb**	**4,969.7 ind**	**± 41.0%**
Char										
Dolly Varden	6.4%	4.3%	4.3%	2.1%	2.1%	11.4 lb	0.2 lb	0.1 lb	12.6 ind	± 79.8%
Lake trout	2.1%	2.1%	2.1%	0.0%	2.1%	11.8 lb	0.2 lb	0.1 lb	8.4 ind	± 108.0%
Unknown char	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**8.5%**	**6.4%**	**6.4%**	**2.1%**	**4.3%**	**23.2 lb**	**0.4 lb**	**0.1 lb**	**21.1 ind**	**± 66.6%**
Whitefishes										
Sheefish	42.6%	27.7%	23.4%	23.4%	17.0%	707.7 lb	10.7 lb	3.9 lb	118.0 ind	± 37.1%
Broad whitefish	44.7%	27.7%	25.5%	23.4%	17.0%	576.6 lb	8.7 lb	3.2 lb	411.9 ind	± 40.4%
Bering cisco	8.5%	6.4%	6.4%	2.1%	2.1%	159.8 lb	2.4 lb	0.9 lb	114.2 ind	± 83.5%
Least cisco	6.4%	4.3%	2.1%	2.1%	2.1%	2.8 lb	0.0 lb	0.0 lb	2.8 ind	± 108.0%
Humpback whitefish	34.0%	27.7%	25.5%	10.6%	19.1%	1,585.3 lb	24.0 lb	8.8 lb	528.4 ind	± 49.1%
Round whitefish	4.3%	2.1%	0.0%	2.1%	2.1%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown whitefish	2.1%	2.1%	2.1%	0.0%	2.1%	39.3 lb	0.6 lb	0.2 lb	28.1 ind	± 108.0%
Subtotal	**63.8%**	**42.6%**	**36.2%**	**36.2%**	**23.4%**	**3,071.6 lb**	**46.5 lb**	**17.1 lb**	**1,203.3 ind**	**± 35.4%**
Anadromous/marine fishes										
Pacific herring	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Rainbow smelt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Pacific tomcod	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Saffron cod	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Pacific halibut	23.4%	2.1%	2.1%	21.3%	6.4%	159.2 lb	2.4 lb	0.9 lb	159.2 lb	± 108.0%
Arctic lamprey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Stickleback (needlefish)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Subtotal	**23.4%**	**2.1%**	**2.1%**	**21.3%**	**6.4%**	**159.2 lb**	**2.4 lb**	**0.9 lb**		**± 108.0%**
Other freshwater fishes										
Alaska blackfish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 lb	± 0.0%
Burbot	8.5%	6.4%	6.4%	2.1%	2.1%	27.0 lb	0.4 lb	0.2 lb	11.2 ind	± 73.0%
Arctic grayling	14.9%	10.6%	6.4%	8.5%	2.1%	69.8 lb	1.1 lb	0.4 lb	99.7 ind	± 81.3%
Northern pike	25.5%	19.1%	19.1%	8.5%	6.4%	954.2 lb	14.5 lb	5.3 lb	212.0 ind	± 47.2%
Longnose sucker	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**38.3%**	**29.8%**	**25.5%**	**14.9%**	**10.6%**	**1,050.9 lb**	**15.9 lb**	**5.8 lb**		**± 43.3%**
All fish	**89.4%**	**59.6%**	**53.2%**	**70.2%**	**55.3%**	**36,379.6 lb**	**551.2 lb**	**202.4 lb**		**± 38.4%**
All resources[b]	**95.7%**	**93.6%**	**91.5%**	**85.1%**	**83.0%**	**54,107.1 lb**	**819.8 lb**	**301.0 lb**		**± 27.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

an estimated 708 lb to the total community harvest, 131 lb more than broad whitefish. Subsistence setnets caught most whitefishes (77% of the harvest); the remaining harvest came from fish wheels (20%) or by rod and reel (3%) (Figure 7-6). Some households reported using, attempting, harvesting, and giving away unknown whitefish species (all 2%).

The harvest of other freshwater fish—including burbot, Arctic grayling, and northern pike—contributed 1,051 lb to the community harvest (Table 7-2). Northern pike made up the bulk (91%) of this category, and 19% of Ruby households harvested northern pike in 2010. Subsistence setnets accounted for the majority of

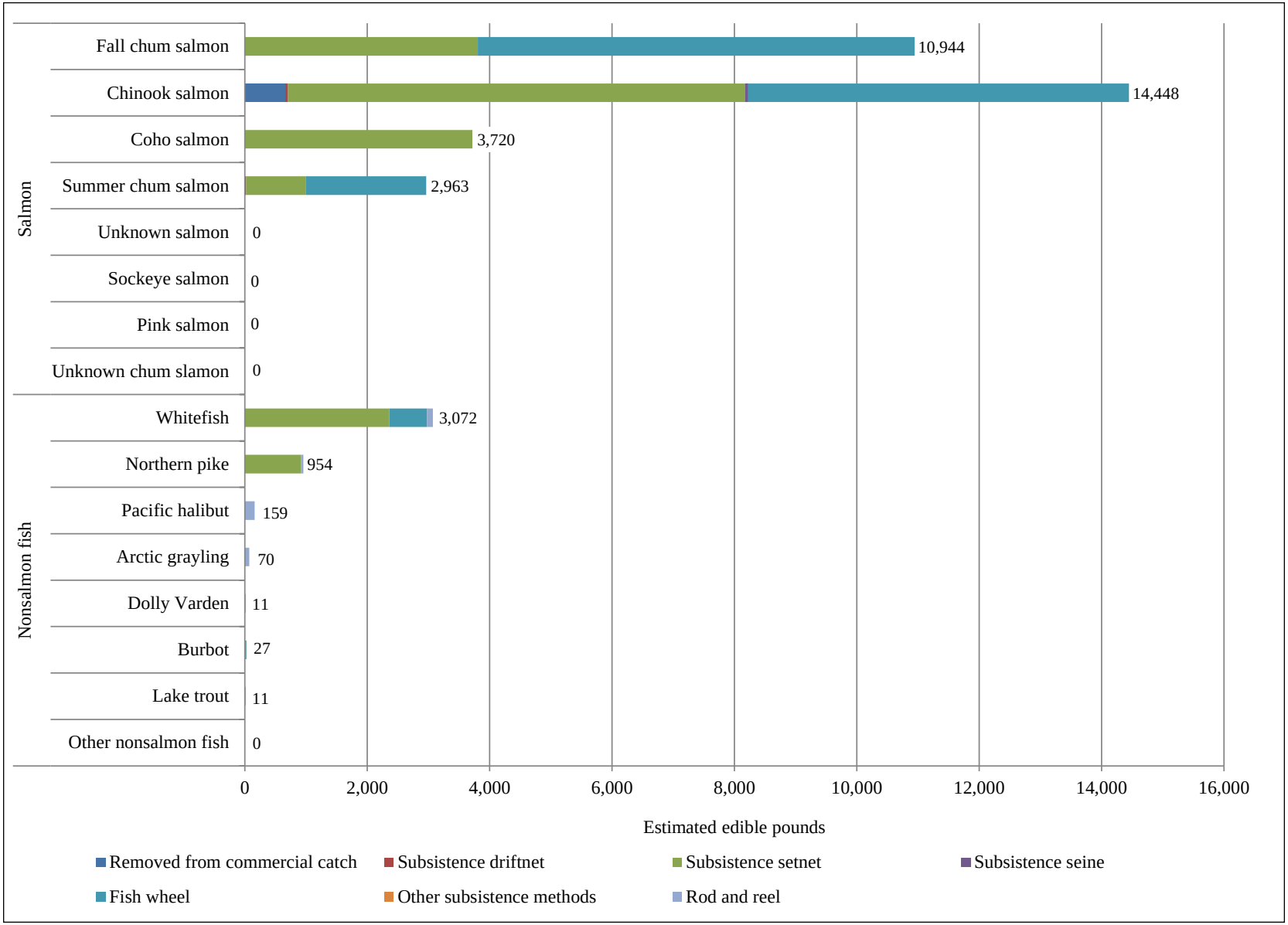


Figure 7-6.–Fish harvests by gear type, Ruby, 2010.

Table 7-3.–Estimated harvest and use of land and marine mammals, Ruby, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Land mammals										
Large land mammals										
Black bear	19.1%	12.8%	6.4%	14.9%	2.1%	421.3 lb	6.4 lb	2.3 lb	4.2 ind	± 61.0%
Brown bear	0.0%	2.1%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Caribou	2.1%	4.3%	2.1%	0.0%	2.1%	365.1 lb	5.5 lb	2.0 lb	2.8 ind	± 108.0%
Moose	89.4%	85.1%	36.2%	66.0%	54.3%	14,407.7 lb	218.3 lb	80.2 lb	26.7 ind	± 22.5%
Subtotal	**89.4%**	**85.1%**	**38.3%**	**68.1%**	**55.3%**	**15,194.0 lb**	**230.2 lb**	**84.5 lb**	**33.7 ind**	**± 22.1%**
Small land mammals										
Beaver	27.7%	10.6%	10.6%	17.0%	6.4%	863.6 lb	13.1 lb	4.8 lb	63.2 ind	± 95.0%
Red fox	2.1%	2.1%	2.1%	0.0%	0.0%	*Not usually eaten*			2.8 ind	± 0.0%
Snowshoe hare	4.3%	4.3%	4.3%	2.1%	4.3%	21.1 lb	0.3 lb	0.1 lb	22.5 ind	± 108.0%
Alaska hare (jackrabbit)	2.1%	2.1%	2.1%	0.0%	0.0%	14.0 lb	0.2 lb	0.1 lb	5.6 ind	± 108.0%
River (land) otter	0.0%	2.1%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Lynx	2.1%	4.3%	2.1%	0.0%	0.0%	11.2 lb	0.2 lb	0.1 lb	2.8 ind	± 108.0%
Marmot	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Marten	27.7%	27.7%	27.7%	0.0%	0.0%	*Not usually eaten*			814.5 ind	± 0.0%
Mink	6.4%	6.4%	6.4%	0.0%	0.0%	50.6 lb	0.8 lb	0.3 lb	30.9 ind	± 108.0%
Muskrat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Porcupine	4.3%	4.3%	4.3%	0.0%	2.1%	5.6 lb	0.1 lb	0.0 lb	7.0 ind	± 108.0%
Arctic ground (parka) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Red (tree) squirrel	2.1%	2.1%	2.1%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	4.2 ind	± 0.0%
Weasel	2.1%	2.1%	2.1%	0.0%	0.0%	*Not usually eaten*			5.6 ind	± 0.0%
Gray wolf	4.3%	6.4%	2.1%	2.1%	2.1%	*Not usually eaten*			1.4 ind	± 0.0%
Wolverine	6.4%	6.4%	6.4%	0.0%	0.0%	*Not usually eaten*			5.6 ind	± 0.0%
Subtotal	**42.6%**	**38.3%**	**36.2%**	**19.1%**	**12.8%**	**966.1 lb**	**14.6 lb**	**5.4 lb**	**966.1 ind**	**± 90.5%**
Marine mammals										
Bearded seal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Ringed seal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Spotted seal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown seal	2.1%	0.0%	0.0%	2.1%	2.1%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Walrus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Beluga	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Bowhead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**2.1%**	**0.0%**	**0.0%**	**2.1%**	**2.1%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0.0%**
All land mammals	**91.5%**	**85.1%**	**48.9%**	**72.3%**	**57.4%**	**16,160.2 lb**	**244.9 lb**	**89.9 lb**		**± 22.3%**
All marine mammals	**2.1%**	**0.0%**	**0.0%**	**2.1%**	**2.1%**	**0.0 lb**	**0.0 lb**	**0.0 lb**		**± 0.0%**
All resources[b]	**95.7%**	**93.6%**	**91.5%**	**85.1%**	**83.0%**	**54,107.1 lb**	**819.8 lb**	**301.0 lb**		**± 27.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

northern pike harvest (96%). Rod and reel gear caught the remaining 4% of the pike harvest. Arctic grayling and burbot, however, were caught with rod and reel. Pacific halibut (reportedly caught in other areas of the state) were also harvested using rod and reel.

Ruby's location on the Yukon River makes the harvest of shellfish in areas around the community unlikely. However, 2% of households reported the harvest of tanner crab, which were likely taken during a trip to coastal regions of the state (Table 7-6). Similarly, 4% of households used and received unknown king crab species from other communities. No other shellfish use was reported.

Ruby residents harvested several species of large land mammals, primarily in the fall and winter. Table D7-3 summarizes the harvest timing of these species. Table 7-3 reports Ruby's estimated use and harvest of land and marine mammals. In total, 92% of Ruby households used some kind of land mammal, and 2% used marine mammals. Seal oil, a commonly exchanged good, was included in the marine mammals category. Land mammals contributed 16,160 lb to the entire subsistence harvest, or 90 lb per capita. In 2010, the

community of Ruby harvested an estimated 27 moose, which contributed 14,408 lb to the total estimated pounds harvested. Moose accounted for 95% of the total large land mammal harvest by weight. Four percent of Ruby households attempted to harvest caribou, and one-half of those succeeded. The harvest of 3 individual caribou resulted in an estimated harvest of 365 edible pounds. All households that harvested caribou shared with others. The harvest of 4 black bears in 2010 contributed 421 lb to the total large land mammal harvest by weight. No brown bears were harvested in 2010.

Although trapping was more commonplace in the past, some Ruby residents still practiced it in 2010. Beavers, a commonly trapped animal, contributed 864 harvested pounds to the community's total (Table 7-3). Beavers are commonly eaten and are considered a delicacy in Ruby. Twenty-eight percent of households used beavers either for food, fur, or for both food and fur. Six percent of households gave some away, and 17% received beavers from others. The same percentage of households used martens and beavers (28%), but households did not report sharing martens. One possible explanation is that martens are usually trapped for commercial purposes and are rarely eaten. In total, residents trapped 815 martens. The percentage of households harvesting any other small land mammal did not exceed 6%. Table D7-4 reports the estimated harvest of small land mammals by month. Most furbearers were harvested in winter months.

Ruby residents hunted a variety of bird species, primarily in the spring and fall. Table D7-5 reports the estimated bird harvest by month. Of the 14 bird species used by Ruby households, nearly one-half of reporting households (49%) used spruce grouse, a species that falls into the "Other Birds" subcategory (Table 7-4). Spruce grouse had the highest use of any bird species. Thirty-eight percent of households harvested "spruce chickens," as they are known locally, which contributed 199 lb to the total estimated subsistence harvest. Overall, 21% of households attempted to harvest migratory birds in 2010 and 17% were successful, leading to a 34% use rate in the community. Six percent of households gave away migratory birds, and 19 % received them.

Nineteen percent of Ruby households attempted to harvest mallards, and 17% reported a harvest. Two percent of households received mallards from other households, and 4% gave some away. Although only 5 of the 19 duck species listed on the survey were used by households, 23% of Ruby households used at least 1 species of duck during the study year. A total of 19% of households attempted to harvest ducks.

Twenty-three percent of households also used geese. As a category, geese presented challenges for species identification. Four percent of households reported using unknown geese, and 15% of households reported using unknown Canada geese. The only goose species specifically identified in household use were cackling and snow geese, each having low levels of harvest and use. Table 7-5 summarizes responses to the bird egg harvest and use portion of the survey. No household in Ruby used or attempted to harvest bird eggs of any kind.

Lastly, the survey asked about the harvest and use of vegetation, which is summarized in Table 7-7. In total, Ruby households harvested 971 lb of berries in 2010, primarily blueberries (503 lb), lowbush cranberries (235 lb), and salmonberries (101 lb). Blueberries were the most heavily harvested (74% of households), used (81%), given away (28%), and received (13%) species of vegetation. Twenty-six percent of households harvested salmonberries, and 40% harvested lowbush cranberries. Ruby residents often make fish ice cream with salmonberries or lowbush cranberries. However, without ethnographic data, the study was unable to capture why residents targeted these species over others.

Other types of vegetation, including greens and mushrooms, added 69 lb to the total subsistence harvest. However, households reported low levels of use for a variety of species. Wild rose hips, Hudson's Bay tea and fiddlehead ferns were used by the most households (11%, 6% and 6% respectively); however, neither species was given to or received from other households. The harvest and use rates for fiddlehead ferns and Hudson's Bay tea were the same: both used and harvested by 6.4% of households, and 2% of households gave some of their supply away. Nine percent of households used some kind of mushroom. Seventy percent of households reported the use of wood, either for smoking fish and moose or, more commonly, to heat homes.

Table 7-4.–Estimated harvest and use of birds, Ruby, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Migratory birds										
Ducks										
Bufflehead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Canvasback	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Common eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Goldeneye sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Mallard	17.0%	19.1%	17.0%	2.1%	4.3%	63.2 lb	1.0 lb	0.4 lb	63.2 ind	± 38.0%
Common merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Red-breasted merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown merganser	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Long-tailed duck (oldsquaw)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Northern pintail	12.8%	10.6%	8.5%	6.4%	4.3%	28.1 lb	0.4 lb	0.2 lb	35.1 ind	± 54.8%
Scaup sp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Black scoter	2.1%	0.0%	0.0%	2.1%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Surf scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
White-winged scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Northern shoveler	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Green-winged teal	4.3%	4.3%	4.3%	0.0%	0.0%	2.1 lb	0.0 lb	0.0 lb	7.0 ind	± 77.1%
Unknown wigeon	4.3%	6.4%	4.3%	0.0%	2.1%	10.8 lb	0.2 lb	0.1 lb	15.4 ind	± 90.1%
Unknown duck	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**23.4%**	**19.1%**	**17.0%**	**8.5%**	**4.3%**	**104.2 lb**	**1.6 lb**	**0.6 lb**	**120.8 ind**	**± 39.5%**
Geese										
Brant	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Cackling goose	4.3%	2.1%	2.1%	2.1%	2.1%	13.5 lb	0.2 lb	0.1 lb	11.2 ind	± 108.0%
Lesser Canada goose	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown Canada goose	14.9%	10.6%	6.4%	8.5%	0.0%	20.2 lb	0.3 lb	0.1 lb	16.9 ind	± 66.2%
Emperor goose	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Snow goose	2.1%	2.1%	2.1%	0.0%	2.1%	6.5 lb	0.1 lb	0.0 lb	2.8 ind	± 108.0%
White-fronted goose	0.0%	4.3%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown goose	4.3%	2.1%	0.0%	4.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**23.4%**	**17.0%**	**8.5%**	**14.9%**	**2.1%**	**40.2 lb**	**0.6 lb**	**0.2 lb**	**30.9 ind**	**± 62.1%**
Other migratory birds										
Tundra (whistling) swan	2.1%	2.1%	2.1%	0.0%	0.0%	14.0 lb	0.2 lb	0.1 lb	1.4 ind	± 108.0%
Sandhill crane	2.1%	2.1%	2.1%	0.0%	2.1%	35.4 lb	0.5 lb	0.2 lb	4.2 ind	± 108.0%
Whimbrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**2.1%**	**2.1%**	**2.1%**	**0.0%**	**2.1%**	**49.4 lb**	**0.7 lb**	**0.3 lb**	**5.6 ind**	**± 108.0%**
Other birds										
Spruce grouse	48.9%	38.3%	38.3%	12.8%	17.0%	198.6 lb	3.0 lb	1.1 lb	283.7 ind	± 26.0%
Ruffed grouse	10.6%	10.6%	10.6%	2.1%	4.3%	41.3 lb	0.6 lb	0.2 lb	59.0 ind	± 60.7%
Ptarmigan sp.	12.8%	10.6%	10.6%	2.1%	4.3%	71.6 lb	1.1 lb	0.4 lb	71.6 ind	± 51.5%
Subtotal	**51.1%**	**40.4%**	**40.4%**	**12.8%**	**19.1%**	**311.5 lb**	**4.7 lb**	**1.7 lb**	**414.3 ind**	**± 27.2%**
All migratory birds	**34.0%**	**21.3%**	**17.0%**	**19.1%**	**6.4%**	**193.8 lb**	**2.9 lb**	**1.1 lb**	**157.3 ind**	**± 51.1%**
All other birds	**51.1%**	**40.4%**	**40.4%**	**12.8%**	**19.1%**	**311.5 lb**	**4.7 lb**	**1.7 lb**	**414.3 ind**	**± 27.2%**
All resources[b]	**95.7%**	**93.6%**	**91.5%**	**85.1%**	**83.0%**	**54,107.1 lb**	**819.8 lb**	**301.0 lb**		**± 27.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

Table 7-5.–Estimated harvest and use of eggs, Ruby, 2010

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Bird eggs										
Duck eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Goose eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Swan eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown shorebird eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Gull eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Unknown eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Subtotal	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0.0%**
All birds and eggs	**59.6%**	**44.7%**	**42.6%**	**27.7%**	**25.5%**	**505.3 lb**	**7.7 lb**	**2.8 lb**	**571.5 ind**	**± 26.5%**
All resources[b]	**95.7%**	**93.6%**	**91.5%**	**85.1%**	**83.0%**	**54,107.1 lb**	**819.8 lb**	**301.0 lb**		**± 27.0%**

Source ADF&G Division of Subsistence household surveys, 2011.
a. Amount of resource harvested is in individual units, unless otherwise specified.
b. All resources include all species of fish, wildlife, and plants reported on the survey.

Table 7-6.–Estimated harvest and use of marine invertebrates, Ruby, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Marine invertebrates										
Unknown clams	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown king crab	4.3%	0.0%	0.0%	4.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Tanner crab	2.1%	2.1%	2.1%	0.0%	0.0%	22.5 lb	0.3 lb	0.1 lb	14.0 ind	± 108.0%
Unknown crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0.0%
Shrimp	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown marine invertebrates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Subtotal	**6.4%**	**2.1%**	**2.1%**	**4.3%**	**0.0%**	**22.5 lb**	**0.3 lb**	**0.1 lb**		**± 108.0%**
All marine invertebrates	**6.4%**	**2.1%**	**2.1%**	**4.3%**	**0.0%**	**22.5 lb**	**0.3 lb**	**0.1 lb**		**± 108.0%**
All resources[b]	**95.7%**	**93.6%**	**91.5%**	**85.1%**	**83.0%**	**54,107 lb**	**819.8 lb**	**301.0 lb**		**± 27.0%**

Source ADF&G Division of Subsistence household surveys, 2011.
a. Amount of resource harvested is in individual units, unless otherwise specified.
b. All resources include all species of fish, wildlife, and plants reported on the survey.

Table 7-7.–Estimated harvest and use of vegetation, Ruby, 2010.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Berries										
Blueberry	80.9%	74.5%	74.5%	12.8%	27.7%	502.7 lb	7.6 lb	2.8 lb	125.7 gal	± 15.2%
Lowbush cranberry	46.8%	42.6%	40.4%	14.9%	19.1%	235.2 lb	3.6 lb	1.3 lb	58.8 gal	± 27.6%
Highbush cranberry	10.6%	10.6%	8.5%	2.1%	0.0%	42.1 lb	0.6 lb	0.2 lb	10.5 gal	± 61.8%
Gooseberry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Currant	4.3%	4.3%	4.3%	0.0%	0.0%	2.8 lb	0.0 lb	0.0 lb	0.7 gal	± 75.5%
Raspberry	12.8%	12.8%	12.8%	0.0%	0.0%	33.0 lb	0.5 lb	0.2 lb	8.3 gal	± 54.5%
Salmonberry	25.5%	25.5%	25.5%	0.0%	8.5%	100.8 lb	1.5 lb	0.6 lb	25.2 gal	± 39.7%
Crowberry (blackberry)	10.6%	10.6%	10.6%	2.1%	4.3%	50.6 lb	0.8 lb	0.3 lb	12.6 gal	± 63.4%
Twisted-stalk (watermelon) berry	2.1%	2.1%	2.1%	0.0%	0.0%	0.7 lb	0.0 lb	0.0 lb	0.2 gal	± 108.0%
Other wild berry	2.1%	2.1%	2.1%	0.0%	0.0%	2.8 lb	0.0 lb	0.0 lb	0.7 gal	± 108.0%
Subtotal	**85.1%**	**80.9%**	**80.9%**	**23.4%**	**38.3%**	**970.7 lb**	**14.7 lb**	**5.4 lb**	**242.7 gal**	**± 15.4%**
Plants/greens/mushrooms										
Wild rhubarb	4.3%	4.3%	4.3%	0.0%	2.1%	28.7 lb	0.4 lb	0.2 lb	7.2 gal	± 106.8%
Eskimo potato	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Fiddlehead fern	6.4%	6.4%	6.4%	0.0%	2.1%	1.8 lb	0.0 lb	0.0 lb	1.8 gal	± 87.6%
Nettle	0.0%	2.1%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Hudson's Bay tea	6.4%	6.4%	6.4%	0.0%	0.0%	1.8 lb	0.0 lb	0.0 lb	1.8 gal	± 88.1%
Mint	4.3%	4.3%	4.3%	0.0%	0.0%	0.3 lb	0.0 lb	0.0 lb	0.3 gal	± 106.8%
Sourdock	2.1%	2.1%	2.1%	0.0%	0.0%	1.4 lb	0.0 lb	0.0 lb	1.4 gal	± 108.0%
Spruce tips	4.3%	4.3%	4.3%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 106.8%
Willow leaves	0.0%	2.1%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Cow parsnip (wild celery)	2.1%	2.1%	2.1%	0.0%	0.0%	0.7 lb	0.0 lb	0.0 lb	0.7 gal	± 108.0%
Wild rose hips	10.6%	10.6%	10.6%	0.0%	0.0%	8.9 lb	0.1 lb	0.0 lb	2.2 gal	± 76.5%
Yarrow	4.3%	4.3%	4.3%	0.0%	0.0%	0.1 lb	0.0 lb	0.0 lb	0.1 gal	± 96.9%
Unknown mushroom	8.5%	8.5%	8.5%	0.0%	2.1%	3.2 lb	0.0 lb	0.0 lb	3.2 gal	± 67.1%
Fireweed	2.1%	2.1%	2.1%	0.0%	0.0%	0.7 lb	0.0 lb	0.0 lb	0.7 gal	± 108.0%
Stinkweed	4.3%	4.3%	4.3%	0.0%	0.0%	14.7 lb	0.2 lb	0.1 lb	14.7 gal	± 102.9%
Punk	4.3%	4.3%	4.3%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	6.3 gal	± 96.5%
Puffballs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0.0%
Unknown greens from land	8.5%	8.5%	8.5%	0.0%	0.0%	6.6 lb	0.1 lb	0.0 lb	6.6 gal	± 105.5%
Subtotal	**29.8%**	**29.8%**	**29.8%**	**0.0%**	**6.4%**	**68.9 lb**	**1.0 lb**	**0.4 lb**	**47.0 gal**	**± 52.5%**
Wood										
Wood	70.2%	53.2%	53.2%	23.4%	8.5%	0.0 lb	0.0 lb	0.0 lb	168.5 crd	± 20.2%
Subtotal	**70.2%**	**53.2%**	**53.2%**	**23.4%**	**8.5%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**168.5 crd**	**± 0.0%**
All vegetation	**91.5%**	**87.2%**	**87.2%**	**40.4%**	**44.7%**	**1,039.6 lb**	**15.8 lb**	**5.8 lb**		**± 15.6%**
All resources[b]	**95.7%**	**93.6%**	**91.5%**	**85.1%**	**83.0%**	**54,107.1 lb**	**819.8 lb**	**301.0 lb**		**± 27.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

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

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

Harvest levels of salmon and land mammals were significantly higher than those in all other categories. (Figure 7-4). Nonsalmon fish contributed less edible weight to the total community harvest than any other single resource category. All 22 nonsalmon fish species accounted for only 4,305 edible lb (12% of the total fish harvest and 8% of the total community harvest of all resources) (Table 7-2). Combined, the remaining four categories—marine mammals, birds and eggs, marine invertebrates, and vegetation—totaled 1,567 edible pounds (3% of Ruby's total harvest) (Figure 7-4). The high level of attempted harvest made in the land mammals category and the high level of harvest of salmon species in edible weight illustrate a subsistence harvest and use pattern that is highly focused on just a few resources. Heavy reliance on a small number of species could create instability if one resource is in short supply. A discussion on food security, presented in a later section, will address the extent and consequences of this pattern in Ruby.

Harvest Areas

As part of the survey, household respondents were asked to indicate the areas where they harvested or searched for resources on a map. From this, ADF&G staff produced maps for each community depicting search and harvest areas for 6 resource categories (salmon, large land mammals, small land mammals, nonsalmon fish, birds, and vegetation). Additionally, a comprehensive map was produced depicting harvest and search areas for all resource categories (Figure 7-7).

During 2010, Ruby residents reported using 856 square miles to harvest wild resources. Unlike other study communities that utilized larger extents of land covering a more diverse range of terrain, Ruby's use areas rarely strayed from nearby waterways. Ruby's search areas along the Yukon River extended downriver to the mouth of the Yuki River and as far upriver as the Klatsuta River. Tributaries to the Yukon River, including Junekaket Creek, Big Creek, Deep Creek, Melozitna River, and Ruby Slough, were important search areas for many species. Additionally, the Ruby-Poorman Road, leading 44 miles to an abandoned Ruby-Poorman mining camp, allowed Ruby residents convenient access to moose hunting areas south of town.

Salmon species, the category of fish with the highest use and harvest, were taken primarily along the banks of the Yukon River directly in front of Ruby (Figure 7-8). However, households also reported salmon fishing as far downriver as the western tip of an island adjacent to the mouth of the Yuki River and as far upriver as the flats above Twin Slough across the Yukon River from Hardluck Slough. Salmon harvests in 2010 took place throughout the 30-mile stretch between these 2 points on the Yukon River. Respondents also mapped nonsalmon fish species, including burbot, northern pike, sheefish, and whitefishes. These species all appear on the same map (Figure 7-9). Similarly to salmon, these species were most commonly harvested from the Yukon River. Residents searched for northern pike on Deep Creek, the only Yukon tributary used for nonsalmon fishing.

Ruby residents who hunted moose used the largest and most diverse land area (Figure 7-10). Many respondents cited the Ruby-Poorman Road as a convenient access route to land south of Ruby. During the September hunt, the road was still drivable either by truck or all-terrain vehicle (ATV). The use of land adjacent to either side of the road, including some areas extending to nearby creeks, suggests that residents hiked off the road or used motorized vehicles to search for moose. Additionally, all sloughs, creeks, and rivers noted above served as moose search areas. Boat travel allowed residents to access Junekaket Creek, Twin Slough, Big Creek, and the Melozitna River. The north bank of the Yukon River across from Ruby lies at the foothills of the Kokrines Hills. Residents heavily used the small unnamed creeks that flow from these hills. Mapped search areas document use well beyond the creek banks, suggesting that residents spent portions of the hunting season on foot and ATVs. Although the majority of respondents searched and harvested moose in September 2010, some respondents participated in a winter hunt. The maps produced in this report, however, do not differentiate between seasons.

Trapping, a subsistence activity common in Ruby (38% participation) (Table 7-3), is documented on the small land animals map (Figure 7-11). Respondents mapped 2 particular trap lines, one up the Melozitna River and the other along Ruby Slough. Although most trapping activities occur on a "line", some respondents felt more comfortable identifying a general area of harvest rather than a specific line. Consequently, both lines and polygons appear on the small land mammals map. Search and harvest areas occurred on portions of Long Creek, Big Creek, and Junekaket Creek with other areas near Deep Creek, Twin Slough, and into a portion of the Kokrines Hills.

The Yukon River provided vital bird hunting areas, especially for ducks and geese (Figure 7-12). Ruby residents primarily traveled on the Yukon River to search for birds. Residents traveled on the Yukon River roughly 15 miles beyond the mouth of Hardluck Slough during the spring and fall hunts. Additionally, a small search area near the mouth of Ruby Slough and one about 4 miles up the Melozitna River were documented as bird search areas. Respondents documented ducks and geese search areas on either side of the river as well as on and around the multiple islands in the mainstem of the river. Hunters also used the area around Deep Creek extending toward the Nowitna River to the east. Respondents also mapped their

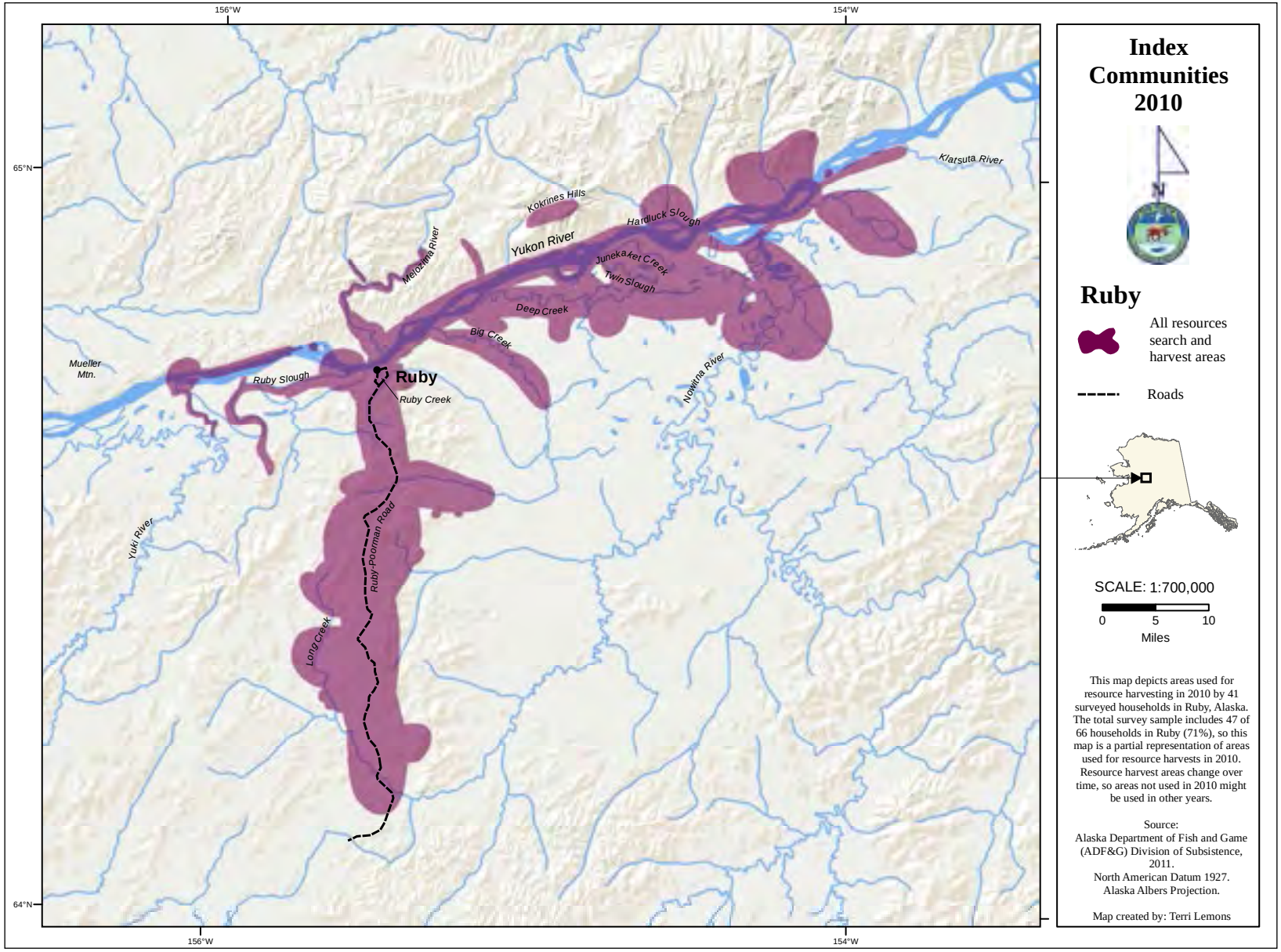


Figure 7-7.–Search and harvest areas, all resources, Ruby, 2010.

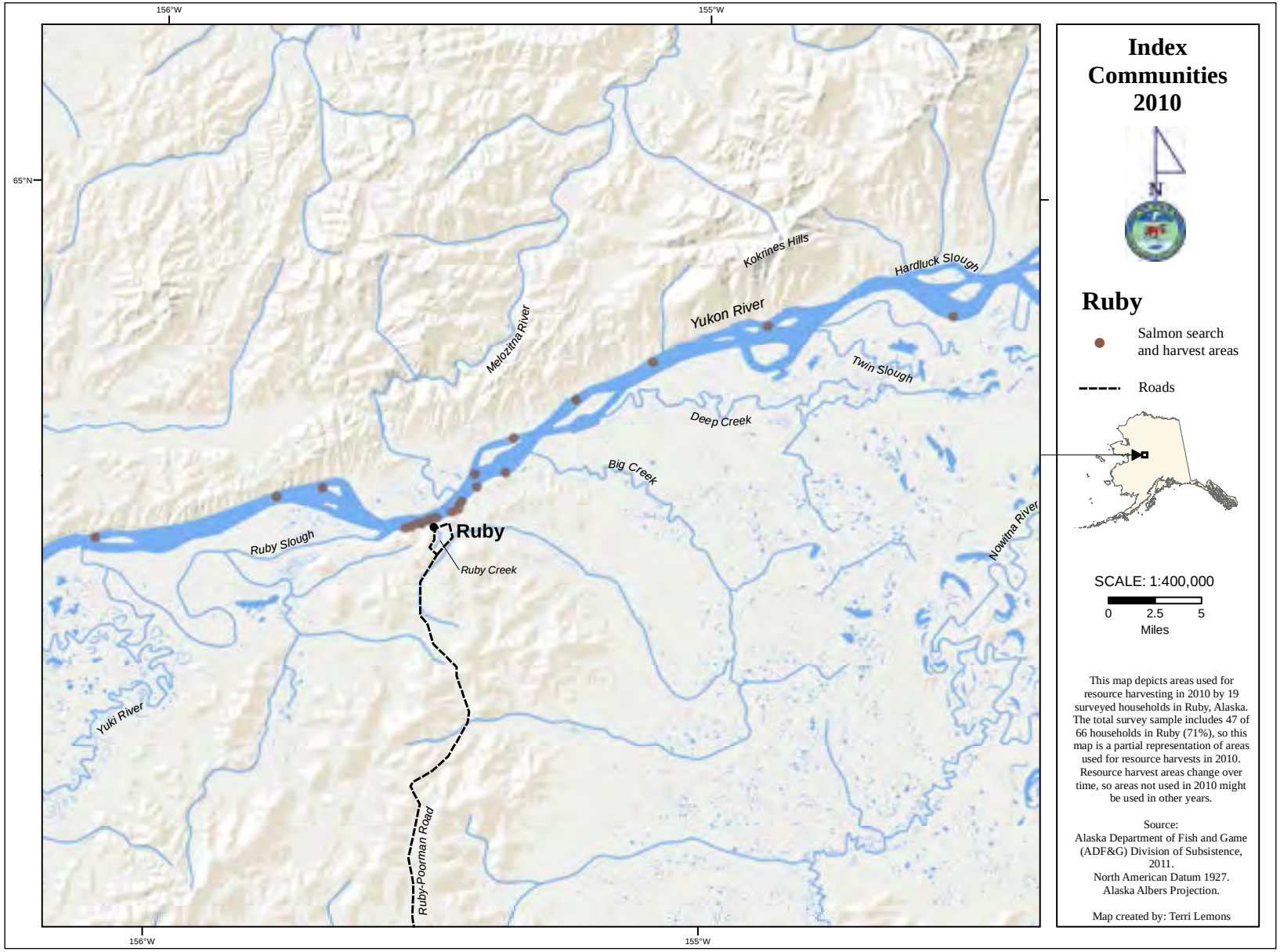


Figure 7-8.–Search and harvest areas, salmon, Ruby, 2010.

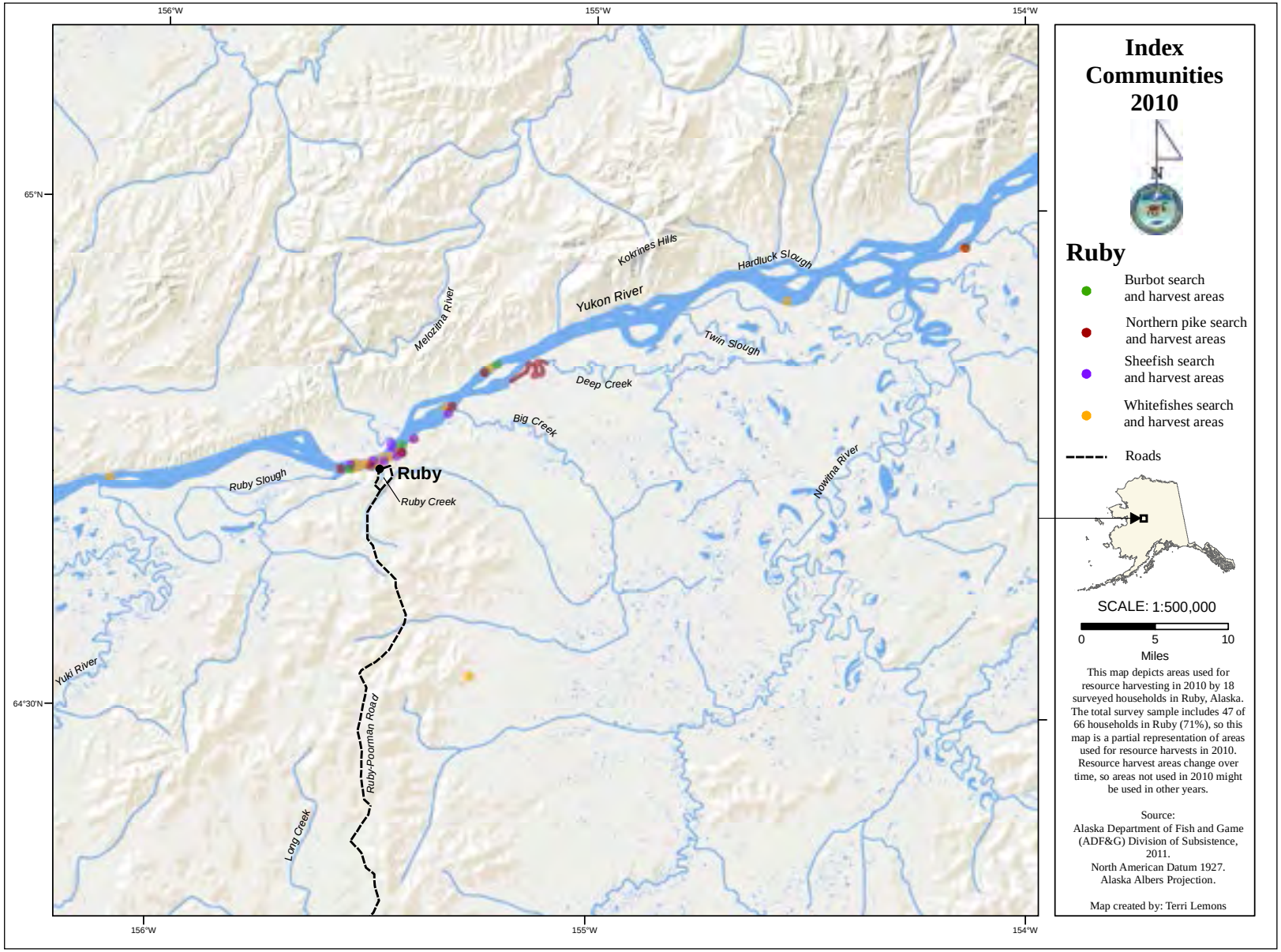


Figure 7-9.–Search and harvest areas, nonsalmon fish, Ruby, 2010.

