Special Publication No. BOG 2015-01

A Summary of Dall Sheep Harvests in 14 Game Management Units in Alaska

by

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and

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January 2015

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

Symbols and Abbreviations

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Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

all atomic symbols

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

General

Alaska Administrative Code	AAC
all commonly-accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly-accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	ã
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	â
trademark	ä
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, c^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	³
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)	a
probability of a type II error (acceptance of the null hypothesis when false)	b
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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This document should be cited as:
Koster, D. and D. Holen. 2015. A Summary of Dall Sheep Harvests in 14 Game Management Units in Alaska. Alaska Department of Fish and Game Division of Subsistence, Special Publication No. BOG 2015-01, Anchorage.

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ABSTRACT

This report provides a summary of Dall sheep harvests in game management units where Dall sheep hunts occur. This includes game management units 7, 9, 11–16, 19–20, and 23–26. During the 2014–2015 regulatory cycle the Alaska Board of Game (board) will consider a suite of proposals addressing hunting for Dall sheep. This report has been prepared to inform the board regarding subsistence harvests and uses of Dall sheep in Alaska. The data included in these tables originate from the Division of Wildlife Conservation's Winfonet database, and the Division of Subsistence's Community Subsistence Information System.

Key words: Dall sheep, subsistence

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1. INTRODUCTION

The purpose of this report is to provide a brief overview of Dall sheep harvests across the state. Included in this report are harvest assessments for each of the game management units (GMU) where the harvest of Dall sheep has been reported. This includes GMUs 7, 9, 11–16, 19–20, and 23–26.

During the 2014–2015 regulatory cycle the Alaska Board of Game (board) will consider a suite of proposals addressing hunting for Dall sheep in all statewide game management units (GMUs) where they occur. This report has been prepared to inform the board regarding subsistence harvests and uses of Dall sheep in Alaska. The board has made positive customary and traditional use findings (C&T) and established amounts reasonably necessary for subsistence (ANS) for Dall sheep in GMUs 11, 19, 23, 24, 25A, and 26 (Table 1). Table 1 provides an overview of C&T findings that have been adopted by the board in areas where Dall sheep are generally present and indicates whether a positive or negative determination has been made. C&T findings are not valid in nonsubsistence areas, such as the Anchorage–Mat-Su–Kenai Peninsula Nonsubsistence Area and the Fairbanks Nonsubsistence Area (Figure 1).

Table 1.–Status of customary and traditional use findings, and amounts reasonably necessary for subsistence, for all GMUs.

GMU	Dall sheep C&T Findings	Finding	ANS
1	No finding		
2	No finding		
3	No finding		
4	No finding		
5	No finding		
6	No finding		
7	No finding		
8	No finding		
9	No finding		
10	No finding		
11	Unit 11	Positive	60–75
12	Unit 12, That portion within the Tok Management area	Negative	
13	Unit 13B, That portion within the Delta Management Area	Negative	
	Unit 13C, That portion within the Tok Management Area and Delta Management Area	Negative	
	Unit 13D	Negative	
14	No finding		
15	No finding		
16	No finding		
17	No finding		
18	No finding		
19	Unit 19	Positive	1–5
20	Unit 20, those portions within the Tok Management Area and the Delta Management Area	Negative	
21	No finding		
22	No finding		
23-26	Units 23 and 26A, that portion west of the Etuvluk River (DeLong Mountains)	Positive	0-9
	Unit 23 (Baird Mountains)	Positive	18-47
	Unit 23 and 26A, that portion east of the Etuvluk River (Schwatka Mountains)	Positive	2-4
	Units 23, 24, 25A, and 26 (Brooks Range)	Positive	75-125
	Units 25B, and 25C (Brooks Range)	Negative	

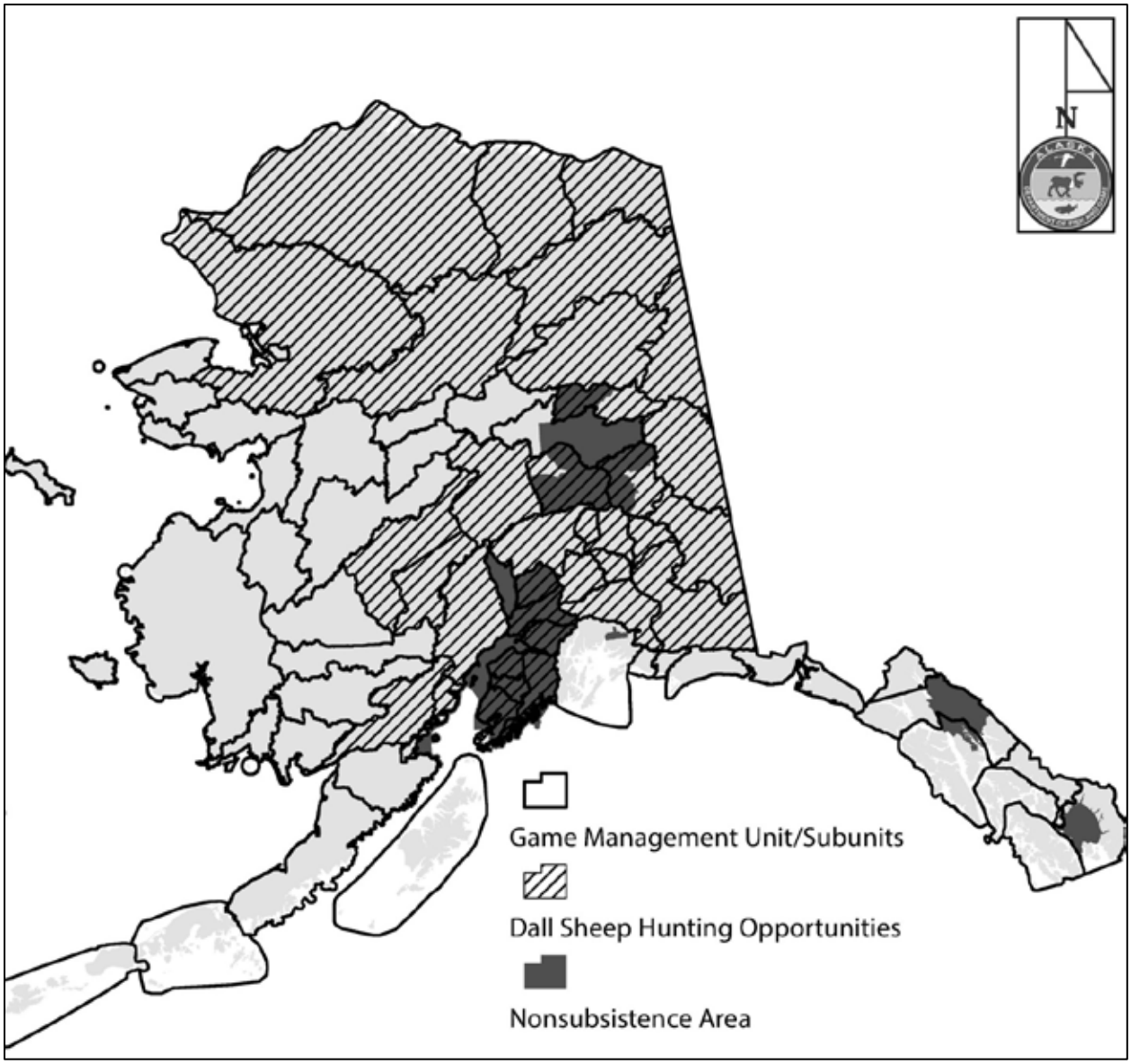

Figure 1.–Game Management Units with Dall sheep hunting opportunities.

2. METHODS

The data included in these tables originate from the Division of Wildlife Conservation's Winfonet database[1], and the Division of Subsistence's Community Subsistence Information System (CSIS)[2]. Harvest data from hunt reports have also been provided in other documents prepared for the board; this report will also provide harvest data from household surveys. The data from Winfonet show the reported number of sheep harvested by year by Alaska residents living in communities in and around each GMU, depending upon typical or expected use areas.

The method for collecting wild harvest and use information as reported in the CSIS is a systematic household survey. The surveys used to collect the data shown in the CSIS column of each table were collected either through comprehensive harvest surveys where all resources are recorded or through a directed survey where only a resource category is recorded—in this case this would be a big game survey. Household surveys are administered face to face, either in a respondent's home or at a local public area. Surveys enumerate the total number of animals that residents harvest in one calendar year (January 1–December 31). This is the year listed in each column. The researchers document the harvest of wild resources being collected by the survey respondents within the State of Alaska, regardless of where they occur. Therefore, harvests of Dall sheep by residents may not be local but could occur anywhere in the State of Alaska. Figure 1 shows the GMUs in Alaska with Dall sheep hunting opportunities. Dall sheep may be present in only a portion of the many GMUs where regulations provide an opportunity throughout the entire GMU for Alaska residents.

In addition to collecting harvest data, the survey instrument collects demographic data; harvest effort, even if a harvest is not made; use; sharing of resources, and, typically, economic data. In addition, mapping has been a standard component of harvest surveys since 2004 and was used in some directed surveys prior to that time. These data are stored in an archive at the Department. Additional information about methods and additional data can be found in the references section of this report, which is broken down by GMU.

Included below are 14 tables that show harvest of Dall sheep in GMUs where Dall sheep hunting opportunities occur. The Winfonet data portion of each table was constructed by identifying records where a harvest was indicated. Summary rows for all Alaska residents include all records for a GMU where the residence address included Alaska and also indicated the hunter was a resident. Nonresident subtotals include all hunters who are not Alaska residents. The 10-year harvest average is for 2004–2013, with 2013 representing the most recent year for which data are available.

The CSIS portion of the table includes the estimated number of sheep harvested for each year where data were collected. A harvest amount of 0 indicates that a survey was taken for that year, but no harvest was reported. Blank cells indicate no survey has been conducted. The "best data" column of the table is based only on CSIS data and represents the most recently available harvest survey estimates. This convention assumes the most recent data are the most representative of community hunting patterns as derived from Division of Subsistence household surveys. An additional column has been provided to show the average of each community's CSIS data points. The total area community under the "average CSIS" column is a sum of averages for each community. This approach assumes each community with data points has a representative average harvest which is totaled to obtain an areawide total.

1. Winfonet is the ADF&G Division of Wildlife Conservation's intranet website. The site provides a wide variety of tools to allow users to access, update, and download different kinds of data, including Dall sheep harvest data.
2. ADF&G Division of Subsistence, Community Subsistence Information System (CSIS): http://www.adfg.alaska.gov/sb/CSIS

Table 2.–Harvests of Dall sheep in GMU 7 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]			
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1990	2000	Best data[4]	Average CSIS
Cooper Landing	0	0	0	0	0	0	1	0	0	0	0.1	2		2	*2.0*
Hope	0	0	0	1	0	0	0	0	0	0	0.1	1		1	*1.0*
Moose Pass	0	0	0	0	0	0	1	0	0	0	0.1		0	0	*0.0*
Seward	0	3	2	1	0	0	0	0	0	0	0.6		0	0	*0.0*
Sunrise	0	0	0	0	0	0	0	0	0	0	0.0				
Total for area communities	0	3	2	2	0	0	2	0	0	0	**0.9**	3	0	**3**	***3.0***
Total unit 7 all AK residents	6	6	4	8	5	3	2	3	2	5	**4.4**	*data unavailable*			
Total unit 7 non-residents[5]	0	0	0	0	1	2	0	1	1	1	**0.6**	*data unavailable*			

[1] Only includes GMU 7 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 7.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] Nonresident totals include all hunters who are not Alaska residents.

Table 3.–Harvests of Dall sheep in GMU 9 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]																	
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1973	1980	1981	1982	1983	1984	1987	1988	1989	1991	1992	2001	2003	2004	2005	2007	Best data[4]	Average CSIS
Chignik Bay	0	0	0	0	0	0	0	0	0	0	0.0						0			0	0			0					*0.0*
Chignik Lagoon	0	0	0	0	0	0	0	0	0	0	0.0						0			0				0					*0.0*
Chignik Lake	0	0	0	0	0	0	0	0	0	0	0.0						0			0	0			0					*0.0*
Cold Bay	0	0	0	0	0	0	0	0	0	0	0.0																		
Egegik	0	0	0	0	0	0	0	0	0	0	0.0						0												*0.0*
Igiugig	0	0	0	0	0	0	0	0	0	0	0.0					0						0	0			0			*0.0*
Iliamna	0	0	0	0	0	0	0	0	0	0	0.0					0					0		0		0				*0.0*
Ivanof Bay	0	0	0	0	0	0	0	0	0	0	0.0						0												*0.0*
King Cove	0	0	0	0	0	0	0	0	0	0	0.0											0							*0.0*
King Salmon	0	0	0	0	0	0	0	0	0	0	0.0					0											0		*0.0*
Kokhanok	0	0	0	0	0	0	0	0	0	0	0.0					0						0	0			0			*0.0*
Levelock	0	0	0	0	0	0	0	0	0	0	0.0								0			0	0			0			*0.0*
Naknek	0	0	0	0	0	0	0	0	0	0	0.0					0											0		*0.0*
Nelson Lagoon	0	0	0	0	0	0	0	0	0	0	0.0							0											*0.0*
Newhalen	0	0	0	0	0	0	0	0	0	0	0.0					0					0		0		0				*0.0*
Nondalton	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0		0							0		0				*0.0*
Pedro Bay	0	0	0	0	0	0	0	0	0	0	0.0				0								0		0				*0.0*
Perryville	0	0	0	0	0	0	0	0	0	0	0.0						0			0				0					*0.0*
Pilot Point	0	0	0	0	0	0	0	0	0	0	0.0							0											*0.0*
Port Alsworth	1	1	1	0	1	3	0	0	0	0	0.7					2							0		6			6	*2.7*
Port Heiden	0	0	0	0	0	0	0	0	0	0	0.0							0											*0.0*
Sand Point	0	0	0	0	0	0	0	0	0	0	0.0											0							*0.0*
South Naknek	0	0	0	0	0	0	0	0	0	0	0.0				0	0											0		*0.0*
Ugashik	0	0	0	0	0	0	0	0	0	0	0.0							0										0	*0.0*
Total for area communities	1	1	1	0	1	3	0	0	0	0	**0.7**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**6**	***2.7***
Total unit 9 all AK residents	2	1	1	0	1	3	1	1	1	0	**1.1**								*data unavailable*										
Total unit 9 non-residents[5]	0	0	0	0	0	0	0	0	0	0	**0.0**								*data unavailable*										

[1] Only includes GMU 9 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 9.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] Nonresident totals include all hunters who are not Alaska residents.

Table 4.–Harvests of Dall sheep in GMU 11 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]									
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1982	1987	2004	2009	2010	2011	2012	2013	Best data[4]	Average CSIS
Chistochina[6]	0	1	0	0	0	0	0	0	0	0	0.1	0	0		0					0	*0.0*
Chisana[5]	0	0	0	0	0	0	0	0	0	0	0.0	0	0								*0.0*
Chitina[6]	2	0	1	1	1	1	0	1	1	1	0.9	0	0					0		0	*0.0*
Copper Center[6]	8	3	4	6	4	4	5	5	2	3	4.4	0	5					1.9		1.9	*2.3*
Gakona[6]	3	2	5	2	1	0	1	2	1	0	1.7	1	11					1.8		1.8	*4.6*
Glennallen[6]	8	3	11	0	4	2	7	9	2	2	4.8	0	5						0	0	*1.7*
Gulkana[6]	0	0	0	0	0	0	0	1	0	0	0.1	1	0						1.1	1.1	*0.7*
Kenny Lake[6]	0	0	0	0	2	3	1	1	0	2	0.9	0	0					0		0	*0.0*
McCarthy[6]	0	1	1	2	3	4	1	1	1	0	1.4	0	1					1.4		1.4	*0.8*
Mentasta[5,6]	0	0	0	1	0	0	0	0	1	0	0.2	6	2						1.3	1.3	*3.1*
Nabesna / Nabesna Road[5]	0	0	0	0	0	0	0	0	0	0	0.0	6	4							4	*5.0*
Silver Springs[6]	0	0	0	1	0	0	0	0	0	0	0.1	0	0					0		0	*0.0*
Slana[6]	0	2	2	0	0	0	0	0	0	0	0.4	11	10			0				0	*7.0*
South Wrangell Mountains	0	0	0	0	0	0	0	0	0	0	0.0	2	0							0	*1.0*
Tazlina[6]	3	1	0	1	0	1	2	2	0	2	1.2	0	2						3	3	*1.7*
Tok[5]	14	16	9	10	13	11	5	6	10	11	10.5	0	12	12			19			19	*10.8*
Tolsona[6]	0	0	0	0	0	0	0	0	1	0	0.1	0	2						0	0	*0.7*
Tonsina[6]	0	0	0	0	0	0	0	0	0	0	0.0	7	11						9	9	*9.0*
Total for area communities	38	29	33	24	28	26	22	28	19	21	**26.8**	34	65	12		0	19	5.1	14.4	**42.5**	***48.3***
Total unit 11 all AK residents	81	66	50	43	53	50	39	38	27	28	**47.5**				*data unavailable*						
Total unit 11 non-residents[7]	18	17	13	10	5	14	10	10	7	17	**12.1**				*data unavailable*						

[1] Only includes GMU 11 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 11.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] Community also summarized in GMU 12 comparison.

[6] Community also summarized in GMU 13 comparison.

[7] Nonresident totals include all hunters who are not Alaska residents.

Table 5.–Harvests of Dall sheep in GMU 12 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]						
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1982	1987	2004	2010	2011	Best data[4]	Average CSIS
Alcan	0	0	0	0	0	0	0	0	0	0	0.0							
Chisana[5]	0	0	0	0	0	0	0	0	0	0	0.0	1	0				0	*0.5*
Mentasta[5,6]	0	0	0	0	0	0	0	0	0	0	0.0	6	2		1.3		1.3	*3.1*
Nabesna / Nabesna Road[5]	0	1	0	0	0	0	0	0	0	0	0.1	6	4				4	*5.0*
Northway	1	0	1	0	0	0	0	0	0	0	0.2		2	4			4	*3.0*
Tanacross	0	0	0	0	0	0	0	0	0	0	0.0		0	0			0	*0.0*
Tetlin	0	0	0	0	0	0	0	0	0	0	0.0		0	1			1	*0.5*
Tok[5]	1	2	4	1	2	3	3	0	1	3	2.0		12	12		19	19	*14.3*
Total for area communities	2	3	5	1	2	3	3	0	1	3	**2.3**	13	20	17	1.3	19	**29.3**	***26.4***
Total unit 12 all AK residents	101	80	81	83	82	73	53	53	52	66	**72.4**			*data unavailable*				
Total unit 12 non-residents[7]	69	82	79	69	58	50	36	36	27	20	**52.6**			*data unavailable*				

[1] Only includes GMU 12 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 12.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] Community also summarized in GMU 11 comparison.

[6] Community also summarized in GMU 13 comparison.

[7] Nonresident totals include all hunters who are not Alaska residents.

Note Sheep harvests for Tok in 2011 are likely from outside GMU 12.

