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Customary and Traditional Use Worksheet, Nushagak Caribou Herd, Game Management Units 17A and 17C

by

Bronwyn Jones

James M. Van Lanen

and

James A. Fall

January 2021

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

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Measures (fisheries)

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

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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Bronwyn Jones, James M. Van Lanen, and James A. Fall,
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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Bronwyn Jones, James M. Van Lanen, and James A. Fall,
Alaska Department of Fish and Game, Division of Subsistence,
333 Raspberry Rd. Anchorage, AK 99518 USA

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INTRODUCTION

BACKGROUND

At its 2022 Central/Southwest regulatory meeting, the Alaska Board of Game (the board) will consider Proposal 22 regarding a customary and traditional use determination for the Nushagak Peninsula caribou herd (NPCH) in game management units (GMUs) 17A and 17C (Figure 1). Under AS 16.05.258, the board is required to identify game populations, or portions of populations, that are customarily and traditionally taken or used for subsistence. To do this, the board follows 5 AAC 99.010 *Boards of Fisheries and Game Subsistence Procedures*, also called the "eight criteria". Under 5 AAC 99.025, in 1988, the board made a positive customary and traditional use (C&T) finding for caribou in Units 9A, 9B, 17, and 18. Generally, the Board of Game makes C&T findings for specific caribou herds. In early 1988, most caribou taken in Unit 17 were from the Mulchatna caribou herd (MCH). Therefore, the information provided to the board in support of the positive C&T determination generally addressed uses specific to the MCH. Under AS 16.05.258(a), the Commissioner of the department provides recommendations to the board concerning the population identification. Since 1988, the department has determined that two distinct caribou populations are now present in Unit 17: the MCH and the NPCH. A customary and traditional use finding specific to the NPCH has not been made. The Alaska Department of Fish & Game (the department) submitted Proposal 22 to provide the board an opportunity to make a C&T determination specifically for the NPCH.

In preparation for regulatory work on Proposal 22, the department has prepared this C&T worksheet for the board's consideration at its meeting currently scheduled for January 2022 in Wasilla. Information is presented for each of the eight criteria at 5 AAC 99.010. This customary and traditional use summary for the NPCH in GMUs 17A and 17C provides a description of customary and traditional harvest and use practices for caribou from the ethnographic and ethnohistorical literature pertaining to the Nushagak Peninsula and Bristol Bay, as well as from Division of Subsistence research projects and household surveys.

Figure 1.–Game Management Unit 17.

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.

In 1988, the board determined that residents of GMUs 17, 9B, and Lime Village and Stony River (both in GMU 19A) had established customary and traditional uses of caribou in GMU 17. Although at that time most caribou taken in Unit 17 were from the Mulchatna Herd, the board's finding pertained to all caribou hunting occurring in GMUs 17 A, B and C. Also in 1988, 146 caribou were transplanted from the Northern Alaska Peninsula Herd to the Nushagak Peninsula (southern portions of GMUs 17A and 17C), establishing the Nushagak Peninsula Caribou Herd, and eventually providing a new wildlife resource for Togiak, Twin Hills, Manokotak, Aleknagik, and Dillingham residents (Evans et al. 2013; Fall et al. 2012). Following successful growth of the herd, in regulatory year 1994–1995, residents of Aleknagik, Clarks Point/Ekuk, Dillingham, Manokotak, Togiak, and Twin Hills were found to have positive customary and traditional uses for caribou on the Nushagak Peninsula by the Federal Subsistence Board (FSB). However, findings specific to the Nushagak Peninsula caribou herd have not been made by the Alaska Board of Game. It should be noted that, while the board makes C&T use findings for caribou herds, the following includes information on uses of caribou by local communities that use the NPCH. Caribou harvest and use in these local communities date back centuries; however, in recent history, due to regulations, caribou hunting on the Nushagak Peninsula by these communities has only been open since the 1994–1995 season.

Historically, a large caribou population occupied the coast of the Bering Sea from Bristol Bay to Norton Sound. In the western portion of the MCH range, archaeological evidence suggests that caribou have been hunted since prehistoric times in the mountain areas southeast of the Kuskokwim River, including portions of what is now GMU 17 (Ackerman 1979; 1980; 1982; 2001; Britton et al. 2013; Charnley 1984). For example, remains of caribou are common in 1,000–2,500 BP Norton tradition sites, along salmon streams northwest of Togiak Bay on the Bering Sea Coast (Wright et al. 1985). Additionally, local traditional knowledge suggests that caribou have always been important to the Alaska Native population residing in what is now GMU 17[1] (Blue et al. 2007; Fall et al. 2012; Van Lanen et al. 2018).

