

Special Publication No. BOG 2020-04

Customary and Traditional Use of Ptarmigan in Game Management Unit 19

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**Alaska Department of Fish and Game, Division of Subsistence
for the March 2020 Board of Game meeting**

January 2020

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 Division of Subsistence reports. All others, including deviations from definitions listed below, are noted in the text at first mention, in the titles or footnotes of tables, and in figures 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

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

General

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

Measures (fisheries)

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

Mathematics, statistics

<i>all standard mathematical signs, symbols and abbreviations</i>	
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 ₀
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance:	
population	Var
sample	var

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MANAGEMENT UNIT 19**

by

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January 2020

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

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This document should be cited as:

Runfola, D.M. and L. Naaktgeboren. 2020. Customary and traditional use of ptarmigan in Game Management Unit 19. Alaska Department of Fish and Game, Division of Subsistence Special Publication No. BOG 2020-04, Fairbanks.

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ABSTRACT

This worksheet was prepared for the Alaska Board of Game (Board) as background for consideration of changes to the harvest regulations for ptarmigan (*Lagopus* spp.) in Alaska's Game Management Unit 19. This worksheet presents the eight criteria that the Board is required to consider under Joint Board of Fisheries and Game regulations (5 AAC 99.010) in order to identify wildlife stocks that are customarily and traditionally taken or used by Alaska residents for subsistence.

Key words: Willow ptarmigan, *Lagopus lagopus*, rock ptarmigan, *L. muta*, white-tailed ptarmigan, *L. leucura*, Interior Alaska, Western Alaska, Board of Game.

INTRODUCTION

The Alaska Board of Game (Board) has not made a determination as to whether there are customary and traditional uses (C&T) of ptarmigans in Game Management Unit 19 (Unit 19) pursuant to Alaska Statute 16.05.258. As a result, the Alaska Department of Fish and Game (the department) has prepared this C&T worksheet for the Board's consideration of Proposal 118 at its March 2020 meeting in Fairbanks. Ptarmigan species (hereinafter *ptarmigan*) with a normal range that comprises Unit 19 include willow ptarmigan *Lagopus lagopus*, rock ptarmigan *L. muta*, and white-tailed ptarmigan *L. leucura*. This worksheet presents the eight criteria that the Board is required to consider under Joint Board of Fisheries and Game regulations (5 AAC 99.010) in order to identify wildlife stocks that are customarily and traditionally taken or used by Alaska residents for subsistence.

This customary and traditional use summary for ptarmigan in Unit 19 provides a description of customary and traditional harvest and use practices, including quantitative harvest and use survey data and qualitative information from the ethnographic and ethnohistorical literature of this region of Western and Interior Alaska, including publications of research completed by the department. Quotations related to customary and traditional uses of ptarmigan from the literature and department key respondent interviews are also included in this report where appropriate. Twelve permanent communities are located within Unit 19. Since study year 2007, the department has conducted comprehensive surveys in a census or sample of households in each of these communities (Figure 1; Table 1), including Lime Village (study year 2007; Holen and Lemons 2010); Lower Kalskag, Upper Kalskag, Aniak, Chuathbaluk, Crooked Creek, Red Devil, Sleetmute, and Stony River (2009; Brown et al. 2012); and McGrath, Takotna, and Nikolai (2011; Ikuta et al. 2014). Many of these communities have also been surveyed intermittently since 2004 by the department as part of the Alaska Migratory Bird Co-management Council's (AMBCC) migratory bird subsistence survey project (Naves and Keating 2019). Harvest estimates from AMBCC surveys are not reported on a community basis but rather as total harvests for various regions and subregions throughout Alaska. Unit 19 communities are within the AMBCC Central Kuskokwim subregion of the Yukon-Kuskokwim Delta region and the Mid Yukon-Upper Kuskokwim subregion of the Interior Alaska region.

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.

The department and other ethnographers have documented the history of middle and upper Kuskokwim River¹ residents' harvest and use of ptarmigan (Hosley 1966; Russell and West 2003; Zagoskin 1967). Ptarmigan are an important food source, especially in winter months, when other sources of wild foods may occasionally be scarce or nonexistent. Subsistence ptarmigan harvest and use data from household surveys in Unit 19 appear in Table 1. Data from AMBCC household surveys conducted throughout all regions of Alaska are presented in Table 2.

Names for various species in the region's indigenous languages indicate the presence, if not significance, of these animals in local cultures' knowledge and awareness of their ecological community. Residents of Unit 19 use various local names for ptarmigan species in the area. Some historical ethnographic texts that include descriptions of ptarmigan in the middle Kuskokwim River region refer to ptarmigan as partridge or white grouse (see Zagoskin 1967). In Central Yup'ik the generic name for ptarmigan is *qangiiq*; however, willow ptarmigan is *aqesgiq*, and rock ptarmigan is *elciayuli* (Charnley 1984; Jacobson 2012). Upper

1. Hereinafter, middle Kuskokwim River communities include all those within GMU 19A, and upper Kuskokwim River communities include those of GMU 19D (Figure 1).