Table 6.–Harvests of Dall sheep in GMU 13 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]										
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1982	1986	1987	1999	2009	2010	2011	2012	2013	Best data[4]	Average CSIS
Cantwell	0	0	0	0	1	1	0	0	1	0	0.3	0			2				0		0	*0.7*
Chase	0	0	0	0	0	0	0	0	0	0	0.0		2						0		0	*1.0*
Chistochina[5]	0	0	0	0	0	0	0	0	0	0	0.0	0		0		0					0	*0.0*
Chitina[5]	0	0	0	0	0	0	0	0	0	0	0.0	0		0					0		0	*0.0*
Copper Center[5]	0	0	0	0	0	0	0	0	1	0	0.1	0		15			1.9				1.9	*5.6*
Copperville	0	0	0	0	0	0	0	0	0	0	0.0											
East Glenn Hwy	0	0	0	0	0	0	0	0	0	0	0.0	0		2							2	*1.0*
Gakona[5]	1	0	0	0	0	0	0	1	0	0	0.2	1		11					1.8		1.8	*4.6*
Glacier View	0	0	0	1	0	0	0	0	0	0	0.1	0									0	*0.0*
Glennallen[5]	0	0	1	0	0	0	0	0	0	0	0.1	0		5						0	0	*1.7*
Gold Creek	0	0	0	0	0	0	0	0	0	0	0.0		0								0	*0.0*
Gulkana[5]	0	0	0	0	0	0	0	0	0	0	0.0	1		0						1.1	1.1	*0.7*
Hurricane-Broad Pass	0	0	0	0	0	0	0	0	0	0	0.0		0								0	*0.0*
Kenny Lake[5]	0	0	0	0	0	0	0	0	0	0	0.0	0		0					0		0	*0.0*
Lake Louise	0	0	0	0	0	0	0	0	0	0	0.0	0		0						0	0	*0.0*
Lower Tonsina	0	0	0	0	0	0	0	0	0	0	0.0	0									0	*0.0*
Mendeltna	2	0	0	0	0	0	0	0	0	0	0.2									0	0	*0.0*
Mentasta[5,6]	0	0	0	0	0	0	0	0	0	0	0.0	6		2						1.3	1.3	*3.1*
Nelchina[5,6]	0	0	0	0	0	0	0	0	0	0	0.0									0	0	*0.0*
Paxson	0	1	0	0	0	0	0	0	0	0	0.1			5						0	0	*2.5*
Sheep Mountain	0	0	0	0	0	0	0	0	0	0	0.0	0									0	*0.0*
Silver Springs	0	0	0	0	0	0	0	0	0	0	0.0											
Slana	0	0	0	0	0	0	0	0	0	0	0.0	11		2						0	0	*4.3*
Sourdough	0	0	0	0	0	0	0	0	0	0	0.0			0							0	*0.0*
Tazlina[5]	0	0	0	0	0	0	0	0	0	0	0.0			2						3	3	*2.5*
Tolsona[5]	0	0	0	0	0	0	0	0	0	0	0.0									0	0	*0.0*
Tonsina[5]	0	0	0	0	0	0	0	0	0	0	0.0	0		11						0	0	*3.7*
West Glenn Hwy	0	0	0	0	0	0	0	0	0	0	0.0			3							3	*3.0*
Willow Creek	0	0	0	0	0	0	0	0	0	0	0.0											

-continued-

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	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]										
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1982	1986	1987	1999	2009	2010	2011	2012	2013	Best data[4]	Average CSIS
Total for area communities	3	1	1	1	1	1	0	1	2	0	**1.1**	19		58	2		1.9	0	1.8	5.4	**14.1**	***34.4***
Total unit 13 all AK residents	66	47	38	46	27	34	26	34	38	31	**38.7**					*data unavailable*						
Total unit 13 non-residents[7]	67	53	36	42	23	29	24	28	21	26	**34.9**					*data unavailable*						

[1] Only includes GMU 13 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 13.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] Community also summarized in GMU 11 comparison.

[6] Community also summarized in GMU 12 comparison.

[7] Nonresident totals include all hunters who are not Alaska residents.

Table 7.–Harvests of Dall sheep in GMU 14 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]				
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1982	1985	2012	Best data[4]	Average CSIS
Anchorage	26	23	13	22	9	12	3	15	4	12	13.9					
Big Lake	1	0	1	0	0	0	0	0	0	0	0.2					
Chickaloon	1	1	0	0	0	0	0	0	0	0	0.2	0			0	*0.0*
Eagle River	12	10	7	5	3	2	1		2	1	4.8					
Elmendorf AFB	1	0	0	0	1	0	0	0	0	0	0.2					
Fort Richardson	2	0	1	0	0	0	0	0	0	0	0.3					
Girdwood	1	2	1	0	1	0	1	0	0	0	0.6					
Meadow Lakes	0	0	0	1	0	0	0	0	0	0	0.1					
Palmer	8	9	4	8	7	4	1	3	4	9	5.7					
Susitna / Alexander Creek[5]	0	0	0	0	0	0	0	0	0	0	0.0			0	0	*0.0*
Sutton	0	1	0	1	0	0	0	0	0	0	0.2					
Talkeetna[5]	1	2	0	0	2	0	0	0	0	0	0.5	0		0	0	*0.0*
Trapper Creek[5]	0	1	0	1	0	0	0	0	0	0	0.2					
Wasilla	13	11	8	9	3	2	8	4	2	5	6.5					
Willow	1	0	0	0	1	0	0	0	0	0	0.2					
Total for area communities	67	60	35	47	27	20	14	22	12	27	33.1	0		0	**0**	***0.0***
Total unit 14 all AK residents	77	74	44	57	33	22	16	25	19	34	**40.1**		*data unavailable*			
Total unit 14 non-residents[6]	42	42	42	57	17	19	13	21	13	16 11	**28.2**		*data unavailable*			

[1] Only includes GMU 14 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 14.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] Community also summarized in GMU 16 comparison.

[6] Nonresident totals include all hunters who are not Alaska residents.

Table 8.–Harvests of Dall sheep in GMU 15 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]											
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1982	1987	1989	1990	1991	1992	1993	1997	1998	2003	Best data[4]	Average CSIS
Anchor Point	0	1	0	0	0	0	0	0	0	0	0.1												
Clam Gulch	0	0	0	1	1	0	0	0	0	0	0.2												
Fritz Creek	0	0	0	0	0	0	0	0	0	0	0.0									0		0	*0.0*
Homer	4	3	0	0	1	1	1	1	0	0	1.1	0										0	*0.0*
Kasilof	2	1	2	1	0	1	1	0	1	0	0.9												
Kenai	3	2	1	2	0	0	0	0	1	1	1.0	0				21	0	0				0	*5.3*
Nanwalek	0	0	0	0	0	0	0	0	0	0	0.0		0	0	0	0	0	0	0		0	0	*0.0*
Nikiski	1	0	1	1	1	1	0	0	0	1	0.6												
Nikolaevsk	0	0	0	0	0	0	0	0	0	0	0.0									0		0	*0.0*
Ninilchik	2	0	0	0	0	1	3	3	2	2	1.3	0								8		8	*4.0*
North Fork Road	0	0	0	0	0	0	0	0	0	0	0.0									0		0	*0.0*
Port Graham	0	0	0	0	0	0	0	0	0	0	0.0		0	0	0	0	0	0	0		0	0	*0.0*
Seldovia	0	0	0	0	0	0	0	0	0	0	0.0	0				0	0	0				0	*0.0*
Soldotna	3	1	5	3	0	1	2	4	1	1	2.1												
Sterling	0	0	1	2	2	0	1	1	0	0	0.7												
Voznesenka	0	0	0	0	0	0	0	0	0	0	0.0									0		0	*0.0*
Total for area communities	15	8	10	10	5	5	8	9	5	5	**8.0**	0	0	0	0	21	0	0	0	8	0	**8**	***9.3***
Total unit 15 all AK residents	16	10	10	10	4	3	7	8	6	2	**7.6**					*data unavailable*							
Total unit 15 non-residents[5]	0	2	0	4	0	0	1	1	1	0	**0.9**					*data unavailable*							

[1] Only includes GMU 15 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 15.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] Nonresident totals include all hunters who are not Alaska residents.

Table 9.–Harvests of Dall sheep in GMU 16 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]				
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1985	2006	2012	Best data[4]	Average CSIS
Beluga	0	0	0	0	0	0	0	0	0	0	0.0		0		0	*0.0*
Lake Creek	0	0	0	0	0	0	0	0	0	0	0.0					
Petersville Road	0	0	0	0	0	0	0	0	0	0	0.0	0			0	*0.0*
Skwentna	0	0	0	0	0	0	0	0	0	0	0.0			0	0	*0.0*
Susitna / Alexander Creek[5]	0	0	0	0	0	0	0	0	0	0	0.0			0	0	*0.0*
Talkeetna[5]	0	0	0	0	0	0	0	0	0	0	0.0	0		0	0	
Trapper Creek[5]	0	0	0	0	0	0	0	0	0	0	0.0	0		0	0	*0.0*
Tyonek	0	0	0	0	0	0	0	0	0	0	0.0		0		0	*0.0*
Total for area communities	0	0	0	0	0	0	0	0	0	0	**0.0**	0		0	**0**	***0.0***
Total unit 16 all AK residents	7	2	6	3	4	5	5	3	6	4	**4.5**		*data unavailable*			
Total unit 16 non-residents[6]	3	0	0	4	3	4	5	3	5	7	**3.4**		*data unavailable*			

[1] Only includes GMU 16 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 16.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] Community also summarized in GMU 14 comparison.

[6] Nonresident totals include all hunters who are not Alaska residents.

Table 10.–Harvests of Dall sheep in GMU 19 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]										
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1983	1984	2002	2003	2004	2005	2007	2009	2011	Best data[4]	Average CSIS
Aniak	0	0	0	0	0	0	0	0	0	0	0.0				0	0	0		0		0	*0.0*
Chuathbaluk	0	0	0	0	0	0	0	0	0	0	0.0	0			0	0	0		0		0	*0.0*
Crooked Creek	0	0	0	0	0	0	0	0	0	0	0.0				0	0	0		0		0	*0.0*
Georgetown	0	0	0	0	0	0	0	0	0	0	0.0											
Lime Village	0	0	0	0	0	0	0	0	0	0	0.0							0			0	*0.0*
McGrath	0	0	0	2	0	0	1	0	0	0	0.3		6							0	0	***3.0***
Napaimute	0	0	0	0	0	0	0	0	0	0	0.0											
Nikolai	0	0	0	1	0	2	0	0	0	0	0.3		3	0						0	0	***1.0***
Red Devil	0	0	0	0	0	0	0	0	0	0	0.0				0	0	0		0		0	*0.0*
Sleetmute	0	0	0	0	0	0	0	0	0	0	0.0	0			0	0	0		0		0	*0.0*
Stony River	0	0	0	0	0	0	0	0	0	0					0	0	0		0		0	
Takotna	0	0	0	0	0	0	0	0	0	0	0.0									0	0	*0.0*
Telida	0	0	0	0	0	0	0	0	0	0	0.0											
Upper Kalskag	0	0	0	0	0	0	0	0	0	0	0.0				0	0	0		0		0	*0.0*
Total for area communities	0	0	0	3	0	2	1	0	0	0	**0.6**	0	9	0	0	0	0	0	0	0	**0**	***4.0***
Total unit 19 all AK residents	24	26	20	21	17	25	19	12	26	27	**21.7**					*data unavailable*						
Total unit 19 non-residents[5]	45	46	47	45	59	42	49	70	59	54	**51.6**					*data unavailable*						

[1] Only includes GMU 19 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 19.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] Nonresident totals include all hunters who are not Alaska residents.

Table 11.– Harvests of Dall sheep in GMU 20 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]					
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1984	1987	2004	2012	Best data[4]	Average CSIS
Anderson	0	0	0	0	0	0	0	1	0	0	0.1		0			0	*0.0*
Clear	0	0	0	0	0	0	0	0	1	0	0.0						
Eilson AFB	1	0	1	1	0	0	0	0	0	1	0.4						
Ester	0	1	0	1	0	0	1	1	0	0	0.4						
Fairbanks	14	21	22	20	13	17	16	15	19	22	17.9						
Fox	0	0	0	0	0	0	0	0	0	0	0.0						
Livengood	0	0	0	0	0	0	0	0	0	0	0.0						
Manley Hot Springs	0	0	0	0	0	0	0	0	0	0	0.0			0	0	0	*0.0*
Minto	0	0	0	0	0	0	0	0	0	0	0.0	0		0	1.3	1.3	*0.4*
Moose Creek CDP	0	0	0	0	1	0	0	0	0	1	0.2						
Nenana	0	1	0	2	0	0	2	2	2	0	0.9			1		1	*1.0*
North Pole	8	6	6	8	11	8	8	8	5	4	7.2						
Salcha	0	0	0	0	1	0	1	1	0	0	0.0						
Two Rivers	1	2	0	1	1	2	1	2	1	3	1.4						
Usibelli Mine	0	0	0	0	0	0	0	0	0	0	0.0						
Total for area communities	24	31	29	33	27	27	29	30	28	31	**28.9**	0	0	1	1.3	**2.3**	***1.4***
Total unit 20 all AK residents	87	98	85	87	96	78	91	108	99	96	**92.5**		*data unavailable*				
Total unit 20 non-residents[5]	43	56	62	76	71	83	71	70	53	52	**63.7**		*data unavailable*				

[1] Only includes GMU 20 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 20.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] Nonresident totals include all hunters who are not Alaska residents.

Table 12.– Harvests of Dall sheep in GMU 23 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3,5]														
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1982	1983	1986	1991	1992	1994	2002	2003	2006	2007	2010	2011	2012	Best data[4]	Average CSIS
Ambler	0	0	0	0	0	0	0	0	0	0	0.0													2.9	2.9	*2.9*
Buckland	0	0	0	0	0	0	0	0	0	0	0.0								0						0	*0.0*
Cape Lisburne	1	0	0	0	0	0	0	0	0	0	0.0															
Deering	0	0	0	0	0	0	0	0	0	0	0.0						0								0	*0.0*
Kiana	0	1	0	0	0	1	0	0	0	0	0.2									0					0	*0.0*
Kivalina	0	0	0	0	0	0	0	0	0	0	0.0	2	0			0					2				2	*1.0*
Kobuk	0	0	0	0	0	0	0	0	0	0	0.0													0	0	*0.0*
Kotzebue	13	9	4	6	6	7	0	0	0	0	4.5			18	8										8	*13.0*
Noatak	2	4	2	2	3	2	1	0	0	0	1.6						0				5	7			7	*4.0*
Noorvik	1	0	1	1	0	1	0	0	0	0	0.4													0	0	*0.0*
Point Hope	0	0	0	0	2	0	0	0	0	0	0.2						27.7								27.7	*27.7*
Red Dog Mine	0	0	0	0	0	0	0	0	0	0	0.0															
Selawik	0	0	0	0	0	0	0	0	0	0	0.0												0		0	*0.0*
Shungnak	0	2	0	0	0	0	0	0	0	0	0.2							0						0	0	*0.0*
Total for area communities	17	16	7	9	11	11	1	0	0	0	**7.2**	2	0	18	8	0	27.7	0	0	0	7	7	0	2.9	**47.6**	***48.6***
Total unit 22 all AK residents	21	16	9	15	16	15	7	0	2	1	**10.2**															
Total unit 22 non-residents[6]	3	0	0	2	4	3	0	0	0	0	**1.2**															

[1] Only includes GMU 23 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 23.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] CSIS estimates include estimates developed by the North Slope Arctic Borough.

[6] Nonresident totals include all hunters who are not Alaska residents.

Table 13.– Harvests of Dall sheep in GMU 24 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3,5]													
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1982	1983	1984	1992	1994	1996	1998	1999	2000	2001	2002	2011	Best data[4]	Average CSIS
Allakaket/Alatna	0	0	0	0	0	0	0	0	0	0	0.0	6		2									4	4	*4.0*
Anaktuvuk Pass[6]	0	0	0	0	0	0	0	0	0	0	0.0				37	27	6.7	10	9.2	5	4.7	16	75	75	*21.2*
Bettles/Evansville	0	0	0	0	0	0	0	0	0	0	0.0	3		1									0	0	*1.3*
Coldfoot	0	1	1	1	0	0	0	0	0	0	0.3												0		
Hughes	0	0	0	0	0	0	0	0	0	0	0.0	0													*0.0*
Huslia	0	0	0	0	0	0	0	0	0	0	0.0		0												*0.0*
Wiseman	6	3	7	4	1	1	2	1	0	0	2.5												2	2	*2.0*
Total for area communities	6	4	8	5	1	1	2	1	0	0	**2.8**	9		3									81	**81**	***28.5***
Total unit 24 all AK residents	16	13	14	14	19	13	17	13	10	9	**13.8**						*data unavailable*								
Total unit 24 non-residents[7]	9	9	14	11	14	14	12	12	12	9	**11.6**						*data unavailable*								

[1] Only includes GMU 24 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 24.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] CSIS estimates include estimates developed by the North Slope Arctic Borough.

[6] Anaktuvuk Pass also summarized in the GMU 26 comparison. At least 22% of the estimated harvest for this community occurred outside of GMU 24.

[7] Nonresident totals include all hunters who are not Alaska residents.

Table 14.– Harvests of Dall sheep in GMU 25 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3]					
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1984	1985	1987	2011	Best data[4]	Average CSIS
Arctic Village	0	0	1	3	0	0	0	0	0	0	0.4						
Beaver	0	0	0	0	0	0	0	0	0	0	0.0		0		0	0	*0.0*
Birch Creek	0	0	0	0	0	0	0	0	0	0	0.0						
Canyon Village	0	0	0	0	0	0	0	0	0	0	0.0						
Central	0	0	0	0	0	0	0	0	0	0	0.0						
Chalkyitsik	0	0	0	0	0	0	0	0	0	0	0.0						
Circle	0	0	0	0	0	0	0	0	0	0	0.0						
Circle Hot Springs Station	0	0	0	0	0	0	0	0	0	0	0.0						
Fort Yukon	0	0	0	0	0	0	0	0	0	0	0.0			0		0	*0.0*
Stevens Village	0	0	0	0	0	0	0	0	0	0	0.0	0				0	*0.0*
Venetie	0	0	0	0	0	0	0	0	0	0	0.0						
Total for area communities	0	0	1	3	0	0	0	0	0	0	**0.4**	0		0	0	**0**	***0.0***
Total unit 25 all AK residents	22	36	51	53	60	54	63	55	47	37	**47.8**		*data unavailable*				
Total unit 25 non-residents[5]	36	40	42	45	38	39	31	47	26	33	**37.7**		*data unavailable*				

[1] Only includes GMU 25 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 25.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] Nonresident totals include all hunters who are not Alaska residents.

Table 15.– Harvests of Dall sheep in GMU 26 by place of residence based on Winfonet data and harvests of Dall sheep by local communities in Alaska based on household surveys.

	Harvests reported in Winfonet[1]											Estimated community harvests from the CSIS[2,3,5]																		
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	10-yr avg	1985	1986	1987	1988	1989	1992	1993	1994	1995	1996	1998	1999	2000	2001	2002	2011	2012	Best data[4]	Average CSIS
Anaktuvuk Pass[6]	1	0	1	0	1	0	0	1	0	0	0.4						37		27		6.7	10	9.2	5	4.7	16	75		75	*21.2*
Atqasuk	0	0	0	0	0	0	0	0	0	0	0.0																			
Barrow	0	0	0	0	0	1	1	1	1	0	0.4			12	12	9	2							3.6	1.7				9	*6.7*
Deadhorse	0	0	0	0	0	0	0	0	0	0	0.0																			
Kaktovik	1	0	0	0	0	0	0	0	0	0	0.0	47	17				44			30.3						18			18	*31.3*
Nuiqsut	0	0	0	0	0	0	0	0	0	0	0.0	0						0											0	*0.0*
Point Lay	0	0	0	0	0	0	0	0	0	0	0.0			0														0	0	*0.0*
Prudhoe Bay	0	0	0	0	0	0	1	0	0	0	0.1																			
Wainwright	0	0	0	0	0	0	0	0	0	0	0.0				0	0													0	
Total for area communities	2	0	1	0	1	1	2	2	1	0	**1.0**	47	17	12	12		83	0	27	30.3	6.7	10	9.2	8.6	6.4	34		0	**102**	***59.2***
Total unit 26 all AK residents	46	44	37	69	70	68	86	101	91	77	**68.9**									*data unavailable*										
Total unit 26 non-residents[7]	47	43	37	60	58	62	46	42	43	37	**47.5**									*data unavailable*										

[1] Only includes GMU 26 harvests reported in Winfonet.

