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Customary and Traditional Use Worksheet, Ptarmigan, Game Management Units 9, 10, and 17

Prepared by

Amy L.Wiita, Jacqueline M. Keating, and Brian L. Davis

for the Central/Southwest Board of Game meeting, February 2018

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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 following reports by the Division of Subsistence. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

Alaska Department of Fish and Game	ADF&G
Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	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	HA
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, $\chi 2$,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)	log2, etc.
minute (angular)	'
not significant	NS
null hypothesis	HO
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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by

Amy L. Wiita, Jacqueline M. Keating , and Brian L. Davis
Alaska Department of Fish and Game, Division of Subsistence, Anchorage

Alaska Department of Fish and Game
Division of Subsistence
333 Raspberry Road, Anchorage, Alaska 99518

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Amy L. Wiita, Jacqueline M. Keating , and Brian L. Davis,
Alaska Department of Fish and Game, Division of Subsistence
333 Raspberry Road, Anchorage, Alaska 99518-1599, USA

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1. INTRODUCTION

BACKGROUND

The Alaska Board of Game will consider Proposal 134 regarding ptarmigan in the Bristol Bay region at its 2018 Central/Southwest regulatory meeting. The board has not made a determination as to whether there are customary and traditional uses (C&T) of ptarmigan *Lagopus spp*. in game management units (GMUs) 9, 10 or 17 pursuant to Alaska Statute 16.05.258. There are three species of ptarmigan in Alaska: rock ptarmigan (*L. muta*), willow ptarmigan (*L. lagopus*), and white-tailed (*L. leucura*). The rock and willow species occur in GMUs 7 and 17, and portions of 10. White-tailed ptarmigan occur farther east. In preparation for regulatory work on Proposal 134, the department has prepared this C&T worksheet for the board's consideration at its February 2018 meeting in Dillingham.

This customary and traditional use summary for rock and willow ptarmigan (hereafter, "ptarmigan") in Units 9, 10 and 17 (Figure 1) provides a description of customary and traditional harvest and use practices for ptarmigan from the ethnographic and ethnohistorical literature of this region of southwest Alaska. Appendix A is included at the end of this report to provide pertinent quotations related to customary and traditional uses of ptarmigan from the literature.

2. 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.

Upland game birds such as ptarmigan have been a valued source of food and raw materials (such as feathers) in the Bristol Bay and Alaska Peninsula regions of Alaska from the prehistoric period to the present. Van Stone and Townsend (1970) note the historical use of ptarmigan by residents of the region. Among the Yup'ik Eskimo and Dena'ina Athabascans residing in the region (GMUs 9 and 17), various longstanding cultural traditions and values surrounding the harvest and use of ptarmigan speak to the length and consistency of ptarmigan use. Similarly, Division of Subsistence harvest data indicate Aleuts living in GMU 10 have established cultural patterns of ptarmigan use. They are a relatively easy bird to catch, when compared to waterfowl. They are available year round, but are especially important in winter and early spring, when other sources of food may be scarce or nonexistent. Like some other important Arctic and subarctic populations, ptarmigan populations fluctuate, which may be attributable to changes in environmental conditions and prior year offspring survival rates[1]. Fluctuations in resource availability can result in low harvests at times and fluctuating harvest trends over time. When large land mammal populations are low, ptarmigan can be an important source of meat.

1. "Ptarmigan are notorious for their here-today, gone-tomorrow populations, pulsing between superabundance and virtual absence in just a few years. The causes of the rapid population changes remain a mystery. Many people think that ptarmigan numbers fluctuate rhythmically, with peaks once every nine or 10 years. Although there is good evidence for these cycles in Iceland, cycles are more legend than proven fact in Alaska. As with many other grouse, the population depends very heavily on each year's production of chicks, since this year's chicks will be next year's breeding stock. Under these conditions, one or two years of poor reproduction, a cold wet spring, or high winter losses can cause drastic declines in abundance. Conversely, one or two good years might result in more ptarmigan than you could swing a shotgun at." (http://www.adfg.alaska.gov/index.cfm?adfg=willowptarmigan.main)

Ptarmigan continue to be an important commonly harvested subsistence resource in all Bristol Bay communities and in communities on both the north and south sides of the Alaska Peninsula (Morris 1987:79). Division of Subsistence studies show that it is not uncommon for 30% to 60% of the households in Bristol Bay/Alaska Peninsula communities to be involved in the harvesting of ptarmigan. In Egegik, household surveys showed that ptarmigan were used by 72% of households interviewed, more than any other wildlife species (Morris 1987:122); in Perryville nearly all the households interviewed (95%) used ptarmigan (Morris 1987:149). In 2004, ptarmigan were the most-harvested species of bird by Port Alsworth residents (Fall et al. 2006). In Togiak, 70% of surveyed households used ptarmigan in 1999/2000 and in Twin Hills 91.7% of surveyed households used ptarmigan, and, with 10.9 pounds per person harvested, ptarmigan was almost half of the bird and egg harvest in pounds usable weight in Twin Hills (Coiley-Kenner et al. 2003). Harvest history estimates from 1987–2014 in Bristol Bay and Alaska Peninsula communities surveyed by the Division of Subsistence appear in Table 1.In the Aleutian Islands communities of GMU 10, a survey of Unalaska in 1994 indicated that 5% of households used rock ptarmigan, 4% of households harvested rock ptarmigan, and 372 individual rock ptarmigan were harvested. Seventy willow ptarmigan were also reported harvested in 1994. Surveys done in False Pass in 1996 indicated that 27% of households used willow ptarmigan and 7% used rock ptarmigan, with harvests of 53 rock ptarmigan and 161 willow ptarmigan. In Akutan, 7 willow ptarmigan were taken in that same year. For additional regional harvest data see also Coiley-Kenner et al. 2003; Evans et al. 2013; Fall 2006; Fall, Andersen, et al. 1993; Fall et al. 1986, 1998, 2006, 2012; Fall, Mason, et al. 1993; Fall and Morris 1987; Krieg et al. 2009; Morris 1985, 1986, 1987; Naves 2015; Naves and Otis 2017; Payne et al. 1983; Reedy-Maschner and Maschner 2012; Schichnes and Chythlook 1991; Schroeder et al. 1987; Wentworth 2007; Wright et al. 1985.

