

Special Publication No. BOG 2020-03

Customary and Traditional Use of Grouse 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



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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

<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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**CUSTOMARY AND TRADITIONAL USE OF GROUSE IN GAME
MANAGEMENT UNIT 19**

by

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January 2020

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This document should be cited as:

Runfola, D.M. and L. Naaktgeboren. 2020. Customary and traditional use of grouse in Game Management Unit 19. Alaska Department of Fish and Game, Division of Subsistence Special Publication No. BOG 2020-03, 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 grouse (various species) 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: Spruce grouse, *Dendragapus canadensis*, ruffed grouse, *Bonasa umbellus*, sharp-tailed grouse, *Tympanuchus phasianellus*, 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 grouse 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. Grouse species (hereinafter *grouse*) with a normal range that comprises Unit 19 include spruce grouse *Dendragapus canadensis*, ruffed grouse *Bonasa umbellus*, and sharp-tailed grouse *Tympanuchus phasianellus*. 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 grouse in Unit 19 (Figure 1) provides a description of customary and traditional harvest and use practices for grouse 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 grouse 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 grouse (Hosley 1966; Russell and West 2003; Zagoskin 1967). Grouse are an important food source, especially in late fall through early spring, when other sources of wild foods may occasionally be scarce or nonexistent. Subsistence harvest and use of grouse 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 grouse species in the area. In English, local names include spruce