[2] May include some Dall sheep from outside GMU 26.

[3] Empty cells indicate no data available because no survey was conducted.

[4] "Best data" is the most recent survey year, regardless of historical results.

[5] CSIS estimates include estimates developed by the North Slope Arctic Borough.

[6] Anaktuvuk Pass also summarized in the GMU 24 comparison. At least 22% of the estimated harvest for this community occurred outside of GMU 26.

[7] Nonresident totals include all hunters who are not Alaska residents.

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APPENDIX–CUSTOMARY AND TRADITIONAL USE WORKSHEETS

CUSTOMARY AND TRADITIONAL USE WORKSHEET - II(21)

DALL SHEEP – GAME MANAGEMENT UNIT 11 (WRANGELL MOUNTAINS)

Prepared by the Division of Subsistence
Alaska Department of Fish and Game

November 1992

Note: In March 1989, the Alaska Board of Game determined that there are customary and traditional uses of Dall sheep in Game Management Unit 11 (Wrangell Mountains). Most of GMU 11 lies within the Wrangell - St. Elias National Park and Preserve. At that meeting, the Board also adopted subsistence hunting regulations for this game population. The following information was originally presented to the Board in the form of a "Eight Criteria Worksheet" in March 1989. Very detailed information was available in part because of a research project jointly conducted by the Division of Subsistence, the National Park Service, and the University of Alaska which collected information on historic and contemporary uses of the Wrangell-St. Elias National Park and Preserve for a variety of purposes, including sheep hunting.

Criterion 1. A long term, consistent pattern of use, excluding interruption by circumstances beyond the user's control such as regulatory prohibitions.

There is extensive documentation of Dall sheep hunting in the Wrangell Mountains by members of Ahtna Athabaskan communities in the 19th and early 20th centuries. Sheep hunting was part of the Ahtna's patterned seasonal round and occurred in the late summer until the first snows (de Laguna and McClellan 1981; Reckord 1983a). McKennan (1981) noted that Upper Tanana people historically hunted sheep in the fall in the Wrangell Mountains. The Upper Tanana Athabaskan population now lives in Northway, Tok, and Tetlin.

Reckord (1983a, 1983b) notes that the establishment of trading posts and cash employment changed, but did not end, these sheep hunting patterns. For example, a Chitina respondent recalled several Ahtna men who worked part of each year on the Copper River and Northwestern railroad, and then quit in late August to ride the train up the Chitina River to good hunting grounds between Chitina and McCarthy (1983b:68). The 1930s still found small groups of Ahtna going to the mountains and fish lakes for winter trapping, fishing and hunting, including Tanada Lake. Even now villages have continued to use and to receive sheep meat, even when they have not been the harvesters themselves. Communities such as Chistochina, Nabesna Road, and Chisana have guides, whose guided hunters often leave much of the sheep meat with the guides, who distribute the meat among family and village residents.

It should be noted, however, that hunting regulations may have affected traditional uses of sheep in the Wrangell Mountains area. For example, in the 1970s, the sheep season in GMU 11 was August 10-September 20 with a limit of one ram with at least a 3/4 curl. Regarding Chitina, Reckord (1983a:89) noted that:

> In the past, Chitina residents depended heavily on sheep, but today they are hunted only rarely. The upper Kotsina is the most popular spot for sheep hunting. The mountains immediately to the west of Chitina are also hunted for sheep. The short mid-summer season probably contributes to the reluctance of people to hunt sheep because it is difficult to transport the meat back to Chitina before it spoils. The game laws that allow only one animal (with a large rack) to be taken also discourage the subsistence usage of sheep. Much effort would have to be invested in the hunt and the rewards would be too small to make sheep hunting a worthwhile subsistence endeavor. The game laws regarding sheep, more than any other species, discourage subsistence use of the species.

Use by Contemporary Residents of the Copper Basin and Upper Tanana area

Household harvest surveys and mapping research conducted by the Division of Subsistence in 1983, 1984, and 1988 documented sheep hunting activities in GMU 11 by residents of the following Copper Basin (GMU 11, 13ABCD, and portions of 12) and Upper Tanana (GMU 12) communities:

Chisana	Gulkana	Mentasta Pass	West Glenn Highway
Chistochina	Homestead North	Nabesna Road	
Chitina	Homestead South	Paxson	
Copper Center	Kenny Lake	Slana	Upper Tanana:
East Glenn Hwy	Lake Louise	South Wrangells	Tanacross
Gakona	McCarthy Rd	Tazlina	Tok
Glennallen	Mentasta	Tonsina	

Table 1 reports the population of each of these communities during Division of subsistence study years. In 1990, there was about 1,000 households in the Copper River basin area. **Figures 1 and 2** show the location of these communities. **Tables 2 and 3** report sheep harvest and use information for Copper Basin communities documented in the 1983 and 1988 division harvest surveys. An estimated 69 sheep were taken by households in these communities in 1987/88. It is possible that not all of this harvest occurred in GMU 11, but it is likely that most did occur in the Wrangell Mountains area since this is the principal sheep hunting area for most of these communities.

Table 4 provides an estimate of the number of households from the local area that hunt sheep in GMU 11. About 239 households in Copper Basin communities have hunted sheep in GMU 11, 20 percent of the total number of households in the area. Of these, 153 reported that they regularly use GMU 11 for hunting sheep (12.8 percent of all households). About eight percent of Copper Basin households (96 households) hunted sheep in GMU 11 in 1987/88 according to the survey results. In addition, an estimated 18 households in Tok and Tanacross have hunted sheep in GMU 11; 15 of these households hunted sheep there in 1987/88.

Figures 3, 4, 5, 6, 7, and 8 summarize results of Division research on the use of the Wrangell-St. Elias Park and Preserve by Copper Basin households for sheep hunting. **Figure 3** shows the percentage of households in each Copper Basin sampling area that have ever hunted sheep in the park-preserve in any one of the 13 units used for data collection. (It should be noted that these are not management units). For example, 100 percent of the six households now living in Chisana have hunted sheep in the park-preserve, 35.7 percent of the 28 Chistochina households have done so, 44.4 percent of the 18 Chitina households, and 19.5 percent of the 161 Copper Center households.

Figure 4 shows the percentage of households in each Copper Basin community that have hunted sheep in GMU 11 (portions of Wrangell-St. Elias NP and Preserve are in GMU 12). **Figure 5** shows the percentage of each sample that has hunted in the National Park portion of Wrangell-St Elias in GMU 11, and **Figure 6** shows the same for the preserve portions only.

Figure 7 combines all the Copper Basin communities and shows what percentage of the households (N = 1,196 households) have ever hunted sheep in the park-preserve, (24.1 percent), GMU 11 (20 percent), the park within GMU 11 (15.7 percent), and the preserve within GMU 11 (10.9 percent). **Figure 8** shows the same data expressed in number of households. We estimate that of the 1,196 Copper Basin households for which the results of our study have been applied, 288 households (representing about 900 people) have at least one member who has hunted sheep in Wrangell-St. Elias National Park and Preserve, 239 households have hunted sheep in GMU 11, 187 have hunted sheep in the park within GMU 11, and 130 households have hunted sheep within the preserve in GMU 11.

In addition, for Tok (a community of the Upper Tanana area):

9.5 percent (35 households) have used the park-preserve for hunting sheep.
4.5 percent (17 households) have used GMU 11.
4.1 percent (15 households) have used the park in GMU 11.
0.9 percent (3 households) have used the preserve in GMU 11.

Also, for Tanacross, another Upper Tanana community with traditional ties to the Wrangell Mountains area:

7.4 percent (3 households) have used the park-preserve for hunting sheep.
3.7 percent (1 household) have used GMU 11.
No households had used the park in GMU 11.
3.7 percent (1 household) had used the preserve in GMU 11.

The 1988 survey did not document any historic or contemporary use of sheep in the park-preserve or GMU 11 by the 1988 residents of Dot Lake, Tetlin, or Northway. See Marcotte (1991:143-155) for a discussion of historic and contemporary uses of the Wrangell-St. Elias National Park and Preserve area by residents of Upper Tanana communities.

The division also collected information on each community's use of each of the 13 subareas (**Figure 9** provides a map of these areas), as well as data on the percentage of Copper Basin and Upper Tanana households that have used each subarea. Also, there is use data by community and area specific to the 1987-88 study year.

Criterion 2. A use pattern recurring in specific seasons of each year.

Historic Uses

Reckord (1983b:26) notes that traditionally, by mid-August the various runs of Copper River salmon had ended, and the Ahtna people prepared for the hunting season by moving to the upland hunting grounds where game was abundant. The hunting of caribou, sheep, goats and moose continued through the first snows. Annually in early fall, the Batzulnetas people traveled overland 20 miles and 3 days to Tanada Lake, where they hunted sheep around Jacksina. Sometimes they were joined by relatives and friends from the upper Tanana villages at Copper Creek and Chisana.

Contemporary Use

Seasons have been set by regulations for many years. At least since statehood, an August 10 - September 20 season has been in effect in GMU 11 for all hunters. The bag limit for all hunters was one ram with at least a 3/4 curl until 1979, when a 7/8 curl requirement was adopted. In 1989, the Board of Game adopted a bag limit of one sheep for subsistence hunters in GMU 11 and a limit of one ram with a full curl for the resident and non-resident season.

Criterion 3. A use pattern consisting of methods and means of harvest which are characterized by efficiency and economy of effort and cost, and conditioned by local circumstances.

Historic Uses

Sometimes Ahtna speared sheep in high mountains, directing groups of sheep along stone fences onto the hunters' waiting spears (Reckord 1983b). Drag pole snares were also set in the fences (de Laguna and McClellan 1981). Arrows were also used in earlier days. Informants reported that fences as long as 5 or 6 miles were maintained in order to funnel moose into snares, sheep into box canyons, or caribou into lakes.

While the men hunted in traditional hunting spots, women collected berries and other vegetables that were ripe in the fall. Sheep were hunted by groups of men who took advantage of their particular behavioral characteristics (they flee upward when faced with danger). The hunting party would break into two separate groups, one standing below the sheep and another standing above the sheep. The lower group would startle the animals and the herd would flee upward into the waiting spears of the second group of hunters. In this way six or seven sheep would be killed at one time. The Chitina people, renowned for their climbing abilities, made ropes of soft moose skin which they sometimes used to gain access to mountain ledges. They erected rock fences to herd sheep to waiting hunters.

Sheep camps were used by Ahtna hunters in the Wrangell Mountains into the 1920s and 1930s. In earlier years, the hunters were equipped with copper pointed spears. By the 1920s, they had guns, and were still using the animals to feed their families. Twin Lakes and Chistochina residents have been using horses for hunting sheep for many years. This use continues today.

Contemporary Use

The division collected information on mode of transportation used while hunting sheep for each of the 13 subdivisions of the park-preserve. Most common were airplane, highway vehicles, on foot, horses, and off-road vehicles. More specific information is available if needed.

In 1980-81, as a result of the creation of the park-preserve, restrictions on allowable modes of transportation were imposed under federal regulation. Aircraft access to park areas for purposes of subsistence hunting was prohibited.

Criterion 4. Consistent harvest and use of fish or game which is near, or reasonably accessible from, the user's residence.

The following section mentions geographic areas in GMU 11, as well as 12 and 13, which Copper Basin and Upper Tanana have hunted sheep in the past and in the 1980s.

Historic Uses

Sheep often walked right through the villages near Taral and present-day Chitina. The upper Kotsina area was favored by Chitina hunters, as well as the mountains immediately west of Chitina. Sheep were easily obtained by the Lower Ahtna (Record 1983a).

The Copper Center sheep hunters used Stuck Mountain (GMU 13) to the south of the village and the Wrangells (GMU 11) immediately east of the village, above 3,000 feet (Reckord 1983a:103).

Upper Ahtna, where fish are less abundant than in the south, took sheep in both the Wrangell Mountains and the Alaska Range. Hunting camps have been reported at Tanada Lake and the Jacksina Creek area. Copper Lake had an Ahtna settlement in earlier years. Archaeological evidence indicates the village used sheep, caribou and some moose. Tanada Lake was the traditional sheep hunting territory and grayling fish camp belonging to the people living at Batzulnetas on the Copper River. The sheep sometimes came to lower elevations by following the creek beds down the mountain sides. The Klawasi River and the Nadina River were reported as locations used for sheep hunting.

Contemporary Use

According to Reckord (1983a), Chistochina hunters, young men and young women, hunt either from a relative's place at Twin Lakes or from one of their hunting camps in the Mentasta Mountains (GMUs 12, 13, and 20). Sheep are also hunted around Copper Lake and along the northern face of the Wrangells (GMU 11). Nabesna Road residents are in the middle of sheep country, in GMU 11, 12, and 13. Nabesna Road

residents, among them Ahtna families living at Twin Lakes, hunt sheep in the Mentasta Mountains and between Twin Lakes and Tanada Lake, or in the Mineral Lakes area. Mentasta Village people hunt sheep in the Mentasta Mountains from Mankomen Lake to the Nabesna River.

Residents of the McCarthy and upper Nizina area hunt sheep. MacColl Ridge, Hawkins Glacier, Williams Peak, Boulder Creek, and Dan Creek were mentioned in interviews conducted by Reckord (1983a).

The results of the 1988 Division of Subsistence harvest survey show that all 13 subareas of the park preserve and all subareas within GMU 11 have been used for sheep hunting by Copper Basin residents who lived there in 1988. Detailed information is available for each community and for each subarea.

In addition, **Table 5** summarizes available documentation of sheep hunting areas from data which appear on maps from the 1984 division Copper Basin mapping project and the 1988 Upper Tanana mapping project. These maps for the Copper Basin communities are available for consultation is necessary. Maps for Upper Tanana communities appear in Marcotte (1991). The mapping methodology is described in Stratton and Georgette 1985.

Upper Tanana (Tok) sheep hunting areas, from maps documenting 20 years of use, included the following areas: on the north side of the Nabesna Road, west of Noyes Mountain (includes GMU 13), Suslota Creek, Copper and Tanada Lake, also Nizina and Chitistone areas (the remainder are all in GMU 11) (see Marcotte 1991:91,107).

Slana Village sheep hunting areas: Mentasta and Slana village people rendezvoused at Mankomen Lake for hunting parties. In autumn the meat was relayed to Mentasta Lake where skin boats were constructed and floated home to Slana with the winter stores. Lost Lake, or Platinum Creek Lake: in the early 1900s, Alaska Natives from the Nabesna River traveled to the area to hunt game, sheep in particular, and to fish for grayling. Nabesna Bar also was used for hunting, fishing and snaring. A small band of Indians came to the bar in 1945, from Cooper Creek, 6 miles downstream. Native subsistence hunters used the trail between Nabesna and the Copper River which followed Platinum Creek to approach "hidden" or "lost" lake where sheep are abundant because a mineral creek; Soda Creek, empties into the lake and attracts much game. Kenny Lake people were known to hunt just south of the area in the mountains. People in the central Copper River Basin have been known to use the Wrangell Mountains, the Chugach Mountains and the Alaska Range. Chisana residents hunted sheep in the immediate community area.

Criterion 5. The means of handling, preparing, preserving, and storing fish and game which have been traditionally used by past generations, but not excluding recent technological advances where appropriate.

Historic Uses

Among the Ahtna people, the division of labor in the hunting camps depended on the nature of the species hunted, although generally the men hunted and the women dried the meat and tanned the skins, freeing the men to return to hunting after bringing in a kill. Several types of preparation stations were set up to handle the meat. Besides a base camp from which the hunting camp left, for example, on the southern end of Tanada Lake, another camp for meat preparation was established in the Jacksina Creek area, were drying racks were constructed with poles carried from the lowlands. The hunters then set up a circuit of camps to which partially flayed meat would be brought as it was taken. The meat was further prepared at the second camps so that it could be more easily transported to the main camp on the lake itself. There the skins were tanned and the meat fully dried. After freeze-up when traveling became good, people and dogs packed the season's production to home villages. Several trips were required to transport the entire supply home, and relays were sometimes set up. The supply included fish taken from the lake. Chistochina village hunters would hunt up by Copper Lake, dry the meat, pack it in a skin boat and descend the river to Chistochina, a run of about two days.

Contemporary Use

Today, sheep meat is most commonly frozen. In some communities, such as South Wrangells (the McCarthy area), Chisana, and the Slana Homestead communities, where electricity is either unavailable or unreliable (such as when home generators are in use), meat may be canned, salted, or dried. Although most hunters skin the animal out, and many bone out the meat before packing it, the remainder of the processing and packaging occurs at home.

Criterion 6. A use pattern which includes the handing down of knowledge of fishing and hunting skills, values, and lore from generation to generation.

Traditional hunting groups included all but the very young, very old and infirm. Young men were taken hunting, while the young girls were taught about the drying of meat at the camp. Composition of hunting groups has changed over the years, and is more often hunting partners, or a few family members, rather than the extended family of earlier years.

Division interviews documented that about 18.5 percent of the Copper Basin's population is Alaska Native; mostly Ahtna Athabaskan who are life long residents of the basin. According to study findings, 15 percent of the households are headed by Alaska Natives. Alaska Native household heads have resided in their communities for an average of 42 years (range 1 to 89) ; for non-native heads, the average is 12 years (range 1 to 64); the mean for all household heads is 16.2 years.

In the Upper Tanana area, 35.7 percent of the population is Alaska Native, again mostly life long residents of the area. Area-wide length of residency data have not been calculated, but probably resemble that for the Copper Basin.

Criterion 7. A use pattern in which the hunting or fishing effort or the products of that effort are distributed or shared among others within a definable community of persons, including customary trade, barter, or sharing and gift-giving; customary trade may include limited exchanges for cash, but does not include significant commercial enterprises.

Historic Uses

Game harvests in earlier years were traditionally treated communally and distributed by the chief or the leader of the hunt. For this reason, game is considered to be more of a status food that others, and particular parts were distributed according to the social status of the recipients and their relationship with the hunters.

While a village was often the primary economic unit, members of villages sometimes combined in hunting activities. Another event that brought people of many villages together was the potlatch. Traditional foods still figure significantly in the potlatch ceremony. At the main meal, stews and hot dishes are served. Those who are to be most honored are served large platters of the most highly valued foods: salmon, moose, and sheep. Potlatching is very active in both the Copper Basin and Upper Tanana areas today.

Contemporary Use

See **Tables 2 and 3** for the number of households using sheep meat, compared with the number harvesting sheep in 1982/83 and 1987/88. This shows that more households used sheep meat than harvested sheep in 1987-88, demonstrating that sharing of harvests occurs.

While some sharing occurs among households, data suggest that the sharing may occur more along family lines than among unrelated community members. It is also possible that the lack of widespread sharing is related to the smaller harvest of sheep than in earlier years.

Regarding contemporary potlatching in Copper River basin communities, Reckord (1983:82) noted that "Those who are to be most honored are served large platters of the most highly valued foods, which are subsistence foods, such as moose, salmon, and sheep. They can then redistribute these foods to those each feels should receive them."

