Tłı̨chǫ Knowledge of Environmental Changes: Implications for Caribou Hunting

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Tłı̨chǫ Knowledge of Environmental Changes: Implications for Caribou Hunting
Petter Jacobsen

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Dora Nitsiza

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K’àodèe Nı̨htł’è Nek’òą T’à Atł’èe

Dıı nı̨htł’è k’e Tłı̨chǫ ʔǫhdaà Gıwhaèhdǫǫ̀ Nàowoò ts’ǫǫ̀hk’e mòht’a eładı̨ı̨ agot’ı̨ı̨, dè gok’eek’òǫ wets’ihʔǫ̀ ekwǫ̀ gha dàgǫ̀ht’ee eyıts’ǫ ekwǫ̀ nàts’ezèe gha dàgǫ̀ht’ee k’e gogı̨ı̨de sìı dek’eèhtł’è. 2009 ımbè eyıts’ǫ 2010 xok’e Whatì k’e ʔǫhdah gıxè godı wedaànàgeetǫ wek’e dıı nı̨htł’è hòlı̨ hǫt’e.

Tłı̨chǫ ʔǫhdaà ı̨nèe hoònǫ xo ʔǫǫ̀ǫ gots’ǫ gomoò goòʔàa ts’ǫ̀ gıxè mòht’a eładìı̨ agot’ı̨ı̨ wets’ıhʔǫ̀ ekwǫ̀ gha dàgǫ̀ht’e, nàts’ezèe sı eyıts’ǫ dè k’e k’ehots’ehde gha dàgǫ̀ht’e k’e gogı̨ı̨de. Gomoò goòʔàa ts’ǫ̀ dıı hagot’ı̨ı̨ t’à mòht’a eładı̨ı̨ agot’ı̨: denahk’e gòkǫ̀ǫ̨, denahk’e gògǫǫ̨, nı̨hts’ı xè ładı̨ı̨ agòdzàa, zah eyıts’ǫ tǫ xè eładı̨ı̨ agòdzà. Tłı̨chǫ dè k’e k’ehogehde t’à edegeeda t’à eyı gomoò goòʔàa ts’ǫ̀ ładı̨ı̨ agot’ı̨ı̨ sìı dànì dǫ nàgezèe eyıts’ǫ dè k’e k’ehogehde sìı gıxè ładı̨ı̨ agòdzà. Tłı̨chǫ ʔǫhdaà hanì hòʔǫǫ̨ ts’ǫ̀ xàyagı̨ı̨htı; mòht’a eładı̨ı̨ agot’ı̨ı̨ wenàowoò gı̨ı̨hchìı eyıts’ǫ eładı̨ı̨ ekwǫ̀ gha nàgezèe agedzà. Dıı hanì eładı̨ı̨ nàgezè agedzà: ı̨nèe edı̨ı̨ nàgezè ı̨lèe sìı eładı̨ı̨ agòdzà, dǫ ı̨whąą̀ nàgezè agedzà, mòht’a dàgǫ̀ht’e ha sìı wek’èhodzǫ-le eyıts’ǫ denahk’e edehogıihdı daànıgedè agòdzà. Eyı ełexè hazǫǫ̀ ts’ıhʔǫ̀ ı̨ła̱a nàgezè ha gı̨ı̨wǫ nı̨dè denahk’e sǫǫ̀mba t’à aget’ı̨ı̨ agòdzà. Mòht’a ładı̨ı̨ agot’ı̨ı̨ wexè ładı̨ı̨ nàts’ezèe sìı ʔǫhdah gıyatìı k’e nàowo gèhtsı hǫt’e. Eładı̨ı̨ k’ehokw’oo t’à ekwǫ̀ gha dàgode ha sìı ǫhdah gıyatìı ghàà godìı dek’eèhtł’è xè weghǫ nàdahotso.