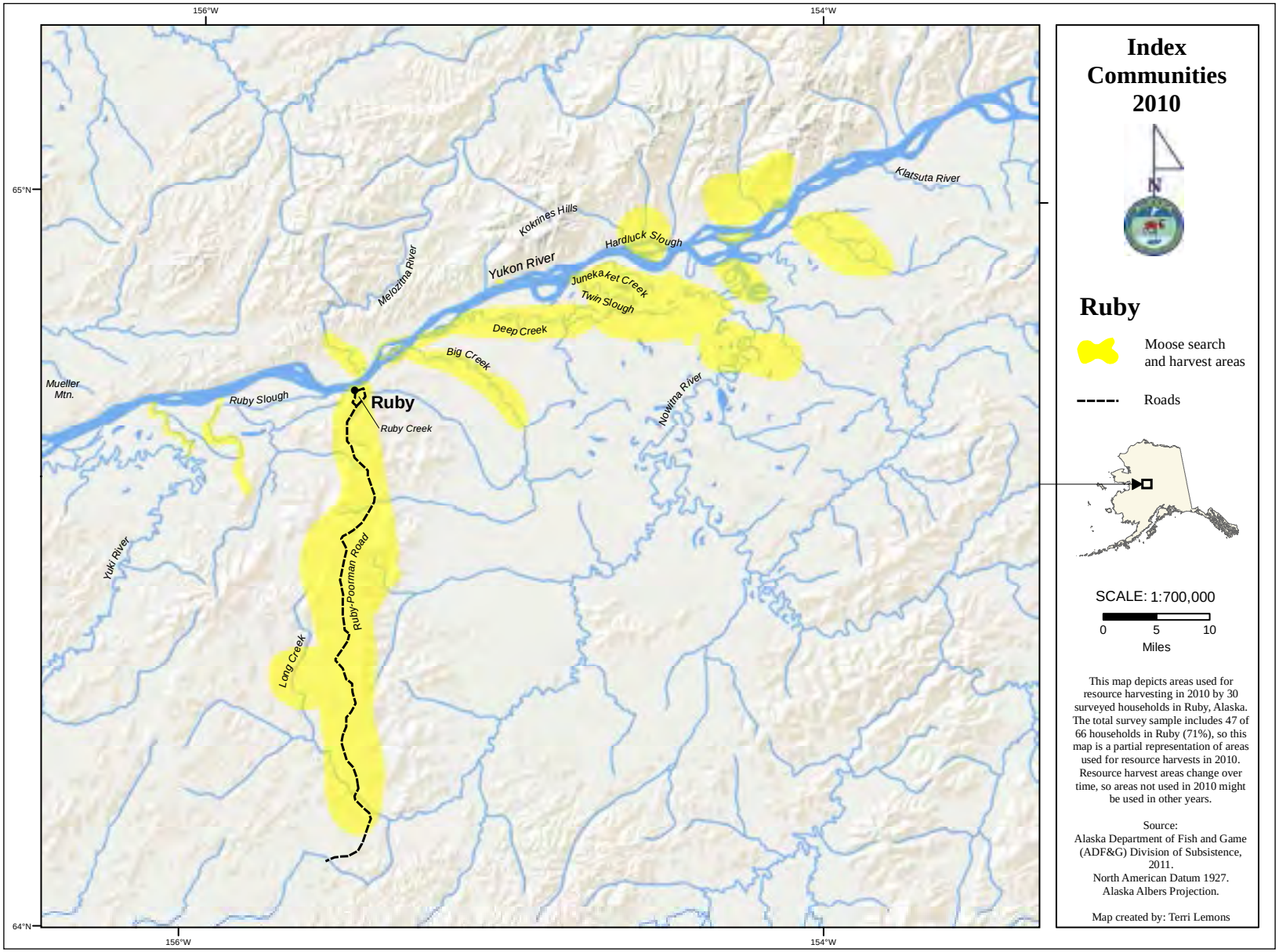


Figure 7-10.–Search and harvest areas, large land mammals, Ruby, 2010.

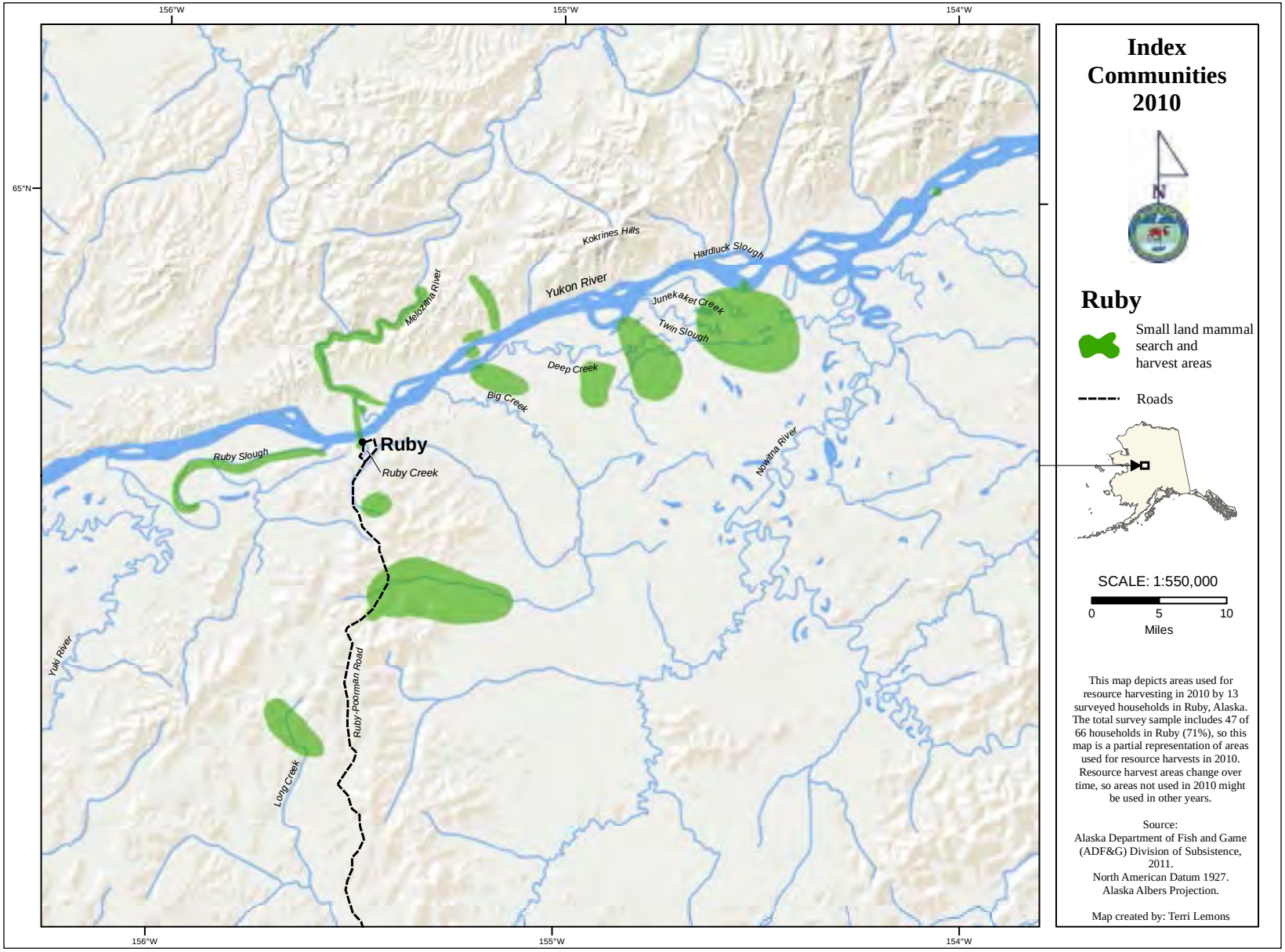


Figure 7-11.–Harvest locations and search areas, small land mammals, Ruby, 2010.

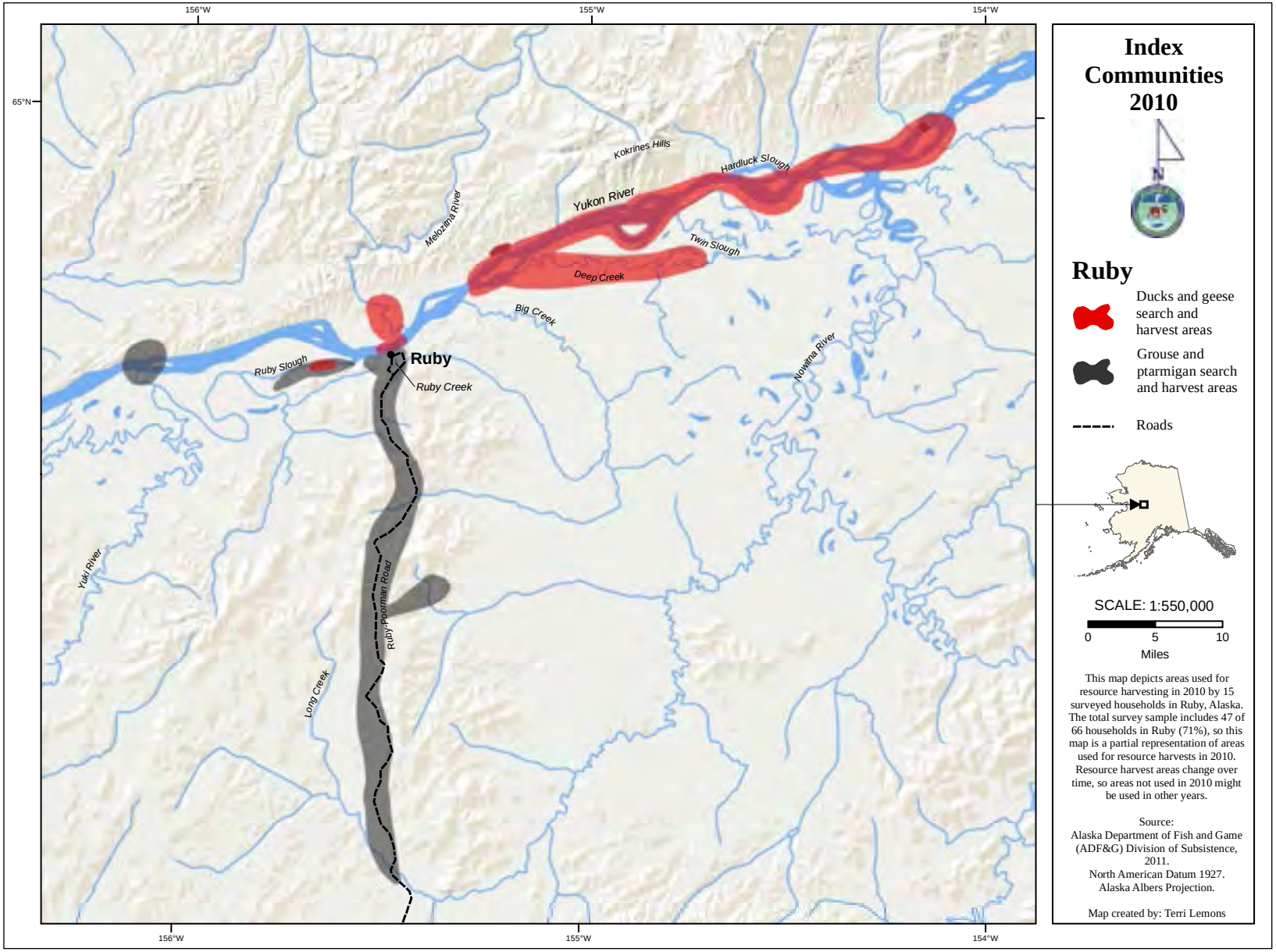


Figure 7-12.–Search and harvest areas, birds, Ruby, 2010.

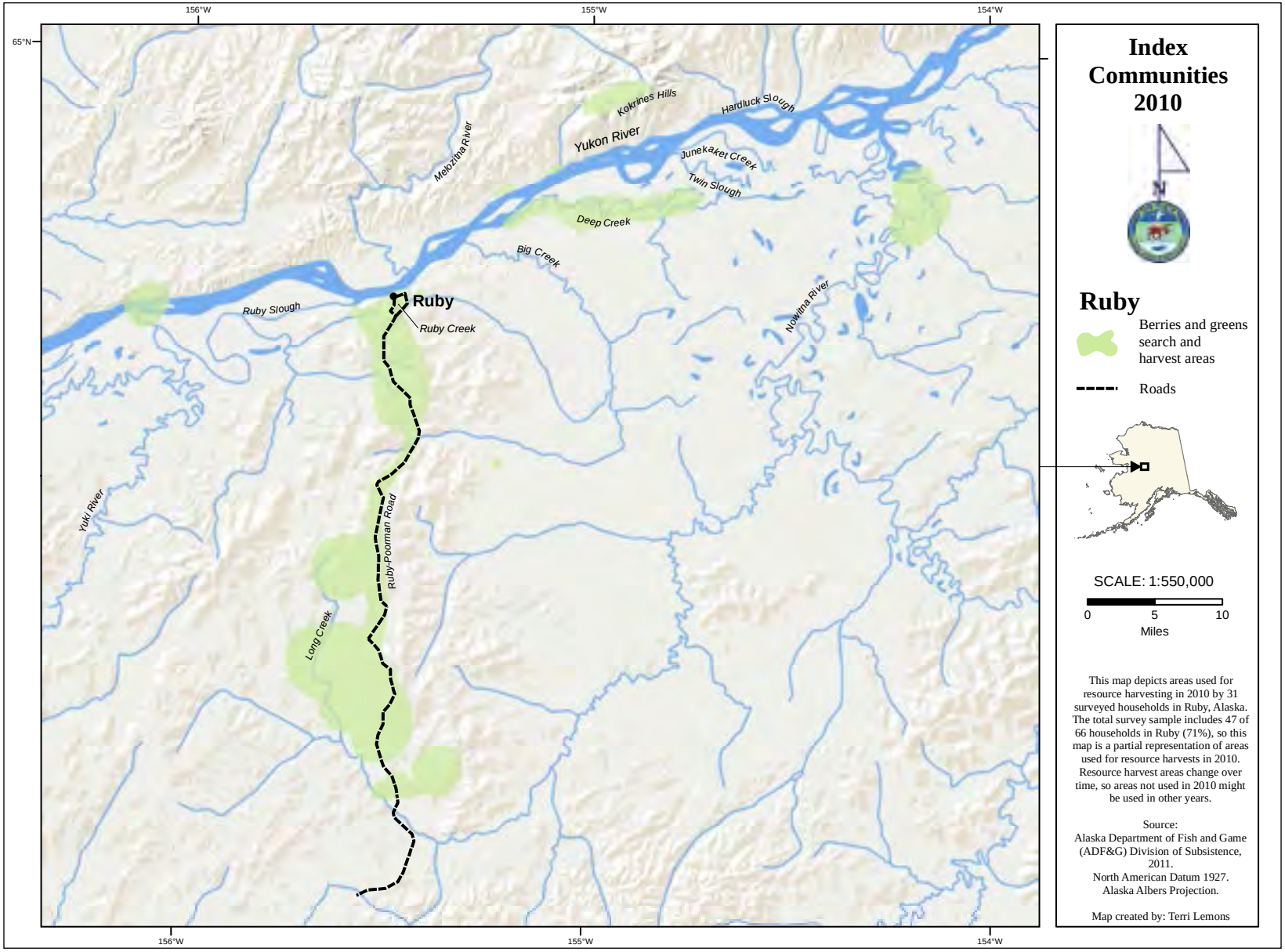


Figure 7-13.–Harvest locations and search areas, vegetation, Ruby, 2010.

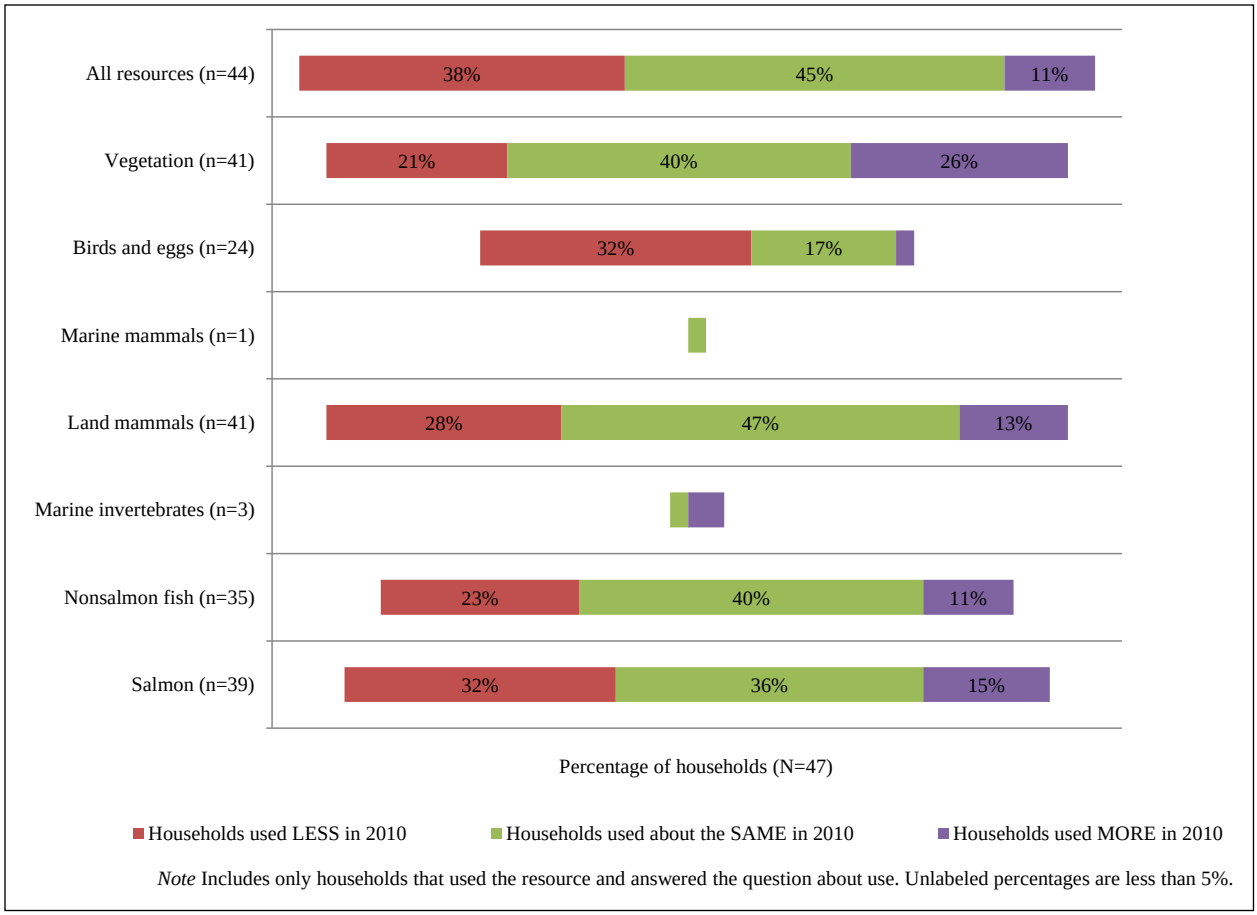


Figure 7-14.–Household use assessments, Ruby, 2010. Responses to the question: Did your household use less, more, or the same amount?

search areas for grouse and ptarmigan. Unlike migratory birds hunted in lakes and on islands during the spring and fall, grouse and ptarmigan can be found during other times of the year on land and in shrubbery. With the exception of a small search area along Ruby Slough and near the mouth of the Yuki River, hunters searched for nearly all other birds along the Ruby-Poorman road.

Households documented harvest of berries and plants with search areas along and off the Ruby-Poorman road, in the Kokrines Hills, and along Deep Creek (Figure 7-13).

Harvest Assessments

The survey asked respondents to assess their own harvests in 2 ways: whether they used more, less, or about the same amount of 7 resource categories in 2010 as in past years, and whether they got "enough" of each of the 7 resource categories. Figures 7-14 and 7-15 summarize these results, and this section discusses responses to those questions. Tables D7-6 and D7-7 report the reasons use of resources was less or more than in recent years. Percentages do not include households that did not respond to the question or reported that they never harvested the resource. Subsistence harvest success can also be assessed by comparing current harvest estimates with past harvest estimates, which will be discussed in a later section.

A substantial amount (40%) reported using the same amount of nonsalmon fish species in comparison to recent years, and 55% reported they got enough. Still, a greater number of households reported using less (23%) nonsalmon fish than those reporting using more (11%).

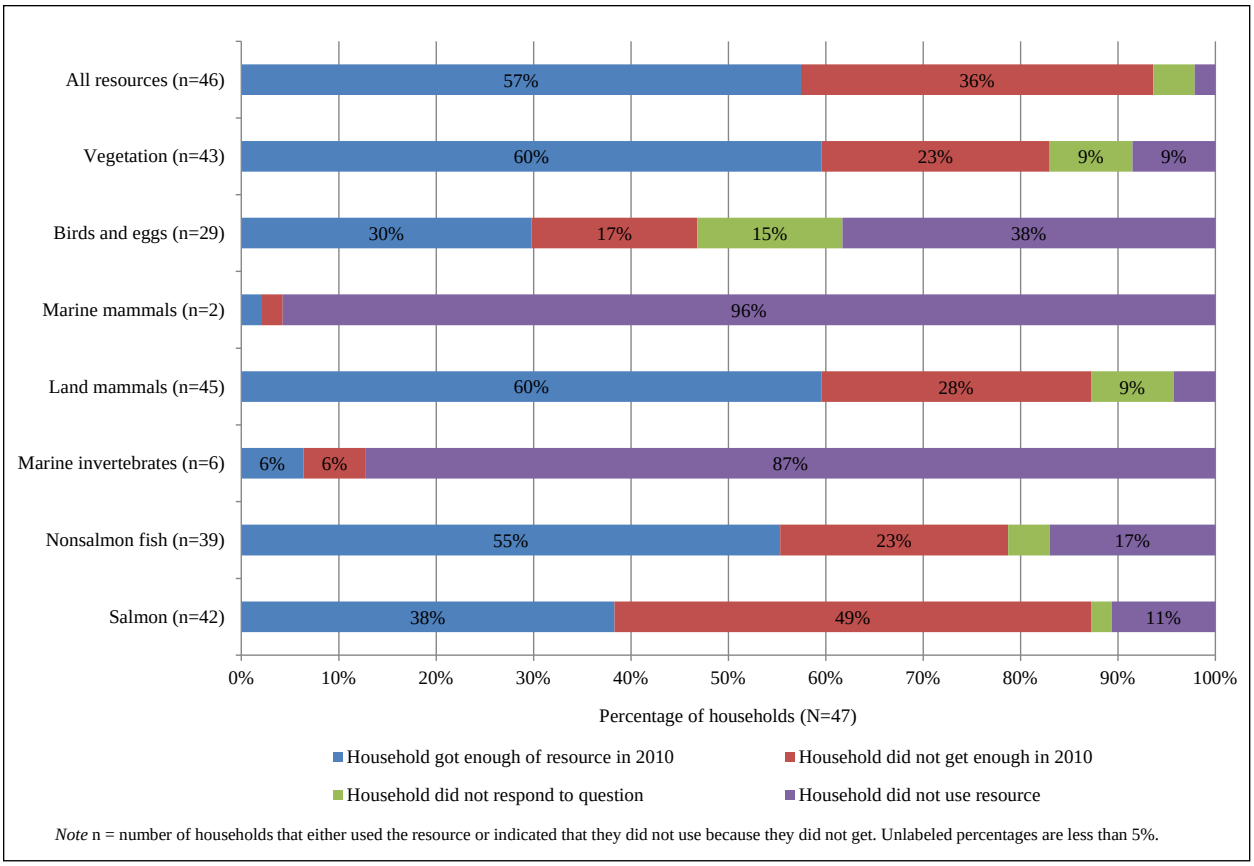


Figure 7-15.–Household harvest assessments, Ruby, 2010. Responses to the question: Did your household get enough ?

In all categories except marine mammals and marine invertebrates, at least 21% of households reported using less in 2010 than in recent years (Figure 7-14). Responses to the salmon and the birds and eggs categories had the most significant decreases in use. For each category (birds and eggs, and salmon) 32% of responding households reported using less compared to prior years.

Land mammals represented the resource category with the most consistent use in comparison to recent years. Nearly one-half (47%) of responding households reported using the same amount of land mammals as in the past. The high attempt rate coupled with a low success rate for moose harvests leads to a likely conclusion that sharing accounts for the continued stability of land mammal use; 60% of households reported that they got enough land mammals, 28% of households reported that they did not get enough land mammals, and 13% reported using more land mammals (Figure 7-14; Figure 7-15).

Survey respondents had the opportunity to give explanations for why they did not get enough of a resource. Explanations given for low moose harvest success include, but are not limited to, conservative ADF&G regulations and hunting grounds that are too far away to access easily (Table D7-8). Tables D7-9 and D7-10 report the number of households that reported doing something different because they did not get enough of a resource and what they did. The majority of households (53%) reported that the impact of not getting enough resources was minor, but some (35%) reported a major impact (Table D7-11).

Finally, 60% of households using plants and berries reported they got enough, and 23% reported they did not get enough (Figure 7-15). Consistent with the number of those who did not get enough, 21% of households reported using less plants and berries than in recent years (Figure 7-14). Nearly double that percentage, however, reported they used the same amount of plants and berries as in recent years (40%).

Table 7-8.–Estimated earned and other income, Ruby, 2010.

Income source	Number of people	Number of households	Total for community	Mean per household[a]	Percentage of total[b]
Earned income					
Local government	47.7	35.9	$842,633	$12,767	36.7%
Services	14.0	12.9	$184,215	$2,791	8.0%
Federal government	22.5	18.7	$171,562	$2,599	7.5%
Mining	2.8	2.9	$137,705	$2,086	6.0%
Retail trade	12.6	10.0	$128,302	$1,944	5.6%
Transportation, communication, and utilities	5.6	5.7	$44,310	$671	1.9%
Agriculture, forestry, and fishing	4.2	2.9	$40,186	$609	1.7%
State government	8.4	7.2	$18,955	$287	0.8%
Other employment	1.4	1.4	$6,876	$104	0.3%
Earned income subtotal	**94.6**	**54.5**	**$1,574,744**	**$23,860**	**68.5%**
Other income					
Alaska Permanent Fund dividend		60.4	$203,270	$3,080	8.8%
Social Security		15.4	$120,482	$1,825	5.2%
Food stamps		15.4	$84,822	$1,285	3.7%
Pension/retirement		7.0	$77,300	$1,171	3.4%
Native corporation dividend		52.0	$60,292	$914	2.6%
Unemployment		11.2	$46,420	$703	2.0%
Disability		5.6	$27,922	$423	1.2%
Energy assistance		19.7	$17,721	$269	0.8%
Meeting honoraria		4.2	$15,919	$241	0.7%
Supplemental Security Income		4.2	$14,250	$216	0.6%
Other		2.8	$13,882	$210	0.6%
Adult public assistance		2.8	$12,431	$188	0.5%
CITGO fuel voucher		30.9	$12,334	$187	0.5%
Gift		1.4	$6,690	$101	0.3%
Veterans assistance		2.8	$6,195	$94	0.3%
Alaska Longevity Bonus		4.2	$3,074	$47	0.1%
Workers' compensation/insurance		1.4	$0	$0	0.0%
Child support		1.4	$0	$0	0.0%
Foster care		1.4	$0	$0	0.0%
Other income subtotal		**61.8**	**$723,004**	**$10,955**	**31.5%**
Community income total			**$2,297,748**	**$34,814**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2011.

a. Means are based on all households in the community, not the number of households in the income category.

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

Jobs and Income

Respondents were asked about earned income (wages earned by all household members 16 years old and older) and other income (Alaska Permanent Fund dividend, Social Security, public assistance, handicrafts[3], etc.). Table 7-8 shows the estimated income from both wage employment and other sources. In 2010, Ruby residents earned a total of $2,297,748. Income per household averaged $34,814, and the per capita income was $12,765. Local government composed the bulk (37%) of all income sources (Figure 7-16). In 2010, the Alaska Department of Labor and Workforce Development reported that local government has become the largest employer with 46% of workers.[4] The city, tribal council, school, and clinic were some of the employers in the local government sector.

In 2010, while still present, mining played a much less significant role in overall income sources than it once did. In 2010 approximately $137,705 (6%) was earned from mining (Table 7-8). In 2010, the Alaska

3. See Plate 7-3 for an example of Ruby handicrafts.

4. Alaska Department of Labor and Workforce Development, Research and Analysis Section. Juneau, n.d. "Alaska Local and Regional Information: Ruby city, 2010." Accessed January 23, 2015. http://live.laborstats.alaska.gov/alari/

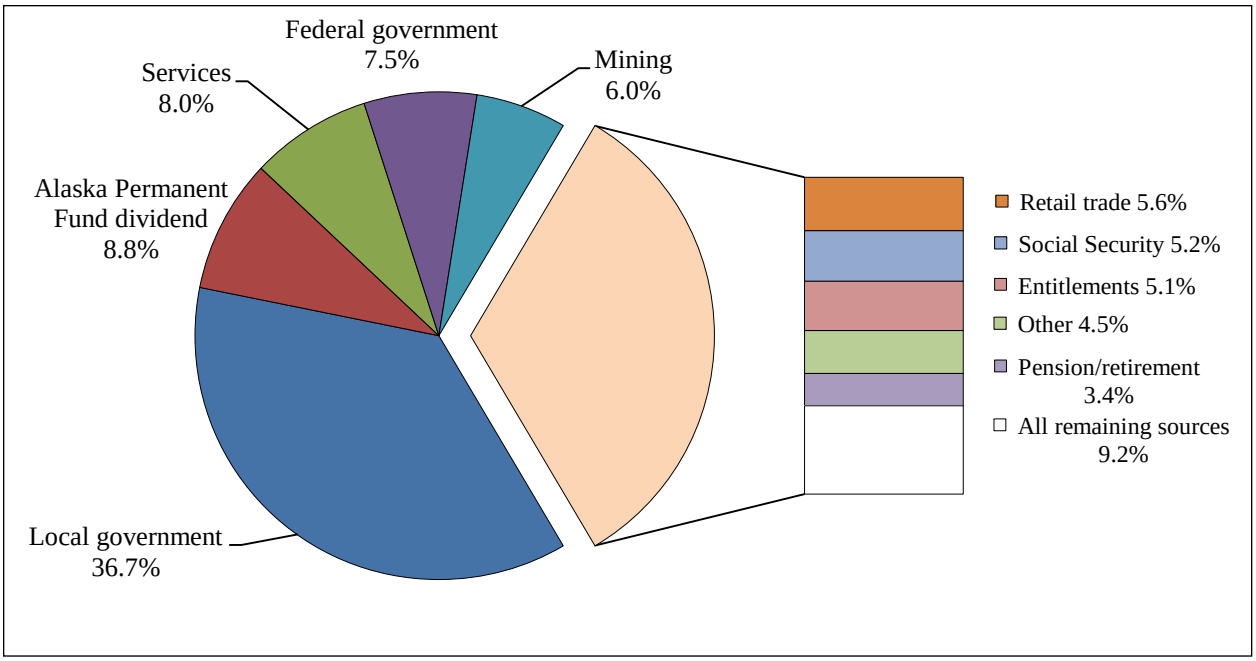


Figure 7-16.–Top 10 income sources, ranked by estimated amount, Ruby, 2010.

Department of Labor and Workforce Development reported that only 4.7% of workers in Ruby participated in mining compared to 6% documented by this survey.[5] Social Security, entitlements, and pension/retirement each contributed 5% or less to Ruby's total income (Figure 7-16).

Approximately 70% of the adults in Ruby held some sort of employment for part of 2010 (Table C4). Adults reporting employment during 2010 worked an average of 8.7 months out of the year. Eighty-three percent of Ruby households reported that at least one of their household members had some kind of employment with an average of three jobs. One-half of the employed adults in Ruby worked full-time, and 29% worked part-time; another 29% worked on-call (Table D7-12).

In 2010, 38% of Ruby residents who reported employment in 2010 earned $5,000 or less per year while only 8% earned $50,000 or more.[6] In comparison, statewide averages show only 20% of workers earning $5,000 or less and more than 17% earning more than $50,000 per year.

Alida Trainor, ADF&G

Plate 7-3.–Some Ruby households participate in the local economy by producing high-quality handicrafts, such as snowshoes.

5. Alaska Department of Labor and Workforce Development, Research and Analysis Section. Juneau, n.d. "Alaska Local and Regional Information: Ruby city, 2010." Accessed January 23, 2015. http://live.laborstats.alaska.gov/alari/

6. Alaska Department of Labor and Workforce Development, Research and Analysis Section. Juneau, n.d. "Alaska Local and Regional Information: Ruby city, 2010." Accessed January 23, 2015. http://live.laborstats.alaska.gov/alari/

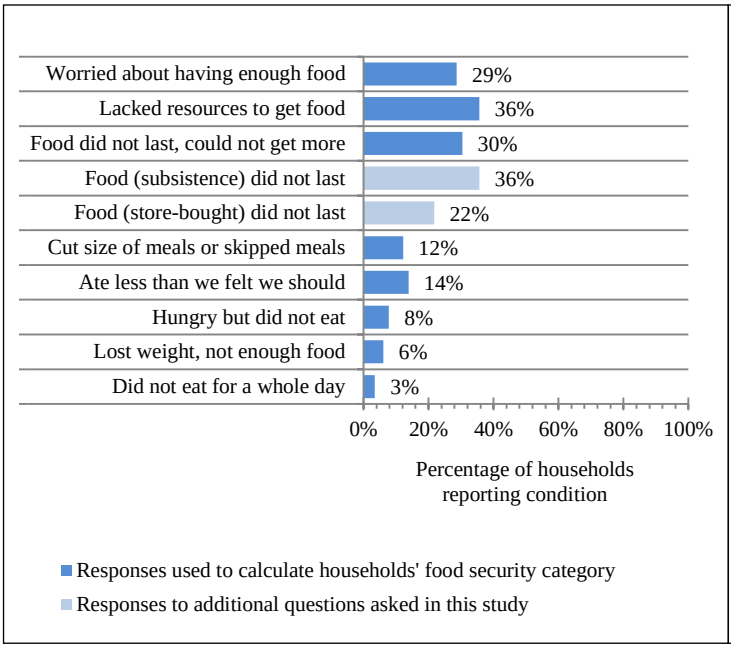


Figure 7-17.–Food insecure conditions, Ruby, 2010.

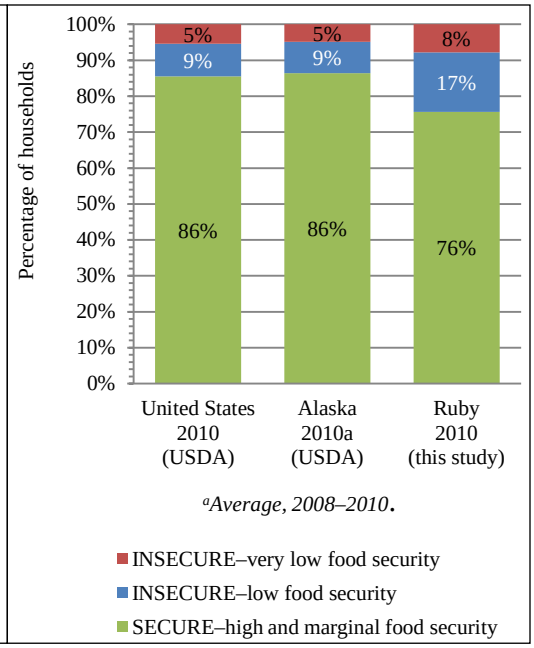


Figure 7-18.–Food security categories, Ruby, 2010.

Food Security

Respondents were asked a short series 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" (Nord et al. 2009:2). The food security questions were modeled on questions developed by the U.S. Department of Agriculture (USDA) and modified by ADF&G to account for differences in access to subsistence and store-bought foods. Core questions and Ruby responses are summarized in Figure 7-17. Based on their responses to various food conditions (whether a household worried about having enough food, whether food that the household had lasted, etc.), households were categorized as having high, marginal, low, or very low overall food security following a USDA protocol (Bickel et al. 2000). Households with high food security did not report any indications of food access problems or other limitations, such as anxiety over food availability or sufficiency in the household, and they gave little to no indication of diet or food intake changes taking place as a result of anxiety.[7] Households with marginal food security reported 1 or 2 instances of food access problems or other limitations. Households with low food security reported reduced quality, variety, or desirability of their diet. Households characterized with very low food security reported multiple instances of disrupted eating patterns and reduced food intake or change in diet. Figure 7-18 compares Ruby's food security to the 2010 USDA food security estimates for Alaska and the United States. Although Alaska and the United States shared the same food security levels, Ruby had 10% fewer households with high or marginal food security (76%). Three percent more households in Ruby were classified as very low food security compared to state and national averages (5%). During the study year of 2010, 76% of Ruby households had high or marginal food security; both categories are considered "food secure." Seventeen percent of households had low food security, and 8% fell into the very low food secure category.

Twenty-nine percent of households reported they worried they would run out of food (Figure 7-17). When asked if their food sources did not last, 30% of reporting households confirmed that this happened. Specifically, 22% of households reported that store-bought foods did not last. However, households reported much greater fluctuation in their access to subsistence foods: 36% of households ran out of subsistence

7. U.S. Department of Agriculture (USDA) Economic Research Service, Washington D.C., 2014. "Definitions of Food Security." Accessed November 7, 2014. http://www.ers.usda.gov/topics/food-nutrition-assistance/

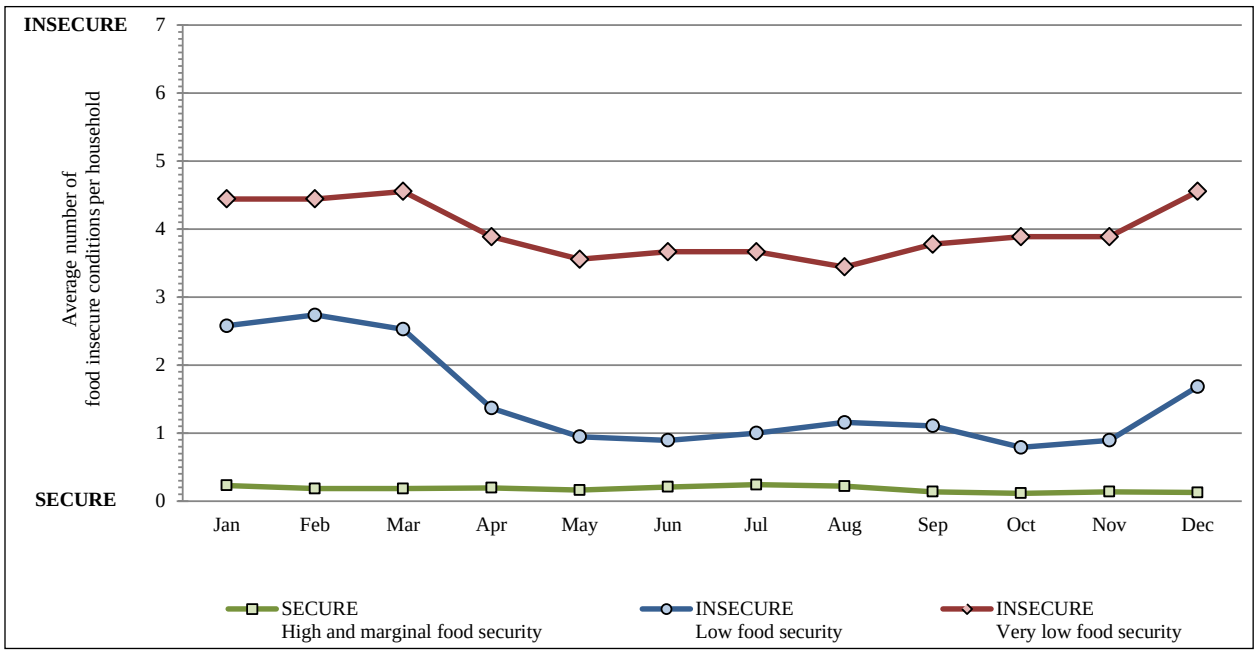


Figure 7-19.–Food insecure conditions by month and household category, Ruby, 2010.

foods at least once during 2010. Store-bought foods are always available, but access to subsistence foods, such as moose or salmon, is only seasonally available. A household's ability to maintain enough subsistence foods depends on whether the household can meet its needs during times of harvest or whether other households share foods during times of low reserves. Although a significant portion of households reported that their subsistence, store-bought, or both kinds of food ran out, only 6% of Ruby households lost weight because they did not have enough food. Three percent of households reported experiencing the most extreme condition of food insecurity, not eating for a whole day.

Food security in Ruby appears to have seasonal patterns (Figure 7-19). Households with very low and those with low food security experienced the same seasonal trend of decreases to food security in the winter months. Households with very low food security had the highest food insecurity between December and March, when they reported 4 to 5 food insecure conditions. Similarly, low food security households experienced the highest levels of food insecurity in January, February, and March. Salmon reserves from the prior summer tended to deplete by this time of year, and households were awaiting the return of harvest season. In contrast, summer months show the lowest levels of food insecurity, likely because of the availability of salmon, a primary resource. In other words, households are most food secure during summer months and least secure in late winter.

Wild Food Networks

Research shows that sharing subsistence harvests is vitally important for maintaining kinship ties, cultural traditions, and the physical well-being of all community residents (Stickney 1981). Figure 7-20 depicts the cooperative pattern of harvesting and processing activities between households in Ruby and between Ruby households and 14 other Alaska communities.

Ruby households reported receiving food from other Yukon River communities, including not only Rampart, Kaltag, Galena, Koyukuk, Grayling, and Anvik, but also the Koyukuk River communities of Huslia and Hughes. Ruby households also reported receiving food from other Alaskan communities, including Anchorage, Barrow, Fairbanks, Ketchikan, Sitka, and Wasilla.

Magdanz et al. (2002:64) reported that in northwest Alaska, active elder households, mature couples, and single active males tend to be the highest producers of subsistence foods. That pattern appears to be

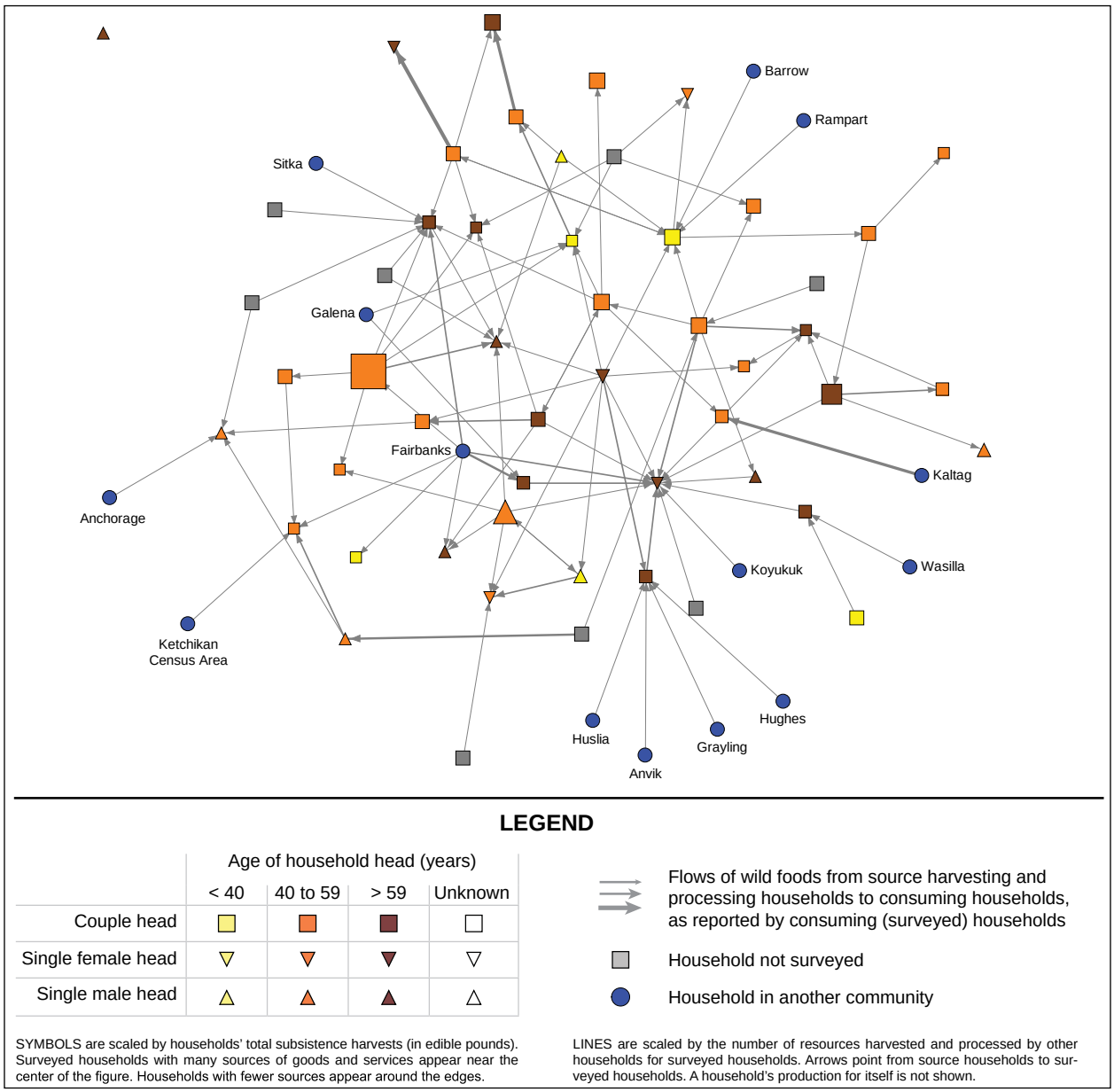


Figure 7-20.–Wild food harvesting and processing network, Ruby, 2010.

consistent with Ruby's sharing network. For example, a mature couple (defined as between the ages of 40 and 59) headed the highest producing household. That household, represented by a large orange square on the left side, shared with a variety of households in other demographic groups, including 2 other mature couple households, 2 elder couples, 1 younger couple, and 1 single elder male household. This means that 6 surveyed households reported receiving some kind of subsistence food from this 1. Because 19 (29%) of the households in Ruby were not surveyed, it is possible that this household shared with many others, making it a heavy harvester and major distributor of resources, also known as a "super-household." Wolfe et al. (2010) characterizes high-producing households as "super-households" because "they produced surpluses of wild foods substantially in excess of the households' own needs, presumably to provision other households in the community" (Wolfe et al. 2010:2). Households from a variety of demographics shared heavily with elder households (over the age of 59). One elder household headed by a single female, 1 by a single male, and a third headed by a couple all received subsistence resources from at least 6 other households. Elder

households received more resources than any other household demographic in Ruby, demonstrating that the community collectively provides for elders.