CRITERION 2: SEASONALITY

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

In GMU 9, ptarmigan are hunted from late fall to early spring, with periods of more intense winter hunting in mountainous areas like Chignik where snow forces ptarmigan down from the higher elevations (Morris 1985, 1987). Hunters take ptarmigan in the winter months both as the focus of a hunting outing, and as an incidental opportunistic harvest while targeting big game animals (Morris 1987:85). Occasional hunting can occur as early as late August, such as in Egegik and Pacific coast Chignik region communities (Morris 1987). March and April were traditionally “hungry times” throughout the state when winter stores of food were typically low. As a result, ptarmigan became a heavily targeted resource where available during that time. In 1986, Dillingham residents reported that ptarmigan were an important resource when the birds formed large flocks in late winter and early spring (Fall et al. 1986). Ptarmigan are less commonly harvested in summer, partly because they are breeding, are well camouflaged, and because people travel less in upland habitat during summer. However, a study in 1987 in False Pass on Unimak Island in GMU 10 found that late summer and early fall was the most important season for ptarmigan hunting (Fall et al. 1996:32).

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.

Today, ptarmigan are taken primarily with shotguns and .22 caliber rifles by individual hunters. Some individuals still use snares and nets. In 2012, residents of Akutan reported that ptarmigan were “…common in winter, hunted right in town with shotguns” (Fall et al. 2012:73). An Ekwok elder reported that some people used to use salmon netting to improvise a fence that the ptarmigan walked or flew into and were captured (Schichnes and Chythlook 1991). Researchers observed this technique in Koliganek in 1991 when the population had rebounded (Schichnes and Chythlook 1991). Another technique was to “build a fence of willow sticks with snares placed along openings” (Schichnes and Chythlook 1991:206). In a survey of residents of the Bristol Bay Borough communities of King Salmon, Naknek, and South

Naknek from 1982–1984, respondents noted traveling by automobile, snowmachine, skiff, 3-wheeler, airplane, and by foot to hunt ptarmigan in the region. Ptarmigan hunting is often practiced as a means of making efficient use of time while traveling across the landscape in search of other, larger game species (Branson 2007; Morris 1985, 1986, 1987; Schroeder et al. 1987; Wright et al. 1985). Little information has been compiled on the traditional means of taking ptarmigan in the Bristol Bay, Alaska Peninsula and Aleutian Islands. Elsewhere in the state ptarmigan were traditionally taken by individuals with bows and blunt-tipped arrows, small nets, and snares (Branson 2007; Fall and Morris 1987; Morris 1985, 1986; Schroeder et al. 1987; Wright et al. 1985).

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.

Communities throughout southwest Alaska and the Aleutians have reported hunting numerous bird species, including ptarmigan (Coiley-Kenner et al. 2003; Evans et al. 2013; Fall 2006; Fall, Andersen, et al. 1993; Fall et al. 1986, 1998, 2006, 2012; Fall, Mason, et al. 1993; Fall and Morris 1987; Krieg et al. 2009; Morris 1985, 1986, 1987; Naves 2015; Naves and Otis 2017; Payne et al. 1983; Reedy-Maschner and Maschner 2012; Schichnes and Chythlook 1991; Schroeder et al. 1987; Wentworth 2007; Wright et al. 1985). Hunters find willow and rock ptarmigan throughout the region. Willow ptarmigan prefer sparsely timbered or treeless areas and favor willow-lined waterways in subalpine areas throughout the region[2]. Tall bushes are an important feature for willow ptarmigan. These birds choose wetter places and more luxuriant vegetation for breeding than the other two species of ptarmigan. In winter, willow ptarmigan remain close to shrubby slopes and valleys, but they seek out areas at lower altitudes than what they use during the breeding season[3]. Rock ptarmigan breed on hilly or mountainous tundra throughout Alaska and prefer slopes and high valleys where shin-high shrubs form a patchy pattern with low herbs and grasses. The summer range of rock ptarmigan often abuts willow ptarmigan range, with rock ptarmigan breeding on higher, drier, rockier ground.[4] All ptarmigan are almost always found on the ground, usually in willow patches, except during nesting season, when they spread out over the tundra. Areas closest to communities are most heavily used, but ptarmigan are taken opportunistically by hunters or trappers traveling throughout community harvest areas. People hunt throughout the region but generally focus effort in their own particular hunting territories. As has been found in other regions of the state, it is likely families in GMUs 9, 10 and 17 traditionally would have traveled in search of ptarmigan during "hungry times," staying wherever they found them in great abundance. Hunting camps would have often been selected in part due to their proximity to areas of abundant ptarmigan, which could be harvested for fresh meals and snacks.

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.