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

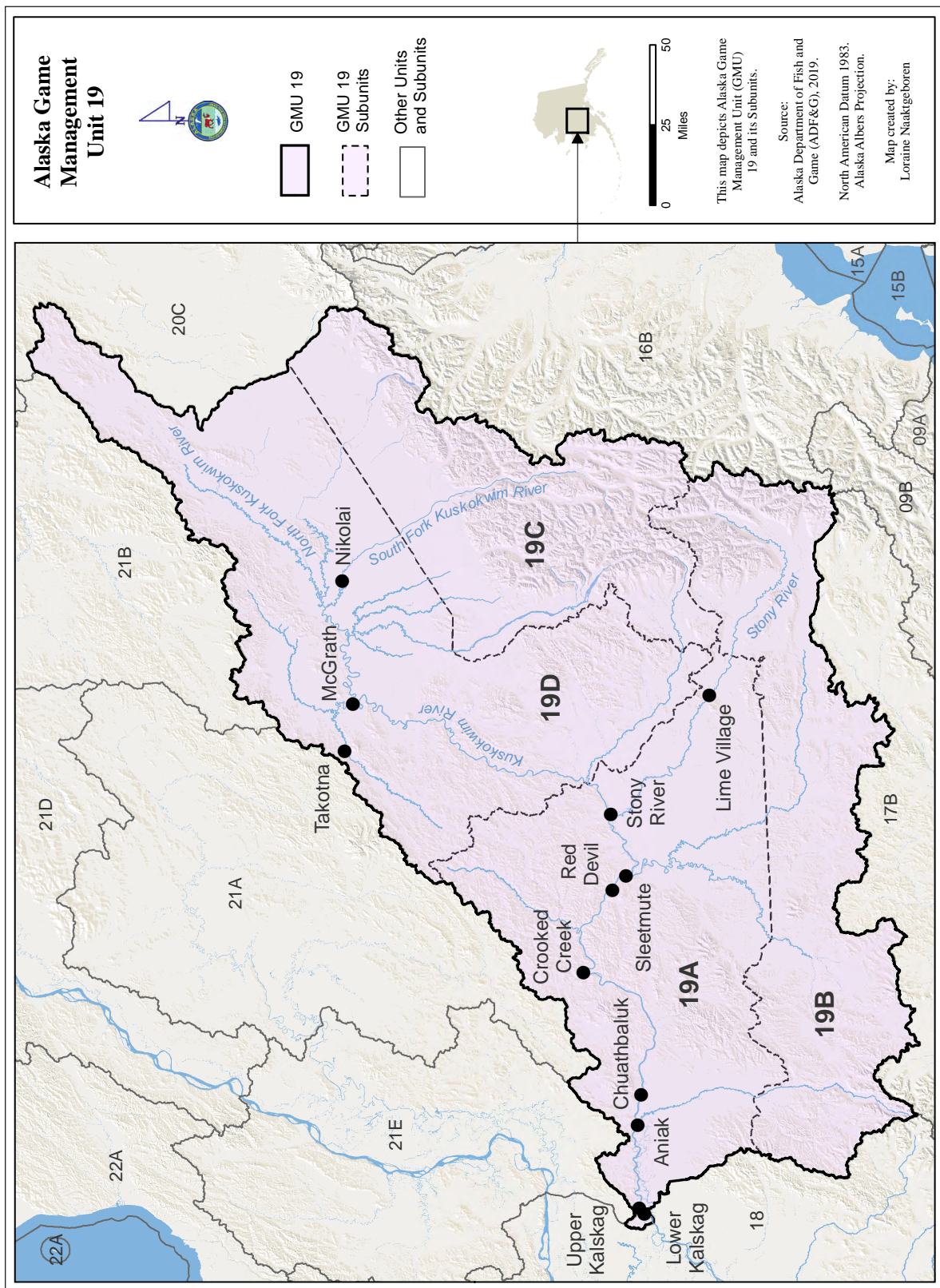


Figure 1.—Alaska Game Management Unit 19.

Table 1.—Harvest and use of grouse, GMU 19 communities, 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	34.8%	34.8%	30.5%	12.8%	7.1%	2.2	0.7	525.0	17.0%
Chuathbaluk	2009	33.3%	33.3%	30.0%	3.3%	6.7%	1.9	0.6	97.0	29.0%
Crooked Creek	2009	33.3%	33.3%	27.3%	6.1%	15.2%	2.1	0.7	121.0	30.0%
Lime Village	2007	57.1%	57.1%	42.9%	28.6%	28.6%	7.5	3.1	118.0	29.0%
Lower Kalskag	2009	44.4%	44.4%	38.1%	9.5%	14.3%	2.7	0.7	293.0	26.0%
McGrath	2011	63.9%	63.9%	60.2%	12.0%	20.4%	12.1	4.8	1722.4	15.1%
Nikolai	2002	85.2%	77.8%	74.1%	33.3%	40.7%	7.9	2.6	363.0	13.0%
Nikolai	2011	80.8%	88.5%	80.8%	23.1%	34.6%	14.8	4.9	576.0	20.5%
Red Devil	2009	81.8%	81.8%	72.7%	18.2%	18.2%	11.8	4.8	220.0	26.0%
Sleetmute	2009	68.8%	68.8%	62.5%	21.9%	12.5%	5.9	2.4	315.0	18.0%
Stony River	2009	58.3%	58.3%	50.0%	16.7%	16.7%	9.4	2.9	267.0	66.0%
Takotna	2011	50.0%	50.0%	50.0%	7.1%	14.3%	18.4	7.8	405.4	64.6%
Upper Kalskag	2009	60.4%	60.4%	47.9%	16.7%	22.9%	3.8	1.1	325.0	20.0%

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

chicken or spruce hen for spruce grouse, willow grouse for ruffed grouse, and pintail grouse for sharp-tailed grouse. Some historical ethnographic texts that include descriptions of grouse in the Central Kuskokwim River region refer to grouse as partridge (see Zagoskin 1967). In Central Yup'ik, spruce grouse translates as *egtuk* and ruffed grouse as *temtemtaaq* (Charnley 1984; Jacobson 2012). Upper Kuskokwim Athabascan names include *dish* (spruce grouse), *trok'wda* (ruffed grouse), and *ch'iltwe* (sharp-tailed grouse; Collins and Petruska 1979; Stokes 1985). Deg Hit'an Athabascan names include *diyh* (spruce grouse) and *gitthid* or *gidilning* (ruffed grouse; Kari 1985). Dena'ina Athabascan speakers refer to spruce grouse as *eldyin* and to ruffed grouse as *k'delneni* (Russell and West 2003).