The single brown triangle in the upper left corner of the diagram represents a household headed by a single male over the age of 59 who did not give or receive any resources. In other words, this household was disconnected from Ruby's sharing network in 2010. The limited number of isolated households (only 1 appears on the network) illustrates a subsistence profile defined by cooperative effort and of resource sharing.

Although 91% of households harvested subsistence resources, nearly all households in Ruby (96%) used some (Table 7-1). Despite the high percentage of households that harvested, 83% of households gave some of their foods away, and 85% reported receiving foods from others. These numbers further demonstrate that sharing plays a vital role in characterizing Ruby's subsistence patterns.

Comparisons with Prior Results

This was the first comprehensive survey conducted by ADF&G in Ruby. The ADF&G Division of Commercial Fisheries conducts postseason subsistence salmon surveys every year with available data beginning in 1978. The Division of Subsistence conducted big game surveys in Ruby each winter harvest season from 1996–1997 through 2002–2003 to estimate the harvest and use of caribou, moose, and bears (Brown et al. 2004b). Historical harvest numbers from that study for moose, caribou and black bears are presented in Figure 7-21. Ruby was included in a study on the traditional ecological knowledge of nonsalmon fish (Brown et al. 2010). This section discusses the current results and compares them with prior harvest studies.

The ADF&G harvest estimates for 2000–2009 result in a 10-year average of 3,408 salmon harvested by Ruby and Kokrines residents. Despite the large harvest numbers, historical data points shown in Figure 7-22 present a picture of fluctuating salmon harvests in the past 17 years with a trend of decline over all salmon species.

During the 10-year period prior to the 2010 study year, 2004 had the highest salmon harvest. Ruby residents harvested 6,234 salmon of all species; the following year they harvested fewer salmon by more than 50% (3,080). Yukon River salmon, particularly Chinook salmon, have experienced extreme fluctuations in run size in recent years resulting in subsistence restrictions and unmet Pacific Salmon Treaty obligations (JTC 2013:4–5).

Between 1998 and 1999, Chinook salmon harvest dropped by more than 3,000 fish (3,891 in 1998 and 777 in 1999). In 2000, after years of being unable to maintain a harvestable surplus above US-Canadian border escapement goals, the Alaska Board of Fisheries declared Yukon Chinook salmon a "stock of concern" (Schmidt and Newland 2012:9). In 2000, ADF&G took unprecedented management actions and implemented subsistence restrictions on the summer portion of Chinook salmon fishing season (JTC 2001).

Although Chinook were the only salmon species officially designated as a stock of concern on the Yukon River, all other salmon species showed decline and extremely low harvest numbers in 2009 prior to the study year. In 2009, Ruby households harvested a total of 1,593 Chinook, summer chum, fall chum, and coho salmon. 2009 is the lowest salmon harvest of all other years presented in Figure 7-22. In contrast, this study estimated a total salmon harvest of 4,970 fish in 2010, a figure much higher than the prior year. Caution should be taken when comparing the study year's estimate to historical harvest numbers. The ADF&G Division of Commercial Fisheries collects the harvest numbers used to create Figure 7-22, and methods differ from those of the Division of Subsistence.

In 1984, a household survey administered in Ruby by the U.S. Fish and Wildlife Service documented the use and harvest of fish, big game, and furbearers (Looman 1987). Until the comprehensive survey in 2010, this was the only report documenting the community-wide use of furbearers. Households reporting trapping activity during the 1984 study year (68%) far exceeded household trapping activity in the 2010 study year (38%). Fifty-six percent of households harvested martens in 1984, but only 28% harvested them in 2010 (Looman 1987:31; Table 7-3). Despite this decline, martens continue to be the most heavily

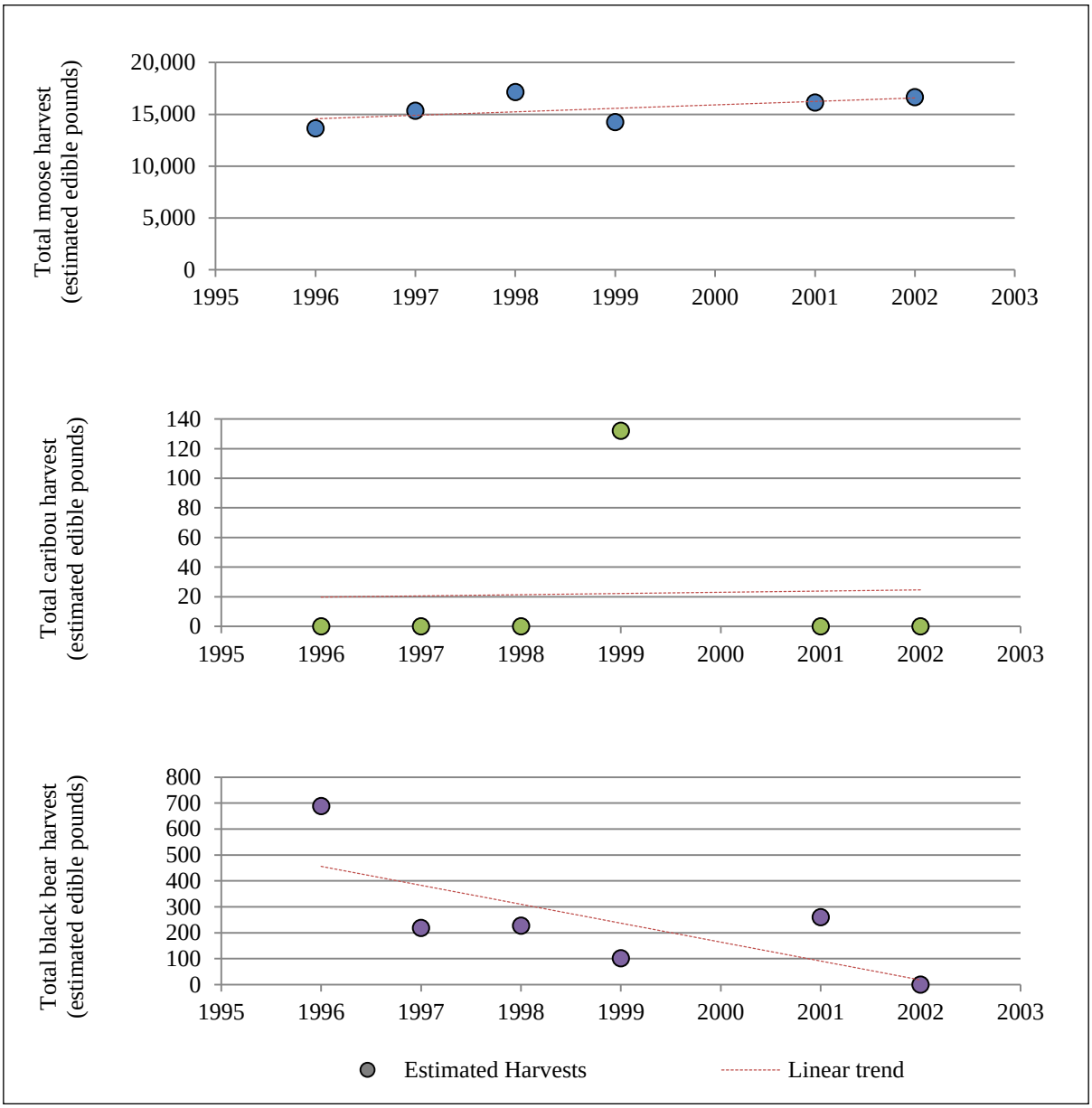


Figure 7-21.–Estimated large land mammal harvests in edible pounds, Ruby, 1995–2002.

harvested furbearer in Ruby. This study found that beavers had the second-highest household harvest rate in the small land mammals category in Ruby (11%). In 1984, however, mink came second to martens with a household harvest rate of 21%. The 2010 trapping data suggest that trapping activity by Ruby residents decreased between 1984 and 2010. During the fur trade in the 1800s and 1900s, trapping was a common winter camp activity. Employment opportunities were limited, and selling fur was a form of income that fit into the seasonal round of subsistence activities. In 2010, Ruby residents lived in year-round homes and had access to other forms of employment. Additionally, the demand for fur declined, which made trapping less profitable. These social and economic changes could explain the decline of trapping. However, without more regular harvest data, it is difficult to fully understand changes in harvest patterns.

Historically and in 2010, large land animals, particularly moose, have played an important role in Ruby's subsistence harvest. In 2010, an estimated 38% of Ruby households harvested large land animals, and 89% of Ruby households used them (Table 7-3). In the final Middle Yukon big game survey (MYBGS) report,

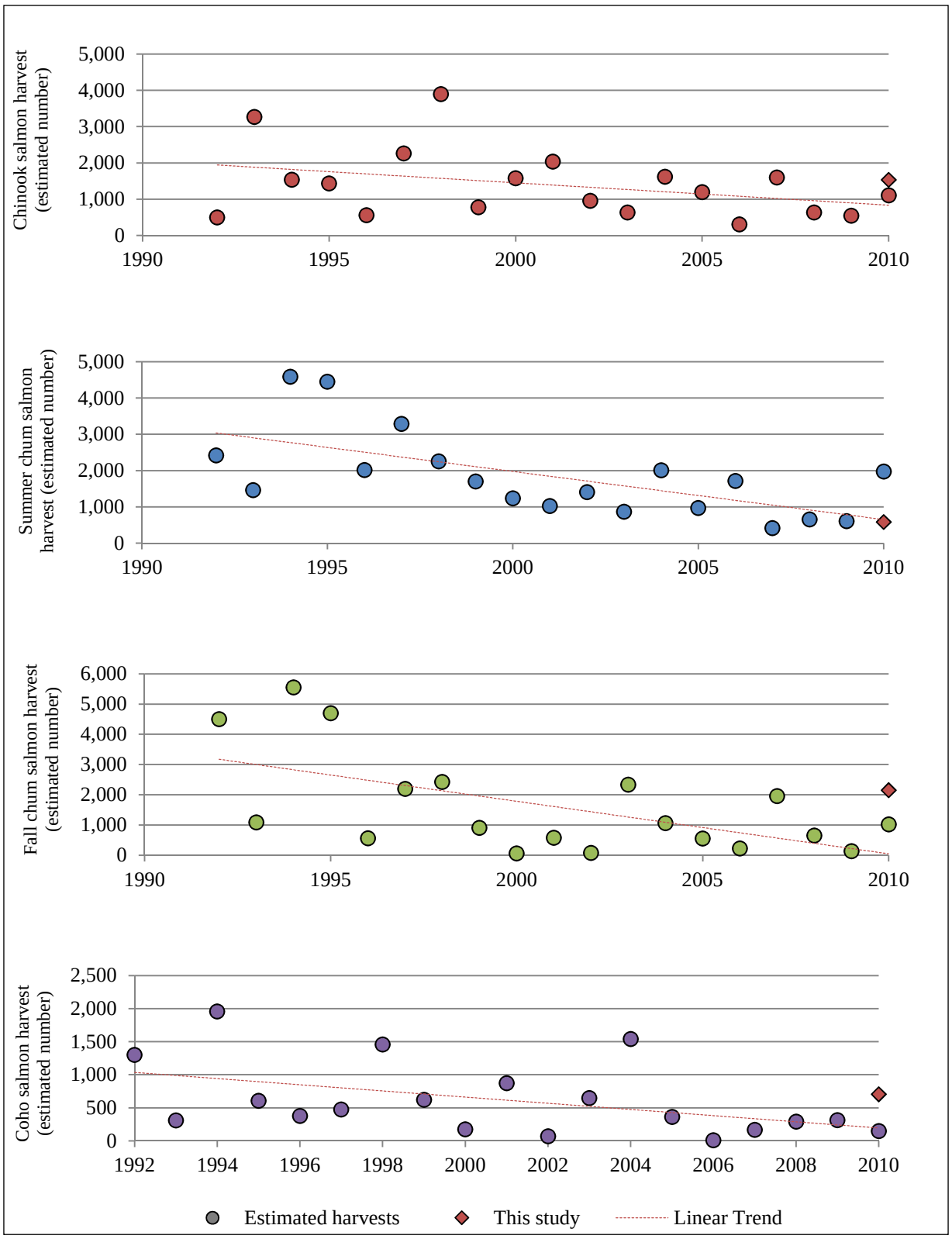


Figure 7-22.–Estimated salmon harvests in numbers of fish, Ruby, 1990–2010.

Table 7-9.–Moose hunter effort, Ruby, 1996–2002, 2010.

	Year						
	1996	1997	1998	1999	2001	2002	2010
Estimated harvest[a]	25	28	32	26	30	31	27
Harvest per household		0.39	0.47	0.36	0.40	0.31	0.66
Hunter effort[b]				6.3	22.4	17.8	9.0

a. Harvest in number of animals.
b. Hunter effort in days per moose harvested.
Source for 2010 from Alaska Department of Fish and Game Division of Subsistence household surveys, 2011; all other years ADF&G Division of Subsistence, Community Subsistence Information System (CSIS) https://www.adfg.alaska.gov/sb/CSIS

Brown et al. (2004:30) noted that although there was "remarkable consistency of harvest as well as use and distribution patterns of resources" over the course of the study (1996–2003), "measurable decreases" in moose, caribou, and black bear harvests were documented.

Despite the consistency regarding harvest noted in the concluding section of the MYBGS, the percentage of successful hunters did fluctuate over the 7-year study. Ninety-seven percent of moose hunters during the study year 1999–2000 made successful harvests. Contrastingly, 2 years earlier, only 35% of Ruby hunters successfully harvested moose.

In order to allow comparisons with the MYBGS, this survey included the same set of questions about harvest effort. In 2010, 18 of 85 hunters made successful moose harvests (21%) (Table C3). This harvest rate is lower than that in 2003, the final study year in the MYBGS. In that year, 97 hunters attempted harvest, and 31 households actually harvested a moose (32%) (Brown et al. 2004b). The average time needed to harvest a moose has decreased by one-half since the conclusion of the MYBGS. In 2003, the average number of days taken to harvest a moose was 18; in 2010 it was 9 (Brown et al. 2004b; Table C3). Without thorough ethnographic interviews, it is difficult to explain the decreased number of search days. A possible reason for a decline in the number of hunting days is the changing density of moose populations and their proximity to the community. In a year when many moose are close to the community, the average number of days needed to harvest a moose will likely be lower than years when moose are spread out over larger areas.

Table 7-9 presents the moose harvest per household and the average number of days to catch each moose. Over the 7 study years in the MYBGS, Ruby households harvested an average of 29 moose each year (Brown et al. 2004b:31). In 2010, households took an estimated 27, demonstrating consistency with the 7-year MYBGS average. The consistency of the 2010 moose harvest, with the harvest of years past, aligns with a final conclusion made in the MYBGS report. In general, "moose harvests in the Middle Yukon and Koyukuk River region are characterized by high participation rates and relatively consistent levels of harvest between years" (Brown et al. 2004b:25). Although moose harvest and hunter effort continued to seem stable, the final report stated that an increased difficulty

> …experienced by most moose hunters in the area is particularly troubling since moose is the primary big game species used by these communities; the value of moose cannot be overestimated as a resource important for food, ceremony, and identity in these primarily Koyukon Athabascan communities. (Brown et al. 2004b:30)

Although harvest numbers in both studies are similar, these numbers do not necessarily suggest a similar hunter effort. Increased effort may compensate for low moose abundance or, contrastingly, low hunter effort may be offset by an abundant moose population. These factors can lead to harvest data comparable to study years when circumstances differed.

Brown et al. (2004) attributed the fluctuating and commonly low caribou harvests to the nature of caribou herds themselves. The 2004 report explains that, "caribou harvests in the middle Yukon-Koyukuk River area vary depending on the movements of caribou herds (thought to be mostly from the Western Arctic

Caribou Herd) and their proximity to communities" (Brown et al. 2004b:11). Caribou harvests in Ruby are low and uncommon. In 1999, the only MYBGS study year that recorded caribou harvest, a total of 132 caribou were harvested. In comparison, 2% of Ruby households harvested a total of 3 caribou in 2010 (Table 7-3). Unusual availability in the local area or travel to another area in the state with better herd access may account for this small caribou harvest.

Similar to 5 out of the 8 MYBGS study years, no brown bear harvests were reported in 2010 (Brown et al. 2004b; Table 7-3). The low number of black bears (4) harvested by Ruby households in 2010 is consistent with the 7-year average of 3 black bears between 1996 and 1999, and early part of the next decade.

Comparing harvest fluctuations across time requires an understanding of local culture, changes in lifestyles, natural animal population cycles, and species population abundance. Steep declines in salmon, particularly Chinook salmon, led many participants in this study to report that their needs were not met. A shift from seasonal residency to a permanent townsite has shaped Ruby's hunting and fishing practices especially in regards to the once-common winter activity of trapping. The harvest of large land animals, especially moose, often depends on a multitude of factors, including distance required to find the animals, access to hunting equipment, the number of animals in the area, and competition with other hunters. Results in the "Wild Food Networks" section demonstrate that despite fluctuations in harvest, the community of Ruby actively distributes food to those who did not make harvests themselves. Sharing plays a vital role in mitigating the difference between low harvest numbers and a household's ability to "get enough." Consequently, the use of subsistence resources remains high, the importance of wild foods significant, and the communal nature of subsistence substantial.

8. REGIONAL DISCUSSION AND CONCLUSION

Prepared by Caroline L. Brown, Elizabeth H. Mikow, and Jeff Park

As part of the survey, residents of the lower and middle Yukon River areas described active lifestyles and patterns of engaging in a variety of subsistence activities, including harvesting large and small mammals, several species of salmon and nonsalmon fishes, migratory waterfowl, upland game birds, and a variety of edible and medicinal plants. As many others do in rural Alaskan communities, the residents of Mountain Village, Marshall, Nulato, Galena, and Ruby pointed out that access to subsistence resources is essential to maintaining their cultural heritage and family and community ties and well-being.

Between January and December 2010, residents of the 2 lower and 3 middle Yukon River communities surveyed reported harvesting an estimated total of 566,082 edible pounds of wild resources (Tables 3-1, 4-1, 5-1, 6-1, 7-1). Broken up by region, the 2 lower Yukon communities—Mountain Village and Marshall—harvested a total of 342,191 lb with an average harvest rate of 304 lb per capita (Tables 3-1, 4-1, C1-2). The 3 middle Yukon communities—Nulato, Galena, and Ruby—harvested a total of 223,891 lb with an average harvest rate of 259 lb per capita (Tables 5-1, 6-1, 7-1, C1-2).

The objective of this first year of the Index Communities Research Program was to describe the contemporary subsistence uses of fish, wildlife, and plant resources by the 2 lower Yukon communities and the 3 middle Yukon communities. These data would then be evaluated along with other data sets from the same regions in order to select index communities for each region (see Introduction for a more detailed description of project objectives). The principal questions addressed were what quantity of wild foods are harvested for subsistence and how these foods are distributed within and between communities. The survey also collected data on the lands and waters used for subsistence in the lower and middle Yukon River areas, as well as local assessments of harvests and food security. For the purposes of this discussion, the two areas—lower and middle Yukon River—will be considered separately since the analysis of potential index communities will occur on a regional level.

Demographics

The communities surveyed in this study—Mountain Village and Marshall in the lower Yukon and Nulato, Galena, and Ruby in the middle Yukon—had a total estimated population of 1,992 individuals with averages of 564 individuals for the lower river communities and 288 individuals in the middle river communities (Table C1-2). Populations ranged from 180 people in the smallest community, Ruby, to 785 people in Mountain Village, the largest survey community. The lower river communities of Marshall and Mountain Village appear to have experienced increases in population over the previous 2 decades, with numbers of people remaining relatively steady in the last decade. In the middle river communities, the populations of Nulato and Ruby have remained remarkably stable over the last several decades, while Galena experienced a dramatic increase in population from 1970 through 2000, as the community grew into a regional hub for the middle Yukon River area. One of the primary factors in this growth was the establishment of a U.S. Air Force base in the early 1940s. The base was later realigned in 1994, resulting in a 20% reduction in the community population; it ultimately closed in 2005 (Galena Economic Development Council 2007).

Residents of the lower Yukon communities are of Yup'ik descent, while the middle river residents are primarily Athabascan, specifically Koyukon Athabascan. In the lower river communities, approximately 92% of households identified themselves as Alaska Native; and in the middle river communities, approximately 81% of households self-identified as Alaska Native.

Regional Wild Food Harvests and Comparisons

The primary objective of data collection in this study was to expand the available contemporary comprehensive data for the middle and lower Yukon River regions in order to assist in the analytical process of selecting

"index" communities. As such, this section will consider the 2010 data in the context of existing regional data on harvest and use practices. It will describe these existing data for each region, highlighting select points of comparison that may become important in the process of an index-community analysis.

Lower Yukon River

Existing regional data for the lower Yukon River region are not extensive, but they do allow for some points of comparison that will be discussed in greater detail below. Table 8-1 lists available data on harvest by subsistence resource category and community, noting the year(s) represented in each data set. Regionally, only 4 out of the 8 communities—Nunam Iqua, Alakanuk, Emmonak, and Mountain Village—had comprehensive subsistence harvest data until this research (increasing that number to 5). Other sources for comparison can be found in data sets for 4 important resource categories: large land mammals, marine mammals, salmon, and nonsalmon fish. Salmon data extend back into the 1960s, but because of methodological changes, those data are not comparable with more recent data until 1988, when the methods for the current program were implemented. Limited additional data sets for nonsalmon fish harvests also exist for all 8 lower Yukon River region communities.

This section begins with a brief comparison of total and per capita harvest levels between the 3 communities in the lower river region—Alakanuk, Emmonak, and Mountain Village—for which both an early baseline of subsistence harvests and a more recent comprehensive subsistence harvest dataset exist. Details of these comparisons can be found in their respective Results chapters for Marshall and Mountain Village and in Fall et al. (2012) for Emmonak. Next, this section considers the harvests of 4 resources or resource categories—large land mammals (specifically moose), salmon, whitefishes, and marine mammals—in order to focus on those aspects of the annual subsistence harvests for lower Yukon River communities that emerge as a regional pattern.[1] A cautionary note is in order—two data points do not always represent a trend; however, some of the shifts described below are consistent across communities and with local knowledge documented in the region. These patterns may prove useful for understanding similar changes in unsurveyed communities and assist in developing the index approach described earlier.

All 3 communities show a decline in per capita harvests from 1980 to 2008–2010. In 1980, residents in Mountain Village harvested an estimated 423,108 lb of wild foods with a per capita harvest of approximately 820 lb (Wolfe 1981). In 2010, the estimated total harvest by residents was 207,765 lb with a per capita of 265 lb (Table 3-1). In 1980, Emmonak residents harvested an estimated 275,490 lb of wild resources with a per capita harvest of 612 lb (Wolfe 1981). In 2008, community members harvested an estimated 379,803 lb of wild foods with a per capita harvest of 482 lb (Fall et al. 2012). In 1980, Alakanuk residents harvested an estimated 431,904 edible pounds of wild foods, with a per capita harvest of 725 lb (Wolfe 1981). In 2008, Alakanuk households harvested an estimated 279,965 lb of wild foods, with a per capita harvest of 322 lb (Wolfe and Scott 2010). In Mountain Village and Alakanuk, community population increased while overall subsistence harvests by weight decreased, resulting in much lower per capita harvests in the 2000s than in the 1980s. In Emmonak, both the human population and the overall subsistence harvest increased. However, the increase in harvest levels did not necessarily track proportionately with the growth in the human population, resulting in moderate decrease in per capita harvest levels.

Harvest Comparisons by Resource

Across the 3 communities, several shifts in the harvest of particular resources or resource categories may clarify the contemporary subsistence practices in the lower river region both in terms of amounts harvested and the composition of the harvest (Figures 8-1, 8-2, and 8-3) . This section identifies these shifts by considering these resources and resource categories individually and in the context of other existing data.

1. Data presented in Wolfe (1981) and Fall et al. (2012) can also be found at Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." https://www.adfg.alaska.gov/sb/CSIS

Table 8-1.–Harvest surveys, lower Yukon River communities, 1977–2011.

Community	2011 population	Type of survey				
		Comprehensive	Salmon	Nonsalmon fish	Large land mammal	Marine mammal
Nunam Iqua (Sheldon Point)	190	1980 [2]	1988–present [4]	1977 [1]	2011 [10]	
Alakanuk	683	1980 [2]	1985 [3]	1977 [1]	2011 [10]	
			1988–present [4]			
			2009 [8]			
Emmonak	796	1980 [2]	1988–present [4]	1977 [1]		1997, seals and sea lions [6]
		2009 [8]				1998, seals and sea lions [7]
Mountain Village	835	1980 [2]	1988–present [4]	1977 [1]	1992, brown bear [5]	
		2010 [9]			2011 [10]	
St. Mary's and Andreafsky	554		1988–present [4]	1977 [1]	1992, brown bear [5]	
					2011 [10]	
Pilot Station	583		1988–present [4]	1977 [1]	1992, brown bear [5]	
Marshall	407	2010 [9]	1988–present [4]	1977 [1]	1992, brown bear [5]	
					2011 [10]	
Russian Mission	303		1985 [3]	1977 [1]	1985 [3]	
			1988–present [4]		2011 [10]	

1. Crawford, D. 1978. Lower Yukon River sheefish study, October 1977–June 1978. Alaska Department of Fish and Game Division of Commercial Fisheries, AYK Region Sheefish Report No. 9, Anchorage.
2. 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.
3. Pete, M. C. 1991. 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.
4. Alaska Department of Fish and Game Division of Commercial Fisheries, annual postseason salmon surveys.
5. Hensel, C. 1993. Brown bear harvests in the Western Alaska Brown Bear Management Area, 1992/1993: statistical information and cultural significance, results of the Association of Village Council Presidents harvest survey of October–December 1993. Association of Village Council Presidents (AVCP), Bethel.
6. Coffing, M., C. L. Scott, 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.
7. Coffing, M., C. L. Scott, C. J. Utermohle. 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.
8. Wolfe, R. J. and C. Scott. 2010. Continuity and change in salmon harvest patterns, Yukon River drainage, Alaska. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Final Report (Study No. 07-253). Robert J. Wolfe and Associates, San Marcos, CA.
9. ADF&G Division of Subsistence household surveys, 2011.
10. Weekley, G., B. Brettschneider, A. Brettschneider, O. Ramirez, T. Haynes. 2011. Lower Yukon large land mammal subsistence harvest survey: The 2009–2010 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.

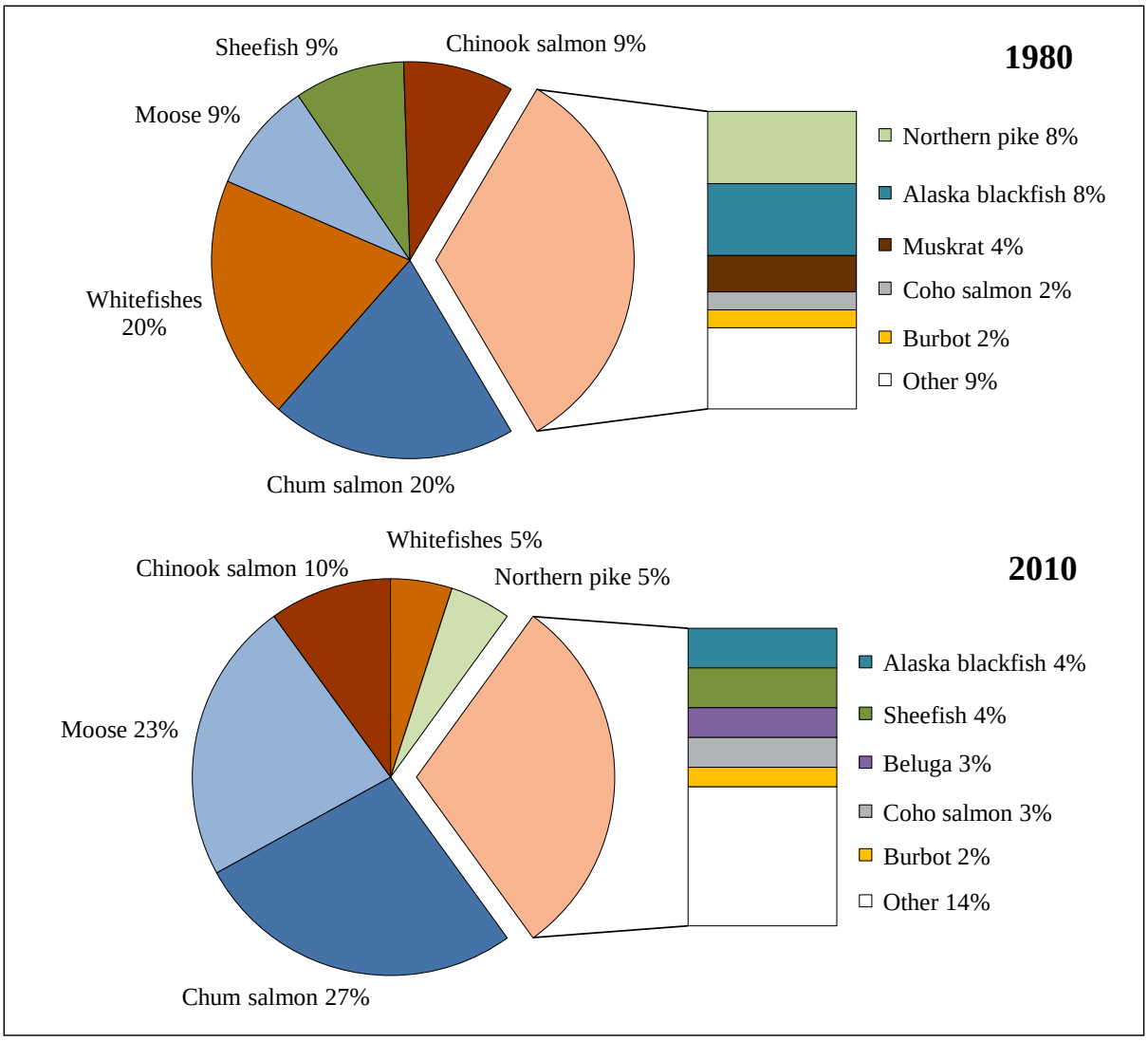


Figure 8-1.–Top 10 resources harvested, ranked by estimated edible weight. Mountain Village, 1980 and 2010.

Moose

Wildlife managers divide the lower Yukon River region into 3 areas: the lower Yukon near the mouths of the river, the Andreafsky area (containing the community of Mountain Village), and the Paimiut area (containing Marshall). Lower Yukon River moose populations in GMU 18 did not support significant moose harvests until a few years before 2010; prior to that, many lower river residents traveled long distances upriver to harvest moose in GMU 21E near Holy Cross and the Paimiut area. However, by 2010, moose populations in the lower Yukon River had increased such that many residents were able to hunt closer to their home communities. A 2008 population estimate survey in the lower Yukon estimated approximately 3,320 moose in the area, or about 2.7 moose per square mile (Perry 2010). A 2002 survey in the Andreafsky area estimated approximately 418 moose in that area, or 0.36 moose per square mile (Seavoy 2004). And finally, in the Paimiut area, a 2006 survey estimated 3,614 moose, or approximately 2.3 moose per square mile, showing steady growth since 1992 (Perry 2008). Moose composition surveys in the lower Yukon and the Andreafsky area in 2010 indicated that these populations are doing well, with 69 and 61 calves per 100 cows respectively and 50% twinning rates, suggesting sufficient habitat to support a healthy moose population (P. Perry, Area Biologist, ADF&G, Bethel, personal communication, June 7,

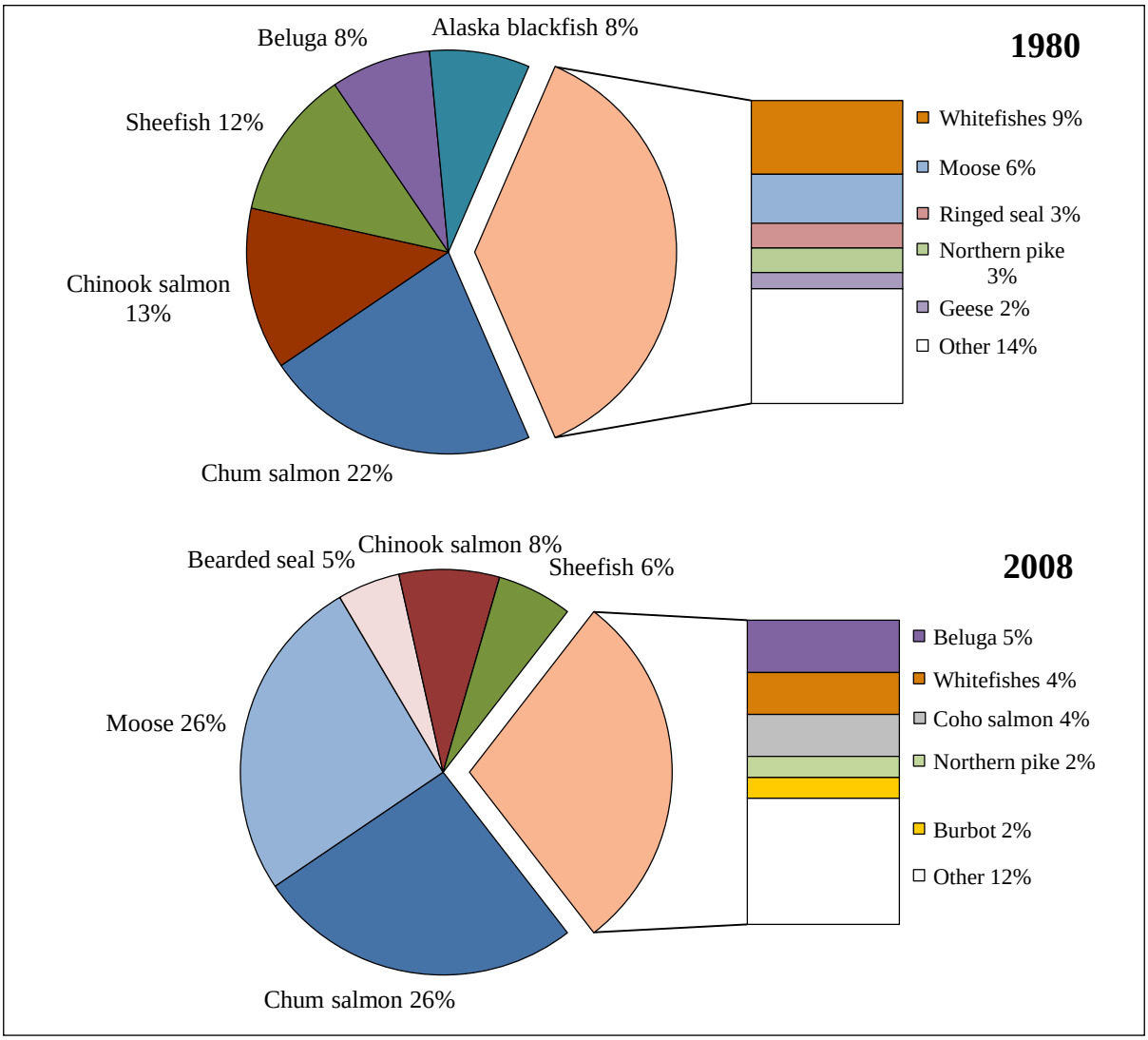


Figure 8-2.–Top 10 resources harvested, ranked by estimated edible weight, Emmonak, 1980 and 2008.

2012). Ethnographic interviews conducted during the 2008 study in Emmonak confirmed that residents were seeing many more moose in the several years prior to 2010 than in the decade before, consistent with the 2008 biological data (Fall et al. 2012). These increased moose populations recently led to liberalized hunting regulations. In 2012, the BOG adopted regulations allowing for a 2 moose bag limit per hunter in the lower Yukon hunt area downriver from Mountain Village.

Recent harvests in the lower Yukon region reflect these increased moose populations and the more liberal hunting regulations, especially when compared to earlier sources. Several studies offer contexts for the 2010 moose harvest estimates, including a Norton Sound/Yukon–Kuskokwim Delta baseline analysis (Wolfe 1981), a partial survey in Russian Mission in 1985 (Pete 1991), and a comprehensive subsistence survey in Alakanuk (Wolfe and Scott 2010), and the more recent lower Yukon large mammal subsistence harvest survey (Weekley et al. 2011) (Table 8-1). These sources taken together point to increased harvest levels of moose in the lower Yukon River region over time. In 1980, Emmonak residents harvested an estimated 25 moose (0.06 moose or 38 lb per capita), and in 2008, they harvested an estimated 136 individual moose (0.17 or 123 lb per capita) (Fall et al. 2012; Wolfe 1981). Similar figures hold true for Alakanuk residents. In 1980, 34 individual moose (0.06 or 41 lb per capita) were harvested, compared to 92 individuals (57 lb per capita) in 2008 and 64 moose (93 lb per capita) in 2009 (Weekley et al. 2011; Wolfe and Scott 2010). This

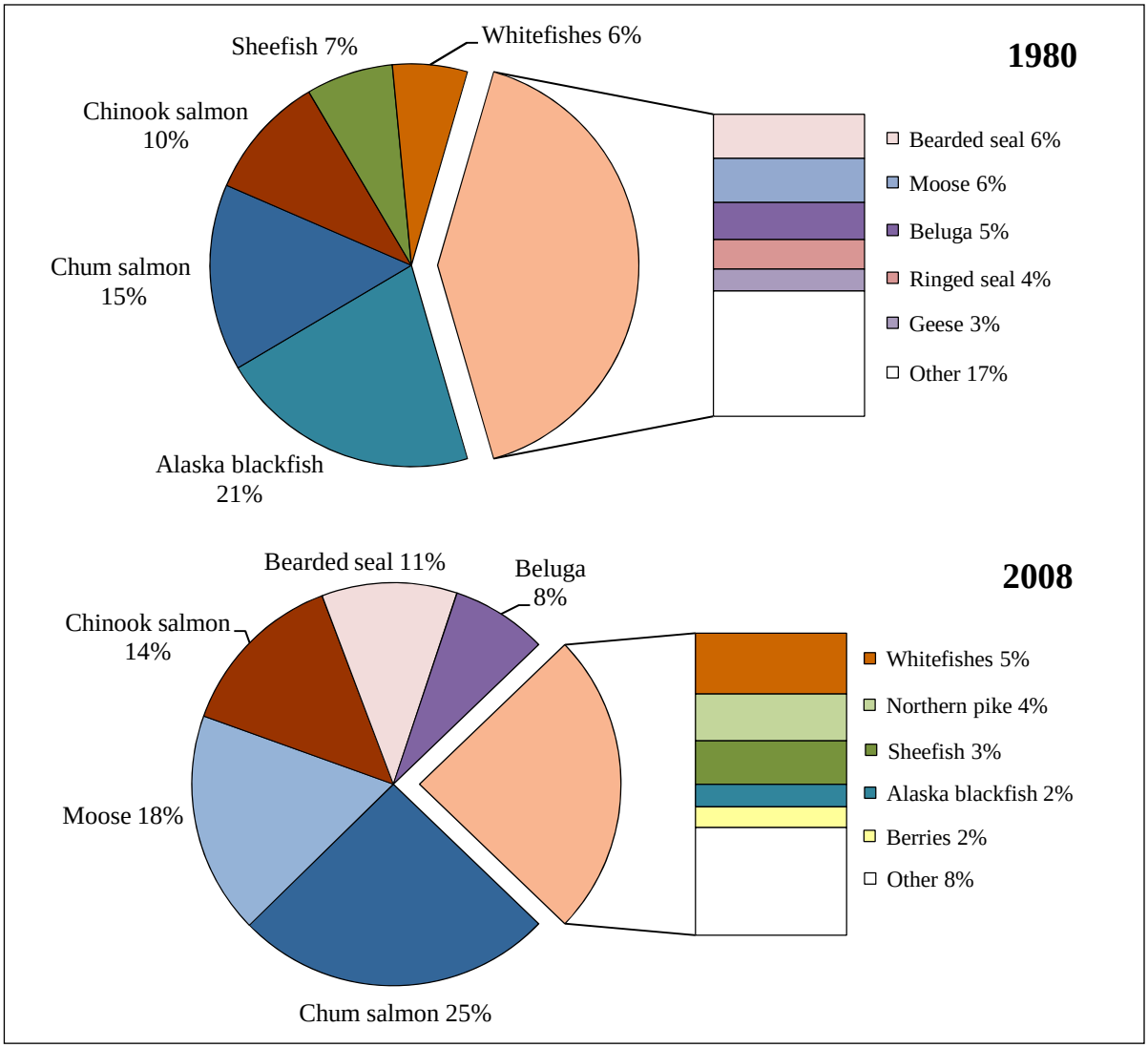


Figure 8-3.–Top 10 resources harvested, ranked by estimated edible weight, Alakanuk, 1980 and 2008.

pattern also follows in Nunam Iqua, where residents reported harvests of 7 moose (0.05 or 34 lb per capita) in 1980 compared to an estimated 18 moose (0.10 or 77 lb per capita) in 2009 (Weekley et al. 2011; Wolfe 1981). Mountain Village offers one exception to this pattern in that moose harvests have stayed relatively stable over time when accounting for changes in the human population: in 1980, residents harvested an estimated 54 moose (0.10 or 75 lb per capita), and in 2010 they harvested 88 moose (0.11 or 61 lb per capita) (Table 3-3; Wolfe 1981). Although the total moose harvest increased, a larger human population resulted in lower per capita rates, from 75 lb per person in 1980 to 61 lb person in 2010.

Much further upriver than these more coastal communities, Russian Mission showed a modest increase in harvests over time: residents harvested an estimated 33 moose (0.14 moose or 98 lb per capita) in 1985, compared to 51 moose (0.16 or 123 lb per capita) in 2009 (Weekley et al. 2011; Wolfe 1981). The lower Yukon large mammal survey and this 2010 study also allow for a comparison of recent data in Marshall: harvest levels are similar for both the 2009 and 2010 study years, with estimated harvests of 44 moose (0.17 or 128 lb per capita) and 43 moose (0.12 or 67 lb per capita), respectively (Table 4-3; Weekley et al. 2011).

