"With a Connection to the Land, Our Spirit is Strong"
Tłı̨chǫ Traditional Knowledge of Climate Change and Impacts for Caribou Hunting: Implication for Traditional Knowledge Research

By

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ABSTRACT

My research was to document the Elders knowledge of climate change and the impacts on caribou hunting. The Elders explained starting in the 1960-70s the weather has become warmer and drier leading to a change in hunting locations and modified hunting times. Changes to wind patterns as well as changes to snow and ice conditions have caused uncertain weather predictions and increased the community members' focus on safety. The consequence of these impacts of climate change is an increased reliance on gas and money to sustain hunting. The Tłı̨chǫ Elders tied these environmental changes to human-environment interactions and interpreted these climate changes with the larger process of social changes within modern society. Based on such social perspectives of the environment, I argue that Traditional Knowledge research of climate change needs to be based on an Indigenous perception, and I provide recommendations to indigenize climate change research with sub-arctic Indigenous peoples.

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ACKNOWLEDGEMENT

I want to say Masi to the Tlicho Nation for allowing me into their land and communities. This project would not have been possible without the generosity and inclusive spirit of the people who welcomed me into their homes and way of life. I want to give special thanks to Tony Rabesca for your generosity and openness. Your guidance through words and gesture made it always a pleasure to visit when I came by Behchoko. Also, Sonny Zoe provided great help in facilitating this research in Whatì. My thesis is based on the cooperation of the knowledgeable Elders: Louis Simpson, Benny Jeremick'ca, Francis Simpson, Charlie Zoe-Nitsiza, Marie Flunkie, Narcisse Bishop, Joseph Moosenose, Louis Wedawin and Dora Nitsiza. Their willingness to explain their knowledge, experiences and teachings made this project a success, and I will always carry their knowledge with me. Masi to Benny Jeremick'ca for teaching me so much of the Tlicho gonaèwo (way of life) through many long conversation and travels on the land. Masi to my translators Albina Nitisiza and Isador Zoe. Our discussions during the research process were critical for developing this thesis. I also want to say Masi to Archie Wetrade, in Gameti, for letting me stay in your house and teach me so much of the Tlicho gonaèwo while travelling on the land. I also want to say Masi to Camilla Zoe-Chocolate for inviting me into your home, and for introducing me to your family and to the Tlicho culture.

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I want to thank my girlfriend, Maren Johansen, for her emotional and intellectual support while writing this thesis and for her love and patience. My absolute appreciation goes to my family in Norway for your exceptional support and help during this long process. Your homes and hearths have always been open during my numerous trips between Norway and Canada.

But now I had to face an elemental question, as an anthropologist of course, but even more so as a person who had always been deeply involved with nature: Is there not a single reality in the natural world, an absolute and universal reality? Apparently the answer to this question is no.

Richard K. Nelson, Make Prayers to the Raven

Chapter One: Introduction

1. The Research

The arctic and sub-arctic regions are experiencing the effects of climate change earlier and more intensely than southern regions (ACIA 2004). The average mean temperature is expected to increase over the entire region (Nichols et al 2004) but local changes vary due to regional and seasonal variations. In recent years, Traditional Knowledge has increasingly become a source for learning about the local impacts of climate change. The purpose of my study was to research Traditional Knowledge of climate change and the impacts of climate change on caribou hunting from the point of view of the Tłı̨chǫ Elders in Whatì, an Indigenous community in the sub-arctic region of Canada's Northwest Territories. I spent six months from 2009 to 2010 documenting the Traditional Knowledge of the Tłı̨chǫ Elders.

The time of my fieldwork coincidently corresponded with two, possibly, interlinked events. First, climate change is altering aspects of the natural and social environment in the Tłı̨chǫ communities and the debate over impacts and the reasons for these changes is increasing. Second, the Environment and Natural Resource Department (ENR) of the Northwest Territories Government imposed a ban on hunting caribou from the Bathurst herd in large parts of the Tłı̨chǫ territory. Contrary to their Treaty rights, the Tłı̨chǫ were not allowed to hunt caribou on large parts of their traditional hunting grounds. As some Elders do not

recognize a decline in the caribou population, they do not agree to the ban. This is due to the Elders distrust of ENR's methods for acquiring knowledge and thus the knowledge itself. The decline in the caribou population is not the topic here, but the controversy and agitation related to the perceived caribou decline heavily influenced the social landscape in which I conducted fieldwork. This influence highlighted the difference between how the Tłįchǫ and the Euro-Canadian perceive the changing climate. This thesis grew out of the *process* of conducting research with the Tłįchǫ Elders, within that social environment.

For there to be value in my research I needed to present the knowledge of Tłįchǫ Elders in culturally appropriately terms; as Henry Sharp wrote, "the heart of anthropology lies in individual ethnographers' attempt to transform their understanding of their experience of the 'other' into terms intelligible to their readers" (2001:14). Therefore, I needed to understand the 'others' correctly before transforming this understanding into intelligible terms for a public unfamiliar with Indigenous issues.

I envisioned trying to understand Tłįchǫ knowledge of the environment as a process similar to learning a new culture. I started to question myself and how I, as an outsider who enters another culture, can create questions that will not fall within one's preconceived understanding of the environment. Celia Haig-Brown answers this question in specific terms, "not yielding to the temptation to blithely answer/investigate our own questions rather than those that come from beyond our cultural and social imagination and epistemologies" (2003: 418). This process of "listening differently" is a powerful tool of discovery of other cultures' knowledge. When encountering knowledge that shows the limitations of one's own

knowledge, it is important not to ignorantly refuse such knowledge based on one's unexamined limitations. Rather, be aware of one's limitations (Haig-Brown 2003). As I started to listen differently, I realized that the knowledge that I thought I should document, did not seem to fit with what I was experiencing on the land with the Elders. The research methodology thus evolved parallel to the evolution of my own understanding.

After three field seasons over two years conducting interviews and participant-observation with the Elders and harvesters, an understanding emerged about the Tłįchǫ knowledge of climate change and the impacts on caribou hunting. This understanding took into account the Tłįchǫ Elders' perception of caribou and climate change, which introduced new interpretations of these issues. These new interpretations focused on the connection between the land, the caribou and the Tłįchǫ. This outlook showed me a different perspective than the ones expressed in a large amount of research and literature on Indigenous knowledge of climate change and caribou. In contrast to that work, my research on climate change portrays an Indigenous ontological view of the environment based on a holistic understanding of climate change. By placing the evolution of human culture into the natural world, therefore, eliminating the perceived difference between 'us' as people and the natural world, the Tłįchǫ emphasize the importance of the role of humans in the ecosystem based on our historical and spiritual connections. Thus, the environment is both natural and social. Hence, the Tłįchǫ assume an active role in the shaping of the environment. Their lifestyle, rooted in tradition and spirituality, allows them to understand the land in broader terms and live within connections to the natural world, which actively works to maintain the sustainability of the ecosystem. In this respect, the introduction of a modern lifestyle, not only contributes to

changes in their cultural practices, but most importantly works to erode the human connection to the natural world. It is this erosion of the connection to the natural world which, for some Tłı̨chǫ Elders, is at the base of climate change.

Expanding on the work of scholars such as Paul Nadasdy (2003, 2007) and Jean Guy Goulet (1998, 1994), my research with the Tłı̨chǫ recognizes all aspects of the Elders' knowledge as legitimate knowledge. Thus, the analysis in this thesis does not refer to certain aspects of Traditional Knowledge as "cultural beliefs", "traditional beliefs" and view them as "cultural constructs" as such views delegitimizes these aspects of Traditional Knowledge while legitimizing the form of knowledge conforming with Western scientific standards and worldview (Nadasdy 2007). Thus, my study presents all aspects of the Tłı̨chǫ knowledge of climate change and caribou in order to offer unadulterated methodological recommendations. This process aims to indigenize Traditional Knowledge research by including and fully respecting knowledge which commonly is referred to as "cultural beliefs" by outsiders.

Thesis Objective

The purpose of my thesis was to research Traditional Knowledge to acquire an understanding of climate change from an Indigenous perspective. My specific research objectives were to document (1) Tłı̨chǫ Traditional Knowledge of climate change, and (2) impacts of climate change on caribou hunting. My findings demonstrate that climate change has both social and ecological implications. Therefore, I argue that many research projects inadequately document Traditional Knowledge, as they rely on a Western perception of the environment and only include the ecological aspects of Traditional Knowledge. Instead, Traditional

Knowledge research needs to be based on the participants' (the Indigenous) perception of the environment and to reflect the nature and origin of their knowledge. For that reason, I provide methodological recommendations for conducting climate change research with sub-arctic Indigenous peoples. Specifically, I emphasize that the historical and spiritual aspects of Traditional Knowledge need to be included in research design and findings, along with the ecological component, in order to reflect an Indigenous perception of the environment. Long-term fieldwork based on participant-observation is the necessary entry point for such encompassing and representative research process.

Traditional Knowledge research (e.g. Fergusson and Messier 1997; Fox 2002; Huntington 2000; Riedlinger 2001) has been criticized for distilling and converting holistic Traditional Knowledge into a new currency that aligns with the existing Western standards of knowledge (Nadasdy, 2003; 2007; Spak 2005; Stevenson 2006). I argue that there is a contradiction between the positivistic research focus of many Traditional Knowledge research projects and the holistic Traditional Knowledge of sub-arctic Indigenous societies. To avoid similar misrepresentation I strived for prolonged engagement and applied participant-observation. I adopted an Indigenous framework premised on two research methods. Semi-structured interviews with Elders and participant-observation in the communities and out on the land provided not only knowledge, but also interpretive understandings by engaging in a learning process between myself, the hunters and the Elders. These methods provided a blend between a Western research approach and Indigenous ways of learning. Participant-observation out on the land provided explanations and the context for the knowledge documented in the interviews. The combination of theory and experience made it possible for me to ask more

detailed questions, because I had started to learn how the Tłı̨chǫ know and understand their world. Documenting Tłı̨chǫ knowledge of climate change and the impacts on caribou hunting also became a process of understanding the relationship between the Tłı̨chǫ and the caribou, and the role of the Tłı̨chǫ within the ecosystem. When understanding the larger processes at work in a Tłı̨chǫ ontology, the impacts and functions of climate change can be seen from a new perspective. As I am presenting Tłı̨chǫ knowledge, I consider it highly relevant to apply the holistic knowledge that certain Tłı̨chǫ Elders have taught me. Therefore, I have placed a great emphasis on the nature of this knowledge and shaping research methodology to support this form of knowledge.

Thesis Structure

This thesis is organized into five chapters. In Chapter One, I explain the context and objectives of the research, essential background information about the Tłı̨chǫ Nation and the characteristics of Traditional Knowledge. In Chapter Two, I analyze literature related to the sub-arctic Indigenous ontology and I provide a critique of Traditional Knowledge research, with specific examples of past work focussed on climate change. The purpose of this chapter is to gain an understanding of the nature of Traditional Knowledge and the process of researching Traditional Knowledge. In Chapter Three, I explain my theoretical framework and my methods for conducting Traditional Knowledge research. Chapter Four outlines the research findings. I describe the Tłı̨chǫ Traditional Knowledge of climate change and impacts of climate change on caribou hunting. In Chapter Five, I discuss the nature of Traditional Knowledge described in the research findings and outline my recommendations to indigenize Traditional Knowledge research.

2. The Context:

In this section I provide a historical view of the economic, political and social aspects of the Tłįchǫ communities. Following an Indigenous research approach, I describe a macro view of the position and consequences of Euro-Canadian influence.

The Tłįchǫ

The Tłįchǫ are a distinct group within the larger Denè Nation. The Denè Nation inhabit the land east of Hudson Bay, west into central Alaska and south into northern Alberta, Saskatchewan and British Columbia. This land is referred to as the Denendeh by the Denè, which means "the land of the people" (Denè Nation 1984:7; Wilson 2004:154). The Tłįchǫ and Denè are part of the Athabaskan linguistic group (Helm 1994, 1961). Historically the Tłįchǫ have been referred to as the Dogrib, but after signing the Tłįchǫ Self-Government Agreement, 'the Tłįchǫ Agreement', Tłįchǫ became the official name. The four Tłįchǫ communities are located in the boreal forest, but their traditional land stretches north of the tree-line into the tundra, where many of their fall hunting grounds for caribou are situated (Figure 1). The traditional land of the Tłįchǫ lies within the boundary 'Mowhi Gogha De Niitlee', (the Tłįchǫ traditional land use area), and consists of the land between the Great Slave Lake and the Great Bear Lake, from the Æedèezhìì (Horn Plateau) in the southwest, and as far northeast as the Coppermine River and Contwoyto Lake (Helm 1961; Tłįchǫ.ca 2011). This boundary was drawn by chief Mowhi during the negotiations of Treaty 11 in 1921.

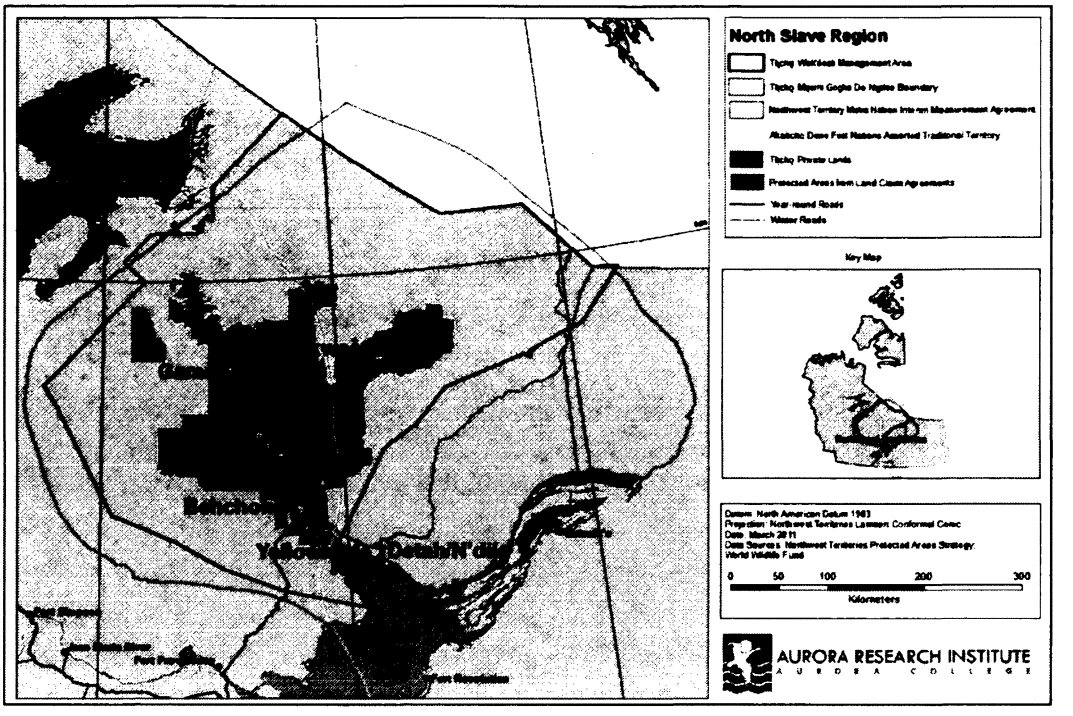

Figure 2: The geographical location of Tłı̨chǫ territory in the Northwest Territories, Canada. Aurora Research Institute 2011.

The Tłı̨chǫ consist of four groups based on territorial distribution of their four communities: the northern group Gameti, the southern group Behchoko, the eastern group Wekweèti, and the Western group Whatì. These groups are not strict divisions, and rather referred to as four families (Personal Communication John. B. Zoe, Feb 2010). Today, the Tłı̨chǫ live mainly in the communities but many Tłı̨chǫ have moved to Yellowknife or other cities for work and education. Historically, Behchoko contained the only trading post in the region, and with the establishment of a hospital and a permanent doctor, the community became the largest settlement in the Tłı̨chǫ region. This community served as the meeting point with Euro-Canadian institutions and culture (Helm 1961). Today, Behchoko is the main community housing the Tłı̨chǫ government buildings, hospital, and high school. Even though people live in the communities, many people spend much time on the land hunting, trapping and fishing. For the Tłı̨chǫ, caribou is the main traditional food. Every fall community hunts are organized

to the barren-land, to bring caribou to the communities. Usually those who go on the trip, bring back caribou meat that they share with the ones who cannot hunt (Personal Communication Tony Rabesca, June 2009). A hunter in Whatì explained, "we can't live without caribou meat. Even if caribou is far we have to go, then we will get it. That's what we are raised with, so we have to get it" (Joseph Moosenose, June 2009). Therefore, caribou is one of the main foci of Tłı̨chǫ life, economy and culture.

Tłı̨chǫ Traditional Economy and the Colonial Legacy

The Denè social organization was characterized by self-sufficient small-scale 'local groups', before the influence of Euro-Canadian institutions. Relying on bush resources, a wide variety of big and small game, fish, plants and berries were harvested. Following the seasonal round, local groups camped along the larger lakes in the winter, where staple foods such as small game and fish were abundant (Asch: 1977, 2004). During summer people congregated in larger numbers in camps on one of the larger lakes in the region. In the camps, labour was organized by gender and age. Men hunted big game and set fishnets, while women were responsible for trapping small game, and making clothes among other things (Helm: 1968, 2000). Resources were distributed evenly, because everyone participated equally and also suffered equally in times of hunger (Asch 2004). During winter, people travelled mostly on foot and with dog sleds. In this way, people travelled after the game and returned only rarely to a central base camp (Asch 2004).

Before contact, the Tłı̨chǫ leadership was fluid and non-permanent, centered on the temporary leadership of successful hunters who had super-natural communication with the game (Helm

1981). During the fur trade, a new type of leader emerged, known as the K'aa'wi, the trading chief. This man was credited with goods from the trading post, which he distributed to the people that followed him. These people provided fur to the chief who used these furs to pay off his debt at the trading post and receive further goods that he distributed to the people (Personal Communication John B. Zoe. March 2010). As the people's trader, he worked as a middleman and spokes-person between the followers and the Hudson's Bay Company (HBC). The first trading post in the region was established in Whatì in 1790, but was closed some years later (Helm 1961). Another Hudson's Bay's trading post was constructed in 1852 at Fort Rae, just south of Behchoko. This post was abandoned in 1904 as the Northern Trading Company established its own post in Behchoko. Significant changes occurred during the fur trade, including the acquisition of new tools and devices and modifications of the seasonal-round to include trips to the trading post. The original economy was still 'total' during this time, because the Denè relied primarily on local resources for survival (Asch 2004). In 1870, the HBC lost its monopoly of the fur trade. Without monopoly, competition increased and improved transportation system evolved through the construction of railways and the introduction of steamboats. Also, starting in the 1890s, money became the new medium of exchange. These external developments changed the Aboriginal economy during the 1900s away from a reliance on local resources to a dependence on both trade goods and local resources. The introduction of the trapline, the dog-teams, and the year-round availability of supplies, led to a more sedentary lifestyle, with the construction of permanent dwellings along traplines or fishing and summer camps at trading posts. However, little change occurred within the internal economy of production and circulation of the local groups (Asch 2004).

During the Second World War, the fur prices dropped while the value of trade goods increased dramatically. Increasingly, people were supported through the introduction of government funding distributed as family allowance and old age pension. When the fur prices did not increase, new measures were needed for both the territorial economy and the Aboriginal economy. As a way of overcoming the economic problems, schools were established and by the 1960s most communities had primary schools located on reserves and within their communities. At that time, people moved into town in order to receive family allowance payments and to live with their children who attended centralized schools. The internal organization and economy was profoundly affected by the introduction of cash benefits, the move from bush camps to towns, and year-round schooling. The seasonal round was deeply affected, "rather than venturing from the bush into town a few times during the season to obtain trade goods, they now travelled from town to the bush a few times a year to obtain bush supplies" (Asch 2004: 187). With the end of the fur trade, the economy shifted into two independent spheres: "one for subsistence, the other for trade goods subsistence" (Asch 2004: 186).

The arrival of Europeans had a large impact on the Tłįchǫ way of life. The contact between the Tłįchǫ and the Euro-Canadian society followed similar patterns as other native peoples of the north. The fur trade, the church and the government were the main points of contact. The fur traders were the only contact the Tłįchǫ had with the Euro-Canadian society until 1859, when an Oblate missionary founded the St. Michael Mission at Fort Rae, near Behchoko. At the beginning of the 20th century, government representatives were permanently located at Behchoko and included the RCMP, an Army signal post, teachers for the government school,

and a game warden. Further contact came through explorers, Euro-Canadian trappers, scientists, prospectors and miners (Helm 1961). From the 1930s, numerous mines have been constructed throughout the Northwest Territories (NWT) and in Tlicho territory. The economy of the Northwest Territories largely relies on the mining industry and the Tłı̨chǫ receives royalties from the mines located on their land and the land they co-manage with the Northwest Territories Government. Many Tłı̨chǫ work in the mining industry, and with a two weeks turnover some can shared this job with a hunting occupation. The mining industry has become a significant part of the Tłı̨chǫ economy, but as I explain in this thesis, the mines, and especially the lengthy ice-roads to the diamond mines on the tundra, heavily impact the land and the animals.

Treaty 11

On August 22nd, 1921, Chief Mofwi signed Treaty 11 on behalf of the Tłı̨chǫ people, which outlined the traditional boundary of the territory, the 'Mowhi Gogha De Niitlee'. In the Treaty, the government asked the people to, "cede, release, surrender and yield up to the Government of the Dominion of Canada, for His Majesty the King and His Successors forever, all their rights, titles and privileges whatsoever to the lands' covered [by the treaty]" (Aboriginal Affairs and Northern Development 2010). In return, the Tłı̨chǫ would keep their rights to hunt, trap and fish throughout the territory, though, "saving and excepting such tracts as may be required or taken up from time to time for settlement, mining, lumbering, trading or other purposes" (Aboriginal Affairs and Northern Development 2010). The Tłı̨chǫ were also promised annual monetary benefits and supplies such as axes, augers, and grinding stones. Additionally, the Treaty stated that it would pay "the salaries to teachers to instruct children

of said Indians in such manner as His Majesty's Government may deem advisable (Aboriginal Affairs and Northern Development 2010).

Tłı̨chǫ Agreement

As the first land, resource and self-government agreement in the NWT, the Tłı̨chǫ Agreement (referred from this point on as the Agreement) was signed by the Tłı̨chǫ, the Government of Canada and the Government of the NWT and came into effect on August 4th 2005. The Agreement established the Tłı̨chǫ government. A Chief and two councillors from each community make up the Tłı̨chǫ government, together with the Grand Chief. Also, the agreement facilitated the establishment of community governments for each Tłı̨chǫ community, which replaced the Indian Acts Band and NWT municipal corporations (Government of the Northwest Territories 2008; Tłı̨chǫ Government 2011).

The significance of the Agreement is that the Tłı̨chǫ has ownership over 39,000 square kilometres of land surrounding the four Tłı̨chǫ communities, including surface and subsurface rights. The agreement guarantees participation in the Wek'eezhii Renewable Resource Board and the Wek'eezhii Land and Water Board, the co-management boards governing the resources within the Tłı̨chǫ traditional lands as outlined by Chief Mofwi in Treaty 11. The Tłı̨chǫ now have their own lawmaking power over all the Tłı̨chǫ citizens, which includes aspects of education, child and family services, income support, social housing and other services (Government of the Northwest Territories 2008; Tłı̨chǫ Government 2011).

Research Community

Initially, I started research in Whatì, Gameti and Wekweèti. Following my first stay in Whatì, I established relationships with numerous members of the community. Also, people in the community government were helpful in facilitating my stay and research. Thus, I choose to focus my research on the Elders in Whatì. The Elders I worked with were: Francis Simpson, Louis Simpson, Benny Jeremick'ca, Charlie Zoe-Nitsiza, Marie Flunkie, Narcisse Bishop, Joseph Moosenose, Louis Wedawin and Dora Nitsiza.

Whatì

The community Whatì, formerly called Lac la Martre after its location besides Marten Lake, lies on the shore of a large bay on the southeast side of the Lake. Across from the community extends a long narrow peninsula, which creates a bay in Marten Lake. Just south of the community, the lake runs into the la Martre River which runs south into Marion Lake and from there further into the Great Slave Lake, working as a connection to the other communities.

Marten Lake runs from northwest to southeast, and contains numerous islands. These islands are used by people in Whatì as fishing camps during the spring and summer. Many people also construct cabins on the islands, which they use all year for fishing or hunting trips, or just as a get-away. The northern side of the lake is recognized as a good area for hunting caribou, and a common destination during the winter months. The forest on the Western side is good

moose hunting territory in the fall. Numerous beaver lodges and muskrat lodges exist throughout the region, which is widely hunted during the spring months.