Department household surveys have documented historical harvests of grouse in Aniak, Crooked Creek, and Red Devil during a period from 1964–1986 (Brelsford et al. 1987), in seven middle Kuskokwim River communities for 1979 (Stickney 1981), in Chuathbaluk and Sleetmute for 1982–1983 (Charnley 1984), and in Stony River village for 1983–1984 (Kari 1985). Grouse harvests were also estimated in Nikolai for 1984 (Stokes 1985) and for 2001–2002 (Holen et al. 2006). In Lime Village in 2007, households harvested an average of 11 lb of grouse (Holen and Lemons 2010). Spruce grouse were the most harvested of all birds by weight in Aniak, Chuathbaluk, Crooked Creek, Sleetmute, and Stony River in 2009 (Brown et al. 2012) and in Takotna and McGrath in 2011 (Ikuta et al. 2014). A McGrath key respondent described how numerous his harvest of grouse is in a typical year: “Spruce chickens; probably on an average year we get 50 and a couple years we got over 90. We eat the heck out of them and then of course use the carcasses for marten bait. Ruffed grouse, too” (Ikuta et al. 2014). In 2011, Takotna hunters harvested more spruce grouse by weight than all species except moose.

CRITERION 2: SEASONALITY

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

Grouse are present in Unit 19 year-round; however, historically they were hunted only during certain seasons each year. In his mid-19th century journals of travel in the Kuskokwim River region, Russian Imperial Army Lt. L. A. Zagoskin recorded local customs of grouse hunting among people living near his station at Kolmakofsky Redoubt at the mouth of the Kolmakof River, between Chuathbaluk and Napaimute. Zagoskin described that boys and girls would routinely check snares set for grouse each morning during winter (Zagoskin 1967). Other ethnographic sources indicate that people in the area hunted grouse most months of the year, except during spring and early summer when birds were nesting and raising young (Kari 1985; Russell and West 2003; Stickney 1981; Stokes 1985).

Table 2.—Harvests of grouse by region, Alaska, 2004–2017.

Regions, subregions	Grouse harvest estimates (number of birds/year)																
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017			
Gulf of Alaska-Cook Inlet																	
Gulf of Alaska Villages							16						16				
Cordova																	
Cook Inlet																	
Kodiak Archipelago																	
Kodiak Villages							11						11				
Kodiak City & Road-connected							11						11				
Kodiak City & Road-connected							0						0				
Aleutian-Pribilof Islands																	
Aleutian-Pribilof Villages																	
Unalaska																	
Bristol Bay*	7,977		3,413	5,579			3,403						5,093	13,394	3,385		
South Alaska Peninsula							0						0				
Southwest Bristol Bay	1,314	3,933	273	715	4,029		2,832						2,832				
Dillingham		3,572		2,698	1,549		570						570				
Yukon-Kuskokwim Delta*	444	388	1,490	334	0	87	736	3,496				2,050	2,094	1,003	1,278	2,313	
Y-K Delta South Coast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Y-K Delta Mid Coast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Y-K Delta North Coast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lower Yukon	65	16	307	0	31	164				27	1,534		70	575	238		
Lower Kuskokwim	112	200	624	116	0	54	391	2,752	0	447			184	898	470		
Central Kuskokwim	267		556	219		182							347	182	306		
Bethel	0	163	4	0	0	0	0	0	0	0	20		28	7	21		
Bering Strait-Norton Sound*	283	488		78		*	*	*	*	*			283		283	0	576
St. Lawrence-Diomedes Is.	*	*		*		0	0	0	0				0		0	0	*
Bering Strait Mainland Villages	*	*		*		0							*		0	*	*
Nome	*	*		*									*			*	*
Northwest Arctic									*				*		*		
Northwest Arctic Villages													0		0		
Kotzebue									8						8		
North Slope*															0		0
North Slope Villages													*		*	*	*
Barrow													*		*	*	*
Interior Alaska*	5,815	*	2,772	*	*	1,289				*			4,294	1,289	3,292	16,241	9,465
Mid Yukon-Upper Kuskokwim	224	877	78			163							393	163	336	*	*
Yukon-Koyukuk	469	0	0	0	0	391							94	391	143	*	*
Upper Yukon	202		94	0		319				886			99	603	300	*	*
Tanana Villages	3,780		1,993			177							2,887	177	1,983	*	*
Tok			607			240							607	240	424	*	*
Upper Copper River	225			0									113		113		
Alaska (all regions)													10,822	7,201	9,802		
Five-regions index (regions included indicated by •)													10,690	7,069	9,671	30,913	15,739

Source: Naves and Keating 2019.