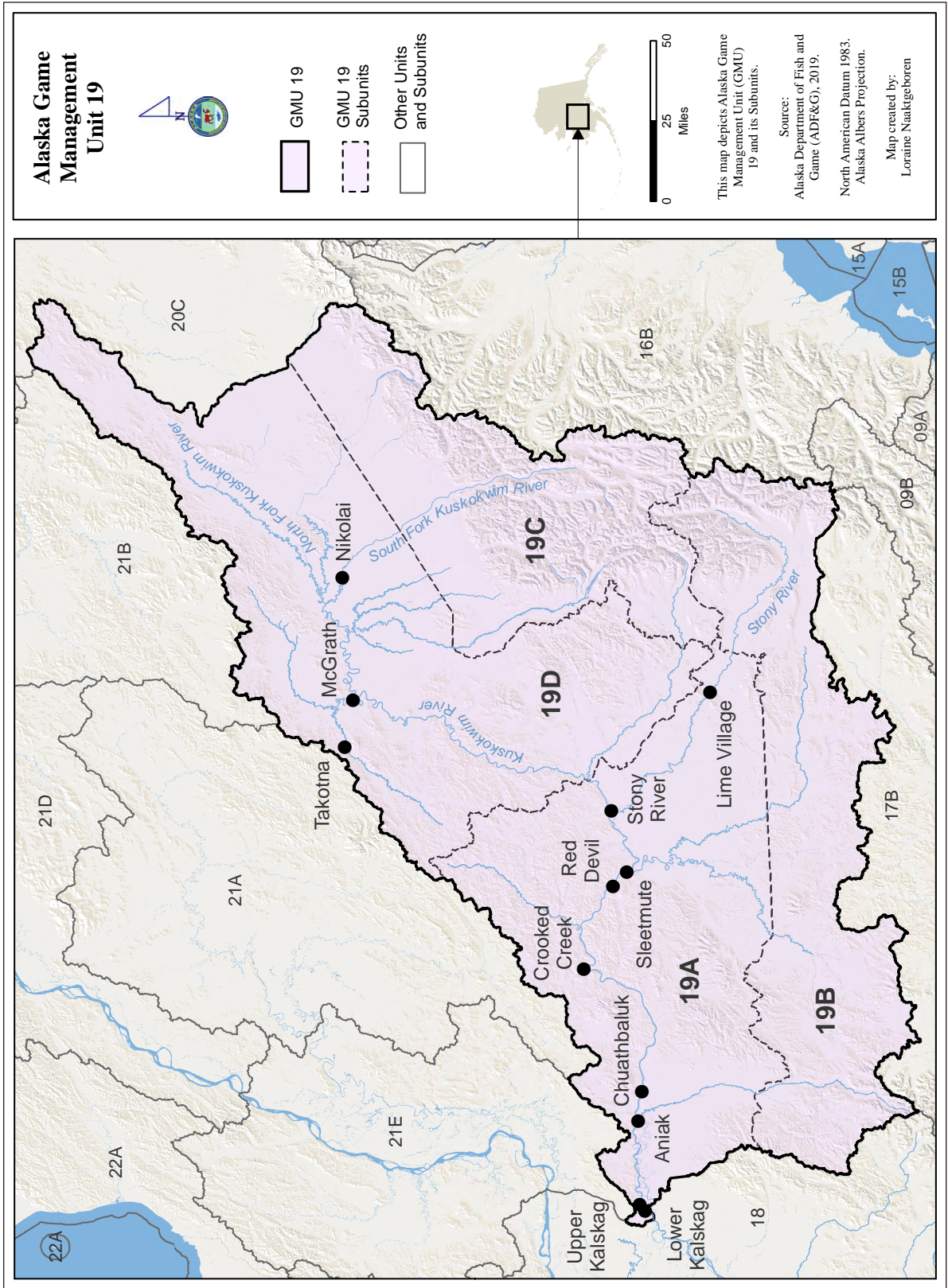


Figure 1.—Alaska Game Management Unit 19.

Table 1.–Harvest and use of ptarmigan, GMU 19, 2002–2011.

Community	Study year	Percentage of households					Estimated harvest			
		Using	Attempting harvest	Harvesting	Receiving	Giving away	Per household (lb)	Per capita (lb)	Per community (individual)	95% CI (+/-)
Aniak	2009	11.3%	11.3%	9.2%	2.1%	2.1%	0.6	0.2	104.0	24.0%
Chuathbaluk	2009	20.0%	20.0%	16.7%	3.3%	6.7%	1.2	0.4	44.0	39.0%
Crooked Creek	2009	6.1%	6.1%	6.1%	0.0%	3.0%	0.4	0.1	16.0	67.0%
Lime Village	2007	28.6%	28.6%	14.3%	14.3%	0.0%	0.8	0.3	13.0	34.0%
Lower Kalskag	2009	27.0%	27.0%	20.6%	7.9%	4.8%	1.2	0.3	92.0	26.0%
McGrath	2011	10.2%	13.9%	10.2%	0.9%	1.9%	0.7	0.3	95.8	35.1%
Nikolai	2002	11.1%	11.1%	11.1%	0.0%	7.4%	1.1	0.4	51.0	11.0%
Nikolai	2011	26.9%	30.8%	26.9%	3.9%	3.9%	2.0	0.7	78.0	43.8%
Red Devil	2009	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0%
Sleetmute	2009	3.1%	3.1%	3.1%	0.0%	0.0%	0.1	0.1	5.0	75.0%
Stony River	2009	25.0%	25.0%	25.0%	8.3%	8.3%	3.9	1.2	78.0	116.0%
Takotna	2011	21.4%	21.4%	21.4%	0.0%	0.0%	4.9	2.1	106.9	96.4%
Upper Kalskag	2009	39.6%	39.6%	27.1%	12.5%	16.7%	2.5	0.7	151.0	35.0%

Source ADFG Division of Subsistence Community Subsistence Information System (CSIS), accessed October 2019.

Kuskokwim Athabascan names include *dilgima* (willow ptarmigan or ptarmigan in general), and *k'ots'ima* (rock ptarmigan; Collins and Petruska 1979; Stokes 1985). The Deg Hit'an Athabascan name for willow ptarmigan is *q'iyaldal* (Kari 1985). Dena'ina Athabascan speakers refer to willow ptarmigan as *q'ach'ema*, to rock ptarmigan as *jel q'ach'ema*, and to white-tailed ptarmigan as *qatsinlggat* or *ch'etl'* (Russell and West 2003).

Department household surveys have documented historical harvests of ptarmigan in Aniak, Crooked Creek, and Red Devil for the period 1964–1986 (Brelsford et al. 1987), in seven middle Kuskokwim River communities in 1979 (Stickney 1981), in Chuathbaluk and Sleetmute for 1982–1983 (Charnley 1984), and in Stony River village for 1983–1984 (Kari 1985). Ptarmigan harvests were also estimated in Nikolai for 1984 (Stokes 1985) and for 2001–2002 (Holen et al. 2006). Subsistence surveys for study years 2007, 2009, and 2011 recorded harvests of ptarmigan in nearly all Unit 19 communities. The average annual ptarmigan harvest in Unit 19 for these study years was approximately two pounds per household (Brown et al. 2012; Holen and Lemons 2010; Ikuta et al. 2014). In 2009, Unit 19 residents also reported using ptarmigan eggs that were given to them by other households (Brown et al. 2012).