Criterion 8. A use pattern which includes reliance for subsistence purposes upon a wide diversity of the fish and game resources of an area and which provides cultural, social, and nutritional elements of the subsistence user's life.

Table 5 summarizes some of the results of the division's 1982/83 and 1987/88 harvest surveys, which report resource use characteristics for each Copper Basin community for a 12 month period in these two study years. Almost every household in the basin uses wild foods, and the vast majority harvest wild foods as well. The range of wild foods used and harvested is also wide (6 to 13 used in the communities in 1987/88). Per capita harvests varied by community, and ranged in 1987/88 from a low of 95 pounds per capita at Gakona to a high of 341 pounds per capita at Chitina.

The resources of the Copper Basin have long been marked by severe fluctuations. Salmon, moose, caribou, sheep, and many other resources have been used by the Ahtna and subsequent settlers in the region, according to abundance and availability. Tables showing the species harvested and used by each community are available for 1982-3 and 1987-88 (Stratton and Georgette 1984; McMillan and Cuccarase 1988; Scott et al. 1992). Typically, at least two species of salmon are used by communities anywhere near the Copper River. In addition, grayling, and trout are commonly harvested by most communities. Game species include moose, caribou, some sheep, hare, and porcupines. Many communities take at least some varieties of wildfowl, particularly grouse and ptarmigan, and to a lesser extent, ducks. Furbearers are taken, and many types of berries and a few greens and roots are gathered.

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TABLE 1. COPPER RIVER BASIN AND UPPER TANANA ESTIMATED HOUSEHOLDS AND POPULATION BY COMMUNITY, 1983, 1984, AND 1988

	1983		1984		1988	
Community	HHs	Pop	HHs	Pop	HHs	Pop
Copper River Basin:						
Cantwell	47	136	47	136	c	c
Chisana	6	13	5	11	6	13
Chistochina	27	65	26	70	29	79
Chitina	24	43	24	43	19	35
Copper Center	129	439	129	439	161	492
East Glenn	65	182	65	182	67	218
Gakona	64[a]	200	47[e]	150	70	209
Glennallen	269[b]	861	269[b]	861	170	470
Gulkana	41	115	20	56	22	67
Kenny Lake	79	392	70	218	93	321
Lake Louise	15	39	14	36	19	39
McCarthy Road	18	52	13	35	19	38
Mentasta	19	67	29	104	25	80
Mentasta Pass	c	c	c	c	11	26
Nabesna Road	10	37	11	48	13	37
Paxson	32[d]	59	20	49	17	39
Slana	17	43	29[e]	78	25	57
Slana North HS	c	c	c	c	35	61
Slana South HS	c	c	c	c	66	186
Sourdough	d	d	d	d	10	26
South Wrangells	16	32	f	f	23	48
Tazlina	b	b	b	b	120	365
Tonsina	76	228	76	228	96	297
West Glenn Hwy	83	238	83	238	106[g]	280[g]
Total	**1,037**	**3,241**	**977**	**2,982**	**1,222**	**3,483**
Upper Tanana:						
Dot Lake	15	50[h]	na	na	20	66
Northway	na	334[i]	na	na	90	324
Tanacross	na	na	na	na	34	93
Tetlin	na	na	na	110	29	116
Tok	na	881[j]	na	na	367	1,081
Total					**540**	**1,680**

[a] Includes households spread out along the Tok Road.
[b] Glennallen includes Tazlina
[c] Community not included in study area.
[d] Paxson includes all of Richardson Highway north of Gakona Junction.
[e] Tok Road households were associated with closest community.
[f] South Wrangells elected to not participate in study.
[g] Includes Chickaloon households in GMU 13.
[h] Martin, 1982.
[i] Case, 1980.
[j] Haynes et al, 1984
Sources: Stratton and Georgette 1984, 1985; file data 1989.

TABLE 2. HARVEST SUMMARY FROM DIVISION OF SUBSISTENCE HOUSEHOLD SURVEYS
RESOURCE: Sheep

GMU	Community	Year	Percentage of Households				Estimated Number Harvested	Estimated Pounds Harvested	Pounds Harvested	
			Used	Attempt	Harvested	Received Gaveaway			Household	Percapita
11										
	McCarthy Road	82	0.		0.		0	0	0.0	0.0
	South Wrangell Mountains	82	26.7		13.3		2	139	8.6	4.0
11,12										
	Nabesna Road	82	50.		25.		6	406	40.6	9.2
13A										
	Lake Louise	82	7.7		0.		0	0	0.0	0.0
13A,13D										
	East Glenn Highway	82	13.3		0.		0	0	0.0	0.0
	Glennallen	82	5.9		0.		0	0	0.0	0.0
	Matanuska Glacier	82	3.3		0.		0	0	0.0	0.0
	Sheep Mountain	82	22.2		0.		0	0	0.0	0.0
13B										
	Gakona	82	8.7		4.3		1	96	2.8	0.8
	Gulkana	82	2.8		2.8		1	78	1.8	0.6
	Paxson-Sourdough	82	0.		0.		0	0	0.0	0.0
13C										
	Chistochina	82	9.1		0.		0	0	0.0	0.0
	Mentasta	82	15.8		10.5		6	383	13.6	4.0
	Slana	82	31.3		31.3		11	739	28.4	10.5
13D										
	Chitina	82	21.7		0.		0	0	0.0	0.0
	Copper Center	82	0.		0.		0	0	0.0	0.0
	Kenny Lake	82	0.		0.		0	0	0.0	0.0
	Lower Tonsina	82	0.		0.		0	0	0.0	0.0
	Tonsina	82	6.7		0.		0	0	0.0	0.0
13E										
	Cantwell	82	0.		0.		0	0	0.0	0.0
14A										
	Chickaloon	82	5.6		0.		0	0	0.0	0.0

1

TABLE 3. HARVEST SUMMARY FROM DIVISION OF SUBSISTENCE HOUSEHOLD SURVEYS
RESOURCE: Sheep

GMU	Community	Year	Percentage of Households					Estimated Number Harvested	Estimated Pounds Harvested	Pounds Harvested	
			Used	Attempt	Harvested	Received	Gaveaway			Household	Percapita
11											
	McCarthy Road	87	23.5	17.6	5.9	17.6	0.	1	73	3.8	1.9
	Slana Homestead South	87	5.9	11.8	5.9	0.	5.9	4	252	3.8	1.3
	South Wrangell Mountains	87	14.3	0.	0.	14.3	0.	0	0	0.0	0.0
11,12											
	Nabesna Road	87	83.3	50.	25.	75.	16.7	4	282	21.6	7.6
13A											
	Lake Louise	87	0.	0.	0.	0.	0.	0	0	0.0	0.0
13A,13D											
	East Glenn Highway	87	6.7	3.4	3.4	3.4	3.4	2	146	2.1	0.6
	Glennallen	87	3.1	3.1	2.1	2.1	2.1	5	341	2.0	0.7
	West Glenn Highway	87	2.5	2.5	2.5	0.	0.	2	173	1.6	0.6
13B											
	Gakona	87	23.2	23.2	16.	7.3	0.	11	726	10.3	3.4
	Gulkana	87	0.	0.	0.	0.	0.	0	0	0.0	0.0
	Paxson	87	28.6	28.6	28.6	0.	7.1	5	316	18.5	8.1
	Sourdough	87	0.	11.1	0.	0.	0.	0	0	0.0	0.0
13C											
	Chistochina	87	7.1	3.6	0.	7.1	0.	0	0	0.0	0.0
	Mentasta	87	8.3	4.2	0.	8.3	0.	0	0	0.0	0.0
	Mentasta Pass	87	20.	20.	10.	10.	0.	2	143	13.0	5.4
	Slana	87	18.2	13.6	9.1	9.1	4.5	2	148	5.9	2.6
	Slana Homestead North	87	12.5	12.5	12.5	0.	12.5	4	285	8.1	4.6
13D											
	Chitina	87	5.6	11.1	0.	5.6	0.	0	0	0.0	0.0
	Copper Center	87	9.4	13.2	4.7	4.7	0.	15	979	6.0	1.9
	Kenny Lake	87	0.	0.	0.	0.	0.	0	0	0.0	0.0
	Tazlina	87	12.	8.1	1.9	10.1	0.	2	150	1.2	0.4
	Tonsina	87	11.1	19.4	11.1	0.	8.3	10	691	7.2	2.3

1

TABLE 4. ESTIMATED NUMBER OF HOUSEHOLDS IN COPPER BASIN AND UPPER TANANA COMMUNITIES THAT HUNT SHEEP IN GAME MANANGEMENT UNIT 11, THE WRANGELL ST. ELIAS NATIONAL PARK AND PRESERVE

	Ever Using		Regular Use		Discontinued Use		Seldom Use		Used in 1987/88	
Community[a]	HH	%	HH	%	HH	%	HH	%	HH	%
Chisana	2	33.3	0	0	0	0	2	33.3	0	0
Chistochina	6	21.4	4	14.3	0	0	2	7.1	1	3.6
Chitina	7	38.9	2	11.1	1	5.6	4	22.2	2	11.1
Copper Center	21	13.2	14	8.5	3	1.6	5	3.1	4	2.3
E. Glenn Highway	11	16.7	9	13.4	2	3.4	0	0	0	0
Gakona	23	33.4	23	33.4	0	0	0	0	13	18.8
Glennallen	25	14.4	14	8.2	2	1.0	9	5.1	4	2.1
Gulkana	0	0	0	0	0	0	0	0	0	0
Kenny Lake	25	26.3	6	6.2	8	8.2	11	11.9	6	6.2
Lake Louise	1	5.9	0	0	0	0	1	5.9	0	0
McCarthy Road	11	64.7	9	52.9	0	0	2	11.8	8	47.1
Mentasta	7	29.2	4	16.7	2	8.3	1	4.2	3	12.5
Mentasta Pass	2	20.0	2	20.0	0	0	0	0	1	10.0
Nabesna Road	8	66.7	7	58.3	0	0	1	8.3	6	50.0
Paxson	2	14.3	2	14.3	0	0	0	0	1	7.1
Slana	8	36.4	4	18.2	2	9.1	2	9.1	2	9.1
Slana Homestead N.	4	12.5	4	12.5	0	0	0	0	4	12.5
Slana Homestead S.	8	11.8	8	11.8	0	0	0	0	8	11.8
Sourdough	0	0	0	0	0	0	0	0	0	0
South Wrangells[b]	6	42.9	5	35.7	0	0	1	7.1	2	14.3
Tazlina	31	25.9	15	12.9	3	2.9	5	3.8	11	9.1
Tonsina	31	31.9	21	22.1	8	8.3	1	1.4	20	20.8
W. Glenn Highway	0	0	0	0	0	0	0	0	0	0
All Copper Basin	239	20.0	153	12.8	31	2.6	49	4.1	96	8.0
Tanacross	1	3.7	1	3.7	0	0	0	0	0	0
Tok	17	4.5	17	4.5	0	0	0	0	15	4.1
All communities	257	16.1	171	10.7	31	1.9	49	3.1	111	7.0

[a] Total number of households: Chisana, 6; Chistochina, 28; Chitina, 18; Copper Center, 161; East Glenn Highway, 67; Gakona, 70; Glennallen, 171; Gulkana, 20; Slana Homestead North, 35; Slana Homestead South, 66; Kenny Lake, 93; Lake Louise, 17; McCarthy Road, 17; Mentasta, 24; Mentasta Pass, 10; Nabesna Road, 12; Paxson, 14; Slana, 22; Sourdough, 9; South Wrangells, 14; Tazlina, 120; Tonsina, 96; West Glenn Highway, 106. Total for Copper Basin, 1,196. Tok, 367; Tanacross, 34. Total for all communities, 1,597.

[b] McCarthy and area

Source: Alaska Department of Fish and Game 1988

TABLE 5. 1984 MAPPED INFORMATION, COPPER BASIN COMMUNITIES' USE OF GMU 11 SHEEP

Community	Sample Size (households)	Map Quadrangle Gulkana	McCarthy	Nabesna	Valdez
Chisana	5 of 5		a	a	
Chistochina	14 of 26[b]	X		X	
Chitina	9 of 24		X		X
Copper Center	25 of 129		X	X	X
East Glenn Hwy	18 of 65	X	X	X	X
Gakona	22 of 47[b]	X	X	X	X
Glennallen[c]	35 of 269[b]	X	X	X	X
Gulkana	9 of 20[b]	X	X	X	X
Kenny Lake	12 of 68[b]	X	X	X	X
Lake Louise	5 of 14		X		
McCarthy Rd	11 of 13		X		X
Mentasta[d]	11 of 29			a	
Nabesna Road	10 of 11	X		X	
Paxson/Sourdough	9 of 20[b]			X	
Slana	20 of 29			X	
Tok	92 of 368	X		X	
Tonsina	22 of 76	X	X	X	X

a Community hunted sheep in GMU 12 only
b Community review meeting of composite map occurred.
c Tazlina included with Glennallen.
d Includes some Mentasta Pass households.

Notes on methodology: Maps were drawn by knowledgeable harvesters of areas they had regularly used during the 20 period 1964 to 1984. Composite maps were used, so respondents expanded existing lines to include areas they used which were not already shown. South Wrangell sample declined to participate in the mapping project. Homestead samples were not contacted for the study, most had been in the area less than a year, and were only seasonally residing in the area at the time of the interviews.

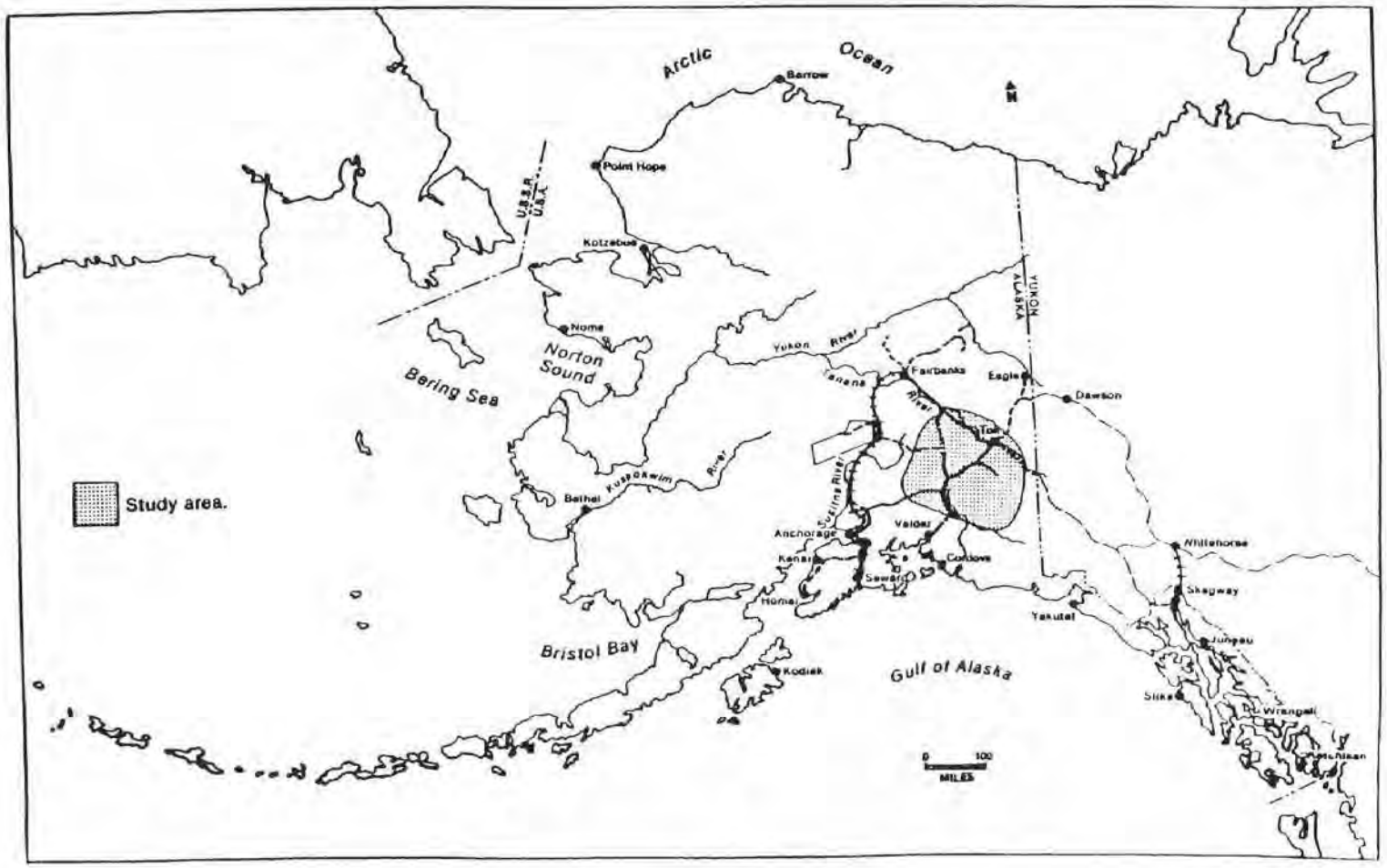
Arctic Ocean
Barrow
Point Hope
U.S.S.R.
U.S.A.
Kotzebue
Nome
Norton Sound
Bering Sea
Yukon River
Tanana River
Fairbanks
Eagle
Dawson
YUKON
ALASKA
Tok
Kuskokwim River
Bethel
Study area.
Susitna River
Anchorage
Valdez
Kenai
Cordova
Seward
Homer
Whitehorse
Skagway
Yakutat
Juneau
Bristol Bay
Kodiak
Gulf of Alaska
Sitka
Wrangell
Prince Rupert
0 100
MILES

FIGURE 1

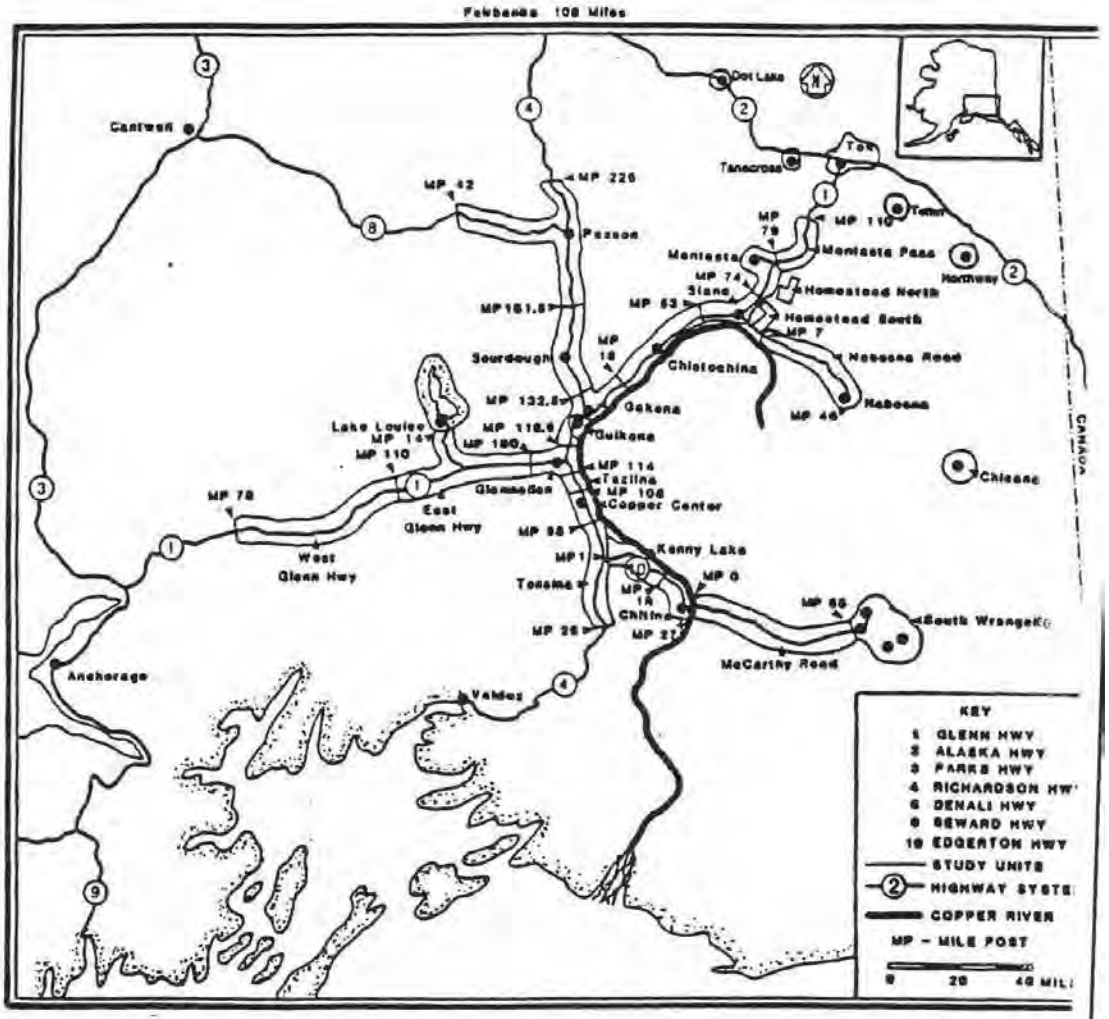

FIGURE 2

Study communities.