Ptarmigan, and on occasion ptarmigan eggs, are primarily used as food for human consumption. Now, as in the past, most ptarmigan are eaten fresh or frozen for later use. Little data have been collected on the handling, preparing, preserving, and storing of ptarmigan in GMUs 9, 10 and 17. This does not indicate a

2. Alaska Department of Fish and Game, Juneau. n.d. "Small Game Species—Willow Ptarmigan." Accessed December 27, 2017. http://www.adfg.alaska.gov/index.cfm?adfg=smallgamehunting.willowptarmigan

3. Alaska Department of Fish and Game, Juneau. n.d. "Small Game Species—Willow Ptarmigan." Accessed December 27, 2017. http://www.adfg.alaska.gov/index.cfm?adfg=smallgamehunting.willowptarmigan

4. Alaska Department of Fish and Game, Juneau. n.d. "Small Game Species—Rock Ptarmigan." Accessed December 27, 2017. http://www.adfg.alaska.gov/index.cfm?adfg=smallgamehunting.rockptarmigan.

lack of use. Fall et al. (2012) reported that ptarmigan in Akutan are processed by skinning rather than plucking. Given the prevalence of ptarmigan in the region and documented harvest data, we can surmise the means of processing the ptarmigan in GMUs 9, 10 and 17 is similar to other regions of the state. In more northern regions, where ptarmigan are also taken primarily in winter, freezing was a traditional preservation technique. Sometimes a ptarmigan was dried whole. Often ptarmigan were boiled or roasted without being eviscerated. Currently some people store frozen ptarmigan in electric freezers, but it is not uncommon in more northern areas to store ptarmigan in storm sheds for a few days or weeks (Magdanz et al. 2011).

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.

Little data exist on the transmission of knowledge, skills, values, and lore relating to ptarmigan in GMUs 9, 10 and 17. Hunting knowledge in other regions is typically taught parent to child. Learning commonly occurs experientially, when children follow their parents hunting, fishing, gathering, and to camp. The Division of Subsistence conducted a survey in Wales in 1994 which asked questions on this topic. The most commonly cited "teachers" were parents, grandparents, and older siblings. The most commonly cited "students" were children, grandchildren, and younger siblings. An occasional exception was crafts, like carving and sewing, which have been taught in schools as well at home. Today, children learn hunting skills, such as how to shoot accurately, by first using small caliber rifles to hunt small game such as ptarmigan. Similarly, in the past, young children learned hunting skills by first learning to snare ptarmigan. Knowledge concerning ptarmigan was also passed from generation to generation through stories (Magdanz et al. 2011). The passing on of knowledge, skills, traditions, and lore is similar, although individual techniques and methods may vary, throughout the state. It is reasonable to assume, without specific reference to historical documentation for communities within GMU 9, that similar methods have been used over the years within these communities as well.

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 the region where Division of Subsistence has conducted studies, researchers have found sharing and distribution of wild resources. Table 1 lists the percentage of households in surveyed GMU 9, 10 and 17 communities using, harvesting, giving, and receiving ptarmigan, and serves to document the extent of sharing of this particular resource over time. Nearly every community that reported harvesting ptarmigan also reported giving and receiving this resource. 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. Nearly all surveyed communities reporting use of ptarmigan in areas where ptarmigan normally range shared the resource (Table 1). In Togiak nearly half (44.1%) of survey respondents reported that they shared ptarmigan. In Manokotak ptarmigan were among the four most frequently shared resources, with over half (59.3%) of the surveyed households reporting sharing ptarmigan, and in Twin Hills more than two-thirds (83.3%) of surveyed households shared ptarmigan. Regional Division research findings report sharing of not only various wild resources (including ptarmigan and other birds) but also processing facilities (e.g., smoke houses), storage (e.g., freezers) and equipment (e.g., boats, nets, transportation) (Fall, Andersen, et al. 1993; Fall et al. 2006; Fall, Mason, et al. 1993; Fall and Morris 1987; Krieg et al. 2009; Morris 1985, 1986, 1987; Schroeder et al. 1987; Wright et al. 1985). Residents of the region note sharing with almost anyone, in general, and with everyone in need (Payne et al. 1983).

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.

Subsistence harvests in communities of the Bristol Bay and Alaska Peninsula region are relatively high and diverse. Harvests in regional and subregional centers (Dillingham, Bristol Bay Borough, Chignik) average about 200–250 pounds per person (usable weight) per year. Harvests in the smaller communities are higher: those of the Alaska Peninsula and Nushagak Bay average about 400 pounds per person, while subsistence harvests in Nushagak River and Iliamna/Lake Clark villages range from 600–800 pounds or more. In addition to moose, major resources in Bristol Bay and on the Alaska Peninsula include five species of Pacific salmon; nonsalmon fish such as Dolly Varden, smelt, and northern pike; small game birds; marine mammals; and wild plants. Detailed data for particular study years are available in Coiley-Kenner et al. (2003), Evans et al. (2013), Fall (2006), Fall, Andersen, et al. (1993), Fall et al. (1986, 1998, 2006, 2012), Fall, Mason, et al. (1993), Fall and Morris (1987), Krieg et al. (2009), Morris (1985, 1986, 1987), Naves (2015), Naves and Otis (2017), Payne et al. (1983), Reedy-Maschner and Maschner (2012), Schichnes and Chythlook (1991), Schroeder et al. (1987), Wentworth (2007), and Wright et al. (1985). Data from these sources may be found in the Division of Subsistence Technical Papers series (http://www.adfg.alaska.gov/sf/publications/) and the Community Subsistence Information System (https://www.adfg.alaska.gov/sb/CSIS/).

Wild food harvest is similarly extensive and diverse in the Aleutian Islands. In Unalaska annual total harvests average around 200 pounds per person (usable weight). Harvests are larger in smaller communities like False Pass, Akutan, and Nikolski, ranging from 300–700 pounds per person per year. Species important to False Pass households include caribou, coho salmon and harbor seal; Unalaska households depend mainly on coho and sockeye salmon, halibut, and marine invertebrates.