CRITERION 2: SEASONALITY

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

Ptarmigan are present in Unit 19 year-round; however, people in the area traditionally hunted the birds in winter through spring (Kari 1985; Russell and West 2003; Stickney 1981; Stokes 1985). Contemporary hunters primarily harvest ptarmigan through mid-winter and spring as well (Brown et al. 2012; Ikuta et al. 2014; Stokes 1985). Appendix A shows figures that illustrate the role of ptarmigan hunting in the overall annual seasonal round of subsistence activities for a variety of communities in Unit 19.

In 1986, key respondents interviewed by the department in Aniak, Crooked Creek, and Red Devil were asked to describe their typical round of seasonal activities related to hunting, fishing and gathering of wild foods from 1964–1986 (Brelsford et al. 1987). They indicated that ptarmigan were primarily hunted October through March in Aniak, October through February in Crooked Creek, and September through November in Red Devil (Brelsford et al. 1987). Crooked Creek hunters also described opportunistically hunting for small game, including ptarmigan, during fall moose hunting trips (Brelsford et al. 1987; Ikuta et al. 2014; Stokes 1985). Ptarmigan are not consistently present in significant numbers near Unit 19 communities or in the areas where residents typically travel. However, some ptarmigan will migrate closer to communities and into riparian habitat in winter months, and residents will hunt them then (Brelsford et al. 1987; Kari 1985; Russell and West 2003; Stokes 1985).

Table 2.–Harvest of ptarmigan by region, Alaska, 2004–2017.

Regions, subregions	Ptarmigan harvest estimates (number of birds/year)												2004–2015 mean		2016		2017	
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	mean	mean	2016	2017		
Gulf of Alaska-Cook Inlet	0	*	*	*	-	-	-	*	-	-	-	*	0	*	0	*		
Gulf of Alaska Villages	0	-	0	-	-	-	0	-	-	-	-	-	0	0	-	-		
Cordova	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Cook Inlet	0	0	-	-	-	-	-	-	-	-	-	-	0	-	-	-		
Kodiak Archipelago	-	-	*	-	-	-	3,761	-	-	-	-	*	3,761	3,761	-	-		
Kodiak Villages	-	-	51	-	-	-	165	-	-	-	-	51	165	108	-	-		
Kodiak City & Road-connected	-	-	*	-	-	-	3,596	-	-	-	-	-	3,596	3,596	-	-		
Aleutian-Pribilof Islands	-	*	-	*	2,055	-	-	-	-	-	-	-	2,055	2,055	-	-		
Aleutian-Pribilof Villages	-	1,591	-	0	1,829	-	-	-	-	-	-	1,140	1,140	1,140	-	-		
Unalaska	-	-	-	-	226	-	-	-	-	-	-	226	226	226	-	-		
Bristol Bay*	8,269	*	3,441	7,893	-	-	-	13,031	-	-	-	-	6,534	13,031	8,159	767		
South Alaska Peninsula	127	-	245	27	-	-	-	664	-	-	-	-	133	664	266	*		
Southwest Bristol Bay	2,862	6,117	7,928	2,033	7,057	-	-	12,128	-	-	-	-	5,199	12,128	6,354	*		
Dillingham	-	1,663	-	1,263	809	-	-	239	-	-	-	-	1,245	239	994	*		
Yukon-Kuskokwim Delta*	10,658	15,098	20,433	5,196	4,667	22,946	13,833	13,272	-	*	-	9,928	13,166	12,344	12,892	6,359		
Y-K Delta South Coast	2,362	2,857	3,149	142	1,463	1,730	3,516	3,146	-	10,218	-	2,637	1,951	4,879	3,122	*		
Y-K Delta Mid Coast	2,402	3,343	9,351	2,218	1,099	12,110	5,697	3,637	-	9,860	-	3,401	5,087	5,312	*			
Y-K Delta North Coast	164	717	323	0	0	369	727	-	-	1,892	-	761	262	1,127	550	*		
Lower Yukon	519	129	41	0	0	196	110	-	-	456	-	884	148	483	259	*		
Lower Kuskokwim	5,212	1,656	7,080	2,787	997	6,798	3,556	3,469	-	11,455	-	850	4,088	4,833	4,386	*		
Central Kuskokwim	0	0	0	0	0	0	78	-	-	-	-	-	0	78	20	*		
Bethel	0	6,010	489	49	1,006	1,242	150	198	-	-	-	1,159	1,466	502	1,145	*		
Bering Strait-Norton Sound*	3,097	3,671	-	784	-	*	*	*	*	-	-	-	2,517	2,517	3,605	578		
St. Lawrence-Diomedes Is.	*	*	-	*	-	0	0	0	0	-	-	-	0	0	0	*		
Bering Strait Mainland Villages	*	*	-	*	-	689	-	-	-	-	-	-	*	689	689	*		
Nome	*	*	-	*	-	-	-	-	-	-	-	-	*	-	-	*		
Northwest Arctic	-	-	*	-	-	-	-	-	*	-	-	-	*	*	1,553	-		
Northwest Arctic Villages	-	-	123	-	-	-	-	-	-	-	-	-	123	-	123	-		
Kotzebue	-	-	-	-	-	-	-	-	1,430	-	-	-	-	1,430	1,430	-		
North Slope*	-	759	-	2,833	1,556	1,267	-	-	-	-	-	-	1,604	-	1,604	2,740		
North Slope Villages	-	*	-	*	*	*	*	*	-	-	-	-	*	*	*	*		
Barrow	-	*	-	*	*	*	*	*	-	-	-	-	*	*	*	*		
Interior Alaska*	1,405	*	923	*	*	-	678	-	-	-	*	-	1,164	678	1,002	440		
Mid Yukon-Upper Kuskokwim	0	14	0	-	-	-	0	-	-	-	-	-	5	0	4	*		
Yukon-Koyukuk	9	0	0	0	0	-	330	-	-	-	-	-	2	330	57	*		
Upper Yukon	32	-	105	46	-	-	148	-	-	227	-	-	61	188	112	*		
Tanana Villages	1,089	-	545	-	-	-	125	-	-	-	-	-	817	125	586	*		
Tok	-	-	273	-	-	-	75	-	-	-	-	-	273	75	174	*		
Upper Copper River	138	-	-	64	-	-	-	-	-	-	-	-	101	-	101	-		
Alaska (all regions)													32,456	37,644	33,644			
Five-regions index (regions included indicated by •)													24,986	30,174	26,174	13,911		

Source: Naves and Keating 2019.