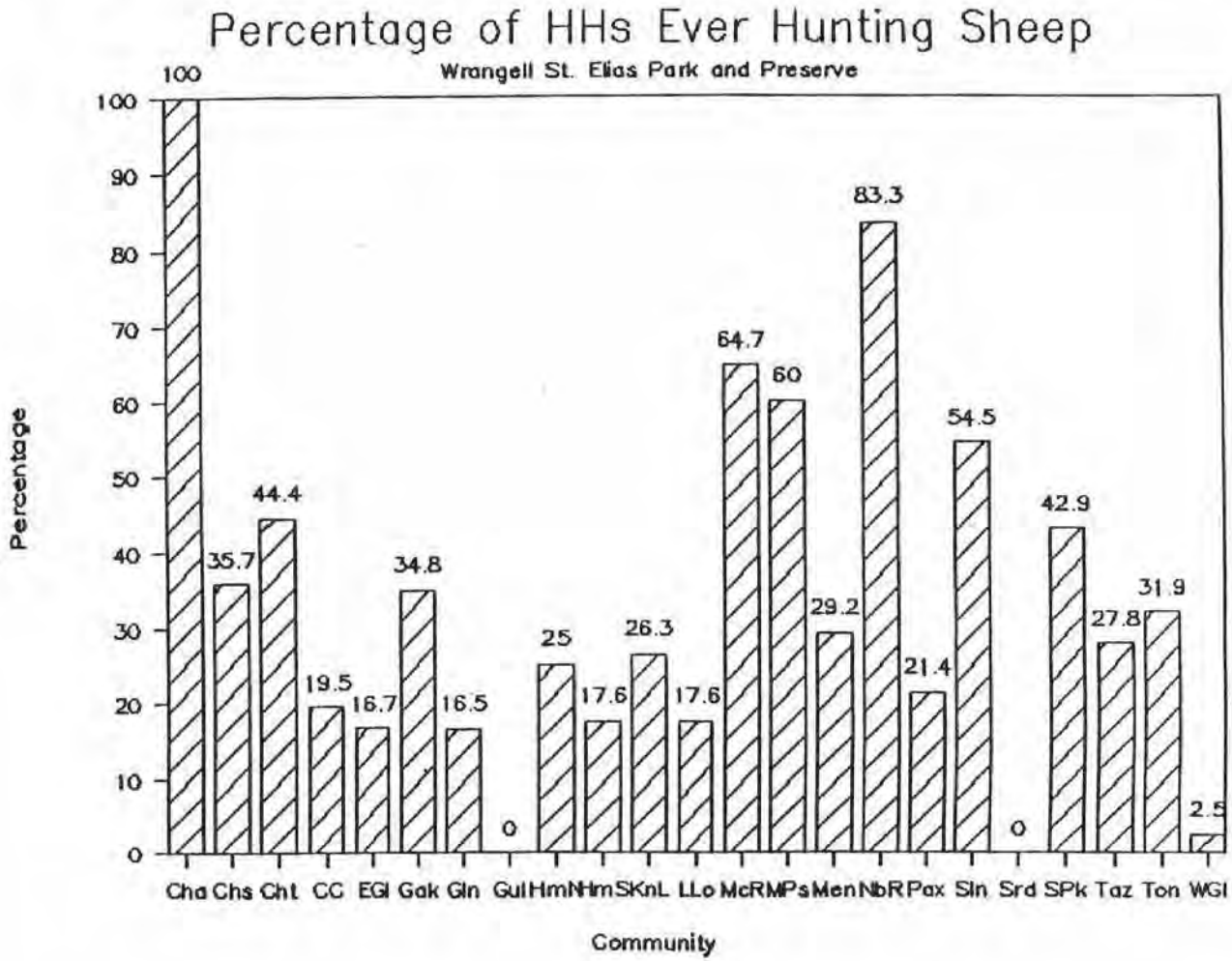
Percentage of HHs Ever Hunting Sheep
Wrangell St. Elias Park and Preserve
Percentage
100
90
80
70
60
50
40
30
20
10
0
100
35.7
44.4
19.5
16.7
34.8
16.5
0
25
17.6
26.3
17.6
64.7
60
29.2
83.3
21.4
54.5
0
42.9
27.8
31.9
2.5
Cha Chs Cht CC EGl Gak Gln Gul Hm NHm SKnL LLo McR MPs Men NbR Pax Sln Srd SPk Taz Ton WGl
Community

FIGURE 3

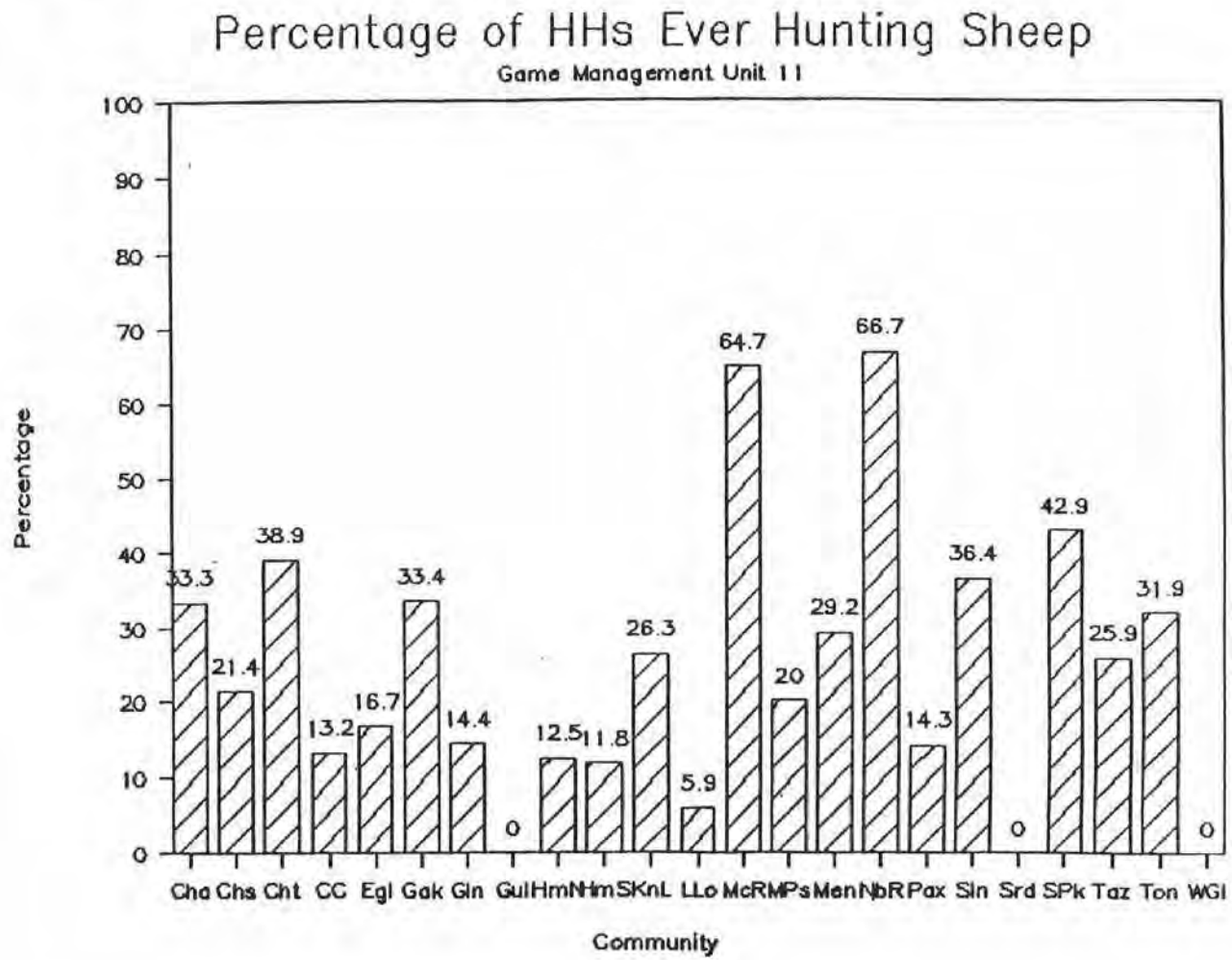
Percentage of HHs Ever Hunting Sheep
Game Management Unit 11
Percentage
100
90
80
70
60
50
40
30
20
10
0
33.3
21.4
38.9
13.2
16.7
33.4
14.4
0
12.5
11.8
26.3
5.9
64.7
20
29.2
66.7
14.3
36.4
0
42.9
25.9
31.9
0
Cha Chs Cht CC Egl Gak Gln GulHmNhmSKnL LLo McRMPsMenNbRPax Sln Srd SPk Taz Ton WGl
Community

FIGURE 4

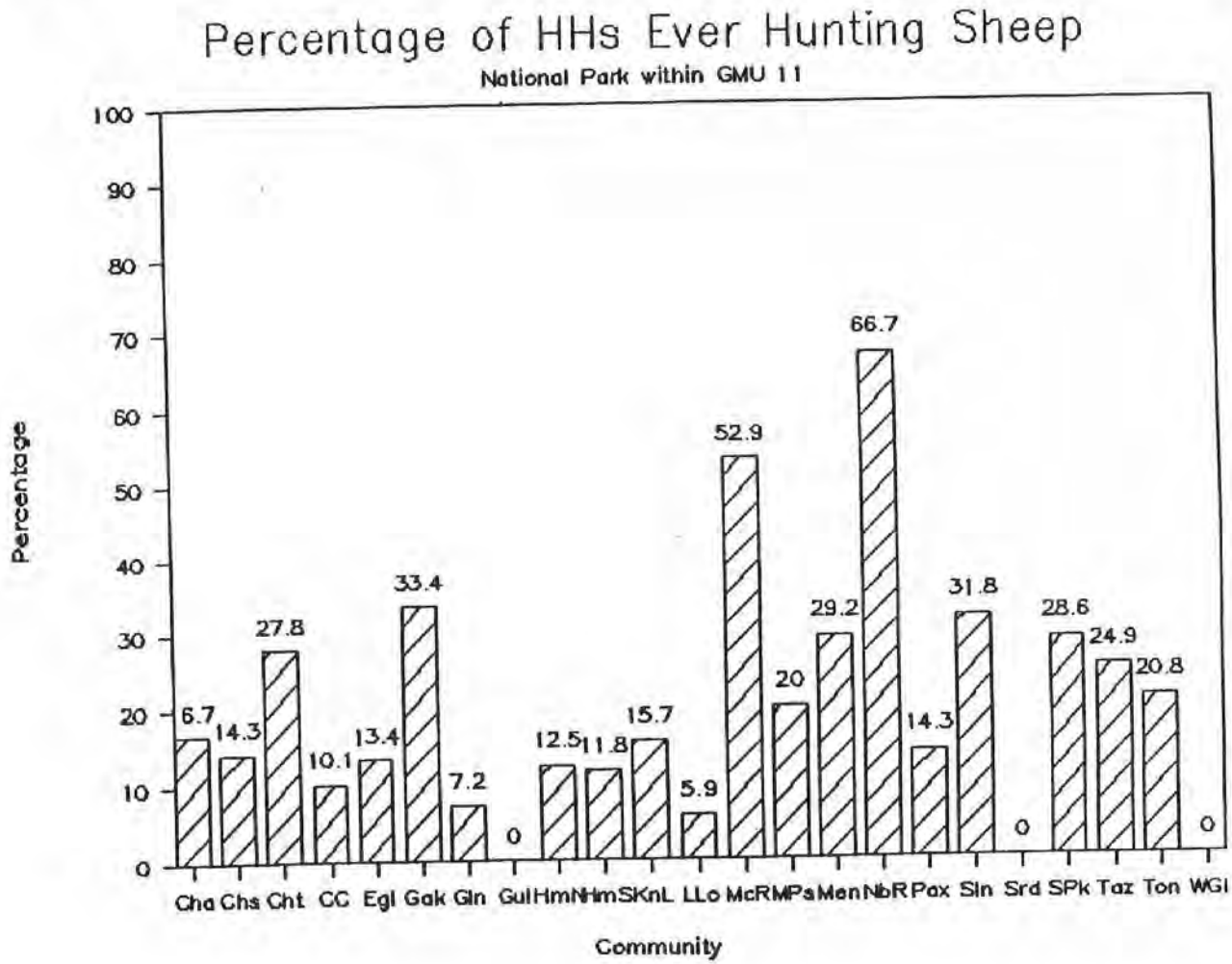
Percentage of HHs Ever Hunting Sheep
National Park within GMU 11
Percentage
100
90
80
70
60
50
40
30
20
10
0
6.7
14.3
27.8
10.1
13.4
33.4
7.2
0
12.5
11.8
15.7
5.9
52.9
20
29.2
66.7
14.3
31.8
0
28.6
24.9
20.8
0
Cha Chs Cht CC Egl Gak Gln Gul Hm Nhm SKnL LLo McR MPs Men NbR Pax Sln Srd SPk Taz Ton WGl
Community

FIGURE 5

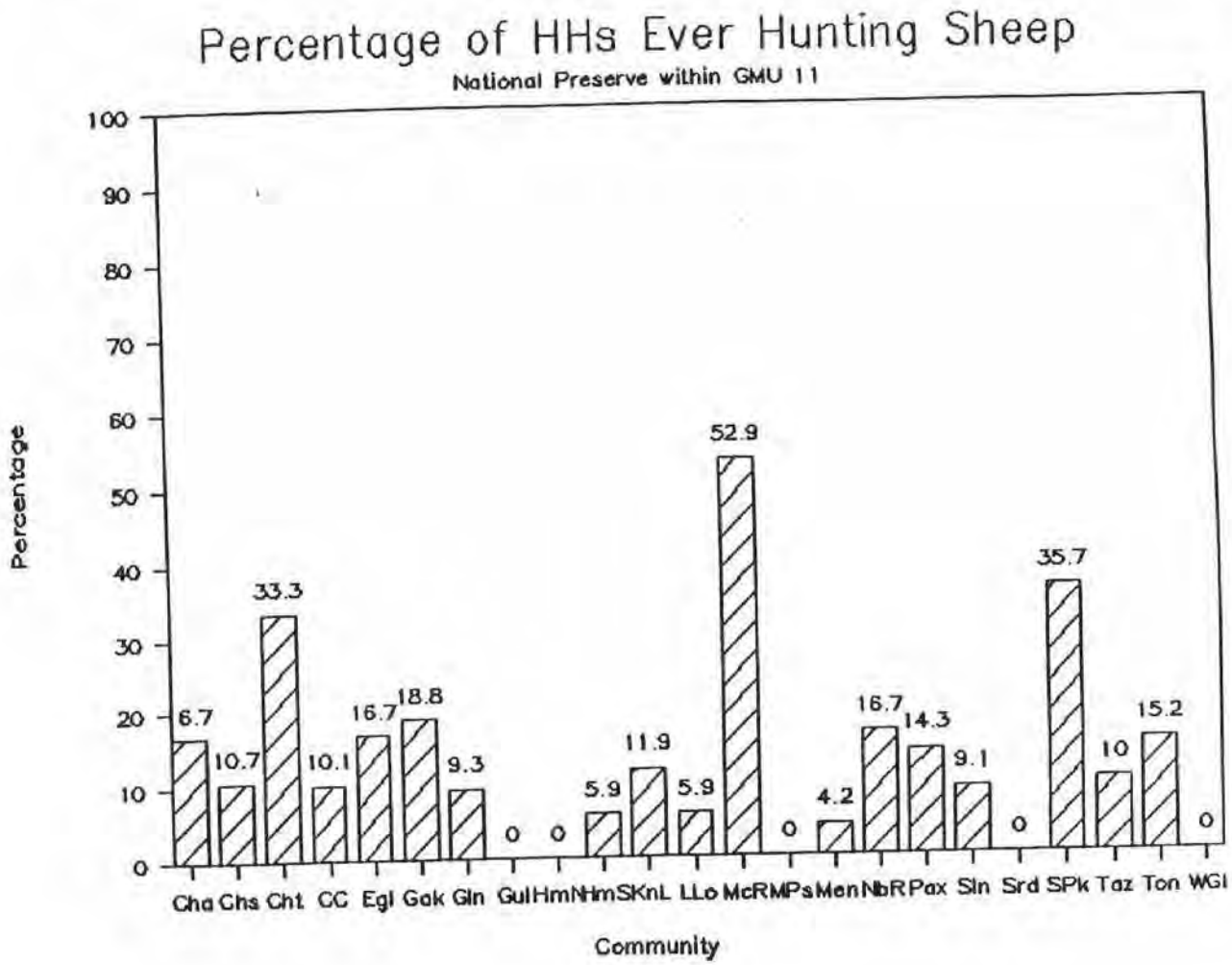
Percentage of HHs Ever Hunting Sheep
National Preserve within GMU 11
Percentage
100
90
80
70
60
50
40
30
20
10
0
6.7
10.7
33.3
10.1
16.7
18.8
9.3
0
0
5.9
11.9
5.9
52.9
0
4.2
16.7
14.3
9.1
0
35.7
10
15.2
0
Cha Chs Cht CC Egl Gak Gln Gul Hm NHm SKnL LLo McR MPs Men NbR Pax Sln Srd SPk Taz Ton WGl
Community

