



**TRADITIONAL KNOWLEDGE ON
CARIBOU ECOLOGY:
VEGETATION → CARIBOU → WOLF
FOOD CHAIN**

Final Report
By Sharon Katz, PhD
Aurora Research Institute
Inuvik, NT
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AURORA RESEARCH INSTITUTE
A U R O R A C O L L E G E

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1. SUMMARY

This study is a part of a study on contaminants in a northern terrestrial environment. It is well recognized that a wealth of traditional knowledge (TK) exist about the ecology of caribou, and that TK may illuminate the contaminants' study. On the other hand, a lot of TK has never been documented yet.

The goal of the contaminants study was to investigate if fluorinated hydrocarbons (Perfluorocarboxylic acids [PFCAs] and Perfluorosulfonates [PFSAs]) bio-magnify in the terrestrial food system. The food chain of vegetation (including lichens), caribou and wolf was chosen for several reasons, as explained in another report by S. Katz et al. [Katz et al. 2009]. Briefly, this food chain is linear, yet encompasses three trophic levels: primary producers (vegetation), herbivores (caribou) and predators (wolves). The vegetation contains root-less species, i.e. lichen and moss, and vascular plant with root systems. For the purpose of monitoring long range transport of contaminants, this is important. The root-less species receive their nutrients from the atmosphere while the vascular plants mainly uptake nutrients from the soil. Caribou is of immense importance to aboriginal people in the study area, and correspondingly has been selected for contaminants monitoring. A further benefit of caribou to this study is that it adapted to a diet high in lichen, especially in winter, so its diet exposes it both to contaminants from atmospheric input (through lichens and moss), and soil and water input (through vascular plants). Finally, wolf's diets consist mainly of caribou, making vegetation →caribou→ wolf a linear, un-branched chain.

In collecting and researching TK, a lot of attention is given to language and heritage; however the parallels between TK and ecology are less widely acknowledged. This is unfortunate, as ecological TK, apart from its inherent value, may also serve to guide, and complement, scientific research. I note that the links between TK and pharmacology are well recognized and serve to guide research into new medicines and pharmacological drugs; in this report I highlight some areas where the ecological TK that was collected in this study can similarly guide wildlife and environmental research.

In general, the TK and scientific knowledge (SK) about caribou ecology agree well and strengthen each other. In certain areas TK and SK complement each other, and this is noted in the report where applicable. For example, one interviewee, Freddy Frost from Old Crow, worked with scientists and incorporates both TK and SK in his interview. Traditionally, caribou were not hunted between April, when the animals are "poor" after a long winter on a diet of lichen and moss, and August. So TK on caribou ecology for the period between June and early-to- mid July is lacking, but SK complements this. In contrast, we recorded a wealth of TK on wolves that follow the migration of barren-ground caribou, and this complements SK, since this subject of SK is underfunded. In conclusion, integrating TK and SK gives a more complete and rich picture of caribou ecology.

This study looked at barren ground caribou, specifically the Porcupine Caribou Herd (PCH), their food, and a major caribou predator, the wolf. The study also looked at cultural anthropology. The on-the-land experience of the interviewees was recorded, both verbally and on maps. This information is outlined in section 4.1. Anyone who is specifically interested in this part of the study is advised to contact the Gwich'in Social and Cultural Institute (GSCI), or the Aurora Research Institute (ARI) and

request electronic copies of the maps. Linguistic information is recorded in section 4.2; we are very pleased that some new place names have come to light in this study. Gwich'in legends and lore were also recorded and are presented in section 4.3.

The TK on caribou is given in section 4.4, while the TK on wolves is given in section 4.5. TK on caribou is extensive, since the existence of Gwich'in people is intimately tied with caribou; indeed Gwich'in people are also known as “the people of the caribou”. Gwich'in people's TK is inseparable from responsible harvesting of caribou; as such, erosion of TK, as the way of life changes, introduces ecological stresses (apart from socio-economical stresses). These ecological impacts are reported separately in section 4.6. A lot of the TK deals with propriety knowledge, specifically in regards to harvesting. The elders talked about when to hunt, which animals to leave alone, how to maintain tidy practices etc. The language reflects this holistic approach; for example, there is a special word for the place where caribou settles down for winter: *Vinijàatan*. This represents much more than a place; the caribou herd spreads out in winter, and where caribou groups decide to winter changes according to annual conditions. Failure to know where *Vinijàatan* is has meant great hardship for the people. Percy Henry gives a heart wrenching account of that, see section 4.1.

The TK on wolves, section 4.5, is especially interesting, since these wolves are linked to migrating prey, as opposed to territorial wolves. These migratory wolves will travel much longer distances than territorial wolves [Frame et al 2004]. The TK shows that they migrate with the caribou; “*It follows the caribou, it lives with the caribou*” (Woody Elias, Fort McPherson). Migrating wolves have been researched a lot less than territorial wolves, and that makes this TK especially valuable for scientists [Dean Cluff, private communications].

The direct on-the-land experience of the interviewees extends as far back as the early 1940's. This period overlaps significant changes in human impacts, due to motorization, and to climate change. The impacts of these changes on the land in general, and on caribou in particular are considered in sections 4.6 and 4.7.

Finally, historical information that arose in the interviews is given in section 4. 8.

Combining TK with SK definitely gives a fuller picture of caribou ecology than either discipline gives on its own. This report focuses on TK, and only occasionally refers to SK, as relevant. In the author's opinion, this study demonstrates the advantages of combining these two disciplines.

The study area focused on the Canadian side of the range of the Porcupine Caribou Herd (PCH). There are three First Nation communities whose lands overlap this range: Dawson (Tr'ondëk Hwëch'in), Fort McPherson (Teetl'it Gwich'in) and Old Crow (Vuntut Gwitchin). The range of the PCH including the three communities is shown in figure 1. Of the three communities, Old Crow is closest to the summer calving grounds of the herd, while Dawson is the furthest and most southerly. The caribou follows an annual migration between their winter range and their calving grounds on the coast of the Beaufort Sea. Dawson (Lat. 64° 3', Long. 139° 25') is at the southern limit of the PCH range, where animals winter. In late spring to early summer, and then in late summer to early fall, the animals migrate close to Old Crow (lat. 67° 34', Long. 139° 50') and Fort McPherson(Lat. 67° 26', Long. 134° 52') .

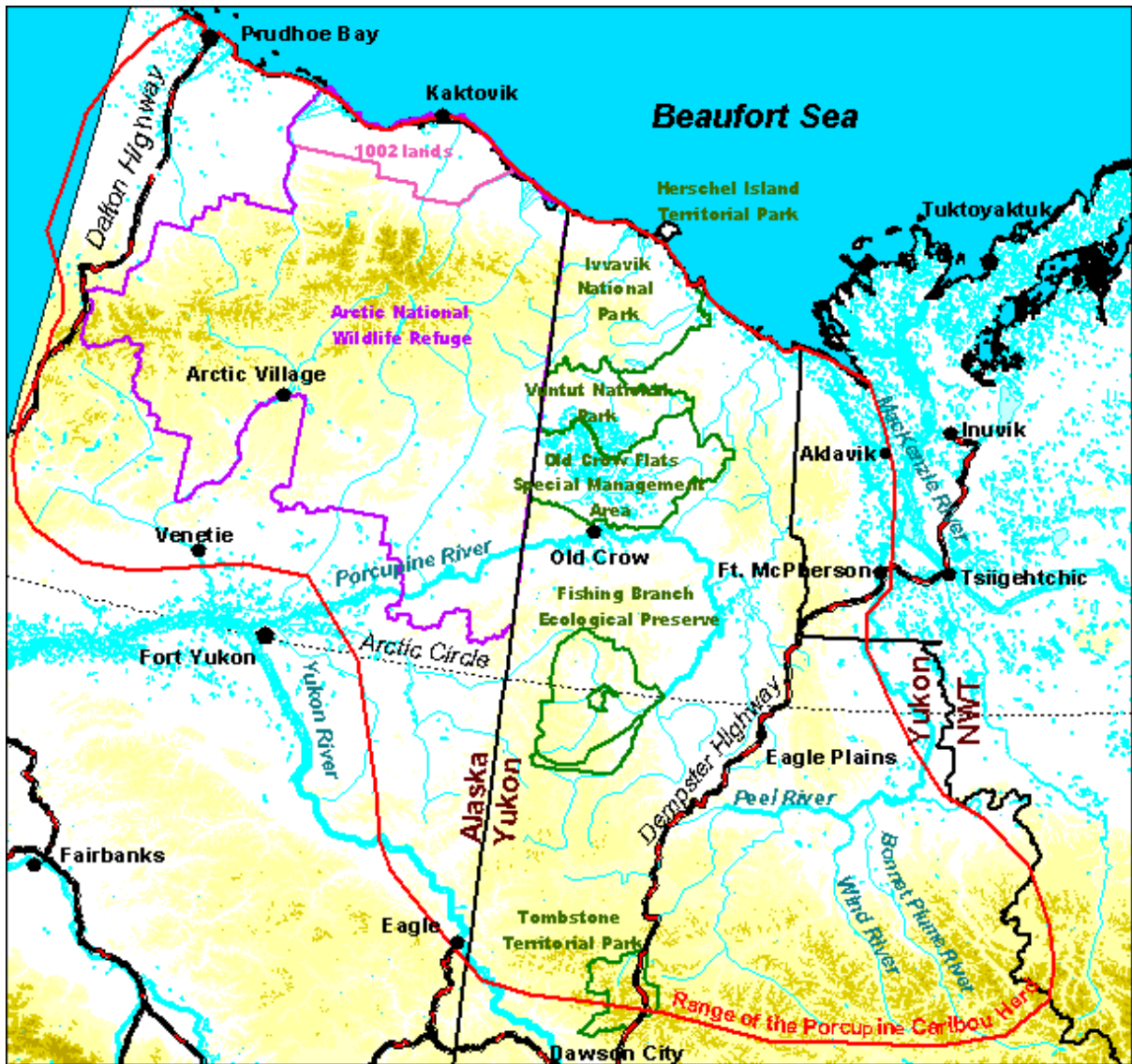


Figure 1.1: Range of the Porcupine caribou herd (PCH). Map copied from www.taiga.net website.

Note on spelling: In Fort McPherson (and also Aklavik, Inuvik and Tsiigehtchic) the spelling is Gwich'in, while in Old Crow it is spelled Gwitchin. Both names are used in this report, according to who they are and where they refer to. The language is referred to as the Gwich'in language throughout.

2. METHODOLOGY

2.1 Community interviews

The Gwich'in Social and Cultural Institute (GSCI) was contracted by the Aurora Research Institute (ARI) to identify and interview traditional knowledge holders from communities within the Porcupine Caribou Herd (PCH) range. The GSCI collaborated with the Tr'ondëk Hwëch'in First Nation (THFN) in Dawson, Yukon, and the Vuntut Gwitchin First Nation (VGFN) in Old Crow, Yukon. Seven interviews were conducted in all; three in Old Crow, two in Dawson and two in Fort McPherson. All the people interviewed were elders, with first-hand experience of living and travelling on the land. The regional heritage researchers selected the elders to be interviewed.

Interview questions were developed by Sharon Katz (ARI) and Alestine Andre (GSCI). The questionnaire was sent ahead of the interviews for review by VGFN and THFN. A consent form was adapted from an existing GSCI consent form by Sharon Katz and Ingrid Kritsch. The consent form was approved by the ethical review committee according to standard NWT license application procedure.

2.2 Interviewers

Dawson: Alestine Andre (GSCI) and Madeline deRepentigny, (THFN). Fort McPherson: Alestine Andre and Sharon Snowshoe, (GSCI). Old Crow: Mary Jane Moses (VGFN).

Mary Jane Moses is shown in figure 2.1. Alestine Andre and Madeline deRepentigny are shown together with interviewees in section 3.



Figure 2.1 Mary Jane Moses conducted the interviews in Old Crow. Mary Jane is a film maker in Old Crow. Photo Credit: S. Smith, copyright VGFN, 2005

2.3 Tape recorders

The Fort McPherson and Dawson interviews were recorded using an Olympus Digital Voice Recorder DS-4000 and Sony Cassette-Corder TCM-900DV. The interviews were transcribed using Express Scribe software for the sound recordings and a Sanyo Memo-Scriber TRC-8800 Dictating/Transcribing System for the cassette tapes.

2.4 Mapping

The interviews in Dawson and Old Crow were conducted using a map of the area. Alestine Andre or the interviewees marked the map as the interviews went along. Each interviewee was assigned a marker color and their initials were used for marking sites and features on the map. The features were marked sequentially, e.g. PH1 for the first feature marked in Percy Henry's interview. The maps are kept at the GSCI office in Tsiigehtchic. Electronic copies may be requested from the GSCI or from ARI.

2.5 Transcription, translation and language verification

The interviews were transcribed by Kristi Benson, and proofed by Alestine Andre, both from the GSCI. Gwich'in language translation and verification was provided by Margaret Thompson and William Firth, both from the Gwich'in Language Centre in Fort McPherson which is part of GSCI. References used for the tables are as follows: Ingrid Kritsch, Sarah Jerome, and Eleanor Mitchell. 2000. Teet'it Gwich'in Heritage Places and Sites in the Peel River Watershed. Gwich'in Social and Cultural Institute; Draft List of Teet'it Gwich'in Place Names, forthcoming, Gwich'in Social and Cultural Institute, Tsiigehtchic, NT; Vuntut Gwitchin First Nation & Shirleen Smith. 2009. People of the Lakes. Stories of Our Van Tat Gwich'in Elders / Googwandak Nakhwach'anjoo Van Tat Gwich'in. The University of Alberta Press, Edmonton, Alberta and Yukon Tourism & Culture, Cultural Services Branch. 2008. Gazetteer of Yukon. Yukon Geographical Place Names Board, Whitehorse, Yukon.