Ekwǫ̀ dànì nadeeʔàa sìı dıı nı̨htł’è k’e hazǫǫ̀ dek’eèhtł’è; dègok’eek’òǫ eyıts’ǫ gok’enık’ǫǫ̨ k’è gòlaa, nàgedèe k’è sìınagòdlàa eyıts’ǫ gok’eek’òǫ t’à ekwǫ̀ gha dàgǫ̀ht’e, asìı hotìı geeda eyıts’ǫ ładı̨ı̨ ekwǫ̀ nadeeʔà agòdzà. Edı̨ı̨ ekwǫ̀ sèzee k’è wet’àaʔàa gǫ̀hɬı̨ı̨ sìı gha kǫ̀nageehkwıı nàowoò hòlı̨, eyìı sìı Tłı̨chǫ nàzèe dǫǫ̀ gı̨ı̨lı̨ı̨ sìı gıgha dè wet’àaʔàa k’è agǫ̀ht’e.

Nǫde t’à, moht’a ładı̨ı̨ agot’ı̨ı̨ ghǫ ʔohdah dànì gınıeđıı sìı wòhdaa dıı nı̨htł’è k’e dek’eèhtł’è. Gomoò goòʔàa ts’ǫ̀ t’asìı edegeedaa nàowoò gınıeđı xè t’asìı t’aàtłǫ ełexè t’à at’ı̨ı̨ t’à eładı̨ı̨ agot’ı̨ı̨ gınıeđıı sìı k’e gogı̨ı̨de. Tłı̨cho ʔǫhdaà dıı hagedı,

gomoò goòʔàa ts’ǫ̀ wek’ezhìı dǫne la wet’àaʔa hogehtsı; nazèe dǫǫ̀ gı̨ı̨lı̨ı̨ eyıts’ǫ t’asìı hagı̨ı̨wǫǫ̨ dǫǫ̀ gı̨ı̨lı̨ı̨. Inèe dǫ yàı̨dàa hagıat’ı̨ı̨ eyıts’ǫ ı̨nì t’à dǫ ełexè yàı̨dà k’e hòı̨ʔà. Hanì dǫ gıt’òǫ ı̨lèe sìı dııdzę̨ę̀ k’e dǫ edaa sìı hanì nàgotsoò-le adaade.

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 explain the environmental changes they have experienced during the last decades and the implication for the caribou, hunting and travelling on the land. The environmental changes are: warmer and drier weather, changes to wind patterns, and changes to snow and ice conditions. 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 knowledge and adapting their ways of hunting caribou. These adaptations are: 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 money to sustain hunting. Recommendations for climate change adaptations are made based on the Elders' suggestions. The implications these changes have for the caribou are explained and emphasized with quotes from the Elders.

This report has detailed descriptions 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 portray 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 for people in the community to learn about: the specific changes in the climate; about forest fires; the impacts of climate change and forest fires for caribou; and the effects on caribou hunting. Some of the Elders have shared their perspectives of why these environmental changes are happening and how social changes 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 consists of five sections: 1) environmental changes and implications for caribou; 2) caribou movement parallel to forest fires, including habitat recovery and valuable caribou feeding grounds; 3) impacts of climate change for caribou hunting; and 4) Elders' perspectives on climate change.

Researcher

The principal researcher was Petter Jacobsen, a graduate student at the University of Northern British Columbia (UNBC). Originally I am from Oslo, Norway. Karyn Sharp, a First Nation Studies instructor at UNBC, was the supervisor. She is Denesuline from Black Lake, Saskatchewan. As a researcher I tried to spend as much time in the Tłı̨chǫ communities as I could, participating in events and daily activities. I wanted to learn about the culture from the Tłı̨chǫ and tried to immerse myself into the culture as much as I could, by participating in several caribou hunting trips on the land.

This research is part of a larger project at UNBC regarding forest fires and their effects on the Bathurst Caribou Herd. The knowledge produced in this research will feed into the larger project's goal to produce models about past and future forest fires 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 comes from the scientific community, but this only represents one way of acquiring knowledge. Traditional Knowledge is a medium to broaden the public understanding of climate change and to include the local communities in the documentation of knowledge about climate change.

Traditional Knowledge looks at 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). This definition includes more than a physical, technical interpretation of Traditional Knowledge, rather this interpretation emphasizes the interrelationship between the physical and the spiritual environment 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 "seated in a way of life" which is based on "generations of cumulative culturally transmitted knowledge about particular environments" (Kendrick 2005).

Research Methods

This Traditional Knowledge study was based on a qualitative research approach, applying the methods of 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 held in the homes of the Elders, except for two interviews conducted in the community government's chamber. Honorariums for their participation were given as well as gifts of dried fruit. 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 designed water bottles.