Note - indicates that region or subregion not surveyed.

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

Note Blank cells indicate that species usually does not occur in this region and/or was not included in survey form.

More recently, key respondents and household survey participants have described similar grouse hunting seasons in the upper Kuskokwim River region (Hosley 1966; Ikuta et al. 2014; Stokes 1985), in Chuathbaluk and Sleetmute (Charnley 1984), in the community of Stony River (Kari 1985), and in Lime Village (Russell and West 2003). 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 grouse were hunted primarily from September through February, with some hunting in August, as well as later in the spring during March and April. Appendix A shows figures that illustrate the role of grouse hunting in the overall annual seasonal round of subsistence activities for a variety of communities in Unit 19 during the 1980s and prior to then.

Contemporary hunters primarily harvest grouse from late summer through mid-winter (Brown et al. 2012; Ikuta et al. 2014; Stokes 1985). Results from household harvest surveys conducted by the department in 2010 also recorded some harvest of grouse in early spring (Brown et al. 2012). Grouse are less commonly harvested in summer, partly because they are well camouflaged and partly because people travel less in upland habitat. A McGrath key respondent explained, “In the fall, the willow grouse and spruce chickens, we’d get a lot of them hunting” (Ikuta et al. 2014). Also, in Nikolai a respondent described the season for hunting two species of grouse:

We get willow—*trok’wda* is willow grouse—during wintertime. They’re ruffed grouse. During fall and during wintertime that’s a pretty important diet for me... Mostly we get it during the fall time like in September. When they start eating the gravel. You know, they go in the sandbars or on the roads. (Ikuta et al. 2014)

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 (including Unit 19) harvested grouse by using snares, nets, bows and arrows, and spears. People set grouse snares made of spruce root cordage with a wood anchor driven into the ground or tied to brush (Hosley 1966). Oswalt and VanStone (Oswalt and VanStone 1967) collected artifacts from an archaeological site dated to the mid- to late 19th century at Crow Village 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 grouse. At the same location, they also uncovered shaft fragments of spears and bow and arrow parts, all of which had been used for grouse 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 grouse. 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 historical spruce root snares were most commonly used to harvest grouse. 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. Sometimes snares were also baited with rocks and sand to attract birds as they searched for these materials to swallow into their crops to aid in digestion. Russell and West (2003) described other Lime Village grouse-hunting techniques, such as using blunt tipped arrows made from birch. Lime Village hunters also used slings, slingshots, and hand-thrown rocks to harvest grouse.

Currently, many hunters in Unit 19 search for grouse on foot or by snowmachine and harvest them primarily with small gauge shotguns and .22 caliber rifles (Charnley 1984; Ikuta et al. 2014; Stokes 1985). In 2012, a Nikolai key respondent explained, “Every chance I get I go hunting for them with snowmobile; spruce grouse, spruce hens, *dish*...right in town or riding around with snowmachines we get it. Same thing with *ch’itwle*...sharp-tailed grouse” (Ikuta et al. 2014). Hunters will search for grouse after they have eaten pebbles which increases their weight causing them to fly more slowly. Often hunters will look for grouse roosting in trees at dawn and dusk (Kari 1985; Russell and West 2003). Hunters have also explained that they will typically harvest grouse opportunistically, often while moose hunting, berry picking, or otherwise while outdoors within or near their communities (Charnley 1984). A Sleetmute key respondent described that “I don’t hunt spruce chickens, they come to me...The thing is, a lot of hunting is just incidental to when you’re doing other things” (Brown et al. 2012).

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 grouse roosting in willows, alders, or spruce and on the ground throughout much of Western and Interior Alaska, including Unit 19. Areas closest to communities are most heavily used, but grouse are taken opportunistically by hunters or trappers traveling throughout community harvest areas that are within Unit 19.