2.6 Research materials

Photographs of Fort McPherson Elders Robert Alexie Sr. and Woody Elias, with interviewer Alestine Andre were taken by Sharon Snowshoe. Photographs of Dawson Elder Percy Henry with interviewer Madeline deRepentigny were taken by Alestine Andre. Photographs of Old Crow elders Freddy Frost, Stanley Njootli and Joel Peter and Old Crow interviewer Mary-Jane Moses were taken by Shirleen Smith.

Maps: One 1:1,000,000 topo map (Firth River), One 1:352,672 (TR'ondëk Hwech'in Heritage Resources)

Transcripts: Seven (7) transcripts – Fort McPherson: Robert Alexie Sr., 42 pages; Woody Elias, 44 pages. Dawson: Percy Henry, 41 pages; Julia Morberg, 24 pages. Old Crow: Freddy Frost, 17 pages; Stan Njootli, 39 pages; Joel Peter, 20 pages.

3. INTERVIEWEES

3.1 Dawson, YT

Two elders were interviewed in Dawson: Percy Henry and Julia Morberg. Both interviews were conducted on January 29th 2009. Percy Henry marked the first site, PH1 with a red marker, and then switched to green. Sites he marked were designated by PH#. Julia Morberg marked on the map with a blue marker, sites designated JM#.



Figure 3.1.1: Percy Henry shows Madeline deRepentigny where he traveled on the land. The photo was taken during his interview in Dawson, January 29th 2009. Julia Morberg, who was also interviewed that day in Dawson, declined to have her picture taken. Photo credit: Alestine Andre, GSCI.

3.2 Fort McPherson, NT

Two elders were interviewed in Fort McPherson: Robert Alexie Sr. and Woody Elias. Both interviews were conducted on January 25th 2009. Robert Alexie marked the map with a red marker, and site designations RAS#. Woody Elias marked with a blue marker, and sites were designated WE#.



Figure 3.2.1: Robert Alexie Sr. and Alestine Andre during Robert's interview in Fort McPherson, January 25, 2009. Photo credit: Sharon Snowshoe, GSCI.

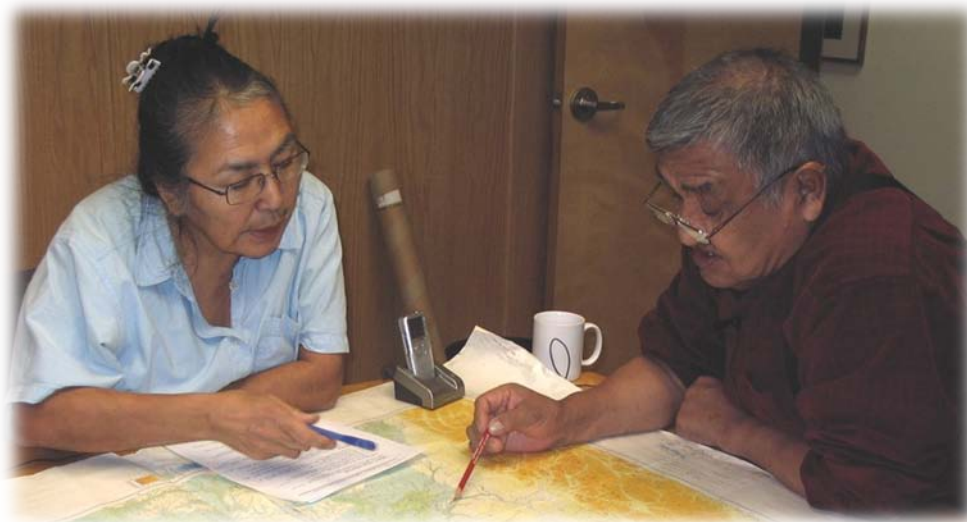


Fig 3.2.2: Woody Elias and Alestine Andre during Woody's interview in Fort McPherson, January 25, 2009. Photo credit: Sharon Snowshoe, GSCI.

3.3 Old Crow, YT

Three elders were interviewed in Old Crow: Freddy Frost, Stan Njootli and Joel Peter. These interviews were conducted on February 13, 2009 by Mary Jane Moses.



Figure 3.3.1: Freddy Frost from Old Crow. Photo Credit: S. Smith, copyright VGFN, 2004.



Figure 3.3.2: Stanley Njootli is standing in front of his camp, June 2010. Photo credit: Mary Jane Moses, VGFN 2010.



Figure 3.3.3: Joel Peter from Old Crow. Photo credit: Mary Jane Moses, VGFN 2010.

4. TRADITIONAL KNOWLEDGE ON CARIBOU ECOLOGY

4.1 Travels on the land

“Last time I was out on the land, was yesterday.” (Stanley Njootli, Old Crow)

“So she’s a tough country...winter is tough time ah?” (Percy Henry, Dawson)

Note: the information about gathering places and trails was taken while drawing on the map, so the information given here complements the maps rather than stands by itself. Electronic copies of the maps can be requested from GSCI.

The interviewees were asked about their travel on the land, and also on the range of the caribou (PCH). In the Fort McPherson and Dawson interviews, this information was marked on the map during the interviews. The maps are kept at the GSCI; photos of the maps are kept electronically at ARI, on the ‘everyone’ file, in the ‘ecology projects material’ folder. The verbal information is given in a table format, in Table 4.1.

Table 4.1: Summary of travels on the land as reported by interviewees.

INTERVIEWEE	WHEN	WHERE and with WHOM	WHY
Robert Alexie Sr., Fort McPherson	With parents in 1941 or 1942, then 1951, 1952 As a young adult, 1956, 1960s Flew in, twice 1987, 1988, 1990, 1992	Trail River area Canyon Creek; over Caribou Mountain, down the Doll Creek, up to Hungry Lake, way over to Canyon Creek. With his father, travelled to Dawson with a dog team. In 1941 or 1942, they met Joe Martin and Percy Henry around Eagle Plains. Walked down Doll Creek to Hungry Lake with Walter Alexie and James Simon. “A lot of caribou in there that time” Hungry Lake. After a big fire in 1963, there was no caribou. Canyon Creek, Aberdeen Creek	Trapping for a living Hunting caribou and trapping Trapping Trapping
Woody Elias, Fort McPherson	Since he left school, first time in 1952. Almost every year until the highway was built.	Through Vittrekwa River, camped in Rock River with other families: Andrew Kunnizzi and John Charlie came from Road River; Abraham Alexie came from Trail River, other families as well.	Hunting

INTERVIEWEE	WHEN	WHERE and with WHOM	WHY
Woody Elias, Fort McPherson	Once on this trail, in 1952	From Rock River to Snare River, Eagle River and Stone River.	Hunting
Freddy Frost, Old Crow	Winter, especially November – December 1970s	Freddy has a camp on the Bell River. He used to trap with a partner, but since his partner died he traps alone. “Travel the winter road, along the Johnson Creek... and I turn off towards the Bell River, mostly follow an old seismic line” PCH calving grounds, with Dick Nukon.	Trapping
Percy Henry, Dawson. Born in 1927 at <i>Ineelu’ Tshik</i> (Mountain Creek), between the Hart and Wind Rivers. He was raised in the Chapman Lake area (upper Blackstone)	Since childhood. In 1942, with his dad, Joe Henry. By dog team. Left in November, turned to the Wind River after Christmas. Came back to Dawson around March. Thinks it was 1943, with Joseph Martin (and others?).	From Moosehide up Twelve Mile River and Chandindu River, through Seela Pass and down the Blackstone to the mouth of the Blackstone River. The dogs were starving, so they continued up the Peel River, up Hart River to Hungry Lake where there was a store, but it was empty. So they went through Hart Creek to the Wind River, where they got caribou and saved some of the dogs (marked PH1 on map). Then they returned to Blackstone River. Same trail to Hungry Lake, no food there, came back on Hart River. It was -80°F (- 62°C) “The trees were just cracking just steady all night” ¹ Then spring was unusually warm and the ice was gone in March, so they had to cut across to Whitestone River (Mark PH4?), spent the spring in John Nukon’s trapper cabin, then drifted down the Porcupine River to Old Crow. Then on to Fort Yukon, Alaska, where he worked on a steamer, the Klondike.	To get food. Hunted caribou. Trapped around the Blackstone River. To get food. Lots of caribou in Whitestone, <i>Vinijàatan</i> (their wintering grounds)

¹ Percy is not sure what year it was, he thinks 1943. -80°F (-62°C) was documented in the Yukon in 1947. It’s possible that it was that cold in 1943 but there is no documentation for that time.

INTERVIEWEE	WHEN	WHERE and with WHOM	WHY
Julia Morberg, Dawson	<p>Repeatedly, at least three years. Starting early September, coming out around February</p> <p>Three years, including one full year in 1978, from May to May</p>	<p>Hart River area, Worm Lake area.</p> <p>Ray Creek, West Hart, Hart River.</p> <p>With dog team. Fixed old cabins to camp in.</p> <p>Mackenzie Mountains.</p>	<p>Hunting, trapping. An area easy to hunt, good trapping. Good for furs.</p> <p>Learning to live off the land and to regain her cultural background</p>
Joel Peter, Old Crow	<p>Since he was six or seven.</p> <p>As a youth and adult, in winter and mostly in the spring. Travels to this day.</p>	<p>Travelled to Crow Flats with his family and grandfather. To Whitefish Lake, above Bell River, and across to Lone Mountain area. Later</p> <p>Travelled with his peers, especially Freddy Frost and Robert Jr.</p> <p><i>“I’ve travelled most of the place[s] where there’s trail and there’s hunting area”</i></p>	<p>Hunting caribou</p> <p>Hunting and (in spring) trapping Muskrat</p>
Stanley Njootli, Old Crow	<p>Since infancy, in springtime.</p> <p>As an adult, year round, with dog team in winter</p>	<p>With his mother, and John Ross Tizya. Crow Flats, around Schaeffer Lake. Then visited different camps all over Crow Flats. Went to Surprise Creek by dog team to visit Abraham Thomas.</p> <p>With various people and on his own.</p> <p>Up the winter road and all along the Porcupine River</p> <p>Around Old Crow area. Crow Point, Fort McPherson Trail, hunts across Aurora Creek</p>	<p>Trapping muskrats, for a living</p> <p>Living a wilderness lifestyle</p>

INTERVIEWEE	WHEN	WHERE and with WHOM	WHY
Stanley Njootli, Old Crow	In summer	By boat on the Porcupine River to Porcupine Lake, then up the headwaters of Bell River and up Porcupine River to Whitestone, then down [the Porcupine River] to Fort Yukon, Alaska.	Hunting and gathering wood
	Three times, in winter, with dog team	Off the Dempster Highway, around <i>Gwazhàl</i> (White Mountain), <i>Gwazhàl Njik</i> and then, places by Lieman Creek and Chance Creek. From Fort McPherson to Old Crow with dog team.	Trapping for fur, and the experience of living off the land
	1971, All summer	From Norman Wells all the way to the Alaska border. Behind Crow Mountain and then from Fort McPherson following the foothills, up [to] the Beaufort Sea all the way to the Alaska border.	Work for Gas Arctic
Joel Peter, Old Crow		Crow Flat, Whitefish Lake, above Bell River and across to Lone Mountain area. Since childhood. Travels a lot with Freddy Frost.	Mostly hunting caribou (in winter), in the spring to trap muskrat

4.2 Linguistic Information

4.2.1 Place names

Vinijàatan: A place where caribou settles for the winter.

Note: not all of the Teetl'it Gwich'in Place Names in the Gwich'in Place Names database have been verified and therefore should be considered in draft form. A verification meeting with Teetl'it Gwich'in Elders has been scheduled for the fall of 2010. The Han Gwich'in and Vuntut Gwitchin terms and place names also need to be verified in the future.

Table 4.2.1: Geographical terms and place names.