From 1818–1829, Russian explorers reported observations of a large caribou population occurring along the Bering Sea coast from Bristol Bay to Norton Sound, including the Yukon-Kuskokwim Delta, and inland along the Nushagak River, Kvichak River, and Togiak River watersheds, in the Tikchik Lakes basin, around Iliamna Lake, along the Alaska Peninsula, in the Kilbuck Mountains north towards Aniak, into the upper Kuskokwim River area, and likely along the western slope of the Alaska Range. At this time it was reportedly common to see groups of caribou numbering in the thousands in southwest Alaska (Nelson 1887). During the late 1800s, caribou had declined from the region and remained sparse and scattered throughout the first half of the 20th century (Petroff 1884; Skoog 1968; Whitman 1997).

The people living in what is now GMUs 17A and 17C have oral history accounts of a time when caribou inhabited the Togiak River drainage prior to the 1900s. In 1979, a Division of Subsistence researcher documented an elder living in Togiak reporting the following information: caribou disappeared from the Togiak area by the early 1900s when he was old enough to start hunting. He reported hearing stories from his elders in the men’s community house about how wolves had driven out the caribou from the Togiak area. Elders would talk and sing about past caribou hunts when there were plenty of the animals for food, clothing, and making boats from their hides. Togiak River residents had relied on caribou hides to make

1. M. Kotwa,, 1963, Old Togiak in prehistory, *In:* Togiak National Wildlife Refuge Comprehensive Conservation Plan 1986, Unpublished Reprint, U.S. Fish and Wildlife Service, Togiak National Wildlife Refuge, Dillingham, Alaska.

boats since moose had historically been scarce in the area. [2] During a 2008 study conducted by the Division of Subsistence, several Togiak elders described additional traditional uses of caribou. According to an elder from Togiak (Fall et al. 2012):

> Before there were rifles, they used the caribou rib bone for part of the "spear" because caribou rib bone doesn't break. At one location, when the walrus were hauling out, they would go up to the one farthest from the water when he was asleep and drive the caribou spear into the walrus near where the collar bone is sticking out, to try to reach the heart to make it bleed.

A different Togiak resident explained:

> In the olden days, for those lucky people, they had a caribou sinew herring net. The nets were very short, but there were so many herring that you didn't need a long net. The whole family would work to take care of the herring.

The purpose of the 1988 transplant was to reintroduce caribou to an area where they had once been abundant. The transplanted herd was managed under an agreement between the U.S. Fish and Wildlife Service, ADF&G, and the communities of Togiak, Manokotak, Aleknagik, and Dillingham. Part of the goal in conducting the transplant was to provide hunting opportunities once the herd size became sufficient to sustain hunting pressure. Local communities agreed not to hunt the herd until such time that their numbers permitted sustainable harvest. In regulatory year 1994–1995, the FSB enacted regulations affording hunters from nearby communities an opportunity to harvest Nushagak Peninsula caribou for subsistence uses after the FSB found that residents of Aleknagik, Clarks Point/Ekuk, Dillingham, Manokotak, Togiak, and Twin Hills have a positive customary and traditional use for caribou on the Nushagak Peninsula. At this time a hunt was established that was limited to federally qualified subsistence users of the communities listed above (Aderman 2015; Holen et al. 2005:17).

Since the reintroduction, the Nushagak Peninsula caribou herd has experienced substantial fluctuations in population size. The herd initially grew to approximately 1,400 caribou by the late 1990s, but during the following decade, the population declined to below 500 caribou in 2006 (Aderman 2015:20). From 2007 to 2015, the population increased to approximately 1,000 caribou. Since 2015, the population has declined, which is due in part to federal regulations managing for high harvest in recent years. The most recent (2019) population was estimated to be 822 caribou.[3] The population currently approximates the population objective of the *Nushagak Peninsula Caribou Management Plan*, which is to maintain a population of 400–900 caribou, with an optimum of 750 caribou (Aderman 2015). With the exception of regulatory years 2015–2016, 2017–2018, and 2019–2020, caribou hunting on the Nushagak Peninsula has been limited to federally qualified subsistence users. Table 1 provides Nushagak Peninsula reported caribou harvest by community, for regulatory years 1994–1995 to 2019–2020.