Aniak hunters have discussed searching for grouse 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 grouse in the Kolmakof, Holukuk, and Oskawalik river drainages,² both historically and contemporaneously. Red Devil hunters have described searching for and harvesting grouse 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 Nikolai hunters harvested grouse 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 grouse along roads in and around their communities, often by all-terrain vehicle or on foot within walking distance of their homes (Ikuta et al. 2014). In the same year, McGrath hunters also discussed hunting grouse while traveling by boat during moose hunts. Hunters explained that this occurred 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.

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.

Grouse are primarily used as food for human consumption. Now, as in the past, most grouse are eaten fresh or frozen for later use. Because grouse are taken primarily in winter, freezing was also a traditional preservation technique. Currently, many people keep frozen grouse in electric freezers, but it is not uncommon to store

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.

grouse frozen in sheds or Arctic entries for a few days or weeks at a time prior to consumption. In 2010, an elder key respondent in Sleetmute noted his observation that access to refrigeration has affected residents' customary uses of grouse:

They have become more interested in harvesting birds, especially grouse, since they discovered how well birds freeze. When they didn't have a freezer, they only killed the ones they could eat right away. Now they're stockpiling grouse. (Brown et al. 2012)

Stokes (1985) described upper Kuskokwim River hunters partially cleaning grouse 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 grouse 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. Grouse are often boiled in soups, fried, or baked. Russell and West (2003) explained that Lime Village residents will cook grouse 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. Women of Lime Village will give girls the dried foot of a spruce grouse 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 feeding grouse soup to sick individuals, which provides a source of nutritious food that is easily digestible. Traditionally in Lime Village, people also allowed grouse meat to rot for application to infected wounds to accelerate healing (Russell and West 2003). Additionally, key respondents in Unit 19 communities describe using inedible grouse parts as bait for marten traps (Brown et al. 2012).

Central Yup'ik people in the western portion of Unit 19A make a child's toy with a grouse crop (Plate 1).³ A key respondent from Aniak described his experience making these toys for his children and grandchildren. 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 most recent meal, which may include plant buds, or 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. Sometimes the dried crop is also tied to the end of a small stick. This is given to children, who play with it like a ball or a rattle.



Plate 1.—A child's toy crafted from a dried grouse 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.

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 middle Kuskokwim River area (which includes Unit 19) 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 grouse 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 grouse behavior and identification, as well as where and how to find them (Russell and West 2003). While grouse hunting, elders teach children the indigenous language names and English names for each species of grouse, 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 grouse 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 grouse 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 grouse anatomy than is possible when viewing the birds alive in their habitat.

Kari (1985) wrote that many Stony River village teenagers hunted grouse 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 a much of the grouse harvest in 2011 (Ikuta et al. 2014). However, male and female hunters of all ages took part in grouse 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 grouse 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 grouse 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 grouse 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 who was 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 grouse. 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, including grouse. 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 is as true historically as it is today. Most foods are shared as part of a 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 grouse, and serves to document the extent of sharing of this particular resource over time. Every community that reported harvesting grouse also reported giving and receiving this resource (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 the 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 grouse, is one type of wild resource that is harvested throughout many months each year in Unit 19 communities. Grouse 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. Appendix B also illustrates 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 help 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 Survey⁴ reports an unemployment rate of 27% in the Yukon-Koyukuk and Bethel census areas, the two census areas that comprise all Unit 19 communities. 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 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. An elder resident of Sleetmute noted the economic and nutritional value of grouse and their superior quality in comparison to commercial foods. He asked rhetorically, “Why would you buy a chicken when you can go out and shoot a spruce chicken, and it’d be healthier food anyway?” (Brown et al. 2012).

Residents of Unit 19 use and rely upon virtually all the edible wild food resources available in their region. Grouse species represent a small but important portion of these resources. One McGrath resident

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

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, specifically noting the value of grouse to a hunter: “You take whatever is made available and it might be that spruce chicken, or it might be a moose, or it might be a porcupine or whatever. We hold off on [spruce] chickens maybe only when we think there’s moose” (Ikuta et al. 2014).