Today, the community is the only permanent village on the lake, but historically there were many permanent cabins where people lived at various times of the year. On the northern side of the lake, where the Grandin River enters the lake, there was a permanent village site with

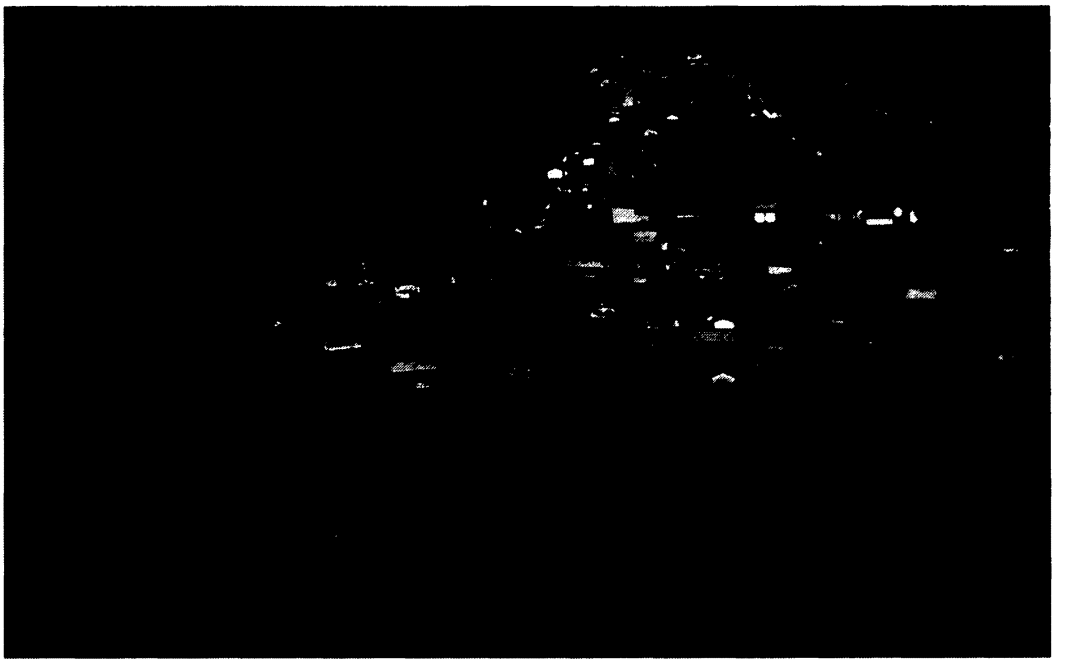

Figure 2: Photo of the Tłı̨chǫ community of Whatì, June 2009. Photo: Petter Jacobsen

several cabins called Egakinlin (Helm 1961). Two of the Elders, who participated in this study, grew up in that village. In 1954, these remaining households moved to the main village at Whatì, mainly because of the construction of a school and the shorter route to the trading

post in Behchoko. The time of the first houses in Whatì is uncertain, but for several decades the two villages at the southern and northern side of the lake coexisted (Helm 1961). Today, a couple of trapper cabins have been constructed in the northern area.

There is limited literature on the history of the Whatì community, as well as the other Tłı̨chǫ communities. The historical description of Whatì is based mostly on the peoples' stories of the area. Dora Nitsiza is an elderly Tłı̨chǫ woman who grew up at Egakinlin but moved to Whatì at a later date. She explained,

> People hardly stayed in the community because they always travelled after the caribou. Here in Whatì they just passed through. They started building cabins here because of the fur trader that was stationed here. Here was a portage. People stopped here when they were on their way to Grandin Lake and towards the Sahtu region. They travelled on the traditional trails, which the people have travelled on for thousands of years. The bush was their store, where they got the food, it was their livelihood and to keep them safe. They had a house here in Whatì but they didn't live here all the time (Dora Nitsiza, February 2010).

The nomadic lifestyle required people to travel to different places throughout the land that provided resources at different times of the year. Dora Nitsiza explained further,

> In 1920s there were only a few houses in Whatì. People stayed from fall until April out on the land hunting, and when it got warmer in the summer they would come back to Whatì. The people would go with the seasons. In the fall they would go with boats from the community, and during winter they would hunt and fish. When spring came, they would go spring-hunting, and when the weather got warmer they went back to the community. Here they would clean up around their houses and make everything ready for the next season (Dora Nitsiza, February 2010).

As permanent occupancy in Whatì does not support the traditional seasonal round, it was not until the construction of a school in Whatì that people started to adopt a more sedentary lifestyle and to live more or less the whole year in the community. The communities of Whatì and Behchoko, which lies further south, are the most populated of the four Tłı̨chǫ communities. Louis Wedawin, a Tłı̨chǫ Elder, explained that these places have the largest secure supply of fish, so if the people could not go, or did not get caribou, they had an alternative resource to live on (Louis Wedawin, February 2010).

Historically and today, the people in Whatì have relied on all the available bush resources within the Mowhi Gogha De Niitlee. The waterways northwest to Kwet'ootî (Grandin Lake) and the land towards the Sahtu region are often used. Also, the waterways connect to regions southeast towards Behchoko. The area southwest of Marten Lake towards Æedèezhìì (Horn Plateau) is also used, but more on an occasional basis, for example for moose hunting. The isolated community is only accessible by vehicle on an ice road open from January until March. Most of the outside resources such as gas, furniture and heavy equipment are transported at this time. During the rest of the year, the community is only accessible by plane.

3. Traditional Knowledge: Recognition of Indigenous Knowledge

In 1925, Bronislaw Malinowski argued in his essay 'Magic, Science and Religion' that it is not the case that only Europeans practice science, while all other societies only use magic or at best religion. Instead Malinowski claims, as presented in Nadasdy (2003) that all people

have and always had their own 'science', which he defined as body of practical empirical knowledge related to their world and that without empirical knowledge of this kind, "a society simply cannot survive in this world" (Nadasdy 2003: 61). The cultural misconception and the label of 'primitive' assigned to Indigenous knowledge are the result of colonialism and the predominance of Judaic-Christian religious tradition within the colonizing movement. Because of the deep rooted preconceptions stemming from colonialism it has been difficult to realize that people from 'primitive' societies' can know something or "even know more about a subject within [for example, the] field of natural science...than do scientists" (Berkes 1999: 12). Indigenous peoples have argued for the validity of their knowledge of the land. Arising from these debates, new schools of thought argue that, "because these [Indigenous] alternate ways of knowing are just as rigorous and empirically based as is [Western] science, they can and should be integrated with science and given equal weight in making management and policy decisions" (Nadasdy 2003: 61). Unfortunately, misconceptions about Indigenous culture and the validity of their worldview are still present and predominant in the field of natural resource management. Berkes describes that there is an "intolerance of many scientists toward knowledge and insights that originate outside institutionalized Western science" (Berkes 1999: 12). Arising from these debates are the thoughts that "Western scientific methodology is merely one way, and not the only way, to acquire knowledge" (Berkes 1999: 12).

Traditional Knowledge

During the end of the last century Indigenous peoples, anthropologists, social scientists and ethno-botanists recognized and acknowledged the accuracy of non-Western people's

classification and understanding of the "working of eco-systems" in ways that extend far beyond what is called 'descriptive biology' in Western science (Freeman 1992). The concept of Traditional Knowledge is, however, interpreted in various ways. Many Western scientists claim Traditional Knowledge to be knowledge of animals and plants and their interactions held by Aboriginal peoples, and define Traditional Knowledge as "the systems of knowledge gained by experience, observation and analysis of natural events that is transmitted among members of a community" (Huntington 1998: 66, Spak 2005: 234). This interpretation puts Traditional Knowledge into a system of knowledge comparable and parallel to Western science.

Other First Nations peoples and scholars use the Traditional Knowledge concept with an interpretation that differs considerably from the one above and have argued on behalf of the validity of Traditional Knowledge as a system of knowledge based on an entire worldview. Traditional Knowledge looks at the complex whole from a different epistemological view than Western science; therefore places little emphasis on individual parts in isolation from their interactive milieu. Trying to understand pieces in isolation from what created them makes little sense (Castellano 2004). Traditional Knowledge interprets the environment in a cyclical process consisting of multidimensional cycles, in which all factors impact others throughout the system as a whole, rather than interpreting the environment in a linear process (Freeman 1992). Traditional Knowledge is said to be a process of personal learning based on experience and transmitted on a personal level. This knowledge is described as one's perspective, instead of something that is universally true. Because it is personal, little emphasis is placed on who is right or wrong or what is true, but rather whose perspective.

In Brant M. Castellano's (2000) discussion of the characteristics of Traditional Knowledge, she refers to James Waldram (1986) who explains Traditional Knowledge as based on two interrelated types of knowledge. The first is, "empirical knowledge" which is acquired through the detailed observation by persons over time and "this information processing forms a constant loop in which new information is interpreted in the context of the existing information, and revisions to the state of knowledge concerning the phenomenon are made when necessary" (Castellano 2000: 23). This knowledge is consistently revised because different perspectives come together from various angles over extended periods of time (Castellano 2000). The second type of knowledge Castellano describes is "revealed knowledge" which "is acquired through dreams, visions, and intuitions that are understood to be spiritual in origin" (Castellano 2000: 24). But this form of knowledge is not only used for spiritual or psychological needs. It is the combination of these knowledges that makes Traditional Knowledge holistic and serves all forms of a society's needs (Castellano 2000).

Traditional Knowledge is transmitted orally. This means that knowledge is adaptive to new circumstances and is not locked in place or time. Knowledge is communicated on a personal level, and shared when the teacher considers the receiver to be ready to learn and to use this knowledge responsibly. Things are said, or not said, in ways that serves more purposes than solely transmitting information, because oral knowledge also includes cultural ways of communicating the information. Oral knowledge includes ways of behaving and learning together with sharing information. As relationships characterize the context of communication, its objective then is not solely explaining effectively information between

two persons, but to maintain a harmonious relationship that maintains open communication between the persons (Castellano 2004).

Traditional Knowledge is often shared through stories. As stories entertain, stories also inform knowledge and portray models of behaviour, desired or undesired (Castellano 2000). As a teaching tool, stories are not an intrusive form of teaching; the listener can choose which lessons to accept or ignore. Stories are thus a personal way of learning as the listener can apply the instructions to one's life in the manner suitable at the time (Castellano 2004). Stories are therefore said to be "good to think with" (Smith 1998: 421).

I consider stories to entail the connection of the people to places, thus creating and maintaining the people's identity of belonging to a place. The knowledge shared in stories informs the community of the interaction with animals and places while simultaneously creating a link to the spiritual dimension that lives in the places portrayed by these stories. Consequently, stories contain the physical description of the environment and its spiritual existence and the people's historical connection to the area that extends into contemporary and future life, as the stories are retold to younger generations. Stories build a social 'architecture' of cultural places in the natural environment, because the stories depict old camps, villages, events, and spiritual and mythical living persons and beings that have existed or do exist in the particular features throughout the land. The 'architecture' of stories, builds the land around the people into a web of interaction between the people and the environment.

Based on my experience with the Tłı̨chǫ, I share Winona LaDuke's (1994) definition of Traditional Knowledge, as quoted in Stella Spak (2005), "the culturally and spiritually based way in which Indigenous people relate to their eco-systems" (234). This definition includes more than just the physical, technical, Western view of Traditional Knowledge. This interpretation emphasizes the interrelationship between the physical and the spiritual in Traditional Knowledge. This worldview emphasizes the importance of respect between humans and animals for a sustainable relationship. In researching Traditional Knowledge, I have relied on the personal accounts of Tłı̨chǫ Elders as the main source of information. The nature of the Tłı̨chǫ Elders' knowledge aligns significantly with this definition.

4. Summary

Traditionally, the Tłı̨chǫ are characterized as a hunting and gathering society. Even though the Tłı̨chǫ are not solely reliant on a hunting and gathering economy today, hunting and gathering on their land is essential to their identity and culture. In the context of Tłı̨chǫ land, I spent approximately six months over the two years of my graduate studies conducting research through interviews and participant-observation. This thesis grew out of the process of conducting research with the Tłı̨chǫ Elders. This thesis will investigate Tłı̨chǫ Elders knowledge of climate change and the impacts on caribou hunting. Documenting Traditional Knowledge of climate change and impacts on caribou hunting has produced insights into the changing environment of the north, and how the Tłı̨chǫ hunters adapt to these changes. This thesis is important for the Tłı̨chǫ government in regards to future policies, and at the same time has implications for future Traditional Knowledge research projects.

Chapter Two:

Literature Analysis of Sub-arctic Hunting Societies' Perceptions of the Environment and Traditional Knowledge Research

1. Introduction

In this chapter, I analyze literature on the ontology of some sub-arctic hunting societies and various Traditional Knowledge research projects on climate change. This analysis highlights a contradiction between the focus of these Traditional Knowledge research projects and the sub-arctic hunting societies' ontology. The Traditional Knowledge research projects, which I analyze, rely on the Western perception of the environment and therefore document only the ecological components of Traditional Knowledge. As the literature on the ontology of sub-arctic hunting societies and my research findings show, for sub-arctic hunting societies the environment and climate change is a combination of ecological and social aspects. Their perception of the natural environment includes the integration of cultural, ecological and spiritual aspects and is therefore broader than the Western perception. By emphasizing this contradiction, I argue that current research methodologies inadequately document the Traditional Knowledge of sub-arctic hunting societies. Instead, Traditional Knowledge research needs to be based on an Indigenous perception of the environment.

Some of the literature (Huntington 1998, 2000) regarding research with Indigenous communities does not adequately present methodology for researching, understanding, and presenting Indigenous Elders' knowledge. Rane Willerslev (2007) states a similar concern of,

"the inadequacy of the theoretical tool kit available to the anthropologist who want to take seriously the attitudes and beliefs that Indigenous peoples have" (181). Underlying my critique of the research methodology is the notion that a methodology of the Traditional Knowledge researcher influences the outcome of the research (Kovach 2009).

Traditional Knowledge is often communicated through what many refer to as stories. However, most Indigenous peoples state that these are not simply 'stories', but they are actually true (Nadasdy 2003). As these stories portray explanations for how and why various events happened, especially of mythical or spiritual character, a researcher can interpret these 'stories' as either the belief or the accurate knowledge of how and why various events happened. The underlying debate here is over non- rational or rational knowledge, or in other terms, cultural beliefs or empirical knowledge.

Debating beliefs and knowledge, Goulet (1987, 1994) describes a Denè person with religious experiences "not as a believer, but someone who knows" (1994: 114). Goulet further explains that "this view is an expression of their belief that all true knowledge, both knowledge that we would consider mundane and knowledge that we would consider religious, is derived directly from personal experience" (1994: 114). Also, David M. Smith writes, "the Denè 'religionist' is not so much a believer as a knower. One knows by virtue of having had the religious experience" (1998: 422). Thus, "cultural beliefs" of spiritual or mythical accounts are not, among the Denè, seen as the beliefs of how and why events happened, but rather an account told by someone who knows.

Nadasdy (2003) debates the distinction between rational and non-rational knowledge. Extending on Malinowski's concerns over how people can 'switch' between different types of thoughts, Nadasdy elaborates:

> how is it possible for them to think rationally and empirically about gardening in one moment and non-rational about gardening magic in the next? The answer is simply that they do not. Certainly, Kluane people do not switch between their empirical knowledge of moose population and their non-empirical understandings of moose as other-than-human persons. The two are inseparable for them, each informing the other and imbuing it with meaning (2003: 112).

All knowledge is culturally situated. Within most social studies it is usually perceived that humans do not experience the world directly but rather indirectly through our cultural understanding. Consequently, no singular, universal reality exists but rather multiple cultural perceptions exist with their own unique set of understandings. Cultural understandings are thus relative, making comparison of true and false statements meaningless (David and Young 1998; Willerslev 2007). The distinction between rational and non-rational knowledge, then seems to be a cultural invention. But as most Traditional Knowledge research is currently done within a Western cultural understanding, the categorization of knowledge into the categories of cultural beliefs or empirical knowledge is based on a Western perspective.

By believing that cross-cultural communication is possible, I am of the understanding that these categories are not universal and thus not real. I see the need to critique the ways of acquiring knowledge from other people. Through the recognition that all aspects of the people's knowledge should be regarded as valid, and not only parts of it, the researcher can present Traditional Knowledge that can actually suggest alternative ways of interpreting our environment to be able to mitigate problems arising from human interaction with nature. As

sub-arctic Indigenous peoples learn about the land in very different ways than Euro-North American, so should Euro-North American researchers learn about the Indigenous knowledge in very different ways.

2. Sub-Arctic Indigenous Societies' Perceptions of the Environment

One of the main pillars of Indigenous cultures is the close connection to the natural environment, with human beings as an integral part of the ecosystem. Because of their close interaction with animals and natural elements, these cultures know that each animal does not just act according to its instincts, but that each animal has a personality, intelligence and acts according to its own wants. Animals are thus known to be like persons. Nadasdy (2003, 2007) refers to this concept as "other-than-human-persons" and Sharp (2001) refers to this as "animal/persons". To further explain this concept Robin Ridington (1998) states, "'person' includes sentient animals, animal masters, and forces of nature" (105). By not making a rigid distinction between humans and animals, 'persons' are thus not synonymous with only humans, but animals are persons one can learn from and communicate with. Ridington explains that, "northern natives negotiate social relations in the same way that they negotiate relations with animals and natural forces" (1998: 105); based on this description, the connection between human and animal "must thus be understood primarily as *social* relations" (Nadasdy 2003: 84). Here "social relations" constitutes a reciprocal relationship in which the animal person and the hunter have obligations to each other. It is important to realize that there are no fixed boundaries between humans and the supernatural, between humans and nature, and between nature and the supernatural. Therefore, the physical differences between humans and animals and elements are only superficial, and transformations between entities are possible (Nadasdy 2003). But it is not only animals that constitute persons; natural elements, such as the wind or thunder, are also "persons" with

whom one can engage in relationship and communication (Brody 1981; Feit 2004; Nadasdy 2003; Ridington 1998; Tanner 1979). This constitutes a holistic worldview, where all natural elements and animals are part of a greater whole in which everything, including humans, is interconnected.

The hunting economy is the center of life in subarctic societies. To describe the significance of hunting among the Kluane, a sub-arctic Indigenous nation, Nadasdy (2003) states, "I am referring not simply to the shooting of animals but also to the entire constellation of values, beliefs, practices, and social relations that surround and give meaning to Kluane peoples' subsistence strategies and their relationship to animals" (66). Thus, as hunting is one of the main activities in sub-arctic Indigenous life, the meaning of this activity permeates most aspects of society.

Several scholars have written about sub-arctic Indigenous peoples and their relationship with the land. In Ridington's (1998) description of Franck Speck's (1935) work with the Naskapi, he states that the Naskapi consider the hunt to be a "holy occupation". During a hunt they experience a powerful transformation in their interaction with animals. Part of the transformation comes before the actual killing, in the "hunt-dream". Speck states that the "hunt-dream" is the main channel in which Naskapi hunters communicate with the invisible world. Dreaming, for the Naskapi, is a process of acquiring knowledge. The meaning of dreams has a significant part of the Athapaskan life. Nadasdy states that the "dream experience are the basis for some of the most powerful forms of true knowledge among

northern Athapaskans" (2003: 95). The purpose and importance of dreaming will be shown in the descriptions below.

In Ridington's (1998) description of Irving Hallowell's (1955) work with the Manitoba Ojibwa, he builds on Speck's observations and states, "success in hunting depends as much upon a man's satisfactory relations with the superhuman 'master' of the species of games and furbearing animals, as upon his technical skills as hunter and trapper" (1998: 102). Furthermore, in Catherine McClellan and Glenda Denniston's (1981) description about northern nomadic hunters' technology, they state that,

> The successful hunter had to know the landscape, the habits of his prey and the probable course of weather. Equally essential to his mind was the knowledge of how to behave in a personalized universe in which animal spirits were thought to be more powerful than humans (377).

Knowing how to behave properly towards animals is as large a part of hunting as their technology. This statement emphasizes the knowledge of the northern Indigenous hunter that "their means of production are mental as well as material" (Ridington 1998: 105). Proper behaviour and communication with the beings of the land are a large part of securing a livelihood in the northern environment. Killing is then a smaller part of the relationship between the two parts: hunter and the animal person. Rather, the act of securing a livelihood in the sub-arctic consists of a whole constellation of activities that encompasses Indigenous societies. In this section, I will look closely at specific characteristics within various sub-arctic hunting cultures.

Animals as Persons

The sub-arctic cultures of the Athabaskan and Algonquin share cultural commonalities (Ridington 1998). The Cree interpret the world around them, as being inhabited by spirits, a worldview in which objects, animals and spirits are conceived of as "persons". The Cree recognize that all these "persons" are active and are an important part of the world (Feit 2004). Therefore, their cosmology is "not divided into a material or natural domain and a human or social domain, (instead) all parts participate in a single personalised social universe" (Feit 1991: 236).

As a hunting people, the Cree live and perceive the world of hunting in quite a different way compared to the general Euro-Canadian perception. For the Cree a good hunter has "power", a connection between the hunter and the spirits of the land. This connection implies a relationship between the hunter, the animal spirit and with the Creator. A relationship based on reciprocal obligations, in which the animal give themselves to the hunter and in return the hunter gives respect in the proper cultural manner. Before going hunting, a hunter might receive knowledge about an animal in a dream or a thought. The hunter follows the event that occurred in the dream and goes out to meet the animal. As this occurs, it is an indication that the hunter has power. Power in this sense means that a thought has come true, and that there is 'friendship' between the animal and the hunter. Power is thus the relationship of thoughts between beings, and the action of this thought. The basis of hunting, for the Cree, does not mean to encounter animals by chance, but by receiving it. Hunting is not to only rely on the intention and work of the hunter, but also the action and intention of the animal, and the animal spirit. Because it is a reciprocal relationship, in which the animals are given to the

hunter, the hunter gives in return certain behaviour and respect to the animal, as part of his obligations. Having received a gift the hunters are obligated to respect this, by giving their own gifts. This means that the hunter gives the food from the hunt to the family, neighbours and to the rest of the community. The gifts are not only for human consumption; the hunters also place a piece of meat at the first meal of the day into the fire, so the smoke will bring the gifts to the spirits as a sign of respect and appreciation. These gifts are part of the obligations and of the reciprocal relationship, thus by giving the hunter anticipates receiving gifts at another time (Feit 1991, 2004; Tanner 1979).

For the Cree there is more in the world than animals and humans that controls actions. In the Cree's cosmology, all animals are like persons because the animals have intelligence, personality and they act according to their own choices. But not only animals are like persons, all active phenomena as water, wind and God are also like persons and act according to their own choices. For the Cree, the animals do not only give themselves, but are provided by the Creator or by the "wind-person". The wind decides which animals they can hunt and which they cannot. The prevailing wind is responsible for the seasonal change to which the animals respond. For example, when the warmer wind comes, a great amount of ducks and geese also arrive and when the warm wind leaves, so do the ducks and geese. Another example is when the colder wind comes, the bear hibernates and is docile which makes him easier to hunt. In these and many other ways, the wind is the one who decides what to hunt and the success of the hunt. But not only is the wind responsible, the Creator is also involved. In fact, he is the most responsible, because he decides all that happens on this earth. Therefore, the Cree see themselves, and other humans, as participating in a "hierarchy of power leading from God to

his wind persons, to masters of the animals, to various spirits, to humans, and to various animals" (Feit 1991: 236). Hunting is not only responsive to the action between the hunter and the animal, but it is also dependent on an integrated chain of leaders and helpers, acting together to give and receive animals (Feit 2004, Tanner 1979).

Acquisition of Knowledge

The Innu hunters of Labrador use drumming to acquire knowledge of which animal to hunt. The practice of drumming is an important and essential part of the hunting process, because "the drum broach the spirit world and facilitate access to the spirit masters of the animals" (Leacock 1994:206), which gives them knowledge of the animals and hunting. Because "for hunters, whose lives ultimately depend on their ability to find and kill animals, trances and dreams are maps and messages from the spirit world, they serve to guide both hunter and shaman through times of crisis and are integral to the hunter's success" (Leacock 1994:206).

The Innu, and other hunting societies, use these practices to acquire knowledge of their natural and spiritual world; these practices are a reliable and a legitimate way of acquiring knowledge. Because these people recognize the world being inhabited by natural and spiritual forces, they explain the actions in the world according to a personalistic cosmology. This is an understanding of how the world works, that does not make or have boundaries between humans and animals, men and women or between natural and supernatural. This is a worldview that makes it possible to establish relationships and being in touch with the very things one depends on. Such a connection has the ability to secure the activities for the hunter and his family, a connection that is essential for the success of the hunter (Brody 2001; Feit

2004). Innu recognize the importance of collaboration with the spirits of the animals to acquire the knowledge that will lead to a successful hunt.

Interconnection

East of Tłı̨chǫ territory, along the eastern coast of the Great Slave Lake is the homeland of the Denesulinè. With a similar lifestyle to the Tłı̨chǫ, the Denesulinè have an elaborate ontology, well documented by scholars such as Smith (1998) and Sharp (2001). In his exploration into the ontology of male Denesulinè who pursue an active life in the bush, Smith (1998) states that,

> The most fundamental assumption of bush sensibility is that all beings, human and nonhuman, are inextricably engaged in a complex communicative interrelationship. Success in life demands actively maintaining harmony in these interrelationships, especially among human beings, and among human and animal persons. Maintaining harmony requires empirical, experiential holistic knowledge. But it means having supraempirically derived knowledge - inkoze- that, while never separated by the Chipewyan from pragmatic everyday knowledge, comes as a gift from animal persons, most commonly in dreams (412).