Studies of local knowledge report that hunters often find it difficult to differentiate between NPCH and MCH caribou while in the field. For example, Togiak respondents interviewed by Van Lanen et al. (2018) frequently commented on caribou encountered from the late 1990s to present, southeast of the community, in the lowlands in the vicinity of the Negukthlik and Ungalikthluk rivers. Togiak respondents believed that these likely were animals from the introduced NPCH but speculated that they could also be MCH caribou or that some mixing had occurred between the NPCH and MCH around this area. Togiak respondents said that any caribou encountered west of the Togiak River drainage were almost certainly MCH caribou. Hinkes et al. (2005) reported that the NPCH range was 552 square miles. While telemetry tracking has shown movement from the Nushagak Peninsula to the northwest by NPCH animals at times, and a portion of the

2. M. Chythlook, n.d., Field notes from October and November 1979, On file at Alaska Department of Fish and Game, Division of Subsistence, Dillingham.
3. Bristol Bay Regional Advisory Council, Meeting Minutes, October 30–31, 2019, Dillingham, page 57, https://www.doi.gov/sites/doi.gov/files/uploads/bbrac-fall-2019-book.pdf

herd appeared to establish a range southeast of Togiak, wildlife biologists continued to consider the NPCH a nonmigratory, resident herd, and any mixing between the NPCH and MCH has not been identified (Hinkes et al. 2005; Holen et al. 2005).

Table 1. Nushagak Peninsula caribou reported harvest by community, regulatory years 1994–2020.

	Community							
Regulatory year	Aleknagik	Dillingham	Manokotak	Togiak	Twin Hills	Clarks Point	Other	Total
1994–1995	3	5	25	1	1	0	--- [a]	35
1995–1996	0	2	50	0	0	0	---	52
1996–1997	1	10	9	0	0	0	---	20
1997–1998	4	38	25	0	0	0	---	67
1998–1999	0	45	10	0	0	0	---	55
1999–2000	1	40	16	6	0	0	---	63
2000–2001	0	107	19	0	0	0	---	126
2001–2002	5	76	46	0	0	0	---	127
2002–2003	0	0	3	0	0	0	---	3
2003–2004	0	7	27	0	0	0	---	34
2004–2005	0	2	7	0	0	0	---	9
2005–2006	1	0	10	0	0	0	---	11
2006–2007	---	---	0	---	---	---	---	0
2007–2008	---	---	0	---	---	---	---	0
2008–2009	---	---	8	---	---	---	---	8
2009–2010	1	6	11	---	---	---	---	18
2010–2011	11	10	24	---	---	---	---	45
2011–2012	17	22	32	15	0	---	---	86
2012–2013	26	38	37	4	4	---	---	109
2013–2014	9	52	41	---	---	---	---	102
2014–2015	4	8	4	---	---	---	---	16
2015–2016[b]	6	33	23	---	---	2	2	64
2016–2017[c]	40	241	87	8	---	---	---	378
2017–2018[d]	0	61	39	0	0	0	---	100
2018–2019[e]	1	5	8	---	---	---	0	14
2019–2020[f]	34	191	55	17	4	0	6	307
Total	**164**	**999**	**616**	**51**	**9**	**2**	**8**	**1,849**
%	8.9	54.0	33.3	2.8	0.5	0.1	0.4	100.0

Note "RC" indicates state registration hunts, open to all Alaska residents.

a. --- no permits issued.

b. 2015–2016 includes 10 caribou harvested in RC501.

c. 2016–2017 includes 28 caribou harvested in RC501, including 2 by nonlocal residents.

d. 2017–2018 includes 5 caribou harvested in RC501.

e. 2018–2019 includes 2 caribou harvested in RC501.

f. 2019–2020 includes 12 caribou harvested in RC501 and 7 caribou harvested illegally.

Table 2 reports caribou harvests and uses for Aleknagik, Clarks Point, Dillingham, Manokotak, Togiak, and Twin Hills based on data from the Division of Subsistence household surveys. With several exceptions, 70% or more of households in each community used caribou during a given study year. The high percentage of households using caribou coincides with relatively high percentages of households harvesting caribou and sharing this resource with other households.

Table 2. Estimated Nushagak Peninsula caribou harvests by community and study year.