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TABLES AND FIGURES

Table 1.–Subsistence harvest and use of ptarmigan in surveyed communities of GMUs 9, 10 & 17 from 1973–2014.

		Percentage of households					Estimated		Estimated pounds harvest	
Community	Study year	Using	Attempting	Harvesting	Giving	Receiving	total harvest	Units	Total	Per capita
					Unit 09B					
Igiugig	1983	0.0	33.3	33.3	0.0	0.0	15.0	ind.	10.0	0.1
	1992	80.0	80.0	80.0	10.0	10.0	242.0	ind.	170.0	3.6
	2005	50.0	41.7	41.7	25.0	16.7	80.0	ind.	56.0	1.4
Iliamna	1983	0.0	40.0	40.0	0.0	0.0	146.0	ind.	102.0	0.7
	1991	73.9	60.9	60.9	34.8	21.7	943.0	ind.	660.0	6.8
	2004	23.1	23.1	23.1	15.4	0.0	143.0	ind.	100.0	1.4
Kokhanok	1983	0.0	52.6	47.4	0.0	5.3	229.0	ind.	160.0	1.1
	1992	69.4	61.1	61.1	36.1	36.1	2,369.0	ind.	1,658.0	9.6
	2005	48.6	40.0	37.1	28.6	14.3	232.0	ind.	163.0	1.0
Levelock	1988	77.8	51.9	51.9	44.4	59.3	220.0	ind.	154.0	1.4
	1992	60.0	50.0	46.7	43.3	30.0	321.0	ind.	225.0	2.0
	2005	42.9	28.6	28.6	21.4	14.3	52.0	ind.	37.0	1.1
Newhalen	1983	0.0	45.5	45.5	0.0	0.0	284.0	ind.	199.0	1.6
	1991	73.1	61.5	61.5	42.3	30.8	1,532.0	ind.	1,073.0	6.8
	2004	32.0	28.0	28.0	24.0	12.0	148.0	ind.	104.0	0.8
Nondalton	1973	0.0	0.0	64.0	0.0	0.0	557.0	ind.	390.0	2.5
	1980	0.0	0.0	43.0	0.0	0.0	250.0	ind.	175.0	1.0
	1981	0.0	0.0	32.0	0.0	0.0	251.0	ind.	175.0	0.9
	1983	0.0	57.1	57.1	0.0	9.5	877.0	ind.	614.0	2.2
	2004	28.9	28.9	28.9	21.1	0.0	102.0	ind.	71.0	0.4
Pedro Bay	1982	0.0	17.6	17.6	0.0	0.0	10.0	ind.	7.0	0.1
	1996	15.4	30.8	15.4	0.0	0.0	6.0	ind.	4.0	0.1
	2004	5.6	5.6	5.6	0.0	0.0	32.0	ind.	22.0	0.3
Port Alsworth	1983	0.0	30.8	30.8	0.0	0.0	52.0	ind.	36.0	0.5
	2004	18.2	22.7	18.2	9.1	0.0	130.0	ind.	91.0	0.8
					Unit 09C					
King Salmon	1983	0.0	30.2	0.0	0.0	0.0	0.0	ind.	0.0	0.0
	2007	6.1	8.2	6.1	2.0	0.0	126.0	ind.	88.0	0.4
Naknek	1983	0.0	25.0	0.0	0.0	0.0	0.0	ind.	0.0	0.0
	2007	33.3	36.0	33.3	9.3	5.3	900.9	ind.	630.6	1.2
South Naknek	1983	0.0	57.1	0.0	0.0	0.0	0.0	ind.	0.0	0.0
	1992	60.0	51.4	48.6	25.7	22.9	252.0	ind.	176.0	1.3
	2007	19.0	14.3	9.5	0.0	4.8	19.0	ind.	13.0	0.3
					Unit 09D					
King Cove	1992	61.3	50.7	45.3	21.3	25.3	2,701.0	ind.	1,891.0	3.4
Nelson Lagoon	1987	92.3	84.6	84.6	46.2	46.2	523.0	ind.	262.0	3.9
	1996	61.5	42.3	42.3	19.2	23.1	374.0	ind.	262.0	3.5
Sand Point	1992	59.6	39.4	35.6	19.2	33.7	1,771.0	ind.	1,240.0	2.0
					Unit 09E					
Chignik City	1984	21.1	10.5	10.5	0.0	15.8	63.0	ind.	44.0	0.4
	1989	31.4	31.4	17.1	5.7	17.1	53.0	ind.	37.0	0.3
	1991	46.7	16.7	10.0	13.3	36.7	106.0	ind.	74.0	0.6
	2003	45.5	27.3	22.7	9.1	27.3	141.0	ind.	99.0	1.2
Chignik Lagoon	1984	17.6	5.9	5.9	0.0	11.8	5.0	ind.	4.0	0.1
	1989	53.3	33.3	26.7	13.3	33.3	22.0	ind.	15.0	0.4
	2003	25.0	25.0	25.0	25.0	12.5	106.0	ind.	74.0	1.0
Chignik Lake	1984	13.0	13.0	13.0	13.0	8.7	43.0	ind.	30.0	0.2
	1989	57.1	52.4	52.4	52.4	19.0	521.0	ind.	365.0	3.3
	1991	83.3	54.2	54.2	50.0	45.8	649.0	ind.	454.0	3.5
	2003	57.1	33.3	33.3	42.9	38.1	252.0	ind.	177.0	1.5
Egegik	1984	72.0	72.0	72.0	36.0	24.0	825.0	ind.	578.0	5.9
	2014	0.5	0.5	0.5	0.2	0.2	223.8	ind.	179.0	2.5
Ivanof Bay	1984	50.0	50.0	50.0	16.7	33.3	72.0	ind.	50.0	1.4
	1989	100.0	100.0	85.7	85.7	57.1	149.0	ind.	104.0	3.3

-continued-

Table 1.–Page 2 of 2.