ENGLISH	TEETL'IT GWICH'IN or VUNTUT GWITCHIN (VTG)	HAN GWICH'IN
Vittrekwa River (upper part), to be verified (WE p 41)	<i>Tsih Ddhàa Njik</i>	
A place in the Rock River area, to be verified (WE p3)	<i>Èiidlaih</i>	
A creek that crosses Patrol Trail (PH p22), to be verified		<i>Tth'an K'it Tshik</i>
A creek which flows into the Blackstone River (RAS p8)	<i>T'oo Shyah Njik</i>	
A gathering place in the Chapman Lake Area, where caribou was abundant in springtime (PH p19, p25)		<i>Tsok Giit'in</i>
A place where Caribou settles for the winter (RAS p 27, WE p30)	<i>Vinijàatan</i>	
A place, sheep trail, in the Rat River area where people used to hunt sheep (WE p16), to be verified	<i>Chii Zhìt Gwìnjòò'</i>	
An area west of Dawson (PH p16). The Dagoo Trail connects to Dawson.		<i>Dàgoo Taii</i>
Big Glacier Creek (PH p16)		<i>Git Choo Njik</i>
Blackstone River, 'black earth creek' (PH p14, 16)	<i>Tth'oh Zraii Njik</i>	<i>Tl'ee Zraii</i>
A winter sulphur place for caribou (PH p14), location to be verified		<i>Vàdzaih Kàn</i>
Caribou Lake, also called Lusk Lake (RAS p9)	<i>Vàdzaih Vàn</i>	
Caribou River (WE p16); (RAS p9) on map: WE7, WE9, to be verified	<i>Vàdzaih K'àn Njik</i> <i>Edigii Njik</i>	
Curtain Mountain (WE p4)	<i>Git Choo</i>	

ENGLISH	TEETL'IT GWICH'IN or VUNTUT GWITCHIN (VTG)	HAN GWICH'IN
First Hill	<i>Tr'oochit Chii</i>	
Shiltee Rock on map: WE2 (WE p 17)	<i>Shitdii</i>	
Football place (PH p25)		<i>Nehkak Choo Deek'it</i>
Glacier (RAS p 25)	<i>Git</i>	
LaPierre House (PH12 p 28) Marked PH12		<i>Zeh Gwatsal</i>
Lots of lakes, lots of water (RAS p10)	<i>Nihtal Git</i>	
Moose Lake (RAS p 16)	<i>Gavanjàazhii</i>	
Mount Deception (RAS p 15)	<i>Vinidiinlaih</i>	
Mount Higgins (Eagle Plains area) (RAS p13)	<i>Jùuk'an'</i>	
Mountain Creek	<i>Ineelu' Tshik</i>	
'Moving trail' (a trail that is used when the people are moving between camps) (RAS p 16)	<i>Injah Taii</i>	
White Snow Mountain (JP p3) aka Snow White Mountain, Snow Mountain, White Mountain	<i>Zhoh Drìn Chòo (VTG)</i>	
Old Robert 's camp(WE5, p 18)	<i>T'oodih</i>	
Outflow, at the outflow, where the creek/river flows out into another body of water	<i>Tshik</i>	
Pass	<i>Gweetoh</i>	
In the Upper Porcupine River area (SN p2)	<i>Gwazhàl Njik (VTG)</i>	
Porcupine River (SN p 18)	<i>Ch'oodèenjìk (VTG)</i>	

ENGLISH	TEETL'IT GWICH'IN or VUNTUT GWITCHIN (VTG)	HAN GWICH'IN
Red Hill (RAS p20), to be verified	<i>Khii Tshik</i>	
Ridge in the Dagoos area, west of Dawson (PH p16)		Dàgoos Geeghan
River or creek (RAS p9)	<i>Njik</i>	
Salter Hill (WE p 16; RAS p4). Edigii Hill on map, marked WE8 on map	<i>Edigii</i> <i>Edigii Kak</i>	
Seela Pass (JM p10)		Han K'aa
Sharp Hills (RAS p16)	<i>Ts'ii Kan Tat</i>	
Stone River (WE p4), Canyon Creek on map	<i>Chii Tshik</i>	
Two sharp mountains across from Two Moose Lake (PH p16)		Idzèe (literary: ears)
A place in the mountains (WE p14), to be verified	<i>Gihdaanjik or Tsih Ddhaa</i> <i>Njik</i>	
Mount Higgins in the Eagle Plains area (SN p 11)	<i>Jùuk'an' (VTG)</i>	
Waterfall on the Vittrekwa River (RAS p 17)	<i>Nàdiinlaih</i>	
In Upper Porcupine River area (SN p2)	<i>Gwazhàl (VTG)</i>	
Whitefish Lake	<i>Itilii</i>	
Wind River Mount Deception (PH p1)	<i>Tr'ineeditr'aii Njik</i>	<i>Vinidiinlaih</i>
Wolf Creek in the Tombstone area marked JM2. Joe and Annie Henry had a camp there (RAS p 20, WE p6). Barrier River on map.	<i>Trìnzhòh Njik</i>	

Table 4.2.2 Gwich'in and Han Gwich'in words with English translation

ENGLISH	GWICH'IN VTG – Old Crow	HAN GWICH'IN
Gwich'in legendary hero	<i>Atachùukàjì</i>	
Fat (RAS p29)	<i>Ik'eh</i>	
Favorable winter weather (PH p31)		<i>Itcheeshu</i>
Fire place	<i>Kwàn' deek'it</i>	
Grizzly bear	<i>Shih</i>	<i>Zhu</i>
Labrador Tea (RAS p 11)	<i>Ìidii màsgit</i>	
CARIBOU FAMILY		
Big bull caribou (RAS p 27. WE p 28), male caribou (JP p6)	<i>Vàdzaih choo</i>	
Calf, young one (RAS p 26, WE p 28)	<i>Egii</i>	
Caribou (RAS p 25, WE p 28, PH p34)	<i>Vàdzaih</i>	<i>Wèdzèy (JM p19, PH p34)</i>
Caribou cow (WE p29)	<i>Vàdzaih njò'</i> <i>Vàdzaih tr'ik (VTG)</i>	
Young bull (JP p6)	<i>Dazhoo tsoo(VTG)</i>	
One-year old bull caribou (JP p7)	<i>Dazhoo tsal (VTG)</i>	
Two-year old bull caribou (RAS p 26, WE p29)	<i>Dazhoo tsoo</i>	
Young female caribou (RAS p 26) (JP p6)	<i>Vàdzaih tsal</i> <i>Ch'iyah't'ok (VTG)</i>	
Moose calf (RAS p36)	<i>Dìtsik</i>	
Unborn calf (RAS p 26); (JP p7)	<i>Ichìdhidii</i> <i>Ch'igii (VTG)</i>	
One-year-old bull caribou (SN p 20)	<i>Dazhoo tsoo tsal (VTG)</i>	

ENGLISH	GWICH'IN VTG – Old Crow	HAN GWICH'IN
<i>WOLF FAMILY</i>		
Female wolf (WE p 35)	Zhòh tr'ik	
Wolf (RAS p34, WE p 35, JP p8)	Zhòh	<i>Zhur</i> [PH p36] <i>Zhu</i> (JM p17)
Wolf pup (RAS p34, WE p35, SN p23); (JP p8)	Zhòh gii Zhòh gii (VTG)	<i>Zhur kaii</i> [PH p36]
Wolf pack, 'the tracks of many wolves' (SN p 23); (RAS p35)	Zhòh k'ih leii	
<i>OTHER ANIMALS</i>		
Moose calf (RAS p37)	<i>Dìtsik</i>	
<i>CARIBOU PARTS</i>		
Bible (RAS p30) (WE p 34)	<i>Idzìt or lidheeghwat</i>	
Caribou arm (RAS p30)	<i>Igìn'</i>	
Caribou shoulder/arm (PH p35)		<i>Wëdzèy kan</i>
Caribou legs (WE p32)	<i>Angwàl'</i>	
Caribou leg skin (WE p 33)	<i>Edreedhoh</i>	
Caribou skin or hide (RAS p30)	<i>Vàdzaih dhòh</i>	
Part of a caribou stomach lace (RAS p30, WE p32) yet to be verified	<i>Icheezhu' or lidheeghwat</i>	
Caribou stomach (JM p20)	<i>Ichit</i>	<i>Jabat</i>
Caribou upper body (PH p35)		<i>Wëdzèy jik</i>
Diaphragm (RAS p 33)	<i>lidhiidrah</i>	
Fat on caribou or moose guts (RAS p 33)	<i>Icheezhù'</i>	

ENGLISH	GWICH'IN VTG – Old Crow	HAN GWICH'IN
Fat inside the rump (WE p 34)	<i>Ik'eetthàl'</i>	
Head (WE p 10)	<i>Itchi'</i>	<i>Wëdzèy tee</i> (PH p35)
Heart (RAS p30)	<i>Idrii'</i>	
Hide (of caribou, untreated) (WE p34)	<i>Heedit'uu</i>	
Its skin (WE p 33)	<i>Vadhòh</i>	
Intestines (RAS p32)	<i>Needhiichii</i>	
Kidney (RAS p30, WE p34)	<i>Atr'òo'</i>	
Neck (PH p35)		<i>Ak'oo</i>
Ribs (RAS p28, WE p 33)	<i>Ichik</i>	<i>Chik</i> (PH p35)
Rump (RAS p29)	<i>Anchàn'</i>	
Saddle (WE p32)	<i>It'i'</i>	
Skin (RAS p30, WE p 33)	<i>Adhòh</i>	
Tenderloin (PH p36)		<i>Thaathaii</i>
VEGETATION		
Bear root (WE p 27)	<i>Trih</i>	
Grass (RAS p 23)	<i>T'oo</i>	
Labrador Tea (RAS p12)	<i>Èidii màsgit</i>	
Lichen (RAS p10, WE p26) (JM p5)	<i>Uudeezhu'</i> <i>Ch'oondéejuu</i> (VTG)	<i>Shii</i> (JM p17)
Yellowberries (WE p26)	<i>Nakàl'</i>	
MISCELLANEOUS		
Aboriginal people (RAS p12)	<i>Dinjii zhuh</i>	

ENGLISH	GWICH'IN VTG – Old Crow	HAN GWICH'IN
A bag of caribou blood. According to legend, what the man in the moon is holding. (PH p30)	<i>Ankaih</i>	Ankaii
'He takes care of sheep' (WE p22)	<i>Divii K'ànahtii</i>	
'Hurry up; they say the caribou are near!' (RAS p15)	<i>'Vits'at kadhoochi', naghwan vadzaih ginuh!'</i>	
Mattress	<i>Chyàh</i>	
Salt lick (WE p19) marked on map:WE10	<i>Łuh ahtsii or Dohghwai' Kit</i>	
Sulphur (RAS p23) 'Smelly water'	<i>Chuu tsanh</i>	
Ochre (WE p23)	<i>Tsaih</i>	
On top of Caribou Mountain (RAS p4)	<i>Edigii kak</i>	
Pre-contact people's language (WE p31)	<i>Ts'iidaii ginjik</i>	
Favorable winter weather (PH p31)		<i>Itcheeshu'</i>
SEASONS		
Spring (RAS p35, WE p36)	<i>Sreendit</i>	
Fall (RAS p35, WE p36)	<i>Khaiints'an'</i>	<i>Raauuka</i> [PH p37]
Winter (RAS p35, WE p36) (SN p24)	<i>Khaii Khaii (VTG)</i>	<i>Sreenah,haii</i> [PH p36]
Summer (RAS p36, WE p 36, SN p 23)	<i>Shin Shin (VTG)</i>	<i>Shin</i> [PH p37, JM p19]

4.3 Old-time tales, legends, lore and beliefs

“We have respect for the caribou... That’s law!” (Julia Morberg, Dawson)

The main theme of Gwich’in lore that was collected in these interviews is hunting lore, since it is directly related to the subject of caribou ecology. The people-centered lore is gathered in this section, while caribou- or wolf-centered lore is found in the sections about caribou ecology (4.4) and wolf ecology (4.5).

A few tales and legends were collected in these interviews. According to Stanley Njootli, the stories are disappearing because the older people who know the stories only tell the stories to younger people who they think might understand and believe these stories. It may be that the context of an interview is not seen as conducive for the interviewees to actually tell them. In several interviews, the elders noted that they know stories, but they’re too long to tell right then. It’s possible that a story has to rise from the context of a gathering, rather than be told upon request.

Some places with a spiritual meaning were mentioned. Stanley Njootli named caribou fences (see section 4.7) and food caches as sacred places. Julia Morberg named Chapman Lake as a protected area; “Because there are some medicine plants in there.” Julia was also told by Randy [Randall] Tetlich, from Old Crow, about a spiritual place near Cache Creek that should be avoided. It is marked JM6 on the map. Percy Henry talked about a gathering place called Kwan’ Deek’it (a fire place), at the head of the Bell River, where the Gwich’in legendary hero *Atachùukąjji* is said to have had a camp.

Stories about people who can talk to animals seem to be ubiquitous to many if not all cultures. The two legends that were collected in this study reflect that.

Joel Peter told a story about a Gwich’in warrior, Ch’eeghwalti’, who lived with the caribou for a year. Ch’eeghwalti’ was a Gwich’in warrior who lived long ago and an ancestor of many Vuntut Gwitchin families presently living. He was the brother of two other great warriors, Shahnuuti’ and Shahvyah. The story goes: “A long time ago, not, not too long ago, Ch’eeghwalti’ went to sleep with the caribou and he wants to find out how the caribou communicate. So he lives with caribou [for] one year. But these bunch of caribou they was suspicious and, and they got two young bull every night [to] sleep beside him and they watch him good. And he says, caribou have human word too. He said, they feel danger around. He went back to people one year later and he never eats meat for one year. And, he finds out how caribou communicate, and so caribou has this power, and he was pretty powerful, and he lives here. Vuntut Gwitchin knows of his life and he protects Vuntut Gwitchin from enemies and [for] survival. So he was important person for, Vuntut Gwitchin is how they know about how caribou communicate”

Percy Henry told the Man in the Moon story about a small boy with extraordinary medicine power who was able to communicate with caribou. He was able to bring forth a large herd of caribou to his group who were starving: “That’s the story of that kind of caribou. And [the child] said one caribou [is] going to be marked, that’s mine. And of all the guys [to] shoot [the caribou] was a really selfish [uncle] who wouldn’t give [the caribou fat he wanted] to him. So, [the child] got mad, oh, he was mad so

[the child made] the caribou disappear.” A more detailed story about the Boy in the Moon was told by Johnny Semple from the COPE Stories.

Story of the Boy in the Moon

Told by Johnny Semple²

These old Indian legends are of long, long ago. Maybe 1000 or more years B.C.