		Percentage of households					Harvest	95%	Harvest weight (lb)		
		Use	Attempt	Harvest	Receive	Give	amount	confidence		Mean per	
Community	Study year	%	%	%	%	%	(ind)	limit (±)	Total	household	Percapita
Aleknagik	1989	84.2%	60.5%	55.3%	60.5%	60.5%	57	0.1	8,621	205.3	60.5
	2001	88.9%	55.6%	47.2%	27.8%	52.8%	48	0.2	7,200	150.0	45.8
	2008	12.5%	6.3%	0.0%	0.0%	12.5%	0	0.0	0	0.0	0.0
Clarks Point	1989	76.5%	52.9%	41.2%	47.1%	64.7%	18	0.0	2,700	158.8	48.2
	2001	85.7%	71.4%	57.1%	57.1%	42.9%	28	0.0	4,200	200.0	71.2
	2008	36.4%	54.5%	9.1%	9.1%	18.2%	2	2.2	245	13.6	6.5
Dillingham	1984	69.9%	26.8%	22.2%	15.0%	54.9%	379	0.3	56,904	82.4	27.9
	2001	13.5%	10.2%	6.3%	6.8%	7.7%	344	0.3	51,622	58.9	21.1
	2010	35.8%	14.8%	5.1%	9.2%	28.7%	63	0.5	9,495	13.1	4.1
Manokotak	1985	88.9%	42.6%	31.5%	46.3%	64.8%	44	0.1	6,638	112.5	21.5
	1999	87.7%	56.8%	49.4%	63.0%	65.4%	130	0.1	19,500	216.7	49.3
	2001	88.3%	41.7%	41.7%	31.7%	53.3%	68	0.2	10,270	130.0	27.9
	2008	49.2%	13.1%	8.2%	6.6%	44.3%	20	0.1	3,069	32.0	8.1
Togiak	1999	70.6%	55.6%	47.4%	40.6%	45.0%	178	0.2	26,635	151.3	36.6
	2001						106	0.3	15,840	102.9	22.6
	2008	82.5%	38.8%	30.0%	36.3%	65.0%	136.3	0.2	20,445	108.8	25.5
Twin Hills	1999	91.7%	83.3%	75.0%	66.7%	66.7%	25	0.3	3,738	162.5	54.2
	2001						8	0.3	1,141	45.7	15.9

Source ADF&G Division of Subsistence CSIS

Note Blank cells indicate the survey did not collect percentage of households that use, attempt, harvest, receive, or give caribou.

CRITERION 2: SEASONALITY

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

Hunting season dates and bag limits change based upon a variety of factors; however, a consistent pattern of taking caribou in GMUs 17A and 17C has been demonstrated over time. In a 1983 study, the Division of Subsistence documented caribou hunting by Togiak residents in conjunction with moose hunting during late fall and mid-winter (Wolfe et al. 1984). In 1999, 16 years after the 1983 study, similar harvest patterns were documented for Togiak, Twin Hills, and Manokotak residents (Coiley-Kenner et al. 2003), and 25 years later, in 2008, similar caribou harvest patterns by Togiak residents were again reported (Fall et al. 2012). The harvest of caribou in the late summer and early fall by residents in GMU 17C is opportunistic, based on the availability of caribou while moose hunting (Holen et al. 2005). The 2005 study also documented that in February and March, snow conditions tend to be good for travel by snowmachine for residents of western GMU 17A and 17C communities (Togiak, Twin Hills, Manokotak, Aleknagik, Dillingham, Clarks Point, and Ekuk), and daylight hours are longer, accompanied by generally warmer temperatures. If caribou are in the area and there is adequate snow cover, these winter months tend to provide travel conditions that are optimal for hunting caribou (Holen et al. 2005).

Caribou harvest amounts for the Nushagak Peninsula herd likely can be correlated to seasonal snow conditions. For example, caribou harvests were high for regulatory years 2000–2001 and 2001–2002, likely due to excellent snow travel conditions, but during the winter of 2002–2003 an absence of snow made access difficult, and very few caribou were reported harvested (Aderman 2015:17). In more recent years, total reported harvest has varied significantly due to variable winter weather and travel conditions. For instance, in 2015–2016, when the population was at its largest, but travel conditions were poor, only 64 caribou were reported harvested. The next year, when snow travel conditions were good, 378 caribou were reported harvested. Only 14 caribou were reported harvested during the 2018–2019 season due to early breakup and an inability for residents to access caribou via snowmachine.[4]

4. Bristol Bay Regional Advisory Council, Meeting Minutes, October 30–31, 2019, Dillingham, page 60, https://www.doi.gov/sites/doi.gov/files/uploads/bbrac-fall-2019-book.pdf

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.