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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--	---	---	---	-								
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).

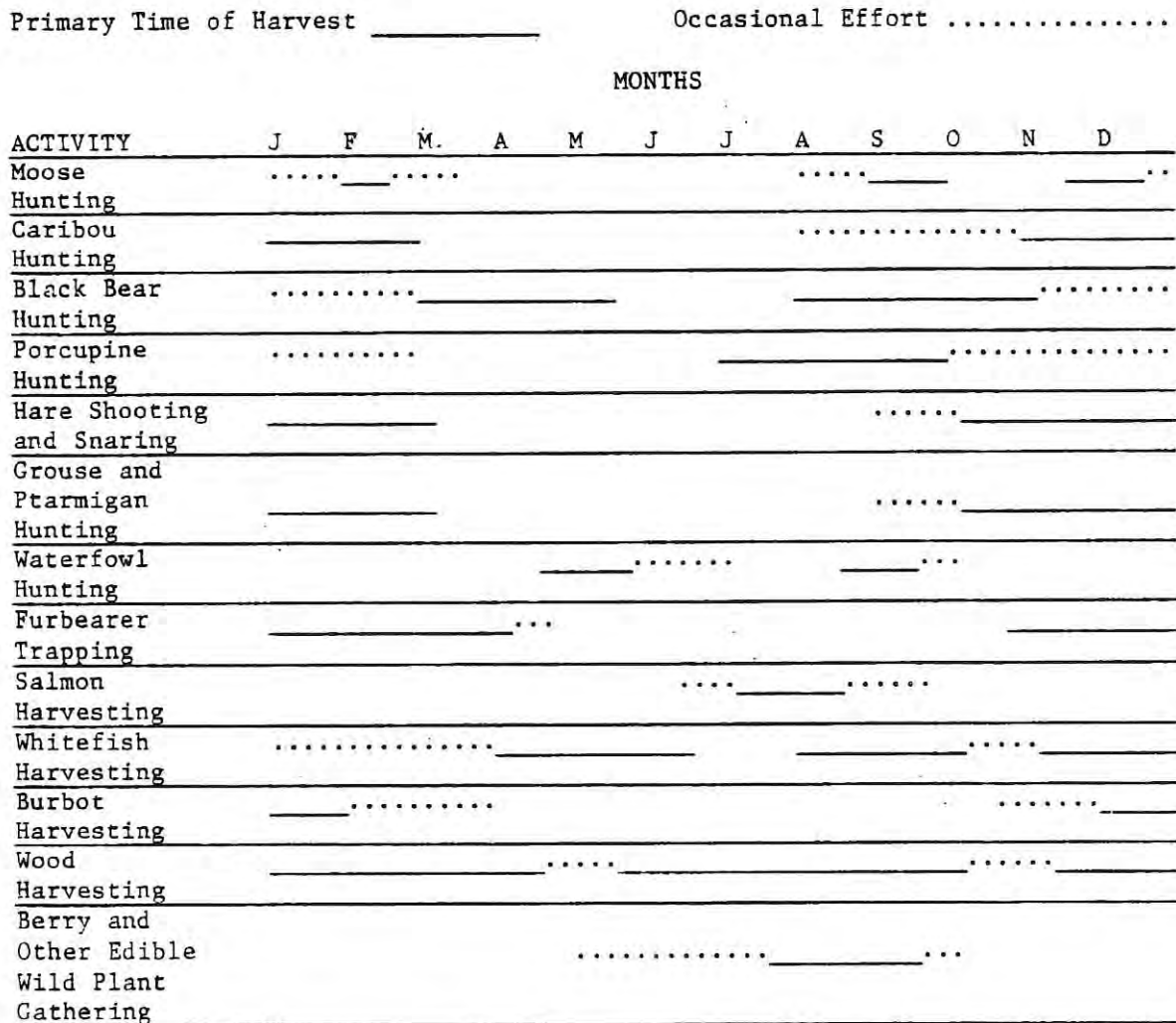


Fig 2. The annual cycle of harvest activities of Stony River residents for selected species, 1980-1984.

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.