Note - indicates that region or subregion not surveyed.

Note * indicates that harvest estimates not available at this geographic scale.

In his mid-19th century journals of travel in the Kuskokwim River region, Russian Imperial Army Lt. L. A. Zagoskin recorded local customs of ptarmigan hunting among people living near his station at Kolmakofsky Redoubt at the mouth of the Kolmakof River, between Chuathbaluk and Napaimute. Zagoskin described that each morning in winter boys and girls would routinely check snares set for ptarmigan (Zagoskin 1967). More recently, key respondents and household survey participants have described ptarmigan hunting in January through April in Chuathbaluk and Sleetmute (Charnley 1984), during winter in the upper Kuskokwim River region (Hosley 1966; Ikuta et al. 2014; Stokes 1985), and winter through early spring in the village of Stony River, particularly during wood gathering trips (Kari 1985). Hosley (1966) and Stokes (1985) each noted that upper Kuskokwim River hunters historically hunted ptarmigan throughout most months of the year, both as target species and opportunistically; however, the primary ptarmigan hunting months were June through November. Kari (1985) and Russell and West (2003) documented Stony River village and Lime Village key respondents explaining that they also hunted ptarmigan through most of the year traditionally, but refrained from hunting any birds, including ptarmigan, during the nesting and rearing season. Hosley (1966) recorded the practice of Nikolai and other upper Kuskokwim River residents harvesting ptarmigan in late fall and early winter after a snowfall and before their plumage changed completely from brown to white. In that setting, the birds stand out against the white background and are easy to hunt.

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.

Historically, people in the Western and Interior regions of Alaska harvested ptarmigan by using snares, nets, bows and arrows, and spears. People set ptarmigan snares made of spruce root cordage or rawhide with a wood anchor driven into the ground or tied to brush (Hosley 1966; Kari 1985; Zagoskin 1967). Oswalt and VanStone (1967) collected artifacts from an archaeological site dated to the mid- to late 19th century at Crow Village, which is located on the Kuskokwim River nine miles downstream of Aniak. At that site, researchers found carved wooden pieces identified as parts of snares that were used to harvest ptarmigan. At the same location, they also uncovered shaft fragments of spears and bow and arrow parts, all of which had been used for ptarmigan hunting, as described by key respondents who were consulted during the archaeological research. Oswalt and VanStone (1967) describe that upland game birds were historically hunted with a bow using arrows with blunt heads. They found

three blunt arrowheads... The first has a multifaceted tip which slopes [toward the shaft] to a long thin tang, while the second is broad and flat across the distal end and also slopes to a thin tang. The third is a spent rifle cartridge fitted over the end of a rounded shaft which slopes to a plain conical tang. The cartridge case is held in place with a crude metal rivet driven through both sides of the case and shaft.

Oswalt and VanStone (1967) also found wooden fragments of a small bow that, according to key respondents residing in the area, would have been used by a boy to hunt for birds such as ptarmigan. Key respondents distinguished the boy's bow from another smaller specimen at the Crow Village site which they identified as a child's toy.

Russell and West (2003) interviewed key respondents in Lime Village who explained that historically spruce root snares were often used to harvest ptarmigan. These were set in areas where the birds tended to rest, land, or feed, and hung on poles or branches at the height of a bird's neck. Hunters piled willows and other shrubs into approximately two-foot high horizontal rows or brush fences. In openings in the fence, they tied a snare to a stick at the height of a bird's neck. Alternatively, hunters attached a snare to bent branches, which allowed it to be set close to the surface of the ground to capture a bird by its feet. These snares were watched closely so a bird would be caught and killed quickly. Russell and West (2003) described other Lime Village ptarmigan-hunting techniques, such as using blunt tipped arrows made from birch. Other ptarmigan hunting weapons included slings, slingshots, and hand-thrown rocks. Lime Village hunters still occasionally use a slingshot made from a flexible, forked willow branch with a leather thong tied between the forks (Russell and West 2003). They would also traditionally hang fish nets in areas where ptarmigan

were known to feed or roost (Kari 1985; Russell and West 2003). If the birds appeared in the area, hunters would chase the ptarmigan into the nets to capture them. Other Lime Village key respondents also described catching ptarmigan by hand after creeping upon them from behind (Russell and West 2003).

Currently, many hunters in Unit 19 search for ptarmigan by snowmachine while traveling. Ptarmigan are harvested primarily with small gauge shotguns and .22 caliber rifles (Charnley 1984; Ikuta et al. 2014; Stokes 1985). Often hunters will look for ptarmigan roosting in trees at dawn and dusk (Kari 1985; Russell and West 2003). Hunters have also explained that they will typically harvest ptarmigan opportunistically, often while moose hunting, berry picking, or otherwise while outdoors within or near their communities (Charnley 1984; Ikuta et al. 2014).

CRITERION 4: GEOGRAPHIC AREAS

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

Hunters find ptarmigan roosting in willows, alders, or spruces, and on the ground throughout much of Western and Interior Alaska, including Unit 19. Hunters also find ptarmigan in tundra, upland, and alpine habitats. Areas closest to communities are most heavily used, but ptarmigan are taken opportunistically by hunters or trappers traveling throughout community harvest areas that are within Unit 19.

Aniak hunters have discussed searching for ptarmigan in riparian habitat, both on gravel bars and in higher ground on and above riverbanks, as well as in forested hills adjacent to the Kuskokwim River (Brelsford et al. 1987; Ikuta et al. 2014). Aniak respondents in 1986 also described hunting ptarmigan in the Kolmakof, Holukuk, and Oskawalik river drainages,² both historically and contemporaneously. Red Devil hunters have described searching for and harvesting ptarmigan in hills north of the community and across the Kuskokwim River, in lowlands in the vicinity of Red Devil, and on winter trapline trails (Brelsford et al. 1987). In 2011 in Nikolai, ptarmigan hunting occurred along the South Fork Kuskokwim River downstream from Nikolai, the North Fork Kuskokwim River, and the Salmon River (Ikuta et al. 2014). In 2011, Takotna and McGrath hunters harvested ptarmigan along roads in and around their communities often by four-wheeler or on foot within walking distance of their homes (Ikuta et al. 2014). McGrath hunters also discussed hunting ptarmigan while traveling by boat during moose hunts. Hunters explained that this occurs in sections of the Kuskokwim River from the mouth of the Stony River upstream to Medfra and in the North Fork Kuskokwim River approximately 30 to 40 miles upstream of Medfra. Nikolai hunters have also described opportunistically taking ptarmigan during fall moose, caribou, and Dall sheep hunts in the foothills of the Alaska Range: these harvests often include rock and white-tailed ptarmigan (Ikuta et al. 2014; Stokes 1985).