The NPCH primarily occupies the approximately 425 square mile Nushagak Peninsula. Opportunity to hunt NPCH is permitted under RC501 for state and federal permits. The RC501 hunt areas encompasses the Nushagak Peninsula and areas north in eastern 17A and western 17C. In addition, there are private lands on the Nushagak Peninsula that could be hunted under state permits. The area open for hunting is on federal public lands in that portion of GMUs 17A and 17C, which consists of the Nushagak Peninsula south of the Igushik River, Tuklung River and Tuklung Hills, west to Tvativak Bay.[5] Since the 1994 establishment of the Nushagak caribou herd subsistence hunt, the residents of western GMU 17A and 17C communities typically access the Nushagak River caribou herd directly from their community using snow machines in the late winter months, often opportunistically taking caribou while moose hunting, demonstrating that residents have pursued the most efficient and economical way to harvest caribou. Caribou are taken efficiently with firearms.

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.

In addition to the information presented under Criteria 1 and 3, long-term and consistent patterns of taking, use of, and reliance on NPCH in areas by local communities were documented in Coiley-Kenner et al. (2003). Figures 1, 2 and, 3 (below) from Coiley-Kenner et al. depict that, dating back to at least 1980, some residents of Manokotak, Togiak, and Twin Hills harvested caribou within an approximately 30-mile radius of their respective community, while some community members traveled great distances to harvest caribou in GMUs 17C and 17B. However, these figures demonstrate that the hunting radius decreased significantly when taking of the Nushagak Peninsula caribou herd was allowed.

5. U.S. Department of the Interior Federal Subsistence Management Program, News release, "2020 Fall Federal Nushagak Peninsula Caribou Season Opening," Accessed October 28, 2020. https://www.doi.gov/subsistence/news/general/2020-fall-federal-nushagak-peninsula-caribou-season-opening

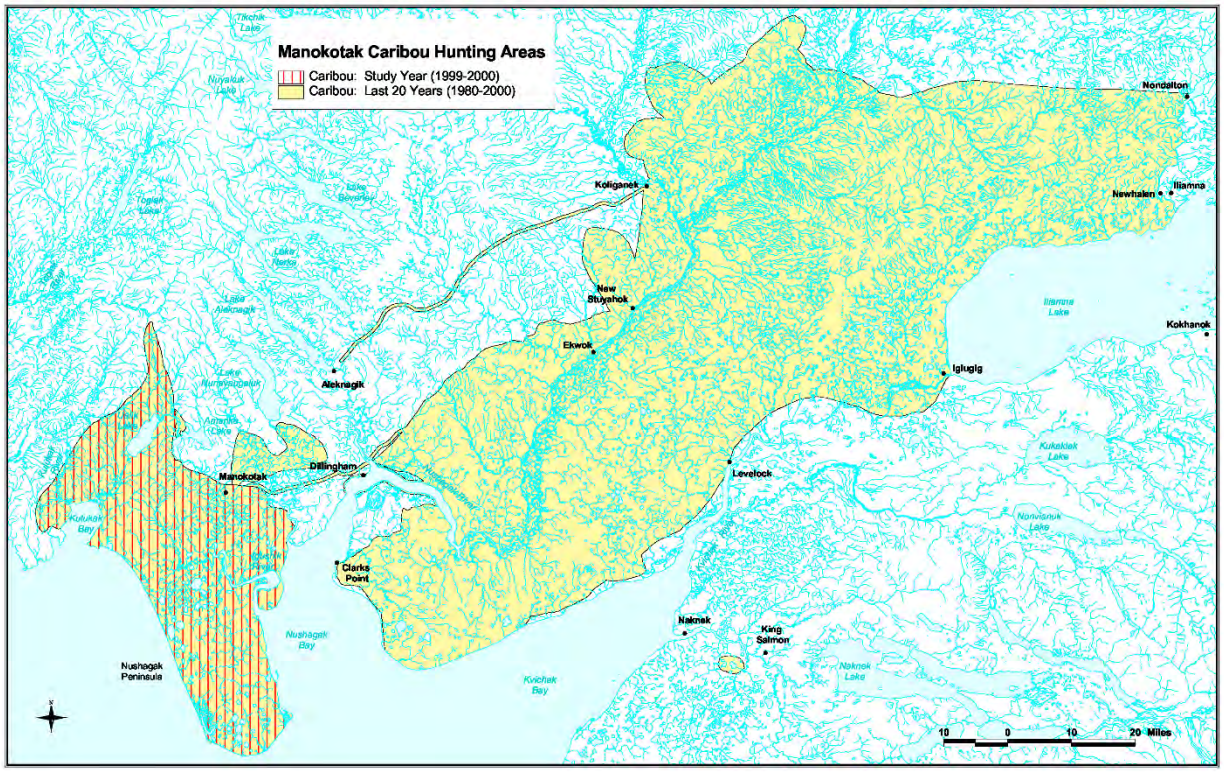

Figure 2.–Manokotak caribou hunting areas, 1980–2000.