Now here is the story of the boy in the moon. There was a very old couple who had a son born to them and this was very strange to the people. It was a winter without meat and the people were half starving and getting worried. Every witch craft tried to bring caribou but with no luck. By this time there was nothing to eat and the small boy, who was not even ready to talk, spoke up to his old father. "Father, let me work with my medicine. It's winter and the people will starve." His father was amazed to hear a small child speaking so well, so he answered, "Oh, my son, you're just a baby; people will only laugh at you". Still, the small boy wanted the people to know that he could bring caribou, never mind if the people laughed at him. So the old man went out and spoke to the people. "Just a few days ago this child was born and now he wants to work with witch craft and bring caribou." The people agreed. "He's just a small baby but make a big fire at the end of the camp and I will bring him there as he says and he will walk around this fire." The people were willing to do as they were asked. The old father brought his son to this fire place and took him out from under his fur coat; the small boy had clothes made for him out of marten skin, coat, pants, and hat. (His name became Marten later, when young people are advised not to do anything wrong or lie or steal because Ttsyook (meaning Marten) will hear or see you).

The small boy was put down on his feet by the fire place and started walking around the fire singing some medicine song or witch craft song. As he reached into the snow, a caribou head appeared and then disappeared again. He told the hunters, "This morning when you go out hunting, you will all see and kill lots of caribou. There will be one special fat cow and whoever kills this fat cow will give me the fat of the caribou. If I receive it, there will be lots of caribou and there will be no starvation ever."

The men went hunting and their families moved after them. When the women and children got to where the men were, the men had killed a lot of caribou and everybody was happy. The small boy asked his father to carry him around to see all the caribou that were killed.

It happened that the little boy's greedy uncle had killed the fat cow. The boy told his father, "This is the caribou that I want the fat from," so the old father left him there by the caribou and went to cut his caribou. The old greedy uncle started saying mean things to the child while he was cutting up this fat caribou, saying, "You say you're witchcraft. You're no

² From a collection of Gwich'in, Slavey and Inuvialuit stories recorded in the 1960s/70s referred to as the "COPE Stories".

witchcraft. Who do you try and make people believe you are?" After cutting the fat caribou up, he cached it and didn't give the child any fat. Just then the old father came back and picked his son up and carried him away. The small child started to cry. Other hunters offered caribou fat to the boy but he only wanted that special caribou fat. While his father packed him and pulling the front part of the caribou home, the boy cried all the way home. He went on crying after getting home and late into the night when all at once the greedy old uncle spoke out, "Send him to the moon. Why he is keeping everyone awake with his crying?" The boy asked his father what was said and the old father answered, "Oh, it's just that silly old man, pay no attention to him". The little boy said, "I heard. I heard it and I will." The little boy told his parents that he would be leaving and left a message with them. He asked his mother if she had a white tanned skin and she had one. The boy told his parents to keep one shoulder arm of caribou inside of this skin and never break the bone but just cut pieces of meat off to eat and every morning it would be whole again. "Tomorrow morning all the caribou which were killed will all vanish again and there will be no meat and no caribou." He also told his parents, "You people will only live so long as the earth but I will be on the moon as long as there's a moon and stars in the sky. And when it is a good winter with plenty of meat, always remember my song and be happy, dance, and make a feast, be thankful for the meat. I will always be watching down on everyone." He took a little bag of caribou blood and a small dog with him and disappeared.

Early the next morning, the hunters went back to where the caribou were killed to haul them in. When they got there, there was no sign of anything, not even a speck of blood. There was no meat and the people were starving to death. Only the old parents of the small boy lived by keeping the meat their son told them to save until they came to a place where there were a lot of caribou. They lived until they passed away of old age.

Hunting etiquette

"Well the rule they got is cow and calf, you don't touch it. That's the first caribou they make trail, even wolf don't bother it." (Percy Henry, Dawson)

1) When hunters ran into a group of caribou, the rule was not to kill the entire group, always let a few go. In the words of Stanley Njootli: *"They say when you see bunch of caribou you always let two or three go... that was our tradition."*

2) Stanley Njootli described the practice when more animals were hunted than could be carried back to camp in one trip: *"When they ... shoot caribou ... and if they can't take it all, they leave some there. They're going to pile it and then when you put it there and pile it and you fix it for coming back to get it, those caribou head you always got to point it towards your camp... There's a reason for that yeah. And they used to do that a long time ago... And that way Gwitchin people know where the camp is... Other people come along and know about it ... and that's part of tradition too."*

3) Robert Alexie describes the cleaning etiquette: “I learned lots from my parents, my father, and especially when we shoot caribou, or, you hunt caribou or you skin caribou, then you look after the place. You know? We skin caribou [carefully], that’s looking after it ... you’re given caribou so you got to look after it. Well ... you skin caribou, (pause) and you gut it, you look after it good, and, everything. By the time you leave there (pause) like, no blood or nothing. If you want to put anything away, you... just don’t leave hair or, piece of caribou hair or ... guts ... you just don’t leave it wide open, you know. They say it don’t look good from the other side. ...a lot of times I show kids, “Put it in snow, step on it. Cover it up. Nothing can see from nowhere.” You know that’s the way it is and I believe that. I really believe that ... later on, some animal going to eat it anyway but it’s the only thing that I really look after.”

4) Woody Elias described how, when he was young, 50 years ago, people would find the place where caribou settles down for winter (*Vinijàatan*), they would not hunt, rather they went go back to the community or camp to tell everyone, and then come back to hunt: “If you see caribou you don’t, just shoot it, you got to come back... how they call that *Vinijàatan*. Well that means that’s where the caribou has settled. See eh? Everybody come back and pretty soon they have a meeting. And they said they’re going to go hunting there. See that’s the way they do it... You can’t just shoot caribou, you got to come back... So I guess you call that ‘control’ ah? That’s the way they do it.”

5) “August, from there, they [people] don’t hunt until November. November [is the] next time you hunt, but, from November you don’t really hunt again until January. So, see after November it [caribou] start settling down [for the winter]. So that’s why you go in January... from March you shouldn’t hunt anymore. From there, from April, you shouldn’t even hunt because caribou is poor [no fat on the meat].”
(Woody Elias)

6) Julia Morberg said that shooting caribou (and other animals) while they are swimming and vulnerable is unethical: “I respect all animals, I respect caribou. I don’t shoot caribou in the river. I don’t shoot any animal on the river, in the river. I shoot them on land. Because, there’s no respect to, I mean, there’s no respect to kill caribou in the river. Why in the river? When they’re swimming across the river.”

7) “You get caribou, you eat, really everything. Except the lungs, I guess” (Woody Elias)

Traditionally, when an animal was killed, all of it was eaten and used. This was expressed by Woody Elias, (citation above), by Julia Morberg (see ‘pre-contact tools’ in section 4.8 Historical Information), and by Percy Henry: “Another thing is ah, you eat everything from caribou or moose, or anything [any animal]. Because they [the animals] eat off the land what we need, because a lot of people just eat the meat, ah, and there’s nothing in meat, nothing, but when you start to eat the marrow, and gristle, everything off caribou then they got all your vitamins. Same as moose. Same as bear... Another story about caribou I know when I was kid, after you eat caribou stomach, inside, [in the] spring time when [the caribou eats] fresh growth that’s your vitamins.”

Good-luck rules

Many, if not all, cultures have practices meant to ward off bad luck. One such Gwich’in practice was told by Stanley Njootli: “If you’re going to cross river, you got to break willow and throw it on the

river. Or on that lake... and, ask for good passage. And then everybody else come behind, they're going to have [a] good passage too."

Survival cooking pot

Caribou stomach can be used as an emergency pot; Woody Elias: "*Tidheeghwat* [part of the stomach]... well I tell you a story about that. It's true this, for survival... but you got to know which part and, what you do if you got no kettle is you... fill it [the stomach] up with snow, and then it wouldn't really burn. And you cook it to the fire. And you see then you ... got to watch it, it doesn't really burn. Then you got soup! You got soup, and, you could eat your kettle too. You see that's really for survival."

4.4 Caribou ecology

Note: unless specifically noted, the information refers to barren ground caribou, from the Porcupine caribou herd.

4.4.1 Diet

"Caribou always eat their same thing, same food. That's why it's important to protect their food. And, if there's no food in this area anymore, they travel into this different area, until their food grows back, and, they come back again." (Julia Morberg, Dawson)

Caribou diet changes with the season. Scientific knowledge is that in summer, caribou eat mainly shrubs and sedges, while in winter they mainly eat lichen and moss (Thompson and McCourt 1981, Boertje 1984). The TK reflects a diet heavier on lichen; the explanation is likely that there was no caribou hunting between April and August, and thus a lot less human interaction with the caribou during that period of year.

"...in the summer they eat lot of hay, grass and lichens... Just the caribou lichens I guess. Willows, I don't think they eat mushrooms³... they don't eat berries." (Freddy Frost)

The interviewees were asked what they can find in caribou stomachs when they cut them open. Stanley Njootli replied: "You find caribou lichen. And you find different grass, sedges." When asked if caribou eat mushrooms, Stanley said: "I've never seen that, I'm not sure, they probably do. But um, they probably get so munched up, and then I, I couldn't tell". He added: "sometimes in the winter, like this... year, deep snow... there's a bunch of caribou in mountains... and there's deep snow, at the mountains... they'll eat those cranberry leaves... and stuff like that... Because there's hardly any food."

³ Caribou do eat mushrooms when mushrooms come out in late summer. According to wildlife biologist Anne Gunn, mushrooms are an important source of protein for caribou [Anne Gunn, private communication].

Caribou also eat “push-ups”. These are sheltered breathing and eating stations that muskrats build on freezing lakes, so they can surface into them. Caribou like eating these grassy shelters. Joel Peter said caribou get fat on push-ups.

The caribou winter diet is low in sodium, so the animals look for salt licks to replenish minerals. Woody Elias marked a salt lick, WE10, on the map, near Eagle Plain. Percy Henry talked of a place called *Vadzaih Kàn* where caribou lick for sulphur or salts: “Where, I think ... some winter they stay around... they eat that salt...sulphur. Yeah, brown water.”

Robert Alexie Sr. described seeing many places where caribou “eat sulphur”. He marked a couple of those places on the map.

Woody Elias listed lichen, grass, push-ups, and berries “...they’ll eat berries. I seen it! they eat the leaves and all,” specifically cloudberry or yellowberry (*Nakàl*). Woody heard that also from Peter Tsal, who said that caribou eat berries in August.

Julia Morberg talked about the West Hart Caribou; these are woodland caribou, not barren ground caribou like the Porcupine Caribou Herd. “I call it mountain caribou because they’re big ah? ... They hang around there all winter. On top the mountains and up way high on the tundra where they eat.” Julia named lichen and moss: “But that’s their main food is caribou moss and caribou lichen.” Note that Julia mostly traveled in winter time, so her description is in agreement with the TK related to caribou winter diet.

4.4.2 Migration and seasonal ranges

The range of the PCH herd was marked on the map by Robert Alexie Sr., Woody Elias (WE13) and Percy Henry. All three communities that these Elders live in are located south of the calving grounds of the North Slope. Some of the interviewees had a chance to go to the calving grounds through work, e.g. with biologists, or with geographers. This should be kept in mind when considering the information related to the calving grounds, and to large congregations of thousands of caribou. It is not clear from these interviews if previous generations of Gwich’in went to the calving grounds, and it is possible that the information in the interviews specific to calving grounds may be a result of SK and not TK.

Migration

According to the TK collected, cows and calves lead the herd. In the words of Percy Henry: “Well the rule they got is cow and calf, you don’t touch it. That’s the first caribou they make trail, even wolf don’t bother it. Those wolf aren’t happy then. If they see that, then the wolf start cry. The Elders say ‘Oh, caribou coming.’ They know it... Suppose to be only cow and calf first. They are the first caribou to cross ahead. Used to be caribou cross all over.” (See also under hunting etiquette in section 4.3)

Calving

Caribou choose windy calving grounds in the summer months to minimize insect predation. Apart from the coastal calving grounds of the Porcupine Caribou Herd, Caribou Mountain (*Edigii Kak*, official name: Salter Hill) was also identified in the interviews as a calving area. Woody Elias: “*Edigii* meaning ‘caribou calving ground... That’s just one mountain... That’s where the wind is so they calve here.’”

Percy Henry and Robert Alexie Sr. both mentioned historical calving grounds in the Caribou River area. “So over here ... they say, used to be caribou calving country. And I asked my dad about it, ‘oh,’ he said ‘you got to ask somebody older than me. Used to be calving in there, like at North Slope’” (Percy Henry). “We call it Caribou Mountain. *Edigii* it means ‘young calf’ hill. They [caribou] used to calve on there many moons ago...a lot of wind there all the time... That’s why.” (Robert Alexie Sr.) Robert is alluding here to the fact that the wind provides relief from insect predation.

Winter range

The winter range of the PCH is extensive, see Figure 1.1. The caribou disperse during the winter, with animals scattered throughout the winter range. The reason for this is that in winter, there is not enough food for all the caribou if they congregate in a relatively small area. Correspondingly, there are references to different wintering areas in many of the interviews. There is a specific Gwich’in word for “a place where caribou settle down for the winter”, or “Caribou winter feeding place”: *Vinijàatan*. This is an important notion for Gwich’in, as the ability of people to sustain themselves through winter relied on finding these places (*Vinijàatan*). If conditions changed, for example if winter was harsh, or there was a lot of snow, the caribou would change their *Vinijàatan*, and this could cause hardship for the people, as told by Percy Henry. Percy travelled on the land on two very cold winters, 1942 and, possibly 1943. In 1942 they finally found caribou by Wind River. The second harsh winter, they didn’t find caribou, but learned later that Elders from Old Crow found caribou in the Wind River-Hart River area. He recounted: “See, at Old Crow, one year they had no caribou. And some young boy said the elder took off way over to Wind River. That’s where they found caribou. That’s a long way ah? [From where the caribou usually winters]. And then, by the time they get there some dog starved but they...shot 40 caribou”. Stanley Njootli named about half a dozen wintering places for caribou. He also cited another elder, Charlie Peter Charlie to indicate that the wintering grounds can change according to the winter conditions. Joel Peter indicated that Crow Flat is a good wintering place for caribou.