Willow ptarmigan is one of the three species that is likely to inhabit areas close to river corridors. Residents will hunt along riverbanks and in adjacent country in winter. Willow and occasionally rock ptarmigan seeking protection from high winds and deep snow will move out of tundra and high country and into lowlands and riparian habitat (Brelsford et al. 1987; Kari 1985; Russell and West 2003; Stokes 1985). Hunters will also travel to tundra habitat, often in higher country, to hunt ptarmigan in winter (Brelsford et al. 1987; Charnley 1984). Recent department research in Unit 19 communities recorded that ptarmigan search and harvest areas largely corresponded to the Kuskokwim River, its tributaries, and the land surrounding them. For example, hunting in 2009 and 2011 occurred in locations along the mainstem Kuskokwim River from Lower Kalskag as far upstream as the South Fork Kuskokwim River near Nikolai, and in several tributary rivers (Brown et al. 2012; Ikuta et al. 2014). Some hunting for ptarmigans also occurred closer to the Alaska Range south and east of Nikolai.

2. The Kolmakof, Holukuk, and Oskawalik rivers flow into the mainstem Kuskokwim River in the area between the communities of Chuathbaluk and Crooked Creek within Unit 19A.

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 advance where appropriate.

Ptarmigan are primarily used as food for human consumption. Now, as in the past, most ptarmigan are eaten fresh or frozen for later use. Because ptarmigan are taken primarily in winter, freezing is also a traditional preservation technique. Currently, many people keep frozen ptarmigan in electric freezers, but it is not uncommon to store ptarmigan frozen in sheds or Arctic entries for a few days or weeks at a time prior to consumption.

Stokes (1985) described upper Kuskokwim River hunters partially cleaning ptarmigan in the field, and that some people prefer plucking them while they are still warm, often while hunting, because the feathers are removed more easily than after the bird has chilled. Some hunters in McGrath would dip birds into hot wax and peel feathers off after the wax had solidified (Stokes 1985). Stokes also described that ptarmigan are gutted, the viscera are discarded, the gizzard is cleaned, and the birds are frozen or air-dried. Residents will eat legs, wings, breasts, back, neck, head, rump, heart, liver, and gizzard (Charnley 1984). Gizzards can be cleaned and consumed raw in emergencies. Ptarmigan are often boiled in soups, fried, or baked. Russell and West (2003) explained that Lime Village residents will cook ptarmigan in soups or roast them on a stick over a campfire. They typically eat the entire bird except for the feathers, bones, crop, feet, and intestines; however, feathers will sometimes be saved to be used as filling for bedding and clothing. Residents will also dry and sometimes smoke ptarmigan as a method of preparing meat for long-term storage. A McGrath key respondent described this: “They eat ptarmigan breast—and they smoke it and dry it and...it’s really good” (Ikuta et al. 2014).

Women of Lime Village give girls the dried foot of a ptarmigan hen to wear as an amulet with the hope that they will become good seamstresses (Russell and West 2003). Customs in Lime Village also include giving sick individuals ptarmigan soup, which provides a source of nutritious food that is easily digestible. Traditionally in Lime Village, people also allowed ptarmigan meat to rot for application to infected wounds to accelerate healing (Russell and West 2003). Central Yup’ik people traditionally have boiled ptarmigan feet to make a broth to be fed to people suffering from illness, as a remedy for their ailment. Additionally, key respondents in Unit 19 communities describe using inedible ptarmigan parts as bait for marten traps (Brown et al. 2012).

Central Yup’ik people incorporate ptarmigan parts into a variety of handicrafts. Most commonly, ptarmigan feathers are used in men’s dance fans. The artist carves a wooden handhold and drills five small holes into the outside edge of the handhold. Ptarmigan wing feathers are inserted into the holes and affixed with glue to create the appearance of a hand with fingers and thumb extended. The dancer holds the fan in his hands and motions with them to simulate the actions of a song that accompanies the dance, or to follow the rhythm of the music. Artists also make a child’s toy with a ptarmigan crop (Plate 1).³ The crop is removed when the bird is cleaned. While the crop is still fresh and moist, the toymaker ties off one orifice with string then inflates the crop through the remaining orifice. Once the crop is inflated, the second orifice is tied off to create a balloon or small poke. The crop often contains the bird’s



Plate 1.—A child’s toy crafted from a dried bird crop and its contents. The crafter inflates the crop, ties the open ends closed, and hangs it to dry. Occasionally, the object is tied to the end of a small stick. Children play with this as a ball or rattle.

3. N. Underwood, Aniak resident, personal communication with the author, October 15, 2019.

most recent meal, which may include plant buds, seeds, or berries. These are left inside the crop, and everything is hung to dry for several days. When the crop membrane and its contents are completely dried, the crop has the appearance and feel of wax paper or parchment. This is given to children, who play with it like a ball or a rattle.

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.

Traditionally, Yup'ik boys in the Central Kuskokwim River area learned how to hunt by living with the men of the community in the ceremonial men's house (*qasgiq*). In Athabascan societies, boys were typically taught survival skills by their maternal uncles. Today, elder family members teach children about hunting ptarmigan and other animals. Parents and grandparents often bring children hunting. Teachers are typically, but not exclusively, the father, or an uncle or grandfather. Lime Village key respondents have explained that elder men of a child's family describe to youth phenomena such as ptarmigan behavior and identification, as well as where and how to find the birds (Russell and West 2003). While ptarmigan hunting, elders teach children the indigenous language names and English names for each species of ptarmigan, as well as the methods and means of harvest. As they grow older, children spend more time hunting and exploring wilderness alone and with peers. When alone or with siblings and friends they practice their shooting skills by hunting ptarmigan and small birds. Elder family members often give young hunters BB guns. As they grow older, a child may receive a gift of a .22 caliber rifle or a small gauge shotgun. At home or in camp, parents and grandparents give ptarmigan and other birds to children for instruction in feather-plucking and cleaning. This kind of work is an important contribution to the family's daily needs of processing and caring for wild foods. It also allows children to make closer observations of ptarmigan anatomy than is possible when viewing them alive in their habitat.