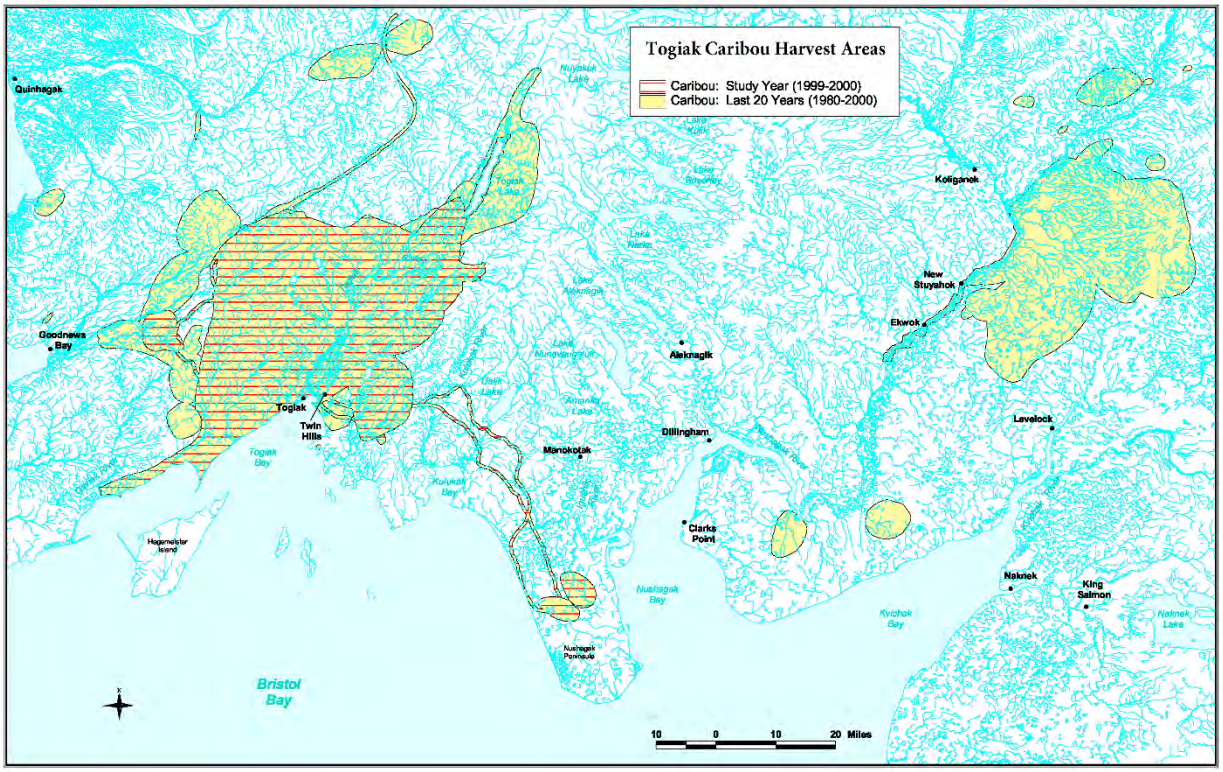

Figure 3.–Togiak caribou harvest areas, 1980–2000.