Spring/fall range

Percy Henry said caribou used to stay in the Blackstone Creek area during spring and fall. Correspondingly, there used to be important gathering places there. Percy names two: *Tsok Giit’in*, and Nehkak Choo Deek’it (a football place). *Tsok Giit’in* is marked as PH10 (see also section 4.8 Historical Information). Beside hunting caribou, the area was also used for trapping foxes. Percy: “Most people stay at *Tsok Giit’in*. Spring time lots of caribou, they stay there. And fall time too.”

Year-round areas

There are areas where caribou stay all year, according to some of the interviews. Joel Peter named Whitefish Lake above Bell River, and White Mountain as two such areas.

Overlap with woodland caribou

An interesting point that Stanley Njootli made was that barren ground caribou and woodland caribou mix during winter: “There’s few thousand [Porcupine caribou] that went down...in that same area as the Hart River Herd, and the Hart River’s Woodland [caribou], and Porcupine is Barren-ground [caribou]. So Elders say they have their meeting too.”

4.4.3 Population oscillation

Similar to many animals, for example rabbits, caribou herds undergo natural population oscillation, where the population of the herd declines and then bounces back. The oscillation period for caribou is about 30-40 years. Woody Elias told the following: “... that was a big story I don’t know when, maybe, in the 1920s, maybe before that, it was caribou disappeared for 40 years, um, [then] I guess somebody went hunting, and really saw caribou so was just surprised, it was big news, and he went back to the people [to tell them the caribou were back]”

Percy Henry linked food availability to caribou numbers. His opinion is that hunting pressure should be kept high, so caribou don’t over graze: “I’d say if you don’t kill enough caribou, it wouldn’t increase, you know because they go by food. Low food, less caribou, lots of food, more caribou. But if you use...lots caribou... then they increase too. See that time, there was big gold rush here? Thousands and thousands of caribou load came into Dawson to feed the people. Forty thousand people, lots of meat eh? So and then there’s lots of caribous eh? I know Richard Martin tell me, there was so much caribou down Blackstone area, when dog team come in, it [the caribou] just moved to [let the dog team] go through. The dogs don’t even bother them. That’s all it is. And now they say, “Oh you, you killed too many caribou.” You don’t kill enough because they go by their supply of food. Because caribou got brave too. So they have food and they got to take care of it.”

4.5 Wolf ecology

“It follows the caribou, it lives with the caribou.” (Woody Elias, Fort McPherson)

Wolves are portrayed as intelligent and cunning, with a complex social structure. Stanley Njootli goes as far as to say that wolf packs herd caribou, akin to dogs herding sheep. Wolves evoke a feeling of unease in people.

4.5.1 Hunting

“They don’t hunt for them. They live with them.” (Percy Henry, Dawson)

Hunting strategy

Several interviewees described the way wolves hunt caribou, saying that the wolves have a strategy to hunt caribou, a strategy they are taught from a young age. Stanley Njootli: “They got a plan, yeah. They got to plan it out. It’s a strategic... hunt ah? ... Yeah, they learn, yeah. They teach them... They’re smart... they learn how to hunt and they know how to hunt... I think they plan ahead, too, a little bit. Yeah, they plan ahead for hunting.” This strategy includes communicating with each other by way of howls, and running ahead and circling the intended prey. Freddy Frost described the way the wolves hunt: the leaders surround a caribou group, and communicate with each other by howling: “They howl to each other and they make sign that way to each other, you know. They’re talking to each other sort of thing, you know.” Julia Morberg’s description is in agreement: “I think they stalk too. Stalk the caribou. And there’s always one wolf ahead...and this one [wolf] he’ll howl eh and bring the rest of the pack in so they can [kill the caribou].”

There was agreement that wolves hunt caribou year round. “...any time they get [a] chance,” (Robert Alexie); “It lives with the caribou... So, it’s really all year. At the calving grounds. And they come again with the caribou when they’re migrating...they go ahead of the caribou, you see? You see, all that you get to know when you’re hunting. If... you see wolf that means there’s caribou in the area. So they really live with the caribou” (Woody Elias) “they follow them all the time... at all times of the year.” (Julia Morberg).

As for the time of day wolves hunt, Stanley Njootli said wolves hunt caribou “early in the morning.” Joel Peter explains why he thinks wolves hunt caribou in the mornings: “Caribou eat during the night and, they’re full in the morning. I think that’s when they [wolves], get after them because caribou is full and they don’t run very far. There’s pretty smart animal there.” Freddy Frost, however, said the wolves hunt caribou wherever they are, at any time of day or night. He believes wolves hunt more caribou in winter than in summer.

Joel Peter said the alpha wolf, who leads the hunt, is a female: “They got the main hunter. It’s probably the female of the pack. And she’s the one, that goes around and the rest of the wolf...chase it [the prey] to where she is...”

Herding

Stanley Njootli thinks wolves may be herding caribou: “I think sometimes they just wound one of those caribou, and leave it like that for a few days so it don’t go too far and then, when they’re hungry they just go and get them... that’s how they, keep them around sometimes. And I think ... if they have chance they’ll keep a herd [in] one place, you know if it’s a herd? And there’s enough wolves? They’ll keep it there. And then they don’t have to hunt they just get it when they want.” Stanley added this is what he thinks, and doesn’t know if anyone else thinks this way.

Migration

Wolves that rely on barren ground caribou migrate with the caribou herd. Most of the wolf research is on more sedentary wolves, for example in the Yellowstone area [Dean Cluff, private communication]. It is more difficult and expensive to study migratory wolves, a fact that emphasizes the value of the TK that was gathered for this study. There was agreement between all the interviewees that the wolves follow the herds, and have their young at the same time the caribou do (see also section 4.5.3. Denning).

Joel Peter: “[Wolves hunt caribou] during migration. And sometime, caribou winter in an area, they find that they... keep getting one or two once in a while, and they stay there with the caribou.”

Overkill

The subject of caribou overkill by wolves came up in Freddy Frost’s interview. It is associated with the caribou congregation on the calving grounds, where thousands of caribou are found together. Overkill like this is not known to scientists. Also, several interviewees, e.g. Stanley Njootli and Percy Henry said that wolves do not follow caribou all the way to the calving grounds, see ‘denning’ in section 4.5.3. Keep in mind that Freddy’s is a single citing, and may be a freak event rather than reflecting a pattern.

Freddy Frost: “I was in them [the calving grounds], back in the 1970s we went out, me and Dick Nukon with some [archeologists], we count caribou out in the calving grounds and, and I was just surprised to see the amount of dead caribou in the area (pause) because there were wolves out there (pause) caribou, they gather in thousands, you know. It might be four or five thousand in one, herd. That wolf he’d walk right in to them and they won’t run, because there’s so many there, it’s thick. You know. The front ones don’t know what’s happening there and ...and he’ll just kill. He’ll kill. We watch it lots of time and, and calves, and cows and they’re just lying all over the place. You’ll... be surprised to see it, but I mean, it’s hard to see, but...that’s nature, that probably...was the first time I saw it but that probably went on for thousands of year maybe that. And there were lots of wolves. They will take more of that caribou. They don’t eat them, they just kill them! They’re [the caribou] just dead, they [the wolves] just eat the tongue out, and little piece of meat off I guess... [and] go and get another one. It’s, it’s amazing what they do. They do that because, I guess because if that caribou leave they’ve got, they’ve got all that meat there.”

Mega-packs

Mega packs are very large packs of wolves, probably too big to be stable. Possibly, these are not “true” packs, but several packs that have merged on a temporary basis. This is another aspect of TK that came up in several interviews, that is not substantiated scientifically. This TK was shared by three of the interviewees, who also refer to other people with the same TK, so it seems strong. Mega-packs could be a phenomenon unique to migrating wolves, which are likely less defensive of their territory. More scientific research is warranted on this subject, in view of the available TK.

Joel Peter: “At times, when they’re hungry and, they’re a big pack like 60 to 100 they’re very dangerous. Especially if they’re hungry and...if they get fooled by you they think you’re a caribou and they could round you up and it happened in the past and so this should be known to young people.”

Woody Elias was told by a friend of his, Isaac, that he (Isaac) saw a pack of 150 wolves. Mega packs run into difficulty providing enough food for the pack, resulting in unusual prey choices, and also in cannibalism. For the connection Woody made to cannibalism, see section 4.5.4. Woody told the following two stories: “Old Ronnie [Pascal]... he told us that himself. He lived at Three Cabin Creek, see? ... He trapped out this way I guess he walked and he roll [a] cigarette, and he, himself, he told us. ... He walked out there, it’s good moonlight. He’s coming back, gee, just like he heard something. Turn around (and) there’s two wolves just like that. So he start walking, [and] just while he’s walking he cut a tree down, he clean it, he make a club. He got to this you know trees along his track eh? He got against one tree, while that, wolf really came close to him. He said he just thought about his smokes. He took it out, once he lit it, he just turn around. He could see all around him was wolves, just like that. So this thing you got to think fast. But one thing you could do is make fire.” The other story is: “Old Mrs. Robert Gwinaachi’ she said they move... way up here... that’s where lots of wolf. She said she was home and she got some little pups... poor little pups just ran in the tent just screaming. She said, gee, she heard just like wind. And then somehow, she thought of wolf so much, she got big fire going I guess she get pan and threw coals outside. So they passed just like wind she said, so much wolf. So you have to think pretty fast.”

Percy Henry and his brother saw a mega pack at Shell Creek in the Yukon. He also makes a connection between mega packs and cannibalism: “You know, I was down Shell Creek in the Yukon, me and my brother we stake claim there, and we saw, I figure four or five hundred pack of wolf. Their trail was like this wide. We walked on their trail, don’t need snowshoes. And, I ask [an] Elder from Old Crow if there’s such a thing? And I thought we [were] just seeing things, and the mountain just black. So I ask this Elder, “Yeah,” he said, “that’s right.” But he said, “If you’ll follow them, you could see little bit of blood or hair (pause) one had to give himself up to feed them... they kill one now and again. They eat it.”

4.5.2 Prey choice

“All we talk about wolf is that ... caribou is their prey. And they follow them all the time...
At all times of the year.” (Julia Morberg, Dawson)

Which animals wolves hunt depends on prey availability. However, caribou is their preferred prey. How many, and which caribou the wolves hunt depends on many factors. The number of wolves, whether it is a pack or lone wolves is one factor. The number of caribou is another factor, which in turn is influenced by the time of year and location. For example, the caribou density is highest on the calving grounds, and this may have a dramatic affect on the wolf behavior, as reported by Freddy Frost. Prey availability is also a factor. If the animals are taking care of their young, this also influences the choice and amount of prey. Freddy Frost said that in an area with lots of caribou and a good pack of wolves, the wolves will hunt caribou every day, between one to four caribou each day.

All the interviewees stated that caribou is the main food for wolves. There are non-typical cases where wolf packs “specialize” in moose rather than caribou.

Freddy Frost: “Oh ...I’d say if a group of wolves were just going to eat caribou it would be about 80% of the time they’ll just live on caribou”; Stanley Njootli “I think probably 80%.”

Some wolf packs “specialize” on moose rather than caribou. Freddy Frost: “But, from what I know...from trapping with some older guys few years back is that, there’s certain...group of wolves. If they, they got territory, and if there were a lot of moose in that territory, those wolves will only live on moose (pause) because they were raised up with moose. So they won’t bother the caribou, they’ll just go after moose.”

Freddy Frost: “If there was no caribou this winter, say for instance this year there’s no caribou, wolves will be getting some moose...” “...you know he [wolf] lived on caribou and, and you know sometime moose... More or less I think sometimes they live on rabbits too, if the caribou herd wasn’t around, you know, they’ll live maybe on rabbits, but that’s not so easy for wolf to get rabbits you know... they live on mice too. Yeah... they can’t kill fox... They can’t catch fox.”

Joel Peter: “When it’s hard for them to get caribou, they... go after moose and, I believe they survive by mice too when there’s no food.”

If prey is scarce and wolves are very hungry, wolves may venture into human communities and eat dogs. Freddy Frost: “Yeah he [wolves]...killed dogs when they got really hungry.” Joel Peter: “...there’s nothing around, mice is not enough for them, and so they come to town and they [eat dogs]. I’m glad somebody caught one, because they, danger for kids.”

There is a prevalent and somewhat romantic notion, that predators go after the sick, handicapped or old animals, and thus help maintain a healthy population. This view was strongly, if not unanimously, negated in these interviews. Possibly, migrating wolves and territorial wolves differ in this, and this subject warrants more scientific research.

They say wolves only go after the lame and the sick. That’s... bullshit!” “They more or less will go after that cow caribou and they’ll look for good caribou too, you know... They’re smart animals. They’re not going to look at that old caribou, they want good meat too.” (Freddy Frost)

“If there’s enough of them and there’s...a strong pack, they’ll go after the healthy ones. They take the healthy ones” (Stanley Njootli). When Stanley was asked if wolves “went after the sick ones, his response was an emphatic: “No, no, no. No, they don’t, no.”