Smith emphasizes the harmony necessary to maintain a successful relationship, based on a holistic form of knowledge, including knowledge received in dreams from animals. Being in a "communicative interrelationship" (1998: 420) entails the ability to communicate with specific animals. Success in hunting, fishing or trapping usually occurs through knowledge which is given from animals and received through dreams. The Denesulinè refer to this as *inkoze*, or medicine-power, and "is the key to understand the communicative interconnectedness of reality. *Inkoze* as a metaphysical concept provides answers to the most basic and important questions concerning why things go well and why they go wrong" (Smith

1998: 420). Furthermore, the Denesulinè have a monistic ontology, as there is no separation of things, there is no dualism. Smith writes that "there are no sacred-profane, natural-supernatural, or material-spiritual dualism" (1998: 423) and states that there is no word for religion, meaning that there is no separate reality because everything has a sacred aspect. Thus, for the Denesulinè all aspects of life are infused with spiritual meaning, because there exists no other reality.

Sharp (2001) describes the ontology of the Denesulinè by explaining two different interpretations, the Western and the Denesulinè, accounts of an unsuccessful hunt. Two Denesulinè hunters tried to shoot a loon. But the hunters were not able to shot and kill it even though the loon was within close range of the experienced hunters. In the common Western explanation, Sharp (2001) writes, the loon is excluded of any personal active participation, and perceived as a passive agent acting in mechanical manner. On the other hand, the Denesulinè perceives the loon as,

> An active participant in the process. The reason for their failure to kill the loon is that the loon chose not to die for them, an explanation that is external to the actor and that lies in the nature of the relationships existing between the actors and the loon. Since, in Denè thought, all animal/persons *know* more than humans and are more powerful than humans, for a human to kill an animal requires the animal's consent (46).

The inability of two Denesulinè men to kill the loon after numerous shots, suggests that the loon is a being of *inkoze*. Sharp explains this complex concept shortly as "an encounter with a spirit" (2001: 22). As the loon was a spirit in the form of a bird, Sharp states, that for the Denè, animals have a dual existence that exist simultaneously. Animals are both the physical bodies that the Denè rely on for their survival, and as supernatural beings that are a part of *inkoze*, and it is in this realm of existence that they are 'true'. This dual

understanding of animals is the root of Denesulinè culture and dominates their knowledge of and interaction with animals (Sharp 2001). Thus, of concern for the Denè is the tie between the physical form and the spiritual aspect of the animal, because what happens to the animal in the physical form echoes in the spiritual realm. As hunting is one of the ways the Denesulinè participate within *inkoze*, it is not offensive for someone to kill an animal, but it is the reason why someone kills an animal that is important. The way a hunter kills an animal reflects how the hunter feels for the animal. Thus, if an animal is disrespectfully killed in the physical form, as being beaten to death, this will have implications in the spiritual realm, and other animals will be offended (Sharp 2001). Expanding on the Denesulinè meaning of the encounter Sharp (2001) writes,

> Since animals are more powerful beings than are humans, the death of an animal at the hands of a hunter forms a sacrificial paradigm in which a being of superior power gives itself to the Denè in order to bind the Chipewyan to the realm of inkoze. Killing an animal that sacrifices itself to the Denè maintains the Denè conjunction with the realm of inkoze. As long as the Denè hunt, their separation from inkoze is not final (47).

Sharp further explains that the thought of duality, is not necessarily a Denesulinè concept, but sits within the English language. The grammar within the language separates natural and supernatural "as modes of being, experience and causality" (Sharp 2001: 66), and this is the core difference between Western and Denè explanations of the hunt.

Reciprocity and Obligation

The Kluane First Nation, situated in the southwest Yukon, share many of the characteristics of other sub-arctic societies described above. As hunting is one of the main activities for the Kluane, the people are engaged in a web of social relations with the animals (Nadasdy 2003,

2007). The character of this relationship is based on reciprocity, "by accepting the gifts animals make of their own bodies, hunters incur a spiritual debt that they must repay through the observance of a whole series of different ritual attitudes and practices" (Nadasdy 2007: 27). Hunters risk offending the animal, if they do not follow the obligations set out in the relationship. An offended animal can make a hunter lose the luck in hunting, by not making themselves available to the hunter in the future, or cause other negative consequences as sickness, death or accidents. Similar to other sub-arctic hunting societies, the base of this relationship is the understanding that animals are, as Nadasdy writes, "other-than-human persons" (2003: 94).

Conclusion of Sub-Arctic Indigenous Societies' Perceptions of the Environment

Compared to most Euro-Canadian cultures, Indigenous peoples of the sub-arctic interact with and understand their environment in very different ways. Here, I have illustrated that areas labelled 'spiritual' or 'beliefs' in the Western vocabulary do not constitute a separate category for the sub-arctic hunting societies, or other Indigenous cultures in general. As Smith (1998) states there is no other reality, because all aspects of life are part of the sacred, one cannot separate empirical knowledge and spiritual beliefs. In agreement, Sharp states that "animals are neither singular or plural, biological or spiritual, but unified beings participating with the Denè in the enduring relationship of inkoze" (2001: 70). The people's Traditional Knowledge of the land is holistic, as Castellano explains, a combination of "empirical knowledge" of the land and "revealed knowledge" acquired through spirituality (2000: 23).

This section does not include a similar description of the Tłįchǫ, because such published accounts do not exist. Instead I have tried to describe the similarities of the sub-arctic hunting societies, which the Tłįchǫ are a part. By illuminating the realities of these Indigenous societies, I have shown the interconnection of beliefs, knowledge and hunting within these cultures, to show how all aspects of Traditional Knowledge are interconnected and depend on each other to the extent that the one cannot be separated from the other. As Pierotti and Wildcat (2000) write, "in TEK, the Western dichotomies of natural vs. supernatural, physical vs. metaphysical, sacred and profane, nature vs. nurture become largely meaningless" (2000: 1339); therefore, "to native peoples, ecology and religion are inseparable, and thus religion serves to code ecological knowledge" (Pierotti and Wildcat 2000: 1339). I have described the active roles and functions that sub-arctic hunting societies play within the ecosystem. Subseqyently, human behaviour/ misbehaviour shapes aspects of the environment. The Indigenous perception of the environment is much broader and includes social, ecological and spiritual aspects, compared to the Western perception of the environment.

3. Traditional Knowledge Research Projects on Climate change

In this section, I analyze projects in the Canadian north that used Traditional Knowledge to understand climate change. My purpose is to highlight the contradiction between the focus of these projects and the ontology of the Indigenous peoples. The projects I review focus on specific components of Traditional Knowledge that align with a Western perception of the natural environment, while the ontology of sub-arctic Indigenous societies is broader and includes cultural, ecological and spiritual aspects. I analyze these research projects by looking at their objectives and ability to include Indigenous perception of the environment.

For Traditional Knowledge to be considered useful in climate change research, it needs to fit into Western scientific categories (Nadasdy 2003). Components of the Traditional Knowledge that align with Western perception of the environment are compartmentalized and distilled out to fit the Western scientific categories of climate change. Those aspects of Traditional Knowledge which contradict the Western perception of the environment, or can provide alternative descriptions of environmental functions are considered useless and irrelevant (Nadasdy 1999, 2007) and therefore not included in climate change research. An example of research which compartmentalizes Traditional Knowledge into Western defined categories is Dyanna Riedlinger's (2001) work with the Inuit community of Sachs Harbour. Riedlinger's objective was to document Traditional Knowledge of climate change and to understand how the changes are affecting the community's seasonal subsistence activities. People in the community reported generally warmer weather, and more intense and unpredictable changes, as earlier springs, faster snowmelt and changing sea ice conditions. These changes affect subsistence activities as people's ability to travel on land and sea ice to access various resources and their hunting and fishing camps was hindered. Responding to these changes the community now modifies the timing, location and method of harvest activity, as well as the species harvested (Riedlinger 2001).

Riedlinger (2001) treated Traditional Knowledge as an intellectual product separable from its social and cultural context which gives it meaning. Rather than providing Inuit knowledge of the working of climate change, Riedlinger selects areas of the Traditional Knowledge that constitutes 'valid' knowledge of how the environment works from a Western science

perspective. In this process, Riedlinger converts the Traditional Knowledge into a new currency that relies on the Western perception of the functioning of the ecosystem. Anthropologists and Indigenous peoples have extensively argued that knowledge is not a product, but rather embedded in the wider cultural context of social relations, values and practices, which gives it relevant significance. This process consequently converts Traditional Knowledge into an acceptable form of knowledge in Western institutional and governance settings, because the new form aligns with Western defined categories (Nadasdy 1999, 2003; Stevenson 2006).

Another example of such a biased research focus is the Tuktu and Nokag Project (Thorpe et al. 2002). This community-driven research used questionnaire and semi-directed interviews in four communities in the Kitikmeot region in Nunavut to document Inuit knowledge about the Bathurst herd and their calving grounds (Thorpe et al. 2002). The results state that the Kitikmeot Inuit experience a trend of warming temperature, which influence caribou migration, health, and population levels. Also, the participants reported the presence of new species in the regions and change in the abundance and movement of various species. The increased temperatures influenced the time and manner the ice melts. The earlier ice melt influenced caribou migration, as caribou had to find new places to cross, or were not able to cross at all. The increased temperatures caused later freeze-up in the fall, from around September to November. Kitikmeot Inuit also experience difficulties predicting the weather in the way they used to.

Traditional Knowledge research, such as Natasha Thorpe et al. (2002) and Riedlinger (2001), is conducted to get a different view of the environment and climate change based on personal and qualitative perspectives. Even though these projects document a different view of the environment, from an Indigenous perspective, the focus is particularly on components that constitute environment and climate change in the Western construct. As I explained in the first section of this chapter, the sub-arctic Indigenous perceptions and knowledge of the environment are based on different aspects than these Traditional Knowledge research projects highlight. In these projects there are few references to social, cultural, mythical, spiritual or any other form of knowledge based on Indigenous understanding.

By distilling out Inuit knowledge of the environment which differs from the Western perception of the environment, the Traditional Knowledge is converted into a form that becomes useable for Western standards. The process of knowledge-integration takes for granted and reproduces the existing power relations between Indigenous peoples and the state "by assuming that Traditional Knowledge is a similar form of data to be incorporated into already existing management bureaucracies and acted upon by scientist and resource managers" (Nadasdy 2003: 144). Instead, Traditional Knowledge research should conform to the Indigenous categories of the environment. This process would challenge the existing unequal power relations between Indigenous peoples and the state. By proposing alternative functions of the environment, Traditional Knowledge research could present different actions in response to climate change or other environmental issues, rather than conforming to the Western perception of the environment and associate solutions. Also, presenting and applying environmental knowledge based on Indigenous perceptions, would bring resource

management into a form that does not solely rely on Western concepts of the natural environment.

Dyanna Riedlinger and Fikret Berkes (2001) look at ways to use Traditional Knowledge, by emphasizing areas where Traditional Knowledge can contribute to scientific investigations and increase the understanding of climate change. Riedlinger and Berkes (2001) state that Inuit experiences with climate change can provide local climate history, which, in turn, can be used to formulate future scientific research hypotheses. Also, local Inuit experiences can provide information on communities' adaptations to the impacts of climate change, and long-term monitoring of climate change. They state that these contributions from Inuit knowledge can bridge the gap between Western science and Traditional Knowledge.

Such process of distilling out pieces of Inuit knowledge to bridge the gap between science and Traditional Knowledge, as Riedlinger and Berkes suggest, would reinforce the existing power structures, because only the Inuit knowledge that conform with Western scientific standards is relied upon. By separating the Inuit knowledge from the cultural context and ontological functions, such procedures delegitimize aspects of Inuit knowledge that include alternative cultural knowledge of the functioning of the environment. Instead the parts of the Inuit knowledge distilled out are legitimized as valid environmental knowledge, because they align with the dominant form of knowledge that can be used in environmental management.

As the historical, mythical and spiritual aspects of the environment are of significant importance to northern Indigenous peoples, and generally to other Indigenous peoples, I question why it receives no attention in these research projects, and also in many other Traditional Knowledge research projects (Fergusson and Messier 1996; Fox 2002; Huntington 2000). Although, these aspects of the Indigenous world receive a lot of attention in anthropological and Indigenous literature, they do not influence the objectives or methods of many contemporary Traditional Knowledge projects. Even though Traditional Knowledge research is supposed to represent the perspective of the Indigenous peoples, there is no reference to aspects of Traditional Knowledge which differ from acceptable Western perception of the environment.

Anne Kendrick et al. (2005) is an example of a study where the researchers refer to other aspects of Traditional Knowledge, but in the process the researchers convert such alternative claims of the function of the natural environment into a form acceptable to a Western audience. Documenting the Traditional Knowledge of Elders and hunters in Lutselke, NWT, regarding variations in caribou movement in the past and present, Kendrick et al. mentions the significance of oral narratives and legends to explain the temporal disappearance of caribou. Under the heading 'Cultural Beliefs' Kendrick (et al.) refers to the Lutselke explanation that caribou "disappear underground or underwater" (2005: 181). Instead of accepting the Elders statement as valid knowledge, Kendrick et al. (2005) see the necessity to provide a symbolic clarification and replace the Lutselke Elders statements with her own. Kendrick et al. (2005) state that narratives, instead of having the role to explain mechanisms that drive natural systems, rather work as reminders that nature changes over time. Also, rather than claiming

that this knowledge is gained from legitimate interaction with the animals, it is referred to as cultural beliefs and "narratives and legends". By providing such symbolic clarification, rather than taking the informants literally, Kendrick et al.'s (2005) statements separate legitimate and rational knowledge from 'invalid' knowledge within the Lutselke Traditional Knowledge. Such separation works to delegitimize these aspects of Traditional Knowledge while legitimizes the knowledge that aligns with Western science (Nadasdy 2007). At the same time, claiming that what the Elders consider real is in fact a metaphor, with the function to remind us that nature changes over time, is not only arrogant, but more importantly, works to undermine the relationship between Indigenous communities and researchers.

I link the critique of these research projects to my own research. When conducting research with the Tłįchǫ I considered it important to accept and respect all of the statements from the Elders. Furthermore, it was important to build my understanding on their cultural categories of the environment which did not separate between society, nature and religion, and to write and present their knowledge likewise. By doing this, I tried not to convert their knowledge into categories which align with the Western categories of what constitute valid environmental functions. Instead, I included all of their statements to create a thesis which incorporated knowledge of climate change within their own cultural understanding of the functioning of the environment.

4. Conclusion

In this chapter, I highlighted the contradiction between the complex ontology of sub-arctic hunting societies and the positivist focus of some Traditional Knowledge research projects directed from a scientific perspective. I have shown that the Indigenous perception of the environment is broader and includes cultural, ecological and spiritual aspects, while the Traditional Knowledge research projects rely on the Western perception of the environment and therefore only document ecological components of Traditional Knowledge. I argue that the methodology for conducting Traditional Knowledge research needs to include other aspects of Traditional Knowledge: the historical and spiritual aspects of the Indigenous perception of the environment.

This contradiction became apparent when I experienced difficulties applying recommended research methods (Huntington 1999, 2000) while conducting research with the Tłı̨chǫ. Most of the available literature on the methodology for researching Traditional Knowledge is premised on a Western approach. Thus, as the methodology of the researcher influences the outcome of the research (Kovach 2009) it is apparent that the outcome of Traditional Knowledge is based on a Western perception of the environment. This occurs due to the lack of recognition of the validity of some aspects of Traditional Knowledge that differs radically from the worldview of the researchers themselves (Nadasdy 2003, 2007). In order for Traditional Knowledge research to reflect the nature of that knowledge I agree with Margaret Kovach's (2009) perspective that, "we are now at a point where it is not only Indigenous knowledges themselves that require attention, but the processes by which Indigenous knowledges are generated" (13).

To understand the complex ontology of northern Indigenous societies one has to consider the amount of time these people have lived with the land. Since time immemorial, their ancestors have studied every detail of the land, in order to know where and how to obtain their needed resources at any time of the year. These understandings of the relationship with the land, do not only apply to the sub-arctic, but are generally similar for most Indigenous peoples. In describing the relationship between the Aboriginals in Australia and their land, Wade Davis (2009) states,

> Imagine for a moment if all the genius and intellect of all the generations that have come before you had been concentrated on a single set of tasks, focused exclusively on knowing a particular piece of ground, not only the plants and animals but every ecological, climatic, geographic detail, the pulse of every sentient creature, the rhythm of every breath of wind, the patterns of every season. This was the norm in Aboriginal Australia. What linked the clan territories was not the physical movement of peoples but rather the strength of a common idea, a subtle but universal philosophy, a way of thinking. This was the Dreaming (157).

Connecting the historical occupancy of the people with the land, Davis illustrates how their philosophy links the people to the land. Thus, the way one thinks about one's existence within the land manifest one's connection.

Climate change is an important issue, thus, we need a better understanding of climate change and what we as humans can and should do to alter or adapt to this change. But all such research should not occur within the confined space of Western ontology. Rather, there is a need to look to other cultural understandings of the human role in the ecosystem to provide insights and solutions to the current problems. Hence, we have to expand our research methodology to expand our perceptions of Indigenous ontology.

"What if we were delighted instead of threatened by what we don't, and possibly can't, know?" (Pinder 1991: 14).

Chapter Three: Research Methodology

1. Introduction

In order to conduct research that is reflective of the Elders' holistic knowledge, I use a qualitative research methodology. A qualitative research form adds "fluidity and flexibility" to the study, which is similar to the Indigenous tradition of storytelling (Struthers 2001: 130). Applying a qualitative research approach, I emphasize the social construction of reality, the relational importance between researcher and the people with whom one studies, and the issue under study. Situated within Indigenous research, I rely on a Grounded Theory approach using participant observation and interviews to document Tłı̨chǫ Knowledge. Over the two-year period of my graduate studies, I spent approximately six months in the Tłı̨chǫ communities. Three research trips were held over these two years. The first was during spring/ summer months in 2009, the second during winter 2010, and the third during fall 2010. I planned the research trips around the seasons of the year to participate and experience the life and activities in the communities during each season. This chapter describes my research process.

2. Theoretical framework

Indigenous Research

I used the principles of Indigenous research as my theoretical framework to situate my research in the Tłı̨chǫ worldview. I interpret theory as being constructed historically and

culturally (Greenwood 2009) and "as a set of principles that explain, describe or predict our reality" (Greenwood 2009: 44). But as theories are used to interpret and understand our surroundings, theories are also grounded in cultural worldviews (Greenwood 2009). The possibilities of theories are therefore multiple and are not solely descriptive or explanatory,

> But can be all of these simultaneously....Theories can provide ways of explaining the world through the use of given understandings. Given the diversity of worldviews, of cultural ways of seeing, understanding, and therefore explaining the world, it is expected that a range of theories may exist simultaneously for any given event or to explain experiences (Pihama 2005: 195).

Furthermore, theory is not solely an explanation or description, instead theory is rooted in practice, because "without unity of theory and practice, theory has little to offer" (Pihama 2005: 196). So if theory emerges from the context of practice, then different theories emerge from the practice of different cultures and their worldviews. Indigenous knowledge becomes a source of theory based on the knowledge arising from the practice of a people's knowledge and action. But such a theory is always culturally relative. Within most social studies it is usually perceived that humans do not experience the world directly but rather indirectly through our cultural understanding. Thus, no singular, universal reality exists but multiple cultural perceptions exist with their own unique set of understandings, making comparison of true and false statements meaningless (David and Young 1998; Willerslev 2007).

Such diversity of interpreting the world is evident by the many different cultural interpretations throughout the world. Through colonialism, the notion of a single Western worldview has become hegemonic, making other worldviews and interpretations of the world invalid or regarded as superstitious imagination (Brody 2001; Deloria 1997; Little Bear 2000). Historically, Indigenous Knowledge systems have been rejected as invalid forms of knowledge and management, because of their difference from Western views (Deloria 1999).

The history of research with Indigenous peoples has mostly been based on a colonial, Western and Eurocentric worldview (Martin 2001; Tuhiwai Smith 1999; Wilson 2003). Such research has often contributed to displacement, misguided social policies, misrepresentation and the further marginalization of Indigenous peoples (Martin 2001). In order for me, as a non-Indigenous researcher, to move away from such hegemonic views, I applied Indigenous research and positioned myself within the main principles of Indigenist research:

- recognition of Indigenous worldviews, knowledges and realities as distinctive and vital to Indigenous existence and survival and allowing these worldviews to serve as a research framework;
- honouring Aboriginal social mores as essential processes through which to live, learn and situate Aboriginal people in their lands and when in the lands of other Aboriginal people;
- emphasizing the social, historical and political contexts which shape the experience, lives, positions and futures;
- privileging the voices, experiences and lives of Aboriginal people and Aboriginal lands; and
- identifying and redressing issues of importance for Indigenous peoples (Martin 2001).

Lester-Irabinna Rigney (1997) created the term Indigenist research to ensure culturally appropriate and respectful research. Thus, a purpose of Indigenist research is to "decolonize existing colonial, Western research practice; that is, it must reframe, reclaim and rename the research endeavour" (Martin 2001: 2). This required me to frame my research, methodology and interpretation to align with the Tłı̨chǫ worldview. I needed to be aware of the larger historical, political and social contexts that shaped the indigenous community in order to

develop my own understanding of being a researcher in the Tłı̨chǫ community. This implies the need to recognize the Tłı̨chǫ worldviews and knowledge as valid and important to the reality and survival of the Tłı̨chǫ community (Martin 2001).

One of the strategies I apply is actively listening, participating and accepting how the people are living their lives. Wilson (2001) states that "Indigenous methodology means talking about relational accountability" (177). This includes listening respectfully, by accepting others ideas, meanings and behaviour, even when they differ considerably from mine (Wilson 2001). I proceed by 'listening differently' as Haig-Brown (2003) explains as "not yielding to the temptation to blithely answer/investigate our own questions rather than those that come from beyond our cultural and social imagination and epistemologies" (418). By letting go of the limitations of one's own personal and cultural norms one can start to encounter and understand the unfamiliar. Haig-Brown advises "listening differently", by not solely following the investigations of our predetermined questions, but instead "being open to encountering and considering the unknown" (2003: 418). This form of listening awakes the researcher's mind to experience other possibilities. When encountering knowledge that shows the limitations of one's own knowledge, it is important not to ignorantly refuse such knowledge based on one's unexamined limitations. Rather, one must be aware of one's limitations, to be able to grasp knowledge beyond the limits of one's language and lived experiences.

By positioning myself within an Indigenous research framework, the process of conducting research was based on relationship building, trust, reciprocity and respect. I continuously

reconsidered Archibald's (2008) question; "was I doing anything different from earlier outsider academics, who created a legacy of mistrust among First Nations concerning academic research?" (36). An important strategy for my research process was establishing good relationships. Spending time with people and participating in cultural activities was important to show my genuine interest for the Tłı̨chǫ people and their culture. 'Visiting' was important in establishing relationships as Pam Colorado (1988) states,

> The visit is an essential ingredient of Native scientific methodology. The visit includes introductions, establishing the relationship between the Elder and the younger person (Who is your clan? Who is your family? What is your Indian name?) socializing including humour, and finally raising the purpose of the visit. Through visits a contract is established (57).

Creating relationships means more than just being friends; it also implies understanding and engaging oneself physically, emotionally and spiritually in many aspects of the cultural world of the Tłı̨chǫ.

Grounded theory

As any explanation of the natural environment is a social construction and not an exact picture of it, my research and the explanations that arise represent one interpretation of reality (Charmas 2006). Grounded in Tłı̨chǫ interpretations of their natural environment, my research presents an interpretation of the natural world different from my own cultural understanding. Because of the distinct interpretations of the world from an Indigenous viewpoint, I used a Grounded Theory approach instead of a theory originating from outside of the Tłı̨chǫ. Through a Grounded Theory process, the emerging theory is "generated, or 'grounded', in data from participants who have experienced the process" (Creswell 2007: 63). This process

works in many ways contrary to a traditional scientific research process based on formulating hypotheses, testing the hypotheses and developing theories based on this process. Through a Grounded Theory approach, the researcher starts with a general question and "the analysis begins as soon as the first bit of data is collected" (Corbin and Strauss 1990: 6). This is necessary because the analysis from previous interviews are used to direct questions and topics in the next interview. By applying this method "the research process itself guides the researcher toward examining all of the possibly rewarding avenues to understanding. This is why the research model is one of discovery and one which grounds a theory in reality" (Corbin and Strauss 1990: 6).

3. Conducting Research

Researcher and Tłı̨chǫ Elders

Working in an Indigenous framework of research one must recognize that there other interpretations of how the natural environment functions. Rather than ignoring such alternative interpretations based on one's preconceived cultural understanding, it is important to listen and accept other interpretations in order to respect and present the actual knowledge of the Indigenous peoples. An example of the sometimes apparent divergence between an Indigenous Elder's knowledge and my area of research occurred during one of the interviews. This example shows that I had no direct control over the course of the interview, as the Elder considered it more important to make me understand something specific at the time.