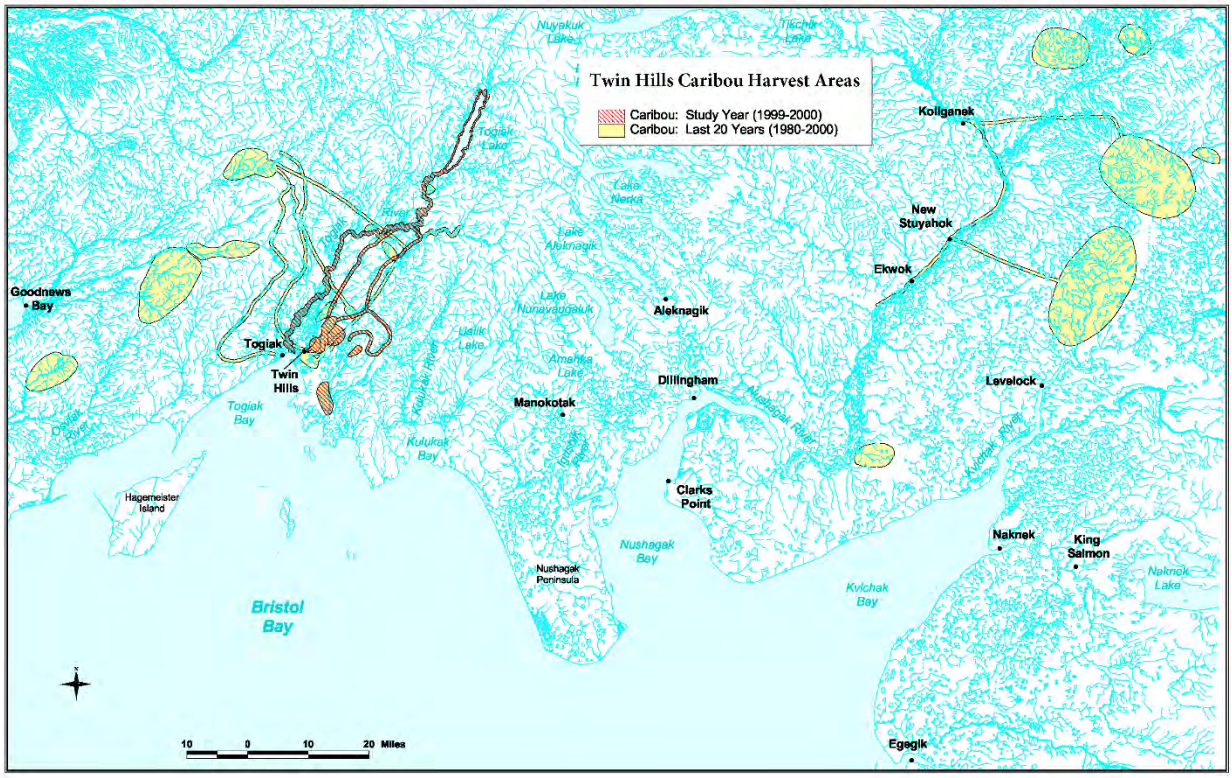

Figure 4.–Twin Hills caribou harvest areas, 1980–2000.

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.

Prior to the availability of electricity, caribou meat was eaten fresh, frozen in caches, dried, and often eaten with seal oil. According to a Togiak elder interviewed in 1979, with no refrigeration, harvesters shared in the field as well as within the village. What could not be used fresh was dried and stored to eat later with seal oil.[6]

Today, residents of communities in GMU 17 eat caribou fresh, frozen, or canned. Some area families continue to dry caribou meat during fall and spring. Dried caribou meat is eaten with seal oil in many of the communities near the Nushagak Peninsula (Fall et al. 2012; Krieg et al. 2007; Wolfe et al. 1984).

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.

According to an elder raised in Togiak, young men were never allowed to start hunting on land or sea until they were taught by the elders' council. Young men during these learning periods were housed in the men's community house (*qasgiq)* with their elders to be counseled about the subsistence way of life

6. M. Chythlook, n.d., Field notes from October and November 1979, On file at Alaska Department of Fish and Game, Division of Subsistence, Dillingham.

(*pingnaqsaram ayuqucianek*) first thing each morning. Elders' counsel to young men coincided with the seasons to harvest fish and game.[7]

Kinship ties: The communities of Togiak, Twin Hills, Manokotak, Aleknagik, and Dillingham all have extensive kinship networks within and between them. Twin Hills was formed by former Togiak residents. The original residents of Manokotak came from the areas of Nushagak, and Togiak bays. Aleknagik was originally settled by people who lived near the Aguluraq River. After the 1919 flu epidemic depopulated the settlement, survivors moved to the present area of High Point and llutsiq Island. Households were also located around Aleknagik Lake and by Sunshine Valley. Later, Aguluraq became a seasonal fish camp for those who had originally lived there year-round. During the first half of the 20th century, non-Alaska Native settlers moved in and started a school. The current residents, "the second generation," came mainly from the Kulukak and Togiak areas, as well as the Kuskokwim area, attracted by a large population of furbearers and commercial fishing.