“And according to people long ago they, they get best caribou they could. And it’s a female caribou.” (Joel Peter)

Joel Peter too was asked if wolves killed sick caribou. His answer: “No, this is not true. It’s not true ... unless they really have to.”

Robert Alexie Sr.: “The [wolves] ones they get too old they just leave. They’re oldies, you know they [the pack] leave them behind ... two [wolf] oldies that’s the one that, they go after them sick caribou. But it’s, like I say, when it’s the pack it’s nothing for them to kill caribou.”

Robert also told that it is easy for wolves to hunt even large Bull Moose: “...I thought... [there would have] to be deep snow before they get moose. But [there was] that deep snow, about that much snow [motions] at Trail River. They went around one moose, in three hours they had that big bull down. There was six of them or seven wolf. Big bull, they had it down in no time.”

Woody Elias said “...But they’ll [wolves] kill, they don’t just kill one. They just kill what they want, that’s all”

However, the Dawson interviewees’ information supported the idea of wolves killing sick animals. Julia Morberg said the wolves go after the weak and the sick: “The ones they take is the calves, and the sick ones”. However, immediately after saying that she described the hunting strategy of wolves [see in section 4.5.1]. Note, again, that Julia was mostly speaking of woodland caribou, and therefore possibly on territorial wolves. Percy Henry said: “The wolf ...they work together at [hunting] caribou, moose, so when the wolf, they chase them, and, you know get the weak one ah? That’s how come caribou is healthy because they got to sweat to get rid of the [wolves?], they have to sweat. And, if one weak one may be a sick [one] and caribou get rid of it, so they’re healthy, the more he [wolf] get that, the healthier the herd is.”

Percy Henry also described wolves that specialize on other prey, like moose or sheep, and don’t go after caribou.

4.5.3 Denning

Wolves have pups around the same time the caribou have their calves. According to some of the interviewees, this is the only time of year that the wolves don’t follow the caribou, and rely on smaller prey. When the caribou resume their migration, the wolf pups are old enough to migrate with the pack. Note that this leaves Freddy Frost’s report about overkill in the calving grounds (section 4.5.1) unexplained. SK agrees that wolves behave territorially during denning [Frame et al 2004].

Freddy Frost, replying to where wolves make their dens: “More or less along rivers or creeks you know. You know, in the summer they’re going to, [eat] rabbits and stuff like that along creeks.”

Stanley Njootli talked about where the wolves migrate north, have their dens, and teach their pups to hunt. He combines SK with TK: “They migrate north from Salmon Cache, it’s, there’s, there were three bunches went north there in late April... And, according to some of those biologist who study them, (pause) they have their dens in the foothills [of] North Slope, in those mountains there, those hills. They raise their young ones there... those wolves in the spring time they go there [to] raise their young ones, and then when that caribou come through in August and September, their young ones is starting to get big enough. That’s where they teach those young ones how to hunt that caribou.”

Percy Henry: “They [wolves] don’t hunt for them [caribou]. They live with them except at the calving time. And they stay up [in] high country, and they have young one too so they’re raised with small animal, ah?”

4.5.4 Lone wolves and cannibalism

Lone wolves are old wolves that get chased out of the pack. They may team up with another lone wolf, but either alone or in a pair, they have to rely on survival strategies different than that of the pack. It is likely that these lone wolves are the source of the belief that wolves hunt sick animals, because the lone wolves can’t hunt healthy animals; they need to employ other hunting strategies. For example, Woody Elias said that wolf packs go in ahead of the caribou, but the lone wolves “hang around”: “If there’s...wolves hanging around ... either they’re old wolf or they got...kicked...out of the herd”. Lone wolves will hunt whatever they can, for example dogs. Woody Elias: “...there’s some around, they’ll kill a dog, you know. That’s the old wolf.”

Old wolves either get chased out of the pack, or, if they don’t “get the hint” they get eaten by the pack. The subject of wolf cannibalism came up in several of the interviews.

Woody Elias: “It [the old wolf] can’t, he can’t go back to the wolf pack. Kill him right there, chase you away I said.”

Joel Peter has seen wolf cannibalism several times: “I seen that a few times in my life, in my trap line. Oh this is the reason, there’s a lone wolf. And, when they get old, the younger ones, like boot them out...because...maybe lack of food and, they don’t want this old wolf to waste food so they kick him out of the pack or, the group. So he go on alone and at times, he doesn’t want to go so...they kill him and they eat him.”

Freddy Frost: “ I never seen that myself but I heard stories where, you know some, old stories about some wolf pack would kill, sometimes if one wolf might be getting weak and sick, or something, they’ll kill it and eat it if they really hungry, you know.”

Woody Elias made a connection between mega-packs of wolves and cannibalism: “I know Isaac he trapped in the Yukon, just up here in this area. I was there but I didn’t see it. He said, wolf pack, 150. And, I really, I never, ever heard of a wolf killing people. But in the pack they could do anything. But what happened with wolf is...a pack like that... [is that] if they’re hungry, they pick one out right there, kill it and eat it.” He also heard about wolf cannibalism from another person, Doreen Lennie from Tsiigehtchic.

Percy Henry heard from an elder from Old Crow (he does not mention the elder’s name) about cannibalism in mega-packs, see ‘mega-packs’ in section 4.5.1.

4.5.5 Preferred parts for eating: tongue and liver

The choice parts for eating are tongue and liver. The alpha wolf gets first pick, starts with the tongue, then cuts open the caribou belly and eats the liver. If there is enough caribou to be hunted, the alpha wolf will only eat those parts. There was agreement between interviewers about this: “If it’s an alpha wolf, and ... there’s lots [of caribou] around [so] he can get caribou when he wants, he can eat the best part. They eat the liver and the tongue ... And then the rest, they’ll just leave it for the other ones” (Stanley Njootli). “And once he [the alpha wolf] kill it [caribou] and, he got it open, the first thing he do is ... take that tongue out. And then ... he cut that belly open. Some time they say it’s just like knife, knife cutting. He takes the guts out and then he eats the liver and he left ... the rest to the pack.” (Joel Peter). Stanley Njootli, however, thinks wolves will come back to eat more of the caribou they hunted: “If they get caribou and then they keep coming back there, and they ... take some more... They don’t eat it all in one time” According to Joel Peter, this depends on what shape the wolves are in: “If they have enough food to eat, they just leave what they kill and they get enough they just keep going and leave it to the crows or fox. And, I guess, if they’re really hungry they’ll clean up everything.” And Woody Elias says wolf cache food: “And then they, they cache food too, like people.”

The TK about tongues being the preferred part and about the alpha wolf getting most or all of it is interesting for the contaminants research. As far as I am aware, caribou tongues were never analyzed for contaminants concentrations. While we would still expect contaminants’ concentration to be higher in the liver (liver shows much higher contamination than caribou muscle), in view of this study there is interest in analyzing caribou tongues as well, especially since tongues are eaten by humans too.

4.5.6 Cultural rules and practices related to wolves

“But we never, ever talk about wolf.” (Julia Morberg, Dawson)

People seem to be ill at ease about wolves, as the citations here reflect.

Stanley Njootli said: “Elders, they don’t believe in taking a lot of wolf, ah? Because really old Elders, they said like don’t bother them, leave them alone.”

Both Joel Peter and Woody Elias described a practice for shooting a wolf: “If you trap a wolf ...you don’t shoot it while it’s looking at you, you rather throw a stick... and while he don’t look at you is when you shoot it. All this should be mentioned to young people. When it looks at you...it gives you some sort of bad luck... something [could] happen to your gun or, anything.” (Joel Peter)

Possibly people were more involved with wolves in earlier times, according to Stanley Njootli: “...our Elders long, long time ago got medicine from those wolf.”

4.6 Direct human impacts

“Nobody use that old trail going over... [to] Lone Mountain anymore, they use that cutline.” (Stanley Njootli, Old Crow)

Skidoos

Traveling by skidoos rather than by dog-sled changed hunting profoundly, and this is reflected in the interviews. There is also concern that skidoos degrade the vegetation. Julia Morberg expressed concern about the impact of skidoos on caribou: “I don’t like seeing skidoos up there roaming around; flying around on top [of] their [caribou] food... there is rules about that. No four-wheelers or skidoos go on top certain times like when the snow is just...cover the ground? That’s no time for them to use skidoos.”

Freddy Frost stated in his interview that since he has been hunting by skidoo (snow machine), he can pack more, so when he goes trapping in the winter he packs enough food for the trip, and does not need to hunt caribou to sustain himself: “Today I trap with snow machine and I don’t have dogs so I carry enough of my own meat to eat and I don’t need to kill caribou so I leave it alone.” (Freddy Frost, p1)

Contamination from fuel leaks from skidoos was mentioned by Woody Elias: “I said you go fifty miles with five gallons of gas. Pretty soon you got ten skidoos, that’s fifty gallons. The first time skidoo came, nobody thought anything. Only thing is you go further, and you never thought, all the gas going on the lake. So that, we did that, ourselves. And, you see that way, the rat [muskrat] disappears. It was so much rats, rat disappeared then ... the fox disappeared. That’s what I see, this is... I learned that by myself. We did that by ourselves by skidoos.”

Roads

Interestingly, none of the interviewees mentioned avoidance behavior of caribou to the road. The noise and pollution from the road have an impact on caribou, and this was mentioned by Woody Elias: “By the highway, see? By the noise and sure all these stuff coming out, you could see it when there’s too many trucks going on the highway. I’m sure something’s going on the food on the side of the highway.”

Seismic lines

Seismic lines, and old roads, made traveling on the land easier, both for people and animals. The seismic lines provide easy access to the land, both for hunting and trapping. Joel Peter: “Well in 1968... June that time it was seismic line... and these, and the winter road, we have access to that to go hunting and, these areas not only for hunting but to trap winter fur too.”

Freddy Frost follows an old seismic line and old roads when he travels on the land: “I travel the winter road. I’m along the Johnson Creek for a while, and I turn off towards the Bell River. ... I mostly follow an old seismic line. You know it’s not... not really hard going that it’s following old roads.”

Stanley Njootli tells how the cut lines (seismic lines) replace old trails: “Well, Fort McPherson trail is still being used every year... Part of it is still used, that old trail, but, nobody use that old trail going over... [to] Lone Mountain anymore, they use that outline.”⁴

Collaring and body monitoring

Woody Elias expressed a concern about collaring caribou, a practice used by wildlife biologists for tracking caribou movement. Concern about collaring is common in the north, and there is pressure on biologist to use lighter and less bulky collars. Woody expressed a concern that collaring caribou makes it a pariah to the herd: “Like caribou collar? ... caribou see it. So they don’t like him [the collared caribou], so they chase him away... If the caribou is alone and they [wolves] already knew it... Already wolf knows it then they’ll kill it.”

Julia Morberg feels strongly about this, as she expressed at the end of her interview: “And one thing too I like to complain about is I, maybe you’re working for them (laughter). But anyways, I don’t like seeing them [biologists] putting all these [collars], poking them around with needles, and touching the caribou when they’re... Putting the collars on, and poking them and getting blood and poking them again with this whatever you call it stuff to knock them out. And, we come along, and we eat caribou. You know that stuff in that caribou could travel to another caribou they could get sick from humans’ touch.”

Population decline

Although several of the interviewees commented on the loss of hunting etiquette, the ease of hunting due to roads, seismic lines and skidoos, they did not make a link between these factors and the decline in the Porcupine Caribou herd population. The only one to directly talk about over-harvesting was Julia Morberg: “The caribou are low because of wolves, people harvesting, you know all those animals. Grizzlies following them. Over-harvested” and “it’s [caribou] going down all the time by people, by animals, and you know whatever. Mine and disturbance.”

4.7 Environmental and climate change impacts

“Maybe it’s drying up.” (Joel Peter, Old Crow)

Weather events like deep snow, rain in winter that freezes to an ice cover over the snow, temperature fluctuations that results in crust over the snow, and overflow all make it harder for caribou to move around, and to reach their food.

Range

Stanley Njootli made an interesting observation, that with warmer winters, many of the caribou may be staying further north in winter, around Arctic Village, Alaska. This may make the caribou life easier,

⁴ In a later conversation with author, Robert Alexie Sr. noted that the cut lines also facilitate wolf movement.

because it shortens the migration route they need to take to the calving grounds. Stanley also thinks the wolves have not yet adjusted to this change, so the wolves still go down to where they expect the caribou to be. This may make life easier for the caribou, by reducing predation stress. “The caribou ... all of a sudden they’re not, you know, for some reason they’re not going to their wintering range down in the head of Ogilvie, or spend one winter in Hart River, you know? So their winter range south of the Porcupine they don’t go there some years, and [but] the wolves expect that [they do]. So they [the wolves] ...down there and, then the caribou don’t go down there, right now, two, second year in a row they’re up in Arctic Village. So that has an effect on the wolf and might have a good effect on the caribou because then, they’re healthy ...and then from there they don’t have too far to go to the calving ground.”

Ice cover

Freddy Frost: “Crust on the snow and that’s hard on them. They’ll move out of the way, they won’t, stay there...if it’s really, really deep snow they’re going to have hard time to get down to their food ah?”

Stanley Njootli: “Some places, ah, caribou ... don’t hang around there all winter because it’s, all, too snow drift, you know, and that kind of stuff. Hard snow, so they go in the hills where it’s, mountains where it’s soft snow and shallow snow and they get their food.” “If it rain in the winter...it freeze[s] and, how are they going to get food? They can’t dig through that ice... So, right now [if] it rain, and...it’s just on top that snow, they can still get at their food. They can still get at their food. But, if it gets so warm, and then it melt right down and everything just turns to ice on their food, then...that could be a big problem for them.”