Researcher:

-How do changes in the climate alter ways of hunting caribou?

The Elder:

> *The Denè looks to the Creator. He provides for us. The creator is the answer. Spirituality is weak, in the community. Because people turn to money, drugs, alcohol and gambling. But God, the Creator is giving us signs. God tells us that the caribou is declining. People should therefore go back to their traditional ways, then nature and things will return to the way they were.*
>
> *The Sky, the great Prophet, is changing. The Prophet, the sky, tells us that things are changing. The 'Big Dipper' has changed place in the sky. This way the Prophet is telling us that great changes will happen. Therefore the environment is changing. People need to go back to spirituality. People need to return to traditional ways. Then the people will understand who they are, understand that they are Denè, and then things will return to the way they were* (Whatì, February 2010).

The question implied one type of answer, but received a very different and larger understanding of the answer than I expected. This explanation showed me the limitation of my research, but most importantly the limitation of my own understanding of the Tłįchǫ holistic knowledge. Rather than ignoring this statement because it did not fit as a typical answer to my question and into my preconceived notions of what to study, this statement provided a pivotal change in my understanding of the Tłįchǫ knowledge. Furthermore, by "listening differently" and following the Grounded Theory approach, it opened up new areas to discover.

Each Elder does not have the same knowledge or explanation of the environment and the changes occurring. Although the essence of the knowledge is similar, some Elders have more detailed knowledge than others, and some Elders are more willing to share this than others. As Traditional Knowledge is more than descriptive knowledge of the environment, aspects of their knowledge do develop through spiritual engagement. Some Elders might regard this knowledge as sacred knowledge and might not want to share this with someone that they do not trust, someone who is not Tłįchǫ, or for other personal reasons. Therefore, researching Traditional Knowledge becomes at times learning detailed knowledge from a particular Elder.

It is important to note that Traditional Knowledge differs between individuals in time and place. Therefore, I emphasize in the research findings Traditional Knowledge learned by individual Elders.

Participant Observation

To learn Traditional Knowledge from the Tłı̨chǫ, I strived to employ 'prolonged engagement' (Baxter and Eyles 1996). While difficult to achieve during research for an MA thesis, I made an effort to spend as much time in the field as possible during my program. This allowed me to establish adequate rapport and trust and to learn the culture from within (Baxter and Eyles 1996). By returning to the field for three long periods over a two-year time span, I developed relationships, participated in various cultural activities at different seasons of the year and was recognized by the community as someone who wanted to get to know the people and the land. This form of engagement provided time for observations and conversations, which provided insights into how Tłı̨chǫ Elders know their environment.

Karen Kaufman (1994) emphasizes the problematic process of "getting in". Building and maintaining trust can be a difficult process for any researcher. As my ethnicity, age and educational level are different than the research participants, my strategy for "getting in" was spending time in the community. A friend from UNBC is Tłı̨chǫ from Behchoko. I was fortunate in that she brought me to many cultural events and introduced me to her friends and family. This allowed me to develop friendships with people in the communities. I was invited to cultural events, hunting and fishing trips and daily activities such as cutting wood and

checking fish nets. The benefit of participant observation is for people to become comfortable with my presence in order for me to conduct research in a trustful and comfortable space.

Returning to the community during winter 2010, I further developed personal relationships. People recognized me from the first trip, and by being there during the coldest and darkest winter months, people recognized me as someone who wanted to spend time and understand their northern culture. During this trip, people started to open up their homes to me and I was invited to spend time on the land with community members. The development of trust and relationships changed my research methods. People introduced me to others as their friend, an introduction that established bonds of trust with new people. If one respected person qualified me then others acted upon that respected person's judgment and regarded me similarly. This gave me 'permission' to participate in several over-night caribou hunting trips at different locations in the Tłı̨chǫ lands.

Travelling on the land was significant, because for me, being in the community, I was still within the realm of the 'whiteman'. For an outsider in the village, much of the technology, food and physical appearance were familiar as to the outside world. Also, I do not speak the language, do not have the opportunity to eat much of their traditional foods and have limited insights into their culture of language, ideas, activities and values; I still lingered much in the 'whiteman's' realm, as I perceived it. That is why by going out on the land with locals, I entered into the Tłı̨chǫ realm; a realm of interaction with the land and animals which has shaped and continues to shape the Tłı̨chǫ identity and place in this world. In this realm, the animate worldview becomes alive through actions, speech and thoughts. Thus, I needed to

take the extra step out of the safety of the community, to be within the knowledge the local people have of the land and to personally experience the social relationship the people have with the land.

Through this process, Traditional Knowledge research became a subjective learning journey. Through my strategy of "listening differently", I allowed myself to accept the possibility of these alternative perceptions of the environment and the possibilities humans have in our interaction with the environment. Spending time in the community and participating in daily activities as chopping wood and fishing was highly important to establish trustful relationships and in order to engage in meaningful conversations regarding climate change and human-environment interactions. These informal conversations and activities became the backbone for learning to understand the Tłįchǫ Traditional Knowledge.

Research Participants

The Elders were chosen based on their extensive and long-term experience and knowledge of the land. In collaboration with a community leader and the translator, a list of knowledgeable Elders was generated. These Elders were identified as having personal experience with the land since the 1930-40s, and were recognized for their Traditional Knowledge which was learned from their ancestors. Using the snowball technique to identify additional participants, the initial set of Elders identified other knowledgeable Elders (Bryman and Teevan 2005). The purpose of this method is for the community Elders themselves to identify the most knowledgeable Elders in the community. Among the Tłįchǫ, most Elders grew up on the land and continue to live a traditional way of life. Only during the later part of their lives have the

Elders been permanently settled in the communities. However, the Elders have maintained a hunting and trapping lifestyle and experienced the Tłįchǫ culture before the permanent settlement in communities. I interviewed seven men and two women. The Elders were between 60-80 years old, except one participant who were between 50-60 years old.. After completing the first round of interviews, I was satisfied with the amount and scope of knowledge documented and concluded not to engage other Elders in the study.

Consent Form/ Information Statement

I presented an information statement to each participant documenting the purpose of the research: who the researcher was, and how to contact the supervisor of the researcher. The consent form was translated to each Elder before the first interview. No signature was required as many of the Elders do not write, but an oral consent of participation in the research was required.

Interviews

The interviews were based on a semi-directed interview technique. I directed the discussion with certain topics and questions; however, the participants could freely express themselves in the way they felt most comfortable. Some interviews during the second and third field period were unstructured, where the Elders continued talking with little interruption by myself. The difference in interviews was based on the characteristics of the Elder. Some Elders liked to explain more than others and expressed their knowledge in long monologues. During those interviews I found that there was little point in asking many questions because the Elder shared what he/she felt was important for me to know, at that point in time. Thus, it was better

to assess the situation and listen rather than interrupt with further questions. These interviews provided a better understanding of the issues, because the Elder explained to me specific areas he or she considered important.

Albina Nitsiza worked as an assistant and translator for the interviews during summer 2009 and fall 2010, and Isodor Zoe during February 2010. The assistants arranged the place and time of the interviews. I also arranged interviews by talking to people in the community. Sitting outside the community store proved to be an effective place to chat with people about my research and to make arrangements for interviews. A topographic map of a large area around the Tłı̨chǫ communities, of the 'Mowhi Godha de Nitlee', from Great Slave Lake to Great Bear Lake and to the barren land was brought to the interviews. This worked as a reminder of the places of fishing, hunting, trapping and longer trips done throughout the Tłı̨chǫ area. The map made it easier for the Elder and me to connect to the same land, and to discuss specific places of interest and significance to the Elder and his / her family.

I interviewed nine Elders over the two-year period. During summer 2009 eight interviews were completed, three of these were audio recorded and one video recorded. During winter 2010, seven interviews were held again with the same persons from 2009, and five of these were audio recorded. Some Elders did not want to audio-record their interviews. During these interviews I took hand-written notes. The assistant translated the interviews continuously as the Elder discussed the topics. Later, translated audio recordings and hand-written notes were transcribed. During the second set of interviews, topics from the first interviews were reviewed and further discussed. The review clarified any unclear statements from the first

interview and provided accuracy to my transcriptions. The interviews were held in the homes of the Elders, except two interviews held in the community government's chamber. Honorariums were given in the form of money and gifts of dried fruit which were much appreciated by the Elders.

Return of Documented Knowledge

Initially I planned to present the research findings at a community presentation during the last trip in fall 2010. After seeing the low participation at other presentations, and after discussion with the assistant, I decided to visit each Elder at their house to provide the transcribed interviews, the research report, photos and gifts of scarves and water bottles. The transcribed interviews and research report were discussed, to some extent, with the Elders and the translator at this time. For the three Elders who were not in the community, the transcribed interviews and gifts were given to the family members who spoke English. Instructions for how to contact me were provided if they wanted to edit the transcribed interviews. The transcripts from each interview and the research report were submitted to the Tłı̨chǫ archives. The research report was given to the Chief and other leaders in Whatì, and was forwarded to the Tłı̨chǫ government for review. I presented the research findings to the Chiefs in the Tłı̨chǫ government on 20th of October 2011 in Yellowknife, Northwest Territories.

Analysis of Interviews

Following the process of Grounded Theory (Charmaz 2006; Corbin and Strauss 1990) I started with 'open coding' in order to identify the content specific to each interview. These codes were selected to represent the important points made by the Elders. The next step was

to develop categories based on similarity of codes that contained descriptions of the same knowledge (Charmaz 2006; Corbin and Strauss 1990). For example, 'impacts on hunting' was a category that emerged from coded transcripts. Codes within that category that emerged from the transcripts, included discussions centered on concepts of 'further north', or 'less caribou around community'. The categories were based on the similarity between codes (Corbin and Strauss 1990). The field notes from personal conversations, observations and experiences provided interpretation and context to the categories identified through the interviews. The initial codes directed the successive interviews. Using this approach, which is consistent with Grounded Theory, the focus of the research developed iteratively as I completed and coded interviews. I reported quotes from Tłı̨chǫ Elders to provide context and to incorporate the voices of the Elders within the study findings.

I did not quantify the Elders' statements. In my experience, not all aspects of Traditional Knowledge are revealed in an interview setting. Therefore, I consider the common method to compare knowledge of one Elder to another and draw quantifiable data out of their statements based on how many had similar statements, as inadequate methods for documenting Traditional Knowledge. Instead I consider it highly important to include single statements and try to understand the larger context those statements imply. In most cases, the Elders expressed similar knowledge of climate change. In some instances, however, Elders explained knowledge of climate change in connection with their personal perception of their environment. Thus, I emphasize the significance of each Elder's knowledge and relied on all the Elders varying statements to describe the Tłı̨chǫ knowledge of climate change.

The methods of participant observation and interviews had a complimentary function. Valuable knowledge was documented in the interviews, but the extent of learning Traditional Knowledge through the interview method was not complete. My experience was that interviews only got the research to a certain point. Not all aspects of Traditional Knowledge were shared in an interview setting, but while conducting participant observation, the Elders shared knowledge that they did not explain in an interview setting. Traditional Knowledge research is a process of learning detailed knowledge from individual Elders, because during particular situations Elders explained specific knowledge, instead of when I asked directly. While conducting participant observation certain Tłı̨chǫ persons guided my behaviour by telling various stories, and in doing so, gave me examples of how to behave at certain places and in certain situations. In this way, I became immersed in a personal learning process. Similarly, during the interview process I could not always direct the conversations, as described in the interview, above, I sometimes 'lost' direction over the research process and rather became immersed in a cultural learning process. I found the middle-ground between unstructured self-learning in the field and the limitations of interviews, by complementing the ontological explanations learned in informal conversations with the knowledge documented in the interviews.

Reflexive Research Journal

I maintained a reflexive journal throughout the entire research process. I drew from Cathy Bailey et al (1999) explanation of reflexivity as "the researcher's self-understanding of the research process, on their ability to 'question; the testimony of respondent (are they telling me what I want to hear?) and on the awareness of the development of the emerging theory" (172).

My journal contained informal conversations with various people concerning my research and the Tłı̨chǫ, personal thoughts and reflections concerning project development, the process of learning Tłı̨chǫ culture, and conversations with the translators before and after the interviews. Most importantly, my journal contained the field notes made during trips out on the land. Recording conversations, stories and events during trips was vital for reflections at a later date. Following Bailey et al.'s (1999) suggestion, reflexivity was applied to each stage of the research process, from the planning phase through fieldwork and to the conclusions. Therefore, the reflexive journal provided a record of my thoughts from the early stages to the final stages. This made it possible to see the pivotal points of understanding when analyzing the process of the research.

Limitations of the Research

Language was one of the main limitations to my understanding of Tłı̨chǫ Traditional Knowledge. As I do not speak Tłı̨chǫ, a translator was needed for most of the interviews. The translation of certain concepts from Tłı̨chǫ to English might have been limited. A few Elders spoke English and I spent time and had personal conversation with those Elders to listen to their way of speaking of the land. I had conversations with the translators before and after interviews to discuss topics covered in the interviews and various statements which were difficult to translate. Time was a limiting factor. If I spent more time in the community I would have been able to participate in further cultural activities and hunting trips, which would have given me a deeper understanding of Tłı̨chǫ Traditional Knowledge. My affiliation with the Environment and Natural Resource Department (ENR) in Yellowknife created reluctance from some Elders to share their knowledge. I suspect that some explanations by

some Elders might have been altered to fit the political situation during the discussions about the caribou decline.

Photographs

Photographs were taken during the research process, after the consent of participants was obtained. During the first period of research I took few photos in order to be less intrusive. Photographs taken of people in the community or during trips on the land were printed in large size and given back to the persons as appreciation of our time together.

"As long as the Denè hunt, their separation from inkoze is not final" (Sharp 2001: 47)

Chapter Four:

Tłįchǫ Knowledge of Climate Change and Impacts for Caribou Hunting

The Tłįchǫ Elders have lived most of their lives on the land participating in the annual round of hunting, trapping and fishing. Based on this lifelong experience, they have intimate knowledge of the environment, which has allowed them to live successfully and comfortably in the sub-arctic climate. Hunting, travelling and activities on the land are intrinsically based on weather and environmental conditions. During the last decades, the Elders have experienced how increasing environmental changes have impacted their caribou hunting. The Tłįchǫ therefore respond to these environmental changes, by acquiring new knowledge and adapting their subsistence activities to the changing conditions. Their knowledge of the environmental changes and impacts on caribou hunting can be summarized into: warmer and drier weather leading to change of hunting locations and modified time of hunting. Also, changes to wind patterns and to snow and ice conditions are creating uncertain weather predictions and increased focus on safety. These consequences of climate change have created a general increased reliance on gas and money. The last part of this section describes how some Tłįchǫ Elders tie these environmental changes to human-environment interactions. The Tłįchǫ Traditional Knowledge views the role of humans as important participants in maintaining the sustainability of the ecosystem. Therefore, some Elders interpret the environmental changes with the larger process of the changes within modern society. In this section, I attempt to reflect this holistic knowledge.

Warmer and Drier Weather

The Elders explained that 'back in the days', approximately 40-50 years ago, it was much colder and the weather has become warmer over the years. During that time, trees would crack in the cold weather. An Elder explained, "in the old days, you set up the tent, you could hear the ice just cracking in those days. And the trees like this [spruce] just crack" (Benny Jeremick'ca, June 2009). The warming of the weather causes the winter to come later. The Elders say that the caribou follow the cold weather. The Elder Charlie Zoe-Nitsiza explained, "back in the days, caribou travel in October, or November, because it was colder. Now they travel around Christmas" (Charlie Zoe-Nitsiza, June 2009). As the weather becomes warmer, the caribou are reported to stay longer on the tundra, until December. This means that the caribou travel south into the forest, and towards the Tłı̨chǫ communities later in the fall. The hunter Joseph Moosenose explained, "in December I still see caribou hanging around the BHP mine in the tundra, in the old days they used to go all the way to Whatì, but now the weather is warm and that's why they want to stay around in the tundra, where it's colder (Joseph Moosenose, June 2009). Another Elder, Francis Simpson expressed the same observation, "it's different now. In older days when it was colder, the animals liked it when it was cold because that's how they were build for" (Francis Simpson, February 2010).

According to the Elders, the increasing temperatures have consequences for the forest which is reported to be in a drier state. The Elders have also observed that it rains less. The rain does not last as long as before, and during the periods of rain it does not shower like in the past. Also, the frequency of rain has decreased from the 1970-80s. The land and forest are therefore drier. When it is dry, the 'adzii' (lichen) grows slower. The Elder say that the 'adzii' is in a

drier state. Dora Nitsiza explained, "It is getting warmer and it is getting drier. It is getting too dry, so the food for the caribou is too dry and dies" (Dora Nitsiza, February 2010). In this dry environment, forest fires resulting from lightening occur more frequently. Most Elders say that there are more and bigger fires than earlier. The large fires burn the caribou feeding grounds and some Elders note that this is one of the reasons some caribou are skinny.

Change of Caribou Hunting Locations

The large forest fires and the increase in temperatures make the caribou stay further north. During summer of 2008, a forest fire burned a large area east of Whatì. As there is no forage, the caribou will not travel through the area but rather move north to better feeding grounds. Therefore, caribou do not come towards the forests around Whatì. Instead the caribou travel towards the forests north-east of Marten Lake and north to Kwet'ootî (Grandin Lake). As a consequence, the hunters need to modify their locations for hunting and travel farther to locate caribou in these northern areas. Benny Jeremick'ca explained, "caribou used to be around town before, and we didn't have to go far to shoot caribou. Now probably because of the big forest fires the caribou go north passed Rae Lakes and to Grandin Lake. They go to where the food is. (Benny Jeremick'ca, February 2010). Another hunter explained, "it's different now. We used to go to Rae lakes and by the end of the lake. Haven't been to Grandin Lake in a long time. It's the first time I go back there in 30 years" (Joseph Moosenose, February 2010).

Before, hunters used to come to Whatì from other communities to hunt caribou, but now these hunters usually have to go further north along the ice-roads to Gameti and Wekweèti. Now that one cannot hunt caribou in close vicinity to the community, a hunter's opportunity to get

caribou is a long snowmobile ride to the end of Marten Lake and to the Kwet'ootî (Grandin Lake) area. In earlier times, people traveling long distances and using dog-teams for transportation would require time and not money, but with the use of the snowmobile, hunting has in many ways become a monetary issue. This will be discussed later in the chapter.

Modified Time for Hunting

As the weather becomes warmer there are longer periods of fluctuating temperatures during the fall. The Elders told me that the ice does not freeze as fast and as early in the fall, as was common 'back in the days'. Thus, hunters need to wait for the cold temperatures to stabilize before they can travel on the lakes with the skidoos. In the past, the caribou moved into the forest around October and November because it was colder. The Elders noted that during the last couple of years the caribou moved into the forest at a later time, in December. As one Elder explained, "sometimes the caribou come early, but sometimes it doesn't come until December. It depends on the weather too. If it's too warm, it's no good" (Benny Jeremick'ca, February 2010). The Elders explained that the delayed migration into the forest was due to the caribou's preference for the colder weather on the tundra and because of the later freeze-up of the lakes and rivers further south. In the spring, some caribou move back to the barren-land earlier. The Elders have noticed that the caribou spend less time in the forest. Francis Simpson explained that "in the past, in that time the caribou would move in November and they used to live in the north, living with us. And they didn't go anywhere. That's where the food is and everything they want is there. Caribou used to stay longer in the forest with us" (Francis Simpson, February 2010). As a consequence, some Elders explain that the time of hunting trips has been modified, by waiting for the ice to freeze properly and for the caribou to arrive into the forest.

Changes to Wind Patterns

The Elders explained that nowadays, there is hardly any wind. Francis Simpson explained that "everything follows the wind. The animals follow and watch the wind. The wind is a fortune-teller" (Francis Simpson, February 2010). Thus, the wind directs action for the environment. Caribou travel better when it is windy. Francis Simpson explained that, "the caribou walk against the wind, because they like the wind in their face, so they go against the wind. If its north wind, they walk towards the wind" (Francis Simpson, June 2009). Another Elder described how, "back in the days when its north wind, the caribou travel to our place quickly" (Charlie Zoe-Nitsiza, June 2009). When it is windy the caribou stay together and are not scattered around. With a decrease/lack of wind, the caribou move around less and are said to be scattered around in smaller groups. Some Elders say that the caribou populations are not declining but that rather the caribou are scattered and do not move in large herds as earlier. Changes in wind pattern thus correlates with changes in the caribou herds' behaviour.

Elders also described changes in the wind patterns. For example, in Whatì the winds from the south and west are usually warmer than the winds from the north and east, but in recent years, the winds from the north and east are sometimes warmer. These changes also create difficulties in weather predictions, as Dora Nitsiza explained

> People used to know which direction the wind was going to blow. If some guys planned to do a trip somewhere, then the people would know what kind of weather would come. If [the wind] came from the north and east it would be very cold, and if the wind came from west and south it would be warm. Now it is different, sometimes the wind from the south is cold and also the wind is cold from the west. Now the north wind is warmer than wind from the south, also wind from the east is warm (Dora Nitsiza, February 2010).

Changes to Snow and Ice

Most of the Elders stated that there is an increase in the amount of snow and changes to the consistency of snow. 'Nowadays' the snow is around 4-5 feet deep. The Elders say that 'back in the days' the snow was harder and one could walk on top of the snow. Now one often falls through the snow because it is loose. The consistency of snow is largely based on the wind. A strong wind would blow the snow away and pack the snow hard. The decrease in wind makes the snow loose, which makes it more difficult for the caribou to travel. With strong winds, the snow would be packed hard and the caribou could more easily run on top. Charlie Zoe-Nitsiza explained,

> Back in the days used to be wind, so the snow wasn't that deep because the wind would blow the snow away, so it is harder for caribou to eat now, snow is now 4 feet deep. Back in the days, people can walk on the hard snow, now people will fall in, because it is not so hard. That is why it's harder for caribou to travel because they fall through the snow (Charlie Zoe- Nitsiza, June 2009).

In such conditions, the caribou use more energy on walking and traveling through the deep and loose snow. Instead, the caribou tend to stay in one area, unless they are noticed by people. In the deep snow it is harder for the caribou to dig for lichen compared to earlier times with less snow. Some caribou are reported to be skinny during the winter, as they use more energy on walking and digging through the deep and loose snow.

Elders explained that because of the warming of the weather, the ice on the lakes and rivers freezes later in the fall. The ice is also thinner during the winter from around 6-7 feet to around 2-3 feet today. Several Elders reported that because of the thin and unstable ice, some caribou fall through the ice. Charlie Zoe-Nitsiza explained, "in the winter it is not that cold, so ice doesn't freeze that fast, so caribou fall through" (Charlie Zoe-Nitsiza, June 2009). Joseph

Moosenose described that "on the Hottah Lake on the northwest side [a hunter] went there with skidoo hunting and see a whole bunch of antler sticking up [through the ice]. Just before Christmas" (Joseph Moosenose, February 2010).

In the fall, there is a longer time period with fluctuating temperatures that freeze and thaw the ice. The warm periods create overflow and slushy conditions on the lakes and rivers, especially if there is a lot of snow followed by a warm period that melts the snow on top of the ice. During periods of slushy conditions, the caribou prefer to travel in the forest. These changing weather periods, between cold and warm weather, also create a crust on the ice, which is hard to travel through for the caribou. Some Elders reported observations of damaged ankles, hooves and legs. Francis Simpson explained,

> The caribou watch their hooves. They don't like to travel, when it has frozen over after it melts because they got to watch their hinds, because if they step through the hard pack of snow it damages them, even the ice damages the hooves. If that does happen they are going to get sick. Not only because of the mining, but because of the hard pack of the snow it wears the hair fall of the hooves, but the caribou are really cautious to make sure they keep it. Because if they don't they are going to damage it. It will damage their feet and you will not be able to walk. That's how caribou are they are very careful. And they have to take care of their hind, their feet (Francis Simpson, February 2010).

These explanations demonstrate the Elders' detailed knowledge of the interconnected weather patterns, and how caribou carefully decides how to follow the changing weather.

Uncertain Weather Predictions

Most Elders and experienced hunters are able to predict the weather. This is an essential skill for successful travel out on the land. The Elders explained how they used to watch the wind

before planning a trip, to see what kind of weather was coming. These predictions are based on their detailed knowledge of wind patterns, but the Elders explain that now they have difficulties predicting the weather as they did in the past. Making accurate predictions to plan future hunting trips is difficult. Now hunters need to deal with unpredictable wind patterns and unexpected changes in the weather. This creates uncertainties when planning hunting trips and travelling out on the land.