Regardless of differences in the patterns of per capita rates between communities, the increased harvest of moose in all of these communities over time is reflected in changes to the composition of the total harvest

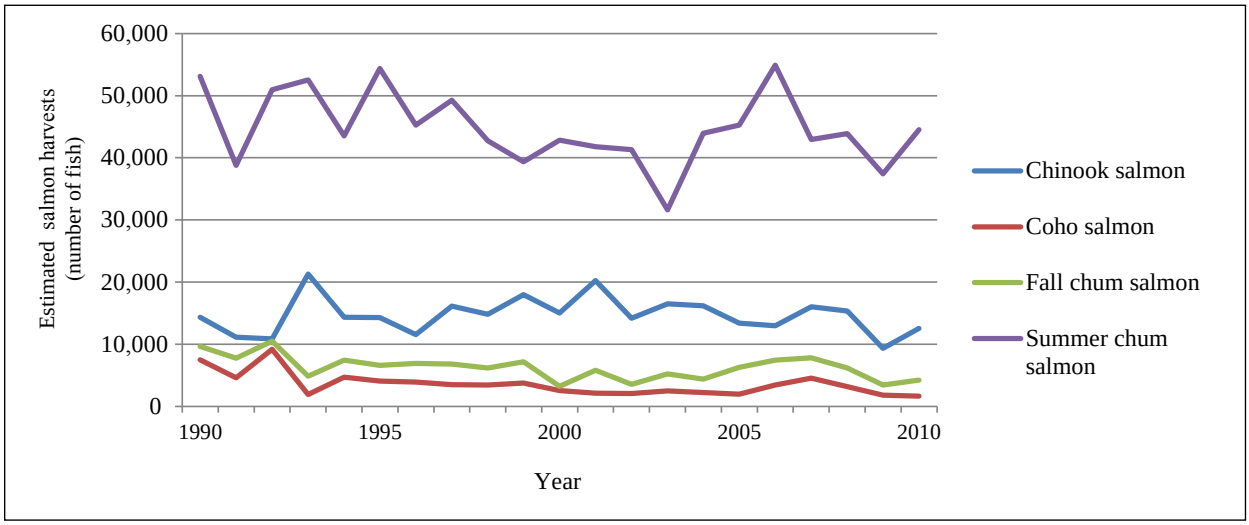


Figure 8-4.–Estimated salmon harvests in numbers of fish, lower Yukon River region, 1990–2010.

(Figures 8-1, 8-2, and 8-3). In 1980, moose accounted for 6%, 6%, and 9% of the total harvest in Alakanuk, Emmonak, and Mountain Village, respectively. By the 2000s, moose accounted for 18%, 26%, and 23% in those same communities.

Salmon

Figure 8-4 shows salmon harvests from 1990 to 2010 for all communities in the lower Yukon River region. Lower river residents have always harvested summer chum salmon in larger quantities than any other salmon species, followed by Chinook salmon. As described in the Introduction to this report, Chinook salmon runs have declined over the last 15 years, accompanied by more conservative management to meet escapement needs and treaty obligations. There was a complete closure of the fall season in 2000, which severely affected the subsistence harvests of fall chum and coho salmon. However, by 2007, fall chum salmon runs had rebounded and have remained healthy.

Figure 8-5 shows a breakdown of subsistence salmon harvests in 3 discrete years: 1990, 2000, and 2010. Over time, the contribution of each species to total subsistence harvests of salmon has remained relatively stable, despite declines in different species over time. The importance of summer chum salmon is evident, accounting for over 60% of the total harvests in each comparison year.

Despite the relative stability of harvest composition in terms of species, per capita harvests have fallen over time. In 1980, residents of Alakanuk harvested 73 lb per capita of Chinook salmon, 112 lb of chum salmon (both summer and fall chum combined), and 12 lb of coho salmon per capita; in 2008, residents harvested 44 lb per capita of Chinook salmon (likely related to restrictions in the subsistence fishery), 82 lb of chum salmon (likely a result of efforts to conserve Chinook salmon which migrate with summer chum salmon), and 5 lb of coho salmon per capita (Wolfe and Scott 2010; Wolfe 1981).[2] This trend of lowered per capita harvests over time is echoed in both Mountain Village and Emmonak. In 1980, Mountain Village residents harvested 72 lb of Chinook salmon, 164 lb of chum salmon, and 18 lb of coho salmon per capita; in contrast, residents harvested 26 lb of Chinook salmon, 74 lb of chum salmon (including summer, fall, and unknown chum salmon), and 8 lb of coho salmon per capita in 2010 (Table 3-2; Wolfe 1981). In 1980, Emmonak residents harvested 80 lb of Chinook salmon, 132 lb of chum salmon, and 15 lb of coho salmon per capita; in 2008, residents harvested 39 lb of Chinook salmon, 125 lb of chum salmon, and 21 lb of coho salmon per capita (Fall et al. 2012; Wolfe 1981). Although declines in per capita harvests can be seen in most cases for

2. Wolfe and Scott's (2010) data on salmon harvests are much higher than data derived from ADF&G's postseason salmon survey in Alakanuk from 2008 (1,238 Chinook salmon, 6,881 summer chum, 1,675 fall chum, and 157 coho salmon), suggesting even lower per capita rates of salmon harvest compared to 1980 estimates. These differences are likely due to sampling methods.

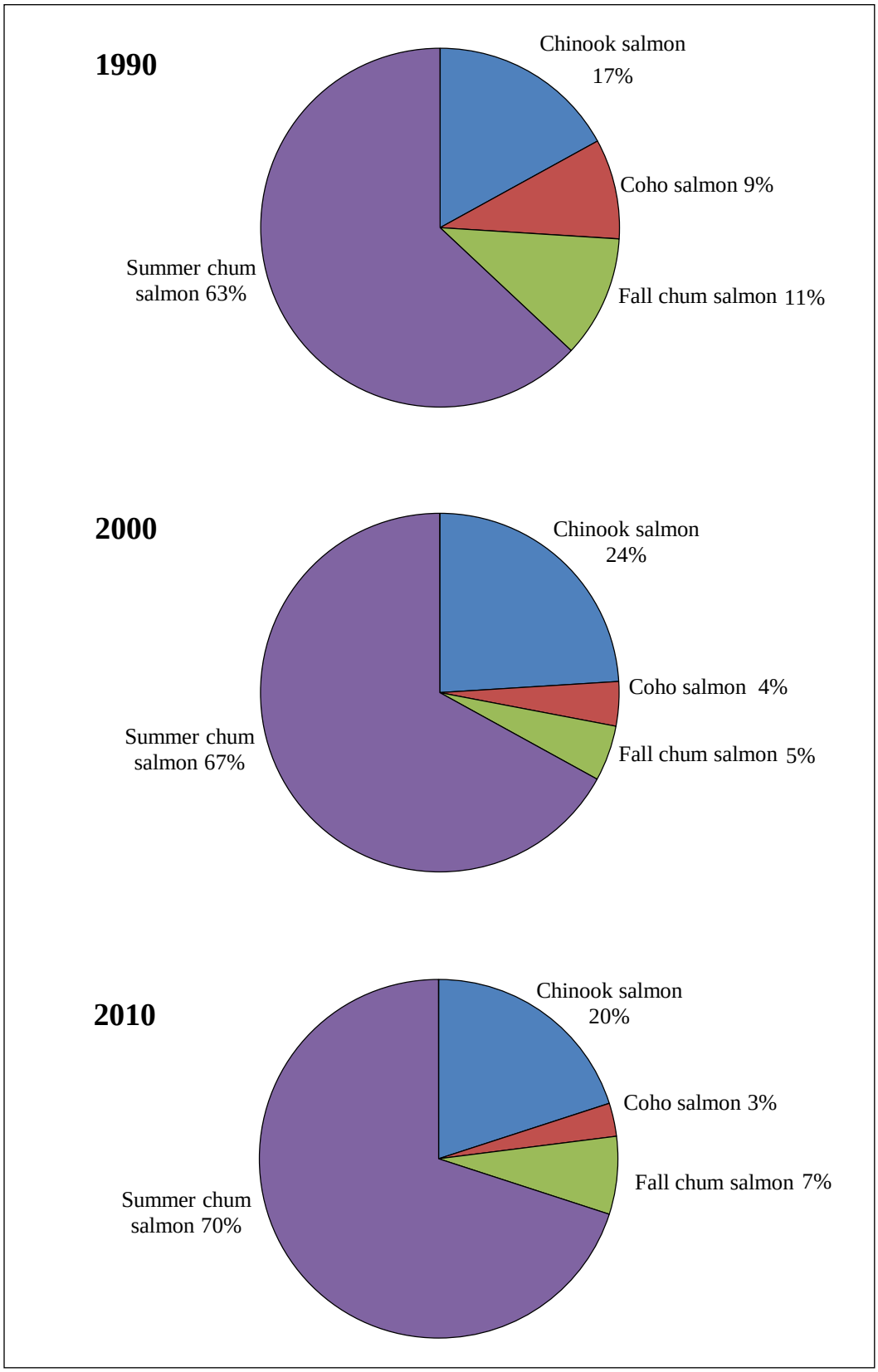


Figure 8-5.–Composition of salmon harvests, lower Yukon River region, 1990, 2000, and 2010.

all salmon species, the decline is most evident in Chinook salmon harvests, likely due to the dual effect of decreased subsistence opportunity related to resource abundance and cascading effects in the reduction of cash available for subsistence activities resulting from elimination of commercial opportunities for Chinook salmon, which began in 2008 (see the Mountain Village chapter for a more detailed description).

Per capita levels provide certain clues regarding the role of salmon within the total subsistence harvest. Across the 3 communities for which older salmon harvest data can be compared with more recent data, salmon compose a greater proportion of the total subsistence harvest in the 2000s when harvests of Chinook salmon and chum salmon had declined than in 1980 when combined harvests were higher. In 1980, Mountain Village residents harvested 19,704 Chinook and chum (summer and fall chum salmon combined) salmon, but they harvested only 13,646 of these fish species in 2010 (Table 3-2; Fall et al. 2012). At the same time, Chinook and chum salmon constituted 29% of the total harvest in 1980, but in 2010, they constituted 37% of the total harvest (Figure 8-1). Despite declining harvests and per capita rates, salmon species accounted for a greater percentage of the total subsistence harvest. The same pattern held for Alakanuk between 1980 and 2008 (Figure 8-2). The exception to this is Emmonak, where increasing salmon harvests resulted in similar per capita rates and percentage of the total subsistence harvest in 1980 and 2008 (Figure 8-3). In this case, harvest levels appear to have kept pace with increases in the human population in Emmonak.

Marine Mammals

An additional point of comparison exists for marine mammal harvests in the lower Yukon River region based on comparisons between Wolfe's 1980 research (1981), 2 reports describing the harvest of ice seals (Coffing et al. 1998, 1999), the 2008 comprehensive research in Emmonak (Fall et al. 2012), and the current research findings. A comparison of data from these sources reveals variable shifts in the patterns of the harvest and use of marine mammals in the lower river communities of Emmonak, Mountain Village, and Alakanuk. For example, in Emmonak, marine mammal harvests were a smaller percentage of the total subsistence harvest in 2008 (11% of the total harvest) than in 1980 (15%), although total harvest levels are similar for the two study years (42,533 lb and 43,310 lb, respectively) (Figure 8-2; Fall et al. 2012; Wolfe 1981). A species-level analysis, however, suggests shifts in the patterns of the harvest and use of beluga whales and seals. The seal hunt, specifically, appears to be affected by changes in the timing, location, and social organization of seal harvests (Fall et al. 2012; Fienup-Riordan et al. 2013). During the 12-month period between June 1980 and May 1981, hunters in Emmonak harvested an estimated 139 ringed seals and 39 bearded seals (Wolfe 1981). Ringed seals were the largest portion of the community's total seal harvest by edible weight. Households harvested an estimated 19 lb of ringed seal per person, compared to an estimated 12 lb each of bearded seal and spotted seal per person. The composition of the seal harvest was nearly opposite in 2008: hunters harvested an estimated 136 bearded seals and 28 ringed seals (Fall et al. 2012). Correspondingly, the per capita harvest of bearded seal doubled (to 24 lb per person), while ringed seal harvest (2 lb per person) was a fraction of the 1980 value. Spotted seal harvest in 2008 (3 lb per person) was just one-quarter of that in 1980 (12 lb per person) (Fall et al. 2012; Wolfe 1981). This change in seal harvest patterns may be directly related to changes in the timing of seal harvests by Emmonak residents (Fall et al. 2012). In 2008, a majority of seal harvests (82%) occurred in the open water months of August through October. In contrast, it is likely that the harvest of ringed seals in 1980 took place in the spring months on the leads of shorefast ice.

Other changes between the study years are evident in the composition of marine mammal harvests. Beluga whales were an important resource for Emmonak residents in both 1980 and 2008, contributing 8% of the total estimated harvest in 1980 (33 whales) and 5% in 2008 (28 whales) (Figure 8-2). However, the per capita harvest in 2008 (25 lb per capita) is only one-half that of 1980 (52 lb) as a result of growth in the human population without a proportional increase in the beluga harvest (Fall et al. 2012; Wolfe 1981).

Hunters in Alakanuk, too, reported shifts in the composition of their seal harvest between 1980 and 2008 (Wolfe and Scott 2010; Wolfe 1981). Within an overall decline in marine mammal harvests from 75,424 lb in 1980 to 56,441 in 2008, Alakanuk hunters harvested similar amounts of bearded seals and beluga whales between the 2 years, but dramatically decreased their harvests of ringed and spotted seals (a combined

26,224 lb in 1980 to 4,428 lb in 2008) (Fall et al. 2012; Wolfe 1981). In contrast, hunters in Mountain Village appear to have decreased their harvest of both bearded and spotted seals (6,720 lb in 1980 and 3,525 lb in 2010; 4,368 lb in 1980 and 970 lb in 2010, respectively) while increasing their harvest of beluga whales (there was no reported harvest in 1980 and a harvest of 6 whales [6,296 lb] in 2010). Based on these comparisons, other lower Yukon area communities may also be experiencing shifts in their harvests of marine mammals, especially harvests of seals and beluga whales.

Whitefishes

Table 8-2 summarizes the existing data for whitefishes (including sheefish) harvests in the lower Yukon River region. It is difficult to compare any of the other data points with the 1977 lower Yukon River sheefish study, because these results only reflect reported harvests from a small sample of fishing households in the respective communities and only accounted for the winter fishing season (Crawford 1978).

Similarly, it is difficult to draw any concrete conclusions from a comparison of the other data sets because of the variability in the data described below.[3] However, it appears that harvest levels from 1980 are much higher for both whitefishes and sheefish in the 4 study communities compared with 10-year averages of harvests from 1997 to 2006 taken from ADF&G Division of Commercial Fisheries postseason salmon surveys, which include harvest estimates of nonsalmon fish species. Accounting for changes in the human population by evaluating per capita harvest levels provides additional information. For example, Emmonak fishers harvested an estimated of 51 whitefish per person in 1980 (total estimated harvest of 22,872 fish), compared with 23 whitefish per capita in 2008 (total estimated harvest of 10,856); for sheefish, estimated harvests were 9 fish per capita in 1980 (4,017 total fish), compared with 6 fish per capita in 2008 (2,762 total fish).

Comparing more recent data from comprehensive surveys with the 1997–2006 whitefish harvest average may indicate a more stable harvest pattern in recent years. Mountain Village's estimated total harvest of 5,608 whitefishes and 1,307 sheefish in 2010 falls within the range of harvests reported on the postseason surveys between 1997 and 2006 (1,364 to 5,022 whitefishes; 414 to 1,437 sheefish) even though they are higher than the average harvest of that decade (Table 8-2). The same general pattern holds true for Marshall fishers' estimated harvests of 3,766 whitefishes and 857 sheefish in 2010, which was just above the 1997–2006 averages (3,121 whitefishes and 628 sheefish). Emmonak is an exception to this pattern: 2008 harvests of both whitefishes and sheefish are much larger than any of the individual years between 1997–2006 or the averages of those years (4,162 whitefishes and 1,551 sheefish).

Considering the contribution of whitefish harvests to total subsistence harvests in lower river communities also provides information about lower use levels. For example, although whitefishes harvests still made up a significant portion of Mountain Village's 2010 harvest (5%, 9,882 lb), whitefish species combined composed a greater contribution to the estimated 1980 harvest (20%, 83,690 lb) (Table 3-1; Wolfe 1981). Similarly, whitefishes accounted for 21% of Emmonak residents' total subsistence harvests in 1980 but only 12% in 2008 (Figure 8-2). The recent lower harvest estimate could potentially reflect either a decreased need for nonsalmon fish to feed dog teams or changing patterns of use for human food, among other reasons.

Middle Yukon River

Like the lower Yukon River region, the middle Yukon area is not described by a large amount of recent harvest data. Table 8-3 lists available data on harvest by subsistence resource category and community, noting the year(s) represented in each data set. Only 2 of the 6 communities in the middle Yukon area (Tanana and Galena) had comprehensive subsistence harvest data until this research, which increases that

3. ADF&G, Division of Commercial Fisheries (CF) also collects nonsalmon harvest data in the postseason salmon surveys conducted in communities along the Yukon River. However, that collection of nonsalmon harvest data is not the primary purpose for the postseason surveys. Further, the implementation of this postseason survey immediately following the salmon season is timed to document accurate salmon harvests. Because nonsalmon fish are harvested all year long, the recall period for fishers is much longer, likely producing less accurate results for nonsalmon harvests.

Table 8-2.–Sheefish and whitefishes harvests in numbers of fish, lower Yukon River communities, 1977–2010.

	Harvest study									
	ADF&G Division of Commercial Fisheries harvest surveys, 1977[a] (reported)		ADF&G Division of Subsistence baseline studies, 1980[b] (estimated)		ADF&G Division of Commerical Fisheries postseason salmon surveys 10-year average, 1997–2006[b] (estimated)		Comprehensive surveys, 2008 (estimated)		ADF&G Division of Subsistence comprehensive survey, 2010[e] (estimated)	
Community	Sheefish	Whitefishes	Sheefish	Whitefishes	Sheefish	Whitefishes	Sheefish	Whitefishes	Sheefish	Whitefishes
Nunam Iqua (Sheldon Point)	465	2	2,323	3,167	877	1,567				
Alakanuk	377	139	3,969	25,071	1,398	2,916	1,231[c]	1,482[c]		
Emmonak	337	479	4,017	22,872	1,551	4,162	2,762[d]	10,856[d]		
Mountain Village	43	76	6,900	24,876	874	3,651			1,307	5,608
St. Mary's and Andreafsky	132	540			798	3,629				
Pilot Station	110	302			885	2,635				
Marshall	111	333			628	3,121			857	3,766
Russian Mission	33	133			372	1,118				

Note A blank cell indicates that a community was not included in the study.

a. Crawford, D. 1978 Lower Yukon River sheefish study, October 1977–June 1978. Alaska Department of Fish and Game Division of Commercial Fisheries, AYK Region

b. 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.

b. Alaska Department of Fish and Game Division of Commercial Fisheries, annual postseason salmon surveys.

c. Wolfe, R.J. and C. Scott. 2010. Continuity and change in salmon harvest patterns, Yukon River drainage, Alaska. U.S. Fish and Wildlife Service Office of Subsistence Management, Fisheries Resource Monitoring Program No. 07-253. Robert J. Wolfe and Associates: San Marcos, CA.

d. 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 Fish and Game Department of Subsistence, Technical Paper No. 371.

e. ADF&G Division of Subsistence household surveys, 2011.

Table 8-3.–Harvest surveys, middle Yukon River communities, 1985–2010.

Community	2011 population	Type of survey			
		Comprehensive	Salmon	Nonsalmon fish	Large land mammal
Kaltag	205		1985 [1] 1988–present [2]	2006 [12]	1996 [5], 1997 [6] 1998 [7], 1999 [8] 2001 [9], 2002 [11]
Nulato	275	2010 [14]	1988–present [2]	2006 [12]	1996 [5], 1997 [6] 1998 [7], 1999 [8] 2001 [9]
Koyukuk	97		1988–present [2]	2002 [10]	
Galena	487	1985 [3] 2010 [14]	1988–present [2]	2006 [12]	1996 [5], 1997 [6] 1998 [7], 1999 [8] 2001 [9], 2002 [11]
Ruby	173	2010 [14]	1988–present [2]	2006 [12]	1996 [5], 1997 [6] 1998 [7], 1999 [8] 2001 [9], 2002 [11]
Tanana	231	1987 [4] 2009 [13]	1988–present [2]	2006 [12]	1996 [5], 1997 [6] 1998 [7], 1999 [8] 2002 [11]

1. Wheeler, P. 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, Juneau.
2. Alaska Department of Fish and Game Division of Commercial Fisheries, annual postseason salmon surveys.
3. Marcotte, J. R. 1990. Subsistence harvest of fish and wildlife by residents of Galena, Alaska, 1985–86. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 155, Juneau.
4. Case, M., L. Halpin. 1990. Contemporary wild resource use patterns in Tanana, Alaska, 1987. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 178, Juneau.
5. Andersen, D.B. Results of the middle Yukon large mammal harvest survey project 1996–1997. Alaska Department of Fish and Game Division of Subsistence, unpublished data, 1997. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd, Fairbanks, AK 99701.
6. Andersen, D. B., C. J. Utermohle, L. Brown. 1998. The 1997–1998 harvest of moose, caribou, and bear in middle Yukon and Koyukuk River communities, Alaska. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 245, Juneau.
7. Andersen, D. B., C. J. Utermohle, L. Brown. 2000. The 1998–99 harvest of moose, caribou, and bear in ten middle Yukon and Koyukuk River communities. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 251, Juneau.

-continued-

to 4 communities. However, 2 important resource categories—salmon and large land mammals, primarily moose—are well documented for middle Yukon communities. The salmon data extend back to the 1960s, but because of methodological changes, those data are not comparable with more recent data until 1988, when the methods for the current program were implemented. Additional data sets on nonsalmon fish harvests also exist for all middle Yukon River communities. Large land mammal harvest data exists for 1997–2002. This section will begin with a discussion of general harvest patterns for Tanana and Galena and then consider each of these resource categories in turn on a regional level based on available data.

Total subsistence harvests appear to have declined in the middle Yukon river. Distinct differences in the harvest patterns for the community of Tanana are evident between 1987 and 2008. Overall, Tanana residents

Table 8-3, continued

8. Andersen, D. B., C. J. Utermohle, G. Jennings. 2001. The 1999–2000 harvest of moose, caribou, and bear in ten middle Yukon and Koyukuk River communities. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 262, Juneau.
9. Andersen, D. B., C. Brown, R. Walker, G. Jennings. 2004. The 2001–2002 harvest of moose, caribou, and bear in middle Yukon and Koyukuk River communities. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 278, Juneau.
10. Andersen, D. B., C. L. Brown, R. J. Walker, K. Elkin. 2004. Traditional ecological knowledge and contemporary subsistence harvest of non-salmon fish in the Koyukuk River drainage, Alaska. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 282, Fairbanks.
11. Brown, C., R. Walker, S. B. Vanek. 2004. The 2002–2003 harvest of moose, caribou, and bear in middle Yukon and Koyukuk River communities. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 280, Juneau.
12. Brown, C., D. Koster, 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.
13. Wolfe, R. J. and C. Scott. 2009. Continuity and change in salmon harvest patterns, Yukon River drainage, Alaska. U.S. Fish and Wildlife Service Office of Subsistence Management, Fisheries Resource Monitoring Program, Final Report (Study No. 07-253). Robert J. Wolfe and Associates, San Marcos, California.
14. ADF&G Division of Subsistence household surveys, 2011.

reported harvesting a total of 745,940 lb of wild foods in 1987 with a per person harvest of 2,157 lb, which includes 1,357 lb of chum salmon per capita, or 63%, fed to dogs (Case and Halpin 1990). In 2008, the overall harvest was an estimated 150,230 lb, with a per person harvest of 671 lb (Wolfe and Scott 2010). This estimate does not include 25,683 chum salmon that were used for dog food. Adding this harvest to the 2008 total salmon harvest by Tanana residents (in order to directly compare to the 1987 estimate) results in a total per capita subsistence harvest of approximately 1,300 lb per person in 2008, still only about one-half of the 1987 estimate.

Galena residents reported harvesting a total of 543,093 lb of wild foods in 1985 with a per person harvest of 787 lb (Marcotte 1988). In 2010, the overall harvest was an estimated 107,644 lb, with a per person harvest of 254 lb (Table 6-1). A large component of the 1985 harvest was summer and fall chum salmon used for dog food (approximately 271,239 total lb), just as it was in Tanana. The decline in dog teams in Galena (and the need to harvest chum salmon to feed them) explains some, but not all, of the decline in total subsistence harvests; the total subsistence harvest in Galena in 1985 without this dog food component was closer to 394 lb per person, still about 150 lb more per person than in 2010.

In addition to the difference in overall harvest levels, these 2 middle Yukon communities also report shifting harvest compositions. The 2 most heavily harvested resources by Tanana residents in 2008 were moose and Chinook salmon, together composing 66% of the total harvest (Figure 8-6). However, in 1987, these 2 species accounted for only 16% of the harvest, showing dramatic shifts in the species composition of subsistence harvests between the 2 years. Comparing 2 data points several decades apart should only be done with caution, because changes do not necessarily represent trends. However, these shifts are consistent with changes in the harvest patterns of particular species in the neighboring community of Galena. In Galena, summer chum salmon and moose, the 2 most heavily harvested species in 1985, accounted for 50% and 17% of the total subsistence harvest, respectively (Figure 8-7) In 2010, moose were still extremely important (34% of the harvest), but summer chum salmon were only 14% of the harvest, and Chinook salmon was the second most heavily harvested resource (15%). Similarly to Tanana, this decline in the summer chum harvest is likely due to the disappearance of the summer chum roe commercial fishery in the 1990s and the decline in the use of sled dogs.

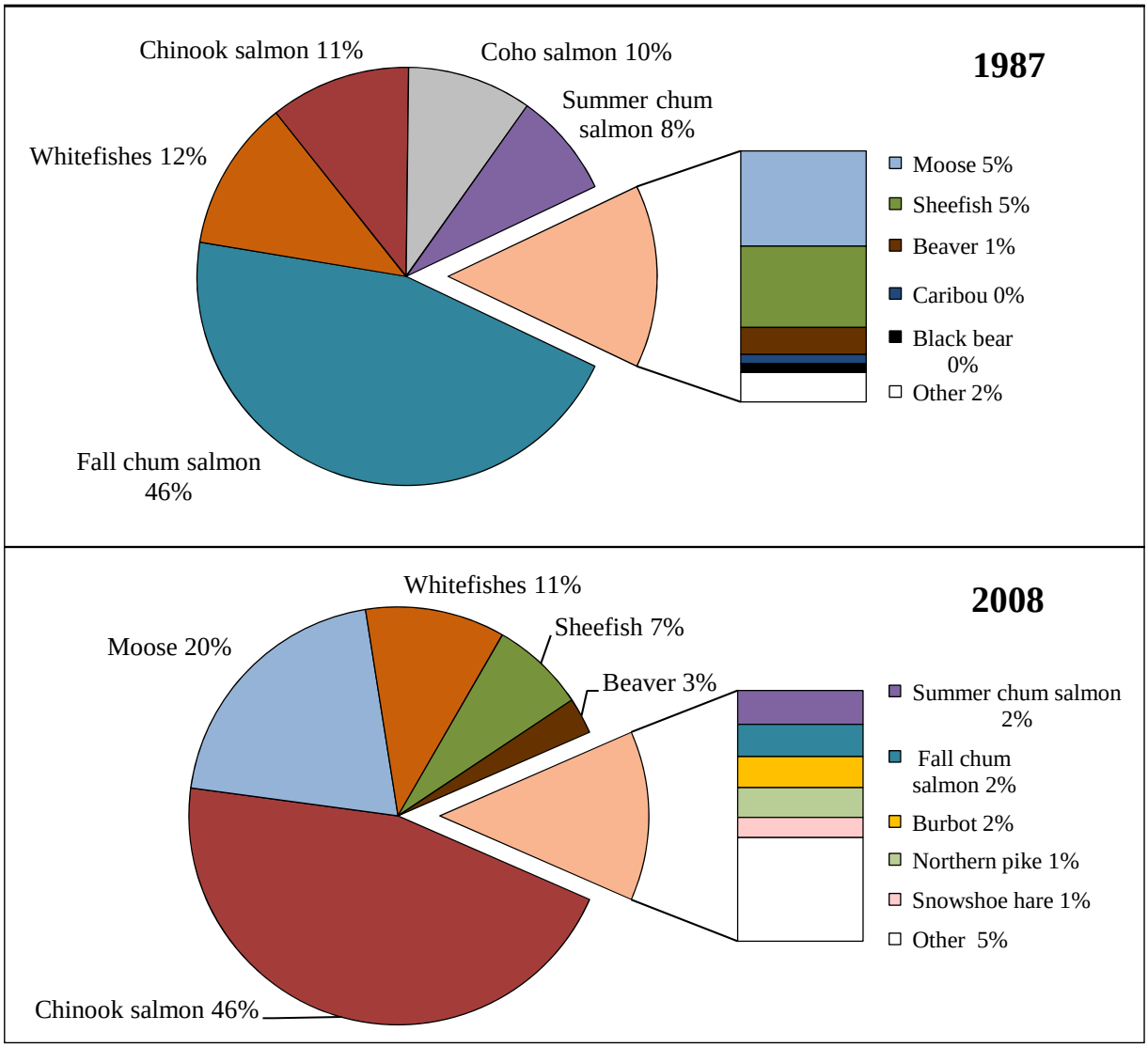


Figure 8-6.–Top 10 resources harvested, ranked by estimated edible weight, Tanana, 1987 and 2008.

Harvest Comparisons by Resource

Moose

Traditionally, moose harvests by local residents have been an essential part of subsistence hunting activities in the lower and middle Yukon River regions (Andersen et al. 1998, 2000, 2001, 2004; Brown et al. 2004b; Fall et al. 2012; Weekley et al. 2011; Wolfe 1981). Historical reliance on moose as a primary subsistence resource has been supported by relatively healthy moose populations throughout GMUs 21 and 24.

Moose in GMUs 21B, 21D, and 24 are managed as separate populations. Based on a 2008 survey, the moose population in GMU 21B was estimated at 2,317 moose (0.27 moose/mi²), below management objectives of 4,000–5,000 moose (Stout 2010a). In GMU 21D, Area Biologist Glenn Stout estimated the 2008 moose population at approximately 8,103, an estimate not significantly different from the earlier survey in 2004–5 of 7,967 moose (Stout 2010b). Although the moose population was stable, it did not yet meet management objectives of 9,000–10,000 moose. Finally, in GMU 24, the moose population was estimated at 8,751 moose in 2008 (Stout 2010c). Although adequate moose harvests occurred, according to the area biologist, the population estimate fell short of the management objective of 10,000–12,000 moose. Moose in GMU

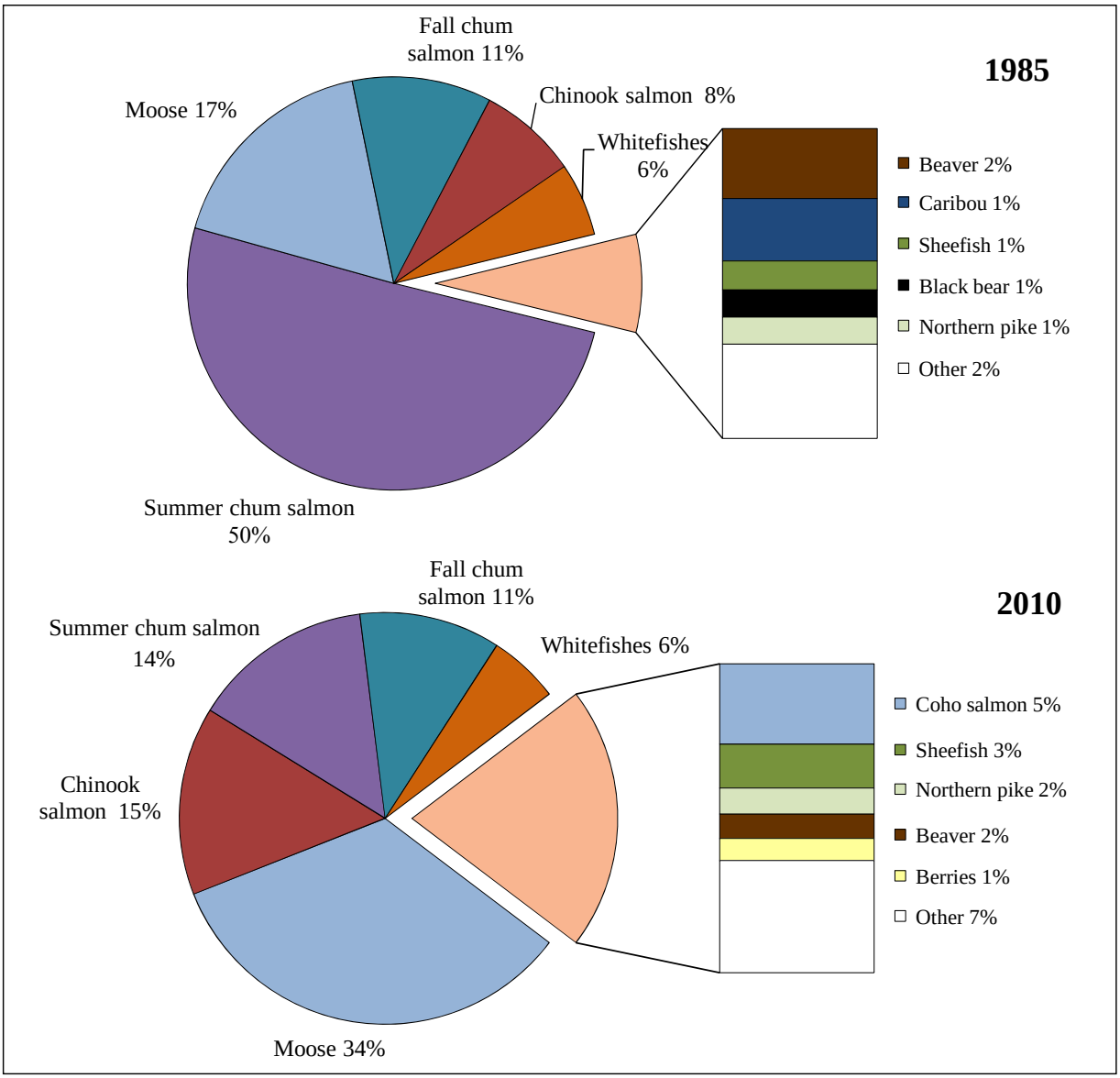


Figure 8-7.–Top 10 resources harvested, ranked by estimated edible weight, Galena, 1985 and 2010.

24 are managed as a single population, but the area is large, spanning 26,068 mi². For the purposes of managing hunting practices, GMU 24 is divided into 4 subunits, GMU 24A, 24B, 24C, and 24D. Given the proximity and geographical similarity of GMU 24 to GMU 21D, the moose population in the southern portion of GMU 24—GMU 24D—is likely more similar to GMU 21D than to the rest of GMU 24 (G. Stout, Area Biologist, ADF&G, Galena, personal communication, June 10, 2012).

According to local knowledge, the number of moose in the middle Yukon River area dramatically increased around the 1940s (Huntington 1993). By the late 1980s and 1990s, moose populations had increased enough to attract many hunters from outside of the local area, and local residents began to express concerns about high levels of hunting activity. As a result, ADF&G formed the Koyukuk River Moose Hunters' Working Group (KMWG) to provide a forum for local and nonlocal hunters to cooperatively develop management recommendations (Alaska Department of Fish and Game Division of Wildlife Conservation 2001). The KMWG was composed of representatives from the Koyukuk, Mid-Lower Yukon, Fairbanks, Matanuska Valley, and Kenai/Soldotna advisory committees, as well as representatives from the federal

Table 8-4.–Moose harvests and hunter effort, middle Yukon River communities, 1997–1999, 2001–2002, 2008, and 2010.

	Community															
	Nulato				Galena				Ruby				Tanana			
	Estimated number of moose harvested		Hunter effort (days per moose harvested)	Harvest area (GMU)	Estimated number of moose harvested		Hunter effort (days per moose harvested)	Harvest area (GMU)	Estimated number of moose harvested		Hunter effort (days per moose harvested)	Harvest area (GMU)	Estimated number of moose harvested		Hunter effort (days per moose harvested)	Harvest area (GMU)
Year	Total for community	Mean per capita			Total for community	Mean per capita			Total for community	Mean per capita			Total for community	Mean per capita		
1997	67	0.22	*No data available*	21D	131	0.24	*No data available*	21D, 24	28	0.13	*No data available*	21B, 21D	42	0.14	*No data available*	20C, 20F, 21B, 21D
1998	57	0.2		21D	88	0.18		21D, 24	32	0.18		21B, 21D	53	0.2		20C, 20F, 21B, 21D
1999	79	0.24	9	21D	96	0.17	9.8	21D, 24	26	0.14	6.3	21B, 21D	39	0.14	6.4	20C, 20F, 21A, 21B
2001	42	0.13	9.8	21D	120	0.18	7.4	21D, 24	30	0.13	22.4	21A, 21B, 21D	*No data available*			
2002	*No data available*				95	0.16	9.8	21D, 23	31	0.15	17.8	21B, 21D	60	0.23	15.4	20C, 20F, 21B, 24
2008	*No data available*				*No data available*				*No data available*				57	0.22	*No data available*	
2010	40	0.15	13.9	21D	67	0.16	9.8	21D	27	0.15	8.9	21B, 21D	*No data available*			

Sources Andersen et al 1998, Andersen et al 2000, Andersen et al 2001, Andersen et al. 2004, Brown et al 2004.

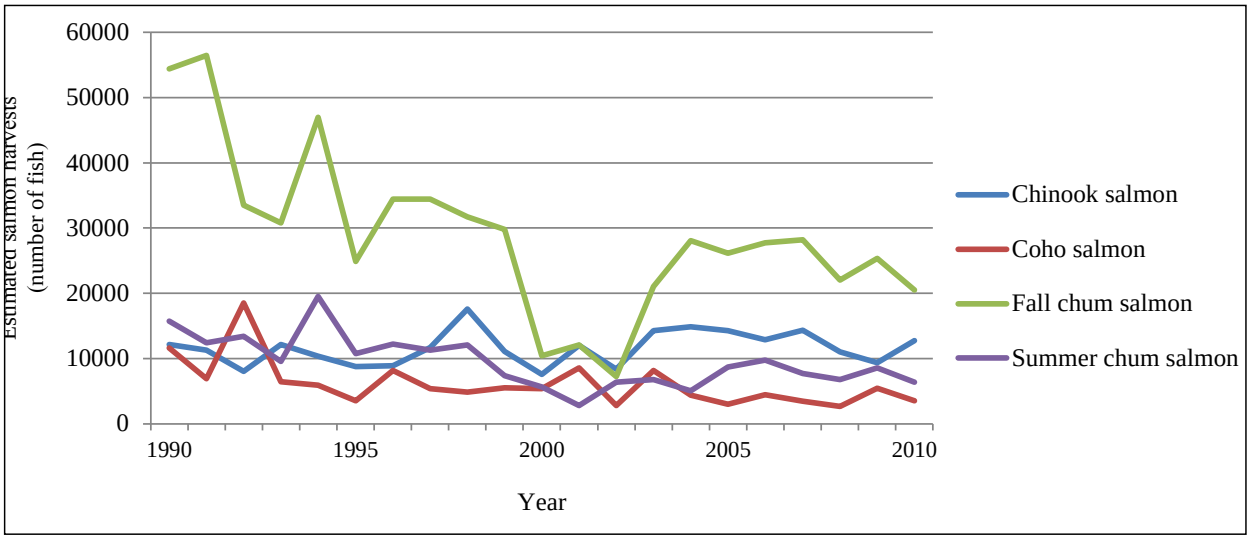


Figure 8-8.–Salmon harvests in numbers of fish, middle Yukon River region, 1990–2010.

Western Interior Regional Advisory Council and commercial guides. Federal and state agency personnel participated in the planning process as technical advisors.

Residents of Nulato, Galena, and Ruby most heavily utilized GMU 21D and the lower portion of GMU 24 (later named 24D), or Zone 1 in the planning process. The KMWG's recommendations for Zone 1 resulted in regulatory changes that intended to maintain high moose population densities without allowing an increase in hunter numbers or harvest levels in the area. The KMWG's recommendations included replacing an existing general registration hunt (RM830) in the Koyukuk Controlled Use Area with an unlimited registration hunt for residents only (RM832, often referred to as the "subsistence hunt") which would open earlier and during which hunters would be required to destroy the trophy value of antlers (Alaska Department of Fish and Game Division of Wildlife Conservation 2001). It also added a drawing permit in GMU 21D system, with separate resident and nonresident drawing pools, in which hunters could retain the antlers. Separate resident and nonresident drawing hunts help to retain opportunity for nonresidents and commercial guides, but at a much lower level than has occurred in recent years. Additionally, the plan outlined the maintenance of a check station at Ella's Cabin on the Koyukuk River to acquire better data on hunter numbers and harvest.

A 5-year big game survey study from 1997–1999 and 2001–2002 in 10 middle Yukon and Koyukuk River communities provides harvest information for area communities during this time of moose population decline and stabilization (Andersen et al. 1998, 2000, 2001, 2004; Brown et al. 2004b). Table 8-4 compares the 1997–1999, 2001–2002 surveys to the 2010 survey. According to the area biologist, moose densities in GMU 21D declined in the late 1990s, stabilizing at these lower densities by about 2005 (G. Stout, Area Biologist, ADF&G, Galena, personal communication, June 10, 2012). Subsistence harvests have also remained constant since the early 2000s, when the moose populations stabilized.