Percy Henry also said that freezing rain makes it hard for caribou to get to their food.

Snow conditions

Snow conditions have a large impact on caribou. Deep snow, packed snow (e.g. by wind) or ice crust make it hard or even impossible to get to their food.

Deep snow makes it harder for caribou to advance, especially the smaller calves. Stanley Njootli recounted an incident where calves (he did not provide numbers) were left behind and got picked up by eagles: “I think they [the calves] were left, there was so much snow that...they got...some of that caribou, not all of them, some of that caribou got ah, left behind a bit because the snow condition and they had their calves on [the] other side Caribou Lookout. And, you could see six or seven eagles flying around there all the time. So I think they pick them. Pick them off whenever they get a chance and all the other little animals there too.”

On the other hand, deep snow makes it more difficult for wolves to hunt caribou: “For them [wolves] too, is hard for them right now it’s deep snow and it’s hard for them to hunt” (Joel Peter). And by implication: “...very easy for it [wolf to hunt]. I never see it but I see some young guys say they [the wolf pack] take that bull caribou like nothing. You know, they know how, ah? This is in the fall, when hardly any snow, little snow.”

In winter: “*Nihtal Git*. It means ah, lots of lakes, lots of creeks and lakes and swampy fingers. In the winter it just turns right into glacier... Good for caribou in the winter” (Robert Alexie Sr.) The Rat River area is a good winter area for caribou, according to Woody Elias: “So what they do is get to here [Rat River area], and then they eat. Before they go way down there... They feed.” In spring: “...So what caribou do when you go back in the spring time, they move only when it’s... [soft snow] snow... got to be just soft before they [caribou] move.” (Woody Elias)

Forest fires

Caribou avoids burnt areas for decades, presumably until lichen re-grow. So forest fires have a big impact on caribou. Increase in the number and severity of forest fires, in the context of climate change, was mentioned in several of the interviews as having a negative impact on caribou.

On the impact of forest fires: “It [Hungry Lake] burnt after 1963 you know. 1961, 1962 after that it burnt in there. And since that time caribou don’t go in there.” (Robert Alexie Sr.)

“And all this is burnt up here, all this country. So that’s why they [caribou] move over this way [east].” (Woody Elias)

Percy Henry puts some blame on fire fighting policies: “Well, what I see is...they let the caribou country burn. Because it’s ah, tree too small not worth saving, but that’s where caribou food is. So...they ask me how come no caribou, (pause) no caribou around Eagle. And I say, you let the food burn up so what they’re going to do now? They can’t eat charcoal.”

In the context of climate change:

Freddy Frost: “...It’s just that sometimes caribou...don’t have much food in the summer when they’re migrating, you know. Back and forth. It’s because we have a lot of forest fires over here in the last few years and lot of the country is burned over, so they won’t got to that part of the area when they migrate. It will go around it or sometimes...not even come...”

Shortened winters, warmer winters

Freddy Frost said that he sets out on the land at the same time each year, the first week of November. Nowadays, it’s harder and slower to move on the land because the creeks are still open, and he needs to take the time to build bridges to cross them: “If I go out in the same, first week in November to trap, but then this creeks are still open, and it’s difficult to get, you know I have to take time and make bridges to get across these creeks.”

Greening of the tundra

One of the impacts of global warming is the “greening of the tundra” [Verbyla 2008]. Vegetation becomes taller, for example willows start growing in low-bush tundra. The taller vegetation catches more snow, resulting in a thicker layer of insulating snow in winter, so the ground cools less in winter. The result is a positive feedback that makes it easier for taller plants to grow. Robert Alexie Sr.: “Well look, eh. From back in 1950s to today? The country used to look, well it still look good but you

know, it's now, the earth is full grown. Just grown there, lot of willows, lot of trees. Big difference now. You know? John Tsal (John Vaneltsi), he was around Blackstone in 1930s and then after the 1980s they took him back over to Dawson and over Blackstone. 'You remember this place here?' they stop and they told him they were going up Blackstone. 'I can't remember' he said 'grow too much'."

Acid rain or soot

Robert Alexie Sr. mentioned acid rain: "Like you know eh, I go up to Trail River. One time...I went up there in spring time... we had white containers [with] snow ... that container was black inside. It's [from] where the snow is from... I don't know what is that. You know the kind of stuff, it's like acid rain?"

4.8 Historical information

Note: see also section 4.3: Old-time tales, legends, lore and beliefs

Note: the information about gathering places and trails was taken while drawing on the map, so the information given here complements the maps rather than stands by itself. Electronic copies of the maps can be requested from GSCI.

Gathering places

Blackstone is a gathering place that was mentioned by all Fort McPherson and Dawson interviewees, so it must have been a major one. According to Percy Henry, there were lots of caribou there in the spring time. The Han place name for this site is *Tsok Giitt'in*, marked on the map as PH10. Other gathering places were also mentioned.

Percy told of another gathering place on Chandindu River (Twelve Mile River), just pass Seela Pass, called *Nehkak Choo Deek'it* [a football place] "Well the one they call [a football Place] so they come down here, and *Dagoo* come there, *Gwich'in* people come, and they play football there, they call football place. They got football field there. ...they usually go once a year to Dawson, back in the spring like in June or, some time Oh, they gather there, have a big banquet. They fall in love, get married... fiddle dance. But they used to have drum dance too." A third gathering place Percy mentioned is, *Kwan' Deek'it*, at the head of the Bell River, where the mythological figure *Atachùukajj* made camp.

Certain places were used by many families to gather together and celebrate, have dances, play hand games, etc. Robert Alexie Sr. named gathering places for spring and fall such as Black City. He said, gatherings took place in time with the caribou migration, "They stay there when the caribou is moving both times, in the springtime and in the fall." Robert knew there were more spring gathering sites, but couldn't point out the exact locations. Woody Elias named other gathering sites, though he didn't mention the time of year: Rat River, Stony River and Bear Creek (mark on map: WE11). He was less sure about Fish Creek, Loon Lake and White Stone.

Robert Alexie Sr. described what was happening in the spring gathering: “I don’t know where it happened but, somewhere in here people’s going to depart ... Part... they go this way and they go that way and big, big camp with drum dance, hand games and all that? Don’t know how, once they get going, they must go a long time sometimes. ...they found out it’s melting pretty bad by the time they finish.” Robert said there used to be big campsites for hunting caribou, at Caribou River, in the Doll [Creek] area, at Deception Mountain and in the Eagle Plains area. “There’s caribou on Caribou Mountain and lots of people stayed at Caribou River... Back in the 1930s. In 1938, I think it was... I don’t remember [the] time but [there were] fifty-two tents” (Robert Alexie Sr.) “...We call it Caribou Mountain. *Edigii* it means ‘young calf’ hill. They [caribou] used to calve on there many moons ago, ah? ...a lot of wind there all the time... That’s why.” (Robert Alexie Sr.)

Julia Morberg also named Blackstone (Note: Julia used the names Black City and Blackstone intermittently as a gathering place). “I think Blackstone [was a gathering place] because people come down from [Fort] McPherson and other areas, and... they gather there, you know... because they used to live there eh? And then they come and visit and, stay there with them and... hunt caribou and get their winter supply and stuff [and] plants and everything else. Harvesting you know. I could just picture them working, ah, they get caribou, dry caribou, and tan and skin but, that’s where they lived long time ago. [At Black City], they found old huts, you know. Old bowls and stuff like that from way back... It’s interesting what they find there because there’s old huts and then there’s evidence of tent frames (pause) and then there’s evidence of cabins on top of those. Like three different areas there.”

Trails

Woody Elias recounted the various trails that people used to follow to go to the mountains, and he marked these on the map. Robert Alexie Sr. drew the winter route between Fort McPherson and Dawson on the map, including the locations of the spring camps. The information is on the map, and in their interviews. Woody mentioned that people used to go through a very cold area, where caribou is not found, but didn’t say, or doesn’t know, why they travelled through that harsh land: “Stony Creek to Whitefish Lake? Well, that’s really when there’s no caribou? They got to go way over here. They cut over ...I just hear about that. And you see, that’s how you’re just going there. Well if there’s nothing there, well, you’re going to have a hard time. But, they do it, and, it’s so cold, this is cold country too, in there, this side? You know we heard story about even dogs freezing where you’re travelling, dogs freeze to death (pause) because they don’t eat.... This is, *Itillii* they call it, Whitefish Lake. It’s from Old Crow and from there they don’t go any further than Rat River, you see? From there...they’re eating no caribou because this is too hard [packed snow].” Woody also talked about a summer trail that people used in August to go moose hunting at Timber Creek: “We hunt in August. That’s Timber Creek... And they [unclear if ‘they’ refers to caribou or to people] got trail there, a summer trail, you could still see it I think”. He mentioned other summer trails: “...below *Shildii* there’s trail that way. And you get another one *Tl’oondih* (pause) then you got another one below Road River, that’s where old Robert used to stay. So these are summer trails... There’s another one at Black Mountain.” He said all the rivers were used as winter trails: “Rat River, Stony, Vittrekwa, Caribou River, Trail River, Road River, last one is Caribou River [winter trails for hunting and trapping]”, “Vittrekwa River there. We used to use that with dog team lots but now, nobody use it... John Charlie, he use[d] the Road River, and same with Abraham Alexie, he used Trail [River]. Then you got Peter Alexie, he used Caribou River.”

Julia Morberg drew a trail from Moosehide, through Seela Pass to Black City. The trail is marked as JM3. This was a summer trail; people would head out on it in spring and come back in September: “I

think ah, in the spring. I could remember when I was a child, I used to see those old people... they packed everything up and they got... dogs with them and dog pack and, babies on their back, and, they heading up to Moosehide Creek and they don't come back until, around September... they probably went there to hunt and dry their meat and stuff ah?"

Percy Henry traveled on that same trail. He said later on, from around 1970, people started using the Patrol Trail as well, which largely follows the old-time trail called the Dagoo Trail. The trail was between Dawson and Fort McPherson that the NWMP used in the late 1800s and early/mid 1900s to monitor activity in the area. He marked the Patrol Trail on the map, PH8 (Note: Robert Alexie Sr. also marked the same trail). Percy mentioned the names of people that he knew who used the Dagoo/Patrol trail: Vittrekwa, and Andrew Kunnizzi, and George Robert. The Dagoo and the Patrol trails are winter trails. Percy also described a summer trail, where people rafted down the Yukon River to just below Eagle, Alaska, then up Sheep Creek (Alaska) and then inland to follow the caribou: "After fishing they go down river with raft and they go up Sheep Creek. And then they come back this way... follow the caribou around... they go back... inland. Well if there's caribou, they follow it and then they go right over to Beaver River. And then they go down Stewart River, back down, go up to White River."

The Patrol trail was also mentioned by Robert Alexie Sr.: "The patrol they used this too, you know. Up Trail River and over Caribou Mountain, and up here, and then, Bonnetplume [River]. It goes up...the Wind River... hits the Peel [River] here, it goes up the Peel. And then ah...goes over to Little Wind [River] ... and then, *T'oo Shyah Njik* right there, to Blackstone [River]."

Caribou fence and corral

This is an ancient method to hunt caribou, by erecting a fence in the path of the herd. The caribou do not jump the fence, but rather the fence serves to redirect the animals to where the hunters are, or into a corral. This technique was employed to supply meat for the winter. Stanley Njootli named Caribou Lookout, a main caribou crossing point, and Summit Lake, as places where caribou fences used to be built. On Caribou Lookout: "Wherever they harvest lots of caribou, they put a fence. Put a fence, they don't necessarily put corral. They put fence like on top of the hill. If there's caribou crossing the river, they get on, where that hill's a crossing too they going to put a fence along that hill. Because that caribou going to run up the hill, they run that fence and they run back down again. So now they got chance to get some more for winter. And ah, they get all they can get for winter ah because it's cold winter sometimes." No buildings were erected at Caribou Lookout, because that may have caused the animals to avoid that spot, and find another crossing point. Stanley: "Buildings have permanent smell and, as the caribou come past they smell that. And they don't get too used to that, they don't like that. So now they might cross somewhere else." Percy Henry explained how a caribou corral was used: "...they make caribou fence. At [a] certain place... but they're very strict ah? Caribou fence they make it, and the caribou go in there, and they shut the gate, they take what they need and when it's enough, they let them loose again. After they finish, they wash that fence right down to the ground, wash it. Otherwise caribou won't go in there."

Telling time

Woody Elias told how people used to keep time when they did not have watches. He knows of two methods, both during winter. There were other methods, e.g. by the moon, but Woody doesn't know them. One method used the Big Dipper (*Ursula Major*), and the other method is by how long it takes water to freeze in a bucket. "They got time by the Big Dipper star. So that's the way somebody talk and says, the Big Dipper is straight up. That would be around maybe nine (in the morning), I don't know but that's the way they tell time... and another way is, it's so cold (pause) you leave water in a dipper pail? You could hear, pretty soon you'll hear it cracking. It's time to get up! That's five o'clock in morning. See? That's the way they tell time. And, that's two things I know but I don't know about the moon."