Kari (1985) wrote that many Stony River village teenagers hunted ptarmigan extensively, often contributing a significant portion of the community's harvest of the birds. This was also common in other communities, such as in Nikolai, where many teenage boys and younger men were responsible for much of the ptarmigan harvest in 2011 (Ikuta et al. 2014). However, male and female hunters of all ages took part in ptarmigan hunts as well. A 94-year-old key respondent in Nikolai described his practice of driving slowly, accompanied by his grandsons, by four-wheeler along trails around the community or near the village airstrip. He and the boys would hunt ptarmigan with a .22 caliber rifle, and the boys would retrieve the catch (Ikuta et al. 2014). Another Nikolai key respondent described how boys improve their shooting skills by practicing during ptarmigan hunts with older men. After his description, he simply stated, "It's good to teach the kids."

Ethnographers have also described customs and traditions involving ptarmigan in Unit 19 communities. Tenenbaum and McGary (1984) documented Alexie Evan's retelling of a Dena'ina Athabascan story from the Lime Village area. In "Raven Rescues his Wife" the raven tells the spruce hen and ptarmigan to sew a skin boat that he will use to rescue his wife who has been stolen from him. Dena'ina Athabascan tradition held that grouse and ptarmigan were skilled skin sewers. Lt. Zagoskin recorded a mid-19th century description of a late winter dance festival among the Central Yup'ik people living in the vicinity of Kolmakofsky Redoubt near present-day Chuathbaluk (Zagoskin 1967). People were gathered in the men's ceremonial house watching a male dancer wearing a raven mask and acting out the role of raven as a trickster. Accompanied by the drumbeat and descriptive lyrics of a narrative song, the dancer made motions to describe how the raven followed a hunter and disrupted his attempts to catch ptarmigan. The dancer mimed the raven as it tangled the hunter's snares or flew off with them after the hunter set them to catch the birds.

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.

In every community in Western and Interior Alaska where the department has conducted studies, researchers have found extensive sharing and distribution of most wild resources. Sharing typically involves the majority of households in the study samples. Certain resources in Unit 19, such as moose and salmon, are more commonly shared than others, which was as true historically as it is today. Most foods are shared as part of normal daily practice following hunting excursions. Some sharing occurs ceremonially or during significant events, such as holidays, funerals, community festivals, other customary celebrations, or when residents and people from outside the community gather for work-related meetings. Table 1 lists the percentages of households in select Unit 19 communities using, harvesting, giving, and receiving ptarmigan, and serves to document the extent of sharing of this particular resource over time. Every community that reported harvesting ptarmigan also reported giving and receiving this resource (Table 1; Brown et al. 2012; Ikuta et al. 2014). In most communities, households use wild foods harvested by others through sharing networks, so the percentages of households harvesting usually are lower than the percentages of households using wild foods.

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 diversity of fish and game resources and that provides substantial economic, cultural, social, and nutritional elements of the subsistence way of life.

Western and Interior Alaska communities harvest, use, and rely upon a wide diversity of fish and game resources. Department research in 2007, 2009, and 2011 in Unit 19 communities documented average annual household harvests of wild foods that ranged from 381 lb in Takotna and 593 lb in McGrath to 1,498 lb in Nikolai and 2,272 lb in Lime Village (Holen and Lemons 2010; Ikuta et al. 2014). During the same study years, Unit 19 communities harvested an average of 63 different species of fish, wildlife, and plants each year, and used an average of 73 different wild resources annually. The mix of resources harvested and used depends upon species availability in each community's harvest and use area. In Nikolai, more than half the weight of annual harvests can be composed of moose, and in Aniak, salmon harvests can represent as much as two-thirds of total annual harvests by weight (Brown et al. 2012; Ikuta et al. 2014). Small game, such as ptarmigan, is one type of wild resource that is harvested throughout many months each year in Unit 19 communities. Ptarmigan are commonly available during the winter and spring when other wild resources may be limited or unavailable. Appendix A provides examples of the annual seasonal cycle of subsistence activities for a selection of Unit 19 communities, which also serves to demonstrate the diversity of resources upon which residents depend.

The harvest of wild foods in Unit 19 communities and throughout rural Alaska supports the physical health and wellbeing of subsistence resource users. Hunting, fishing, and gathering also helps residents maintain essential connections with their diverse sociocultural and linguistic heritage while providing critical economic support for communities. Although subsistence harvest and use activities are not primarily of monetary importance, residents consider wild foods as possessing great value. This value represents a critical sector of the rural Alaskan economy. Additionally, the amount of cash available in many rural Alaska communities is limited relative to urban parts of the state. The U.S. Census Bureau American Community Survey reports an unemployment rate of 27% in the Yukon-Koyukuk and Bethel census areas, the two census areas that comprise all Unit 19 communities.⁴ The five-year average median household income from 2013–2017 was \$37,819 per year in the Yukon-Koyukuk Area, and \$53,853 per year in the Bethel Census Area. Both median income amounts are significantly lower than the 2013–2017 five-year average median

4. U.S. Census Bureau, Washington, D.C., n.d. "American FactFinder." Accessed October 17, 2019.
http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

household income in Alaska as a whole, which was \$76,114 per year. At the same time, costs of store-bought food items, especially meat, fish, fruits, and vegetables, transported into GMU 19 communities are unaffordable to most residents.

Residents of Unit 19 use and rely upon virtually all the edible wild food resources available in their region. Ptarmigan species represent a small but important portion of these resources. One McGrath resident summarized the notion that hunting many species is essential to a way of life that is dependent upon wild foods: “It’s a good way to keep all your resources, because by spring you need to harvest...ducks and spruce chickens and a few rabbits and in fall your moose and your bear so that you have a variety” (Ikuta et al. 2014). Another McGrath key respondent explained his perception of the need to harvest various resources: “You take whatever is made available” (Ikuta et al. 2014).