Community	Study year	Percentage of households					Estimated total harvest	Units	Estimated pounds harvest	
		Using	Attempting	Harvesting	Giving	Receiving			Total	Per capita
Unit 09E										
Perryville	1984	95.0	60.0	60.0	30.0	75.0	547.0	ind.	383.0	3.3
	1989	92.6	63.0	59.3	40.7	63.0	648.0	ind.	453.0	3.9
	2003	74.1	51.9	51.9	44.4	48.1	1,189.0	ind.	832.0	6.7
Pilot Point	1987	70.6	70.6	70.6	17.6	11.8	141.0	ind.	99.0	1.5
	2014	0.6	0.4	0.4	0.2	0.2	190.8	ind.	152.6	2.4
Port Heiden	1987	73.0	59.5	59.5	32.4	27.0	370.0	ind.	259.0	2.5
Ugashik	1987	80.0	80.0	80.0	20.0	0.0	66.0	ind.	46.0	4.6
	2014	1.0	1.0	0.8	0.3	0.3	70.0	ind.	56.0	6.4
Unit 10										
Akutan	1990	72.0	44.0	40.0	28.0	44.0	190.0	ind.	133.0	1.3
	1996	14.3	10.7	10.7	7.1	3.6	23.0	ind.	16.0	0.2
	2008	11.1	11.1	5.6	0.0	8.3	25.6	ind.	17.9	0.2
Atka	1994	17.9	14.3	14.3	3.6	7.1	37.0	ind.	26.0	0.3
False Pass	1988	90.0	65.0	65.0	55.0	65.0	1,222.0	ind.	611.0	8.8
	1996	46.7	33.3	26.7	13.3	20.0	215.0	ind.	150.0	3.0
Nikolski	1990	7.1	7.1	7.1	0.0	0.0	1.0	ind.	1.0	0.0
	1996	11.1	0.0	0.0	0.0	11.1	0.0	ind.	0.0	0.0
Saint George	1994	0.0	0.0	0.0	0.0	0.0	0.0	ind.	0.0	0.0
Saint Paul	1994	1.2	1.2	1.2	0.0	0.0	15.0	ind.	11.0	0.0
Unalaska	1994	10.5	14.0	8.9	3.8	3.2	1,028.0	ind.	719.0	0.4
Unit 17A										
Togiak	1999	70.0	59.0	59.0	44.1	41.0	4,190.0	ind.	2,933.0	4.0
	2008	71.3	46.3	45.0	30.0	36.3	2,955.0	ind.	2,068.5	2.6
Twin Hills	1999	91.7	91.7	91.7	83.3	58.3	1,075.0	ind.	753.0	10.9
Unit 17B										
Koliganek	1987	73.8	54.8	54.8	40.5	35.7	701.0	ind.	491.0	2.6
	2005	60.7	42.9	42.9	32.1	21.4	310.0	ind.	217.0	1.4
Unit 17C										
Aleknagik	1989	73.7	50.0	50.0	50.0	44.7	801.0	ind.	561.0	3.9
	2008	46.9	31.3	31.3	28.1	25.0	530.0	ind.	371.0	2.1
Clarks Point	1989	76.5	58.8	58.8	47.1	52.9	462.0	ind.	323.0	5.8
	2008	100.0	81.8	81.8	72.7	72.7	810.0	ind.	567.0	15.1
Dillingham	1984	31.4	19.6	19.0	7.2	19.6	2,466.0	ind.	1,728.0	0.9
	2010	39.1	28.4	26.8	15.4	17.8	3,449.0	ind.	2,414.0	1.1
Ekwok	1987	27.6	27.6	20.7	0.0	6.9	35.0	ind.	25.0	0.2
Manokotak	1985	74.1	72.2	68.5	46.3	25.9	1,538.0	ind.	1,077.0	3.5
	1999	82.7	70.4	69.1	59.3	45.7	2,414.0	ind.	1,690.0	4.3
	2008	78.7	54.1	54.1	32.8	41.0	2,587.0	ind.	1,811.0	4.8
New Stuyahok	1987	32.5	27.5	27.5	10.0	5.0	135.0	ind.	95.0	0.3
	2005	40.8	32.7	32.7	16.3	14.3	309.0	ind.	216.0	0.5

Source Alaska Department of Fish and Game (ADF&G). 2017. Community Subsistence Information System (CSIS). http://www.adfg.alaska.gov/sb/CSIS/ accessed on November 22, 2017.