The interviews were based on a semi-directed interview technique. In this way, 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. The Elders explained certain issues with little interruption by me. I learned that 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 these interviews, I learned that the best approach was not to ask many questions because the Elder shared what he/she felt was important to explain, at that point in time. The first period of research focused on: changes in the environment, how caribou adapt to climate changes, caribou's behaviour in relation to forest fires, and how climate changes are affecting caribou hunting. The second period of research, during winter 2010, elaborated on the first period and included discussions regarding Elders' understandings of climate change.

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 1940s-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 Isadore Zoe during winter 2010. They 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 Behchokǫ̀, Gameti and Wekweètì 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 a 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 I 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 the 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 complementary function, in order for me to learn more of the Traditional Knowledge of the Elders.

Not all the Elders 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.

Research Community: Whatì

The community of Whatì, formerly called Lac la Martre after its location beside 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 Marian Lake and towards the Great Slave Lake, working as a connection to the other communities.

Figure 1: Whati, 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 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 are 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 Behchokǫ̀. 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. 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 Kwet'ootî (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 lifestyle, 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 Behchokǫ̀, 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 Mowhi Gogha De Niitlee, the. 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 Behchokǫ̀. The area southwest of Marten Lake towards Horn Plateau is also used, for example for moose hunting. The isolated community is only accessible by vehicle on an ice road open from January until April. Most of the outside resources such as gasoline, furniture and heavy equipment are transported at this time. During the rest of the year the community is only accessible by aircraft.

Climate Change and Implications for Barren-Ground Caribou

This section outlines the environmental changes experienced in the region and the implications for barren-ground caribou. The environmental changes are: 1) warmer and drier weather, 2) changes to wind patterns, 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 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-Chocolate explained, "back in the days, caribou travel in October, or November, because it was colder. Now they travel around Christmas" (Charlie Zoe-Chocolate, 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. 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 what they are built 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, 'adzii' (lichen) grows slower. The Elder say that '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 lightning 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 in recent years, wind patterns have changed and decreased. 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). The wind directs actions in 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-Chocolate, June 2009). When it is windy the caribou stay together and are not scattered around. With changes in the wind pattern, the caribou move around less and are said to be scattered around in smaller groups. Some Elders say that the caribou populations have not declined but 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 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 are 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- Chocolate 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- Chocolate, 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. 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 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-Chocolate explained, "in the winter it is not that cold, so ice doesn't freeze that fast, so caribou fall through" (Charlie Zoe- Chocolate, June 2009). Joseph Moosenose described,

> *"Last year some trappers from Gameti went to Hottah Lake and saw couple of hundred caribou drowned, they only saw the antler sticking up from the ice. This happens in different places around".*
>
> Joseph Moosenose, June 2009

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, 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 tears the hair so it falls off the hooves. But the caribou are really cautious to make sure they keep it. Because if they don't they are going to damage the hooves. It will damage their feet and they will not be able to walk. That's how caribou are, they are very careful. They have to take care of their hinds, their feet".

Francis Simpson, February 2010

Forest Fires and Caribou Movement

Elders expressed concerns about the increase of forest fires and 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 be. It is said that the fires are larger than back in the days, and that these fires burn away large areas of the caribou feeding grounds. Smaller fires can be good for the environment, but the larger fires experienced in recent years, 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 to come back to the burned area and the surrounding area for the next ten years. There is no food for the caribou in this large area. 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 the fire 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 burned areas are. 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 after a forest fire. The Elders stated that the caribou start coming back to burned areas after five to ten years, when the lichen and moss start to grow again. But 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 depending on the severity of the burn.

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 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 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, the regrowth of the vegetation depends on the amount of rain, snow, elevation and exposure to sun.

Forest Fire and Suppression

All the Elders remember when fire fighting crews 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 fires 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, because we wanted to protect it. Now they just let area 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.

Valuable Caribou Feeding Ground

The summer and beginning of fall, when the caribou are in the barrenlands, are the most important feeding time for the caribou. The barrenlands are regarded as the most important feeding grounds where the caribou become healthier and fat. During the fall and spring migration the caribou spend a lot of energy and do not eat that much. In the early winter they eat well, but as the winter progresses, with increased snow it becomes harder for the caribou to feed. The caribou dig through the snow, or if there is a lot of snow, lichen on the trees in an option. In times with a lot of snow, a herd will stay in an area where they find sufficient amount of lichen. Here they will stay until bothered by predators or people.