FIGURE 6

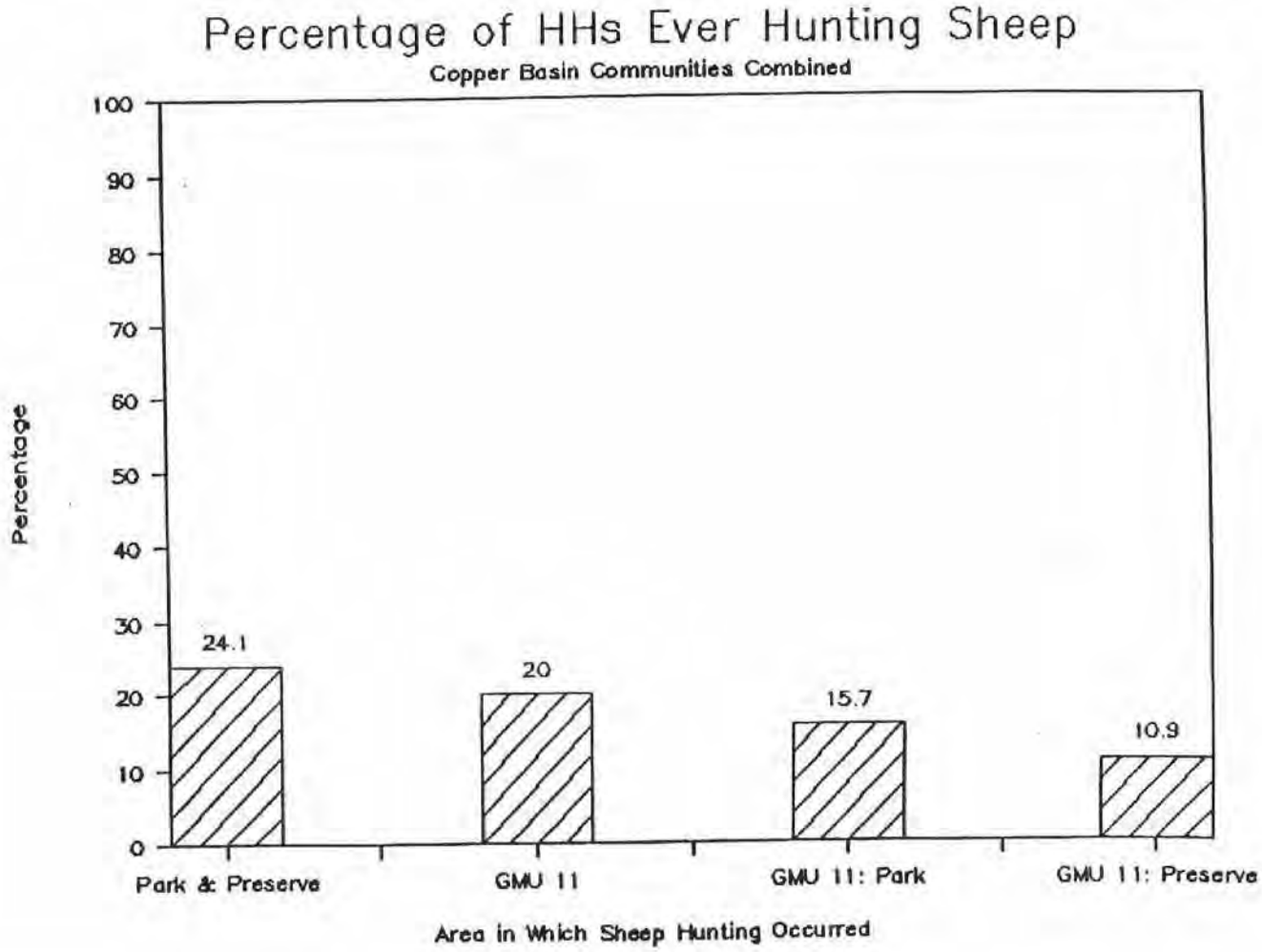
Percentage of HHs Ever Hunting Sheep
Copper Basin Communities Combined
Percentage
100
90
80
70
60
50
40
30
20
10
0
24.1
20
15.7
10.9
Park & Preserve
GMU 11
GMU 11: Park
GMU 11: Preserve
Area in Which Sheep Hunting Occurred

FIGURE 7

158

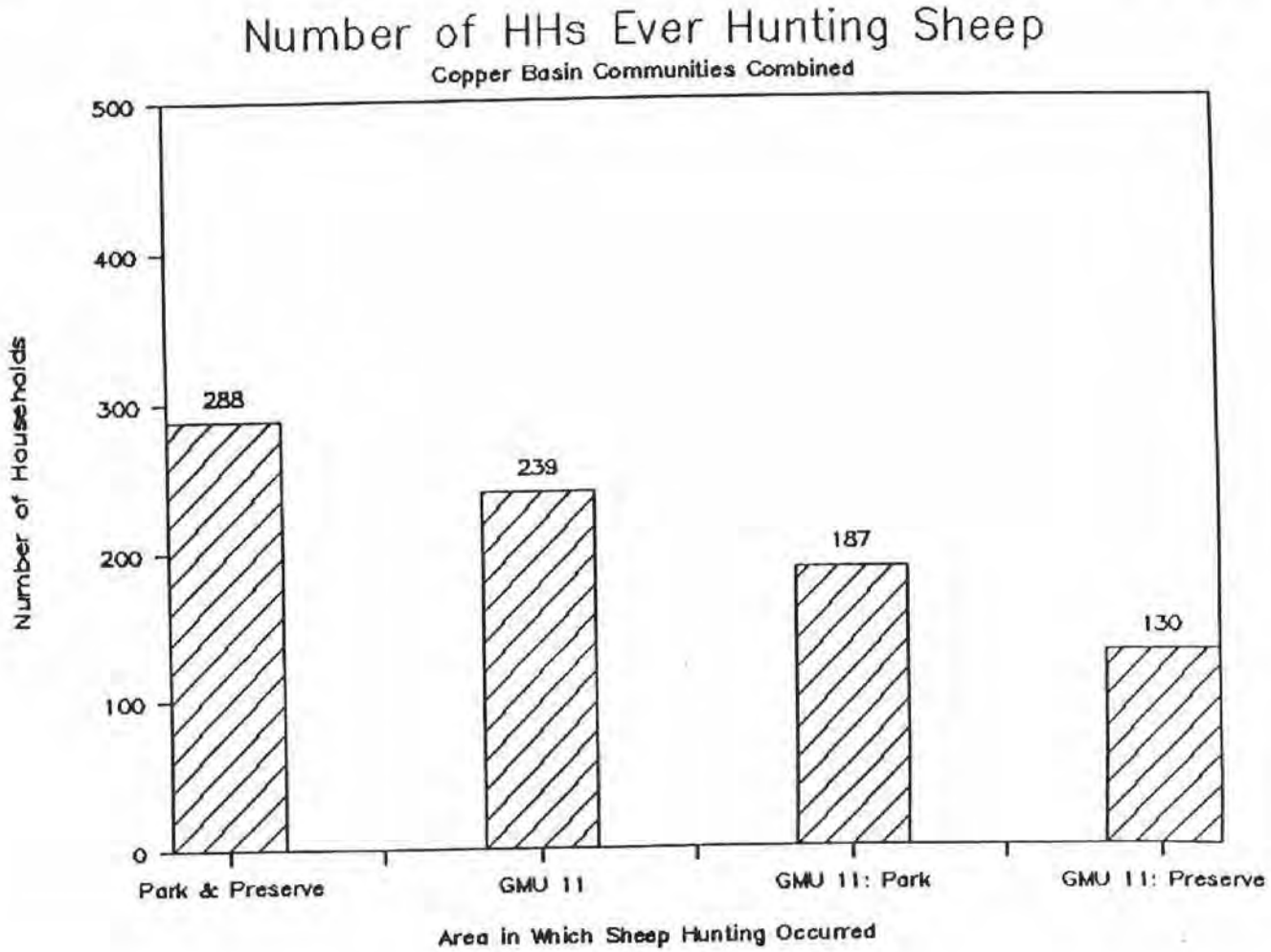
Number of HHs Ever Hunting Sheep
Copper Basin Communities Combined
Number of Households
500
400
300
200
100
0
288
239
187
130
Park & Preserve
GMU 11
GMU 11: Park
GMU 11: Preserve
Area in Which Sheep Hunting Occurred

FIGURE 8

Fig. 9. Areas identified within the Wrangell-St. Elias National Park and Preserve for recording areas used for subsistence fishing, hunting, and trapping.

Special Publication No. BOG 2010-02 **RC**

Customary and Traditional Use Worksheet:

Dall Sheep in GMU 19, McGrath Area

Prepared by the
Alaska Department of Fish and Game
Division of Subsistence
for the February–March 2010 Fairbanks Board of Game meeting

February 2010

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

all commonly-accepted abbreviations e.g., Mr., Mrs., Ms, Ms, etc.

all commonly-accepted professional titles e.g., Dr., Ph.D., R.N., etc.

Alaska Administrative Code	AAC
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	use 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

STATE OF ALASKA

SEAN PARNELL, GOVERNOR

DEPARTMENT OF FISH AND GAME

DIVISION OF SUBSISTENCE

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March 16, 2010

Administrative File:

Pursuant to deliberations on Proposal 82 at the February 26-March 7, 2010 regulatory meeting, the Alaska Board of Game considered information presented by the Division of Subsistence in the Customary and Traditional Use Worksheet for Dall Sheep in Game Management Unit 19 found in Record 3, Tab 8.

On March 2, 2010, the Board made a positive customary and traditional use finding, with 6 of 7 board members voting for the positive finding and Teresa Sager Albaugh abstaining.

Ted Spraker moved to establish an Amount reasonably Necessary for Subsistence (ANS) of 2-8 sheep, which was seconded by Stosh Hoffman, Jr. Al Barrett moved to amend the ANS finding to be 1-3 Dall sheep in Unit 19, which was seconded. Ben Grussendorf objected stating that the ANS finding needed to include 5 Dall sheep. Roger Seavoy, Area Biologist, stated that he prefers a management goal of 5-10 sheep as an allowable harvest. The vote to establish an ANS of 1-3 Dall Sheep in Unit 19 failed with two board members voting for it, 4 voting against it, and 1 abstaining. That brought back the original recommendation to establish and ANS of 1-5 Dall sheep in Unit 19, which received no objection.

However, Proposal 82 failed such that no winter subsistence sheep hunt was provided. Proposal 82 failed by a vote of 2 in favor (Spraker and Hoffman), 4 opposed, and 1 (Sager Albaugh) abstaining. Lou Bradley spoke to the record stating that a reasonable opportunity for subsistence was provided through the fall full-curl trophy hunt.

Jim Simon, PhD
Northern Regional Program Manager
ADF&G Division of Subsistence

SPECIAL PUBLICATION NO. BOG 2010-02

CUSTOMARY AND TRADITIONAL USE WORKSHEET:

DALL SHEEP IN GMU 19, MCGRATH AREA

by

Alaska Department of Fish and Game, Division of Subsistence
Fairbanks

Alaska Department of Fish and Game
Division of Subsistence
1300 College Road, Fairbanks, Alaska, 99701-1599

February 2010

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This document should be cited as:
ADF&G Division of Subsistence. 2010. Customary and traditional use worksheet: Dall sheep in GMU 19, McGrath area. Alaska Department of Fish and Game Division of Subsistence Special Publication No. BOG 2010-02, Fairbanks.

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INTRODUCTION

Proposal 82 for the February–March 2010 Alaska Board of Game (BOG) meeting in Fairbanks requests the establishment of a subsistence registration hunt for Dall sheep *Ovis dalli* with ¾-curl or smaller horns, excluding ewes with lambs, in Game Management Unit (GMU) 19C. The proposal also recommends a small number of permits in addition to other stipulations.[1] However, there is currently no customary and traditional use finding in regulation for sheep in GMU 19. This worksheet pertaining to the 8 criteria in 5 AAC 99.010 has been developed by the Alaska Department of Fish and Game (ADF&G) to assist the BOG in making a customary and traditional use determination prior to considering the proposed limited registration permit hunt.

THE EIGHT CRITERIA

CRITERION 1: LENGTH AND CONSISTENCY OF USE

A long-term consistent pattern of noncommercial taking, use, and reliance on the fish stock or game population that has been established over a reasonable period of time of not less than one generation, excluding interruption by circumstances beyond the user's control, such as unavailability of the fish or game caused by migratory patterns.

While sheep meat is still highly prized by Nikolai residents, changes in the seasonal round and resources use patterns have resulted in a decrease of sheep hunting among local residents (Holen et al. 2006; Stokes 1985:157). For example, technological advances such as fish wheels, firearms, and steel traps have focused harvest patterns on fish, particularly salmon resources, as well as caribou *Rangifer tarandus* and furbearers. Also, moose *Alces americanus* began to repopulate the area in the late 1880s; according to sources, this coincided with a decline in the caribou populations in the 1920s and 1930s, allowed moose to become a major source of winter meat and shifted hunting pressure from the Alaska Range foothills to the river corridors (Stokes 1985:73).

Additionally, state hunting regulations have also inhibited traditional sheep hunting practices [Collins 2004 (revised)]. Holen et al. (2006:107,109) note that in the 1960s, Nikolai hunters traveled by dog team up the Little Tonzona River to hunt sheep in November, when snow conditions were ideal for travel. Accumulated snowfall also pushed sheep off the high mountains, making them more accessible to hunters, who harvested both ewes and rams. However, currently in GMUs 19 and 20, sheep can be hunted only between August 10 and September 20, and only mature rams with a full curl can be harvested, animals that are traditionally of less interest to local hunters. Finally, social changes, including missionization, sedentarization in villages, decreases in the human population due to disease, and shifts in seasonal economic patterns cemented the declining use of the Alaska Range foothills (Hosley 1966; Stokes 1985; Stickney [1981]).

Historical use of sheep in GMU 19 has been documented for residents of Lime Village, McGrath, Nikolai, and Telida (Bishop 1978; Kari 1983; Stokes 1985; Holen et al. 2006). Small but consistent harvests have been reported to ADF&G by local residents since the 1980s (Table 1). No household reported a harvest of Dall sheep during a comprehensive baseline survey in Nikolai residents in 2002 (Holen et al. 2006:107). However, Stokes (1985) notes that

[1] The proponent would like this hunt to disallow the use of aircraft and to make permits available only in Nikolai, Telida, McGrath, and Takotna.

Nikolai hunters historically traveled great distances to obtain sheep, or *drodeya* in Upper Kuskokwim Athabascan, in the Alaska Range. While harvest estimates are not available for the earlier period, Stokes (1985) reported that residents believe that sheep were far more numerous than reflected by contemporary harvest levels: likely averaging approximately 5 per year during the 1960s, ranging from 1–8 in the 1980s, and 0–3 in the 2000s (Table 1).[2]

CRITERION 2: SEASONALITY

A pattern of taking or use recurring in specific seasons of each year.

Sheep were traditionally harvested by Upper Kuskokwim residents between August and October, with additional harvests occurring in June and July and again in November (Stokes 1985:70). Nikolai hunters traditionally hunted sheep in November by dog team when snow conditions were ideal for travel (e.g., there was enough snow for sleds but not so much that trails had to be broken) and when accumulated snow forced sheep off high, mountainous areas, making them more accessible to hunters (Ray Collins, area resident, personal communication February 11, 2010; Holen et al. 2006).

During a 1983 harvest survey, Stokes documented that Nikolai residents reported harvesting sheep primarily in September, October, and February, and they reported fewer harvests in January and March. McGrath residents reported harvests in September (Stokes 1985:77,79). As noted above, changes in transportation technologies, resource availability, and regulatory changes affect the seasonal round.

Today, sheep hunting is restricted to the legal fall season of August 10 to September 20, with a bag limit of 1 full-curl ram. Most of the harvest takes place in August, due to the lack of a winter season.

CRITERION 3: MEANS AND METHODS OF HARVEST

A pattern of taking or use consisting of methods and means of harvest that are characterized by efficiency and economy of effort and cost.

Oral reports of historical sheep hunting by Nikolai residents documented by Stokes (1985) suggest that, in the pre-firearm period, hunters employed multiple strategies to harvest sheep. Hunters used camouflage clothing made from white animal skins, and canvas in later periods, when hunting in the snowy areas characteristic of sheep habitats. Knowledge of sheep movements allowed hunters to approach and then disperse sheep into brushy canyon bottoms or lure them towards hunters hidden in the brush during the fall rut. Larger hunting parties sometimes engaged in "drives," during which sheep were chased past concealed hunters who harvested them with spears, hatchet-like weapons, and arrows.

Today, sheep are taken with firearms, usually incidental to other activities (Stokes 1985:156–157). More than half of the sheep hunters report the use of registered guides in this area,[3] and most hunters report the use of airplanes to access sheep hunting areas in the current fall hunt.

---

[2] Current regulations carry a harvest reporting requirement (5 AAC 92.010 (h)).

[3] Current statute stipulates nonresident sheep hunters must be accompanied by a registered guide (AS 16.05.407).

CRITERION 4: GEOGRAPHIC AREAS

The area in which the noncommercial, long-term, and consistent pattern of taking, use, and reliance upon the fish stock and game population has been established.

According to Stokes (1985), Nikolai hunters historically often traveled great distances to obtain sheep. Hunters followed sheep in the mountainous portions of the headwaters of the Big River in GMU 19C; other hunt areas included the upper Middle, Windy, South, and East forks of the upper Kuskokwim River and the headwaters of the Stony, Swift, and Big rivers (Figure 1). In the 1960s, Nikolai hunters also reportedly traveled up the Little Tonzana River into the Alaska Range.

CRITERION 5: MEANS OF HANDLING, PREPARING, PRESERVING, AND STORING

A means of handling, preparing, preserving, and storing fish or game that has been traditionally used by past generations, but not excluding recent technological advances where appropriate.

Information pertaining to the methods and means of handling, preparing, and preserving sheep resources in GMU 19C is available in the ethnographic literature [Collins 2004 (revised)]. Traditionally, big game meat was eaten fresh or preserved for future use by freezing or drying, depending on the season. Today, sheep meat is probably eaten fresh or preserved by freezing.

In addition to being an important historical component of local diets, sheep skins also provided materials for mattresses, bedding, and moccasin liners (Stokes 1985:156–157).

CRITERION 6: INTERGENERATIONAL TRANSMISSION OF KNOWLEDGE, SKILLS, VALUES, AND LORE

A pattern of taking or use that includes the handing down of knowledge of fishing or hunting skills, values, and lore from generation to generation.

As with many subsistence practices, the knowledge and skills needed to successfully harvest sheep were handed down from generation to generation, typically through participation in hunting and processing practices. For example, young hunters would have the opportunity to learn about sheep movements by participating in large hunting parties described above and in smaller hunting groups that lured and/or chased sheep for harvest (Stokes 1985). Knowledge of traditional sheep hunting methods remains part of the local oral tradition (Ray Collins, area resident, personal communication February 11, 2010) and a limited numbers of local hunters have continued to pursue sheep hunting during the contemporary regulatory fall hunt.

CRITERION 7: DISTRIBUTION AND EXCHANGE

A pattern of taking, use, and reliance where the harvest effort or products of that harvest are distributed or shared, including customary trade, barter, and gift-giving.

According to Collins [2004 (revised)], local residents have always shared sheep meat with community members. Oral historical sources document the hunting, processing, and sharing of sheep meat, and that all households had equal portions. Additionally, local residents note that sheep have been served at potlatches, important community ceremonial events where the entire community participates [Collins 2004 (revised)].

Today, much of the sheep meat distributed to residents of the communities of Nikolai and Telida is provided by locally based guides of trophy hunting clients (Stokes 1985).

CRITERION 8: DIVERSITY OF RESOURCES IN AN AREA; ECONOMIC, CULTURAL, SOCIAL, AND NUTRITIONAL ELEMENTS

A pattern that includes taking, use, and reliance for subsistence purposes upon a wide variety of fish and game resources and that provides substantial economic, cultural, social, and nutritional elements of the subsistence way of life.