In general, the 2010 per capita harvest estimates for Nulato and Galena appear consistent with the earlier survey project and with the biological assessment of stable moose populations in the GMUs most used by local hunters. In Galena, where hunters primarily use GMU 21D, moose harvests have ranged from 67 (2010) to 120 (2001), but with remarkably stable per capita values. The exception to this is 1997, which was the first data year for the Middle Yukon Big Game project, but the second data point for moose harvests in Galena through household surveys. In 1985, the year of the baseline comprehensive survey, Galena residents harvested an estimated 122 moose, or approximately 0.31 moose per person. In 1997, the estimated harvest was 131 moose, with a per person harvest of 0.24 moose. By 1998, that harvest had fallen to 88 moose, with a per capita harvest of 0.18 moose. For the remaining 4 years of data between 1999

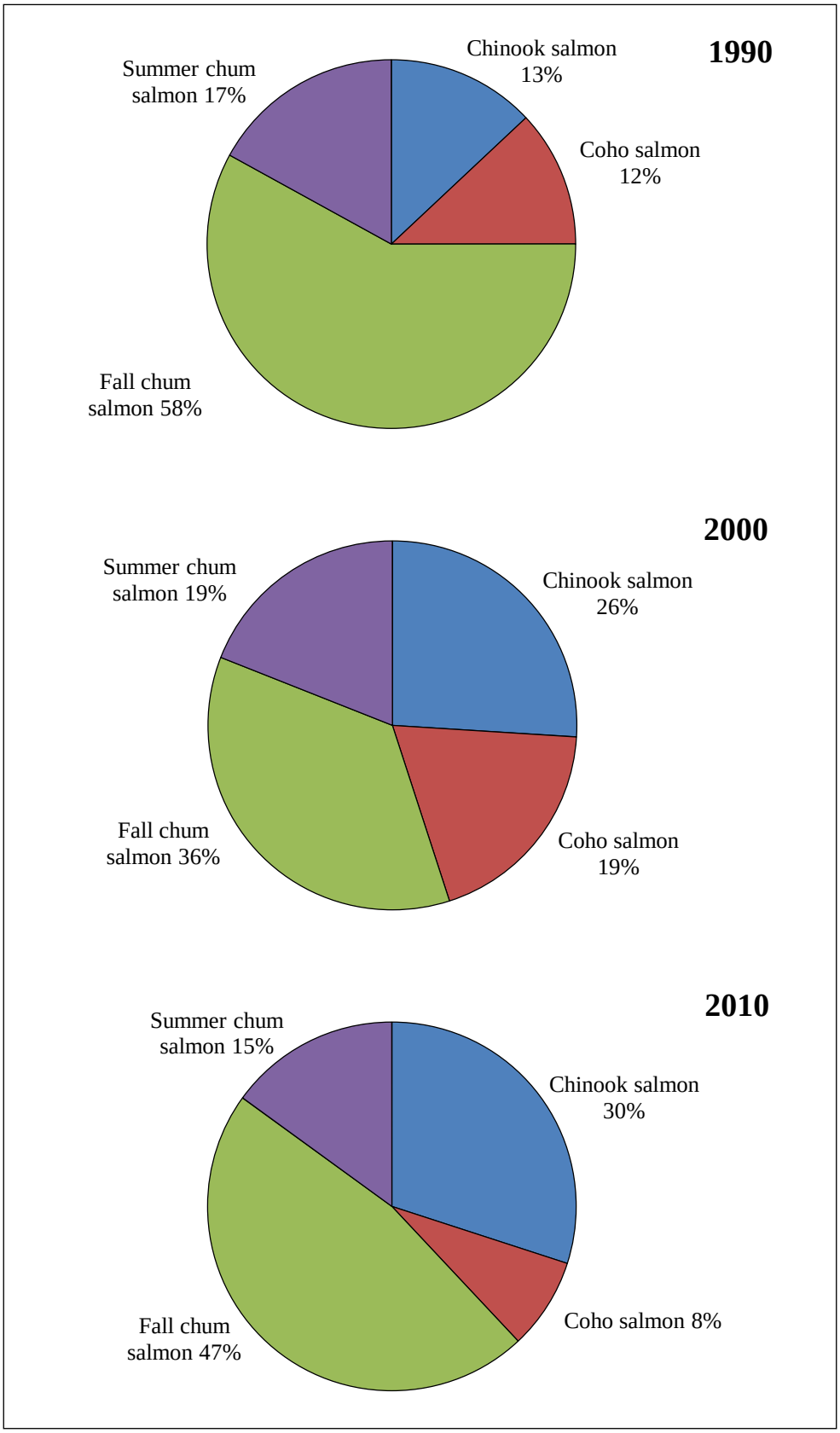


Figure 8-9.–Composition of salmon harvests, middle Yukon River region, 1990, 2000, and 2010.

and 2010, both the total harvests and the per capita harvests remained relatively stable. However, Galena residents expressed concerns that finding and harvesting moose was more difficult in 2010 than it was in the 1990s.

A similar trend held for Nulato residents. The peak of the moose population in GMU 21D, where Nulato residents harvested most of their moose, was in 1997, after which the population declined until it stabilized around 2005–2006 (Stout 2010b). Nulato residents' harvests track this decline and stabilization. Adjusting for human population fluctuations, the per capita moose harvest in Nulato fell from 0.24 in 1999 to 0.13 in 2001; the per capita harvest in 2010 was 0.15 moose per person. Though moose harvests were relatively stable from 2000–2010, the effects of lower levels of moose harvests may have been exacerbated by several years of declining salmon returns (described in the next section).

The harvest of moose by Ruby hunters appears to be an exception to this pattern. Throughout the 1997–1999, 2001–2002 survey project, Ruby hunters harvested between 26 and 32 moose per year (an average of 29 moose per year), primarily in GMUs 21B and 21D. The per capita harvest ranged from 0.13 to 0.18 moose per person, or an average of 0.15 moose per person. In 2010, Ruby hunters harvested an estimated 27 moose, or 0.15 moose per person, an estimate very similar to earlier reports. This different pattern in Ruby may be explained by the differences between moose populations in GMU 21D where Nulato and Galena residents hunt and GMU 21B, where many Ruby residents reporting hunting.

The 1997–1999, 2001–2002 data set can also be considered alongside comprehensive data from other middle Yukon communities. In 1987, Tanana residents reported an estimated moose harvest of 57 moose (40,050 lb harvested or 116 lb per person) (Figure 8-6; Case and Halpin 1990). Between 1997 and 2002, their harvest of moose ranged from 39 to 60 with an average of 50 moose harvested annually. In 2008, the total harvest was 57 moose (30,600 lb or 137 lb per person) (Figure 8-6; Wolfe and Scott 2010). Thus, although the total harvest has declined, the per capita harvest has stayed relatively constant; the human population has declined from 1987, and the contribution of moose to the total subsistence harvest actually increased (5% of the total subsistence harvest in 1987 to 20% in 2008). These changes are likely explained by the changes in the composition of salmon species harvested, described above: since summer and fall chum salmon are harvested in smaller quantities, moose harvests account for a larger component of the total harvest.

Salmon

ADF&G has collected annual harvest data on salmon species by Yukon River communities through post-season household surveys since the 1960s. Figure 8-8 shows salmon harvests from 1990 to 2010 for middle Yukon River communities. In general, the drainage-wide harvests of Chinook salmon have been relatively stable with significant dips in the 2000 harvest because of the aforementioned crash and again since 2007 because of declining runs. Summer chum salmon harvests declined severely after 1996 when the middle Yukon River commercial summer chum roe fishery disappeared (Fall et al. 2009). From 1996–2010, the annual harvest remained relatively stable at about 70% of the historical harvest. After experiencing severe declines after the 2000 salmon crash, fall chum salmon runs began rebuilding through the 2000s, but harvests increased only to approximately 60% of historical harvest levels through the 1980s and 1990s (Fall et al. 2013).

The regulatory context (discussed in the Introduction) for this region is similar to that of the lower Yukon River region, and restrictions put in place on subsistence salmon fisheries in 1993, 1998, 2000–2002, and 2009 are evident in the lowered harvests seen in those years. The overall trend of declining Chinook salmon harvests can be attributed to continued poor runs, particularly since 2008. Fall chum salmon are heavily harvested for subsistence in the middle Yukon River region, and large fluctuations in harvest of this resource are apparent over the years. A large proportion of the fall chum salmon harvests for the region occurred in the community of Tanana, which, as previously mentioned, historically had a number of large dog teams. Summer chum salmon harvest levels have declined since the mid-1990s, partially due to the closure of the salmon roe commercial fishery in 1997 (Fall et al. 2009).

Table 8-5.–Sheefish and whitefishes harvests in numbers of fish, middle Yukon River communities, 1986–2010.

	Harvest study									
	ADF&G Division of Subsistence baseline studies, 1986 and 1987		ADF&G Division of Commerical Fisheries postseason salmon surveys 10-year average, 1997–2006 [c]		ADF&G Division of Subsistence household surveys, 2002 and 2006		USFWS Office of Subsistence Management comprehensive survey, 2007[f]		ADF&G Division of Subsistence comprehensive survey, 2010[g]	
Community	Sheefish	Whitefishes	Sheefish	Whitefishes	Sheefish	Whitefishes	Sheefish	Whitefishes	Sheefish	Whitefishes
Tanana	5,250[a]	24,918[a]	1,144	8,697	834[e]	8,278[e]	1691	4643		
Ruby			84	790	198[e]	347[e]			118	1085
Galena	519[b]	10,402[b]	287	3,383	1,982[e]	30,415[e]			523	2,726
Koyukuk			161	507	384[d]	1047[d]				
Nulato			249	725	559[e]	1,271[e]			373	980
Kaltag			109	352	206[e]	578[e]				

a. Case, M. and L. Halpin. 1987. Contemporary wild resource use patterns in Tanana, Alaska, 1987. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 178, Juneau.
b. Marcotte, J. R. 1990. Subsistence harvest of fish and wildlife by residents of Galena, Alaska, 1985–1986. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 155, Juneau.
c. Alaska Department of Fish and Game Division of Commercial Fisheries, annual postseason salmon surveys.
d. Andersen, D. B., C. L. Brown, R. J. Walker, K. Elkin. 2004. Traditional ecological knowledge and contemporary subsistence harvest of non-salmon fish in the Koyukuk River drainage, Alaska. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 282, Fairbanks.
e. ADF&G Division of Subsistence household surveys, Middle Yukon nonsalmon directed harvest profile, 2006.
f. Wolfe, R. J. and C. Scott. 2010. Continuity and change in salmon harvest patterns, Yukon River drainage, Alaska.
g. ADF&G Division of Subsistence household surveys, 2010.

Figure 8-9 shows the composition of subsistence harvests of salmon in the years 1990, 2000, and 2010. A comparison of the 2010 estimated subsistence salmon harvests to previous harvest estimates allows a greater understanding of the composition and quantity of such harvests over time. Unlike Figure 8-5, which shows the dominant contribution of summer chum salmon harvests in lower Yukon River communities, Figure 8-8 shows the much higher levels of fall chum salmon harvests by middle river residents. The high harvests of fall chum salmon from 1990–2010 are mirrored in the contribution of this resource to total salmon subsistence harvests in the middle Yukon River region in these 3 years: fall chum salmon have contributed between 36% and 58% of total harvests in 1990, 2000, and 2010. The lowest contribution of fall chum salmon to the overall salmon harvest in 2000 is likely related to the crash of salmon returns in that year (Brown et al. 2015). The contribution of Chinook salmon to total salmon harvests has appeared to increase over time: in 1990, this resource contributed 17% to the total salmon harvest for the region, increasing to 30% in 2010. Summer chum salmon accounted for a similar portion of total salmon harvests in each of the three years, ranging from 15% to 19%. Coho salmon harvest levels contributed a similar portion of the total salmon harvest in 1990 (12%) and 2010 (8%), but their contribution increased to 19% in 2000. The higher contribution of coho salmon to the total harvest in 2000 may be related to the crash of other salmon species in that year; in fact, although coho salmon contributed a higher percentage to subsistence salmon harvests, the total harvest numbers for this resource (as well as the other salmon species) was lower than the historical average from 1991–2000 (Fall et al. 2002).

The 2 communities for which earlier comparable comprehensive survey data are available—Galena and Tanana—show a similar pattern of decreasing per capita harvests over time to the lower Yukon River region communities described earlier. In 1985, residents of Galena harvested an estimated 397 lb of summer chum salmon, 86 lb of fall chum salmon , and 61 lb of Chinook salmon per capita; in contrast, residents harvested 36 lb of summer chum salmon, 28 lb of fall chum salmon, and 38 lb of Chinook salmon per capita in 2010 (Marcotte 1988). In 1987, residents of Tanana harvested 234 lb of Chinook salmon per capita, 175 lb of summer chum salmon, and 983 lb of fall chum salmon compared to 306 lb of Chinook salmon, 124 lb of summer chum salmon, and 518 lb of fall chum salmon per capita in 2008 (Case and Halpin 1990; Wolfe and Scott 2010). Chum harvests have declined significantly since the late 1980s with the disappearance of the commerical roe fishery and the decline in dog teams, while Chinook salmon per capita harvests have actually increased slightly.

Nonsalmon fish

Table 8-5 summarizes the existing data for whitefishes (including sheefish) harvests in the middle Yukon River region. These data come from ADF&G Division of Subsistence surveys in 1986, 1987, 2002, and 2010, as well as Wolfe and Scott (2010) and the ADF&G Division of Commercial Fisheries postseason salmon survey. Comparing across such diverse sources using different sampling methods should be approached with caution, as described in the lower Yukon nonsalmon fish section. However, changes in nonsalmon harvest patterns appear to follow those of other resources. Harvest levels from the 1980s are much higher for both whitefishes and sheefish in the 2 middle Yukon communities for which this older data exist compared with more recent estimates, with one exception. For example, Tanana fishers harvested a total of 24,198 whitefishes in 1987 compared with 8,278 whitefishes in 2002 and 4,643 fish in 2007; for sheefish, estimated harvests were 5,250 fish in 1986 compared with 834 fish in 2002 and 1,691 sheefish in 2007. However, this pattern appears to be interrupted for Galena fishers. In 1986, Galena fishers harvested an estimated of 10,402 whitefishes; this harvest jumped to 30,145 in 2002, but then dropped back to 2,726 whitefishes in 2010. The same held for sheefish—Galena fishers harvested 519 fish in 1986, 1,982 sheefish in 2002, and 523 sheefish in 2010. The 2002 harvest may have been an anomaly, or the data may have resulted from methodological differences in data collection. Despite these differences in harvest levels, whitefishes (including sheefish) continue to account for similarly sized components of both Tanana and Galena's total subsistence harvests between the 1980s and 2000s. Tanana fishers' harvest of whitefishes (including sheefish) composed 17% of the total harvest in 1987 and 18% in 2008; Galena fishers' harvests composed 7% of the total in 1985 and 9% in 2010 (Figure 8-6; Figure 8-7).

Conclusions

The communities in the middle and lower Yukon region have experienced a great deal of change in their subsistence patterns, despite continuing their historical and traditional hunting, fishing, trapping, and gathering practices. Given the dearth of historical harvest data, it is difficult to track changes in harvest levels over time across all species. However, annual salmon harvest estimates and more limited big game and nonsalmon fish harvest estimates allow for these comparisons among these historically most important species. On average, communities in both the lower and middle Yukon River reported smaller per capita harvests of wild resources, even as the harvests of particular resources, such as moose and Chinook salmon, became more important to these community economies. Reasons for this varied widely, including decreased resource availability, the need to work in the cash economy, the cost of gas, reductions in dog teams throughout the middle Yukon River region, and weather, among others.

All of these changes underscore the vulnerability of subsistence economies. Communities also labor under the pressures brought by increasing fuel costs (for both transportation and heating homes), the requirements of more regular employment, the challenges and expense of rural infrastructures (e.g., the cost of freight and plane tickets to urban Alaska), and many other changes. This survey marked the first time that harvest assessment data were collected across species and food security levels were measured. Lower and middle Yukon River households reported various levels of food security as compared to state or national averages. Some communities reported more security while others reported less food security than state and national averages; however, no regional patterns were explicit. At the same time, respondents reported dense sharing networks that linked many, if not all households in a community. Such practices are a clear measure against the insecurity of fluctuating harvests and external pressures. In sum, subsistence in the lower and middle Yukon region remains a vital part of the cultural, economic, and social aspects of community life. However, these communities also experience a great deal of pressure that can affect their subsistence practices, highlighting the need for sound management of resources and the regulatory protection of subsistence patterns.

REFERENCES

Alaska Department of Commerce, Community, and Economic Development (ADCCED), Division of Community and Regional Affairs
2011. *Current community conditions: fuel prices across Alaska, January 2011 update*. http://commerce.state.ak.us/dcra/pub/Fuel_Report_Jan_2011.pdf

Alaska Department of Fish and Game (ADF&G)
1987. *Family fish camps on the Yukon River, Wildlife Use Notebook Series, No. 3*. Alaska Department of Fish and Game, Division of Subsistence: Juneau.

2001. *Koyukuk River moose management plan 2000–2005: Unit 24 and the northern portion of Unit 21D.* Alaska Department of Fish and Game Division of Wildlife Conservation: Fairbanks. http://www.adfg.alaska.gov/static/research/plans/pdfs/koyplan.pdf

2006. *Yukon–Innoko moose management plan for game management subunits 21A and 21E.* Alaska Department of Fish and Game, Division of Wildlife Conservation: Juneau. http://www.adfg.alaska.gov/static/home/about/management/wildlifeplanning/pdfs/yukon_innoko_plan.pdf

Alaska Methodist University
1969. *Yupik Eskimo communities: Bethel, Chignik, Emmonak, Mountain Village, St. Mary's, Togiak, Tuluksak.* Alaska Methodist University: Anchorage.

Alaska State Housing Authority Department of Planning and Technical Services
1971. *Mountain Village comprehensive development plan*: Anchorage.

Albert, P.
1995. *The history of Kokrines and Ruby along the Yukon River: a project.* University of Alaska Fairbanks: Fairbanks.

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.

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

Andersen, D.B., C. Brown, R. Walker, and G. Jennings
2004. *The 2001–2002 harvest of moose, caribou, and bear in middle Yukon and Koyukuk river communities.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 278: Juneau

Andersen, D.B. and C.L. Scott
2010. *An update on the use of subsistence-caught fish to feed sled dogs in the Yukon River drainage, Alaska*. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program.

Andersen, D.B., C.J. Utermohle, and L. Brown
1998. *The 1997–1998 harvest of moose, caribou, and bear in middle Yukon and Koyukuk river communities, Alaska.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 245: Juneau

2000. *The 1998–1999 harvest of moose, caribou, and bear in ten middle Yukon and Koyukuk river communities.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 251: Juneau

Andersen, D.B., C.J. Utermohle, and G. Jennings
2001. *The 1999–2000 harvest of moose, caribou, and bear in ten middle Yukon and Koyukuk river communities.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 262: Juneau.

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.

Berardi, G.
1999. *Schools, settlement, and sanitation in Alaska Native villages*. Ethnohistory 46(2), pages 329–359.

Bergstrom, D.J., K.C. Schultz, V. Golembeski, B.M. Borba, D. Huttunen, L.H. Barton, T.L. Lingnau, R.R. Holder, J.S. Hayes, K.R. Boeck, and W.H. Busher
2001. *Annual management report Yukon and Northern areas, 1999*. Alaska Department of Fish and Game, Division of Commercial Fisheries: Anchorage.

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.

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.

Bower, W.T.
1919. *Alaska fisheries and fur industries in 1918: Appendix VII to the report of the U.S. Commissioner of Fisheries for 1918*. Government Printing Office: Washington D.C.

Brase, A.J. and H.H. Hamner
2002. *Subsistence and personal use salmon harvests in the Alaska portion of the Yukon River drainage, 2001*. Alaska Department of Fish and Game, Division of Commercial Fisheries: Anchorage.

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., 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. and D. Koster
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., R.J. Walker, and S.B. Vanek
2004a. *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

2004b. *The 2002–2003 harvest of moose, caribou, and bear in middle Yukon and Koyukuk river communities.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 280: Juneau

Bue, F.J., B.M. Borba, and D.J. Bergstrom
2006. *Yukon River fall chum salmon stock status and fall season salmon fisheries: a report to the Alaska Board of Fisheries*. Alaska Department of Fish and Game, Division of Sport Fish, Research and Technical Services: Anchorage.

Busher, W.H. and T. Hamazaki
2004. *Subsistence and personal use salmon harvests in the Alaska portion of the Yukon River drainage, 2003*. Alaska Department of Fish and Game, Division of Commercial Fisheries: Anchorage.

Busher, W.H., T. Hamazaki, and D.M. Jallen
2009. *Subsistence and personal use salmon harvests in the Alaska portion of the Yukon River drainage, 2008*. Alaska Department of Fish and Game: Anchorage.

Carlo, P.
1978. *Nulato: an Indian life on the Yukon*. Poldine Carlo: Fairbanks.

Calista Corporation, Land and Natural Resources Department and Village Management Services
1989. *The Calista region: a gentle people, a harsh life*: Anchorage.

Calista Professional Services
1984. *Prospects for reviving the reindeer industry in the Yukon–Kuskokwim region*. State Department of Community and Regional Affairs, Municipal and Regional Assistance Division, State of Alaska: Anchorage.

Case, M. and L. Halpin
1990. *Contemporary wild resource use patterns in Tanana, Alaska, 1987.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 178: Juneau

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.

Clark, A.M.
1981. "*Koyukon*" [in] W.C. Sturtevant and J. Helm, editors *Handbook of North American Indians*, 6: Subarctic. Smithsonian Institution Press: Washington, D.C.

Coates, J.
2004. *Experience and expression of food security across cultures: practical implications for valid measurement.* Food and Nutrition Technical Assistance Project, FHI 360: Washington, DC.

Coates, J., E.A. Frongillo, B.L. Rogers, P. Webb, P.E. Wilde, and R. Houser
2006. *Commonalities in the experience of household food insecurity across cultures: what are measures missing?* Journal of Nutrition 136(5), page 1438S–1448S.

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

Conitz, J.M.
2012. *A program for improving fisheries management and research in the Arctic-Yukon-Kuskokwim (AYK) region.* Alaska Department of Fish and Game, Division of Commercial Fisheries: Anchorage.

Crawford, D.
1978. *Lower Yukon River sheefish study, October 1977–June 1978.* Alaska Department of Fish and Game, Division of Commercial Fisheries: Anchorage.

Dau, J.
2001. *Caribou management report, Units 21D, 22A, 22B, 23, 24 and 26A* [in] C. Healy, editor *Caribou management report of survey-inventory activities 1 July 1998–30 June 2000*. Alaska Department of Fish and Game, Project 3.0: Juneau.

Eggers, D.M., M.D. Plotnick, and A.M. Carroll editors.
2010. *Run forecasts and harvest projections for 2010 Alaska salmon fisheries and review of the 2009 season.* Alaska Department of Fish and Game: Anchorage.

Fall, J.A., D.B. Andersen, D. Caylor, M. Coffing, S. Georgette, and M. Turek
2002. *Alaska subsistence fisheries 2000 annual report.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 306: Juneau.

Fall, J.A., B.M. Balivet, A.R. Brenner, D. Holen, L. Hutchinson-Scarbrough, B. Jones, T.M. Krieg, T. Lemons, M.A. Marchioni, E. Mikow, L.A. Sill, and A. Trainor
2013. *Alaska subsistence and personal use salmon fisheries 2010 annual report*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 381: Anchorage

Fall, J.A., C. Brown, M.F. Turek, N. Braem, A. Russell, W.E. Simeone, D.L. Holen, L.C. Naves, L. Hutchinson-Scarborough, T. Lemons, V. Ciccone, T. Krieg, and D. Koster
2009. *Alaska subsistence salmon fisheries 2006 annual report*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 344: 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.

Fienup-Riordan, A.
1986. *When our bad season comes: a cultural account of subsistence harvesting and harvest disruption on the Yukon Delta*. Alaska Anthropological Association: Anchorage.

Fienup-Riordan, A., C.L. Brown, and N.M. Braem
2013. *The value of ethnography in times of change: The story of Emmonak*. Deep Sea Research Part II: Topical Studies in Oceanography 94, pages 301–311.

Frongillo, E.A. and S. Nanama
2006. D*evelopment and validation of an experience-based measure of household food insecurity within and across seasons in northern Burkina Faso.* Journal of Nutrition 136(5), page 1409s–1419s.

Galena Economic Development Council
2007. *Galena USAF Base reuse plan*. City of Galena: Galena, AK.

Hart, B.
1981. *The history of Ruby, Alaska, "the gem of the Yukon"*. National Bilingual Materials Development Center, Rural Education, University of Alaska Anchorage: Anchorage.

Hart, B., D. Tressler, and A. Lewis
1977. *Kwikpagmiut.* Lower Yukon School District.

Holder, R.
2009a. *Federal waters of districts 1, 2 and 3 of the Yukon River closed to non-federally qualified subsistence users* [news release]. U.S. Fish and Wildlife Service: Fairbanks.

2009b. *Federal waters of District 4 of the Yukon River drainage closed to non-federally qualified subsistence users* [news release]. U.S. Fish and Wildlife Service: Fairbanks.

Holder, R.R. and D. Senecal-Albrecht editors.
1998. *Yukon River comprehensive salmon plan for Alaska.* Alaska Department of Fish and Game: Fairbanks.

Holder, R.R. and H.H. Hamner
1998. *Estimates of subsistence salmon harvests within the Yukon River drainage in Alaska, 1994*. Alaska Department of Fish and Game, Division of Commercial Fisheries: Anchorage.

Honea, J.
1981. *John Honea: Ruby*. Hancock House: Blaine, WA.

Howard, K.G., S.J. Hayes, and D.F. Evenson
2009. *Yukon River Chinook Salmon Stock Status and Action Plan 2010; A Report to the Alaska Board of Fisheries.* Alaska Department of Fish and Game, Divisions of Sport Fish and Commercial Fisheries Special Publication No. 09-26: Anchorage.

Huntington, S.
1993. *Shadows on the Koyukuk: an Alaska Native's Life Along the River*. Alaska Northwest Books: Anchorage.

Jacobson, S.A.
1984. *Yup'ik Eskimo Dictionary*. Alaska Native Language Center, University of Alaska, Fairbanks: Fairbanks.

Jallen, D.M., S.K.S. Decker, and T. Hamazaki
2012. *Subsistence and personal use salmon harvests in the Alaska portion of the Yukon River drainage, 2011*. Alaska Department of Fish and Game, Fishery Data Series No. 12-72: Anchorage.

Jallen, D.M. and T. Hamazaki
2011. *Subsistence and personal Use Salmon Harvests in the Alaska Portion of the Yukon River Drainage, 2009*. Alaska Department of Fish and Game, Fishery Data Series No. 11-07: Anchorage.

Jetté, J.
1908. *On Ten'a folklore*. The Journal of the Royal Anthropological Institute of Great Britain and Ireland 38, pages 298–367.

1911. *On superstitions of the Ten'a Indians (middle part of the Yukon Valley, Alaska)*. Anthropos 16.

1913. *Riddles of the Ten'a Indians*. Anthropos 8, pages 181–201.

Joe, M.
1987. *Martha Joe: Nulato*, Yukon-Koyukuk biography series. Spirit Mountain Press: Fairbanks. ISBN 9780910871143

JTC (Joint Technical Committee of the Yukon River US/Canada Panel)
2001. *Yukon River salmon season review for 2001 and technical committee report*. Alaska Department of Fish and Game, Division of Commercial Fisheries Regional Information Report No. 3A01-35: Anchorage.

2010. *Yukon River salmon 2009 season summary and 2010 season outlook*. Alaska Department of Fish and Game, Division of Commerical Fisheries Regional Information Report No. 3A10-01: Anchorage.

2013. *Yukon River salmon 2012 season summary and 2013 season outlook*. Alaska Department of Fish and Game, Division of Commerical Fisheries Regional Information Report No. 3A13-02: Anchorage.

De Laguna, F.

1936. *An archaeological reconnaissance of the Middle and Lower Yukon Valley, Alaska*. American Antiquity 2(1), pages 6–12.

1947. *Prehistory of northern North America as seen from the Yukon.* Society for American Archaeology: Menasha, WI.

Klein, D.R.

1966. *Waterfowl in the economy of the Eskimos on the Yukon–Kuskokwim Delta, Alaska.* Arctic 19(4), pages 319–336.

Lingnau, T. and P. Salomone

2003. Informational Letter. Preliminary 2003 Yukon area Chinook and summer chum salmon fishery summary.

Looman, S.

1987. *Use of wild resources by Ruby residents: a report on a 1984 household survey.* U. S. Fish and Wildlife Service: Galena.

Loyens, W.J.

1966. *The changing culture of the Nulato Koyukon Indians.* University of Wisconsin: Madison, WI.

Magdanz, J.S., C.J. Utermohle, and R.J. Wolfe

2002. *The production and distribution of wild food in Wales and Deering, Alaska.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 259: Kotzebue.

Marcotte, J.R.

1982. *The king salmon drift net fishery on the Middle Yukon: an overview and study of the 1982 season.* Alaska Department of Fish and Game, Division of Subsistence.

1988. *Subsistence harvest of fish and wildlife by residents of Galena, Alaska, 1985-86.* Alaska Department of Fish and Game, Division of Subsistence.

Marshall High School Journalism Class

1984. *The history of Marshall, Alaska: also called Maserculiq and Fortuna Ledge.* Marshall High School: Marshall, AK.

Mobley, C.M.

2005. *Archaeological survey for the Ruby Airport improvements, Ruby, Alaska.* Charles M. Mobley & Associates: Anchorage.

Moncrieff, C.F. and J. Klein

2003. *Traditional ecological knowledge of salmon along the Yukon River.* Yukon River Drainage Fisheries Association: Anchorage.

Moncrieff, C., C. Brown, and L. Sill

2009. *2009 Arctic Yukon Kuskokwim sustainable salmon initiative project final product: natural indicators of salmon run abundance and timing, Yukon River.* Yukon River Drainage Fisheries Association and the Alaska Department of Fish and Game, Division of Subsistence: Anchorage, Fairbanks.

Naves, L.C.

2010rev. *[2009] 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.

Nelson, E.W.

1978. *E. W. Nelson's notes on the Indians of the Yukon and Innoko Rivers, Alaska*. James W. VanStone, editor. Field Museum of Natural History: Chicago. http://www.biodiversitylibrary.org/bibliography/5279

1983rev. *[1899] The Eskimo about Bering Strait.* Smithsonian Institution Press: Washington, D.C. ISBN 087474671X

Nelson, R.K.
1983. *Make Prayers to the Raven: A Koyukon View of the Northern Forest.* University of Chicago Press: Chicago. ISBN 978-0226571638

Nord, M., M. Andrews, and S. Carlson
2008. *Household food security in the United States, 2007.* Department of Agriculture, Economic Research Service: Washington, DC.

2009. *Household food security in the United States, 2008.* Department of Agriculture, Economic Research Service: Washington, DC.

Orth, D.J.
1971rep. *[1967] Dictionary of Alaska Place Names.* United States Government Printing Office.

Osgood, C.
1940. *Ingalik Material Culture.* Yale University Press: New Haven, Connecticut.

Pérez-Escamilla, R., A.M. Segall-Corrêa, L.K. Maranha, M. de F.A. Sampaio, L. Marín-León, and G. Panigassi
2004. *An adapted version of the U.S. Department of Agriculture food insecurity module is a valid tool for assessing household food insecurity in Campinas, Brazil.* Journal of Nutrition 134(8), pages 1923–1928.

Perry, P.
2008. *"Unit 18 moose management report"* [in] P. Harper, editor, *Moose management report of survey and inventory activities 1 July 2005–30 June 2007.* Alaska Department of Fish and Game, Project 1.0: Juneau.

2010. *"Unit 18 moose"* [in] P. Harper, editor, *Moose management report of survey-inventory activities 1 July 2007-30 June 2009*. Alaska Department of Fish and Game, Division of Wildlife Conservation: Juneau.

Pete, M.C.
1991. *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.

Robert, M.
1984. *Trapping patterns in the vicinity of the Kaiyuh Flats, west central Alaska*. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 84: Fairbanks

Seavoy, R.J.
2001. *"Unit 18 furbearer management report"* [in] C. Healy, editor, *Furbearer management report of survey and inventory activities 1 July 1997–30 June 2000.* Alaska Department of Fish and Game: Juneau.

2004. *"Unit 18 moose management report"* [in] C. Brown, editor, *Moose management report of survey and inventory activities 1 July 2001–30 June 2003.* Alaska Department of Fish and Game. Project 1.0: Juneau.

Schmidt, S.N. and E. Newland
2012. *Yukon River king salmon stock status, action plan and summer chum salmon fishery, 2012; a report to the Alaska Board of Fisheries.* Alaska Department of Fish and Game Division of Sport Fish, Research and Technical Services, Special Publication No. 12-30: Anchorage.

Shaw, R.D.
1998. *An archaeology of the Central Yupik: a regional overview for the Yukon-Kuskokwim Delta, northern Bristol Bay, and Nunivak Island.* Arctic Anthropology 35(1), pages 234–246.

Stickney, A.A.
1981. *Middle Kuskokwim food survey–II.* Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 53: Bethel.

Stout, G.W.
2010a. "*Unit 21B moose*" [in] P. Harper, editor, *Moose management report of survey and inventory activities 1 July 2007–30 June 2009*. Alaska Department of Fish and Game, Project 1.0: Juneau.

2010b. "*Unit 21D moose*" [in] P. Harper, editor, *Moose management report of survey and inventory activities 1 July 2007–30 June 2009*. Alaska Department of Fish and Game, Project 1.0: Juneau.

2010c. "*Unit 24 moose*" [in] P. Harper, editor, *Moose management report of survey and inventory activities 1 July 2007–30 June 2009*. Alaska Department of Fish and Game, Project 1.0: Juneau.

Sullivan, R.J.
1942. *The Ten'a food quest*. Catholic University of America Press: Washington D.C.

Swindale, A. and P. Bilinsky
2006. *Development of a universally applicable household food insecurity measurement tool: process, current status, and outstanding issues.* Journal of Nutrition 136(5), page 1449S–1452S.

Trotter II, R.T. and J.J. Schensul
1998. *"Methods in applied anthropology"* [in] H.R. Bernard, editor, *Handbook of methods in cultural anthropology.* AltaMira Press: Walnut Creek, CA.

U.S. Census Bureau
1982. *1980 Census of Population: characteristics of the population, number of inhabitants.* : Washington D.C.

Valencia, K., C.A. Phillips, and L. Boltz editors.
2005. *The Alaska wilderness guide, 9th edition.* Morris Communications Company LLC: Anchorage.

VanStone, J.W.
1974. *Athapaskan adaptations: hunters and fisherman of the subarctic forests.* Aldine Publishing Company: Chicago.

Volk, E.C., M.D. Plotnick, and A.M. Carroll
2009. *Run forecasts and harvest projections for 2009 Alaska salmon fisheries and review of the 2008 season.* Alaska Department of Fish and Game: Anchorage.

Webb, P., J. Coates, E.A. Frongillo, B.L. Rogers, A. Swindale, and P. Bilinsky
2006. *Measuring household food insecurity: why it's so important and yet so difficult to do.* Journal of Nutrition 136(5), page 1404s–1408s.

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.
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.

Whitmore, C., D.J. Bergstrom, F.M. Andersen, G. Sandone, J. Wilcock, L.H. Barton, and D. Mesiar
1990. *Annual management report Yukon Area, 1988*. Alaska Department of Fish and Game, Division of Commercial Fisheries: Anchorage.

Wolfe, R.J.
1981. *Norton Sound/Yukon Delta sociocultural systems baseline analysis.* Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 59.

1982. *Alaska's great sickness, 1900: An epidemic of measles and influenza in a virgin soil population*. Proceedings of the American Philosophical Society 126(2), pages 91–121.

1984. *Commercial fishing in the hunting-gathering economy of a Yukon River Yup'ik society*. Inuit Studies (Supplemental Issue 8), pages 159–184.

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

Wolfe, R.J. and L.J. Ellanna
1983. *Resource use and socioeconomic systems: case studies of fishing and hunting in Alaskan communities*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 61: Juneau.

Wolfe, R.J. and C. Scott
2010. *Continuity and change in salmon harvest patterns, Yukon River drainage, Alaska*, U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program No. 07-253. Robert J. Wolfe and Associates: San Marcos, CA.

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

Wunderlich, G.S. and J.L. Norwood
2006. *Food insecurity and hunger in the United States: an assessment of the measure*. Panel to review the U.S. Department of Agriculture's measurement of food insecurity and hunger. Committee on National Statistics, Division of Behavioral and Social Sciences and Education, the National Academies Press: Washington, D.C.

Yarber, Y.
1986. *Henry Ekada: Nulato*. Yukon-Koyukuk biography series. Spirit Mountain Press: Fairbanks.

APPENDIX A–SURVEY INSTRUMENT

COMPREHENSIVE SUBSISTENCE SURVEY

NULATO, ALASKA

From January 1, 2010 to December 31, 2010

SURVEY PRINTED
2011-03-02

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

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

HOUSEHOLD ID:		
COMMUNITY ID:	NULATO	258
INTERVIEWER:		
INTERVIEW DATE:		
START TIME:		
STOP TIME:		
DATA CODED BY:		
DATA ENTERED BY:		
SUPERVISOR:		

PHOTO BY JAMES VAN LANEN

COOPERATING ORGANIZATIONS

NULATO TRADITIONAL COUNCIL
BOX 65049
NULATO, AK 99765

(907) 898-2339

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, 2010, and December 31, 2010, 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 Nulato?	*If person has NOT always lived in Nulato…*			
							WHEN did they LAST move here?	From WHERE did this person move?	Where is this person's birth home?*	TOTAL years lived here?
								community in Alaska, OR state in the US, OR country		
ID#	*circle*	*relation*	*circle*	*circle*	*age*	*circle*	*year*			*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 **NULATO: 258**

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 for each person should be on the same row on the left and right pages.

	Fish		Big Game		Marine Mammals		Birds & Eggs		Plants & Berries	
	…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?
ID #	*circle each activity reported for each person, make no mark in other cells*									
HEAD	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
1										
NEXT, enter participation for spouse or partner. If household has a SINGLE HEAD, leave HEAD 2 row BLANK, and move to PERSON 3.										
HEAD	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
2										
BELOW, enter participation for children (oldest to youngest), grandchildren, grandparents, or anyone else living full-time in this household.										
PERSON 3	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
3										
PERSON 4	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
4										
PERSON 5	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
5										
PERSON 6	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
6										
PERSON 7	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
7										
PERSON 8	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
8										
PERSON 9	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
9										
PERSON 10	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
10										
PERSON 11	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
11										
PERSON 12	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
12										
PERSON 13	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
13										
PERSON 14	try to catch fish or shlfsh?	process fish or shlfsh?	hunt for land animals	process land animals	hunt for marine mamls	process land animals	hunt or gather birds or eggs	process birds or eggs	gather berries or plants	process plants
14										

PERMANENT HH MEMBERS: 01 **NULATO: 258**

EMPLOYMENT STATUS

HOUSEHOLD ID

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

This page asks about jobs and income. We ask about jobs and income because we are trying to understand all parts of the community economy. Many people use wages from jobs to support subsistence activities. Starting with the first head of your household, what job or jobs did he or she have last year?

For each member of this household born before 1995, 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 1995 (this includes anyone who is 16 years old or older).

						WORK SCHEDULE…**					
	Person Code from page 2	What kind of work did he or she do in this job?	For whom did he or she work in this job?	In the past year, what months did he or she work in this job?		FULL TIME	PART TIME	SHIFT - FULL TIME	ON-CALL, VARIES	SHIFT - PART TIME	In the past year how much did he or she earn in this job?
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 - expenses

EMPLOYMENT: 23 **NULATO: 258**

OTHER INCOME

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

HOUSEHOLD ID

Between JANUARY 1, 2010, and DECEMBER 31, 2010…

…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 2010?	TOTAL amount all members of your household received from _____ in 2010.
		circle one	*dollars*
DIVIDENDS	ALASKA PERMANENT FUND DIVIDEND	Y N	$ /YR
	32		
	NATIVE CORPORATION DIVIDENDS	Y N	$ /YR
	13		

Alaska PFD IN 2010
1 PFD = $1,281
2 PFDs = $2,562
3 PFDs = $3,843
4 PFDs = $5,124
5 PFDs = $6,405
6 PFDs = $7,686
7 PFDs = $8,967
8 PFDs = $10,248
9 PFDs = $11,529
10 PFDs = $12,810
11 PFDs = $14,091
12 PFDs = $15,372

Regional Corporations	*Dividend*
Doyon Ltd.....	*$ 4.21*
Calista Corp.....	*$ 2.25*

Village Corporation(s)	*Dividend*
Gana-a'yoo Corporation.....	*$ 1.50*

Between JANUARY 1, 2010, and DECEMBER 31, 2010…

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

IF NO, go to the next page.

If YES, continue below…

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

		Received? *circle one*	Total Amount? *dollars*
OTHER	CITGO FUEL VOUCHER	Y N	$ /YR
	CHILD SUPPORT	Y N	$ /YR
	15		
	FOSTER CARE	Y N	$ /YR
	41		
	MEETING HONORARIA *(not per diem)*	Y N	$ /YR
	OTHER *(describe)*	Y N	$ /YR
	OTHER *(describe)*	Y N	$ /YR

Scratch paper for calculations

for _____ weeks =
for _____ months =

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 **NULATO: 258**

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, 2010, AND DECEMBER 31, 2010),
   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,* did you or members of your household….

…fish commercially for _____?

…keep some _____ from your COMMERCIAL CATCH for your own use or to share?

Was the _____ that you kept INCIDENTAL CATCH?

That is, NOT a target species in the fishery

IF "…keep some from commercial catch" is YES, ask questions below…

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.

Insert names below in blanks above	*COM FISH?*	*KEEP?*	*INCI?*	How many were removed for your OWN USE?	How many were removed for your CREW?	How many were removed to give to OTHERS?	Units ***	
				number	*number*	*number*	*specify*	*comments*
CHINOOK SALMON *KING SALMON*	Y N	Y N	Y N					
113,000,001								
SOCKEYE SALMON *RED SALMON*	Y N	Y N	Y N					
115,000,001								
COHO SALMON	Y N	Y N	Y N					
112,000,001								
CHUM SALMON *DOG SALMON*	Y N	Y N	Y N					
111,000,001								
PINK SALMON *HUMPIES*	Y N	Y N	Y N					
114,000,001								
HERRING	Y N	Y N	Y N					
120,200,001								
HALIBUT	Y N	Y N	Y N					
121,800,001								
LAMPREY *EEL*	Y N	Y N	Y N					
122,000,001								
SHEEFISH	Y N	Y N	Y N					
125,600,001								
BROAD WHITEFISH	Y N	Y N	Y N					
126,404,001								

RETAINED COMMERCIAL HARVESTS continued on next page…

* *"LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.*

** *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc.*

*** *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

RETAINED COMMERCIAL HARVESTS

HOUSEHOLD ID

...RETAINED COMMERCIAL HARVESTS continued from previous page.

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

…fish commercially for _____?	…keep some _____ from your COMMERCIAL CATCH for your own use or to share?	Was the _____ that you kept INCIDENTAL CATCH? *That is, NOT a target species in the fishery*

IF "…keep some from commercial catch" is YES, ask questions below…

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.

Insert names below in blanks above	*COM FISH?*	*KEEP?*	*INCI?*	How many were removed for your OWN USE? *number*	How many were removed for your CREW? *number*	How many were removed to give to OTHERS? *number*	Units *** *specify*	*comments*
HUMPBPACK WHITEFISH	Y N	Y N	Y N					
126,408,001								
LEAST CISCO	Y N	Y N	Y N					
126,406,061								
BERING CISCO	Y N	Y N	Y N					
126,406,041								
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					
	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 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.

* "LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.

** "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc.

*** 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: 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, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….

…use** _____? …receive _____ from someone in another household or community? …give _____ to someone in another household or community? …try** to harvest _____? *TRY includes looking, even if you got none*

IF …try to harvest is "YES," ask questions below…

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.

Please estimate how many salmon ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many were...

Insert names below in blanks above	*USE?*	*REC?*	*GIVE?*	*TRY?*	Caught with SET NET	Caught with DRIFT NET	Caught with SEINE NET	Caught with FISH WHEEL	Caught with ROD & REEL	Caught with OTHER GEAR	Units ***	How many OF THOSE were used just for dogfood?
					number harvested by each gear type						*specify*	*number*
CHINOOK SALMON *KING SALMON*	Y N	Y N	Y N	Y N								
113,000,000												
SOCKEYE SALMON *RED SALMON*	Y N	Y N	Y N	Y N								
115,000,000												
COHO SALMON	Y N	Y N	Y N	Y N								
112,000,000												
SUMMER CHUM SALMON *DOG SALMON*	Y N	Y N	Y N	Y N								
111,010,000												
FALL CHUM SALMON	Y N	Y N	Y N	Y N								
111,020,000												
PINK SALMON *HUMPIES*	Y N	Y N	Y N	Y N								
114,000,000												
SALMON - UNKNOWN	Y N	Y N	Y N	Y N								
119,000,000												
	Y N	Y N	Y N	Y N								
	Y N	Y N	Y N	Y N								
	Y N	Y N	Y N	Y N								

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.

* *"LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.*

** *"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.*

NON-COMMERCIAL SALMON: 04 **NULATO: 258**

SUBSISTENCE SUMMARY: SALMON

HOUSEHOLD ID

If this household did NOT USE or HARVEST salmon last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping and network questions…

MAPPING: SALMON

On map, mark all the areas where members of your household fished for SALMON.