Lichen is regarded as the most important food during the whole year, but lichen on the trees will be eaten at times during winters with a lot of snow. Grass along rivers or lakes are a valuable food source during the summer and in spring when the snow starts to melt. Some Elders mentioned that caribou particularly like the partly rotten grass along lakes. The caribou 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 Hislop Lake and from the northeast side of Marten Lake towards 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 ground for the caribou.

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

- The forest all around Kwet'ootî (Grandin Lake) is attractive feeding ground.

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.

Summary

The Elders have explained various environmental changes they are experiencing in the region and the impacts on 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 drier. Along with a decrease in rain, the dry forest is more susceptible for forest fires and when it burns, larger areas burn. The Elders explain that forest fires are easily ignited by lightning 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 burn large areas of lichen covered forest, caribou feeding grounds are reduced. As the main food for the caribou diminishes, the caribou need to change their migration patterns to find areas with good feeding grounds. Traveling through deep and loose snow exhausts more energy, than 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 it is 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 these changes. 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 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.

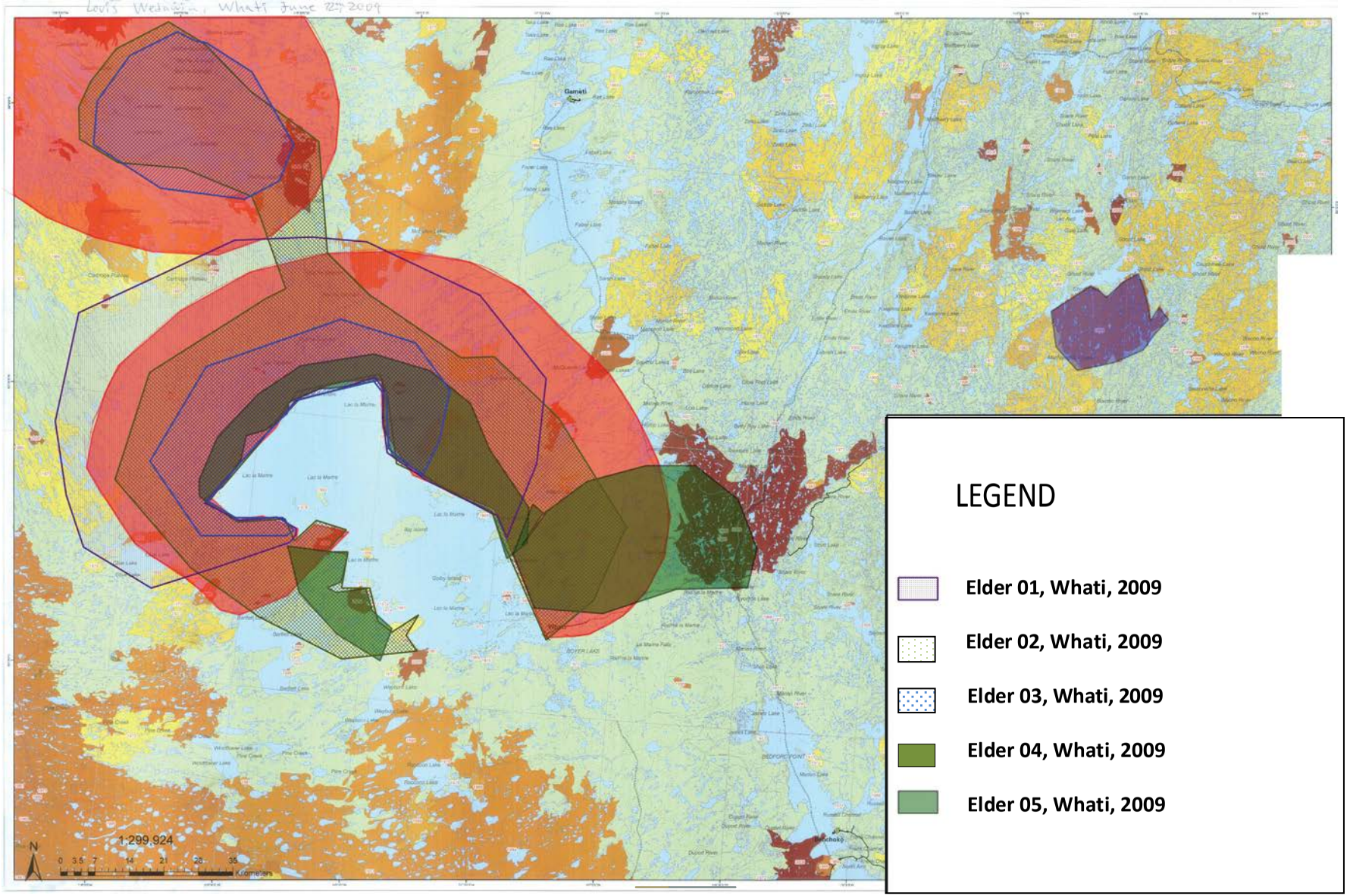

Figure 4: Valuable Caribou Feeding Ground

Impacts of Climate Change for Caribou Hunting

This section outlines the implications climate change has for caribou hunting for Whatì hunters during winter months. Hunting, travelling and activities 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 environment as described by the Elders above. The Tłı̨chǫ respond to these environmental changes by acquiring new knowledge and adapting their subsistence activities to the changing conditions. These adaptations to environmental changes are 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 gasoline and money.

Change of Caribou Hunting Locations

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 the 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 past Rae Lakes and to Kwet'ootî (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 the end of Marten Lake. Haven't been to Kwet'ootî (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 snowmobile ride to the end of Marten Lake and to the Kwet'ootî (Grandin Lake) area. In earlier times, people used to travel 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 report.

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 reported that the ice does not freeze as fast and as early in the fall, as was common 'back in the days'. Hunters need to wait for the cold temperatures to stabilize before they can travel on the lakes with snowmobiles. 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 they don'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. 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 in 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 observed the wind to predict the weather, before planning a trip. These predictions are based on their detailed knowledge of wind