Hunting groups: Winter and spring hunting parties are often larger than fall hunting parties and include members from different households and extended family groups. In a 1983 study, Wolfe et al. found that groups ranged in size from 1 to 12 persons. Of 27 recorded hunts, the mean group size was 4. Hunters were more likely to be young men in the same age range. Of 27 recorded hunts, most hunting groups contained married brothers hunting together with one or more unrelated age-mates. Fathers and sons only occasionally hunted together during winter and spring. In fall, however, there were more cross-generational hunting groups, and wives and children might also go along (Wolfe et al. 1984).

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.

Caribou harvested in communities near the Nushagak Peninsula are shared throughout the Bristol Bay region and elsewhere. Networks of households participate in harvesting and processing caribou; these networks are then linked together through sharing and exchange within and between communities. Modes of exchange include generalized reciprocity and instances of barter (exchanging caribou directly for other resources) or customary trade (exchanging caribou for small amounts of cash) (Fall et al. 1986; Holen et al. 2005; Krieg et al. 2007; Schichnes and Chythlook 1988).

Studies of Manokotak subsistence production in 1995 and 2000 showed that caribou were widely shared: an estimated 65% of households reporting receiving caribou during both study years (Coiley-Kenner et al. 2003). These studies found that Manokotak hunters generally divide the meat between partners in the field. Then it is redistributed at home by the female head of the household.

Available ethnographic and harvest survey data for Bristol Bay demonstrate that barter often involves resources such as seal oil, salmon, and moose and caribou meat (Krieg et al. 2007:3). For example, Krieg et al. documented that a 78-year-old resident of Dillingham received two cases of canned Chinook salmon, 20 lb of half-dried sockeye salmon bellies (*gumchaq)*, and 10 quarts of Chinook strips from a friend in Alegnagik, and in exchange gave one hindquarter of moose and two hindquarters of caribou in barter (Krieg et al. 2007:38).

Wolfe et.al (1984) and Van Lanen et al. (2018) found Togiak residents to be part of an exchange network that includes New Stuyahok. Togiak is closer to maritime resources, such as seals, than New Stuyahok, which is closer to large concentrations of caribou. Residents of the two communities exchange products of the land and sea. For instance, several older New Stuyahok men originally came from the Togiak area. Based on kin ties, some hunters from Togiak (and Manokotak) regularly come to New Stuyahok to go hunting for moose and caribou. Commonly, the Togiak hunters bring seal meat, seal oil, and walrus as gifts

7. M. Chythlook, n.d., Field notes from October and November 1979, On file at Alaska Department of Fish and Game, Division of Subsistence, Dillingham..

to New Stuyahok relatives. In return, their relatives accompany them on caribou hunts in New Stuyahok's hunting territory. Some visitors are sponsored by friends they have made in the commercial salmon fishery. On one occasion, several caribou had already been taken by New Stuyahok hunters when a Togiak contingent arrived. The seals were simply exchanged for the caribou (Wolfe et al. 1984:368).

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.

Residents of communities near the range of the NPCH harvest a wide variety of resources throughout the year, including salmon, migratory birds, seals, walruses, marine and freshwater nonsalmon fish, bird eggs, crabs and clams, brown bears, tundra hares, ptarmigan, berries, wild greens, moose, and caribou (ADF&G 1985; Coiley-Kenner et al. 2003; Fall et al. 2012). Studies conducted by the Division of Subsistence have documented that harvests of fish, wildlife, and wild plants remain a key component of the local economy and central to the way of life of Nushagak Peninsula area community residents, a way of life linked directly to centuries-old traditions of the Yup'ik people of southwest Alaska. For example, Coiley-Kenner et al. (2003) found that in 1999 virtually every household in Togiak used wild foods, and the vast majority of households were involved in subsistence harvests and sharing. Average harvests were 1,017 lb per household and 246 lb per capita. In 2008, as in 1999, subsistence harvests and uses were diverse, with the average Togiak household using about 27 different kinds of wild foods. Salmon, with 35% of the harvest as estimated in usable weight, and other fish, at 21%, composed the majority of the harvest in 2008, with land mammals ranking third at 17%. This was a change from 1999, when land mammals ranked first with 29% of the total. However, more Togiak households reported using large land mammals in 2008 (93% of households) than in 1999 (75% of households) reflecting widespread sharing in the community (Coiley-Kenner et al. 2003:47; Fall et al. 2012:177).

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