Sheep are just one of the many wild resources that are typically harvested for subsistence uses by residents of GMU 19. Other major resources harvested for subsistence by residents of GMU 19 include salmon; nonsalmon fish species; large land mammals, such as moose, caribou, and black bears *Ursus americanus*; small land mammals such as beavers, snowshoe hares, and porcupines; ducks, geese, and other birds; marine invertebrates; and berries and other plants (see the ADF&G CSIS[4]).

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[4] Community Subsistence Information System (http://www.subsistence.adfg.state.ak.us/CSIS)

Table 1.–GMU 19C sheep harvests by residents of Nikolai and McGrath, 1983–2009.

Year	Number of sheep harvested	Number of hunters
1983	2	8
1984	8	10
1985	3	6
1986	1	7
1987	1	8
1988	0	6
1991	1	2
1996	1	1
1997	0	1
1998	0	1
1999	0	1
2005	n/d	n/d
2006	0	3
2007	3	6
2008	0	1
2009	2	3

Note: No data are available for 2005.

Source ADF&G Division of Wildlife Conservation.

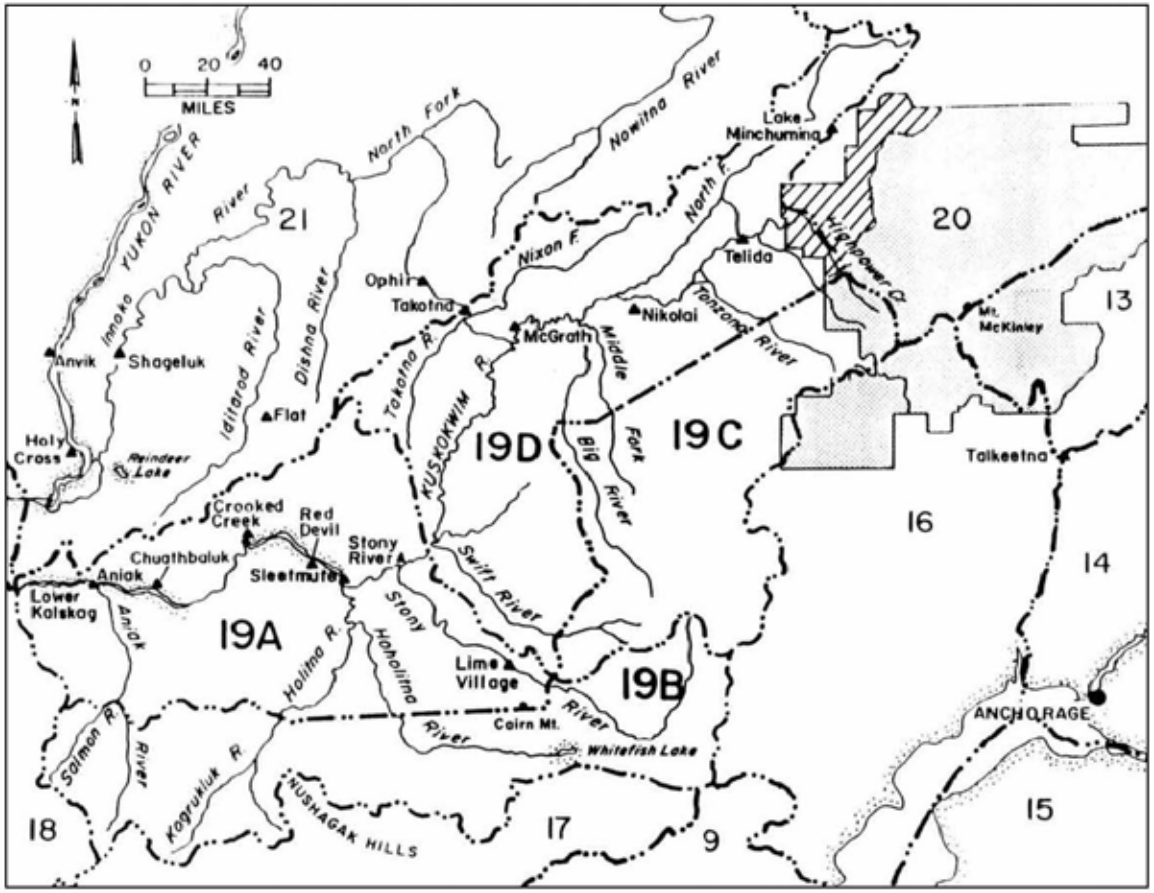

Figure 1.–Map of Game Management Unit 19.

EIGHT CRITERIA WORKSHEET, BOARD OF GAME 1991

GMU: 23, Baird Mountains — Positive C & T Finding: 1989

SPECIES: Dall Sheep

COMMUNITIES: Noorvik, Kiana, Ambler, Shungnak, Kobuk, Kotzebue, Noatak.

1. LENGTH AND CONSISTENCY OF USE. Sheep bones dating from 900-1400 A.D. have been excavated from archeological sites in northwest Alaska. In the historic period, *Ihupiat* men spent summers on foot in the Brooks Range, hunting sheep and caribou. Sheep hunting declined in the 1940s when caribou began migrating further south and hunters no longer had to travel as far north to find them. Nevertheless, some men continued to hunt sheep. Today residents of the Kobuk River villages, Noatak, and Kotzebue hunt sheep in the Baird Mountains, though typically only a few men in each village do so. The harvest is believed to be small. For example, the upper Kobuk villages in sum probably take no more than 5-8 sheep per year throughout the unit. If caribou declined, sheep hunting might again increase.

2. SEASONALITY. In the past, sheep were primarily taken in summer by men on foot. This was the prime time for sheep hunting because the summer skins were ideal for parkas and inner clothing. Sheep were also occasionally taken in winter by men hunting and trapping in mountain areas. Contemporary sheep hunting occurs primarily in fall (August-September) and in winter and spring when snow conditions are good for traveling. In general, rams are preferred in fall before they rut; females are preferred in winter because rams get too skinny.

3. MEANS AND METHODS OF HARVEST. In the past, the *Ihupiat* walked into the mountains with their pack dogs in summer to hunt sheep. Sheep were stalked, snared, and killed with bows and arrows. Today sheep are hunted with the use of snowmachines, boats, airplanes, and rifles. Hunters look for sheep at mineral licks and at other places they are known to frequent. Nearly all sheep hunters hunt with snowmachines during months of snow cover, particularly in spring. Some hunters also charter airplanes in fall to reach sheep hunting areas. On the Noatak River, hunters take boats to the upper canyon where sheep can be found near the river. On rare occasions, Kobuk River hunters take boats up a Kobuk tributary as far as it is navigable, then walk to sheep hunting areas.

4. GEOGRAPHIC AREAS. Noatak and Kotzebue hunters take sheep in the upper Noatak Canyon, the Maiyumeraks, and the western Baird Mountains. Noorvik and Kiana sheep hunters use the Squirrel River headwaters and other areas in the western Baird Mountains. Upper Kobuk hunters take sheep in the eastern Bairds and Schwatka Mountains, though their primary sheep hunting area is on the north side of the Noatak headwaters. Noatak and Kotzebue hunters also use sheep hunting areas on the north side of the Noatak River.

5. MEANS OF HANDLING, PREPARING, PRESERVING, AND STORING. In the past, men dried sheep meat, then packed it back to their villages by foot or with pack dogs. Sheep skins were made into mukluks and mittens, and used as fancy parka trimming. The horns were carved into net sinkers and net meshing tools. Today sheep skin is still used for mittens and skin socks. Sheep horn is preferred to caribou antler for *ulu* handles because of its greater durability. Like caribou, sheep is best when served fresh; it is roasted, baked, or made into soup. It is also frozen for later use.

6. INTERGENERATIONAL TRANSMISSION OF KNOWLEDGE. Knowledge of terrain, timing, weather conditions, and survival techniques are skills that elders pass on to their younger providers. Young adult men accompany older men on sheep hunting trips.

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7. DISTRIBUTION AND EXCHANGE. Sheep meat is a delicacy, and particularly craved by elders who relied on the meat when they were younger and caribou were not available. Because sheep hunting areas are distant, the animals small, and the bag limits low, sheep meat is rarely plentiful. Nevertheless, successful sheep hunters share their catch as widely as possible, with many village households receiving a meal-sized chunk. Because of their obligations to share their harvest, sheep hunters have expressed interest in a higher bag limit.

8. DIVERSITY OF RESOURCES USED IN THE AREA. For coastal communities marine mammals are a primary source of food, whereas in inland communities whitefish, sheefish, salmon, caribou, and moose are central to the local diet. Subsistence studies have documented the current use of more than 100 different species of plants and animals in the area.

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EIGHT CRITERIA WORKSHEET, BOARD OF GAME 1991

GMU: 23, De Long Mountains — Positive C & T Finding: 1989

SPECIES: Dall Sheep

COMMUNITIES: Ambler, Shungnak, Kobuk, Kotzebue, Noatak, Kivalina, Point Hope.

1. LENGTH AND CONSISTENCY OF USE. Sheep bones dating from 900-1400 A.D. have been excavated from archeological sites in northwest Alaska. In the historic period, *Ihupiat* men spent summers on foot in the Brooks Range, hunting sheep and caribou. Sheep hunting declined in the 1940s when caribou began migrating further south and hunters no longer had to travel as far north to find them. Nevertheless, some men continued to hunt sheep. Today residents of the upper Kobuk, Noatak, Kivalina, Point Hope, and Kotzebue routinely hunt sheep in the DeLong Mountains, though typically only a few men in each village do so. The harvest is believed to be small. For example, the upper Kobuk villages in sum probably take no more than 5-8 sheep per year throughout the unit. If caribou declined, sheep hunting might again increase.

2. SEASONALITY. In the past, *Kuravanmiut* (upper Kobuk people) walked north over mountain passes to hunt sheep from July through September. In the coastal area, *Siuualik* men took walking trips for sheep and other game during July and August. This was the prime time for sheep hunting because the summer skins were ideal for parkas and inner clothing. Sheep were also occasionally taken in winter by men hunting and trapping in mountain areas. Contemporary sheep hunting primarily occurs from August through April. In Kivalina, sheep are occasionally killed in early summer when they wander down to coastal cliffs. In general, rams are preferred in fall before they rut; females are preferred in winter because rams get too skinny.

3. MEANS AND METHODS OF HARVEST. In the past, the *Ihupiat* walked into the mountains with their pack dogs in summer to hunt sheep. Sheep were stalked, snared, and killed with bows and arrows. Today sheep are hunted with the use of snowmachines, boats, airplanes, and rifles. Hunters look for sheep at mineral licks and at other places they are known to frequent. Nearly all sheep hunters hunt with snowmachines during months of snow cover, particularly in spring. Some hunters also charter airplanes in fall to reach sheep hunting areas. On the Noatak River, hunters take boats to places where mountains come close to the river, then walk to sheep hunting areas.

4. GEOGRAPHIC AREAS. Kivalina and Point Hope hunters take sheep in winter in the Wulik Peaks area; occasionally they take sheep in summer near Cape Thompson. Noatak and Kotzebue hunters take sheep in fall in the upper Noatak Canyon and in the Poktovik Mountains. Noatak hunters also use the Kelly, Kugururok, and Niminktuk drainages for sheep hunting. Upper Kobuk residents hunt sheep in fall and winter on the north side of the Noatak River in the Douglas and Midas Creek areas. All these areas are north or west of the Noatak River. Areas south of the Noatak River are also used by Noatak, Kotzebue, and occasionally upper Kobuk sheep hunters.

5. MEANS OF HANDLING, PREPARING, PRESERVING, AND STORING. In the past, men dried sheep meat, then packed it back to their villages by foot or with pack dogs. Sheep skins were made into mukluks and mittens, and used as fancy parka trimming. The horns were carved into net sinkers and net meshing tools. Today sheep skin is still used for mittens and skin socks. Sheep horn is preferred to caribou antler for *ulu* handles because of its greater durability. Like caribou, sheep is best when served fresh; it is roasted, baked, or made into soup. It is also frozen for later use.

6. INTERGENERATIONAL TRANSMISSION OF KNOWLEDGE. Knowledge of terrain, timing, weather conditions, and survival techniques are skills that elders pass on to their younger providers. Young adult men accompany older men on sheep hunting trips.

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7. DISTRIBUTION AND EXCHANGE. Sheep meat is a delicacy, and particularly craved by elders who relied on the meat when they were younger and caribou were not available. Because sheep hunting areas are distant, the animals small, and the bag limits low, sheep meat is rarely plentiful. Nevertheless, successful sheep hunters share their catch as widely as possible, with many village households receiving a meal-sized chunk. Because of their obligations to share their harvest, sheep hunters have expressed interest in a higher bag limit.

8. DIVERSITY OF RESOURCES USED IN THE AREA. For coastal communities marine mammals are a primary source of food, whereas in inland communities whitefish, sheefish, salmon, caribou, and moose are central to the local diet. Subsistence studies have documented the current use of more than 100 different species of plants and animals in the area.

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EIGHT CRITERIA WORKSHEET, BOARD OF GAME 1989

GMU: 24 Positive C&T Finding: 1989

SPECIES: Dall Sheep

ALASKA RESIDENTS USING THE SPECIES: Unit 24 communities: Anaktuvuk Pass, Allakaket, Alatna, Wiseman, Bettles and Evansville.

1. **LENGTH AND CONSISTENCY OF USE** (long-term, consistent, excluding interruptions by circumstances beyond the user's control):

Residents of these communities have long-term and consistent use of sheep in GMU 24. Historical use by Anaktuvuk Eskimos and Koyukuk Natives is well document in several ethnographic accounts.

2. **SEASONALITY** (recurring in specific seasons of each year):

Traditionally sheep were hunted throughout the year, but were considered most desirable to take in the fall time when in prime condition.

3. **MEANS AND METHODS OF HARVEST** (efficient, economic, conditioned by local circumstances):

Koyukuk River residents use boats for travel up the Alatna and John rivers to access sheep hunting areas. Once in the area, considerable hiking is required. Access by Wiseman residents since 1960 has included aircraft. Knowledge of sheep concentrations and travel routes is used by the hunters and sheep are often approached from upslope.

4. **GEOGRAPHIC AREAS** (near or reasonably accessible for the user's residence):

The Brooks Range Mountains in the Alatna River and John River drainages are used today by Allakaket, Alatna, and Bettles residents. Historically the upper Noatak River and Kobuk River drainages were also used. Anaktuvuk Pass residents hunt sheep from the headwaters of the Anaktuvuk River westward to Chandler Lake.

5. **MEANS OF HANDLING, PREPARING, AND STORING** (traditionally used by past generations, but not excluding recent technological advances):

Sheep meat is eaten fresh, or preserved by freezing.

6. **INTERGENERATIONAL TRANSMISSION OF KNOWLEDGE, SKILLS, VALUES, AND LORE** (handed down between generations):

Knowledge and skills handed down primarily by participation in hunting and processing activity. Allakaket and Alatna hunters travel to the mountains if groups of 6 to 10, with both young adult males and elders, in trips where few store-bought provisions are carried and direct reliance on available resource is stressed.

7. **DISTRIBUTION AND EXCHANGE** (customary trade, barter, sharing, and gift giving within a definable community of persons):

Sheep meat is shared among households, primarily through the extended family.

8. DIVERSITY OF RESOURCES IN AN AREA; ECONOMIC, CULTURAL, SOCIAL, AND NUTRITIONAL ELEMENTS (wide diversity, substantial elements in a subsistence user's life):

GMU 24 is heavily used for a wide variety of resources by local residents. These include moose, salmon, caribou, black bear, small game, sheefish, and whitefish. Some Koyukuk River communities display among the highest per capita harvest outputs in the state.

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EIGHT CRITERIA WORKSHEET, BOARD OF GAME, MARCH 1991

SPECIES: Dall Sheep — Positive C&T finding: 1989

GMU/SUBUNIT: GMU 24 Central Brooks Range - that portion within Gates of the Arctic National Park and the John River drainage

and

GMU 24 Eastern Brooks Range - that portion outside Gates of the Arctic National Park and the John River drainage

ALASKA RESIDENTS USING THE SPECIES: Local community residents: Anaktuvuk Pass, Wiseman, Bettles/Evansville, Alatna, Allakaket, Hughes. Dall sheep are also used by local residents outside established communities and by other state residents.

1. **LENGTH AND CONSISTENCY OF USE** (long-term and consistent, excluding interruptions by circumstances beyond the user's control)

   Historic uses: Residents of these communities have used sheep consistently over a great period of time. Historical use by Anaktuvuk Eskimos and Koyukon Athabaskans along the Koyukuk River drainage is well documented in several ethnographic accounts. First hand accounts of sheep hunting by local residents dating back to 1912 can also be found (Nictune 1980).

   Contemporary use: Dall sheep are harvested by residents of all area communities. In 1973, an estimated 15 sheep were harvested by Anaktuvuk Pass hunters, 10 by Allakaket and Alatna, and 5 by Bettles/Evansville (Nelson 1982). In 1982, sheep hunting continued to play a role in local harvest activities (Marcotte and Haynes 1985). At least three sheep were taken by Wiseman residents in 1984. Harvest fluctuate year to year dependent on the sheep availability and weather and travel conditions in the area.

2. **SEASONALITY** (recurring in specific seasons of each year)

   Traditionally sheep were hunted primarily from late summer through the fall, a time when the prime condition of the animals made them most desirable for harvest.

3. **MEANS AND METHODS OF HARVEST** (efficient, economic, conditioned by local circumstances)

   Koyukuk River residents use boats for travel up the Alatna and John Rivers to access sheep hunting areas. Once in the area, considerable hiking is required. Access by Wiseman residents since 1960 has included aircraft. Knowledge of sheep concentrations and travel routes is used by the hunters and sheep are often approached from upslope.

   During late summer and fall some sheep hunting areas are accessed with aid of all terrain vehicles in the upper John River drainage near Anaktuvuk Pass.

4. **GEOGRAPHIC AREAS** (near or reasonably accessible from the user's residence)

Historic uses: Brooks Range mountains in the Alatna River and John River drainages were used by Allakaket, Alatna, and Bettles area residents. The upper Noatak River and Kobuk River drainages were also used. Anaktuvuk Pass residents have hunted sheep from the headwaters of the Anaktuvuk River westward to Chandler Lake. Wiseman residents in 1930 sought sheep within 100 miles of Wiseman (Marshall 1933).

Contemporary use: The general area where residents of Bettles, Allakaket, and Hughes hunt sheep incorporates much of Koyukuk River drainage, including the Alatna River and John River drainages. Anaktuvuk Pass sheep harvest areas in recent times indicated that a large area is needed to support this community (Pedersen 1979). In 1984, Wiseman residents indicated sheep hunting in the North Fork of the Koyukuk River, the Hammond River, and in the Chandalar River drainage. These areas lie within GMU 24 west of the Dalton Highway or in GMU 25.

The Dalton Highway Corridor Management Area, which closes hunting with firearms within five miles of the Dalton Highway affects local hunting opportunity for Wiseman and Coldfoot residents.

5. **MEANS OF HANDLING, PREPARING, PRESERVING, AND STORING** (traditionally used by past generations, but not excluding recent technological advances)

Sheep meat is eaten fresh, or preserved by freezing. Traditionally, sheep in excess of an amount that can be hauled in one trip was cached for later transport. Meat in access of what was eaten fresh was frozen of dried. Hides weren used in making winter clothing.

Contemporary use: There has been very little change in how sheep are handled today. Sheep meat is preserved by drying and freezing and cooked in a variety of ways such as roasting, boiling and in soups and stews.