NETWORK: SALMON

WHO CAUGHT the SALMON your household used last year?			WHO PROCESSED the SALMON your household used last year?		
List most important harvesters and processors first.					
SALMON harvesters living in…			SALMON processors living in…		
…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities

ASSESSMENTS: SALMON 110000000

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

Last year…

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

If LESS or MORE… *X = do not use*

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

_____ 2

Last year…

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

If NO…

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

WHY did your household NOT get enough salmon?..... _____ 1

_____ 2

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

Did your household do anything DIFFERENTLY because you did NOT get enough salmon?..... Y N

IF YES…

What did your household do differently?..... _____ 1

_____ 2

NETWORKS & ASSESSMENTS OF SALMON: 66, 67 **NULATO: 258**

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, 2010, AND DECEMBER 31, 2010),
   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,* did you or members of your household….					IF …try to harvest is "YES," ask questions below… 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.							
…use** _____?	…receive _____ from someone in another household or community?	…give _____ to someone in another household or community?	…try** to harvest _____? TRY includes looking, even if you got none		Please estimate how many whitefish ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many were...							How many OF THOSE were used just for dogfood?
Read names below in blanks above	USE?	REC?	GIVE?	TRY?	Caught with SET NET	Caught with DRIFT NET	Caught with SEINE NET	Caught with FISH WHEEL	Caught with ROD & REEL	Caught with OTHER GEAR	Units ***	
					number harvested by each gear type						specify	number
SHEEFISH	Y N	Y N	Y N	Y N								
125,600,000												
HUMPBACK WHITEFISH	Y N	Y N	Y N	Y N								
126,408,000												
BROAD WHITEFISH	Y N	Y N	Y N	Y N								
126,404,000												
ROUND WHITEFISH	Y N	Y N	Y N	Y N								
126,412,000												
BERING CISCO	Y N	Y N	Y N	Y N								
126,406,040												
LEAST CISCO	Y N	Y N	Y N	Y N								
126,406,060												
UNKNOWN WHITEFISH	Y N	Y N	Y N	Y N								
126,499,000												
	Y N	Y N	Y N	Y N								
	Y N	Y N	Y N	Y N								
	Y N	Y N	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.

* "LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.

** "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.

*** UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.

HARVESTS: OTHER FISH

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for other fish for subsistence, such as LUSH, SMELT, or any other other fish?..... 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 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,* did you or members of your household….

IF ...try to harvest is "YES," ask questions below…

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.

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many were...

Insert names below in blanks above	…use** _____? *USE?*	…receive _____ from someone in another household or community? *REC?*	…give _____ to someone in another household or community? *GIVE?*	…try** to harvest _____? *TRY?* (*TRY includes looking, even if you got none*)	Caught with SET NET	Caught with DRIFT NET	Caught with SEINE NET	Caught with FISH WHEEL	Caught with ROD & REEL	Caught with OTHER GEAR	Units ***	How many OF THOSE were used just for dogfood?
					number harvested by each gear type						*specify*	*number*
BURBOT *LUSH*	Y N	Y N	Y N	Y N								
124,800,000												
NORTHERN PIKE	Y N	Y N	Y N	Y N								
125,500,000												
SMELT	Y N	Y N	Y N	Y N								
120,400,000												
GRAYLING	Y N	Y N	Y N	Y N								
125,200,000												
RAINBOW TROUT	Y N	Y N	Y N	Y N								
126,204,000												
DOLLY VARDEN *CHAR*	Y N	Y N	Y N	Y N								
125,006,000												
LAKE TROUT	Y N	Y N	Y N	Y N								
125,010,000												
BLACKFISH	Y N	Y N	Y N	Y N								
124,600,000												
STICKLEBACK *NEEDLEFISH*	Y N	Y N	Y N	Y N								
123,800,000												
LAMPREY *EEL*	Y N	Y N	Y N	Y N								
122,000,000												

OTHER FISH continued on next page…

* "LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.
** "USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.
*** UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.

HARVESTS: OTHER FISH

HOUSEHOLD ID

OTHER FISH continued from previous page…

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

…use** _____? …receive _____ from someone in another household or community? …give _____ to someone in another household or community? …try** to harvest _____? *INCLUDE looking, even if you got none*

IF …try to harvest is "YES," ask questions below…

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.

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many were...

Insert names below in blanks above	*USE?*	*REC?*	*GIVE?*	*TRY?*	Caught with SET NET	Caught with DRIFT NET	Caught with SEINE NET	Caught with FISH WHEEL	Caught with ROD & REEL	Caught with OTHER GEAR	Units ***	How many OF THOSE were used just for dogfood?
					number harvested by each gear type						*specify*	*number*
HERRING	Y N	Y N	Y N	Y N								
120,200,000												
HALIBUT	Y N	Y N	Y N	Y N								
121,800,000												
PACIFIC TOMCOD	Y N	Y N	Y N	Y N								
121,008,000												
SAFFRON COD *TOMCOD*	Y N	Y N	Y N	Y N								
121,010,000												
SUCKER	Y N	Y N	Y N	Y N								
126,000,000												
	Y N	Y N	Y N	Y N								
	Y N	Y N	Y N	Y N								
	Y N	Y N	Y N	Y N								
	Y N	Y N	Y N	Y N								
	Y N	Y N	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.

* "LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.

** "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.

NON-SALMON FINFISH: 06 **NULATO: 258**

SUBSISTENCE SUMMARY: FISH OTHER THAN SALMON

HOUSEHOLD ID

If this household did NOT USE or HARVEST fish other than salmon last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping and network questions…

MAPPING: FISH OTHER THAN SALMON

On map, mark all the areas where members of your household fished for WHITEFISH, SHEEFISH, NORTHERN PIKE, and BURBOT.

NETWORK: FISH OTHER THAN SALMON

WHO CAUGHT the WHITEFISH your household used last year?			WHO PROCESSED the WHITEFISH your household used		
List most important harvesters and processors first.					
WHITEFISH harvesters living in…			WHITEFISH processors living in…		
…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities

WHO CAUGHT the OTHER FISH your household used last year?			WHO PROCESSED the OTHER FISH your household used last		
List most important harvesters and processors first.					
OTHER FISH harvesters living in…			OTHER FISH processors living in…		
…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities

ASSESSMENTS: FISH OTHER THAN SALMON

100000002

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

Last year…

…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

Last year…

…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 fish other than salmon 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 **NULATO: 258**

SUBSISTENCE HARVESTS: MARINE INVERTEBRATES

HOUSEHOLD ID

1. Do you or members of your household USUALLY get marine invertebrates for subsistence, such as KING CRAB, CLAMS, or any other marine invertebrates?..... Y N
2. During the last year (between JANUARY 1, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….					IF …try to harvest is "YES," ask questions below…		
…use** _____?	…receive _____ from someone in another household or community?	…give _____ to someone in another household or community?	…try** to harvest _____? TRY includes looking, even if you got none		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.		
Insert names below in blanks above	*USE?*	*REC?*	*GIVE?*	*TRY?*	How many did your HH get? *amount*	Units *** *specify*	*comments*
KING CRAB	Y N	Y N	Y N	Y N		GAL	
501,008,000							
TANNER CRAB	Y N	Y N	Y N	Y N		GAL	
501,012,000							
CLAMS	Y N	Y N	Y N	Y N		GAL	
500,600,000							
SHRIMP	Y N	Y N	Y N	Y N		GAL	
503,400,000							
OTHER INVERTEBRATES	Y N	Y N	Y N	Y N		GAL	
509,900,000							
	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N		GAL	
	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.

* "LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.

** "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.

MARINE INVERTEBRATES: 08 **NULATO: 258**

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 and network questions…

MAPPING: MARINE INVERTEBRATES

There are no maps for marine invertebrates, continue to NETWORK questions below.

NETWORK: MARINE INVERTEBRATES

WHO GOT the INVERTEBRATES your household used last year?			WHO PROCESSED the INVERTEBRATES your household used last year?		
List most important harvesters and processors first.					
Harvesters living in…			Processors living in…		
…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities

ASSESSMENTS: MARINE INVERTEBRATES

500000000

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

Last year…

…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

Last year…

…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 marine invertebrates 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 — NULATO: 258

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, CARIBOU, or any other large land animals?..... Y N
2. During the last year (between JANUARY 1, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….

Insert names below in blanks above	…use** _____? USE?	…receive _____ from someone in another household or community? REC?	…give _____ to someone in another household or community? GIVE?	…try** to harvest _____? TRY includes looking, even if you got none TRY?	SEX	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units *** specify
						number killed in each month													
MOOSE	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	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															IND
210,600,000																			
BROWN BEAR	Y N	Y N	Y N	Y N															IND
210,800,000																			
	Y N	Y N	Y N	Y N															IND
	Y N	Y N	Y N	Y N															IND
	Y N	Y N	Y N	Y N															IND
	Y N	Y N	Y N	Y N															IND

IF ...try to harvest is "YES," ask questions below…

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.

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.

* "LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.

** "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.

LAND MAMMALS: 10 **NULATO: 258**

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, SNOWSHOE HARE, or any other small land animals?..... Y N
2. During the last year (between JANUARY 1, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….

…use** _____? …receive _____ from someone in another household or community? …give _____ to someone in another household or community? …try** to harvest _____? *TRY includes looking, even if you got none*

IF ...try to harvest is "YES," ask questions below…

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.

Insert names below in blanks above	*USE?*	*REC?*	*GIVE?*	*TRY?*	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units ***	Number Used For Food or for Food & Fur
					number killed in each month													*specify*	
BEAVER	Y N	Y N	Y N	Y N														IND	
220,200,000																			
MUSKRAT	Y N	Y N	Y N	Y N														IND	
222,400,000																			
SNOWSHOE HARE	Y N	Y N	Y N	Y N														IND	
221,004,000																			
ARCTIC HARE *JACKRABBIT*	Y N	Y N	Y N	Y N														IND	
221,002,000																			
PORCUPINE	Y N	Y N	Y N	Y N														IND	
222,600,000																			
TREE SQUIRREL	Y N	Y N	Y N	Y N														IND	
222,804,000																			
PARKA SQUIRREL (GROUND)	Y N	Y N	Y N	Y N														IND	
222,802,000																			
MARMOT	Y N	Y N	Y N	Y N														IND	
221,800,000																			
	Y N	Y N	Y N	Y N														IND	
	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.

* "LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.

** "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.

LAND MAMMALS: 10 **NULATO: 258**

SUBSISTENCE HARVESTS: FUR ANIMALS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt or trap for fur animals for subsistence, such as MARTEN, WOLF, or any other fur animals?..... Y N
2. During the last year (between JANUARY 1, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….

IF …try to harvest is "YES," ask questions below…

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.

Insert names below in blanks above	…use** _____? USE?	…receive _____ from someone in another household or community? REC?	…give _____ to someone in another household or community? GIVE?	…try** to harvest _____? TRY? (TRY includes looking, even if you got none)	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units *** specify	Number Used For Food or for Food & Fur
					number caught in each month														
MARTEN	Y N	Y N	Y N	Y N														IND	
222,000,000																			
WOLVERINE	Y N	Y N	Y N	Y N														IND	
223,400,000																			
WOLF	Y N	Y N	Y N	Y N														IND	
223,200,000																			
RED FOX	Y N	Y N	Y N	Y N														IND	
220,804,000																			
LAND OTTER	Y N	Y N	Y N	Y N														IND	
221,200,000																			
LYNX	Y N	Y N	Y N	Y N														IND	
221,600,000																			
MINK	Y N	Y N	Y N	Y N														IND	
222,200,000																			
WEASEL	Y N	Y N	Y N	Y N														IND	
223,000,000																			
	Y N	Y N	Y N	Y N														IND	
	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.

* "LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.

** "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.

FURBEARERS: 14 **NULATO: 258**

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 and network questions…

MAPPING: LAND ANIMALS

On map, mark all the areas where members of your household looked for MOOSE, CARIBOU, and SMALL LAND MAMMALS.

NETWORK: LAND ANIMALS

WHO KILLED the MOOSE your household used last year?			WHO PROCESSED the MOOSE your household used last year?			WHO KILLED the CARIBOU your household used last year?			WHO PROCESSED the CARIBOU your household used last year?		
List most important harvesters and processors first.						*List most important harvesters and processors first.*					
MOOSE harvesters living in…			MOOSE processors living in…			CARIBOU harvesters living in…			CARIBOU processors living in…		
…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities

ASSESSMENTS: LAND ANIMALS

122000002

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

Last year…

…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

Last year…

…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 land animals 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 **NULATO: 258**

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, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….

…use** _____? …receive _____ from someone in another household or community? …give _____ to someone in another household or community? …try** to harvest _____? *TRY includes looking, even if you got none*

IF …try to harvest is "YES," ask questions below…

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.

Insert names below in blanks above	USE?	REC?	GIVE?	TRY?	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units ***	
					number killed in each month													*specify*	*comments*
BEARDED SEAL *MUKLUK*	Y N	Y N	Y N	Y N														IND	
300,802,000																			
RINGED SEAL	Y N	Y N	Y N	Y N														IND	
300,810,000																			
SPOTTED SEAL	Y N	Y N	Y N	Y N														IND	
300,812,000																			
SEAL OIL *OR OTHER SEAL PRODUCTS*	Y N	Y N	Y N	Y N														IND	
300,899,000																			
BELUKHA WHALE *WHITE MUKTUK*	Y N	Y N	Y N	Y N														IND	
301,602,000																			
BOWHEAD WHALE *BLACK MUKTUK*	Y N	Y N	Y N	Y N														IND	
301,606,000																			
WALRUS	Y N	Y N	Y N	Y N														IND	
301,400,000																			
	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N														IND	
	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.

* "LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.

** "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.

MARINE MAMMALS: 12 **NULATO: 258**

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 and network questions…

MAPPING: MARINE MAMMALS

On map, mark all the areas where members of your household looked for SEALS and BELUKHA WHALES.

NETWORK: MARINE MAMMALS

WHO KILLED the SEALS your household used last year?			WHO PROCESSED the SEALS your household used last year?			WHO KILLED the WHALES your household used last year?			WHO PROCESSED the WHALES your household used last year?		
List most important harvesters and processors first.						***List most important harvesters and processors first.***					
SEALS harvesters living in…			SEALS processors living in…			WHALES harvesters living in…			WHALES processors living in…		
…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities

ASSESSMENTS: MARINE MAMMALS

300000000

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

Last year…

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

If LESS or MORE… *X = do not use*

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

_____ 2

Last year…

…did your household GET ENOUGH marine mammals?..... Y N

If NO…

What KIND of marine mammals did you need?..... _____

WHY did your household NOT get enough marine mammals?..... _____ 1

_____ 2

How would you describe the impact to your household of not getting enough marine mammals 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 — NULATO: 258

HARVESTS: DUCKS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt ducks for subsistence, such as MALLARD, GOLDENEYE, 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,* did you or members of your household….

IF …try to harvest is "YES," ask questions below…

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.

Insert names below in blanks above	…use** _____? *USE?*	…receive _____ from someone in another household or community? *REC?*	…give _____ to someone in another household or community? *GIVE?*	…try** to harvest _____? *TRY includes looking, even if you got none* *TRY?*	January February November December WINTER	April May June SPRING	July August SUMMER	September October FALL	Season of harvest unknown *number*	Units *** *specify*
					number killed in each season					
MALLARD	Y N	Y N	Y N	Y N						IND
410,214,000										
NORTHERN PINTAIL	Y N	Y N	Y N	Y N						IND
410,220,000										
GOLDENEYE	Y N	Y N	Y N	Y N						IND
410,210,000										
WIGEON	Y N	Y N	Y N	Y N						IND
410,236,000										
GREEN WINGED TEAL	Y N	Y N	Y N	Y N						IND
410,232,060										
NORTHERN SHOVELER	Y N	Y N	Y N	Y N						IND
410,230,000										
SCAUP	Y N	Y N	Y N	Y N						IND
410,226,000										
BUFFLEHEAD	Y N	Y N	Y N	Y N						IND
410,202,000										
LONG-TAILED DUCK *OLDSQUAW*	Y N	Y N	Y N	Y N						IND
410,218,000										
CANVASBACK	Y N	Y N	Y N	Y N						IND
410,204,000										

DUCKS continued on next page…

* *"LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.*

** *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*

*** *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVESTS: DUCKS

HOUSEHOLD ID

DUCKS continued from previous page…

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

…use** _____? …receive _____ from someone in another household or community? …give _____ to someone in another household or community? …try** to harvest _____? *INCLUDE looking, even if you got none*

IF …try to harvest is "YES," ask questions below…

Please estimate how many ducks ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE ducks that members of the 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.

Insert names below in blanks above	*USE?*	*REC?*	*GIVE?*	*TRY?*	January February March April (WINTER)	May June (SPRING)	July August September (SUMMER)	October November December (FALL)	Season of harvest unknown	Units ***
					number killed in each season				*number*	*specify*
BLACK SCOTER *BLACK DUCK*	Y N	Y N	Y N	Y N						IND
410,228,020										
SURF SCOTER	Y N	Y N	Y N	Y N						IND
410,228,040										
WHITE-WINGED SCOTER	Y N	Y N	Y N	Y N						IND
410,228,060										
COMMON EIDER	Y N	Y N	Y N	Y N						IND
410,206,020										
UNKNOWN EIDER	Y N	Y N	Y N	Y N						IND
410,206,990										
COMMON MERGANSER	Y N	Y N	Y N	Y N						IND
410,216,020										
RED-BREASTED MERGANSER	Y N	Y N	Y N	Y N						IND
410,216,040										
UNKNOWN MERGANSER	Y N	Y N	Y N	Y N						IND
410,216,990										
UNKNOWN DUCKS	Y N	Y N	Y N	Y N						IND
410,299,000										
	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N						IND
	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, 2010, and DECEMBER 31, 2010.*

** *"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 **NULATO: 258**

SUBSISTENCE HARVESTS: GEESE

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt geese for subsistence, such as LITTLE "CACKLERS", SPECKLEBELLY, or any other geese?..... Y N
2. During the last year (between JANUARY 1, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….

IF …try to harvest is "YES," ask questions below…

Please estimate how many geese ALL MEMBERS OF YOUR HOUSEHOLD got 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.

Insert names below in blanks above	…use** _____? USE?	…receive _____ from someone in another household or community? REC?	…give _____ to someone in another household or community? GIVE?	…try** to harvest _____? TRY includes looking, even if you got none TRY?	January February November December WINTER	April May June SPRING	July August SUMMER	September October FALL	Season of harvest unknown number	Units *** specify
					number got in each season					
CANADA GEESE *LITTLE "CACKLERS"*	Y N	Y N	Y N	Y N						IND
410,404,040										
CANADA GEESE *BIG "LESSER"*	Y N	Y N	Y N	Y N						IND
410,404,080										
CANADA GEESE *UNKNOWN SPECIES*	Y N	Y N	Y N	Y N						IND
410,404,990										
WHITE-FRONTED GEESE *SPECKLEBELLY*	Y N	Y N	Y N	Y N						IND
410,410,000										
BRANT *SEA GEESE*	Y N	Y N	Y N	Y N						IND
410,402,000										
EMPEROR GEESE	Y N	Y N	Y N	Y N						IND
410,406,000										
SNOW GEESE	Y N	Y N	Y N	Y N						IND
410,408,000										
UNKNOWN GEESE	Y N	Y N	Y N	Y N						IND
410,499,000										
	Y N	Y N	Y N	Y N						IND
	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.

* *"LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.*

** *"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 **NULATO: 258**

SUBSISTENCE HARVESTS: OTHER BIRDS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt other birds for subsistence, such as SPRUCE CHICKEN, PTARMIGAN, or any other other birds?..... Y N
2. During the last year (between JANUARY 1, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….

…use** _____? …receive _____ from someone in another household or community? …give _____ to someone in another household or community? …try** to harvest _____? *TRY includes looking, even if you got none*

IF ...try to harvest is "YES," ask questions below…

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.

Insert names below in blanks above	*USE?*	*REC?*	*GIVE?*	*TRY?*	January February November December WINTER	April May June SPRING	July August SUMMER	September October FALL	Season of harvest unknown	Units ***
					number got in each season				*number*	*specify*
SPRUCE GROUSE *SPRUCE CHICKEN*	Y N	Y N	Y N	Y N						IND
421,802,020										
RUFFED GROUSE *WILLOW GROUSE*	Y N	Y N	Y N	Y N						IND
421,802,060										
PTARMIGAN	Y N	Y N	Y N	Y N						IND
421,804,990										
SANDHILL CRANE	Y N	Y N	Y N	Y N						IND
410,802,000										
TUNDRA SWAN *WHISTLING SWAN*	Y N	Y N	Y N	Y N						IND
410,604,000										
WHIMBREL	Y N	Y N	Y N	Y N						IND
411,009,040										
	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N						IND
	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.

* *"LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.*

** *"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 **NULATO: 258**

SUBSISTENCE HARVESTS: EGGS

HOUSEHOLD ID

1. Do you or members of your household USUALLY gather eggs for subsistence, such as DUCK EGGS, SWAN EGGS, or any other eggs?..... Y N
2. During the last year (between JANUARY 1, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….

IF …try to harvest is "YES," ask questions below…

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.

…use** _____?	…receive _____ from someone in another household or community?	…give _____ to someone in another household or community?	…try** to harvest _____? *TRY includes looking, even if you got none*			
Insert names below in blanks above	*USE?*	*REC?*	*GIVE?*	*TRY?*	How many did you gather? *amount*	Units *** *specify*	*comments*
DUCK EGGS	Y N	Y N	Y N	Y N			
430,200,000							
GEESE EGGS	Y N	Y N	Y N	Y N			
430,400,000							
SWAN EGGS	Y N	Y N	Y N	Y N			
430,600,000							
GULL EGGS	Y N	Y N	Y N	Y N			
431,212,990							
SHORE BIRD EGGS	Y N	Y N	Y N	Y N			
431,099,000							
UNKNOWN EGGS	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	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.

* "LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.

** "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 **NULATO: 258**

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 and network questions…

MAPPING: BIRDS & EGGS

On map, mark all the areas where members of your household looked for DUCKS & GEESE and PTARMIGAN & GROUSE.

NETWORK: BIRDS & EGGS

WHO GOT the BIRDS your household used last year?			WHO PROCESSED the BIRDS your household used last year?			WHO GOT the EGGS your household used last year?			WHO PROCESSED the EGGS your household used last year?		
List most important harvesters and processors first.						***List most important harvesters and processors first.***					
BIRDS harvesters living in…			BIRDS processors living in…			EGGS harvesters living in…			EGGS processors living in…		
…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities

ASSESSMENTS: BIRDS & EGGS

430000000

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

Last year…

…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

Last year…

…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 birds & eggs 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 **NULATO: 258**

SUBSISTENCE HARVESTS: BERRIES

HOUSEHOLD ID

1. Do you or members of your household USUALLY pick berries for subsistence, such as BLUEBERRIES, CROWBERRIES, or any other berries?..... Y N
2. During the last year (between JANUARY 1, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….

IF …try to harvest is "YES," ask questions below…

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.

Insert names below in blanks above	…use** _____? *USE?*	…receive _____ from someone in another household or community? *REC?*	…give _____ to someone in another household or community? *GIVE?*	…try** to harvest _____? *TRY includes looking, even if you got none* *TRY?*	How many did you pick? *amount*	Units *** *specify*	*comments*
BLUEBERRIES	Y N	Y N	Y N	Y N		GAL	
601,002,000							
SALMONBERRY *CLOUDBERRIES*	Y N	Y N	Y N	Y N		GAL	
601,022,000							
BLACKBERRIES *CROWBERRIES*	Y N	Y N	Y N	Y N		GAL	
601,007,000							
LOW-BUSH CRANBERRIES	Y N	Y N	Y N	Y N		GAL	
601,004,000							
HIGH-BUSH CRANBERRIES	Y N	Y N	Y N	Y N		GAL	
601,006,000							
RASPBERRY	Y N	Y N	Y N	Y N		GAL	
601,020,000							
CURRANTS	Y N	Y N	Y N	Y N		GAL	
601,012,000							
GOOSEBERRY	Y N	Y N	Y N	Y N		GAL	
601,010,000							
	Y N	Y N	Y N	Y N		GAL	
	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.

* "LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.

** "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.

PLANTS: 17 **NULATO: 258**

SUBSISTENCE HARVESTS: GREENS

HOUSEHOLD ID _____

1. Do you or members of your household USUALLY pick greens for subsistence, such as WILD RHUBARB, CHYTHLOOK, or any other greens?..... Y N
2. During the last year (between JANUARY 1, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….					IF ...try to harvest is "YES," ask questions below…		
…use** _____?	…receive _____ from someone in another household or community?	…give _____ to someone in another household or community?	…try** to harvest _____? *TRY includes looking, even if you got none*		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.*		
Insert names below in blanks above	*USE?*	*REC?*	*GIVE?*	*TRY?*	How many did you pick? *amount*	Units *** *specify*	*comments*
WILD RHUBARB	Y N	Y N	Y N	Y N		GAL	
602,006,000							
FIREWEED	Y N	Y N	Y N	Y N		GAL	
602,042,000							
STINKWEED *CHYTHLOOK*	Y N	Y N	Y N	Y N		GAL	
602,044,000							
HUDSON BAY TEA *LABRADOR TEA*	Y N	Y N	Y N	Y N		GAL	
602,018,000							
FIDDLEHEAD FERNS	Y N	Y N	Y N	Y N		GAL	
602,014,000							
WILD CELERY	Y N	Y N	Y N	Y N		GAL	
602,032,000							
FIELD MINT	Y N	Y N	Y N	Y N		GAL	
602,022,000							
SOURDOCK	Y N	Y N	Y N	Y N		GAL	
602,028,000							
WILLOW LEAVES	Y N	Y N	Y N	Y N		GAL	
602,031,000							
UNKNOWN GREENS	Y N	Y N	Y N	Y N		GAL	
602,048,000							

During the last year, did your household use any other kind of greens?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

* *"LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.*

** *"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 **NULATO: 258**

SUBSISTENCE HARVESTS: OTHER PLANTS

HOUSEHOLD ID

1. Do you or members of your household USUALLY get other plants for subsistence, such as ESKIMO POTATO, MUSHROOMS, or any other other plants?..... Y N
2. During the last year (between JANUARY 1, 2010, AND DECEMBER 31, 2010), 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,* did you or members of your household….

IF …try to harvest is "YES," ask questions below…

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.

Insert names below in blanks above	…use** _____?	…receive _____ from someone in another household or community?	…give _____ to someone in another household or community?	…try** to harvest _____? *TRY includes looking, even if you got none*	How many did you get? *amount*	Units *** *specify*	*comments*
	USE?	*REC?*	*GIVE?*	*TRY?*			
ESKIMO POTATO	Y N	Y N	Y N	Y N		GAL	
602,009,000							
ROSE HIPS	Y N	Y N	Y N	Y N		GAL	
602,036,000							
MUSHROOMS	Y N	Y N	Y N	Y N		GAL	
602,040,000							
PUFFBALLS	Y N	Y N	Y N	Y N		GAL	
602,046,020							
PUNK	Y N	Y N	Y N	Y N		GAL	
602,046,010							
YARROW	Y N	Y N	Y N	Y N		GAL	
602,037,000							
NETTLE	Y N	Y N	Y N	Y N		GAL	
602,016,000							
SPRUCE TIPS	Y N	Y N	Y N	Y N		GAL	
602,030,000							
FIREWOOD	Y N	Y N	Y N	Y N			*If UNIT is sled or boat load, enter sizes per load!* *N of LOGS = LENGTH= DIAMETER=*
604,000,000							*In coding, convert boat and sled loads to CORDS.*
	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.

* *"LAST YEAR" means between JANUARY 1, 2010, and DECEMBER 31, 2010.*

** *"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.*

PLANTS: 17 **NULATO: 258**

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 and network questions…

MAPPING: BERRIES & GREENS

On map, mark all the areas where members of your household looked for BERRIES & GREENS.

NETWORK: BERRIES & GREENS

WHO PICKED the PLANTS your household used last year?			WHO PROCESSED the PLANTS your household used last year?			WHO PICKED the FIREWOOD your household used last year?			WHO PROCESSED the FIREWOOD your household used last year?		
List most important harvesters and processors first.						***List most important harvesters and processors first.***					
PLANTS harvesters living in…			PLANTS processors living in…			FIREWOOD harvesters living in…			FIREWOOD processors living in…		
…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities	…THIS Household	... OTHER Households in Nulato	...Other Communities

ASSESSMENTS: BERRIES & GREENS

601000000

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

Last year…

…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

Last year…

…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 berries & greens 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 **NULATO: 258**

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 village 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 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 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 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

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?..... AD1 N Y ?

If YES, in which months did this happen?..... J F M A M J J A S O N D

In the last 12 months, did you or other adults in your household ever EAT LESS THAN YOU FELT YOU SHOULD because the HH could not get the food that was needed?..... AD2 N Y ?

In the last 12 months, were adults in the HH ever HUNGRY BUT DID NOT EAT because there was not enough food?..... AD3 N Y ?

In the last 12 months, did adults in the HH LOSE WEIGHT because there was not enough food?..... AD4 N Y ?

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?..... AD5 N Y ?

If YES, in which months did this happen?..... J F M A M J J A S O N D

FOOD SECURITY: 201 **NULATO: 258**

SURVEY SUMMARY

HOUSEHOLD ID

ASSESSMENTS: ALL RESOURCES

0

To conclude our survey, 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

QUESTIONS, COMMENTS, CONCERNS

Do you have any questions, comments, or concerns?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

ASSESSMENTS OF ALL RESOURCES & COMMENTS: 30, 66 **NULATO: 258**

INTERVIEW SUMMARY

HOUSEHOLD ID

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

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!!!!

INTERVIEW SUMMARY: 30 **NULATO: 258**

APPENDIX B–CONVERSION FACTORS

The following table presents the conversion factors used in determining how many pounds were harvested of each resource surveyed. For instance, if respondents reported harvesting 3 quarts 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	Reported units	Conversion factor
Chum salmon	ind	5.0838
Chum salmon [CF retention]	ind	5.0838
Summer chum salmon	ind	5.0838
Fall chum salmon	ind	5.0838
Unknown chum salmon	ind	5.0838
Unknown chum salmon [CF retention]	ind	5.0838
Coho salmon	ind	5.2875
Coho salmon [CF retention]	ind	5.2875
Chinook salmon	ind	9.4392
Chinook salmon	gal	9.4392
Chinook salmon [CF retention]	ind	9.4392
Pink salmon	ind	2.3400
Pink salmon [CF retention]	ind	2.3400
Sockeye salmon	ind	5.0394
Sockeye salmon [CF retention]	ind	5.0394
Unknown salmon	ind	6.4233
Pacific herring	gal	6.0000
Pacific herring [CF retention]	gal	6.0000
Pacific herring roe	gal	7.0000
Eulachon (hooligan, candlefish)	ind	0.0000
Eulachon (hooligan, candlefish)	gal	0.0000
Rainbow smelt	ind	0.2500
Rainbow smelt	lb	1.0000
Rainbow smelt	5-gal bucket	30.0000
Rainbow smelt	gal	6.0000
Rainbow smelt	qt	1.5000
Rainbow smelt	6-gal bucket	36.0000
Pacific tomcod	ind	3.2000
Saffron cod	ind	0.2100
Lingcod	ind	4.0000
Pacific halibut	lb	1.0000
Pacific halibut [CF retention]	lb	1.0000
Arctic lamprey	ind	0.6000
Arctic lamprey	lb	1.0000
Arctic lamprey	gal	6.0000
Arctic lamprey [CF retention]	ind	0.6000
Arctic lamprey [CF retention]	lb	1.0000
Arctic lamprey [CF retention]	gal	6.0000
Unknown rockfish	ind	4.0000
Unknown rockfish [CF retention]	ind	4.0000
Stickleback (needlefish)	ind	0.2000
Stickleback (needlefish)	gal	6.0000

-continued-

Appendix B.–Page 2 of 6.

Resource	Reported units	Conversion factor
Alaska blackfish	ind	0.7500
Alaska blackfish	lbs	1.0000
Alaska blackfish	gal	6.0000
Alaska blackfish	plastic bag	12.0000
Burbot	ind	2.4000
Dolly Varden	ind	0.9000
Lake trout	ind	1.4000
Unknown char	ind	1.5000
Arctic grayling	ind	0.7000
Northern pike	ind	4.5000
Northern pike	gal	6.0000
Sheefish	ind	6.0000
Sheefish [CF Retention]	ind	6.0000
Longnose sucker	ind	0.7000
Broad whitefish	ind	1.4000
Broad whitefish	lb	1.0000
Broad whitefish [CF retention]	ind	1.4000
Broad whitefish [CF retention]	lbs	1.0000
Bering cisco	ind	1.4000
Bering cisco [CF retention]	ind	1.4000
Least cisco	ind	1.0000
Least cisco [CF retention]	ind	1.0000
Humpback whitefish	ind	3.0000
Humpback whitefish [CF retention]	ind	3.0000
Round whitefish	ind	0.5000
Round whitefish	gal	6.0000
Unknown whitefish	ind	1.4000
Black bear	ind	100.0000
Brown bear	ind	141.0000
Caribou	ind	130.0000
Moose	ind	540.0000
Muskox	ind	295.0000
Beaver	ind	15.0000
Red fox	ind	0.0000
Snowshoe hare	ind	2.5000
Alaska hare (jackrabbit)	ind	2.5000
River (land) otter	ind	3.0000
Lynx	ind	4.0000
Marmot	ind	5.0000
Marten	ind	0.0000
Mink	ind	2.0000
Muskrat	ind	0.7500
Porcupine	ind	4.0000
Arctic ground (parka) squirrel	ind	0.5000
Red (tree) squirrel	ind	0.5000
Weasel	ind	0.0000

-continued-

Appendix B.–Page 3 of 6.

Resource	Reported units	Conversion factor
Gray wolf	ind	0.0000
Wolverine	ind	0.0000
Bearded seal	ind	140.0000
Harbor Seal	ind	56.0000
Ringed seal	ind	56.0000
Spotted seal	ind	56.0000
Unknown seal	ind	56.0000
Walrus	ind	1100.0000
Beluga	ind	1000.0000
Bowhead	ind	28677.0000
Bufflehead	ind	0.4000
Canvasback	ind	1.1000
Common eider	ind	2.2100
Unknown eider	ind	2.2100
Goldeneye sp.	ind	0.8000
Mallard	ind	1.0000
Common merganser	ind	1.2700
Red-breasted merganser	ind	0.6200
Unknown merganser	ind	0.9500
Long-tailed duck	ind	0.8000
Northern pintail	ind	0.8000
Scaup sp.	ind	0.9000
Black scoter	ind	0.9000
Surf scoter	ind	0.9000
White-winged scoter	ind	0.9000
Northern shoveler	ind	0.6000
Green-winged teal	ind	0.3000
Unknown wigeon	ind	0.7000
Unknown duck	ind	0.8552
Brant	ind	1.2000
Cackling goose	ind	1.2000
Lesser Canada goose	ind	1.2000
Unknown Canada goose	ind	1.2000
Emperor goose	ind	2.5000
Snow goose	ind	2.3000
White-fronted goose	ind	2.4000
Unknown goose	ind	2.4000
Tundra (whistling) swan	ind	10.0000
Sandhill crane	ind	8.4000
Whimbrel	ind	0.1000
Unknown grebe	ind	1.5000
Spruce grouse	ind	0.7000
Ruffed grouse	ind	0.7000
Ptarmigan sp.	ind	1.0000
Duck eggs	ind	0.1500
Duck eggs	gal	7.5000
Goose eggs	ind	0.3000
Goose eggs	gal	7.5000

-continued-

Appendix B.–Page 4 of 6.

Resource	Reported units	Conversion factor
Swan eggs	ind	0.6300
Swan eggs	gal	7.5000
Crane eggs	ind	0.6000
Shorebird eggs	ind	0.0500
Unknown shorebird eggs	ind	0.0500
Unknown shorebird eggs	gal	6.0000
Gull eggs	ind	0.3300
Gull eggs	gal	7.5000
Murre eggs	ind	0.0500
Arctic tern eggs	ind	0.0500
Arctic tern eggs	gal	6.0000
Ptarmigan eggs	ind	0.1000
Unknown eggs	ind	0.2200
Unknown eggs	gal	6.0000
Razor clams	ind	0.2500
Razor clams	gal	3.0000
Unknown clams	gal	3.0000
Unknown clams [CF retention]	gal	3.0000
Tanner crab	ind	1.6000
Tanner crab	lbs	1.0000
Unknown crab	ind	1.5300
Unknown crab [CF retention]	ind	1.5300
Shrimp	gal	2.0000
Unknown marine invertebrates	gal	2.1300
Blueberry	lb	1.0000
Blueberry	gal	4.0000
Blueberry	qt	1.0000
Blueberry	pt	0.5000
Blueberry	half-pt	0.2500
Lowbush cranberry	lb	1.0000
Lowbush cranberry	gal	4.0000
Lowbush cranberry	qt	1.0000
Lowbush cranberry	pt	0.5000
Highbush cranberry	gal	4.0000
Highbush cranberry	qt	1.0000
Highbush cranberry	pt	0.5000
Highbush cranberry	half-pt	0.2500
Gooseberry	gal	4.0000
Currant	gal	4.0000
Currant	qt	1.0000
Currant	pt	0.5000
Currant	half-pt	0.2500
Raspberry	lb	1.0000
Raspberry	gal	4.0000
Raspberry	qt	1.0000
Raspberry	pt	0.5000
Raspberry	half-pt	0.2500

-continued-

Appendix B.–Page 5 of 6.

Resource	Reported units	Conversion factor
Salmonberry	lb	1.0000
Salmonberry	gal	4.0000
Salmonberry	qt	1.0000
Salmonberry	pt	0.5000
Salmonberry	half-pt	0.2500
Blackberry	lbs	1.0000
Blackberry	gal	4.0000
Blackberry	qt	1.0000
Blackberry	pt	0.5000
Twisted stalk (watermellon) berry	pt	0.5000
Other wild berry	lb	1.0000
Other wild berry	gal	4.0000
Other wild berry	qt	1.0000
Other wild berry	pt	0.5000
Other wild berry	half-pt	0.2500
Wild rhubarb	lb	1.0000
Wild rhubarb	gal	4.0000
Wild rhubarb	qt	1.0000
Wild rhubarb	plastic bag	2.0000
Wild rhubarb	pt	0.5000
Wild rhubarb	half-pt	0.2500
Eskimo potato	lb	1.0000
Eskimo potato	gal	4.0000
Eskimo potato	qt	4.0000
Eskimo potato	plastic bag	2.0000
Fiddlehead fern	lb	1.0000
Fiddlehead fern	gal	1.0000
Fiddlehead fern	qt	0.2500
Fiddlehead fern	plastic bag	0.5000
Fiddlehead fern	pt	0.1250
Nettle	gal	1.0000
Hudson Bay tea	lb	1.0000
Hudson Bay tea	gal	1.0000
Hudson Bay tea	qt	0.2500
Hudson Bay tea	plastic bag	0.5000
Hudson Bay tea	pt	0.1250
Hudson Bay tea	half-pt	0.0625
Mint	lb	1.0000
Mint	gal	1.0000
Mint	qt	0.2500
Mint	plastic bag	0.5000
Mint	pt	0.1250
Mint	half-pt	0.0625
Sourdock	gal	1.0000
Sourdock	qt	0.2500
Spruce tips	lb	1.0000
Spruce tips	gal	1.0000
Spruce tips	qt	0.2500
Spruce tips	plastic bag	0.5000
Spruce tips	half-pt	0.0625

-continued-

Appendix B.–Page 6 of 6.

Resource	Reported units	Conversion factor
Willow leaves	gal	1.0000
Willow leaves	qt	0.2500
Willow leaves	half-pt	0.0625
Wild celery	gal	1.0000
Wild celery	half-pt	0.0625
Wild rose hips	gal	4.0000
Wild rose hips	qt	1.0000
Wild rose hips	pt	0.5000
Wild rose hips	half-pt	0.2500
Yarrow	ind	0.0625
Yarrow	gal	1.0000
Yarrow	qt	0.2500
Yarrow	plastic bag	0.5000
Yarrow	pt	0.1250
Yarrow	half-pt	0.0625
Unknown mushrooms	lb	1.0000
Unknown mushrooms	gal	1.0000
Unknown mushrooms	qt	0.2500
Unknown mushrooms	pt	0.1250
Fireweed	gal	1.0000
Fireweed	qt	0.5000
Fireweed	plastic bag	0.1250
Fireweed	pt	0.0625
Stinkweed	half-pt	1.0000
Stinkweed	gal	1.0000
Stinkweed	qt	0.2500
Stinkweed	plastic bag	0.5000
Stinkweed	pt	0.1250
Stinkweed	half-pt	0.0625
Punk	lb	1.0000
Punk	gal	1.0000
Punk	qt	0.5000
Punk	plastic bag	0.5000
Punk	pt	0.1250
Puffballs	gal	1.0000
Puffballs	qt	0.2500
Unknown greens from land	gal	1.0000
Unknown greens from land	qt	0.2500
Unknown greens from land	plastic bag	0.5000
Unknown greens from land	pt	0.1250
Unknown greens from land	half-pt	0.0625
Wood	crd	0.0000

Source ADF&G household surveys, 2011.

APPENDIX C–ADDITIONAL TABLES, ALL STUDY COMMUNITIES

Table C1.–Demographic and sample characteristics, 5 Yukon River communities, 2010.

	Communities				
Characteristics	Mountain Village	Marshall	Nulato	Galena	Ruby
Sampled households	115	46	84	80	47
Eligible households	181	85	90	158	66
Percentage sampled	63.5%	54.1%	93.3%	50.6%	71.2%
Sampled Population	499	185	243	215	128
Estimated Population	785.4	341.8	260.4	424.6	179.7
Household size					
Mean	4.3	4.0	2.9	2.7	2.7
Minimum	1	1	1	1	1
Maximum	14	11	7	6	7
Age					
Mean	28.2	28.9	36.5	35.4	35.7
Minimum	0	0	0	0	1
Maximum	87	81	90	83	91
Median	15	19	21	17	19
Sex					
Estimated male					
Number	402.9	183.2	140.4	201.5	103.9
Percentage	51.3%	53.6%	53.9%	47.4%	57.8%
Estimated female					
Number	382.5	158.6	120.0	223.2	75.8
Percentage	48.7%	46.4%	46.1%	52.6%	42.2%
Length of Residency					
Population					
Average	15.4	19.3	20.7	16.6	19.1
Minimum	0	1	0	0	0
Maximum	64	50	64	65	70
Household Heads					
Average	20.6	24.3	24.3	18.9	22.3
Minimum	1	4	1	0	0
Maximum	64	50	64	65	70
Alaska Native					
Estimated households					
Number	162.1	83.1	84.6	116.5	52.0
Percentage	89.6%	97.7%	94.0%	73.7%	78.7%
Estimated population					
Number	747.6	338.1	251.8	290.3	148.9
Percentage	95.2%	98.9%	96.7%	68.4%	82.8%

Source ADF&G Division of Subsistence household surveys, 2011.

Table C2.–Birthplaces of household heads, 5 Yukon River communities, 2010.