Focus on Safety

There are always certain areas with open water that the people know about, such as the start and end of the Grandin River, south of Kwet'ootî (Grandin Lake). The warmer weather creates periods of unsecure ice and overflow on the lakes and rivers. This creates dangerous situations on hunting trips as the travelling conditions on rivers and trails unexpectedly change. As the conditions change, hunters need to travel new routes to hunting grounds to avoid areas with slushy and overflow condition. The Elders advise people to travel in groups, who can provide help to each other if snowmobiles get stuck in the changing travelling conditions. Joseph Moosenose explained,

> One person cannot travel alone. You can go through the open water, or you get overflow, and once your skidoo get stuck what are you going to do. It happened. In January, there was three skidoos were coming back, one broke down. So two skidoo and three people, they help each other so one skidoo pulled two sleds. They got into the overflow water and get stuck. So what happen is that these guys here from Rae, eight people, they meet them and helped them out, to pull the skidoo and the sled. With eight people to help them, in a foot deep snow, it took them 10 hours to get it out. So that's the kind of thing. We can't just leave people who get stuck like that, so they help each other. They got into a dry place on the lake and one was an Elder, 77 years old, so he had to catch a ride back here. They took him back here. So that's what happens. It really dangerous for one person to travel alone, because the weather is really changed (Joseph Moosenose, February 2010).

Sharing knowledge has always been an important method for travelling safely across the land. With today's uncertainty in weather, communication about the changing conditions on the land is important to inform people about dangerous areas, especially to younger people and to people from other communities. People who do not know the land are told to only follow the skidoo trails that have been built, and to not follow other trails they see or take shortcuts. Talking about current conditions and how the weather and snow conditions are changing at certain places can prevent accidents from happening. Also, some Elders suggest building a new trail on the west side of Grandin River, from Æedetsîtì (Lac Tempier) to Kwet'ootî (Grandin Lake) to avoid the dangerous areas of unexpected overflow and slushy conditions on the Grandin River.

Increased Reliance on Gas and Money

As the caribou travel further north, the possibility to hunt caribou in a closer vicinity to the community decreases. The hunters must now rely on longer snowmobile trips further north to find the caribou. Thus, hunting trips for caribou are much more expensive than in the past. For one round trip to Kwet'ootî (Grandin Lake), a snowmobile needs approximately six jerry-cans (20 litres) and four jugs (1 litre) of oil, for a total price of $250-300. An Elder explained, "now people have to go further away to hunt. Spend much more money on gas and oil because we have to go further away to hunt. So it is more expensive to hunt now. Less people go hunting because it is more expensive" (Louis Wedawin, February 2010). A hunter also expressed his concerns, "for some people who are working it's ok, but for some people who are not working it's really tough. Because it is too far now. Too far to get caribou now"

(Joseph Moosenose, February 2010). The renewable resource office in Whatì provides every registered hunter with 30 gallons of gas: six jerry-cans per each winter season. That is approximately one round trip to Kwet'ootî (Grandin Lake). As hunting is sometimes unreliable, hunters need many trips out on the land and north to Kwet'ootî (Grandin Lake) to secure caribou for their extended families and friends for the season. Some Elders emphasized the importance of a subsidy program for hunters and trappers. As hunters need to travel further north to hunt caribou, the current subsidy is not sufficient to cover the high price of gas, the cost of repairs and equipment, and for the off-season period.

Sharing meat is an important aspect of Tłı̨chǫ culture, especially to persons and families that cannot hunt. As hunting trips have become increasingly expensive, people work together and provide hunters with money to buy gas. The hunter then shares the meat with these people, along with the hunter's family and friends. In this way, the high cost of hunting is shared by the community which has become a reciprocal process like the sharing of caribou meat among community members

Climate Change and the Tłı̨chǫ

The climate in the sub-arctic is changing. As the Elders experience these environmental changes, they connect this to their larger experience and knowledge of Denendeh. Thus, as the changing parts influence their knowledge of the whole, they also have explanations for why these changes are occurring. The description of changes in the environment and how it affects the caribou and hunting should not be seen independently from the following explanations. Changes do not happen by themselves and the explanations of the Elders put the individual changes, as described above, into a holistic knowledge of the environment.

Tłı̨chǫ and the Land

The relationship between the Tłı̨chǫ and the land is complex, but one of the underlying principles is respect. The Elders often say that 'if you take care of the land, then the land will take care of you'. This implies that everything on the land has a life and spirit of its own. If one shows respect and gratitude to the land, the land will provide and take care of you. The Tłı̨chǫ have lived on their land since time immemorial, and through this historical connection with the land and animals, they have created strong ties to the land.

The relationship between the Tłı̨chǫ and the caribou is best characterized as a respectful connection. A relationship based on mutual respect, in which the caribou behaviour affects the humans and the human behaviour affects the caribou. Tłı̨chǫ Elders speak of caribou as individuals who make their own choices often in response to certain human's respectful or disrespectful behaviour. Human behaviour therefore affects the caribou, similar to the behaviour of one person to another person.

Many Elders refer to disrespectful behaviour as a reason why the caribou didn't come towards the community during the last two winters. Many Elders refer to the story, 'hitting caribou with a stick'. Elders heard this from their grandparents, so it has reference to human-caribou connection from older times. But they also refer to a man who hit a caribou with a stick in the 1950's. The man was hunting caribou just outside of town, but as his bullet didn't kill the caribou instantly, he hit the caribou with a stick until it was dead. This behaviour is highly disrespectful to the caribou. Thus, the caribou chose to stay away from the area around the

community for 30 years, and it was not until the winter after the man died, that the caribou returned to the community.

Elders also identify other forms of disrespectful behaviour that would offend the caribou so they chose to stay away from the forest around the community. Respecting the caribou also means not to chase the caribou on the snowmobile, or not leaving useful parts of meat or dead caribou after a hunt. Elders referred to these forms of disrespectful behaviour as possible reasons why caribou stayed away.

Mutual respect implies that the caribou give themselves to the humans when they are needed. Even if the caribou know that they will be killed they come towards the communities and give themselves to the people. The caribou do this because the caribou know that they are needed by the people. Through the proper treatment of the caribou when it has been killed and by proper disposal of the caribou bones, the caribou spirit will be reborn. The relationship between the Tłįchǫ and the caribou is therefore based on mutual understanding as the caribou give themselves to the humans, while the proper Tłįchǫ behaviour will guarantee the sustainability of a healthy caribou population.

Traditional Lifestyle and Climate Change

The relationship between the Tłįchǫ and caribou is an example of the philosophy of the Tłįchǫ, in their interaction with each other and towards the natural world. The Elders emphasize that everything on the land, including humans, has a life and spirit on its own. The

spiritual and physical spheres are not regarded as a separate entity, but rather the physical and spiritual spheres are one and actions of spiritual nature imbue meaning into the physical reality. An example of this is how the proper treatment and disposal of caribou bones by humans is important for the rebirth of the caribou spirit into new caribou. Humans have therefore a central role and function within the ecosystem and human conduct in the world has implications for the wellbeing of other living beings. The human role in the world as hunters and harvesters is also one that generates and maintains spiritual connections; a role that sustains the flow and existence of living things. The continuation of being harvesters thus secures further harvest for the people and well-being of animal populations.

The environmental changes are interpreted by some Elders as the consequences of the Tłı̨chǫ's (and other peoples) discontinuation of the central role as hunters and harvesters in the ecosystem. An Elder explained,

> Everything is changing now in the last 20 years. Elders used to really do everything spiritually, they respect everything, the Creator gave them everything, their lands, the trees, the woods, everything, the water, they knew that. That is why everyday they prayed. Early in the morning when they wake up they pray, and at night time before they sleep they pray. They thank their God for giving them everything that they had. Today it is not like that. The last 20 years all this has changed. People has changed their attitude in the community, people has turned away from the traditional way of life like we used to live. They left all that away and they left out the spiritual way (Francis Simpson, February 2010).

As changes in the larger Euro-Canadian society has brought changes to the Tłı̨chǫ lifestyle, many Tłı̨chǫ have decreased their activity with the land. Departing from their traditional lifestyle, beliefs and knowledge, the younger generations are losing the connections and knowledge of the land and animals. This knowledge includes the proper behaviour which is important in the respectful relationship with animals and especially caribou. As humans are

starting to retreat from this respectful relationship, that characterizes their role as harvesters, the environment is also starting to change behaviour. The climate is therefore changing and the caribou are retreating from the humans. A Tłı̨chǫ Elder explained,

> The Denè looks to the Creator. He provides for us. The creator is the answer. Spirituality is weak in the community. Because people turn to money, drugs, alcohol and gambling. But God, the Creator is giving us signs. God tells us that the caribou is declining. People should therefore go back to their traditional ways, then nature and things will return to the way they were.
>
> The Sky, the great Prophet, is changing. The Prophet tells us that things are changing. The 'Big Dipper' has changed place in the sky. This way the Prophet is telling us that great changes will happen. Therefore the environment is changing. People need to go back to spirituality. People need to return to traditional ways. Then the people will understand who they are, understand that they are Denè, and then things will return to the way they were (Dora Nitsiza, February 2010).

The cultural and social changes are thus seen as underlying reasons for climate changes. Some Elders see the discontinuation of human interaction with the land as a focal point to changes they see on the land including the decline of animals, such as the caribou. The cultural transformation from the essential role as hunters and harvester towards a modern disconnected society will continue to disrupt the sustainability of animal population as well as the larger ecosystem. Therefore, climate change is understood by some Elders as the reaction to the discontinuation of the human relation within the environment and a reaction to the new way of life humans have started.

Cultural Change and Pollution

The cultural changes resulting from colonialism have brought about many technological changes which pollute the environment. The pollution from cars, snowmobiles, diesel-generators in the community, and factories as well as chemicals from the mines impact the

environment negatively. Some Elders reported that humans are destroying the land by pollution instead of taking care of the land.

The pollution from the mines are said to be spread out over the tundra and is absorbed by the plants. Consequently, some caribou get sick from eating the plants around the mine sites. Some Elders described how the ankles and hooves of the caribou become damaged when they walk through the areas close to the mines. White spots and bristles on the bones and joints were shown as evidence for the pollution from the mines. The Elder Dora Nitsiza explained,

> During the last four years, been seeing different results in the caribou when using the skins, the meat and other parts that I use. When you take apart the caribou you can see white spots and bristles, especially inside the knee parts and on the skin. Also, there are rough parts on the caribou bones, especially on the ankles. The caribou is changing. Sometimes there is less hair on the ankles. They get this from when they walk near the mine sites. Before the caribou meat was nice and tender. But the last 4-5 years, the caribou is changing (Dora Nitsiza, February 2010).

Some Elders emphasized that in addition to the pollution, the mines are obstacles and intrusions on the caribou's habitat. An Elder explained,

> Ever since the mine was built, seems like they are forced and chased away. And the places where they lived are different, it changes with them. They don't seem to stay longer or something seem to chase them away. When your trail is not healthy and you don't feel comfortable with it then you don't stay in one place, but right away you keep moving on, that's how its seem to be with the caribou. Because their traditional path is not good, it's blocked up so the caribou don't stay that long. Because of the mining. When you travel somewhere and your skidoo trail is nice and clear, but as soon as you know that something is bothering you on your trail, like mining, you don't feel comfortable with it and you turn away (Francis Simpson, February 2010).

Cultural changes have brought many technological changes which have altered people's interaction with the land. Thus, the cultural change from traditional lifestyle to a more modern

and Western lifestyle erodes the peoples' connection to the land, and while the same technology erodes their connection to the land, it also pollutes the land.

Recommendations for Climate Change Adaptations to Hunting and Travelling on the Land

These recommendations are based on the Elders suggestions to facilitate improvements for hunters:

- Build new trails: some Elders suggested building new snowmobile trails to avoid places where snow and ice conditions often unexpectedly change. Specifically, on the west side of Grandin River from Æedetsîtì (Lac Tempier) to Kwet'ootî (Grandin Lake) to avoid areas of overflow and slushy conditions on the Grandin River.

- Subsidy program: the consequence of the need to travel further north to hunt caribou, is an increased cost for gas, engine oil and maintenance on equipment. Some Elders expressed concerned that the current subsidy is not sufficient to cover the high price for gas, the cost of repairs and the long off-season period. An increase in the hunting subsidy program will also allow more people to hunt which in turn will bring more bush food back to their families.

- Effective communication: as weather changes quickly and unexpectedly it is important to effectively communicate the conditions on the land to people who plan to travel or

are travelling on the land. This is especially the case for younger people and visitors who are not familiar with the land. The communication of snow, route and weather conditions can be done over radio or bulletin boards, etc.

Conclusion

The Elders have experienced many changes throughout their lives. Elders told stories of their travels by canoe to the barren-lands when they were young. Now, chartered planes take them to hunting camps in the barren-lands. Even though the technology changes, they still rely on their knowledge of the land to hunt and live comfortably on the land. In the process of doing so they increase their knowledge of the land. Although many social changes have altered the Tłįchǫ way of life and their interactions with the land, the land and their interaction with it are one of the main pillars of their culture.

The Elders have experienced a number of environmental effects resulting from climate change. Environmental changes have consequences for the way Tłįchǫ travel and hunt on the land. As the weather becomes warmer, the forest becomes dryer. Along with a decrease in rain, the dry forest is more susceptible to forest fires and when it burns, larger areas are burned. As the main food for the caribou diminish, the caribou need to change their migration patterns to find areas with good feeding grounds. Thus, the hunters need to change their hunting locations and travel further north. The warmer weather also causes longer periods of fluctuating temperatures which creates periods with insecure ice, overflow and slush. The delay in secure ice causes the hunters to modify the timing of hunting. Unexpected changes to the ice and snow create uncertainties and dangerous situations, and with the use of

snowmobiles it is easy to get stuck in the overflow and slush. A focus on safety has always been important when hunting and travelling on the land, but these environmental changes increases the focus on safety. Travelling safely also includes being able to predict future weather conditions. As hunters have to travel further north to hunt caribou, information needs to be shared about the dangerous areas on the route. Sharing information helps limit the possibility of accidents. The need to go further north to hunt caribou increases the monetary cost of hunting. An increase in the hunting subsidy will help defer the high costs of travelling farther; a strategy that brings more people out on the land and brings more caribou meat back to their families.

The changing environment has affected the behaviour of caribou. But caribou are not merely an object that adapts in a predictable way according to those changes. Most Elders persistently explained that no one can know or understand all the ways of the caribou and that no one can decide or manage for the caribou. The caribou are like people. They care for themselves in similar ways as humans. Each individual caribou and each herd have their own individual will to decide what they want to do, where to go, what to eat and where they want to travel. Dora Nitsiza explained that, "Caribou has its own way to survive, they are like human beings. How will they survive? They will probably change what they eat" (Whatì, February 2010). As the Elders explained it, various factors in the environment are changing, but the caribou have their own choice as to how to react and adapt to the changing climate. Just as the hunters choose how they modify and adapt to the changes in the environment, so do the caribou choose where to go and how to modify their annual round between the forest in winter and the tundra in the summer.

Elders often say that 'if you take care of the land, then the land will take care of you'. The move away from a traditional lifestyle means spending less time in contact with the natural environment. The younger generations have less knowledge of the land and animals, including the knowledge of proper behaviour with the land and animals. In order to learn about the land and prevent environmental changes, it is important for people, especially the younger generations, to learn about and spend time out on the land with the Elders. As taking care of the land includes having knowledge of the land and knowledge of proper behaviour with the land and animals, learning from the Elders is an important action in preventing further changes. Furthermore, the continuation of respectfully hunting caribou and spiritually interacting with the land in traditional ways can alter or prevent changes in the environment from happening. By being active in the processes in the environment, the continuation of traditionally interacting with the land will maintain the relationship between the Tłı̨chǫ and the land and uphold important functions in the environment.

Chapter Five:

Recommendations for Traditional Knowledge Research on Climate Change

1. Introduction

In this chapter, I describe how the historical and spiritual are essential aspects of Traditional Knowledge. In addition, I outline my recommendations for Traditional Knowledge research Specifically, I argue that by understanding and including historical and spiritual aspects, Traditional Knowledge research would align with an indigenous perception of the environment. One of the first influences to my understanding of Traditional Knowledge occurred, of course, when hunting out on the land:

On a caribou hunting trip in the Tłı̨chǫ land, Archie Wetrade and I followed a skidoo trail north of the community Gameti. About an hour along the trail I spotted caribou tracks ahead of my skidoo, I told Archie but he just told me to proceed. Then just as we entered a lake from a portage, I saw two caribou about 50 meters in front of us. So we stopped. Archie found his rifle, bullets, and we slowly drove our skidoos closer to them. As we approached closely, they walked off the trail into the loose snow of the lake towards the forest. Archie stopped, disembarked, leaned his rifle on the skidoo and shot, five shots, but no hits. The two caribou walked in a fast pace toward the forest, but stopped. So we followed. Archie shot several more shots, but missed. The caribou then walked into the safety of the trees. Archie spotted darker spots on the ice in front of us and decided not to pursue any further due to the dark spots which means overflow and unsecure ice. His initial response to the situation was that the aim on his rifle was off, and that was why he didn't hit the caribou.

After searching for caribou the whole day further north towards the Great Bear Lake, we met up with a friend who was also out hunting caribou, and headed for their cabin on Beaverlodge Lake. Sitting around the woodstove eating a caribou leg in the evening, we started to talk about caribou. Archie started to explain the incident earlier in the day, "Caribou are like spirits," he said. "They come and go with the wind. Those two caribou came to us. It was two of them and two of us. So they would give themselves to us. But sometimes you can't shoot them. If they don't want to give themselves to a hunter, the hunter can shot many times and will only miss. Because the caribou decides". Slightly puzzled by this explanation and the experiences during a long day, I nodded understandingly to the statement, without really understanding the meaning at the time.

This form of interaction between the sub-arctic Indigenous peoples and animals is common and many other scholars have written extensively about this (Brody 1981, Feit 2004; Nadasdy 2003, Ridington 1998; Sharp 2001; Smith 1998). As described in the literature analysis, the interaction between the peoples and the animals in the sub-arctic is based on long-term social relationships. My experience with the Tłįchǫ demonstrated a similar relationship with the land. Therefore, I can offer a similar critique of research with Indigenous peoples, as did Nadasdy (2003, 2007) and Stevenson (2006). I argue that the field of Traditional Knowledge research should evolve to accommodate the nature of Indigenous knowledge. By evolving, I mean that research methods must adapt to the people's form of learning and base one's research on knowledge, which spans areas such as nature, religion and culture, rather than applying Western categories of interpretation. Furthermore, Traditional Knowledge researchers need to take seriously the ontological concepts of the Indigenous peoples and their specific knowledge of the environment that arises from this worldview. It is highly self-contradicting to ask for the recognition of Traditional Knowledge when ignoring or denying the ontology that knowledge exists within. These methodological considerations have evolved in some disciplines, as Sylvie Poirier (2005) writes,

> it is only recently that anthropology has started to take seriously and at face value local ontological and epistemological principles and stances and to examine and investigate how and to what extent these principles ground and inform other objectivity, as well as other ways of being, knowing and relating to the 'natural' world (9).

The important value of Indigenous Knowledge is the challenge to the hegemony of the cornerstone concept of Western thought, the dualism between 'nature' and culture'. By challenging these cultural categories, Indigenous knowledges allow us to confront and potentially dismiss the presumed universality of "an absolute dichotomy between nature and

culture, animality and humanity, matter (body) and mind [and] instinct and reason (Poirier 2005: 9). In doing so, we can move beyond the Western concept of nature as something objectified "that can be quantified, mechanized and dehumanized in a way that made us think that knowledge of nature was independent of our relations with it" (Poirier 2005: 9).

2. Recommendations to Indigenize Traditional Knowledge Research

In the literature analysis, I describe a contradiction between the focus of some Traditional Knowledge research and the ethnographic descriptions of sub-arctic hunting societies. Such Traditional Knowledge research mainly focuses on empirical knowledge of the indigenous peoples, which are the areas that align most with Western science, see for example Fox (2002), Huntington (1998, 2000), Riedlinger (2001) and Thorpe et al. (2002). Such research commonly describes knowledge of distribution, trends in abundance, or the scientifically acceptable explanations of how plants and animals respond to the environment. For caribou research, this includes where caribou moves, when they move and how they move, a superficial and culturally devoid description of the relationship between caribou, the people and the environment.

Alternatively, descriptions of sub-arctic hunting societies state that the Traditional Knowledge of Indigenous peoples is much more complex. The point is that while the Western culture separates and divides the world into categories of nature, religion and culture, these Western categories do not exist for Indigenous peoples, such as the Denè. Thus, there exist "no clearly defined boundaries between philosophy, history, sociology, biology and anthropology in indigenous thought" (Wildcat and Pierotti 2000: 1335).

As Indigenous people themselves and many anthropologists have shown, there are more aspects of Indigenous Knowledge that constantly inform each other and thus need to be included in Traditional Knowledge research (Nadasdy 2003, 2007; Stevenson 2006). In debating Traditional Knowledge research, Nadasdy writes that "it seems to me that the only way to avoid contributing to disempowerment of aboriginal peoples ... is for us to build a theoretical framework that can accommodate the possibility that there might be some literal truth to what hunters tell us" (2007: 37). Expanding on this idea, I discuss aspects of Traditional Knowledge that must be considered if Traditional Knowledge research is to be based on an indigenous perception of the environment. I understand these aspects of knowledge to work together, as strands of knowledge woven into a holistic understanding that represents the knowledge of the people.

Historically created Knowledge

The historical ties that people have to place are based on their long-term occupancy of their traditional territory. Here, I refer to place as consisting of everything a place contains. The contemporary people's identity to the land is reproduced through the continuation of telling stories of particular places. Most hills, large rocks, gorges, waterfalls, lakes, rivers, or any specific feature in the landscape have mythical and historical events tied to them. Reconnecting to the spirits that dwell in these places through telling the stories of them and communicating with them at these places, reproduces the identity and continues the connection with the people to their land. But most importantly, the interaction with the land and animals continues the interdependent relationship that maintains the sustainability of the ecosystem. In this way, the historical occupancy has created an interaction with the land,

which, through time has evolved the web of life that is the whole ecosystem of the Tłı̨chǫ lands. By including historical interaction of the people and the caribou, we can expand our research focus. For example, when considering the caribou migration, the caribou comes to the people because the people are hungry. The caribou, even though they are scared of humans, are sympathetic to the people in times of hunger. Thus, the caribou move towards the people wherever they are and give themselves to the people. Because of the connection between the people and the caribou, which extends from ancient time, the caribou know that people need them to survive. This historical connection has generated an understanding between the people and the caribou; as long as the people behave respectfully, the caribou will continue to give themselves to the people. Behaving respectfully involves placing the caribou remains in certain protected places so that the caribou spirit will be born again, and the caribou herds will regenerate and stay healthy. This understanding is based on a reciprocal relationship which secures the wellbeing of both the people and the caribou.

The continuing interaction with the land is essential to the workings of ecosystems. For the Tłı̨chǫ and other sub-arctic indigenous peoples, this historical interaction with the land also takes place in the spiritual realm. Although this knowledge of human-animal interaction differs from Western concepts of how the environment works, such knowledge should not be dismissed on the case that it differ radically from one's own culture's knowledge.

Spiritually created Knowledge

The empirical and historical knowledge work together because the one cannot exist without the other. The knowledge of the land could not happen without the historical occupancy of

living on the land. Neither could history of a people exist without a land. But these two elements cannot cooperate without the existence of the communication between the land and the people. The people learn from the land and the land learns from the people. Communication with the land lies within the realm of spirituality. When spirituality is a way of behaving, then spirituality is the individual interaction between a person and the land.

Spirituality has evolved with the historical occupancy throughout the land, and is alive in the people's continued knowledge of and interaction with places and animals. Furthermore, spirituality is alive through the stories of interaction between the mythical, historical, people and the land- a combination that incorporates all aspects of the environment. Thus, stories create meaning of the place to the people by merging all the elements. As this is a process of reproducing culture, it also reproduces the connection and understanding for future generations of people and animals communicating together. Communicating spiritually, from your heart, with the animals and the land is the essential of and the symbol of the historical connection between the people and the land, and it is through the continued spiritual interaction with the land that spirituality merges people and the land. The knowledge of how to communicate and with whom, is the manifestation of the wisdom that the people and the land have created together, a manifestation of an interconnected history.

When a researcher only focuses on describing the caribou migration routes found in Traditional Knowledge, the researcher fails to consider why the caribou travel to certain areas, including to where the people are. By choosing only this knowledge, the researcher is left with an understanding of caribou movement that differentiates between the interdependent

human-caribou relationship and caribou migration. Consequently, the researcher develops reasons for caribou movement that corresponds with a Western scientific viewpoint. Incorporating other aspects of Traditional Knowledge would reveal how migration functions based on human-caribou communication.

When the caribou migrate into the forest and to areas where the people live, some hunters communicate with the caribou leaders through dreaming. In Tłįchǫ the word to foresee- 'nate', is the same as the word for dreaming- 'nate'[1] . Thus, as this linguistically implies the hunter foresees the situation through dreaming or in the dream the hunter communicates with the animal spirit on how the hunt will proceed. Through dreaming, his soul will 'fly' to the caribou leader to tell them that the people are hungry and are in need of food. The caribou leader will in turn talk to its king- 'wotso'- to say that the people need food and ask permission for them to travel towards the people. Even though it is far to travel, the caribou will travel to where the hungry people are.