REFERENCES

- Brelsford, T., R. Peterson, and T.L. Haynes
1987. *An overview of resource use patterns in three Central Kuskokwim communities: Aniak, Crooked Creek, and Red Devil*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 141: Fairbanks.
- Brown, C.L., J.S. Magdanz, D.S. Koster, and N.S. Braem
2012. *Subsistence harvests in 8 communities in the central Kuskokwim River drainage, 2009*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 365: Fairbanks.
- Charnley, S.
1984. *Human ecology of two central Kuskokwim communities: Chuathbaluk and Sleetmute*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 81: Juneau.
- Collins, R.L. and B. Petruska
1979. *Dinak'i: Upper Kuskokwim Athabaskan junior dictionary*. University of Alaska, National Bilingual Materials Development Center: Anchorage.
- Holen, D. and T. Lemons
2010. *Subsistence harvests and uses of wild resources in Lime Village, Alaska, 2007*. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 355: Anchorage.
- Holen, D.L., W.E. Simeone, and L. Williams
2006. *Wild resource harvests and uses by residents of Lake Minchumina and Nikolai Alaska, 2001–2002*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 296.
- Hosley, E.H.
1966. *Factionalism and acculturation by an Alaskan Athapaskan community*. University of California Los Angeles, Ph.D. thesis: Los Angeles.
- Ikuta, H., C.L. Brown, and D.S. Koster
2014. *Subsistence harvests in 8 communities in the Kuskokwim River drainage and lower Yukon River, 2011*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 396: Fairbanks.
- Jacobson, S.A.
2012
Yup'ik Eskimo Dictionary, 2nd edition. Alaska Native Language Center, University of Alaska: Fairbanks.
- Kari, P.R.
1985. *Wild resource use and economy of Stony River Village*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 108.
- Naves, L.C. and J.M. Keating
2019. *Alaska subsistence harvest of birds and eggs, 2004–2017 data book, Alaska Migratory Bird Co-Management Council*. Alaska Department of Fish and Game, Division of Subsistence Special Publication No. 2019-04: Anchorage.
- Oswalt, W.H. and J.W. Van Stone
1967. *The ethnoarchaeology of Crow Village, Alaska*. Smithsonian Institution, Bureau of American Ethnology, Bulletin 199: Washington DC.
- Russell, P.N. and G.C. West
2003. *Bird traditions of the Lime Village area Dena'ina: upper Stony River ethno-ornithology*. ISBN 978-1-877962-38-7
- Stickney, A.A.
1981. *Middle Kuskokwim food survey–II*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 53: Bethel.

Stokes, J.

1985. *Natural resource utilization of four upper Kuskokwim communities*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 86: Juneau.

Tenenbaum, J. and M.J. McGary editors.

1984. *Dena'ina Sukdu'a: traditional stories of teh Tanaina Athabaskans*. Alaska Native Language Center, University of Alaska Fairbanks: Fairbanks.

Zagoskin, L.

1967. *Lieutenant Zagoskin's travels in Russian America, 1842–1844: the first ethnographic and geographic investigations in the Yukon and Kuskokwim valleys of Alaska*, Arctic Institute of North America, Anthropology of the North: Translations from Russian Sources No. 7. University of Toronto Press: Toronto, Ont.

APPENDIX–SEASONALITY OF HARVESTS

Figure A1.—Annual round of resource harvest in Chuathbaluk and Sleetmute, June 1982–May 1983 (Charnley 1983).

Species	Month of Harvest											
	Ja	Fe	Ma	Ap	Ma	Ju	Ju	Au	Se	Oc	No	De
Moose	-	—	-	-	-	-	-	-	—	-	-	-
Caribou	—	—	-	-	-	-	-	—	—	-	—	—
Black and brown bear					—	-	-	—	—			
Porcupine	-	-	-	-	-	-	-	-	-	-	-	-
Snowshoe hare	—	—	—	—						—	—	—
Grouse	—	—	—						—	—	—	—
Ptarmigan	—	—	—	—								
Waterfowl				—		-	-	—				
Mink	—	—									—	—
Marten	—	—									—	—
Wolf	—	—	—								—	—
Wolverine	—	—	—								—	—
Land otter	—	—	—	—							—	—
Red fox	—	—									—	—
Lynx	—	—	—								—	—
Beaver	—	—	—	—							—	—
Muskrat	—	—	—	—	—	—					—	—

— concentrated harvest efforts
 ----- occasional harvest efforts

Fig. 15. The annual round of resource harvest in Chuathbaluk and Sleetmute, June 1982 - May 1983.

Figure A2.-Seasonal round of resource harvesting activities for Nikolai residents, 1983 (Stokes 1985).

Resource Harvested		Months Harvested												
English	Upper Kuskokwim Athabaskan	J	J	A	S	O	N	D	J	F	M	A	M	
king salmon	gas	-X	XXX	--										
chum salmon	srughot'aye	-XX	XXX	X--	---	---								
coho salmon	nosdlaghe			--	-XX	XXX	-							
whitefish	sajila	X--	---	---	--X	XXX	-						- XXX	
sheefish	zidlaghe	XXX	X--	XXX	X--	---	---						--	
pike	ch'ighilduda	---	---	---	-XX	XX-	---				--	-XX	X-- -XX	
blackfish	hozrighe										---	---		
grayling	ts'idatana	XX-	---	---	---	XXX	XX							
black bear	shlsr	X--	---	---	XXX	X--							- XXX	
grizzly bear	tsone	-			XX	XX-							-XX	
moose	dineje	X--	---	--X	XXX	X		XX	XXX	XXX	XXX			
caribou	midzish				--	---	---	XXX	XXX	XXX	--			
sheep	drodeya				XX	XX							- --X --	
beaver	tso'	X--	---	---	---	-							XXX XXX XXX	
marten	suje							XX	XXX	XXX	XXX			
mink	tats'uts'a							XX	XXX	XXX	XXX			
otter	mizreya'							XX	XXX	XXX	XXX			
fox	k'altsa						X	XXX	XXX	XXX	XXX	XX		
lynx	gwhchuh							XX	XXX	XXX	XXX	XX		
wolf	tekone				--	---	---	---	-XX	XXX	XXX	XXX		
muskrat	nitołtroda	X-											- XXX	
hare	gwh	-			--X	XXX	XX							
porcupine	nune	XXX	XXX	XXX	XX								-X	
waterfowl		---		---	-XX	X							-XX XXX	
grouse		--		--X	XXX	XXX	-	---	-					
berries	jija'	-	---	XXX	XXX	XX-								
plants	dlot'	---	-	-	--X	XXX	X							
firewood	duł	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	

XXX primary harvest periods
 --- alternate harvest periods

Fig. 4. Seasonal round of resource harvesting activities for Nikolai residents, 1983.