	Community of residence of household head				
Birthplace of household head	Mountain Village	Marshall	Nulato	Galena	Ruby
Alakanuk	0.6%	1.4%	0.0%	0.0%	0.0%
Anchorage	0.0%	0.0%	1.6%	3.7%	1.3%
Anvik	0.0%	0.0%	1.6%	0.0%	0.0%
Barrow	0.0%	0.0%	0.0%	0.7%	1.3%
Bethel	1.1%	4.1%	0.0%	0.7%	0.0%
Chevak	0.6%	0.0%	0.0%	0.0%	0.0%
Emmonak	0.6%	1.4%	0.0%	0.0%	0.0%
Fairbanks	0.0%	0.0%	0.8%	1.5%	3.9%
Galena	0.0%	0.0%	0.8%	41.5%	2.6%
Holikachuk	0.0%	0.0%	0.8%	0.0%	0.0%
Hooper Bay	2.3%	0.0%	0.0%	0.0%	0.0%
Hughes	0.0%	0.0%	0.0%	0.0%	3.9%
Huslia	0.0%	0.0%	0.0%	3.7%	0.0%
Kalifonsky Census Designated Place	0.0%	1.4%	0.0%	0.0%	0.0%
Kaltag	0.0%	0.0%	7.3%	0.7%	0.0%
Kokrines	0.0%	0.0%	0.0%	0.0%	3.9%
Kotlik	0.0%	1.4%	0.0%	0.0%	0.0%
Koyukuk	0.0%	0.0%	0.0%	5.9%	1.3%
Manokotak	0.0%	1.4%	0.0%	0.0%	0.0%
Marshall	0.0%	75.7%	0.0%	0.0%	0.0%
McGrath	0.0%	0.0%	0.8%	0.0%	0.0%
Mountain Village	74.7%	1.4%	0.0%	0.0%	0.0%
Napaskiak	0.6%	0.0%	0.0%	0.0%	0.0%
Nenana	0.0%	0.0%	0.0%	0.7%	0.0%
Nome	0.0%	0.0%	0.8%	0.0%	0.0%
Nulato	0.0%	0.0%	73.4%	1.5%	5.2%
Palmer	0.0%	0.0%	0.0%	0.7%	0.0%
Pilot Station	1.1%	1.4%	0.0%	0.0%	0.0%
Point Hope	0.0%	0.0%	0.0%	0.7%	0.0%
Rampart	0.0%	0.0%	0.0%	0.0%	2.6%
Ruby	0.0%	0.0%	0.0%	1.5%	46.8%
Shageluk	0.0%	0.0%	0.8%	0.0%	0.0%
Nunam Iqua (Sheldon Point)	0.6%	0.0%	0.0%	0.0%	0.0%
Sitka	0.0%	0.0%	0.8%	0.0%	0.0%
South Naknek	0.6%	0.0%	0.0%	0.0%	0.0%
Saint Marys (Andreafsky)	1.1%	0.0%	0.0%	0.0%	0.0%
Saint Michael	1.7%	0.0%	0.0%	0.0%	0.0%
Talkeetna	0.0%	0.0%	0.0%	0.7%	0.0%
Tanana	0.0%	0.0%	3.2%	4.4%	1.3%
Wiseman	0.0%	0.0%	0.0%	0.7%	0.0%
Wrangell	0.0%	0.0%	0.0%	0.7%	0.0%
Allakaket	0.6%	0.0%	0.0%	0.0%	0.0%
Nelson Sound	0.0%	0.0%	0.0%	0.7%	0.0%
St. Mary's/Pitka's Point/Andreafsky	0.6%	0.0%	0.0%	0.0%	0.0%
Other U.S.	10.3%	2.7%	5.6%	25.9%	20.8%
Foreign	0.0%	0.0%	0.0%	0.0%	1.3%
Outside Alaska	0.6%	1.4%	0.8%	2.2%	0.0%
Missing	2.3%	6.8%	0.8%	0.7%	3.9%

Source ADF&G Division of Subsistence household surveys, 2011.

Table C3.–Estimates of moose hunting effort, 5 Yukon River communities, 2010.

	All hunters					Successful (harvesting) households				
Community	Estimated total harvest	Number of hunters	Estimated days hunted	Hunting days per hunter	Moose per hunter	Number of hunters[a]	Estimated days hunted	Hunting days per hunter	Hunting days per moose harvested	Moose per successful hunter
All	**176.0**	**523.8**	**5699.7**	**10.9**	**0.3**	**154.1**	**1939.9**	**12.6**	**11.0**	**1.1**
Mountain Village	88.1					*no data available*				
Marshall	42.5	124.5	1672.3	13.4	0.3	35.1	493.0	14.0	11.6	1.2
Nulato	39.6	108.4	1059.4	9.8	0.4	37.5	552.0	14.7	13.9	1.1
Galena	67.2	205.6	1908.1	9.3	0.3	63.2	656.6	10.4	9.8	1.1
Ruby	26.7	85.3	1059.9	12.4	0.3	18.3	238.4	13.1	8.9	1.5

Source ADF&G Division of Subsistence household surveys, 2011.

a. A maximum of one hunter is counted per moose harvested.

Table C4.–Employment characteristics, 5 Yukon River communities, 2010.

Characteristic	Community				
	Mountain Village	Marshall	Nulato	Galena	Ruby
All adults					
Number	508.2	222.9	202.5	319.0	136.2
Mean weeks employed	20.0	17.9	18.9	30.5	25.9
Employed adults					
Number	284.3	111.2	119.9	220.2	94.6
Percentage	55.9%	49.9%	59.2%	69.0%	69.5%
Jobs					
Number	334.2	151.8	171.5	258.9	139.1
Mean	1.2	1.4	1.4	1.2	1.5
Minimum	1	1	1	1	1
Maximum	5	6	5	4	4
Months employed					
Mean	8.3	8.8	7.4	10.3	8.7
Minimum	1	1	1	1	1
Maximum	12	12	12	12	12
Percentage employed year round	36.2%	44.2%	33.0%	54.5%	50.0%
Mean weeks employed	35.69	35.92	31.96	44.24	37.23
Households					
Total number	181.0	85.0	90.0	158.0	66.0
Employed					
Number	147.4	63.8	70.2	122.5	54.5
Percentage	81.4%	75.0%	78.0%	77.5%	82.6%
Jobs per employed household					
Mean	2.3	2.4	2.4	2.1	2.6
Minimum	1	1	1	1	1
Maximum	6	7	7	5	11
Employed Adults					
Minimum	1	1	1	1	1
Maximum	5	3	5	3	5
Mean					
Employed households	1.9	1.7	1.7	1.8	1.7
Total households	1.6	1.3	1.3	1.4	1.4
Mean person-weeks of employment	68.7	62.3	54.4	78.5	64.7

Source ADF&G Subsistence Division household surveys, 2011.

APPENDIX D–ADDITIONAL TABLES

Table D3-1.–Participation in harvesting and processing activities, Mountain Village, 2010.

Total number of people	**785.4**
Fish	
Fish	
Number	335.2
Percentage	42.7%
Process	
Number	357.3
Percentage	45.5%
Land mammals	
Hunt	
Number	226.6
Percentage	28.9%
Process	
Number	289.6
Percentage	36.9%
Marine mammals	
Hunt	
Number	92.9
Percentage	11.8%
Process	
Number	122.8
Percentage	15.6%
Birds and eggs	
Hunt	
Number	212.5
Percentage	27.1%
Process	
Number	253.4
Percentage	32.3%
Plants	
Gather	
Number	516.2
Percentage	65.7%
Process	
Number	437.5
Percentage	55.7%
Any resource	
Attempt	
Number	587.1
Percentage	74.7%
Process	
Number	530.4
Percentage	67.5%

Source ADF&G Division of Subsistence household surveys, 2011.

Table D3-2.–Estimated harvest of fish for consumption by dogs, Mountain Village, 2010.

Resource	Amount	Pounds
Nonsalmon fish		
Stickleback (needlefish)	0.0 gal	0.0 lb
Other nonsalmon fish	9.4 ind	9.0 lb
Pacific tomcod	0.0 ind	0.0 lb
Arctic grayling	0.0 ind	0.0 lb
Saffron cod	0.0 ind	0.0 lb
Burbot	23.6 ind	56.7 lb
Arctic lamprey	31.5 ind	18.9 lb
Northern pike	63.0 ind	283.3 lb
Whitefish	231.4 ind	620.1 lb
Salmon		
Unknown salmon	0.0 ind	0.0 lb
Sockeye salmon	1.6 ind	7.9 lb
Pink salmon	1.6 ind	3.7 lb
Unknown chum salmon	0.0 ind	0.0 lb
Coho salmon	1.6 ind	8.3 lb
Fall chum salmon	17.3 ind	88.0 lb
Chinook salmon	0.0 ind	0.0 lb
Summer chum salmon	31.5 ind	160.0 lb
Total	**412.4 ind**	**1,256.0 lb**
Whitefish		
Unknown whitefish	0.0 ind	0.0 lb
Round whitefish	15.7 ind	7.9 lb
Least cisco	7.9 ind	7.9 lb
Bering cisco	15.7 ind	22.0 lb
Sheefish	18.9 ind	113.3 lb
Humpback whitefish	141.7 ind	425.0 lb
Broad whitefish	31.5 ind	44.1 lb
Subtotal	**231.4 ind**	**620.1 lb**
Other Fish		
Pacific herring	0.0 gal	0.0 lb
Eulachon (hooligan, candlefish)	0.0 gal	0.0 lb
Rainbow smelt	0.0 gal	0.0 lb
Lake trout	0.0 ind	0.0 lb
Unknown char	0.0 ind	0.0 lb
Dolly Varden	0.0 ind	0.0 lb
Longnose sucker	9.4 ind	6.6 lb
Pacific halibut	0.0 lb	0.0 lb
Subtotal	**9.4 ind**	**6.6 lb**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D3-3.–Estimated large land mammal and gray wolf harvest by month and sex, Mountain Village, 2010

	Resource								
	Black bear	Brown bear	Caribou			Moose			Wolf
Harvest Month	Unknown	Unknown	Male	Female	Unknown	Male	Female	Unknown	Unknown
January	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	1.6
February	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0
March	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
April	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
June	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
August	0.0	0.0	0.0	0.0	0.0	14.2	0.0	0.0	0.0
September	0.0	0.0	0.0	0.0	0.0	58.2	0.0	0.0	0.0
October	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0
November	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
December	0.0	0.0	0.0	0.0	0.0	4.7	3.1	0.0	0.0
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Harvest	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**83.4**	**4.7**	**0.0**	**1.6**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D3-4.–Estimated small land mammal harvest by month, Mountain Village, 2010.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
Beaver	0.0	0.0	3.1	7.9	61.4	0.0	0.0	1.6	6.3	0.0	0.0	15.7	0.0	**96.0**
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	112.7	27.0	68.3	28.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.4	1.6	**263.6**
Alaska hare (jackrabbit)	0.0	7.9	20.5	15.7	0.0	0.0	0.0	0.0	0.0	0.0	18.9	0.0	0.0	**63.0**
River (land) otter	0.0	3.1	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	**11.0**
Lynx	22.0	18.9	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.9	31.5	0.0	**94.4**
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Marten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Mink	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	**3.1**
Muskrat	0.0	0.0	1.6	0.0	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**6.3**
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	1.6	0.0	**3.1**
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Red (tree) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Weasel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	**1.6**
Gray wolf	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.6**
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**
Total Harvest	**136.3**	**56.9**	**98.2**	**52.2**	**66.1**	**0.0**	**0.0**	**1.6**	**6.3**	**1.6**	**40.9**	**82.1**	**1.6**	**543.7**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D3-5.–Estimated marine mammal harvest by month, Mountain Village, 2010.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
Bearded seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	7.9	6.3	0.0	0.0	0.0	**25.2**
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	0.0	0.0	1.6	0.0	0.0	0.0	1.6	6.3	0.0	0.0	0.0	**9.4**
Spotted seal	0.0	0.0	4.7	0.0	1.6	0.0	0.0	1.6	1.6	7.9	0.0	0.0	0.0	**17.3**
Unknown seal	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	**1.6**
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**
Beluga	0.0	0.0	0.0	0.0	0.0	0.0	3.1	1.6	0.0	1.6	0.0	0.0	0.0	**6.3**
Bowhead	0.0	0.0	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 Harvest	**0.0**	**0.0**	**4.7**	**0.0**	**3.1**	**0.0**	**4.7**	**14.2**	**11.0**	**22.0**	**0.0**	**0.0**	**0.0**	**59.8**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D3-6.–Estimated bird harvest by season, Mountain Village, 2010.

	Estimated harvest by season					
Resource	Winter	Summer	Spring	Fall	Season unknown	**Total**
Bufflehead	0.0	0.0	0.0	0.0	0.0	**0.0**
Canvasback	0.0	0.0	0.0	0.0	0.0	**0.0**
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 sp.	0.0	0.0	3.1	0.0	0.0	**3.1**
Mallard	0.0	0.0	184.2	90.5	0.0	**274.7**
Common merganser	0.0	0.0	0.0	0.0	0.0	**0.0**
Red-breasted merganser	0.0	0.0	0.0	0.0	0.0	**0.0**
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	0.0	128.6	106.4	0.0	**235.0**
Scaup sp.	0.0	0.0	0.0	0.0	0.0	**0.0**
Black scoter	0.0	0.0	124.3	18.9	0.0	**143.2**
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	0.0	12.6	15.7	0.0	**28.3**
Green-winged teal	0.0	0.0	34.6	66.1	0.0	**100.7**
Unknown wigeon	0.0	0.0	198.5	3.2	0.0	**201.6**
Unknown duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Brant	0.0	0.0	1.6	0.0	0.0	**1.6**
Cackling goose	0.0	0.0	254.1	173.1	0.0	**427.2**
Lesser Canada goose	0.0	0.0	102.3	37.8	0.0	**140.1**
Unknown Canada goose	0.0	0.0	25.4	30.2	0.0	**55.6**
Emperor goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Snow goose	0.0	0.0	42.9	11.1	0.0	**54.0**
Greater white-fronted goose	0.0	0.0	571.8	275.5	0.0	**847.3**
Unknown goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	4.8	0.0	127.0	17.5	0.0	**149.2**
Sandhill crane	0.0	0.0	47.2	12.6	0.0	**59.8**
Whimbrel	0.0	0.0	0.0	0.0	0.0	**0.0**
Spruce grouse	1.6	0.0	0.0	6.3	0.0	**7.9**
Ruffed grouse	9.4	0.0	0.0	7.9	0.0	**17.3**
Ptarmigan sp.	715.9	0.0	833.9	121.2	0.0	**1,671.0**
Total Harvest	**731.7**	**0.0**	**2,692.1**	**993.9**	**0.0**	**4,417.7**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D3-7.–Reported impact to households responding that they did not get enough of a resource, Mountain Village, 2010.

		Households not getting enough ____ .				Impact to those not getting enough ____ .									
	Sampled	Valid responses		Did not get enough		No response		Not noticable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	115	110	95.7	42	38.2	0	0.0	4	9.5	12	28.6	19	45.2	7	16.7
Nonsalmon fish	115	98	85.2	22	22.4	0	0.0	2	9.1	10	45.5	8	36.4	2	9.1
Marine invertebrates	115	6	5.2	1	16.7	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0
Land mammals	115	113	98.3	14	12.4	1	7.1	1	7.1	7	50.0	5	35.7	0	0.0
Marine mammals	115	85	73.9	18	21.2	3	16.7	2	11.1	8	44.4	3	16.7	2	11.1
Birds and eggs	115	96	83.5	20	20.8	1	5.0	2	10.0	10	50.0	7	35.0	0	0.0
Plants and berries	115	110	95.7	30	27.3	2	6.7	2	6.7	13	43.3	10	33.3	3	10.0
All resources	115	115	100.0	37	32.2	3	8.1	1	2.7	9	24.3	18	48.6	6	16.2

Source ADF&G Division of Subsistence household surveys, 2011.

Table D3-8.–Households reporting why they did not get enough of a resource, Mountain Village, 2010.

		Reasons															
Resource by category	Households reporting wanting more	No reason given	Personal/ family	Did not have enough help	Resource availability	Resources too far	No equipment/ equipment problems	Did not receive	Did not try/ low effort	Unsuccessful (unlucky)	Weather/ environment	Other	Working/ not enough time	Regulations	Resources too small/ diseased	Gas prices too high	Did not get enough
Resource not specified	7	1	2	0	0	0	0	1	0	1	0	1	1	0	0	0	0
All resources	**4**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**
Fish	**4**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**2**	**0**
Salmon	5	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Chum salmon	18	0	7	0	0	0	0	1	1	0	0	2	4	4	0	0	2
Summer chum salmon	8	3	0	0	1	0	0	2	1	0	0	0	0	2	0	0	0
Fall chum salmon	5	1	1	0	0	0	0	0	0	0	0	0	3	3	0	0	0
Coho salmon	4	1	1	0	0	0	0	0	0	0	0	1	2	0	0	0	0
Chinook salmon	31	4	10	0	2	0	0	2	1	0	0	3	6	14	0	0	1
Pink salmon	3	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Unknown salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nonsalmon fish	3	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0
Pacific halibut	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Alaska blackfish	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Burbot	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Dolly Varden	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Lake trout	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Arctic grayling	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Northern pike	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Sheefish	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Whitefish	3	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Broad whitefish	6	0	0	0	0	0	0	1	2	0	0	0	1	0	0	0	0
Humpback whitefish	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Unknown whitefish	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mammals																	
Black bear	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Moose	16	2	1	0	3	0	0	5	0	3	1	0	2	1	0	0	0
Alaska hare (jackrabbit)	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

-continued-

Table D3-8.–Page 2 of 2.

Resource by category	Households reporting wanting more	Reasons															
		No reason given	Personal/ family	Did not have enough help	Resource availability	Resources too far	No equipment/ equipment problems	Did not receive	Did not try/ low effort	Unsuccessful (unlucky)	Weather/ environment	Other	Working/ not enough time	Regulations	Resources too small/ diseased	Gas prices too high	Did not get enough
Mammals, continued																	
Unknown small land mammals /furbearers	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Bearded seal	5	0	1	0	1	0	0	2	0	0	0	0	0	0	0	1	0
Harbor seal	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ringed seal	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Unknown seal oil	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Beluga	11	0	1	1	0	0	0	4	2	2	0	0	0	0	0	1	0
Birds and eggs	**9**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**2**	**1**
Ducks	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Mallard	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Northern pintail	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Black scoter	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Geese	3	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
Canada goose	2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Snow goose	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Swan	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tundra (whistling) swan	2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Ptarmigan	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bird eggs	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Gull eggs	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Marine invertebrates																	
King crab	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Vegetation																	
Berries	19	1	4	1	2	0	0	1	2	0	1	1	5	0	0	1	1
Blueberry	7	0	0	0	1	1	0	0	1	0	2	0	1	1	0	0	1
Highbush cranberry	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Crowberry	6	0	0	0	0	0	0	0	2	0	2	0	2	1	0	0	0
Raspberry	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Salmonberry	11	0	0	0	1	1	0	1	1	0	5	0	3	1	0	0	0
Wood	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Other wood	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

Source ADF&G Division of Subsistence household surveys, 2011

Table D3-9.–Households reporting doing things differently because they did not get enough of a resource, Mountain Village, 2010.

		Households not getting enough				Households doing something differently because they did not get enough			
		Valid responses		Did not get enough		Valid responses		Did something differently	
Resource	Sampled households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	115	85	73.9	42	49.4	42	100.0	29	69.0
Nonsalmon fish	115	79	68.7	22	27.8	22	100.0	14	63.6
Marine invertebrates	115	7	6.1	1	14.3	1	100.0	0	0.0
Land mammals	115	78	67.8	14	17.9	14	100.0	9	64.3
Marine mammals	115	61	53.0	18	29.5	18	100.0	7	38.9
Birds and eggs	115	70	60.9	20	28.6	20	100.0	11	55.0
Berries and greens	115	92	80.0	30	32.6	29	96.7	20	69.0
All resources	115	86	74.8	37	43.0	36	97.3	27	75.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D3-10.–Things households reported doing differently because they did not get enough of a resource, Mountain Village, 2010.

		Bought/bartered		Used more commercial foods		Replaced with other subsistence foods		Asked others for help		Made do without		Increased effort to harvest		Obtained food from other sources		Got public assistance	
Resource	Valid responses	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	31	0	0.0	17	54.8	6	19.4 #	0	0.0	5	16.1	3	9.7	1	3.2	0	0.0
Nonsalmon fish	14	1	7.1	7	50.0	2	14.3 5	1	7.1	2	14.3	1	7.1	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	0.0	0	0.0	0	0.0
Land mammals	10	0	0.0	7	70.0	1	10.0 #	0	0.0	2	20.0	0	0.0	0	0.0	0	0.0
Marine mammals	8	0	0.0	3	37.5	3	37.5	0	0.0	2	25.0	0	0.0	0	0.0	0	0.0
Birds and eggs	12	1	8.3	7	58.3	0	0.0	0	0.0	3	25.0	0	0.0	0	0.0	0	0.0
Berries and greens	20	0	0.0	12	60.0	1	5.0 0	0	0.0	5	25.0	3	15.0	1	5.0	0	0.0
All resources	26	0	0.0	19	73.1	3	11.5 4	1	3.8	7	26.9	0	0.0	1	3.8	0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D3-11.–Reasons use of resources was less than in recent years, Mountain Village, 2010.

	Reasons for less use compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Land mammals		Marine mammals		Birds and eggs		Berries and greens		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Family or personal	12	25.5	8	26.7	0	0.0	3	15.0	3	13.6	5	23.8	9	21.4	9	22.5
Resource availabilty	2	4.3	4	13.3	0	0.0	0	0.0	2	9.1	2	9.5	10	23.8	8	20.0
Resources too far	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
No equipment/equipment problems	5	10.6	7	23.3	0	0.0	2	10.0	1	4.5	4	19.0	4	9.5	5	12.5
Did not receive	4	8.5	6	20.0	1	50.0	4	20.0	9	40.9	0	0.0	2	4.8	2	5.0
Did not try/low effort	5	10.6	3	10.0	0	0.0	2	10.0	3	13.6	0	0.0	6	14.3	6	15.0
Unsuccessful (unlucky)	1	2.1	1	3.3	1	50.0	2	10.0	4	18.2	1	4.8	0	0.0	0	0.0
Weather/environment	1	2.1	0	0.0	0	0.0	0	0.0	0	0.0	1	4.8	7	16.7	1	2.5
Other	0	0.0	1	3.3	0	0.0	2	10.0	1	4.5	0	0.0	0	0.0	1	2.5
Working/not enough time	8	17.0	1	3.3	0	0.0	2	10.0	0	0.0	4	19.0	8	19.0	6	15.0
Regulations	11	23.4	1	3.3	0	0.0	0	0.0	0	0.0	0	0.0	1	2.4	6	15.0
Resources too small/diseased	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Did not get enough	3	6.4	0	0.0	0	0.0	2	10.0	0	0.0	1	4.8	1	2.4	1	2.5
Did not need	0	0.0	1	3.3	0	0.0	0	0.0	0	0.0	2	9.5	1	2.4	1	2.5
Did not give any away	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Too expensive (fuel)	3	6.4	1	3.3	0	0.0	1	5.0	1	4.5	3	14.3	1	2.4	5	12.5
Use other resources	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D3-12.–Reasons use of resources was more than in recent years, Mountain Village, 2010.

	Reasons for more use compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Land mammals		Marine mammals		Birds and eggs		Berries and greens		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Increased availability	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	6.7	0	0.0
Used other resources	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Good weather	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	6.7	0	0.0
Received more	0	0.0	2	20.0	0	0.0	1	20.0	7	63.6	2	15.4	1	6.7	1	9.1
Needed more	4	40.0	1	10.0	0	0.0	1	20.0	0	0.0	0	0.0	3	20.0	5	45.5
Increased effort	2	20.0	3	30.0	0	0.0	0	0.0	1	9.1	5	38.5	5	33.3	1	9.1
Got more help	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	7.7	2	13.3	0	0.0
Other	2	20.0	1	10.0	0	0.0	1	20.0	1	9.1	2	15.4	1	6.7	2	18.2
Regulations	1	10.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Traveled farther	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Increased success	1	10.0	3	30.0	1	100.0	2	40.0	2	18.2	3	23.1	1	6.7	2	18.2
Needed less	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	6.7	0	0.0
Store-bought too expensive	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D3-13.–Reported job schedules, Mountain Village, 2010.

	Jobs		Employed adults		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	177.6	53.1%	173.5	61.0%	107.3	72.8%
Part-time	63.0	18.8%	57.8	20.3%	46.5	31.5%
Shift	0.0	0.0%	0.0	0.0%	0.0	0.0%
On-call (occasional)	90.4	27.1%	78.7	27.7%	54.5	37.0%
Part-time shift	1.6	0.5%	1.6	0.6%	1.6	1.1%
Schedule not reported	1.6	0.5%	1.6	0.6%	1.6	1.1%

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-1.–Participation in harvesting and processing activities, Marshall, 2010.

Total number of people	**341.8**
Fish	
Fish	
Number	158.9
Percentage	46.5%
Process	
Number	143.1
Percentage	41.8%
Land mammals	
Hunt	
Number	131.2
Percentage	38.4%
Process	
Number	147.8
Percentage	43.2%
Marine mammals	
Hunt	
Number	16.6
Percentage	4.9%
Process	
Number	16.6
Percentage	4.9%
Birds and eggs	
Hunt	
Number	110.9
Percentage	32.4%
Process	
Number	83.2
Percentage	24.3%
Plants	
Gather	
Number	190.3
Percentage	55.7%
Process	
Number	124.5
Percentage	36.4%
Any resource	
Attempt	
Number	251.3
Percentage	73.5%
Process	
Number	207.0
Percentage	60.5%

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-2.–Estimated harvest of fish for consumption by dogs, Marshall, 2010.

Resource	Amount	Pounds
Nonsalmon fish		
Other nonsalmon fish	0.0 ind	0.0 lb
Unknown Char	0.0 ind	0.0 lb
Arctic grayling	0.0 ind	0.0 lb
Rainbow smelt	0.0 ind	0.0 lb
Pacific halibut	0.0 lb	0.0 lb
Northern pike	86.8 ind	390.8 lb
Burbot	0.0 ind	0.0 lb
Alaska blackfish	0.0 lb	0.0 lb
Arctic lamprey	200.2 ind	120.1 lb
Whitefish	960.9 ind	3,215.2 lb
Salmon		
Unknown salmon	0.0 ind	0.0 lb
Sockeye salmon	0.0 ind	0.0 lb
Unknown chum salmon	0.0 ind	0.0 lb
Pink salmon	92.4 ind	216.2 lb
Coho salmon	0.0 ind	0.0 lb
Fall chum salmon	0.0 ind	0.0 lb
Chinook salmon	0.0 ind	0.0 lb
Summer chum salmon	0.0 ind	0.0 lb
Total fish	1,340.3 ind	3,942.3 lb
Whitefish		
Unknown whitefish	0.0 ind	0.0 lb
Least cisco	0.0 ind	0.0 lb
Round whitefish	0.0 ind	0.0 lb
Bering cisco	0.0 ind	0.0 lb
Sheefish	332.6 ind	1,995.7 lb
Humpback whitefish	212.5 ind	637.5 lb
Broad whitefish	415.8 ind	582.1 lb
Subtotal	**960.9 ind**	**3,215.2 lb**
Other fish		
Pacific herring	0.0 gal	0.0 lb
Pacific tomcod	0.0 ind	0.0 lb
Saffron cod	0.0 ind	0.0 lb
Stickleback (needlefish)	0.0 gal	0.0 lb
Dolly Varden	0.0 ind	0.0 lb
Lake trout	0.0 ind	0.0 lb
Longnose sucker	0.0 ind	0.0 lb
Stickleback (needlefish)	0.0 ind	0.0 lb
Subtotal	**0.0 ind**	**0.0 lb**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-3.–Estimated large land mammal and gray wolf harvest by month and sex, Marshall, 2010.

	Resource								
	Black bear	Brown bear	Caribou			Moose			Wolf
Harvest Month	Unknown	Unknown	Male	Female	Unknown	Male	Female	Unknown	Unknown
January	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0
February	1.8	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0
March	0.0	0.0	5.5	0.0	0.0	0.0	0.0	0.0	12.9
April	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
June	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
August	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
September	3.7	0.0	0.0	0.0	0.0	35.1	0.0	0.0	0.0
October	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
November	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
December	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7
Total Harvest	**9.2**	**0.0**	**5.5**	**0.0**	**0.0**	**40.7**	**1.8**	**0.0**	**16.6**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-4.–Estimated small land mammal harvest by month, Marshall, 2010.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
Beaver	31.4	18.5	9.2	5.5	62.8	0.0	1.8	11.1	7.4	0.0	0.0	0.0	0.0	**147.8**
Red fox	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	**7.4**
Snowshoe hare	5.5	5.5	37.0	29.6	0.0	0.0	0.0	0.0	0.0	0.0	7.4	14.8	0.0	**99.8**
Alaska hare (jackrabbit)	0.0	0.0	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	11.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**11.1**
Lynx	0.0	5.5	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	**16.6**
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	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.9**
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	9.2	0.0	29.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**38.8**
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	**3.7**
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Red (tree) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Weasel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Gray wolf	0.0	0.0	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	**16.6**
Wolverine	0.0	0.0	11.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**11.3**
Total Harvest	**37.0**	**29.6**	**105.6**	**35.1**	**92.4**	**0.0**	**1.8**	**11.1**	**11.1**	**0.0**	**7.4**	**18.5**	**5.5**	**355.1**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-5.–Estimated marine mammal harvest by month, Marshall, 2010.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
Bearded seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.8	5.5	0.0	0.0	0.0	**9.2**
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	1.8	0.0	0.0	11.1	0.0	0.0	0.0	**12.9**
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Beluga	0.0	0.0	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	0.0	0.0	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 Harvest	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.8**	**1.8**	**1.8**	**16.6**	**0.0**	**0.0**	**0.0**	**22.2**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-6.–Estimated bird harvest by season, Marshall, 2010.

	Estimated harvest by season					
Resource	Winter	Summer	Spring	Fall	Season unknown	**Total**
Bufflehead	0.0	0.0	0.0	0.0	0.0	**0.0**
Canvasback	0.0	0.0	0.0	0.0	0.0	**0.0**
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 sp.	0.0	9.2	9.2	12.9	0.0	**31.4**
Mallard	0.0	9.2	118.3	181.1	0.0	**308.6**
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	9.2	0.0	9.2	0.0	**18.5**
Northern pintail	0.0	14.8	49.9	72.1	0.0	**136.7**
Scaup sp.	0.0	0.0	0.0	0.0	0.0	**0.0**
Black scoter	0.0	16.6	14.8	1.8	0.0	**33.3**
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	9.2	37.0	16.6	0.0	**62.8**
Green-winged teal	0.0	9.2	0.0	46.2	0.0	**55.4**
Unknown wigeon	0.0	0.0	53.6	29.6	0.0	**83.2**
Unknown duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Brant	0.0	0.0	0.0	0.0	0.0	**0.0**
Cackling goose	0.0	7.6	126.6	141.7	0.0	**275.8**
Lesser Canada goose	0.0	0.0	90.7	105.8	0.0	**196.4**
Unknown Canada goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Emperor goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Snow goose	0.0	0.0	14.8	11.1	0.0	**25.9**
Greater white-fronted goose	0.0	3.7	221.7	207.0	0.0	**432.4**
Unknown goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	0.0	7.4	120.1	59.1	0.0	**186.6**
Sandhill crane	0.0	0.0	0.0	3.8	0.0	**3.8**
Whimbrel	0.0	0.0	0.0	0.0	0.0	**0.0**
Spruce grouse	0.0	0.0	0.0	5.5	0.0	**5.5**
Ruffed grouse	0.0	0.0	0.0	18.5	0.0	**18.5**
Ptarmigan sp.	267.9	0.0	146.0	0.0	0.0	**413.9**
Total Harvest	**267.9**	**96.3**	**1,002.5**	**922.0**	**0.0**	**2,288.7**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-7.–Households reporting why they did not get enough of a resource, Marshall, 2010.

		Reasons															
Resource by category	Households reporting wanting more	No reason given	Personal/ family	Did not have enough help	Resource availability	Resources too far	No equipment/ equipment problems	Did not receive	Did not try/ low effort	Unsuccessful (unlucky)	Weather/ environment	Other	Working/ not enough time	Regulations	Resources too small/ diseased	Gas prices too high	Did not get enough
Resource not specified	5	2	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0
All resources	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Fish	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
Salmon	6	0	0	0	1	0	0	0	1	0	0	1	0	2	0	0	0
Chum salmon	4	0	0	0	1	0	0	0	0	0	0	0	0	2	0	1	0
Summer chum salmon	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
Fall chum salmon	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0
Coho salmon	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Chinook salmon	18	0	2	0	1	0	0	0	0	0	0	1	0	10	0	4	2
Sockeye salmon	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Smelt	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Burbot	2	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0
Sheefish	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Whitefish	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Broad whitefish	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Mammals																	
Land mammals	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Caribou	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moose	7	1	1	0	0	0	0	0	0	0	0	2	1	3	0	0	0
Beaver	2	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Alaska hare (jackrabbit)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spotted seal	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Unknown seal oil	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Beluga	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Birds and eggs																	
Geese	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Tundra (whistling) swan	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Bird eggs	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Goose eggs	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

-continued-

Table D4-7. Page 2 of 2.

Resource by category	Households reporting wanting more	Reasons															
		No reason given	Personal/ family	Did not have enough help	Resource availability	Resources too far	No equipment/ equipment problems	Did not receive	Did not try/ low effort	Unsuccessful (unlucky)	Weather/ environment	Other	Working/ not enough time	Regulations	Resources too small/ diseased	Gas prices too high	Did not get enough
Vegetation																	
Berries	3	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Blueberry	8	2	3	0	1	0	0	0	1	0	0	0	0	0	0	0	0
Currant	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Raspberry	2	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0
Salmonberry	3	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0
Blackberry	2	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-8.–Reported impact to households responding that they did not get enough of a resource, Marshall, 2010.

Resource category	Sampled households	Households not getting enough				Impact to those not getting enough									
		Valid responses		Did not get enough		No response		Not noticable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	46	42	91.3	17	40.5	0	0.0	1	5.9	6	35.3	7	41.2	3	17.6
Nonsalmon fish	46	41	89.1	7	17.1	0	0.0	0	0.0	7	100.0	0	0.0	0	0.0
Marine invertebrates	46	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Land mammals	46	43	93.5	8	18.6	1	12.5	0	0.0	4	50.0	2	25.0	1	12.5
Marine mammals	46	31	67.4	5	16.1	0	0.0	2	40.0	1	20.0	2	40.0	0	0.0
Birds and eggs	46	40	87.0	6	15.0	0	0.0	0	0.0	3	50.0	3	50.0	0	0.0
Plants and berries	46	43	93.5	15	34.9	1	6.7	1	6.7	7	46.7	5	33.3	1	6.7
All resources	46	45	97.8	18	40.0	0	0.0	2	11.1	8	44.4	6	33.3	2	11.1

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-9.–Households reporting doing things differently because they did not get enough of a resource, Marshall, 2010.

		Households not getting enough				Households doing something differently because they did not get enough			
		Valid responses		Did not get enough		Valid responses		Did something differently	
Resource	Sampled households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	46	45	97.8	17	37.8	17	100.0	12	70.6
Nonsalmon fish	46	42	91.3	7	16.7	7	100.0	4	57.1
Marine invertebrates	46	4	8.7	0	0.0	0	0.0	0	0.0
Land mammals	46	42	91.3	8	19.0	8	100.0	7	87.5
Marine mammals	46	32	69.6	5	15.6	5	100.0	3	60.0
Birds and eggs	46	40	87.0	6	15.0	6	100.0	4	66.7
Berries and greens	46	43	93.5	15	34.9	15	100.0	9	60.0
All resources	46	44	95.7	18	40.9	18	100.0	9	50.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-10.–Things households reported doing differently because they did not get enough of a resource, Marshall, 2010.

		Bought/bartered		Used more commercial foods		Replaced with other subsistence foods		Asked others for help		Made do without		Increased effort to harvest		Obtained food from other sources		Got public assistance	
Resource	Valid responses	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	13	0.0	0.0	4.0	30.8	5.0	38.5	1.0	7.7	4.0	30.8	0.0	0.0	0.0	0.0	2.0	15.4
Nonsalmon fish	4	0.0	0.0	4.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Marine invertebrates	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land mammals	6	0.0	0.0	4.0	66.7	2.0	33.3	0.0	0.0	2.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0
Marine mammals	2	0.0	0.0	2.0	100.0	0.0	0.0	0.0	0.0	1.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0
Birds and eggs	4	0.0	0.0	2.0	50.0	3.0	75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Berries and greens	11	1.0	9.1	6.0	54.5	1.0	9.1	0.0	0.0	2.0	18.2	0.0	0.0	1.0	9.1	0.0	0.0
All resources	9	0.0	0.0	4.0	44.4	4.0	44.4	1.0	11.1	2.0	22.2	0.0	0.0	0.0	0.0	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-11.–Reasons use of resources was less than in recent years, Marshall, 2010.

	Reasons for less use compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Land mammals		Marine mammals		Birds and eggs		Berries and greens		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Family or personal	4	17.4	3	23.1	0	0.0	2	20.0	0	0.0	1	8.3	5	35.7	4	33.3
Resource availabilty	5	21.7	1	7.7	0	0.0	1	10.0	0	0.0	2	16.7	2	14.3	0	0.0
Resources too far	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
No equipment/equipment problems	3	13.0	1	7.7	0	0.0	2	20.0	0	0.0	0	0.0	3	21.4	1	8.3
Did not receive	0	0.0	1	7.7	0	0.0	1	10.0	0	0.0	0	0.0	1	7.1	3	25.0
Did not try/low effort	0	0.0	3	23.1	0	0.0	1	10.0	1	50.0	4	33.3	2	14.3	0	0.0
Unsuccessful (unlucky)	0	0.0	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0	0	0.0	0	0.0
Weather/environment	1	4.3	0	0.0	0	0.0	1	10.0	0	0.0	2	16.7	2	14.3	1	8.3
Other	2	8.7	1	7.7	0	0.0	0	0.0	0	0.0	1	8.3	0	0.0	0	0.0
Working/not enough time	1	4.3	2	15.4	0	0.0	0	0.0	0	0.0	1	8.3	1	7.1	1	8.3
Regulations	8	34.8	1	7.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	16.7
Resources too small/diseased	0	0.0	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0	0	0.0	0	0.0
Did not get enough	0	0.0	0	0.0	0	0.0	0	0.0	1	50.0	0	0.0	0	0.0	0	0.0
Did not need	0	0.0	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0	0	0.0	0	0.0
Did not give any away	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Too expensive (fuel)	3	13.0	1	7.7	0	0.0	1	10.0	0	0.0	1	8.3	0	0.0	1	8.3
Use other resources	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-12.–Reasons use of resources was more than in recent years, Marshall, 2010.

	Reasons for more use compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Land mammals		Marine mammals		Birds and eggs		Berries and greens		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Increased availability	1	10.0	2	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Used other resources	0	0.0	0	0.0	0	0.0	2	28.6	0	0.0	0	0.0	0	0.0	0	0.0
Good weather	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Received more	1	10.0	1	12.5	0	0.0	0	0.0	3	60.0	1	33.3	0	0.0	0	0.0
Needed more	3	30.0	2	25.0	0	0.0	2	28.6	1	20.0	0	0.0	1	33.3	2	25.0
Increased effort	2	20.0	2	25.0	0	0.0	3	42.9	0	0.0	1	33.3	1	33.3	2	25.0
Got more help	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	12.5
Other	1	10.0	1	12.5	0	0.0	0	0.0	1	20.0	0	0.0	1	33.3	0	0.0
Regulations	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	33.3	0	0.0	0	0.0
Traveled farther	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Increased success	2	20.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	12.5
Needed less	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	12.5
Store-bought too expensive	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	12.5

Source ADF&G Division of Subsistence household surveys, 2011.

Table D4-13.–Reported job schedules, Marshall, 2010.

	Jobs		Employed adults		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	76.96	50.7%	68.41	61.5%	46.8	73.3%
Part-time	47.03	31.0%	32.07	28.8%	29.8	46.7%
Shift	0.00	0.0%	0.00	0.0%	0.0	0.0%
On-call (occasional)	21.38	14.1%	19.24	17.3%	19.1	30.0%
Part-time shift	6.41	4.2%	4.28	3.8%	4.3	6.7%
Schedule not reported	0.00	0.0%	0.00	0.0%	0.0	0.0%

Source ADF&G Division of Subsistence household surveys, 2011.

Table D5-1.–Participation in harvesting and processing activities, Nulato, 2010.

Total number of people	**260.4**
Fish	
Fish	
Number	121.6
Percentage	46.7%
Process	
Number	130.2
Percentage	50.0%
Land mammals	
Hunt	
Number	115.1
Percentage	44.2%
Process	
Number	128.0
Percentage	49.2%
Marine mammals	
Hunt	
Number	0.0
Percentage	0.0%
Process	
Number	1.1
Percentage	0.4%
Birds and eggs	
Hunt	
Number	63.5
Percentage	24.4%
Process	
Number	52.7
Percentage	20.2%
Plants	
Gather	
Number	131.3
Percentage	50.4%
Process	
Number	128.0
Percentage	49.2%
Any resource	
Attempt	
Number	178.9
Percentage	68.7%
Process	
Number	180.0
Percentage	69.1%

Source ADF&G Division of Subsistence household surveys, 2011.

Table D5-2.–Estimated harvest of fish for consumption by dogs, Nulato, 2010.

Resource	Amount	Pounds
Nonsalmon Fish		
Other nonsalmon fish	0.0 ind	0.0 lb
Longnose sucker	2.1 ind	1.5 lb
Burbot	37.5 ind	90.0 lb
Northern pike	0.0 ind	0.0 lb
Dolly Varden	1.1 ind	1.0 lb
Unknown char	2.1 ind	3.2 lb
Whitefish	113.6 ind	250.7 lb
Arctic grayling	81.4 ind	57.0 lb
Salmon		
Unknown chum salmon	0.0 ind	0.0 lb
Unknown salmon	0.0 ind	0.0 lb
Pink salmon	0.0 ind	0.0 lb
Sockeye salmon	0.0 ind	0.0 lb
Summer chum salmon	114.9 ind	584.3 lb
Fall chum salmon	289.3 ind	1,470.7 lb
Coho salmon	276.5 ind	1,462.0 lb
Chinook salmon	5.4 ind	51.2 lb
Total	**924.0 ind**	**3,971.6 lb**
Whitefish		
Unknown whitefish	0.0 ind	0.0 lb
Bering cisco	0.0 ind	0.0 lb
Round whitefish	4.3 ind	2.1 lb
Humpback whitefish	53.6 ind	160.7 lb
Broad whitefish	53.6 ind	75.0 lb
Sheefish	2.1 ind	12.9 lb
Least cisco	0.0 ind	0.0 lb
Subtotal	**113.6 ind**	**250.7 lb**
Other Fish		
Pacific herring	0.0 gal	0.0 lb
Pacific herring roe	0.0 gal	0.0 lb
Rainbow smelt	0.0 gal	0.0 lb
Pacific tomcod	0.0 ind	0.0 lb
Saffron cod	0.0 ind	0.0 lb
Unknown cod	0.0 ind	0.0 lb
Pacific halibut	0.0 lb	0.0 lb
Arctic lamprey	0.0 ind	0.0 lb
Stickleback (needlefish)	0.0 gal	0.0 lb
Bering wolffish	0.0 ind	0.0 lb
Alaska blackfish	0.0 lb	0.0 lb
Lake trout	0.0 ind	0.0 lb
Unknown nonsalmon fish	0.0 ind	0.0 lb
Subtotal	**0.0 ind**	**0.0 lb**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D5-3.–Estimated large land mammal and gray wolf harvest by month and sex, Nulato, 2010.

	Resource								
	Black bear	Brown bear	Caribou			Moose			Wolf
Harvest Month	Unknown	Unknown	Male	Female	Unknown	Male	Female	Unknown	Unknown
January	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
February	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
March	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
April	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
June	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
August	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0
September	8.6	0.0	0.0	0.0	0.0	36.4	0.0	0.0	0.0
October	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
November	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3
December	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Harvest	**8.6**	**0.0**	**0.0**	**0.0**	**0.0**	**39.6**	**0.0**	**0.0**	**6.4**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D5-4.–Estimated small land mammal harvest by month, Nulato, 2010.

	Estimated harvest by month												
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk
Beaver	10.7	42.9	73.9	10.7	23.6	0.0	0.0	0.0	0.0	0.0	2.1	10.7	0.0
Red fox	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Snowshoe hare	1.1	0.0	1.1	4.3	0.0	0.0	0.0	0.0	0.0	0.0	5.4	23.6	0.0
Alaska hare (jackrabbit)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
River (land) otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Lynx	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1	0.0
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Marten	5.4	36.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	122.1	11.8	0.0
Mink	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
Muskrat	0.0	0.0	0.0	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Porcupine	0.0	0.0	0.0	0.0	1.1	0.0	1.1	2.1	1.1	3.2	0.0	0.0	0.0
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red (tree) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Weasel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0
Gray wolf	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	1.1	0.0
Wolverine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0
Total Harvest	**17.1**	**83.6**	**75.0**	**15.0**	**31.1**	**0.0**	**1.1**	**2.1**	**1.1**	**3.2**	**144.6**	**51.4**	**0.0**

Source ADF&G Division of Subsistence household survey, 2011.