patterns, but now they experience 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 traveling 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 as the traveling conditions on rivers and trails unexpectedly change. When conditions change, hunters need to travel new routes to avoid areas with overflow or slushy conditions, in order to get safely to their 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 gets stuck what you are going to do. It happened. In*

January, three skidoos were coming back, one broke down. So two skidoos and three people, they help each other so one skidoo pulled two sleds. They got into the overflow water and got stuck. So what happened is that these guys here from Rae, eight people, they met them and helped them out, to pull the skidoo and the sled. With eight people to help them, in a foot of 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's 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 strategy for traveling 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 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. Some Elders suggest building a new trail on the west side of Grandin River, from Lac Tempier to Kwet'ootî (Grandin Lake) to avoid the dangerous areas of unexpected overflow and slushy conditions on Grandin River.

Increased Reliance on Gasoline 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 harvest caribou. Consequently, there is an increased cost of hunting trips. For one round trip to Kwet'ootî (Grandin Lake), a snowmobile needs approximately six jerry-cans of gasoline (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

Another hunter expressed similar concerns: "For some people who are working its 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" (February 2010). The renewable resource office in Whatì provided every registered hunter with 30 gallons of gasoline; 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 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 gasoline. 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 adequate to cover the high price of gasoline, 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 where snow and ice conditions often unexpectedly change. Specifically, on the west side of Grandin River from 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 gasoline, engine oil and maintenance on equipment. Some Elders expressed concerned that the current subsidy is not sufficient to cover the high price for gasoline, 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 country 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 visitors 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 snowmobiles it is easy to get stuck in the overflow and slush conditions. Traveling safely includes being able to predict future weather conditions. Changing wind patterns cause unexpected changes to the weather which 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 helps limit the possibility of potential accidents. The need to go further north to hunt caribou increases the monetary cost of hunting. Improved subsidized programs for hunters were emphasized to decrease the high costs of traveling; a strategy that would bring more people on the land and bring more caribou meat back to their families.

Elders' Perspectives of Environmental Changes

The climate in the sub-arctic is changing. As the Elders experience the environmental changes, they have explanations for these changes. The description of changes in the environment and how these changes affect the caribou 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 understanding of the environment. As nature is a social environment, the current cultural and societal changes needs to be included with the environmental changes.