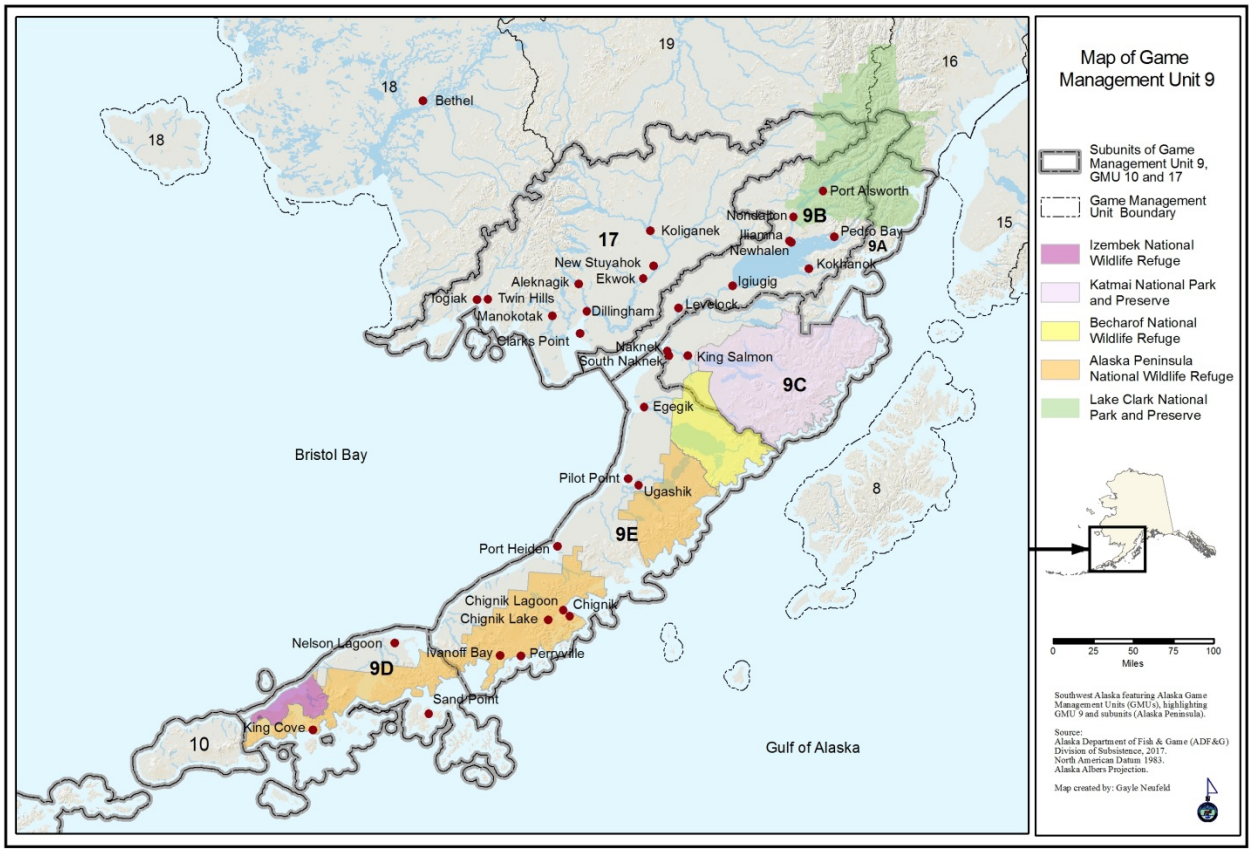

Figure 1.–Alaska Game Management Units 9 and 17.

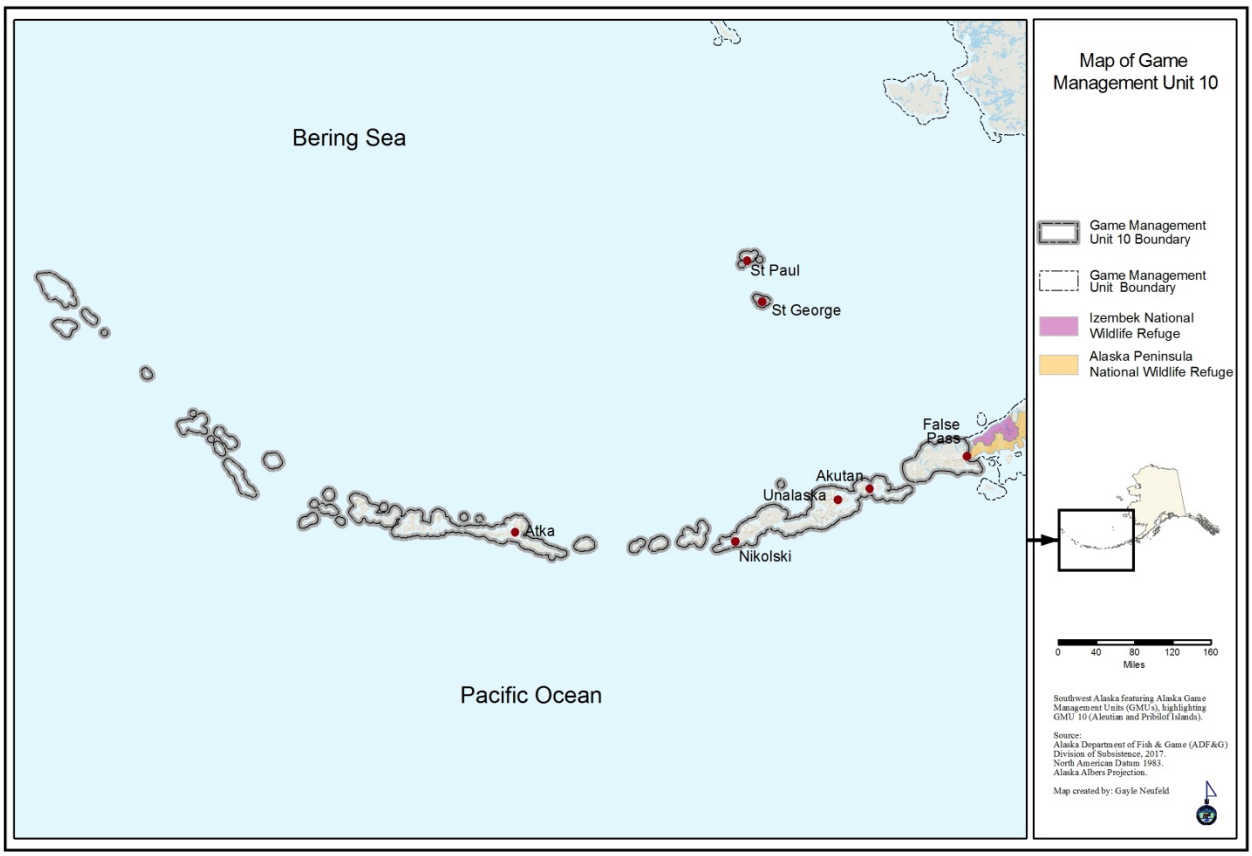

Figure 2.–Alaska Game Management Unit 10.