Table D5-5.–Estimated bird harvest by season, Nulato, 2010.

	Estimated harvest by season					
Resource	Winter	Summer	Spring	Fall	Season unknown	**Total**
Bufflehead	0.0	0.0	0.0	0.0	0.0	**0.0**
Canvasback	0.0	0.0	0.0	0.0	0.0	**0.0**
Common eider	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown eider	0.0	0.0	2.1	0.0	0.0	**2.1**
Goldeneye sp.	0.0	0.0	2.1	0.0	0.0	**2.1**
Mallard	0.0	8.6	39.6	0.0	0.0	**48.2**
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	4.3	33.2	0.0	0.0	**37.5**
Scaup sp.	0.0	0.0	0.0	0.0	0.0	**0.0**
Black scoter	0.0	4.3	2.1	2.1	0.0	**8.6**
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	0.0	0.0	0.0	0.0	**0.0**
Green-winged teal	0.0	0.0	6.4	0.0	0.0	**6.4**
Unknown wigeon	0.0	0.0	12.9	0.0	0.0	**12.9**
Unknown duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Brant	0.0	0.0	0.0	0.0	0.0	**0.0**
Cackling goose	0.0	0.0	31.1	0.0	0.0	**31.1**
Lesser Canada goose	0.0	0.0	46.1	1.1	0.0	**47.1**
Unknown Canada goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Emperor goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Snow goose	0.0	0.0	2.1	0.0	0.0	**2.1**
Greater white-fronted goose	0.0	0.0	30.0	0.0	0.0	**30.0**
Unknown goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	0.0	0.0	0.0	0.0	0.0	**0.0**
Sandhill crane	0.0	0.0	0.0	0.0	0.0	**0.0**
Whimbrel	0.0	0.0	0.0	0.0	0.0	**0.0**
Spruce grouse	10.7	0.0	0.0	303.2	0.0	**313.9**
Ruffed grouse	26.8	0.0	0.0	24.6	0.0	**51.4**
Ptarmigan sp.	51.4	0.0	21.4	31.1	0.0	**103.9**
Total Harvest	**88.9**	**17.1**	**229.3**	**362.1**	**0.0**	**697.5**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D5-6.–Reasons use of resources was less than in recent years, Nulato, 2010.

	Reasons for less use compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Land mammals		Marine mammals		Birds and eggs		Berries and greens		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Family or personal	1	2.4	3	9.4	0	0.0	5	16.7	1	11.1	3	12.0	1	3.6	2	7.1
Resource availabilty	11	26.8	2	6.3	0	0.0	2	6.7	0	0.0	2	8.0	9	32.1	3	10.7
Resources too far	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
No equipment/equipment problems	1	2.4	2	6.3	0	0.0	2	6.7	0	0.0	1	4.0	2	7.1	2	7.1
Did not receive	6	14.6	7	21.9	2	66.7	3	10.0	6	66.7	10	40.0	5	17.9	4	14.3
Did not try/low effort	3	7.3	6	18.8	0	0.0	3	10.0	0	0.0	3	12.0	4	14.3	1	3.6
Unsuccessful (unlucky)	2	4.9	2	6.3	0	0.0	9	30.0	0	0.0	2	8.0	0	0.0	3	10.7
Weather/environment	1	2.4	3	9.4	0	0.0	1	3.3	0	0.0	1	4.0	1	3.6	1	3.6
Other	2	4.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	7.1	0	0.0
Working/not enough time	6	14.6	7	21.9	1	33.3	2	6.7	0	0.0	1	4.0	5	17.9	6	21.4
Regulations	9	22.0	0	0.0	0	0.0	0	0.0	1	11.1	0	0.0	0	0.0	4	14.3
Resources too small/diseased	0	0.0	0	0.0	0	0.0	2	6.7	0	0.0	0	0.0	0	0.0	0	0.0
Did not get enough	2	4.9	3	9.4	0	0.0	3	10.0	0	0.0	1	4.0	2	7.1	4	14.3
Did not need	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	4.0	0	0.0	0	0.0
Did not give any away	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Too expensive (fuel)	2	4.9	1	3.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	14.3
Use other resources	0	0.0	0	0.0	0	0.0	0	0.0	1	11.1	0	0.0	0	0.0	0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D5-7.–Reasons use of resources was more than in recent years, Nulato, 2010.

	Reasons for more use compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Land mammals		Marine mammals		Birds and eggs		Berries and greens		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Increased availability	2	16.7	0	0.0	0	0.0	1	16.7	0	0.0	1	16.7	1	11.1	0	0.0
Used other resources	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Good weather	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Received more	0	0.0	0	0.0	0	0.0	1	16.7	4	50.0	0	0.0	1	11.1	3	27.3
Needed more	3	25.0	1	20.0	0	0.0	1	16.7	2	25.0	0	0.0	2	22.2	2	18.2
Increased effort	2	16.7	1	20.0	0	0.0	0	0.0	0	0.0	4	66.7	2	22.2	2	18.2
Got more help	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other	4	33.3	1	20.0	0	0.0	1	16.7	2	25.0	0	0.0	3	33.3	4	36.4
Regulations	1	8.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Traveled farther	0	0.0	1	20.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Increased success	1	8.3	2	40.0	0	0.0	3	50.0	0	0.0	1	16.7	0	0.0	2	18.2
Needed less	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Store-bought too expensive	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D5-8.–Reported impact to households responding that they did not get enough of a resource, Nulato, 2010.

		Households not getting enough ____ .				Impact to those not getting enough _____ .									
	Sampled	Valid responses		Did not get enough		No response		Not noticable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	84	78	92.9	40	51.3	0	0.0	2	5.0	17	42.5	14	35.0	7	17.5
Nonsalmon fish	84	71	84.5	23	32.4	0	0.0	3	13.0	8	34.8	6	26.1	6	26.1
Marine invertebrates	84	3	3.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Land mammals	84	78	92.9	29	37.2	1	3.4	1	3.4	13	44.8	8	27.6	6	20.7
Marine mammals	84	37	44.0	6	16.2	2	33.3	2	33.3	2	33.3	0	0.0	0	0.0
Birds and eggs	84	61	72.6	18	29.5	0	0.0	3	16.7	11	61.1	1	5.6	3	16.7
Plants and berries	84	81	96.4	23	28.4	0	0.0	4	17.4	14	60.9	1	4.3	4	17.4
All resources	84	84	100.0	38	45.2	2	5.3	3	7.9	13	34.2	10	26.3	10	26.3

Source ADF&G Division of Subsistence household surveys, 2011.

Table D5-9.–Households reporting doing things differently because they did not get enough of a resource, Nulato, 2010.

		Households not getting enough				Households doing something differently because they did not get enough			
		Valid responses		Did not get enough		Valid responses		Did something differently	
Resource	Sampled households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	84	79	94.0	40	50.6	39	97.5	22	56.4
Nonsalmon fish	84	72	85.7	23	31.9	22	95.7	11	50.0
Marine invertebrates	84	6	7.1	0	0.0	0	0.0	0	0.0
Land mammals	84	77	91.7	29	37.7	28	96.6	23	82.1
Marine mammals	84	38	45.2	6	15.8	5	83.3	1	20.0
Birds and eggs	84	57	67.9	18	31.6	18	100.0	10	55.6
Berries and greens	84	81	96.4	23	28.4	22	95.7	10	45.5
All resources	84	83	98.8	38	45.8	37	97.4	24	64.9

Source ADF&G Division of Subsistence household surveys, 2011.

Table D5-10.–Things households reported doing differently because they did not get enough of a resource, Nulato, 2010.

		Bought/bartered		Used more commercial foods		Replaced with other subsistence foods		Asked others for help		Made do without		Increased effort to harvest		Obtained food from other sources		Got public assistance	
Resource	Valid responses	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	23	2	8.7	18	78.3	2	8.7	0	0.0	2	8.7	1	4.3	0	0.0	0	0.0
Nonsalmon fish	12	0	0.0	9	75.0	2	16.7	0	0.0	2	16.7	0	0.0	0	0.0	0	0.0
Marine invertebrates	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Land mammals	22	0	0.0	20	90.9	1	4.5	0	0.0	0	0.0	1	4.5	0	0.0	0	0.0
Marine mammals	1	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Birds and eggs	10	0	0.0	9	90.0	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0	0	0.0
Berries and greens	10	0	0.0	7	70.0	0	0.0	1	10.0	2	20.0	0	0.0	1	10.0	0	0.0
All resources	26	0	0.0	20	76.9	0	0.0	1	3.8	5	19.2	1	3.8	0	0.0	0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D5-11.–Households reporting why they did not get enough of a resource, Nulato, 2010.

		Reasons															
Resource by category	Households reporting wanting more	No reason given	Personal/ family	Did not have enough help	Resource availability	Resources too far	No equipment/ equipment problems	Did not receive	Did not try/ low effort	Unsuccessful (unlucky)	Weather/ environment	Other	Working/ not enough time	Regulations	Resources too small/ diseased	Gas prices too high	Did not get enough
Resource not specified	7	0	4	0	0	0	0	0	2	0	1	0	0	0	0	0	0
All resources	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Fish	**3**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**
Salmon	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Chum salmon	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0
Summer chum salmon	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Fall chum salmon	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Coho salmon	12	0	0	0	0	0	0	0	1	2	0	0	1	0	0	0	1
Chinook salmon	37	0	11	3	3	6	0	0	4	0	1	1	3	4	4	0	1
Sockeye salmon	2	0	2	0	0	0	0	0	0	0	0	0	0	2	2	0	0
Nonsalmon fish	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Pacific cod	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Pacific halibut	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Burbot	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Dolly Varden	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Arctic grayling	12	0	2	0	0	2	0	0	3	0	0	0	0	3	3	0	0
Northern pike	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Sheefish	8	0	0	2	2	0	0	0	1	0	0	1	0	1	1	0	0
Trout	3	0	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0
Rainbow trout	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Whitefish	5	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Broad whitefish	3	0	0	2	2	0	0	0	0	0	0	0	0	1	1	0	0
Humpback whitefish	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Mammals																	
Moose	31	0	11	2	2	1	0	0	3	4	8	0	1	3	3	1	1
Beaver	3	0	1	0	0	0	0	0	1	0	0	2	0	0	0	0	0
Snowshoe hare	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marten	2	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Unknown seal oil	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Unknown seal	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Beluga	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0

-continued-

Table D5-11. Page 2 of 2.

Resource by category	Households reporting wanting more	Reasons															
		No reason given	Personal/ family	Did not have enough help	Resource availability	Resources too far	No equipment/ equipment problems	Did not receive	Did not try/ low effort	Unsuccessful (unlucky)	Weather/ environment	Other	Working/ not enough time	Regulations	Resources too small/ diseased	Gas prices too high	Did not get enough
Birds and eggs																	
Ducks	8	0	0	1	1	0	0	0	4	2	0	0	0	0	0	0	0
Mallard	4	0	0	1	1	1	0	0	1	0	0	1	0	0	0	0	0
Long-tailed duck	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Northern pintail	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Teal	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
American wigeon	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Geese	12	0	2	1	1	1	0	0	5	3	0	1	0	0	0	0	0
Lesser canada goose	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Greater white-fronted goose	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Grouse	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Spruce grouse	4	0	0	1	1	0	0	0	1	2	0	0	0	0	0	0	0
Ptarmigan	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Duck eggs	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Vegetation																	
Berries	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Blueberry	14	0	3	1	1	2	0	0	0	3	0	2	0	2	2	0	0
Lowbush cranberry	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Crowberry	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Salmonberry	4	0	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0
Blackberry	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Wood	5	0	1	1	1	0	0	0	1	0	0	0	1	1	1	0	0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D5-12.–Reported job schedules, Nulato, 2010.

	Jobs		Employed adults		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	89.6	52.3%	77.0	64.2%	51.6	73.4%
Part-time	57.5	33.5%	49.5	41.3%	37.3	53.1%
Shift	4.4	2.6%	4.4	3.7%	4.4	6.3%
On-call (occasional)	14.4	8.4%	13.2	11.0%	12.1	17.2%
Part-time shift	0.0	0.0%	0.0	0.0%	0.0	0.0%
Schedule not reported	5.5	3.2%	4.4	3.7%	3.3	4.7%

Source ADF&G Division of Subsistence household surveys, 2011.

Table D6-1.–Estimated harvest of fish for consumption by dogs, Galena, 2010.

Resource	Amount	Pounds
Nonsalmon fish		
Other nonsalmon fish	0.0 ind	0.0 lb
Dolly Varden	0.0 ind	0.0 lb
Unknown rockfish	0.0 ind	0.0 lb
Lingcod	0.0 ind	0.0 lb
Arctic grayling	0.0 ind	0.0 lb
Burbot	88.9 ind	213.3 lb
Northern Pike	88.9 ind	399.9 lb
Pacific halibut	0.0 lb	0.0 lb
Alaska blackfish	0.0 lb	0.0 lb
Whitefish	922.3 ind	2,481.0 lb
Salmon		
Unknown chum salmon	0.0 ind	0.0 lb
Pink salmon	0.0 ind	0.0 lb
Unknown salmon	0.0 ind	0.0 lb
Sockeye salmon	0.0 ind	0.0 lb
Coho salmon	11.9 ind	62.7 lb
Chinook salmon	4.0 ind	37.3 lb
Fall chum salmon	691.3 ind	3,514.2 lb
Total fish	**1,807.1 ind**	**6,708.4 lb**
Whitefish		
Bering cisco	0.0 ind	0.0 lb
Round whitefish	0.0 ind	0.0 lb
Unknown whitefish	0.0 ind	0.0 lb
Least cisco	0.0 ind	0.0 lb
Sheefish	118.5 ind	711.0 lb
Broad whitefish	400.9 ind	561.3 lb
Humpback whitefish	402.9 ind	1,208.7 lb
Subtotal	**922.3 ind**	**2,481.0 lb**
Other fish		
Pacific herring	0.0 gal	0.0 lb
Rainbow smelt	0.0 gal	0.0 lb
Pacific tomcod	0.0 ind	0.0 lb
Saffron cod	0.0 ind	0.0 lb
Arctic lamprey	0.0 ind	0.0 lb
Stickleback (needlefish)	0.0 gal	0.0 lb
Lake trout	0.0 ind	0.0 lb
Unknown char	0.0 ind	0.0 lb
Longnose sucker	0.0 ind	0.0 lb
Subtotal	**0.0 ind**	**0.0 lb**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D6-2.–Participation in harvesting and processing activities, Galena, 2010.

Total number of people	**424.6**
Fish	
Fish	
Number	188.5
Percentage	44.4%
Process	
Number	210.3
Percentage	49.5%
Land mammals	
Hunt	
Number	214.3
Percentage	50.5%
Process	
Number	240.1
Percentage	56.5%
Marine mammals	
Hunt or trap	
Number	4.0
Percentage	0.9%
Process	
Number	2.0
Percentage	0.5%
Birds and eggs	
Hunt	
Number	144.8
Percentage	34.1%
Process	
Number	131.0
Percentage	30.8%
Plants	
Gather	
Number	240.1
Percentage	56.5%
Process	
Number	220.2
Percentage	51.9%
Any resource	
Attempt	
Number	318.0
Percentage	74.9%
Process	
Number	302.2
Percentage	71.2%

Source ADF&G Division of Subsistence household surveys, 2011.

Table D6-3.–Estimated large land mammal and gray wolf harvest by month and sex, Galena, 2010.

	Resource									
	Black bear	Brown bear	Caribou			Moose			Muskox	Wolf
Harvest Month	Unknown	Unknown	Male	Female	Unknown	Male	Female	Unknown	Unknown	Unknown
January	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	7.9
February	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9
March	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0
April	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9
May	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
June	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
August	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0
September	0.0	0.0	2.0	4.0	0.0	63.2	0.0	0.0	0.0	0.0
October	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
November	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.9
December	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Harvest	**9.9**	**0.0**	**2.0**	**4.0**	**0.0**	**67.2**	**0.0**	**0.0**	**1.0**	**47.4**

Source ADF&G Division of Subsistence household survey, 2011.

Table D6-4.–Estimated small land mammal harvest by month, Galena, 2010.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
Beaver	7.9	11.9	35.6	23.7	27.7	0.0	0.0	0.0	7.9	0.0	4.0	13.8	0.0	**132.3**
Red fox	9.9	11.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.9	29.6	0.0	**63.2**
Snowshoe hare	15.8	25.7	29.6	4.0	0.0	0.0	0.0	0.0	9.9	67.2	21.7	33.6	0.0	**207.4**
Alaska hare (jackrabbit)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	**4.0**
River (land) otter	2.0	4.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	2.0	0.0	**15.8**
Lynx	33.6	41.5	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.6	67.2	0.0	**179.7**
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Marten	102.7	136.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	167.9	100.7	0.0	**507.6**
Mink	4.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	**13.8**
Muskrat	0.0	0.0	0.0	5.9	31.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**37.5**
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	4.0	0.0	0.0	0.0	**7.9**
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Red (tree) squirrel	0.0	0.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**20.0**
Weasel	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	4.0	5.9	0.0	**15.8**
Gray wolf	7.9	7.9	4.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	11.9	9.9	0.0	**47.4**
Wolverine	2.0	2.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	**13.8**
Total Harvest	**187.6**	**248.9**	**91.0**	**51.5**	**59.3**	**0.0**	**0.0**	**2.0**	**19.8**	**73.1**	**264.7**	**268.6**	**0.0**	**1,266.2**

Source ADF&G Division of Subsistence household survey, 2011.

Table D6-5.–Estimated bird harvest by season, Galena, 2010.

	Estimated harvest by season					
Resource	Winter	Summer	Spring	Fall	Season unknown	**Total**
Bufflehead	0.0	0.0	0.0	0.0	0.0	**0.0**
Canvasback	0.0	0.0	0.0	0.0	0.0	**0.0**
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 sp.	0.0	0.0	9.9	0.0	0.0	**9.9**
Mallard	0.0	4.0	65.2	29.6	0.0	**98.8**
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	2.0	28.0	4.0	0.0	**34.0**
Ringneck duck	0.0	0.0	4.0	0.0	0.0	**4.0**
Scaup sp.	0.0	0.0	0.0	0.0	0.0	**0.0**
Black scoter	0.0	0.0	4.0	0.0	0.0	**4.0**
Surf scoter	0.0	0.0	9.9	0.0	0.0	**9.9**
White-winged scoter	0.0	0.0	0.0	0.0	0.0	**0.0**
Northern shoveler	0.0	0.0	0.0	4.0	0.0	**4.0**
Green-winged teal	0.0	2.0	0.0	5.9	0.0	**7.9**
Unknown wigeon	0.0	4.0	13.8	31.6	0.0	**49.4**
Unknown duck	0.0	0.0	7.9	2.0	0.0	**9.9**
Brant	0.0	0.0	0.0	0.0	0.0	**0.0**
Cackling goose	0.0	9.9	33.6	4.0	0.0	**47.4**
Lesser Canada goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown Canada goose	0.0	0.0	47.4	2.0	2.0	**51.4**
Emperor goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Snow goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Greater white-fronted goose	0.0	7.9	81.0	0.0	0.0	**88.9**
Unknown goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	0.0	0.0	0.0	0.0	0.0	**0.0**
Sandhill crane	0.0	0.0	0.0	0.0	0.0	**0.0**
Whimbrel	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown grebe	0.0	0.0	2.0	0.0	0.0	**2.0**
Spruce grouse	26.0	0.0	12.0	470.0	0.0	**508.0**
Ruffed grouse	16.0	0.0	12.0	428.0	0.0	**456.0**
Ptarmigan sp.	146.2	0.0	11.9	19.8	0.0	**177.8**
Total Harvest	**188.2**	**29.7**	**342.4**	**1,000.8**	**2.0**	**1,562.9**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D6-6.–Reasons use of resources was less than in recent years, Galena, 2010.

	Reasons for less use compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Land mammals		Marine mammals		Birds and eggs		Berries and greens		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Family or personal	3	9.7	0	0.0	0	0.0	1	5.3	0	0.0	0	0.0	3	17.6	4	16.7
Resource availabilty	8	25.8	2	13.3	0	0.0	3	15.8	0	0.0	3	37.5	8	47.1	9	37.5
Resources too far	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
No equipment/equipment problems	3	9.7	1	6.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Did not receive	2	6.5	1	6.7	1	100.0	2	10.5	0	0.0	2	25.0	1	5.9	1	4.2
Did not try/low effort	2	6.5	2	13.3	0	0.0	1	5.3	0	0.0	2	25.0	1	5.9	0	0.0
Unsuccessful (unlucky)	2	6.5	0	0.0	0	0.0	6	31.6	0	0.0	0	0.0	1	5.9	1	4.2
Weather/environment	2	6.5	0	0.0	0	0.0	1	5.3	0	0.0	1	12.5	0	0.0	1	4.2
Other	1	3.2	1	6.7	0	0.0	1	5.3	1	50.0	0	0.0	1	5.9	1	4.2
Working/not enough time	4	12.9	2	13.3	0	0.0	4	21.1	0	0.0	1	12.5	2	11.8	4	16.7
Regulations	4	12.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	4.2
Resources too small/diseased	0	0.0	1	6.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	4.2
Did not get enough	3	9.7	2	13.3	0	0.0	2	10.5	1	50.0	1	12.5	0	0.0	4	16.7
Did not need	0	0.0	1	6.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	4.2
Did not give any away	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Too expensive (fuel)	4	12.9	1	6.7	0	0.0	0	0.0	0	0.0	0	0.0	1	5.9	2	8.3
Use other resources	0	0.0	1	6.7	0	0.0	1	5.3	0	0.0	0	0.0	0	0.0	0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D6-7.–Households reporting why they did not get enough of a resource, Galena, 2010.

		Reasons															
Resource by category	Households reporting wanting more	No reason given	Personal/ family	Did not have enough help	Resource availability	Resources too far	No equipment/equipment problems	Did not receive	Did not try/ low effort	Unsuccessful (unlucky)	Weather/ environment	Other	Working/ not enough time	Regulations	Resources too small/ diseased	Gas prices too high	Did not get enough
Resource not specified	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fish	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**
Salmon	7	1	1	0	2	0	0	0	1	0	1	0	1	0	0	0	0
Fall chum salmon	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coho salmon	3	0	1	0	0	0	0	0	1	0	1	1	0	0	0	0	0
Chinook salmon	24	2	2	1	6	0	0	6	2	1	1	5	1	1	2	2	1
Sockeye salmon	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific halibut	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern pike	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sheefish	4	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0
Whitefish	5	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Humpback whitefish	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Mammals																	
Caribou	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Moose	18	2	4	0	2	0	0	2	2	6	1	0	5	1	1	1	0
Snowshoe hare	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Marten	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Beluga	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Birds and eggs	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Migratory birds	2	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0
Ducks	3	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0
Geese	4	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0
Cackling goose	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Swans	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Grouse	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ruffed grouse	2	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0
Ptarmigan	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Marine invertebrates																	
King crab	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

-continued-

Table D6-7. Page 2 of 2

Resource by category	Households reporting wanting more	Reasons															
		No reason given	Personal/ family	Did not have enough help	Resource availability	Resources too far	No equipment/equipment problems	Did not receive	Did not try/ low effort	Unsuccessful (unlucky)	Weather/ environment	Other	Working/ not enough time	Regulations	Resources too small/ diseased	Gas prices too high	Did not get enough
Vegetation																	
Berries	5	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0
Blueberry	14	1	2	0	5	0	0	0	0	1	0	2	3	0	0	0	1
Raspberry	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Salmonberry	5	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Unknown mushrooms	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Wood	5	0	1	0	1	0	0	0	0	0	0	1	1	1	0	0	1

Source ADF&G Division of Subsistence household surveys, 2011.

Table D6-8.–Households reporteing doing things differently because they did not get enough of a resource, Galena, 2010.

		Households not getting enough				Households doing something differently because they did not get enough			
		Valid Responses		Did not get enough		Valid responses		Did something differently	
Resource	Sampled households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	80	61	76.3	22	36.1	22	100.0	18	81.8
Nonsalmon fish	80	50	62.5	8	16.0	7	87.5	5	71.4
Marine invertebrates	80	7	8.8	1	14.3	1	100.0	0	0.0
Land mammals	80	72	90.0	15	20.8	15	100.0	14	93.3
Marine mammals	80	8	10.0	1	12.5	1	100.0	0	0.0
Birds and eggs	80	41	51.3	9	22.0	9	100.0	4	44.4
Berries and greens	80	64	80.0	23	35.9	23	100.0	15	65.2
All resources	80	73	91.3	23	31.5	23	100.0	19	82.6

Source ADF&G Division of Subsistence household surveys, 2011.

Table D6-9.–Things households reported doing differently because they did not get enough of a resource, Galena, 2010.

		Bought/bartered		Used more commercial foods		Replaced with other subsistence foods		Asked others for help		Made do without		Increased effort to harvest		Obtained food from other sources		Got public assistance	
Resource	Valid responses	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	17	1	5.9	9	52.9	5	29.4	1	5.9	1	5.9	0	0.0	0	0.0	0	0.0
Nonsalmon fish	5	0	0.0	4	80.0	0	0.0	1	20.0	1	20.0	0	0.0	0	0.0	0	0.0
Marine invertebrates	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Land mammals	14	0	0.0	11	78.6	0	0.0	1	7.1	1	7.1	0	0.0	0	0.0	1	7.1
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
Birds and eggs	4	0	0.0	3	75.0	0	0.0	0	0.0	1	25.0	0	0.0	0	0.0	0	0.0
Berries and greens	15	0	0.0	8	53.3	3	20.0	2	13.3	3	20.0	0	0.0	0	0.0	0	0.0
All resources	19	0	0.0	16	84.2	1	5.3	0	0.0	1	5.3	0	0.0	0	0.0	0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D6-10.–Reported impact to households responding that they did not get enough of a resource, Galena, 2010.

		Households not getting enough				Impact to those not getting enough									
	Sampled	Valid responses		Did not get enough		No response		Not noticable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	80	60	75.0	22	36.7	0	0.0	1	4.5	12	54.5	7	31.8	2	9.1
Nonsalmon fish	80	50	62.5	8	16.0	0	0.0	3	37.5	3	37.5	2	25.0	0	0.0
Marine invertebrates	80	7	8.8	1	14.3	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0
Land mammals	80	71	88.8	15	21.1	0	0.0	0	0.0	8	53.3	6	40.0	1	6.7
Marine mammals	80	8	10.0	1	12.5	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0
Birds and eggs	80	45	56.3	9	20.0	0	0.0	2	22.2	4	44.4	2	22.2	1	11.1
Plants and berries	80	65	81.3	23	35.4	0	0.0	6	26.1	11	47.8	5	21.7	1	4.3
All resources	80	73	91.3	23	31.5	0	0.0	0	0.0	14	60.9	8	34.8	1	4.3

Source ADF&G Division of Subsistence household surveys, 2011.

Table D6-11.–Reasons use of resources was more than in recent years, Galena, 2010.

	Reasons for more use compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Land mammals		Marine mammals		Birds and eggs		Berries and greens		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Increased availability	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	33.3	1	11.1	0	0.0
Used other resources	0	0.0	1	20.0	0	0.0	1	7.7	0	0.0	0	0.0	1	11.1	1	11.1
Good weather	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Received more	2	22.2	1	20.0	2	66.7	3	23.1	1	100.0	0	0.0	0	0.0	1	11.1
Needed more	1	11.1	1	20.0	0	0.0	4	30.8	0	0.0	0	0.0	1	11.1	3	33.3
Increased effort	2	22.2	0	0.0	0	0.0	2	15.4	0	0.0	3	50.0	2	22.2	1	11.1
Got more help	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other	3	33.3	1	20.0	0	0.0	0	0.0	0	0.0	0	0.0	1	11.1	0	0.0
Regulations	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Traveled farther	1	11.1	0	0.0	1	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Increased success	0	0.0	1	20.0	0	0.0	3	23.1	0	0.0	2	33.3	2	22.2	2	22.2
Needed less	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	11.1	1	11.1
Store-bought too expensive	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D6-12.–Reported job schedules, Galena, 2010.

	Jobs		Employed adults		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	176.6	68.2%	164.1	74.5%	110.6	90.3%
Part-time	60.2	23.3%	50.0	22.7%	47.4	38.7%
Shift	2.0	0.8%	2.0	0.9%	2.0	1.6%
On-call (occasional)	14.0	5.4%	12.0	5.5%	9.9	8.1%
Part-time shift	4.0	1.6%	4.0	1.8%	4.0	3.2%
Schedule not reported	2.0	0.8%	2.0	0.9%	2.0	1.6%

Source ADF&G Division of Subsistence household surveys, 2011.

Table D7-1.–Participation in harvesting and processing activities, Ruby, 2010.

Total number of people	**179.7**
Fish	
Fish	
Number	80.7
Percentage	44.9%
Process	
Number	87.7
Percentage	48.8%
Land mammals	
Hunt	
Number	109.0
Percentage	60.6%
Process	
Number	117.5
Percentage	65.4%
Marine mammals	
Hunt	
Number	0.0
Percentage	0.0%
Process	
Number	0.0
Percentage	0.0%
Birds and eggs	
Hunt	
Number	43.9
Percentage	24.4%
Process	
Number	52.4
Percentage	29.1%
Plants	
Gather	
Number	126.0
Percentage	70.1%
Process	
Number	114.6
Percentage	63.8%
Any resource	
Attempt	
Number	150.3
Percentage	83.6%
Process	
Number	148.9
Percentage	82.8%

Source ADF&G Division of Subsistence household surveys, 2011.

Table D7-2.–Estimated harvest of fish for consumption by dogs, Ruby, 2010.

Resource	Amount	Pounds
Nonsalmon fish		
Other nonsalmon fish	0.0 ind	0.0 lb
Lake trout	0.0 ind	0.0 lb
Burbot	1.4 ind	3.4 lb
Dolly Varden	0.0 ind	0.0 lb
Arctic grayling	0.0 ind	0.0 lb
Pacific halibut	0.0 lb	0.0 lb
Northern pike	70.2 ind	316.0 lb
Whitefish	551.9 ind	1,328.4 lb
Salmon		
Unknown chum salmon	0.0 ind	0.0 lb
Pink salmon	0.0 ind	0.0 lb
Sockeye salmon	0.0 ind	0.0 lb
Unknown salmon	0.0 ind	0.0 lb
Summer chum salmon	71.7 ind	364.7 lb
Coho salmon	37.9 ind	200.5 lb
Chinook salmon	4.2 ind	39.8 lb
Fall chum salmon	1,904.2 ind	9,680.4 lb
Total	**2,641.5 ind**	**11,933.1 lb**
Whitefish		
Round whitefish	0.0 ind	0.0 lb
Least cisco	0.0 ind	0.0 lb
Unknown whitefish	0.0 ind	0.0 lb
Bering cisco	105.3 ind	147.4 lb
Sheefish	7.0 ind	42.1 lb
Broad whitefish	112.3 ind	157.3 lb
Humpback whitefish	327.2 ind	981.6 lb
Subtotal	**551.9 ind**	**1,328.4 lb**
Other fish		
Pacific herring	0.0 gal	0.0 lb
Rainbow smelt	0.0 gal	0.0 lb
Pacific tomcod	0.0 ind	0.0 lb
Saffron cod	0.0 ind	0.0 lb
Arctic lamprey	0.0 ind	0.0 lb
Stickleback (needlefish)	0.0 gal	0.0 lb
Alaska blackfish	0.0 lb	0.0 lb
Unknown char	0.0 ind	0.0 lb
Longnose sucker	0.0 ind	0.0 lb
Subtotal	**0.0 ind**	**0.0 lb**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D7-3.–Estimated large land mammal and gray wolf harvest by month and sex, Ruby, 2010.

	Resource								
	Black bear	Brown bear	Caribou			Moose			Wolf
Harvest month	Unknown	Unknown	Male	Female	Unknown	Male	Female	Unknown	Unknown
January	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	1.4
February	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
March	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
April	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
June	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
August	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0
September	2.8	0.0	0.0	0.0	0.0	21.1	0.0	0.0	0.0
October	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
November	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
December	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Harvest	**4.2**	**0.0**	**2.8**	**0.0**	**0.0**	**26.7**	**0.0**	**0.0**	**1.4**

Source ADF&G Division of Subsistence household survey, 2011.

Table D7-4.–Estimated small land mammal harvest by month, Ruby, 2010.

	Estimated harvest by month													
Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
Beaver	1.4	26.7	29.5	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	**63.2**
Red fox	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.8**
Snowshoe hare	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	14.0	5.6	0.0	**22.5**
Alaska hare (jackrabbit)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0	**5.6**
River (land) otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Lynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	**2.8**
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	4.2	192.4	70.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	257.0	290.7	0.0	**814.5**
Mink	0.0	25.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	4.2	0.0	**30.9**
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Porcupine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	4.2	0.0	0.0	0.0	0.0	**7.0**
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Red (tree) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	**4.2**
Weasel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	**5.6**
Gray wolf	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**
Wolverine	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	**5.6**
Total Harvest	**7.0**	**247.1**	**103.9**	**2.8**	**0.0**	**0.0**	**0.0**	**2.8**	**4.2**	**8.4**	**272.4**	**317.4**	**0.0**	**966.1**

Source ADF&G Division of Subsistence household survey, 2011.

Table D7-5.–Estimated bird harvest by season, Ruby, 2010.

	Estimated harvest by season					
Resource	Winter	Summer	Spring	Fall	Season unknown	**Total**
Bufflehead	0.0	0.0	0.0	0.0	0.0	**0.0**
Canvasback	0.0	0.0	0.0	0.0	0.0	**0.0**
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 sp.	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	0.0	0.0	40.7	22.5	0.0	**63.2**
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	0.0	22.5	12.6	0.0	**35.1**
Scaup sp.	0.0	0.0	0.0	0.0	0.0	**0.0**
Black scoter	0.0	0.0	0.0	0.0	0.0	**0.0**
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	0.0	0.0	0.0	0.0	**0.0**
Green-winged teal	0.0	0.0	2.8	4.2	0.0	**7.0**
Unknown wigeon	0.0	0.0	12.6	2.8	0.0	**15.4**
Unknown duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Brant	0.0	0.0	0.0	0.0	0.0	**0.0**
Cackling goose	0.0	0.0	11.2	0.0	0.0	**11.2**
Lesser Canada goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown Canada goose	0.0	2.8	14.0	0.0	0.0	**16.9**
Emperor goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Snow goose	0.0	0.0	2.8	0.0	0.0	**2.8**
Greater white-fronted goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Unknown goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	0.0	0.0	1.4	0.0	0.0	**1.4**
Sandhill crane	0.0	0.0	4.2	0.0	0.0	**4.2**
Whimbrel	0.0	0.0	0.0	0.0	0.0	**0.0**
Spruce grouse	25.3	28.1	56.2	174.1	0.0	**283.7**
Ruffed grouse	16.9	0.0	0.0	42.1	0.0	**59.0**
Ptarmigan sp.	35.1	0.0	0.0	36.5	0.0	**71.6**
Total Harvest	**77.2**	**30.9**	**168.5**	**294.9**	**0.0**	**571.5**

Source ADF&G Division of Subsistence household surveys, 2011.

Table D7-6.–Reasons use of resources was less than in recent years, Ruby, 2010

	Reasons for less use compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Land mammals		Marine mammals		Birds and eggs		Berries and greens		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Family or personal	1	7.1	2	18.2	0	0.0	1	7.1	0	0.0	2	13.3	2	20.0	3	16.7
Resource availabilty	5	35.7	1	9.1	0	0.0	4	28.6	0	0.0	4	26.7	1	10.0	3	16.7
Resources too far	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
No equipment/equipment problems	1	7.1	1	9.1	0	0.0	0	0.0	0	0.0	1	6.7	0	0.0	1	5.6
Did not receive	1	7.1	1	9.1	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	2	11.1
Did not try/low effort	1	7.1	1	9.1	0	0.0	0	0.0	0	0.0	5	33.3	0	0.0	1	5.6
Unsuccessful (unlucky)	1	7.1	1	9.1	0	0.0	6	42.9	0	0.0	0	0.0	0	0.0	4	22.2
Weather/environment	4	28.6	1	9.1	0	0.0	0	0.0	0	0.0	0	0.0	2	20.0	1	5.6
Other	0	0.0	1	9.1	0	0.0	0	0.0	0	0.0	1	6.7	0	0.0	0	0.0
Working/not enough time	0	0.0	1	9.1	0	0.0	1	7.1	0	0.0	0	0.0	3	30.0	0	0.0
Regulations	2	14.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	5.6
Resources too small/diseased	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Did not get enough	0	0.0	2	18.2	0	0.0	5	35.7	0	0.0	2	13.3	2	20.0	5	27.8
Did not need	1	7.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	5.6
Did not give any away	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Too expensive (fuel)	0	0.0	1	9.1	0	0.0	0	0.0	0	0.0	1	6.7	1	10.0	0	0.0
Use other resources	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	5.6

Source ADF&G Division of Subsistence household surveys, 2011.

Table D7-7.–Reasons use of resources was more than in recent years, Ruby, 2010.

	Reasons for more use compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Land mammals		Marine mammals		Birds and eggs		Berries and greens		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Increased availability	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	28.6	0	0.0
Used other resources	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Good weather	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	14.3	0	0.0
Received more	1	14.3	1	20.0	1	33.3	1	20.0	0	0.0	0	0.0	0	0.0	1	20.0
Needed more	2	28.6	1	20.0	0	0.0	0	0.0	0	0.0	0	0.0	2	28.6	2	40.0
Increased effort	0	0.0	1	20.0	0	0.0	0	0.0	0	0.0	1	100.0	1	14.3	0	0.0
Got more help	0	0.0	0	0.0	0	0.0	1	20.0	0	0.0	0	0.0	1	14.3	0	0.0
Other	3	42.9	0	0.0	2	66.7	2	40.0	0	0.0	0	0.0	0	0.0	1	20.0
Regulations	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Traveled farther	1	14.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Increased success	0	0.0	2	40.0	0	0.0	1	20.0	0	0.0	0	0.0	1	14.3	1	20.0
Needed less	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Store-bought too expensive	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D7-8.–Households reporting why they did not get enough of a resource, Ruby, 2010.

		Reasons															
Resource by category	Households reporting wanting more	No reason given	Personal/ family	Did not have enough help	Resource availability	Resources too far	No equipment/ equipment problems	Did not receive	Did not try/ low effort	Unsuccessful (unlucky)	Weather/ environment	Other	Working/ not enough time	Regulations	Resources too small/ diseased	Gas prices too high	Did not get enough
Resource not specified	3	0	1	1	1	1	0	0	1	0	0	0	0	0	0	1	0
Fish	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Salmon	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chum salmon	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Fall chum salmon	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Coho salmon	4	0	0	1	1	1	0	0	0	0	0	2	0	0	0	0	0
Chinook salmon	22	0	1	2	2	5	0	0	6	2	3	5	0	2	2	1	0
Nonsalmon fish	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Burbot	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Arctic grayling	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Pike	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern pike	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Sheefish	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Whitefish	5	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0
Broad whitefish	2	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0
Mammals																	
Black bear	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Moose	16	0	0	0	0	5	0	0	2	0	8	1	2	1	1	0	1
Beaver	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown seal oil	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Birds and eggs																	
Mallard	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geese	3	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Canada goose	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Greater white-fronted goose	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
Ptarmigan	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Duck eggs	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Goose eggs	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Gull eggs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

-continued-

Table D7-8. Page 2 of 2.

Resource by category	Households reporting wanting more	Reasons															
		No reason given	Personal/ family	Did not have enough help	Resource availability	Resources too far	No equipment/ equipment problems	Did not receive	Did not try/ low effort	Unsuccessful (unlucky)	Weather/ environment	Other	Working/ not enough time	Regulations	Resources too small/ diseased	Gas prices too high	Did not get enough
Marine invertebrates																	
Crabs	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
King crab	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Shrimp	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
Vegetation																	
Berries	4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Blueberry	7	0	0	0	0	0	0	0	0	2	0	2	0	3	3	0	0
Highbush cranberry	2	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0
Crowberry	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Raspberry	2	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0
Salmonberry	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source ADF&G Division of Subsistence household surveys, 2011.

Table D7-9.–Households reporting doing things differently because they did not get enough of a resource, Ruby, 2010.

		Households not getting enough				Households doing something differently because they did not get enough			
		Valid responses		Did not get enough		Valid responses		Did something differently	
Resource	Sampled households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	47	42	89.4	23	54.8	22	95.7	15	68.2
Nonsalmon fish	47	39	83.0	11	28.2	10	90.9	6	60.0
Marine invertebrates	47	8	17.0	3	37.5	3	100.0	1	33.3
Land mammals	47	44	93.6	13	29.5	13	100.0	9	69.2
Marine mammals	47	3	6.4	1	33.3	1	100.0	0	0.0
Birds and eggs	47	25	53.2	8	32.0	8	100.0	3	37.5
Berries and greens	47	42	89.4	11	26.2	11	100.0	6	54.5
All resources	47	46	97.9	17	37.0	16	94.1	13	81.3

Source ADF&G Division of Subsistence household surveys, 2011.

Table D7-10.–Things households reported doing differently because they did not get enough of a resource, Ruby, 2010.

		Bought/bartered		Used more commercial foods		Replaced with other subsistence foods		Asked others for help		Made do without		Increased effort to harvest		Obtained food from other sources		Got public assistance	
Resource	Valid responses	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	15	4	26.7	9	60.0	2	13.3	0	0.0	2	13.3	1	6.7	0	0.0	0	0.0
Nonsalmon fish	5	1	20.0	3	60.0	0	0.0	0	0.0	1	20.0	0	0.0	0	0.0	0	0.0
Marine invertebrates	1	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Land mammals	10	0	0.0	9	90.0	1	10.0	1	10.0	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	0	0.0	0	0.0
Birds and eggs	3	0	0.0	3	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Berries and greens	6	1	16.7	4	66.7	1	16.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
All resources	13	1	7.7	11	84.6	0	0.0	1	7.7	0	0.0	0	0.0	0	0.0	1	7.7

Source ADF&G Division of Subsistence household surveys, 2011.

Table D7-11.–Reported impact to households responding that they did not get enough of a resource, Ruby, 2010.

		Households not getting enough ____ .				Impact to those not getting enough _____ .									
	Sampled	Valid responses		Did not get enough		No response		Not noticable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	47	42	89.4	23	54.8	2	8.7	1	4.3	10	43.5	6	26.1	4	17.4
Nonsalmon fish	47	39	83.0	11	28.2	1	9.1	1	9.1	6	54.5	2	18.2	1	9.1
Marine invertebrates	47	6	12.8	3	50.0	0	0.0	2	66.7	1	33.3	0	0.0	0	0.0
Land mammals	47	45	95.7	13	28.9	0	0.0	1	7.7	6	46.2	4	30.8	2	15.4
Marine mammals	47	2	4.3	1	50.0	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0
Birds and eggs	47	29	61.7	8	27.6	1	12.5	3	37.5	3	37.5	1	12.5	0	0.0
Plants and berries	47	43	91.5	11	25.6	0	0.0	1	9.1	8	72.7	2	18.2	0	0.0
All resources	47	46	97.9	17	37.0	1	5.9	0	0.0	9	52.9	6	35.3	1	5.9

Source ADF&G Division of Subsistence household surveys, 2011.

Table D7-12.–Reported job schedules, Ruby, 2010.

	Jobs		Employed adults		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	54.5	39.2%	47.3	50.0%	34.4	63.2%
Part-time	28.7	20.6%	27.2	28.8%	18.7	34.2%
Shift	14.3	10.3%	14.3	15.2%	12.9	23.7%
On-call (occasional)	40.1	28.9%	27.2	28.8%	18.7	34.2%
Part-time shift	1.4	1.0%	1.4	1.5%	1.4	2.6%
Schedule not reported	0.0	0.0%	0.0	0.0%	0.0	0.0%

Source ADF&G Division of Subsistence household surveys, 2011.