Spiritual communication between the people and the land occurs also in other ways. Before going hunting, a ceremony of feeding the fire is usually conducted and when travelling on the

[1] June Helm (1994) states that "the status of 'nate', rendered as "dreamer" or "prophet" in English, has traditionally existed with the Dogrib cultural repertoire" (1994: 19). Among the Denè Tha, Goulet (1994, 117) states that "individuals who know an animal and who develop the ability to travel to and from the "other land" through dreams and visions are known as "preacher," "prophet", or "dreamer" in English and *ndatin*-from the verb *ndate* "s/he dreams"- in the local dialect" (1994, 117). Several other scholars (Brody 1981; Nadasdy 2007; Ridington 1998; Sharp 2001) emphasize dreaming in the relationship between the Denè and animals.

land ceremonies of feeding the land are usually conducted. Through these small and usually individual ceremonies, a person communicates with the spirits that live in the area, in order to ask to be given animals and for safe journey. Through their historical connection to the land, the people know where certain spirits live. They know where mythical and historical events happened and what ceremonies to conduct in those areas. Thus, spiritual communication informs the everyday knowledge of the land and informs knowledge of caribou migration, as well as knowledge of other animals that live throughout the land. Spiritual communication informs the occurrence of wind and weather systems that move through the land, which affect the life and activities of animals and people. The spiritual relationship between the people and the land is thus essential to living successfully and comfortably in the environment of the north. For Traditional Knowledge research, it is vital to recognize the spiritual aspects of Traditional Knowledge that shows the human-animal communication which directs the animal behaviour and migration.

3. Discussion

The historical knowledge provides the background for today's spiritual connection which informs the empirical knowledge of people. Thus, these aspects work together to constantly develop new knowledge, at an individual and collective level. Including these historical and spiritual aspects of Indigenous knowledge, not only provides new understandings to the issue under study, but improves the possibilities to understand the Elders' Traditional Knowledge. In cases when only components of Traditional Knowledge that align with the Western categories are documented, the researcher distils components of the Indigenous knowledge that constitutes valid knowledge according to the Western culture. Through such processes,

knowledge which is not documented, because of the alternative explanations of the natural environment, is delegitimized (Nadasdy 2007). Instead, I consider it more important in Traditional Knowledge research to be inclusive and expand one's research focus to reflect the holistic nature of Indigenous knowledge and the context for the formation of this knowledge. By including, rather than narrowing and excluding, Tłı̨chǫ Traditional Knowledge emphasizes the importance of the connection between aspects of the environment. Similarly, Traditional Knowledge research should include knowledge that melds the Western cultural separation of society, nature and religion. The documentation of such knowledge requires long-term fieldwork and participant observation, so that the researcher can better understand the participants' perception of the environment; that nature is a social environment for sub-arctic Indigenous people and thus that climate change has both social and ecological implications. Climate change research therefore requires prolonged personal engagement. To document changing weather patterns the researcher needs to understand the underlying perspectives of the people which contain the observation of climate change held within Traditional Knowledge.

The Denè prefer to learn through observation and later copying what other 'teachers' have done, rather than imposing knowledge upon others through formal teaching methods (Sharp 2001, Ridington 1998, Goulet 1998). Storytelling is an example, where a story is told at the time when someone needs to hear an example of behaviour, but the recipient can choose what messages to take from it and when to apply these messages to one's own behaviour (Smith 1998). Working with the Denè Tha in northern Alberta, Goulet (1994) describe similar ways of learning for researchers. As the Denè value personal experience as the primary way to

actually learn something, rather than formal instruction or second-hand knowledge, Goulet writes that, "personal experience on the part of the investigator becomes the cornerstone and the necessary entry point for the investigator" (Goulet 1994: 119). Furthermore, Goulet states that, "academics who hold to research based on a positivist philosophy stand to lose out because, in the eyes of the Denè, they stand too removed from what the Denè consider authoritative experiences" (Goulet 1994: 119). Similar to my own research experience with the Tłįchǫ, I acquired valuable knowledge through the interview method, but the personal experience through participant-observations provided a significant understanding of the Tłįchǫ knowledge. Personal experience of listening to the Elders and personal experience on the land with the Elders should therefore be "the necessary entry point for the investigation" (Goulet 1994: 119) in Traditional Knowledge research on climate change.

Being able to open up to knowledge that lies beyond the limitations of my cultural knowledge, I needed to "listen differently" (Haig- Brown 2003: 418) to start to see the connected environment of the Tłįchǫ. Some Elders told me that the environment is changing because the humans are changing. Following my Western cultural perception, my initial interpretation was the mechanical explanation of pollution. Since the environment is both social and natural, pollution is for some Elders only one part of the situation. Due to various historical reasons, some people's behaviour and communication with the land have changed, and they do not kill animals nor use the land in culturally appropriate ways. When living in social relationships with one's environment, one's behaviour and communication is essential in maintaining sustainable relationships. Altering one's behaviour then changes one's connection to the environment, thus altering a relationship which has been significant in the

northern life throughout history. The environmental changes recorded in this thesis are indicators that the human relationships with various elements of the land are altered at a social level.

Tłįchǫ Elders knowledge of climate change cannot be told without these important links. Nor can such holistic knowledge exist independently or be separated into Western defined categories of biology, sociology and religion. The Elders describe a chain of environmental changes which is generated by the general warming of the temperature. Starting in the 1960-70s, the decrease in rain and increasing temperatures caused a drier forest which resulted in larger forest fires. The increasing temperatures also caused longer periods of unsecure ice, overflow and slush, creating dangerous conditions for travel during winter. Changes in the wind direction, caused unexpected and abnormal changes to the weather, which are hard to predict. In recent years, the caribou preferred to travel in a more northern direction than in the past, therefore the Whatì hunters need to go further north to hunt. The changes in the weather and changes in the caribou behaviour are understood, by some Elders, as reactions to the cultural and social changes within the Tłįchǫ, and the larger human society. A discontinuation of the traditional lifestyle based on hunting and spiritually communicating with the environment, is a disconnection of the understanding between various parts of the environments, including the role and place of humans. From a social perspective of the environment, such discontinuation is seen as underlying reasons for changes to the environment. Such interconnection illustrates how Tłįchǫ knowledge of climate change is a holistic form which incorporates all aspects of the environment and includes historical and spiritual knowledge which melds with empirical knowledge of the land.

Extending on Malinowski's concerns over how indigenous people can 'switch' between different types of thoughts, Nadasdy writes,

> How is it possible for them to think rationally and empirically about gardening in one moment and non-rational about gardening magic in the next? The answer is simply that they do not. Certainly, Kluane people do not switch between their empirical knowledge of moose population and their non-empirical understandings of moose as other-than-human persons. The two are inseparable for them, each informing the other and imbuing it with meaning (Nadasdy 2003: 112).

Thus, there are two points that need to be made. First, is the common belief that a singular universal reality exists; a hegemonic belief that permeates much of the debate over Traditional Knowledge and Western science. The second point is perspective-ism based on cultural understanding. Sharp (2001) writes, "where Chipewyan knowledge transcends Western knowledge, where their knowledge most offends the value of whites and leads them to disavow Denè knowledge, is not their knowledge of animal behaviour and ecology but their knowledge of their nature" (2001: 66). As Sharp implies, Euro-Canadians who have moved to the Denendeh know the land very differently than the original inhabitants. For the Denè, knowledge of the *nature* of animals means how they behave as persons. This knowledge of animal nature one cannot learn solely by observation, but can only come about through patient interaction and engagement through history.

As one singular universal reality does not exist, cultural perspective is at the base of the difference between Traditional Knowledge and Western science. Thus, in order to Indigenize Traditional Knowledge research and present unadulterated Indigenous knowledge in the debate over climate change, we must understand these points and actually start to take the knowledge of our informants seriously and literally. When we do, our work can actually start

to legitimize the Indigenous knowledge that does not align with Western categories. Furthermore, by understanding that multiple realities exists, we can document and present knowledge that can bring about sustainable solutions.

4. Closing

As I described in the first chapter, this thesis grew out of the process of working within the politically tense social environment that came about in the NWT when caribou were considered to decline. As some Elders did not recognize the government biologists' claim of a dramatic decline in the caribou population, some did not support the caribou hunting ban. As discussed earlier, hunted caribou are reborn if protocol is followed. Therefore a hunting ban would for some Tłįchǫ hunters not just prevent a decline of caribou from happening, but discontinue the relationship between the caribou and the people. Likewise, for climate related changes to slow down or alter, we should keep in mind that we are, and always have been, connected in a network of relations to the elements around us, and start to behave and communicate accordingly.

Tony Rabesca, a Tłįchǫ from Behchoko, explained to me the quote which became the name for this thesis: *"with a connection to the land, our spirit is strong"*. With these words, Tony stated that the Tłįchǫ have a strong historical connection to the environment. Tony described to me his journeys out on the land hunting and travelling alone and with his family, learning from his parents how to live successfully in the bush in the Tłįchǫ way. The connection to the land is essential for a strong identity as a Tłįchǫ person, and strong Tłįchǫ identities are

essential for a united people. Thus, when "our spirit is strong" is when Tłı̨chǫ persons and people have a strong connection to the land.

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Appendix I: UNBC Ethical Approval

UNIVERSITY OF NORTHERN BRITISH COLUMBIA

RESEARCH ETHICS BOARD

MEMORANDUM

To: Petter Jacobsen

CC: Karyn Sharp

From: Henry Harder, Chair

Research Ethics Board

Date: April 27, 2009

Re: **E2009.0420.059**

Past and future fire dynamics: implications for central arctic caribou and dependent communities

---

Thank you for submitting the above-noted research proposal to the Research Ethics Board. Your proposal has been approved.

We are pleased to issue approval for the above named study for a period of 12 months from the date of this letter. Continuation beyond that date will require further review and renewal of REB approval. Any changes or amendments to the protocol or consent form must be approved by the Research Ethics Board.

Good luck with your research.

Sincerely,

Henry Harder

Appendix II: Aurora Research Institute Scientific Research Licence 2009

SCIENTIFIC RESEARCH LICENCE
Licence # 14530N
File # 12 410 844

ISSUED BY: **Aurora Research Institute - Aurora College**
Inuvik, Northwest Territories

ISSUED TO: Mr. Petter Jacobsen
University of Northern British Columbia
3333 University Way
Prince George, BC V2N 4L5
Tel: (250) 960-6444

ON: 05-Jun-09

TEAM MEMBERS: Karyn Sharp, Translator (TBD), Field Assistant (TBD)

AFFILIATION: University of Northern British Columbia - FNST

FUNDING: NSERC

TITLE: Past and future fire dynamics: implications for central arctic caribou and dependent communities (Community based component)

OBJECTIVES OF RESEARCH:
The intent of this research is to record TEK concerning environments rebounding from forest fires, the correlation between these areas and the caribou population, and the impacts from forest fires on the communities access to caribou hunting.

DATA COLLECTION IN THE NWT:
DATE(S): June 5 to July 15, 2009
LOCATION: Wekweti, Wha Ti, Rae Lakes and Yellowknife

Licence Number 14530 expires on 31-Dec-2009
Issued in the Town of Inuvik on 05-Jun-09

Pippa Seccombe-Hett
Director, Aurora Research Institute

Appendix III: Aurora Research Institute Scientific Research Licence 2010

Licence No. 14083
File No. 12 410 844
March 12, 2010

2010
Northwest Territories Scientific Research Licence

Issued by:	**Aurora Research Institute – Aurora College** Inuvik, Northwest Territories
Issued to:	Mr. Petter Jacobsen University of Northern British Columbia 3333 University Way Prince George, BC V2N 4L5 Phone: (250) 960-6444 Email: petterljacobsen@gmail.com
Affiliation:	University of Northern British Columbia - FNST
Funding:	NSERC
Team Members:	Karyn Sharp, Translator (TBD), Field Assistant (TBD)
Title:	**Past and future fire dynamics: implications for central arctic caribou and dependent communities (Community based component)**
Objectives:	The intent of this research is to record TEK concerning environments rebounding from forest fires, the correlation between these areas and the caribou population, and the impacts from forest fires on the communities access to caribou hunting.
Dates of data collection:	March 11-31; July 31 - October 1, 2010
Location:	Wekweeti, Whati, Gameti and Yellowknife

Licence No.14083 expires on December 31, 2010
Issued in the Town of Inuvik on March 12, 2010

* original signed *

Pippa Secoombe-Hett,
Director, Aurora Research Institute

Appendix IV: Tlicho Government research approval

Tłı̨chǫ Government
Box 412, Rae-Edzo, NT X0E 0Y0 • Tel: (867) 392-6381 Fax: (867) 392-6389 www.tlicho.ca

Interdisciplinary Studies Program
University of Northern British Columbia,
3333 University Way,
Prince George, B.C. V2N 4Z9

May 1, 2009

To: Petter Jacobsen, IDIS Candidate

Re: E2009.0420.059 - Past and future fire dynamics: implications for central arctic caribou and dependent communities (Traditional Knowledge Research Project)

The Tłı̨chǫ Government has received your proposal for the Traditional Knowledge Research Project under the University of Northern British Columbia on Tuesday, April 8th, 2009.

The Tłı̨chǫ Government has accepted your application for the Traditional Knowledge Research Project Proposal from April 1, 2009 to March 31, 2010. Any changes or amendments to the protocol will require an approval by the Tłı̨chǫ Government.

The TK Project Team needs to consult with the Dept. of Language, Culture & Communications and Lands Protection under the Tłı̨chǫ Government on community tour to Behchokǫ̀, Whatì, Gamètì, and Wekweètì.

The Tłı̨chǫ Government will require final report of the Traditional Knowledge Research Project on caribou ecology, fire dynamics, and human use patterns of caribou within a landscape model designed to understand and forecast the long terms implications of climate change for the distribution of barren-ground caribou on the Bathurst herd's winter range. Have a safe journey and Masi Cho.

If you require more information contact me at (867) 392-6381 or e-mail to tonyrabesca@tlicho.com

In Tłı̨chǫ Unity,

Tony Rabesca,
Dir. Of Language, Culture & Communications

C.C: George Mackenzie, Grand Chief
C.C: John B. Zoe, (TEO) Tłı̨chǫ Executive Officer

Appendix V: Information Statement

Information Statement

Traditional Knowledge research project

This research project is about Traditional Knowledge of forest fires and the Bathurst caribou herd. I, Petter Jacobsen would like to conduct an interview with you about the increase of forest fires and how these affect caribou behaviour, movement and population size. The research will be included in a model to enhance the management of forest fires and caribou in the Northwest Territories.

This is a voluntary interview and if there are any questions you don't want to answer you do not have to. You may terminate the interview at any point and can withdraw from the research process at any time. Your name will not be associated with any of this work and I will not publish or credit your name in any printed or presented work, unless you should request it. Also, should you request it anything that you say here will not be discussed outside of this interview so as whatever is disclosed will remain confidential.

If you would like copies of any works stemming from this research, published papers or presentations, I will forward it in to you. If you would like any copies please contact myself at the address provided.

If you have any comments or concerns please contact Karyn Sharp (UNBC) by phone: 250-960-5118 or email: sharp@unbc.ca, or Office of Research reb@unbc.ca or 250-960-5650, or Petter Jacobsen by phone: (250) 960-6444 or email: jacobsen@unbc.ca

Appendix VI: Interview guide 2009

The relationship between climate change and caribou?

1. Have you notice a change in weather and climate since you were young?
   - what specifically has changed?

2. How does the change in climate affect the caribou?

The relationship between caribou and forest fires?

3. How is caribou affected by forest fires?
   - Forest fires and caribou migration/ health?

4. Have forest fires become worse over the years?

The relationship between caribou and the people?

5. Is caribou the most important country food for you and your family?
6. Have climate change changed ways of hunting caribou?

   - How does that affect the community?
     -socially?
     -economically?
     -Culturally?

Appendix VII: Report presented to the Tlicho Government, October 20th 2011, Yellowknife, NWT. Tlicho Elders Knowledge of Climate Change and Forest Fires: Implications for Barren-Ground Caribou Hunting

A Study in Traditional Knowledge with Tłı̨chǫ Elders in Whatì

Petter Jacobsen M.A.
University of Northern British Columbia

UNBC Copy Services.
Phone: 250 960-6464
University of Northern British Columbia
3333 University Way,
Prince George, B.C. V2N 4Z9

Acknowledgement

I would like to thank the following Elders and Knowledge-Holders for sharing the knowledge and stories. The report is based on the Traditional Knowledge of these Elders and Knowledge-holders and would not be possible without them

Francis Simpson
Louis Simpson
Benny Jeremaicka
Charlie Zoe-Nitsiza
Marie Flunkie
Narcisse Bishop
Joseph Moosenose
Louis Wedawin
Dora Nitsiza

Special thanks to Tony Rabesca, in Bechoko, and Sonny Zoe who were instrumental in facilitating for the project. Also, members of the Whatì community government have been very helpful throughout the research.

I would also like to thank Albina Nitsiza and Isodor Zoe for the translation work they have done. Their fluency in both Tłı̨chǫ and English made the translations efficient and effortless. The explanations they provided to the researcher before and after interviews facilitated greater understanding of the issues discussed. Also, their knowledge of the community and the Elders made the project proceed much easier.

Executive Summary

This report describes the Tłı̨chǫ Elders' Traditional Knowledge of climate change, forest fires and implications for caribou and caribou hunting. The report is based on research with Elders in Whatì during summer 2009 and winter 2010.

The Tłı̨chǫ Elders have experienced environmental changes during the last decades and the implication these changes have for hunting and travelling on the land. The environmental changes are summarized into: warmer and drier weather, changes to wind pattern, and changes to snow and ice conditions. The implications these changes have for the caribou are explained and emphasized with quotes from the Elders. As the Tłı̨chǫ live closely with the land, these environmental changes impact hunting and travelling on the land. The Tłı̨chǫ Elders respond to these environmental changes by acquiring new knowledge and adapting their ways of hunting caribou. These adaptations is generalized into: changes of hunting locations, modified time for hunting, uncertain weather predictions, and an increased focus on safety. Together these impacts and adaptations create a greater reliance on cash to sustain hunting. Recommendations for climate changes adaptations are made based on the Elders suggestions.

This report has detailed description of caribou movement in relation to fires and burned areas, including habitat recovery and its impact on caribou health and migration. Forest fire suppression recommendations are made for important feeding grounds for caribou, which in turn are valuable hunting areas for Tłı̨chǫ hunters.

Lastly, this report explains some of the Elders perspectives of climate change. These perspectives portray ontological understandings of the environment based on a holistic reasoning of climate change. By placing the behavior of humans into the environmental system, the Tłı̨chǫ Elders' perspectives portrays the importance of the human role, as hunters and harvesters, in the environment based on a historical and spiritual relationship; a connection that the adoption of a modern lifestyle is eroding.

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Introduction

This study is based on the Traditional Knowledge of the Elders in Whatì. This report is made for the people in Whatì, for the Elders who participated in this study, and especially for the younger generations to learn more of their Elders' knowledge. The purpose is to share the knowledge recorded in the study so people in the community can learn about: what specifically is changing in the climate; about forest fires; how climate change and forest fires are affecting the caribou; and how this affect caribou hunting. Some of the Elders have also shared their perspectives for why these changes are happening in the climate and how changes towards a modern society and human behaviour are part of creating these changes. Taking these perspectives into consideration can help improve the younger generations' knowledge of the land and connect the people to the land and animals.

This report is divided into five sections: 1) the environmental changes experienced by the Elders, and implications for caribou, 2) caribou movement parallel to forest fires and burned areas, including habitat recovery and its impact on caribou health and migration, 3) valuable caribou feeding grounds, 4) impacts of climate change for caribou hunting, and 5) Elders perspectives on climate change.

Researcher

The principal researcher is Petter Jacobsen, an Interdisciplinary Studies master student at University of Northern British Columbia (UNBC). Originally I am from Oslo, Norway. I have a Bachelor of Arts degree in Anthropology from UNBC. Karyn Sharp is my supervisor and a professor in First Nation Studies at UNBC. She is Denesuline from Black Lake, Saskatchewan. As principal researcher, I have tried to spend as much time in the Tłı̨chǫ communities, participating in events and daily activities. I wanted to learn about Tłı̨chǫ culture from the Tłı̨chǫ themselves and have tried to immerse myself into the culture as much as I can. I am very interested in outdoor activities and have tried to participate in many trips out on the land, during my stay with the Tłı̨chǫ. I am experienced in the northern environment from my upbringing in Norway, and through these trips I gained insights into how the Tłı̨chǫ travel, learn from and interpret the land.

This research is part of a larger project regarding forest fires and its affect on the Bathurst Caribou Herd. The knowledge produced in this research will feed into the larger project's goal to produce models of the past and future fires regime in the Northwest Territories.

Traditional Knowledge

The Tłı̨chǫ Elders have immense knowledge of the land. As climatic changes are increasingly impacting northern regions, the knowledge of the Elders needs to be taken into consideration to inform on climate change, as people living in the north are the ones who experience the changes in their daily lives. Most knowledge of climate change come from the scientific community, but this only represents one way of acquiring knowledge. Traditional Knowledge is therefore a medium to broaden our understanding of climate change, and also includes the local communities in the production of knowledge about climate change.

Traditional Knowledge looks at the complex whole in which all factors impact others, throughout the natural system as a whole, and places little emphasis on individual parts in isolation from its interactive environment. The concept of Traditional Knowledge is interpreted in various ways, but I consider Traditional Knowledge as "the culturally and spiritually based way in which indigenous people relate to their eco-systems" (LaDuke 1994, Spak 2005: 234). This definition includes more than a physical, technical interpretation of Traditional Knowledge; rather this interpretation emphasizes the interrelationship between the physical and the spiritual in Traditional Knowledge. This worldview emphasizes the importance of respect in the relationship between humans and animals. Traditional knowledge is not solely a system of knowledge, it is also "seated in a way of life" which is based on "generations of cumulative culturally transmitted knowledge about particular environments" (Kendrick 2005: 177).

Methods of Research

The research was based on interviews and participant observation. I interviewed nine Elders over the two year period. During summer 2009 eight interviews were completed, three of these were audio recorded and one video recorded. During winter 2010 seven interviews were held again with the same Elders from 2009, and five of these were audio recorded. I took hand-written notes of the interviews which were not audio-recorded.

The interviews were based on a semi-directed interview technique. I directed the discussion with certain topics and questions, but the participants could freely open up and express themselves in the way they felt most comfortable. Some interviews during the second field period were unstructured, where the Elders continued talking with little interruption by myself. The difference in interviews was based on the characteristics of the Elder. Some Elders liked to explain more than others and expressed their knowledge in long monologs. During these interviews I found that there was little point in asking many questions because the Elder shared what he/she felt was important to explain, at that point in time. The interviews were divided into four areas: changes in the environment, how caribou are affected by/ adapt to climate changes, caribou's reaction to forest fires, and how climate changes are

affecting caribou hunting. The second period of research, during winter 2010, included discussions regarding the understanding and reasons behind climate change. The interviews were held in the homes of the Elders, except two interviews done in the community government's chamber. Honorariums for their participation were given in the form of money and gifts of dried fruit were given. At the end of the research, I visited each Elder at their house to provide the transcribed interviews, the research report, photos and gifts of scarves and water bottles.

The Elders were chosen based on their extensive and long-term experience and knowledge of the land. These Elders were identified as having personal experience with the land since the 1940-50s, and are recognized for their Traditional Knowledge which was learned from their ancestors. In collaboration with a community leader and the translator, a list of knowledgeable Elders was generated. These Elders then identified other knowledgeable Elders (i.e. snowball technique).

Albina Nitsiza worked as an assistant and translator for the interviews during summer 2009, and Isodor Zoe during February 2010. The assistants arranged the place and time of the interviews with the Elders. I also arranged informal interviews with community members; sitting outside the community store proved to be an effective place to chat with people about my research and make arrangements for interviews.

A topographic map over a large area around Whatì and Marten Lake, from Great Bear Lake to Bechoko, Gameti and Snare Lake was brought to the interviews. These worked as a reminder of the places of fishing, hunting, trapping and longer trips done throughout the Tłı̨chǫ land. The map included marked areas of recorded forest fires since 1970s, which provided useful way of explaining movement of caribou around burned areas according to which year the burns occurred. The map made it easier for the Elder and me to connect to the same land, and to discuss specific places of interest and significance for the Elder and his/ her family. Through the knowledge and stories shared about areas on the map, the map connected me to the significance of the land and caribou for the Tłı̨chǫ Elders.

I participated in several trips on the land with Elders and hunters. During summer 2009, several trips were made on Marten Lake and during winter 2010 several hunting trips were made to the north-east side of Marten Lake and Kwet'ootî (Grandin Lake). Through these trips I gained insights into how the Tłı̨chǫ travel, learn and relate to the land. Participant observation was an essential method to learn the context of the knowledge documented in the interviews. Valuable knowledge was documented in the interviews, but the extent of learning Traditional Knowledge through interviews is limited. My experience was that interviews only get the research to a certain point because not all aspects of Traditional Knowledge are shared in an interview setting. While conducting participant observation, the Elders shared knowledge that they would not explain in an interview setting. Researching the Elders' knowledge is at times a process of learning detailed knowledge from individual Elders,

because during particular situations Elders explained specific knowledge, instead of when I asked directly. Thus, the methods of participant observation and interviews had a complimentary function, in order for me to learn more of the Traditional Knowledge of the Elders.