Figure A3.—The annual cycle of harvest activities of Stony River residents for selected species, 1980–1984 (Kari 1985).

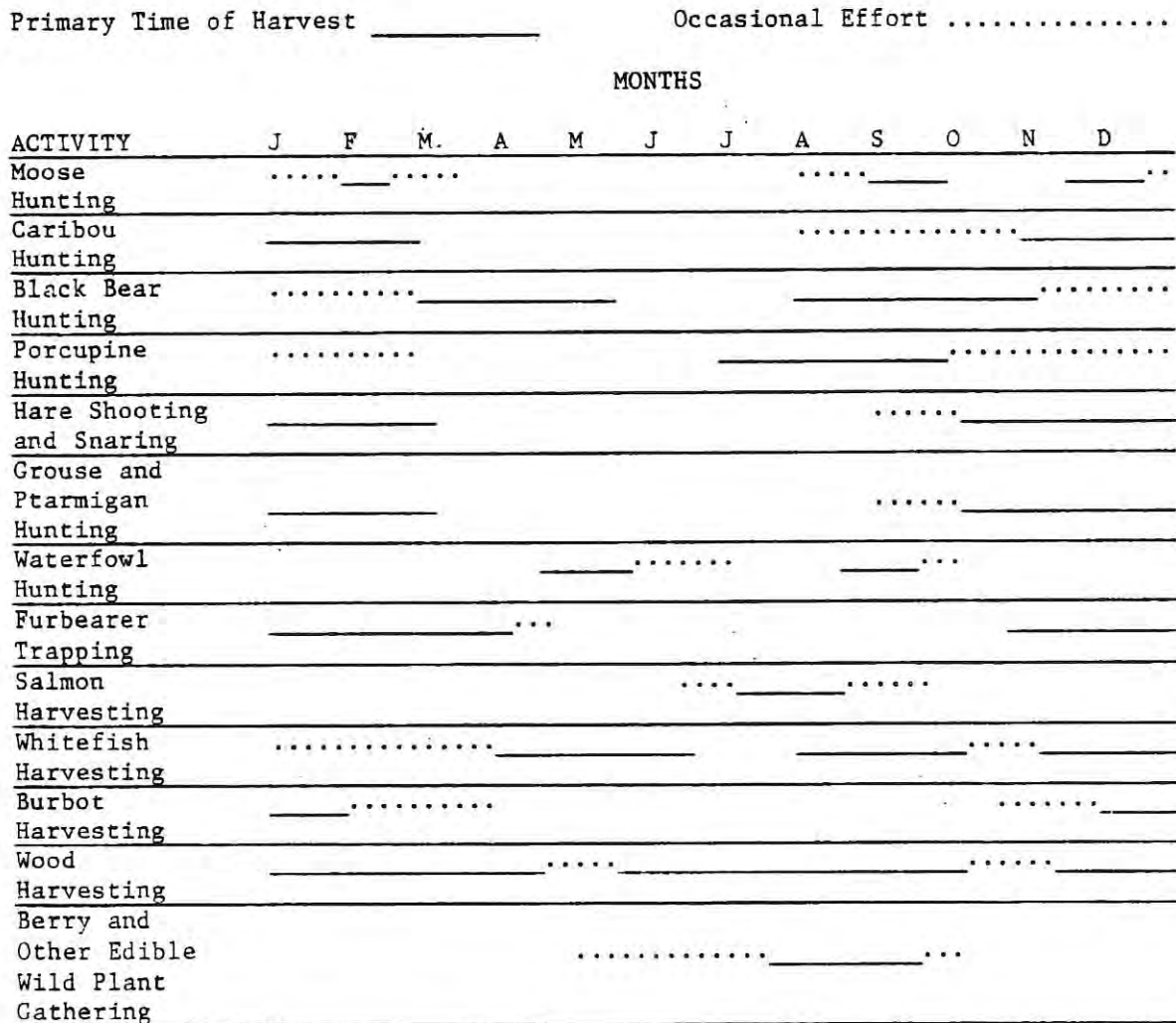


Fig 2. The annual cycle of harvest activities of Stony River residents for selected species, 1980–1984.

Figure A4.-The seasonal round of harvest activities by Red Devil residents, ca. 1964-1986 (Brelsford et. al 1986).

Resource	Months Harvested											
	J	F	M	A	M	J	J	A	S	O	N	D
Large Mammals												
Bear (black & brown)			-		X	X	X	X	X	-		
Caribou	-	-	-	-				X	X	-	-	-
Moose		X							X		-	
Sheep								X				
Furbearers												
Beaver	X	X	X	X						-	X	X
Land otter	X	X	X	X								
Lynx	X	X								-	X	X
Marten	X	X								-	X	X
Muskrat				X	X							
Red Fox	X	X								-	X	X
Wolf	X	X								-	X	X
Wolverine	X	X								-	X	X
Salmon												
Chum, Red						-	X	X				
King						X	-					
Silver								X	X			
Freshwater Fish												
Burbot	X	X			-	-				-	X	X
Dolly Varden *						X	X	X	X			
Grayling	-	-	-	-	-	X	X	X	X	X	X	X
Lamprey										X	X	
Pike	X	X	X	X	X	X	X	X	X	X	X	X
Sheefish					X	X	X	X	X	-		
Sucker						X	X	X				
Whitefish					X	X	X	X	X	X		
Small Mammals and Wildfowl												
Grouse	-	-	-	-	-				X	X	-	-
Porcupine					-	-	-	-	X		-	
Ptarmigan	-	-	-	-					X	X	X	-
Snowshoe hare	X	-							-	-	X	X
Waterfowl					X	-			-	-		
Plants												
Berries								X	X			
Other edible plants				X	X	X		-	-			
Wood	X	X	X	X	X	X	X	X	X	X	X	X

* Dolly Varden are also referred to as trout in this community, although no rainbow trout are found above the Aniak River.

X Primary months of harvest
 - Secondary months of harvest

Figure 4. The Seasonal Round of Harvest Activities by Red Devil Residents, ca. 1964-86.