APPENDIX A.–LITERATURE EXCERPTS PERTAINING TO CUSTOMARY AND TRADITIONAL PTARMIGAN HUNTING AND USE PATTERNS IN GAME MANAGEMENT UNIT 9, 10, AND 17

Following are quotations from selected literature pertaining to customary and traditional ptarmigan hunting and use patterns in Game Management Unit 9, Alaska.

Branson, J. B. 2007. The canneries, cabins, and caches of Bristol Bay, Alaska. NPS Research/Resources Management Report 2007-63. United States Department of Interior, Lake Clark National Park and Preserve.

[Describing a photo circa 1935] Edward Seversen (1916-1937) at a spring beaver trapping camp in Lake Clark-Iliamna country, circa 1935, with his work cut out for him. There are eleven beavers to skin….A brace of ptarmigan hang in a tree…(pg. 170).

[Describing a photo circa 1940] …the river boats are loaded up with all manner of personal gear from a winter of isolation living off the country. Moose meat, caribou, spruce grouse, ptarmigan, trout, and beaver meat would have provided the bulk of their diet.

Evans, S., M. Kukkonen, D. Holen, and D. S. Koster. 2013. Harvests and uses of wild resources in Dillingham, Alaska, 2010. Alaska Department of Fish and Game Technical Paper No. 375, Juneau. http://www.adfg.alaska.gov/techpap/TP375.pdf

"Upland game birds, specifically grouse and ptarmigan, were harvested by Dillingham residents along the Igushik River, throughout the Wood-Tikchik State Park, the Wood River, and up the Nushagak River throughout the year" (pg. 34).

Fall, J. A., D. B. Andersen, L. Brown, M. Coffing, G. Jennings, C. Mishler, A. Paige, C. J. Utermohle, and V. Vanek. 1993. Noncommercial harvests and uses of wild resources in Sand Point, Alaska. Alaska Department of Fish and Game Technical Paper No. 226, Juneau. http://www.adfg.alaska.gov/techpap/tp226.pdf

The community of Unga was located on Unga Island and at one time had a larger population than Sand Point. It developed because the discovery of gold on Unga Island. The following account describes some subsistence activities at Unga earlier in the twentieth century (pg. 14).

When the bay would go half dry, people could dig for clams, catch Dungeness crab, or just beach comb. There was stream fishing for trout, and Tommy's Lake for lake fishing. In the winter, obliging ducks and ptarmigan could be shot. Groups went out after birds or just for skiff rides. Kids could go right out in the middle of the bay and catch halibut. People ate bidarkies, clams, sea eggs, octopus, along with whatever they got from hunting (Sand Point High School 1982:26) (pg. 14).

Production at the mine on Unga Island had declined markedly by the 1930s and subsequently, the population declined (Langdon 1982:64) (pg. 14).

A minimum of 19 kinds of wild birds and eggs was used for subsistence purposes by Sand Point residents in 1992. These fall into three broad categories: upland game birds, migratory birds, and eggs. Ptarmigan was the only upland game bird locally available to Sand Point hunters. An

estimated 39.4 percent of the households hunted ptarmigan; 35.6 percent were successful, harvesting an estimated 1,771 birds. Overall, 59.6 percent of the households used ptarmigan, 33.7 percent received ptarmigan, and 19.2 percent gave away this resource. The per capita harvest of 2.1 pounds was the highest of any single bird type (pg. 81).

Fall, J. A., R. Mason, T. Haynes, V. Vanek, L. Brown, G. Jennings, Craig Mishler, and C. Utermohle. 1993. Noncommercial harvests and uses of wild resources in King Cove, Alaska. Alaska Department of Fish and Game Technical Paper No. 227, Juneau.
http://www.adfg.alaska.gov/techpap/tp227.pdf

A minimum of 18 kinds of wild birds and eggs were used for subsistence purposes by King Cove residents in 1992. These fall into three broad categories: upland game birds, migratory birds, and eggs. Ptarmigan was the only upland game bird locally available to King Cove hunters. An estimated 50.7 percent of the households hunted ptarmigan; 45.3 percent were successful, harvesting an estimated 2,701 birds. Overall, 61.3 percent of the households used ptarmigan, 25.3 percent received ptarmigan, and 21.3 percent gave away this resource. The per capita harvest of 3.4 pounds was the highest of any single bird type (pg. 77).