Research Community: Whatì

The community Whatì, formerly called Lac la Matre after its location besides Marten Lake, lies on the shore of a large bay on the southeast side of the Lake. Across from the community extends a long narrow peninsula, which creates a bay in Marten Lake. Just south of the community, the lake runs into the la Martre River which runs south into Marion Lake and from there further into the Great Slave Lake, working as a connection to the other communities.

Figure 1: Photo of the Tłı̨chǫ community of Whatì, June 2009. Photo: Petter Jacobsen

Marten Lake runs from northwest to southeast, and contains numerous islands. These islands are used by people in Whatì to set up fishing camps during the spring and summer. Many people also construct cabins on the islands, which they use all year for fishing or hunting trips, or just as a get-away. The northern side of the lake is recognized as a good area for hunting caribou, and a common destination during the winter months. The forest on the western side is said to be good moose hunting territory in the fall. Numerous beaver lodges and muskrat lodges exist throughout the region, which is widely hunted during the spring months.

Today, the community is the only permanent village on the lake, but historically there were many permanent cabins where people lived at various times of the year. On the northern side

of the lake, where the Grandin River enters the lake, there was a permanent village site with several cabins, called Egakinlin (Helm 1961). In 1954, the remaining households moved to the main village at Whatì, mainly because of the construction of a school and the shorter route to the trading post in Bechoko. The time of the first houses in Whatì is uncertain, but for several decades the two villages at the southern and northern side of the lake coexisted (Helm 1961). Today, a couple of trapper cabins have been constructed in the northern area.

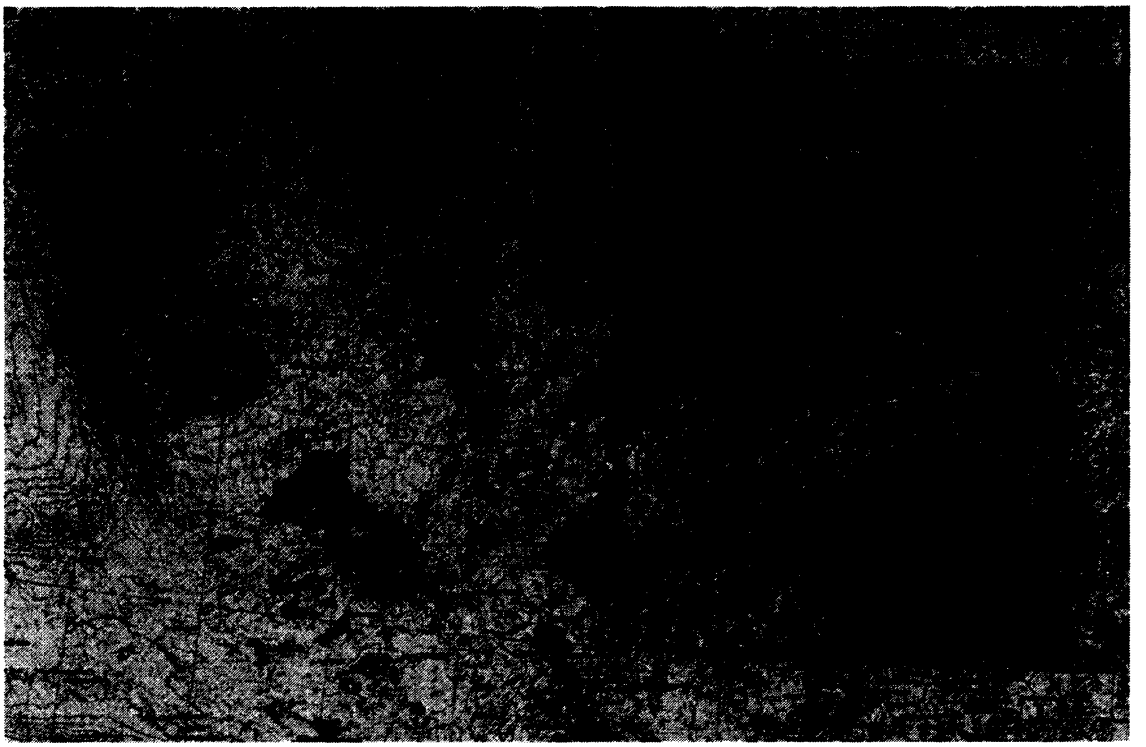


Figure 2: topographic map of the Tlicho land.

There is limited literature on the history of the Whatì community, as well as the other Tłı̨chǫ communities. This description of Whatì is based mostly on the peoples' stories of the area. Dora Nitsiza, an elderly Tłı̨chǫ woman in Whatì, explained,

> people hardly stayed in the community because they always travelled after the caribou. Here in Whatì they just passed through. They started building cabins here because of the fur trader that was stationed here. Here was a portage. People stopped here when they were on their way to Grandin Lake and towards the Sahtu region. They travelled on the traditional trails, which the people have travelled on for thousands of years. The bush was their store, where they got the food, it was their livelihood and to keep them safe. They had a house here in Whatì but they didn't live here all the time (Dora Nitsiza, February 2010).

The nomadic lifestyle required people to travel to different places throughout the land that provided resources at different times of the year. Dora Nitsiza explained further,

> In 1920s there were only a few houses in Whatì. People stayed from fall till April out on the land hunting, and when it got warmer in the summer they would come back to Whatì. The people would go with the seasons. In the fall they would go with boats from the community, and during winter they would hunt and fish. When spring came, they would go spring-hunting, and when the weather got warmer they went back to the community. Here they would clean up around their houses and make everything ready for the next season (Dora Nitsiza, February 2010).

As permanent occupancy in Whatì does not support the traditional seasonal round, it was not until the construction of a school in Whatì that people started to adopt a more sedentary lifestyle and to live more or less the whole year in the community. The communities of Whatì and Bechoko, which lies further south, are the most populated of the four Tłı̨chǫ communities. Louis Wedawin, a Tłı̨chǫ Elder, explained that these places have the largest secure supply of fish, so if the people could not go, or did not get caribou, they had an alternative resource to live on (Louis Wedawin, February 2010).

Historically and today, the people in Whatì have relied on all the available bush resources within the Mowhi Gogha De Niitlee. The waterways northwest to Kwet'ootî (Grandin Lake) and the land towards the Sahtu region are often used. Also, the waterways connect to regions southeast towards Bechoko. The area southwest of Marten Lake towards Æedèezhìì (Horn Plateau) is also used, but more on an occasional basis, for example for moose hunting. The isolated community is only accessible by vehicle on an ice road open from January until March. Most of the outside resources such as gas, furniture and heavy equipment are transported at this time. During the rest of the year the community is only accessible by plane.

1. Climate Change and Implications for Barren-Ground Caribo

This section outlines the environmental changes and implications for barren-ground caribou. The environmental changes are summarized into: 1) warmer and drier weather, 2) changes to wind pattern, and 3) changes to snow and ice. The implications these changes have for the caribou are explained and emphasized with quotes from the Elders.

Warmer and Drier Weather

The Elders explained that 'back in the days', approximately 40-50 years ago, it was much colder and the weather has become warmer over the years. During that time, trees would crack in the cold weather. An Elder explained, "in the old days, you set up the tent, you could hear the ice just cracking in those days. And the trees like this [spruce] just crack" (Benny Jeremaik'ca, June 2009). The warming of the weather causes the winter to come later. The Elders say that the caribou follow the cold weather. The Elder Charlie Zoe-Nitsiza explained, "back in the days, caribou travel in October, or November, because it was colder. Now they travel around Christmas" (Charlie Zoe-Nitsiza, June 2009). As the weather becomes warmer, the caribou are reported to stay longer on the tundra, until December. This means that the caribou travel south into the forest, and towards the Tłı̨chǫ communities later in the fall. The hunter Joseph Moosenose explained, "in December I still see caribou hanging around the BHP mine in the tundra, in the old days they used to go all the way to Whatì, but now the weather is warm and that's why they want to stay around in the tundra, where it's colder (Joseph Moosenose, June 2009). Another Elder, Francis Simpson expressed the same observation, "it's different now. In older days when it was colder, the animals liked it when it was cold because that's how they were build for" (Francis Simpson, February 2010).

According to the Elders, the increasing temperatures have consequences for the forest which is reported to be in a drier state. The Elders have also observed that it rains less. The rain does not last as long as before, and during the periods of rain it does not shower like in the past. Also, the frequency of rain has decreased from the 1970-80s. The land and forest are therefore drier. When it is dry, the 'adzii' (lichen) grows slower. The Elder say that the 'adzii' is in a drier state. Dora Nitsiza explained, "It is getting warmer and it is getting drier. It is getting too dry, so the food for the caribou is too dry and dies" (Dora Nitsiza, February 2010). In this dry environment, forest fires resulting from lightening occur more frequently. Most Elders say that there are more and bigger fires than earlier. The large fires burn the caribou feeding grounds and some Elders note that this is one of the reasons some caribou are skinny.

Changes to Wind Patterns

The Elders explained that nowadays, there is hardly any wind. Francis Simpson explained that "everything follows the wind. The animals follow and watch the wind. The wind is a fortune-

teller" (Francis Simpson, February 2010). Thus, the wind directs action for the environment. Caribou travel better when it is windy. Francis Simpson explained that, "the caribou walk against the wind, because they like the wind in their face, so they go against the wind. If its north wind, they walk towards the wind" (Francis Simpson, June 2009). Another Elder described how, "back in the days when its north wind, the caribou travel to our place quickly" (Charlie Zoe-Nitsiza, June 2009). When it is windy the caribou stay together and are not scattered around. With a decrease/lack of wind, the caribou move around less and are said to be scattered around in smaller groups. Some Elders say that the caribou populations are not declining but that rather the caribou are scattered and do not move in large herds as earlier. Changes in wind pattern thus correlates with changes in the caribou herds' behaviour.

Elders also described changes in the wind patterns. For example, in Whatì the winds from the south and west are usually warmer than the winds from the north and east, but in recent years, the winds from the north and east are sometimes warmer. These changes also create difficulties in weather predictions, as Dora Nitsiza explained

> People used to know which direction the wind was going to blow. If some guys planned to do a trip somewhere, then the people would know what kind of weather would come. If [the wind] came from the north and east it would be very cold, and if the wind came from west and south it would be warm. Now it is different, sometimes the wind from the south is cold and also the wind is cold from the west. Now the north wind is warmer than wind from the south, also wind from the east is warm (Dora Nitsiza, February 2010).

Changes to Snow and Ice

Most of the Elders stated that there is an increase in the amount of snow and changes to the consistency of snow. 'Nowadays' the snow is around 4-5 feet deep. The Elders say that 'back in the days' the snow was harder and one could walk on top of the snow. Now one often falls through the snow because it is loose. The consistency of snow is largely based on the wind. A strong wind would blow the snow away and pack the snow hard. The decrease in wind makes the snow loose, which makes it more difficult for the caribou to travel. With strong winds, the snow would be packed hard and the caribou could more easily run on top. Charlie Zoe-Nitsiza explained,

> back in the days used to be wind, so the snow wasn't that deep because the wind would blow the snow away, so it is harder for caribou to eat now, snow is now four feet deep. Back in the days, people can walk on the hard snow, now people will fall in, because it is not so hard. That is why it's harder for caribou to travel because they fall through the snow (Charlie Zoe-Nitsiza, June 2009).

In such conditions, the caribou use more energy on walking and traveling through the deep and loose snow. Instead, the caribou tend to stay in one area, unless they are noticed by people. In the deep snow it is harder for the caribou to dig for lichen compared to earlier times with less snow. Some caribou are reported to be skinny during the winter, as they use more energy on walking and digging through the deep and loose snow.

Figure 2: Caribou running through the snow, north of Marten Lake, February 2010. Photo: Petter Jacobsen

Elders explained that because of the warming of the weather, the ice on the lakes and rivers freezes later in the fall. The ice is also thinner during the winter from around 6-7 feet to around 2-3 feet today. Several Elders reported that because of the thin and unstable ice, some caribou fall through the ice. Charlie Zoe-Nitsiza explained, "in the winter it is not that cold, so ice doesn't freeze that fast, so caribou fall through" (Charlie Zoe-Nitsiza, June 2009). Joseph Moosenose described that "on the Æîts'èetì (Hottah Lake) on the northwest side [a hunter] went there with skidoo hunting and see a whole bunch of antler sticking up [through the ice]. Just before Christmas" (Joseph Moosenose, February 2010).

In the fall, there is a longer time period with fluctuating temperatures that freeze and thaw the ice. The warm periods creates overflow and slushy conditions on the lakes and rivers, especially if there is a lot of snow followed by a warm period that melts the snow on top of the ice. During periods of slushy conditions, the caribou prefer to travel in the forest. These changing weather periods, between cold and warm weather, also create a crust on the ice,

which is hard to travel through for the caribou. Some Elders reported observations of damaged ankles, hooves and legs. Francis Simpson explained,

> the caribou watch their hooves. They don't like to travel, when it has frozen over after it melts because they got to watch their hinds, because if they step through the hard pack of snow it damages them, even the ice damages the hooves. If that does happen they are going to get sick. Not only because of the mining, but because of the hard pack of the snow it wears the hair fall of the hooves, but the caribou are really cautious to make sure they keep it. Because if they don't they are going to damage it. It will damage their feet and you will not be able to walk. That's how caribou are they are very careful. And they have to take care of their hind, their feet (Francis Simpson, February 2010).

Summary

The Elders have explained various environmental factors of climate change. These environmental changes are affecting the caribou and their habitat. The overall warming of the weather is affecting most other elements on the environment. As the weather becomes warmer the forest becomes dryer. Along with a decrease in rain, the dry forest is more susceptible for forest fires and when it burns, larger areas are burned. The Elders explain that forest fires are easily ignited by lightening or other agents.

In a dry forest, the main food for the caribou, lichen, grows slower and with an increase in larger forest fires that burns large areas of lichen covered forest, caribou feeding grounds are reduced. As the main food for the caribou diminish, the caribou need to change their migration patterns to find areas with good feeding grounds. Travelling through deep and lose snow is more energy exhaustive, than in the older days when the strong wind and cold temperatures packed the snow hard.

Some Elders explain that during times of significant negative changes in the habitat and life of the caribou, the caribou will not get pregnant. The best way to determine the state of the caribou health is to examine the unborn caribou fetus to see if they are healthy or skinny. The Elders explained that examining the caribou's intestines also is a good indicator of caribou health.

The environmental factors described affect the habitat for the caribou, and as the environment is changing the caribou adapt to them. But the caribou are not merely an object that adapts according to the changes in the environment. Most Elders persistently explained that no one can know or understand all the ways of the caribou and that no one can decide or manage for the caribou. The Elders say that the caribou are like persons; they care for themselves just like us humans. Each individual caribou and each caribou herd have their own individual will to

decide what they want to do, where to go, what to eat and where they want to travel. Dora Nitsiza explained that, "Caribou has its own way to survive, they are like human beings. How will they survive? They will probably change what they eat" (Whatì, February 2010). As the Elders explain it, various factors in the environment are changing, but the caribou have their own choice as to how to react and adapt to the changing climate. This interpretation will be discussed further in the last part of the report.

2. Forest Fires and Caribou Movement

Most Elders expressed concerns about the increase in forest fires and in larger fires, which is different than in the old days. Only a few Elders said that they did not know if there are more forest fires lately than in past. But most Elders expressed concern over the fire's destruction of the caribou feeding grounds. Some caribou were reported to be skinny and not as healthy as they used to, because forest fires burn away large areas of their food. One elder said that smaller fires can be good for the environment, but the larger fires that they experience lately, have severe consequences for caribou health and movements.

After the large fire east of Whatì during the summer of 2008, the Elders know the caribou are not likely come back to this and the surrounding area for the next ten years. There is no food for the caribou in this large area, so instead the caribou will travel north of this area, towards Kwet'ootî (Grandin Lake) and Gameti, where the caribou know there are good feeding grounds. A hunter explained, "the caribou used to go straight towards the area around Whatì but it didn't happen this year because this area was burned. That's why the caribou didn't even come close to Whatì at all" (Joseph Moosenose, Whatì, June 2009).

The caribou travel away from burned areas. The burned areas smell for a couple of years even after it has stopped burning. The caribou have good sense of smell, so they will avoid the burned areas for a long time. They smell the black ash and smoke from the burns, which tells them that there is no food for them in the area. Instead, the caribou will go 30-40 miles away from these areas. Sometimes, during the fall and spring migration, the caribou will go through burned areas, but they go straight through in a fast pace. Most often they avoid the burned areas.

Figure 3: Forest burned in 2008, east of Whatì. Photo: Petter Jacobsen

The Elders say that the caribou remember where the forest fires have been. For years the caribou will avoid these areas and rather travel to where they know there are good feeding grounds. The burned areas therefore alter the caribou migration routes. The burned areas make them take a different and usually northern route to other areas where they know there are good feeding grounds.

Return of Caribou to Burned Areas

After two to three years the vegetation starts to grow back. Some Elders stated that the caribou starts coming back to burned areas after five to ten years, when the lichen and moss starts to grow again. Most elders said that usually it takes at least 10 years for the caribou to come back to burned areas, and in some cases up to 20-30 years before the caribou returns to a burned area.

The Elders showed examples of caribou movement in burned areas:

- Areas northeast of Marten Lake that were burned in 1979, in 1982 and one area burned in 1994 have grown back to normal now and the caribou travel and eat in these areas.

- Areas burned in 1994 north of Marten Lake there were still no sightings of caribou

- In an area south of Æezôtì (Ghost Lake) that burned in 1998 there has been little growth of lichen, so still no sight of caribou tracks nor caribou, twelve years after the burn.

The Elders explained that there are various factors influence the intensity and rate of growth of vegetation. The intensity of the fire and how far down into the ground it burned, influences the amount of time before vegetation starts to grow back. Also, vegetation regrowth depends on the amount of rain, snow, elevation and exposure to sun.

Forest Fire and Suppression

All the Elders remember when they used to take out forest fires right away. This was done so the fires would not intensify and continue to burn good caribou feeding grounds. Francis Simpson remembered, "back in the days they would fight right away and not let them burn. So there was lots of caribou food, and lots of caribou around here [Whatì]" (June, 2009).

Most Elders feel that the current fire suppression is not sufficient. Instead of letting fires burn when there are no dangers to communities, the Elders want the fires to be taken out as soon as possible to avoid destruction of good feeding grounds. Francis Simpson explained further, "back in the days, soon as they spot fires, we would fight fires. We worked all day. We didn't want to let our land burn down, cause we wanted to protect it. Now they just let areas just burn, but they should take it out" (Whatì, June 2009). The Elders in Whatì expressed discontent with having firefighting crews ready, when the crews are not going to fight the fires that destroy the caribou feeding grounds.

3. Valuable Caribou Feeding Ground

The summer and beginning of fall until November, when the caribou are in the barren-grounds, are the most important feeding time for the caribou. During this time period they become healthier and fat. The barren-grounds are regarded as the most important feeding grounds for the caribou. During the migration, in fall and spring, the caribou spend a lot of energy and do not eat that much, so they become thinner. In the early winter they also eat well, but as the winter progress with increased snow it becomes harder for the caribou to feed. The caribou then dig through the snow, or if there is a lot of snow they will also eat the lichen off the trees. If there is a lot of snow, they will stay in an area where they find sufficient amount of lichen, until they are bothered by predators or people.

Lichen on the ground is regarded as the most important food during the whole year, but lichen on the trees will be eaten at times when there is lots of snow. Grass along rivers or lakes are also valuable food during the summer and in spring when the snow starts to melt, and some Elders mentioned that caribou particularly like the semi-rotten grass along lakes. The caribou will also eat the tips of willows and birch branches.

Whatì Elders indicated several forest areas (see figure 4) that are valuable feeding grounds for the caribou, which should be protected in case of forest fires:

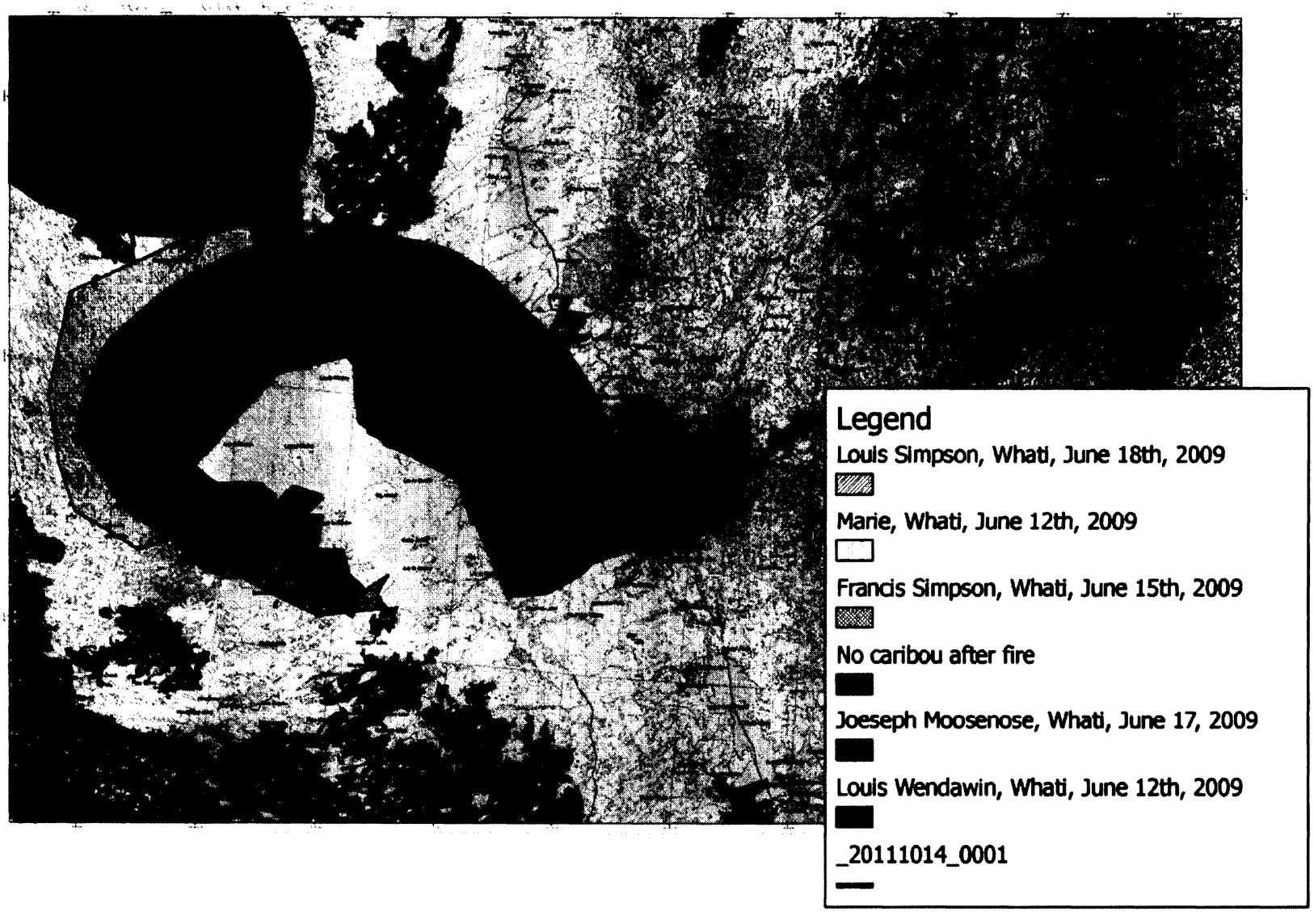
- The forest areas east from Whatì towards K'eàgotì (Hislop Lake) and from the northeast side of Marten Lake towards Semïtì (Faber Lake) are good feeding grounds. Mainly because this is not rock country and there are lots of swamps and lichen covered forests.

- Northwest side of Marten Lake is valuable feeding grounds for the caribou.

- The area around Grandin River is especially good feeding grounds. There is lots of grass along the river that the caribou eat.

- The forest all around Kwet'ootî (Grandin Lake) are attractive feeding grounds.

These forest areas are important feeding areas for the caribou which they return to every winter. All the areas noted are also important hunting areas for the Tłı̨chǫ hunters in the future, especially after the introduction of the hunting ban in their other hunting areas.


Legend
Louis Simpson, Whati, June 18th, 2009
Marie, Whati, June 12th, 2009
Francis Simpson, Whati, June 15th, 2009
No caribou after fire
Joeseph Moosenose, Whati, June 17, 2009
Louis Wendawin, Whati, June 12th, 2009
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4. Impacts of Climate Change and Forest Fires for Caribou Hunting

This section outlines the implications climate change has for caribou hunting for Whatì hunters during winter months. Hunting, travelling and activities out on the land are intrinsically based on weather and environmental conditions. The Tłı̨chǫ have immense knowledge of their environment and how to live successfully and comfortably in the sub-arctic climate. Over the last several years, changes are occurring to the weather as described by the Elders above. The Tłı̨chǫ therefore respond to these environmental changes by acquiring new knowledge and adapting their subsistence activities to the changing conditions. These adaptations to environmental changes is generalized into; 1) change of hunting locations, 2) modified time for hunting 3) uncertain weather predictions, 4) increased focus on safety, and 5) increased reliance on gas and money.