6. **INTERGENERATIONAL TRANSMISSION OF KNOWLEDGE, SKILLS, VALUES, AND LORE** (handed down between generations)

Knowledge and skills associated with all aspects of sheep hunting and use is learned through participant observation. Family members accompany hunting trips at an early age and are shown by example the proper ways to care for the products of the hunt.

Allakaket and Alatna hunters travel to the mountains if groups of 6 to 10, with both young adult males and elders, in trips where few store-bought provisions are carried and direct reliance on available resource is stressed.

Traditional management practices, which include an ethic of avoiding waste, were strongly emphasized in traditional values. The Koyukon and Inupiat continue to observe a general respect for all animals which are relied upon.

7. **DISTRIBUTION AND EXCHANGE** (customary trade, barter, sharing, and gift giving within a definable community of persons.)

Sheep meat is highly prised and is shared among the hunting party and subsequently with the family and the community.

8. **DIVERSITY OF RESOURCES IN AN AREA; ECONOMIC, CULTURAL, SOCIAL, AND NUTRITIONAL ELEMENTS** (wide diversity, substantial elements in a subsistence user's life)

A wide variety of resources is used by local residents. These include moose, salmon, caribou, black bear, small game, sheefish, and whitefish. In 1982 and 1983, Koyukuk River communities display among the highest wild food harvest levels in the state, with per capita annual harvest levels:

Hughes:	1,498 pounds
Huslia:	1,082
Allakaket/Alatna:	909
Bettles/Evansville:	260

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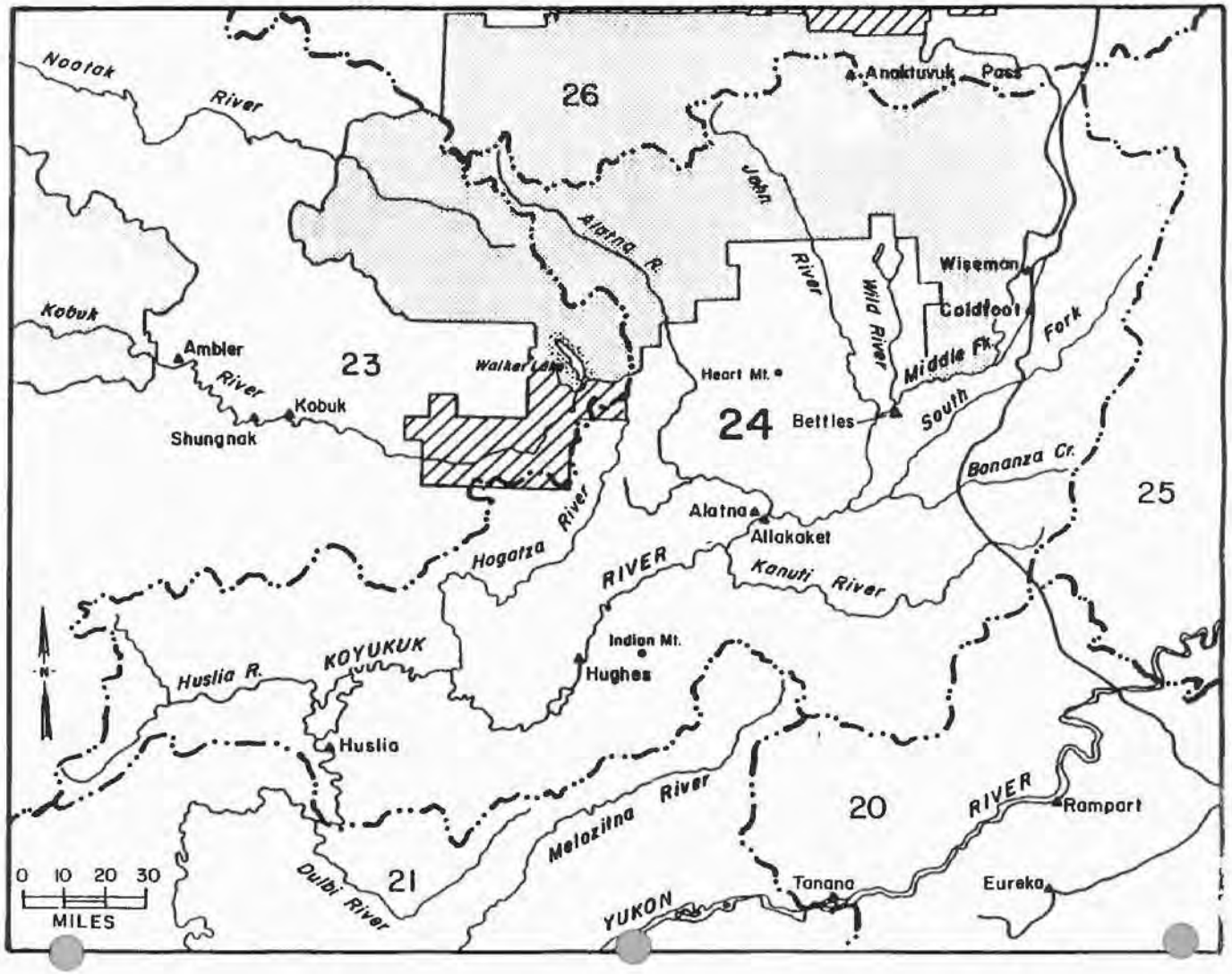
Nootak
River
26
Anaktuvuk Pass
John
River
Alatna R.
Wiseman
Wild River
Coldfoot
Middle Fk.
Fork
Kobuk
Ambler
River
23
Walker Lake
Heart Mt.
24
Bettles
South
Kobuk
Shungnak
Bonanza Cr.
25
Alatna
Allakaket
Hogatza River
RIVER
Kanuti River
Indian Mt.
Hughes
KOYUKUK
Huslia R.
Huslia
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RIVER
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Dulbi River
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Tanana
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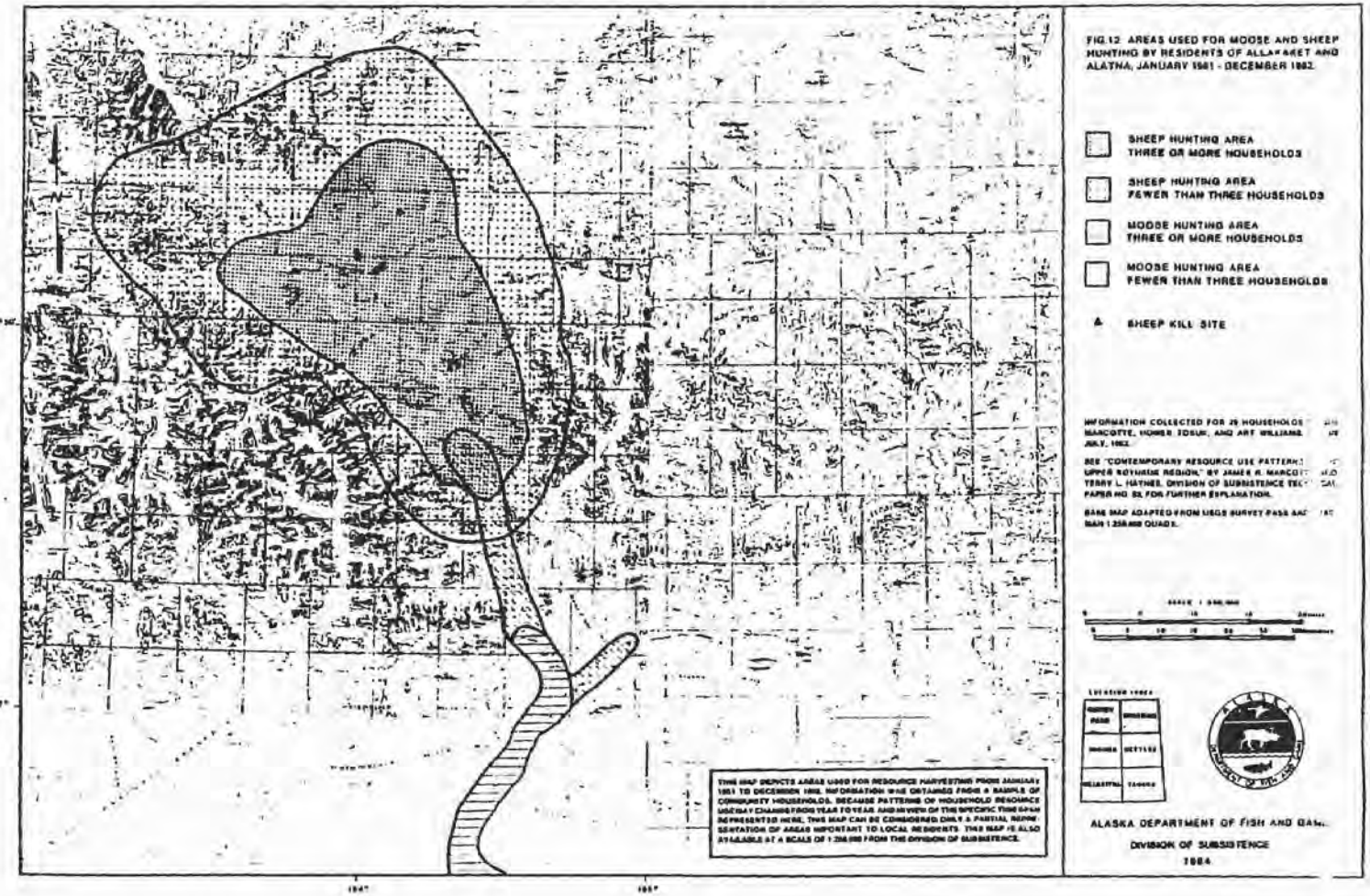

FIG.12 AREAS USED FOR MOOSE AND SHEEP HUNTING BY RESIDENTS OF ALLAKAKET AND ALATNA, JANUARY 1981 - DECEMBER 1982.

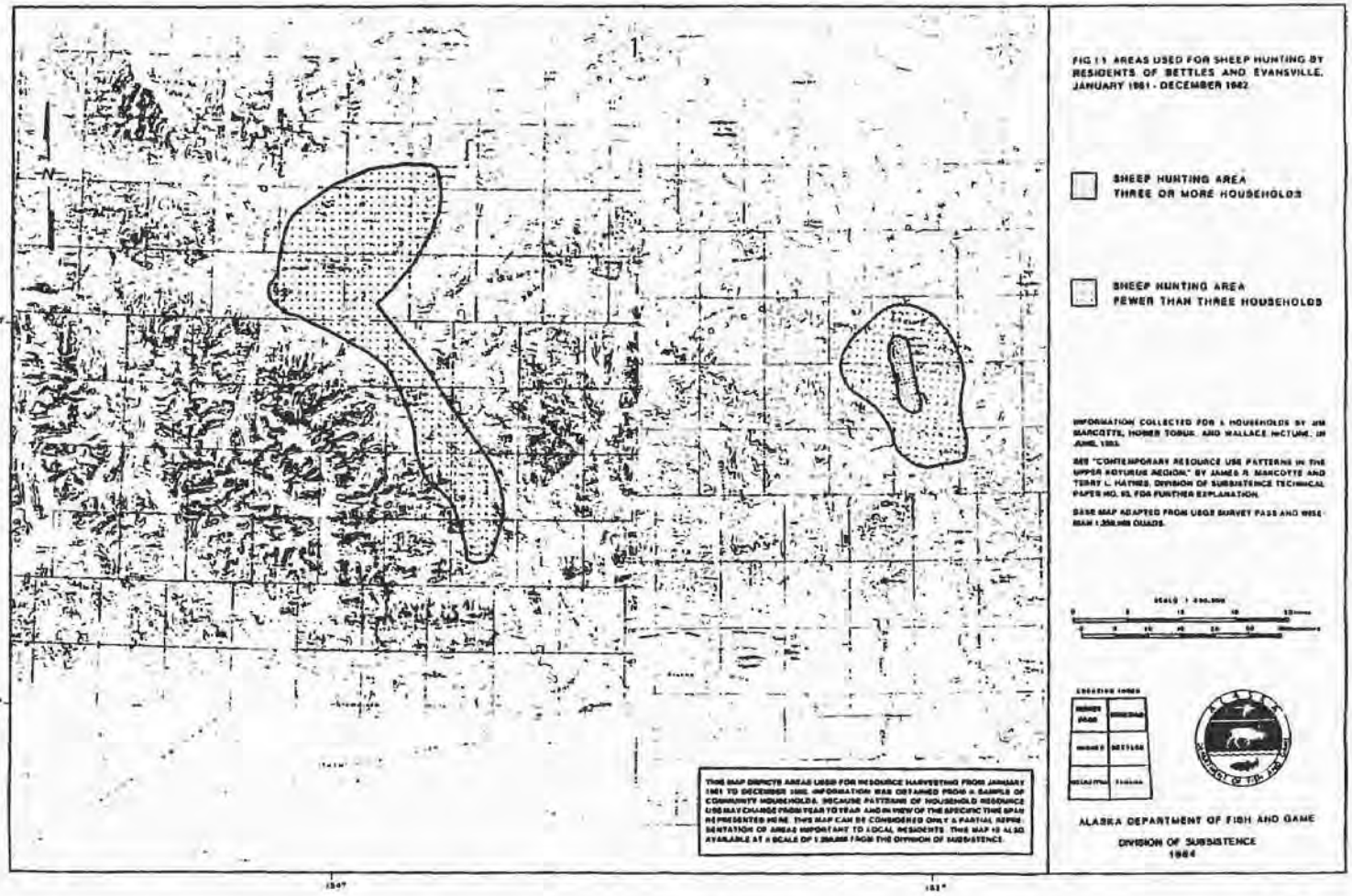

FIG. 11 AREAS USED FOR SHEEP HUNTING BY RESIDENTS OF BETTLES AND EVANSVILLE, JANUARY 1981 - DECEMBER 1982

EIGHT CRITERIA WORKSHEET, BOARD OF GAME 1991

GMU: 26A, B, and C Positive C&T Finding: 1987

SPECIES: Dall Sheep

ALASKA RESIDENTS USING THE SPECIES: Local use is by residents ofAnaktuvuk Pass and Kaktovik, but significant non-local use is known to occur in GMU 26B and 26C.

1. **LENGTH AND CONSISTENCY OF USE** (long-term, consistent, excluding interruptions by circumstances beyond the user's control):

Sheep are an important terrestrial resource firmly rooted in the seasonal round of resource harvesting in Anaktuvuk Pass and Kaktovik. Recent mapping of resident resource harvest areas for the two communities indicate that sheep are taken within GMU 26A, B, and C. Historically residents of the central and eastern arctic Alaska are known to have harvested sheep in many parts of GMU 26.

2. **SEASONALITY** (recurring in specific seasons of each year):

Anaktuvuk Pass and Kaktovik sheep hunters normally harvest sheep in late fall (late Oct. through late Nov.) and in early spring (March) in conjunction with caribou and furbearer hunting. This seasonal round has been in effect for some time and is deeply engrained in local hunt planning.

3. **MEANS AND METHODS OF HARVEST** (efficient, economic, conditioned by local circumstances):

Sheep hunting is a community activity, where extended family groups often travel travel and hunt together. All sheep hunting is by snowmachine or ATV, and is often carried out from established hunting camps near productive harvest sites.

4. **GEOGRAPHIC AREAS** (near or reasonably accessible from the user's residence):

Sheep harvest sites are within easy snowmachining or ATV distance of the community. Sheep hunting sites used by Kaktovik hunters in GMU 26 extend from the U.S - Canada boundary (GMU 26C) to the upper Canning River drainage (GMU 26B). Anaktuvuk Pass sheep hunters are known to use sheep hunting sites from Itkillik Lake (GMU 26b) to the Killik River (GMU 26A).

5. **MEANS OF HANDLING, PREPARING, AND STORING** (traditionally used by past generations, but not excluding recent technological advances):

Sheep are quartered in the field, and brought back to the community for final processing and distribution. Sheep meat is eaten fresh, or preserved by freezing; some is processed into dried meat.

6. **INTERGENERATIONAL TRANSMISSION OF KNOWLEDGE, SKILLS, VALUES, AND LORE** (handed down between generations):

Hunting skills and knowledge are conveyed through participation in hunting and processing. Important principles of resource conservation such as avoiding overharvests and waste are emphasized in local values and lore, handed down from community elders.

7. **DISTRIBUTION AND EXCHANGE** (customary trade, barter, sharing, and gift giving within a definable community of persons):

Sheep meat is shared widely in the communities, and often comprises a significant part of the community meal prepared during Thanksgiving and Christmas. Some sheep meat is shared with extended family in other North Slope communities.

8. **DIVERSITY OF RESOURCES IN AN AREA; ECONOMIC, CULTURAL, SOCIAL, AND NUTRITIONAL ELEMENTS** (wide diversity, substantial elements in a subsistence user's life):

A wide variety of local resources are harvested by Anaktuvuk Pass and Kaktovik residents, including caribou, moose, marine mammals, birds, and fish. Sheep are considered a significant component of the local resource economy, and though not harvested at a high rate every year, they are considered "money in the bank" for years when main resource harvest of caribou (Anaktuvuk Pass) or bowhead whale (Kaktovik) are less than optimum.

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97-116-BOG
Findings of the Alaska Board of Game on Dall Sheep Management
in the Western Brooks Range

The Board of Game considered information on the management and use of Dall sheep in the western Brooks Range contained in reports from the Division of Wildlife Conservation, the Division of Subsistence and public testimony at its meeting in Nome, Alaska. Based on this information the Board makes the following findings.

1. Dall sheep in the western Books Range occur in three populations: the DeLong Mountains in Game Management Units 23 and 26A west of the Etivluk River, the Baird Mountains in Game Management Unit 23 and the Schwatka Mountains in Game Management Units 23, 24 and 26A east of the Etivluk River.

2. The amount necessary to provide for subsistence use of Dall sheep in the DeLong Mountains is 0 to 9 sheep per year.

3. The amount necessary to provide for subsistence use of Dall sheep in the Baird Mountains is 18 to 47 sheep per year.

4. The amount necessary to provide for subsistence use of Dall sheep in Game Management Unit 23 and Game Management Unit 26A portions of the Schwatka Mountains is 2 to 4 sheep per year.

5. The harvest of Dall sheep in the western Brooks Range should be allocated according to the following model, developed for game populations with Customary and Traditional (C&T) uses and a variable harvestable surplus:

a. If the harvestable surplus is less than the minimum necessary for subsistence purposes, the department may issue Tier II subsistence permits and apply conditions to the hunt consistent with the C&T use pattern.

b. If the harvestable surplus is between the minimum and maximum necessary for subsistence purposes, the department may issue subsistence registration permits and apply conditions to the hunt consistent with the C&T use pattern.

6. Applying this model to sheep of the Western Brooks Range results in the following determinations:

a. The harvestable surplus of sheep in the DeLong and Baird Mountains is variable. When the harvestable surplus is sufficient to allow subsistence harvest in either population, the department may issue subsistence registration permits. The conditions of the permits shall prohibit use of aircraft. (In deference to the request of subsistence users, no harvest will be allowed if the harvestable surplus is below the minimum necessary for subsistence.)

b. Because the harvestable surplus in the Schwatka Mountains substantially exceeds the demand for both C&T use and general hunting, the department may allow general hunting under authority of harvest tickets.

c. When the harvestable surplus in these populations is greater than the maximum amount necessary to provide for subsistence use, the department may issue general drawing permits to harvest the number of sheep in excess of that amount.

Larry Holmes

Larry Holmes, Chair
Alaska Board of Game

Date: 11/16/97
Anchorage, Alaska

Vote: 6-0-1
Absent: Fleagle