Pre-contact tools

Julia Morberg was traveling in the Worm Lake and Ray Creek area, and they found old caches: "We found some old cache and like canned butters. It [the butter] was still good." They saw old tree stumps that were chopped with stone axes, indicating they were chopped before the Gwich'in and Tr'ondëk Hwëch'in people traded for metal axes: "Worm Lake and Ray Creek area...we see lots of old stump, chopped up you know, and you can just kick it and tip them, tip it over. In West Hart, I don't see too much in there but in Big Hart River, you go down the river, you know there's ah, Peel River here it goes in the Mackenzie Mountains, the Mackenzie River? But there's along here too, there's probably trail...because I see old signs of old, old trees that's not even chopped by ... axe? It's chopped by stone, probably... it's old, I mean, the stump is old? And it's just, it's not sharp like [with] axe eh? It's kind of like round. You know how they chop, and yeah, you can tell it's very old because, every time check things out like that, you know there's somebody been there way back and, and the stump just, you can just move it, it falls off."

Julia was asked what people used animal bones for. She replied: "They probably make tools out of them for scraping and for fishing, and everything else... they make, bone grease too... They [the people] used to eat some good parts [like the marrow] of the bone ... and [then]... give [the bones] to their dogs, you know."

5. REFERENCES

Boertje RD. 1984 Seasonal diets of the Denali caribou herd, Alaska. *Arctic* **37**:161-165

Frame, PF, Hik DS, Cluff, HD, Paquet, PC Long Foraging Movement of a Denning Tundra Wolf *ARCTIC* **57**, NO. 2 (JUNE 2004) P. 196–203

Thompson D. C. and K. H. McCourt 1981 Seasonal Diets of the Porcupine Caribou Herd *American Midland Naturalist*, **105(1)**, 70-76

Verbyla, D. The greening and browning of Alaska based on 1982–2003 satellite data *Global Ecology and Biogeography*, (2008) **17**, 547–555

6. APPENDICES

Appendix A: Consent Form

INFORMED CONSENT STATEMENT

Aurora Research Institute (ARI) Vegetation-Caribou-Wolf Food Chain Project 2008/2009

GSCI Interviews: Fort McPherson, NT & Dawson City, Yukon

To be signed or agreed to verbally on tape.

The Gwich'in Social and Cultural Institute (GSCI) is conducting a traditional knowledge study for the ARI of caribou and wolves in the range of the Porcupine caribou herd in the Northwest Territories and Yukon. The project is being conducted with funding from the Northern Contaminants Program.

The ARI will use the information gathered from these interviews to monitor contaminants in caribou in northern Canada. They will do this by looking at the eating habits of caribou and wolves. The ARI project will determine if perfluorinated compounds bio-accumulate in the vegetation-caribou-wolf food chain. That is if there is an increase in their concentration as you go up the food chain.

We will be asking you about traditional land use, place names, old time trails and gathering sites, legends about wolves and caribou. We will ask about the hunting and feeding habits of wolves, the relative importance of caribou in wolves' diet and the time of year that caribou are hunted by wolves. The ARI will have access to this data but will not own it.

A report will be prepared by ARI using this information which will be forwarded to the Northern Contaminants Program. The results will be presented at the annual meeting of the Northern Contaminants Program in 2009.

You will have the choice of your interview being recorded or not on digital audio tape. If you prefer, we can take notes of the interview. Interviews will be transcribed and will be stored at the GSCI head office in Tsiigehtchic and at the Aurora Research Institute in Inuvik, in locked archive rooms. Sound recordings and transcripts will be put on deposit at the NWT Archives at the end of the project for safe-keeping. Initially the information will be available to team members, and later to GSCI-authorized researchers. The transcripts are kept indefinitely.

The GSCI also requests permission to take photos of people being interviewed. The photos could be used in reports, posters, books, web-sites, or in other resources.

You do not have to answer any questions you do not want to, and you can stop the interview at any time.

Interviewee name: _____

Community: _____

Date: _____

Interviewers: _____

Translator: _____

Interview Location: _____

(I.e. Band office, home, RRC office)

May the GSCI interview you for this report?

YES NO

Do you (*Interviewee*) wish to be given credit for the information you provide? That is, have your name in the report? If not, confidentiality of your name is ensured.

YES NO

May the GSCI use the audio tapes and the transcripts in future for other purposes such as publications, reports, website, etc.?

YES NO

May the GSCI take your photo for use in this report?

YES NO

May the GSCI use these photos in future for other purposes such as publications, reports, website, etc.?

YES NO

Would you like a copy of the taped interview?

YES NO

Would you like a copy of the transcript of the interview?

YES NO

By signing below, you give informed consent for this interview. The GSCI respects the choices you made filling this consent form.

X _____

_____ Date

Appendix B: Interview questions

Vegetation –caribou-wolf food chain

These are only a guideline. Follow up with stories if people start to tell stories – get as much details as possible! If names of people are mentioned, get their full names.

Traditional Use (this will determine land use area)

1. Where have you / people travelled in this area?
2. Why were you /people there? Where were you / people coming from?
3. Who were you / people travelling with? Can you remember their names?
4. What season(s)?
5. When did you first go? When was your last trip?
6. How long has this area been used?
7. Does this area have a reputation – hard to travel through, easy area to hunt, known as good place to hunt caribou, etc?

Named Places^s

8. Are there any Gwich'in or English place names in this area named after caribou, caribou food, or wolves? Draw on map and number.
9. Are there any Gwich'in or English place names in this area that refer to trails (old time, dog team), campsites, and caribou range area(s)?
10. What do these names mean / translate as? Why are the places named these names? Is there a story that goes along with the place name?
11. What is the exact extent (area) of these names, to your knowledge? (I.e. the whole mountain range? The mouth of the valley? Just one part of the mountain? Mark extent on map.

Old Time Trails

12. Where are the trails in this area? What route did /do people take to travel to this area from Dawson / Fort McPherson? Draw on map and number.
13. What time of the year were the trails used?
14. Why did you / people travel on these trails – i.e. to hunt, to trap?

Gathering Sites (Mark all on map and number)

15. Have you heard about gathering places in the area? If so, where?
16. Did people do anything special at the gathering places? (I.e. gather to hunt, to stay in the spring, to make moose skin boats, to celebrate by tea dancing, drum dancing, stick gamble?)

Legends

17. Are there any legends about caribou or wolves in the area? If so, what are the stories? Where on the land did the stories take place?

Sacred or Spiritual Sites

18. Are there sacred or spiritual sites about caribou or wolves in the area? If so, what is the story that goes with them?

19. Are there special cultural rules / practices about caribou, caribou food, wolves? If so, what are the rules that go with them?

Gwich'in Names

20. What is the Gwich'in word for caribou food? What does it mean? Where can it be found? Is there a story about caribou food?
21. What is the Gwich'in word for caribou? How many other Gwich'in words are there to name the different category of caribou (i.e. female caribou, male caribou (1st year male, bull caribou, etc.), unborn caribou, and a herd of caribou?)
22. What are the Gwich'in words for the different caribou parts (hind quarters, stomach, bible, ribs, etc.)?
23. What is the Gwich'in word for wolf? How many other Gwich'in words are there to name wolves (i.e. wolf pack, a lone wolf, wolf cubs?)
24. What are the Gwich'in words for the seasons? (spring, spring thaw, summer, fall freeze up, fall, winter)

Relationships

25. How many caribou do wolves hunt? Is it a preferred prey? What other prey do wolves go after?
26. How much of wolf's diet is caribou?
27. Where do wolves hunt caribou? At what times of the year? Times of day? Do they prefer hunting certain categories of caribou (males, females, females with calves, etc)? Anything else to note about wolves hunting caribou?
28. After hunting caribou or wolf, can you tell what the animal was eating? For example from cutting up the stomach or guts?
29. Are there recent changes to the environment that affect the relationship between caribou and their food? Between caribou and wolves?

Do you have anything else to add?

Mahsi' Choo!

[§] These questions (8 to 11) will not be included in the Old Crow interviews, since they were asked in previous interviews. The relevant transcripts from these older interviews will be added.

Appendix C: Ethical Review Form

Application for Ethics Review of Research Procedures

(Please fill in the form provided)

Identification and Purpose

1. Date: Nov 5th 2008

Name of Applicant(s): Sharon Katz

Address: 191 Mackenzie Rd, Inuvik, NT, X0E 0T0

Phone: 867-777-3298 Ext. 31

Fax: 867-777-4264

E-mail: skatz@auroracollege.nt.ca

Title of Research:

Bioaccumulation of Perfluorinated Compounds in the Vegetation-Caribou-Wolf Food Chain -
Traditional Knowledge

2. If the project is part of a course, academic program, or contract, give the name of the instructor or supervisor: N/A

Campus:

3. Purpose:

(Give a brief outline of the main features and variable of the research problem. Include a brief statement which describes the significance and potential benefits of the study).

Rationale

This is one part of a research project on Bioaccumulation of Perfluorinated Compounds in the Vegetation-Caribou-Wolf Food Chain, taking place in the Yukon and NWT. To enhance the knowledge obtained from the research project, traditional knowledge is gathered about the vegetation-caribou-wolves food chain and the relationship between them.

The scientific part of the project aims to assess if perfluorinated compounds bio-accumulate in the simplified food chain that is studied; that is, are Perfluorinated Compounds concentration highest in wolves, intermediate in caribou and lowest in vegetation.

The scientific part uses two analysis methods (isotope analysis and fatty acids analysis) to give a breakdown of the caribou and wolves diet. The rationale for this part is that the data obtained from these methods can be corroborated by traditional knowledge.

Objectives

- *Obtain traditional knowledge about the feeding and preying habits of wolves
- *Obtain TK about the relative importance of Caribou in wolves' diet
- *Obtain TK about the composition and seasonality of wolves' diet
- *Knowledge of wolves' prey preference, e.g. prey age, prey sex, prey geography, hunting vs. scavenging.
- *Compare TK from different regions (Fort McPherson area, Dawson area, Old Crow area), corresponding to different seasons when caribou is present as relevant to the above questions
- *Obtain TK about the composition and seasonality of caribou diet.
- *Obtain TK about caribou and wolf and oral history information.

Significance

The interpretation of the scientific data in the science part of this project relies on a good model for the caribou and wolf diet. Two analysis methods (isotope analysis and fatty acid analysis) are used in the project. Traditional knowledge is considered another method of modeling the animal's diets. The increased number of methods is expected to improve the accuracy of the diet model.

Of note is that this is the first collaboration between heritage organizations and the Northern Contaminants program to use the mode of TK interviews.

Subjects (If no human subjects are required, skip this section.)

1. Briefly describe the number and kind of subjects required for data collection.

Total of eight Gwich'in elders for traditional Knowledge interviews: Two elders in Fort McPherson, three in Dawson and three in Old Crow.

2. Describe any potential risks to the subjects.

There is no risk to the subjects.

3. Describe any potential benefits to the subjects.

The elders will be paid honoraria.

The elders will enjoy an opportunity to share their traditional knowledge and have it considered on par with the scientific knowledge collected.

4. What information about the research problem and their role in the project will potential subjects be given?

See the attached consent form.

5. How will consent of the subjects to participate be obtained? Attach a copy of the consent form(s) being used. (Consent forms should have the researcher's name and contact information).

(Copy of the consent form is omitted here, since it is given in Appendix A)

6. What will the subjects be required to do in the course of the project?

The subjects (elders) will give interviews about traditional land use, place names, old time trails and gathering sites, legends about wolves and caribou in the range of the Porcupine caribou herd in NWT and Yukon. They will provide information about the feeding and preying habits of wolves, the relative importance of caribou in wolves' diet, the composition and seasonality of wolves' diet, wolves prey preference and the composition and seasonality of caribou diet.

7. What assurances will the subjects be given and what precautions will be taken regarding the confidentiality of the data or information which they provide in the study?
For assurances see 1st question on page 2 of the above consent form.

GSCI wishes to give Gwich'in elders and participants the option to give their names in the research project. From GSCI's experience (1993-2008). Gwich'in people like to know who provided the information and furthermore participants' names on the recordings and/or transcripts will add credence or strength to the traditional knowledge provided by Gwich'in people.

8. Will children be used as a source of data? Yes ____ No

If yes, indicate how consent will be obtained on their behalf.

9. Will the researcher or any member of the research team be in a position of power or authority in relation to his subjects? (For example, a teacher doing research and using her class as subjects, or a counselor collecting research data from his clients).

Yes ____ No

If yes, indicate how coercion of subjects will be avoided?

10. Will deception of any kind be necessary in the project: Yes ____ No

If yes, explain why and indicate how subjects will be debriefed after the study.

Community Values and Access to Data and Findings

1. How will you respect the community norms and values?

The research is conducted by Gwich'in heritage researchers.

2. Who will have access to the original data of the study?

Organizations participating in this research: Aurora Research Institute (Inuvik NT), Gwich'in Social and Cultural Institute (Tsiigehtchic NT), Vuntut Gwitchin First Nations (Old Crow YT) and TR'ondëk Hwëch'in First Nations (Dawson YT).

3. How will subjects access the findings of the study?

Contact any of the organizations listed in question 2 above. Note that the Gwich'in Social and Cultural Institute have an office in Fort McPherson, so all subjects can access the findings in their community.

4. What will be the final disposition of the original data after the study is completed?

The interviews will be transcribed and will be stored at the GSCI head office in Tsiigehtchic, and at the Aurora Research Institute in Inuvik. The sound recordings and transcripts will also be put on deposit at the NWT Archives at the end of the project for safe-keeping.

The final report will be presented at the NCP 2009 results workshop. The audience includes, among others, the NWT environmental Contaminants Committee and other community members from the NWT.

Signature of Applicant(s)

Signature of Advisor, Instructor or Supervisor

Mail to: Chair of the Ethics Review Committee, Aurora Research Institute,

Aurora College, Box 1450, Inuvik, NT XOE OTO

Phone: (867) 777-3838 Fax: (867) 777-4264

Email – licence@nwtresearch.com