Change of Caribou Hunting Locations

The large forest fires and the increase in temperatures make the caribou stay further north. During summer of 2008, a forest fire burned a large area east of Whatì. As there is no forage, the caribou will not travel through the area but rather move north to better feeding grounds. Therefore, caribou did not come towards the forests around Whatì. Instead the caribou travel towards the forests north-east of Marten Lake and north to Kwet'ootî (Grandin Lake). As a consequence, the hunters need to modify their locations for hunting and travel farther to locate caribou in these northern areas. Benny Jeremaik'ca explained, "caribou used to be around town before, and we didn't have to go far to shoot caribou. Now probably because of the big forest fires the caribou go north passed Rae Lakes and to Grandin Lake. They go to where the food is. (Benny Jeremaik'ca, February 2010). Another hunter explained, "it's different now. We used to go to Rae lakes and by the end of the lake. Haven't been to Grandin Lake in a long time. It's the first time I go back there in 30 years" (Joseph Moosenose, February 2010).

Before, hunters used to come to Whatì from other communities to hunt caribou, but now these hunters usually have to go further north along the ice-roads to Gameti and Wekweeti. Now that one cannot hunt caribou in close vicinity to the community, a hunter's opportunity to get caribou is a long snowmobile ride to the end of Marten Lake and to the Kwet'ootî (Grandin Lake) area. In earlier times, people used to traveling long distances and using dog-team for transportation would require time and not money, but with the use of the snowmobile, hunting has in many ways become a monetary issue. This will be discussed later in the chapter.

Figure 5: caribou hunting camp at Kwet'ootî (Grandin Lake), February 2010. Photo: Petter Jacobsen

Modify Time for Hunting

As the weather becomes warmer there are longer periods of fluctuating temperatures during the fall. The Elders told me that the ice does not freeze as fast and as early in the fall, as was common 'back in the days'. Thus, hunters need to wait for the cold temperatures to stabilize before they can travel on the lakes with the skidoos. In the past, the caribou moved into the forest around October and November because it was colder. The Elders noted that during the last couple of years the caribou moved into the forest at a later time, in December. As one Elder explained, "sometimes the caribou come early, but sometimes it doesn't come until December. It depends on the weather too. If it's too warm, it's no good" (Benny Jeremaik'ca, February 2010). The Elders explained that the delayed migration into the forest was due to the caribou's preference for the colder weather on the tundra and because of the later freeze-up of the lakes and rivers further south. In the spring, some caribou move back to the barren-land earlier. The Elders have noticed that the caribou spend less time in the forest. Francis Simpson explained that "in the past, in that time the caribou would move in November and they used to live in the north, living with us. And they didn't go anywhere. That's where the food is and everything they want is there. Caribou used to stay longer in the forest with us" (Francis Simpson, February 2010). As a consequence some Elders explain that the time of hunting trips has been modified, by waiting for the ice to freeze properly and for the caribou to arrive into the forest.

Uncertain Weather Predictions

Most Elders and experienced hunters are able to predict the weather. This is an essential skill for successful travel out on the land. The Elders explained how they used to watch the wind before planning a trip, to see what kind of weather was coming. These predictions are based on their detailed knowledge of wind patterns, but the Elders explain that now they have difficulties predicting the weather as they did in the past. Making accurate predictions to plan future hunting trips is difficult. Now hunters need to deal with unpredictable wind patterns and unexpected changes in the weather. This creates uncertainties when planning hunting trips and travelling out on the land.

Focus on Safety

There are always certain areas with open water that the people know about, such as the start and end of the Grandin River, south of Kwet'ootî (Grandin Lake). The warmer weather creates periods of unsecure ice and overflow on the lakes and rivers. This creates dangerous situations on hunting trips as the travelling conditions on rivers and trails unexpectedly change. As the conditions change, hunters need to travel new routes to avoid areas with slushy and overflow condition, in order to get to hunting grounds.

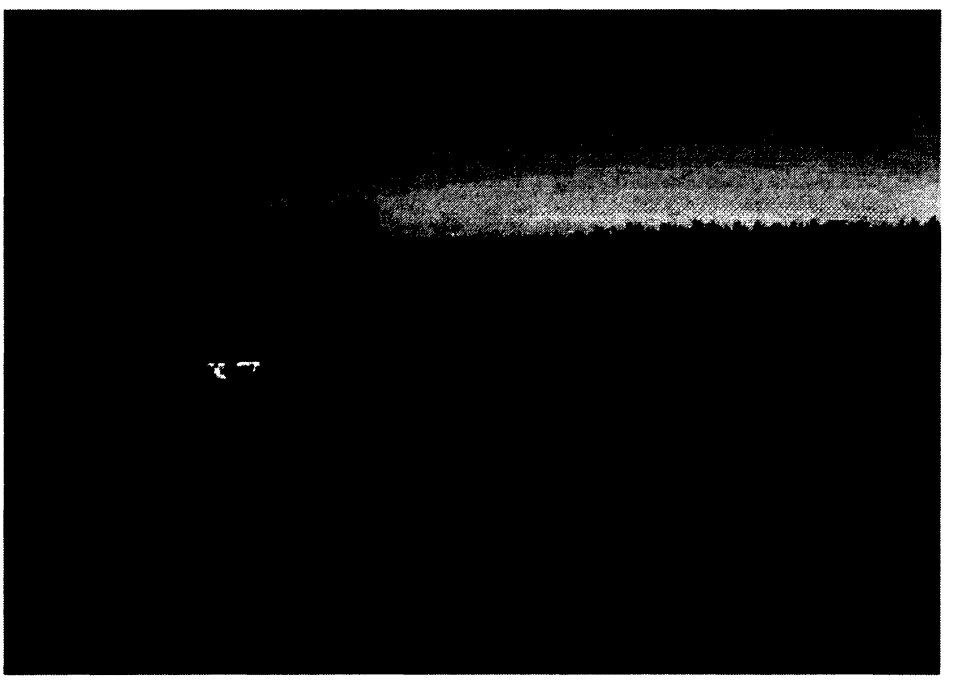

Figure 6: Jerry Simpson by open water on Grandin River, February 2010. Photo: Petter Jacobsen

The Elders advise people to travel in groups, who can provide help to each other if snowmobiles get stuck in the changing travelling conditions. Joseph Moosenose explained:

> One person cannot travel alone. You can go through the open water, or you get overflow, and once your skidoo get stuck what are you going to do. It happened. In January, there was three skidoos was coming back, one broke down. So two skidoo and three people, they help each other so one skidoo pulled two sleds. They got into the overflow water and get stuck. So what happen is that these guys here from Rae, eight people, they meet them and helped them out, to pull the skidoo and the sled. With eight people to help them, in a foot deep snow, it took them 10 hours to get it out. So that's the kind of thing. We can't just leave people who get stuck like that, so they help each other. They got into a dry place on the lake and one was an Elder, 77 years old, so he had to catch a ride back here. They took him back here. So that's what happens. It really dangerous for one person to travel alone, because the weather is really changed (Joseph Moosenose, February 2010).

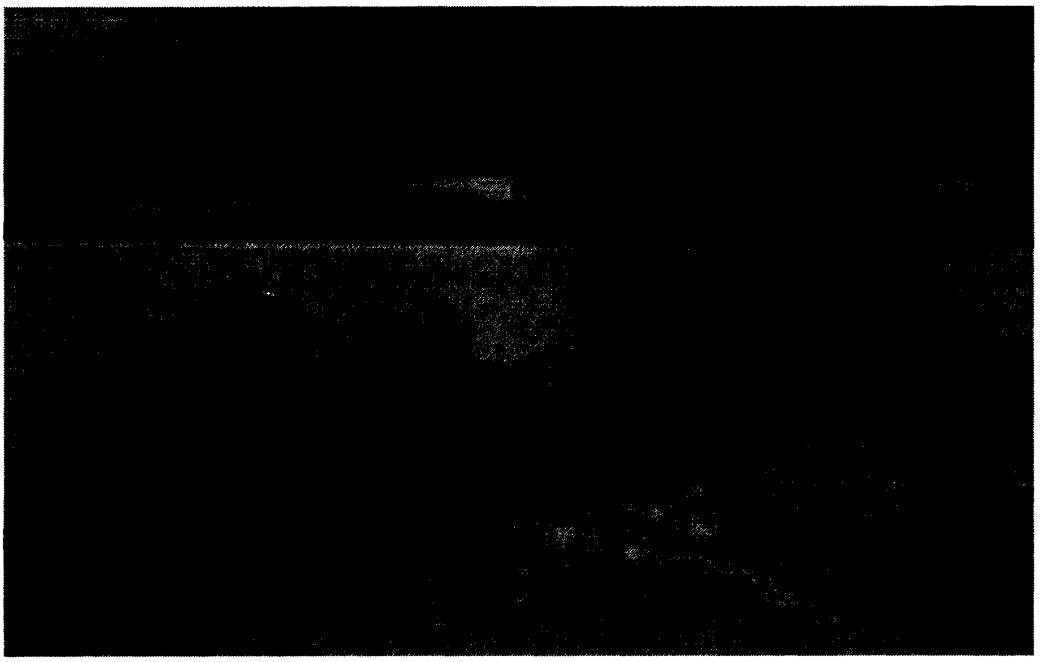

Figure 7: Broken down snowmobile pulled on the sled. Notice the last snowmobile helps pulling two sleds, March 2010. Photo: Petter Jacobsen

Sharing knowledge has always been an important method for travelling safely across the land. With today's situation, communication about the changing conditions on the land is important to inform people about dangerous areas, especially to younger people and to people from other communities. People who do not know the land are told to only follow the skidoo trails that have been built, and to not follow other trails they see or take shortcuts. Talking about

current conditions and how the weather and snow conditions are changing at certain places can prevent accidents from happening. Also, some Elders suggest building a new trail on the west side of Grandin River, from Ædetsîtì (Lac Tempier) to Kwet'ootî (Grandin Lake) to avoid the dangerous areas of unexpected overflow and slushy conditions on the Grandin River.

Increased Reliance on Gas and Money

As the caribou travels further north, the possibility to hunt caribou in close vicinity to the community decreases. The hunters must now rely on longer snowmobile trips further north to find the caribou. Thus, hunting trips for caribou are much more expensive than in the past. For one round trip to Kwet'ootî (Grandin Lake), a snowmobile needs approximately six jerry-cans (20 liters) and four jugs (1 liter) of oil, for a total price of $250-300. An Elder explained, "now people have to go further away to hunt. Spend much more money on gas and oil because we have to go further away to hunt. So it is more expensive to hunt now. Less people go hunting because it is more expensive" (Louis Wedawin, February 2010). A hunter also expressed his concerns: "for some people who are working it's ok, but for some people who are not working it's really tough. Because it is too far now. Too far to get caribou now" (Joseph Moosenose, February 2010). The renewable resource office in Whatì provides every registered hunter with 30 gallons of gas; six jerry-cans per each winter season. That is approximately one round trip to Kwet'ootî (Grandin Lake). As hunting is sometimes unreliable, hunters need many trips out on the land and north to Kwet'ootî (Grandin Lake) to secure caribou for their extended families and friends for the season.

Sharing meat is an important aspect of Tłįchǫ culture, especially to persons and families that cannot hunt. As hunting trips have become increasingly expensive, people work together and provide hunters with money to buy gas. The hunter then shares the meat with these people, along with the hunter's family and friends. In this way, the high cost of hunting is shared by the community which has become a reciprocal process like the sharing of caribou meat among community members

Some Elders emphasized the importance of a subsidy program for hunters and trappers. As hunters need to travel further north to hunt caribou, the current subsidy is not sufficient. The current program is not sufficient to cover the high price of gas, the cost of repairs and equipment, and for the off-season period.

Recommendations for Climate Change Adaptations to Hunting and Travelling on the Land

These recommendations are based on the Elders suggestions to facilitate improvements for hunters:

- Build new trails: some Elders suggested building new snowmobile trails to avoid places were snow and ice conditions often unexpectedly change. Specifically, on the west side of Grandin River from Æedetsîtì (Lac Tempier) to Kwet'ootî (Grandin Lake) to avoid areas of overflow and slushy conditions on the Grandin River.

- Subsidy program: the consequence of the need to travel further north to hunt caribou, is an increased cost for gas, engine oil and maintenance on equipment. Some Elders expressed concerned that the current subsidy is not sufficient to cover the high price for gas, the cost of repairs and the long off-season period. An increase in the hunting subsidy program will also allow more people to hunt which in turn will bring more bush food back to their families.

- Effective communication: as weather changes quickly and unexpectedly it is important to effectively communicate the conditions on the land to people who plan to travel or are travelling on the land. Especially, to younger people and to visitor who are not familiar with the land. Communication of conditions can be done over radio or bulletin boards, etc.

Summary

Environmental changes have consequences for the way Tłı̨chǫ travel and hunt on the land. Unexpected changes create uncertainties and dangerous situations, and with the use of heavy machines as skidoo it is easy to get stuck in the overflow and slush conditions. Travelling safely also includes being able to predict somewhat about how the future will be. Changes in wind pattern, causes unexpected changes to the weather that are hard to predict. As hunters have to travel further north to hunt caribou, information needs to be shared about the dangerous areas on the route. Sharing information thus help limited the possibility of accidents. The need to go further north to hunt caribou increases the price on the monetary cost of hunting. Further subsidized programs for hunters was emphasized to help out with the high costs of travelling that far; a strategy that brings more people out on the land and brings more caribou meat back to their families.

5. Elders Perspectives of Environmental Changes

The climate in the sub-arctic is changing. As the Elders experience the changes, they also have explanations for why these changes are occurring. The description of changes in the environment and how it affects the caribou should not be seen independently from the following explanations. Changes do not happen by themselves and the explanations of the Elders puts the individual changes, as described above, into a holistic understanding of the environment as some Elders describes it.

This section explains the Elders' understandings of the changes in the environment and to the caribou. These perspectives of some Tłı̨chǫ Elders portray ontological understanding of the environment based on a holistic reasoning to why climate change is happening. By placing the behavior of human beings into the environmental system, these explanations portray the importance of the human role in the environment based on our historical and spiritual connections; connections and relationships that the introduction of a modern lifestyle is eroding.

Not all the Elder have the same understanding or explanation of the environment and the changes occurring. Though the essence of the understanding is similar, some Elders know more than others, and some Elders are willing to share more of their knowledge than others.

Caribou Personal Choices

The Elders often say that no one knows the ways of the caribou, how it will behave or where it will travel to. The Elders see the caribou as individual beings, similar to a person who is capable of making their own choices. The Elders say that it is not only environmental changes or human behaviour that determines the caribou behaviour. These are important factors, but it is the caribou themselves, on an individual level and herd level, who are the one to make the ultimate decision on where they go or what they chose to do.

Human Behaviour and Caribou

The Tłı̨chǫ relationship with the land is based on mutual respect. The Elders often say that 'if you take care of the land, then the land will take care of you'. This implies that everything on the land has a life and spirit on its own, including the caribou. If one show respect and gratitude to the land, the land will provide and take care of you. The Tłı̨chǫ have lived on this land since time immemorial, and through this historical connection with the land and animals they have created strong spiritual ties to the land.

The relationship between the Tłı̨chǫ and the caribou is best characterized by a respectful connection. A relationship based on mutual respect, in which the caribou behaviour affects the humans and the human behaviour affects the caribou. Tłı̨chǫ Elders speak of caribou as individuals who take their own choices often in response to certain human's disrespectful behaviour. Human behaviour therefore affects the caribou, similar to the behaviour of one person to another person.

Many Elders refer to disrespectful behaviour as a reason to why the caribou did not come to the forest around Whatì during the last two winters. Many Elders refer to the story, 'hitting caribou with a stick'. Elders heard this from their grandparents, so it has reference to human-caribou relationship from older times, but they also refer to a man who hit a caribou with a stick in the 1950's. The man was hunting caribou just outside of town, but as his bullet didn't kill the caribou instantly, he hit the caribou with a stick. This behaviour is highly disrespectful to the caribou. Thus, the caribou chose to stay away from the forest around the community for about 30 years.

Not only Elders in Whatì, but most people in the Tłı̨chǫ region, refer to this story in conversation about respect and caribou.

Elders also identify other forms of disrespectful behaviour that would offend the caribou so they chose to stay away from Whatì. Respecting the caribou also means not to chase the caribou on the skidoo, or not leaving useful parts of meat or dead caribou after a hunt. Disposal of caribou bones in the right manner is regarded as highly important. Elders referred to these forms of disrespectful behaviour as possible reasons to why caribou stayed away from the forest around Whatì.

Mutual respect implies that the caribou give themselves to the humans when they are needed. Even if the caribou know that they will be killed they come towards the communities and give themselves to the people. The caribou do this because the caribou know that they are needed by the people. Through the proper treatment of the caribou when it has been killed and by proper disposal of the caribou bones, the caribou spirit will be reborn. Proper human behaviour therefore secures a sustainable caribou population. The relationship between the Tłı̨chǫ and the caribou is therefore based on mutual respect as the caribou give themselves to the humans, while the proper Tłı̨chǫ behaviour will guarantee the sustainability of a healthy caribou population.

Caribou Collars

Most Elders are upset of the disrespectful behaviour of placing collars on the caribou. Many Elders stated that the collars stress the caribou and make them insecure because the caribou worry why the collar is there. The insecurity and stress keep the caribou from eating, making

them skinny and unhealthy. The Elders say that the collars are too big so it moves around the neck. Several Elders refer to finding caribou that have lost the hair around their neck, because of the collar. Placing collars on the caribou is disrespectful behaviour as it causes unnecessary pain and stress to the caribou.

Traditional Lifestyle and Climate Change

The Elders know that everything on the land has a life and spirit on its own. Humans also have a spirit that is connected to the larger sphere. Human conduct in the world therefore has implications for the wellbeing of other living beings. An example of this is how humans' proper treatment and disposal of caribou bones are important for the rebirth of the caribou spirit into new caribou. Therefore, humans have a central role in the ecosystem.

In the western world the spiritual and the physical is regarded by many as separate entities/ spheres. But as many Tłı̨chǫ Elders explain, the physical and spiritual world is one and actions of spiritual nature often imbue meaning into the physical reality. The human role in the world as hunters and harvesters is also one that generates and maintains spiritual connections; a role that sustains the flow and existence of living things. The continuation of being hunters and harvesters thus secures further harvest for the people and well-being of animal populations.

The environmental changes the Elders experience today are consequences of a gradual decline of Tłı̨chǫ (and other peoples) continuation of the central role humans have, as hunters and harvesters, in the ecosystem. An Elder in Whatì explained,

> Everything is changing now in the last 20 years. Elders used to really do everything spiritually, they respect everything, the Creator gave them everything, their lands, the trees, the woods, everything, the water, they knew that. That is why everyday they prayed. Early in the morning when they wake up they pray, and at night time before they sleep they pray. They thank their God for giving them everything that they had. Today it is not like that. The last 20 years all this has changes. People has changed their attitude in the community, people has turned away from the traditional way of life like we used to live. They left all that away...and they left out the spiritual way (February, 2010).

As changes in the larger Euro-Canadian society has brought changes to the Tłı̨chǫ lifestyle, many Tłı̨chǫ have decreased their activity with the land. Changing away from their traditional lifestyle, beliefs and knowledge, the younger generations starts to lose the connections and knowledge of the land and animals. This knowledge includes the proper behaviour which is important in the respectful relationship with animals and especially caribou. As humans are

starting to retreat from this respectful relationship, that characterizes their role as harvesters, the environment is also starting to change its behaviour in reaction to the humans discontinuation. The climate is therefore changing and the caribou are retreating away from the humans. An Elder explained;

> The Dene looks to the Creator. He provides for us. The creator is the answer. Spirituality is weak in the community. Because people turn to money, drugs, alcohol and gambling. But God, the Creator is giving us signs. God tells us that the caribou is declining. People should therefore go back to their traditional ways, then nature and things will return to the way they were.
>
> The Sky, the great Prophet, is changing. The Prophet tells us that things are changing. The 'Big Dipper' has changed place in the sky. This way the Prophet is telling us that great changes will happen. Therefore the environment is changing. People need to go back to spirituality. People need to return to traditional ways. Then the people will understand who they are, understand that they are Dene, and then things will return to the way they were (February, 2010).

Some of the Elder see the changes of culture and social behavior as underlying reasons to why the climate is changing. They see the discontinuation of human interaction with the land as a focal point to changes to the land and to animal behavior, as the caribou. Climate change is therefore response to the new modern way of life humans have started.

Pollution

The Elders consider that simultaneously with a withdrawal from the traditional lifestyle, humans are, instead of taking care of the land, destroying the land due to pollution. Most Elders referred to pollution from cars, diesel-generators in the community and chemicals from the mines as factors impacting the environment.

The pollution from the mines were said to be spread out over the tundra and absorbed into the plants. Consequently, some caribou get sick from eating the plants around the mine sites. Some Elders described how the ankles and hooves of the caribou became damaged when they walked through the areas close to the mines. White spots and bristles on the bones and joints were shown as evidence for the pollution from the mines. An Elder explained,

> During the last 4 years, been seeing different results in the caribou when using the skins, the meat and other parts that she uses. When you take apart the caribou you can see white spots and bristles, especially inside the knee parts and on the skin. Also, there are rough parts on the caribou bones,

especially on the ankles. The caribou is changing. Sometimes there is less hair on the ankles. They get this from when they walk near the mine sites. Before the caribou meat was nice and tender. But the last 4-5 years, the caribou is changing (Whatì, February 2010).

Figure 8: Dora Nitsiza pointing out unusual white spots on a caribou bone, February 2010. Photo: Petter Jacobsen.

Some Elders emphasized that the mines are obstacles and intrusions on the caribou's habitat. An Elder explained:

> Ever since the mine was build, seems like they are forced and chased away. And the places where they lived are different, it changes with them. They don't seem to stay longer or something seem to chase them away. When your trail is not healthy and you don't feel comfortable with it then you don't stay in one place, but right away you keep moving on, that's how its seem to be with the caribou. Because their traditional path is not good, it's blocked up so the caribou don't stay that long. Because of the mining. When you travel somewhere and your skidoo trail is nice and clear, but as soon as you know that something is bothering you on your trail, like mining, you don't feel comfortable with it and you turn away (February, 2010).

Cultural changes have brought many technological changes which have altered people's interaction with the land. At the same time, the new technology heavily pollutes the land.

Conclusion and Recommendations

The Elders have experienced many social and environmental changes throughout their lives. Many Elders told stories of their travels by canoe to the barren-lands when they were young. Now, chartered planes take them to hunting camps in the barren-lands. Even though the technology changes, they still rely on their knowledge of the land to hunt and live comfortably on the land. In the process of doing so increase their knowledge of the land. Although, many social changes have altered the Tłı̨chǫ way of life and interaction with the land, the land and their interaction with it is one of the ground-pillars of their culture.

The northern communities will experience the increasing environmental changes in the future. Adapting to these changes is critical. As the Elders have explained, the weather is much warmer these days than it has been in the past. The winters are warmer and spring comes earlier. This makes ice and snow conditions unstable which in turn creates dangerous travel conditions on the land. Effectively communicating about areas of dangerous and unstable ice is important to increase the safety for people travelling out on the land. Also, making new trails over secure areas will increase safety.

The dry and warm summers are the right conditions for more and larger forest fires. The large fires destroy areas of good feeding grounds for the caribou and causes changes to their migration routes. As has been the case in Whatì, the large fire in 2008 has altered the migration route for the caribou making them travel further north than usual. As a consequence, the hunters in Whatì have to travel much further north to get caribou meat for their families and the community. This is a costly expense which presents one case of the consequences climate change might create in the future. As the Elders emphasized it is highly important to take out fires in the caribou feeding grounds east and north of Whatì, around Marten Lake. If more fires destroy these caribou feeding grounds, the hunters in Whatì will need to travel even further north at a higher price.

As climate change alters the habitat for the caribou, the caribou will change their ways of living, eating and travelling. This will have consequences for Tłı̨chǫ hunting of caribou. But, as some Elders explain, the continuation of hunting caribou and maintaining interaction with the land can slow or prevent some of the changes in the environment from happening. As the acceptance of a modern western lifestyle has altered the Tłı̨chǫ's' interaction with the land, a continuation of the traditional lifestyle will not only decrease the emission of pollutions, but most importantly maintain the people's interaction with land and animals.

Elders often say that 'if you take care of the land, then the land will take care of you'. The move away from a traditional lifestyle means spending less time in contact with the natural environment. The younger generations have less knowledge of the land and animals, including the knowledge of proper behaviour with the land and animals. In order to learn about the land and prevent environmental changes it is important for people, especially the

younger generations, to learn about and spend time out on the land with the Elders. As taking care of the land includes having knowledge of the land and knowledge of proper behaviour with the land and animals, learning from the Elders is an important action in preventing further changes to the land and animals. Furthermore, the continuation of respectfully hunting caribou and spiritually interacting with the land in traditional ways can alter or prevent changes in the environment from happening. By being active in the processes in the environment, the continuation of the traditional lifestyle will maintain the relationship between the people and the land.

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