This section explains some of 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 behaviour 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.

Human Behaviour and Caribou

The relationship between the Tłı̨chǫ and the caribou is best characterized by a respectful connection. 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 humans. If one shows 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 Elders often say that no one knows the ways of the caribou, how they will behave or where they 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 ones to make the ultimate decision on where to go or what they chose to do.

In this respectful relationship, caribou behaviour affects the humans and human behaviour affects the caribou. Tłı̨chǫ Elders speak of caribou as individuals who take their own choices often in response to certain human 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 did not come to the forest around Whatì during the last two winters. Many Elders refer to the story, 'hitting caribou with a stick'. This story 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 until it was dead. This behaviour is highly disrespectful to the caribou. Subsequently, 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.

Not only Elders in Whatì, but most people in the Tłı̨chǫ region, refer to this story in conversation about respect and caribou. This is an example of the use of storytelling as a method to learn about caribou behaviour and the proper interaction between people and caribou.

Elders identify several forms of disrespectful behaviour that would offend the caribou. Respecting the caribou 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. These forms of disrespectful behaviour are referred to as possible reasons to why caribou stayed away from the forest around Whatì.

Mutual respect implies that the caribou present themselves to the humans when they are needed. Even if the caribou know that they will be killed they come towards the communities and to areas where they know the hunters are waiting. 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 secures a sustainable caribou population. The relationship between the Tłı̨chǫ and the caribou is therefore based on mutual respect as the caribou present themselves to the humans, while the proper Tłı̨chǫ behaviour will guarantee a healthy relationship between the caribou and the people.

Caribou Collars

Most Elders are upset by 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 collars are too big and move around the neck of the animal. Several Elders report 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, including humans. Human conduct in the world 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. Through such behaviours, humans have an important role in the ecosystem.

In the western world the spiritual and the physical are regarded by many as separate entities. But as many Tłı̨chǫ Elders explain, the physical and spiritual world is one and actions of a spiritual nature often imbue meaning into the physical reality. The human role in the world as hunters and harvesters is 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 the well-being of the relationship between animals and people.

The gradual decline of hunting and harvesting as a central human role the ecosystem is seen as a consequence of the environmental changes experienced today. 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 every day 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 have changed their attitude in the community, people have 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".*
>
> Whatì, February, 2010

As changes in the larger Euro-Canadian society have brought changes to the Tłı̨chǫ lifestyle, many Tłı̨chǫ have altered their activity with the land. Changing away from the traditional lifestyle, beliefs and knowledge, the younger generations start 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, certain elements of the environment are starting to change behaviour in reaction to the humans' discontinuation. Therefore, the environment is changing and the caribou are retreating away from the humans. An Elder explained:

> *"The Dene look 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 are 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".*
>
> Whatì, February, 2010

Some of the Elder see the changes of culture and social behaviour as underlying reasons why the environment is changing. They see the discontinuation of human interaction with the land as a focal point to changes to the land and to animal behaviour, as the caribou. Environmental changes are a 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 was said to be spread out over the tundra and absorbed into the plants. Subsequently, some caribou get sick from eating the plants around the mine sites and walking through polluted areas. 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 are 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 are 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 built, it 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 seems 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 it seems 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".*
>
> Whatì, February, 2010

Conclusions 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 rely on their knowledge of the land to hunt and live comfortably on the land. In the process of doing so, their knowledge of the land is enhanced. Although, many social changes have altered the Tłįchǫ 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 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 traveling 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 create changes to their migration routes. As has been the case in Whatì, the large fire in 2008 altered the migration route for the caribou making them travel further north than in previous years. 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, and the forest around Kwet'ootî (Grandin 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 travelling. This will have consequences for Tłı̨chǫ hunting of caribou. But, as some Elders explain, the continuation of hunting and maintaining interaction with the land can uphold the connection with the people and the environment and thus prevent certain environmental changes. As the acceptance of a modern western lifestyle has altered the Tłı̨chǫ's interaction with the land, a continuation of the traditional lifestyle could decrease the emission of pollution, and 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 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, learning from the Elders is an important action in upholding the connection between the people and the land. 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 can maintain the relationship between the people and the land.

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