Wild resources were frequently and widely shared among King Cove households in 1992. Almost every household (94.7 percent) received at least one type of wild resource from someone living in another household, and most households (81.3 percent) gave away at least one resource to others. The average household received 7.3 kinds of wild resources and gave away 4.7 kinds. The majority of King Cove households received marine invertebrates (85.3 percent), salmon (52.0 percent), land mammals (56.0 percent), and fish other than salmon (68.0 percent).). Additionally, 44.0 percent received birds and/or eggs, 32.0 percent received wild plants and 16.0 percent received marine mammal products. The most widely received resources included king crab (received by 69.3 percent of the households), octopus (52.0 percent), sockeye salmon (36.0 percent), halibut (46.7 percent), coho salmon (30.7 percent), Tanner crab (38.7 percent), berries (30.7 percent), ptarmigan (25.3 percent), and Pacific cod (24.0 percent). Overall, 40.0 percent of the households gave away salmon, 42.7 percent gave away other fish, 42.7 percent gave away marine invertebrates, 26.7 percent gave away wild fowl, 21.3 percent gave away land mammals, 41.3 percent gave away wild plants, and 9.3 percent gave away marine mammals. Resources given away by the most households included sockeye salmon (26.7 percent), halibut (22.7 percent), coho salmon (26.7 percent), Tanner crab (20.0 percent), ptarmigan (21.3 percent), king crab (25.3 percent), octopus (20.0 percent), berries (37.3 percent), and caribou (18.7 percent) (pg. 40).

Fall, J. A., C. L. Brown, N. M. Braem, L. H-S, D. S. Koster, T. M. Krieg, and A. R. Brenner. 2012. Subsistence harvests and uses in three Bering Sea communities, 2018: Akutan, Emmonak, and Togiak. Alaska Department of Fish and Game Technical Paper No. 371, Juneau.
http://www.adfg.alaska.gov/techpap/TP371.pdf

In Akutan: “Rock ptarmigan nest high above the village. They are common in winter, and hunted right in town with shotguns. They are skinned, not plucked” (pg. 73)

Morris, J.M.

1985 The use of fish and wildlife resources by residents of the Bristol Bay Borough, Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 123. http://www.adfg.alaska.gov/techpap/tp123.pdf

"Frequently ptarmigan are taken while hunting other species, such as caribou or moose. A survey conducted by the Division of Game indicated that many hunters took ptarmigan during brown bear hunts in 1983; 203 ptarmigan were harvested by 48 Alaskan residents and 253 ptarmigan by 124 non-Alaska residents while hunting brown bears (Sellers and McNay 1984:53)" (pg. 100).

Morris, J. M. 1986. Subsistence production and exchange in the Iliamna Lake region, southwest Alaska, 1982-1983. Alaska Department of Fish and Game Technical Paper No. 136, Juneau. http://www.adfg.alaska.gov/techpap/tp136.pdf

[In the Iliamna Region] sometimes trips were made for the sole purpose of harvesting ptarmigan, but frequently birds or small game were taken while hunting caribou or moose" (pp. 55–56).

Payne, J. T., S. R. Braund, and James T. Payne and Associates. 1983. North Aleutian shelf basin sociocultural systems analysis. Alaska OCS Socioeconomic Studies Program Technical Report Number 67. https://www.boem.gov/BOEM-Newsroom/Library/Publications/1983/83_TR67.aspx

There is no "unspoken law" about these [hunting] territories, they are simply respected. An individual can go in another area but, in general, they use their own areas….

"It's not expected to share, but people just do it. You share your good fortune and it will come back to you." Although the rules of exchange are up to the individual, those in need, like an elderly widow, will receive food as well as strangers. One person said, "Even someone you don't like you give food. A man's got to eat…." (pp. 95–96).

Schichnes, J. and M. Chythlook. 1991. Contemporary use of fish and wildlife in Ekwok, Koliganek, and New Stuyahok, Alaska. Alaska Department of Fish and Game Technical Paper No. 185, Juneau. http://www.adfg.alaska.gov/techpap/tp185.pdf

"…ptarmigan were caught on the tundra in winter or in the brush along river channels in March and April" (Nushagak River residents) (pg. 62).

"One elder in Ekwok recalled that some people used to capture ptarmigan by improvising a fence with salmon netting. Ptarmigan walked or flew into the net. In that matter, he reported it was possible to harvest two sacks of ptarmigan a day. The researcher observed this technique in Koliganek when the ptarmigan population rebounded in 1991. When the ptarmigan walked or flew into the net, it was caught. In that manner, he reported it was possible to harvest two sacks of ptarmigan a day. Another technique was to build a fence of willow sticks with snares placed along openings" (pg. 206).

VanStone, J. W., and J. B. Townsend. 1970. Kijik: An historic Tanaina Indian settlement. Fieliana Vol 59. Field Museum of Natural History.

"Rabbits and ptarmigan are also certain to have been plentiful during the winter months and could easily be taken with snares. In fact, it was likely that these creatures were a staple that could be depended upon when supplies of dried fish were running low…" (pg 157).

Wright, J. M., J. M. Morris, and R. Schroeder. 1985. Bristol Bay regional subsistence profile. Alaska Department of Fish and Game Technical Paper No.114, Juneau.
http://www.adfg.alaska.gov/techpap/tp114.pdf

In discussion on species used and seasonal harvests in Nushagak Bay: "Many residents of the subregion rely on local marine, freshwater, and terrestrial resources. They harvest marine mammals, waterfowl, clams, salmon, and a variety of other fish from Nushagak Bay and neighboring coastal areas. Salmon, a number of other types of fish, and waterfowl are harvested in the bay and from rivers and lakes. They harvest moose, porcupine, spruce grouse, furbearers, berries, and fireweed from forests. From the tundra, caribou, ptarmigan, furbearers, and berries are taken..." (pg. 42).

In regards to the Upper Alaska Peninsula Subregion: "If caribou are not taken in the immediate vicinity of the community, the midsection of the Alaska Peninsula near the Becharof Wildlife Refuge is a commonly used hunting ground for those with air transportation. Other resources such as, berries, hare, porcupine, or ptarmigan are usually harvested in the vicinity of the home community" (pg. 72).