OVERVIEW - Boreal caribou habitat and habitat use in Wek'èezhìı

Introduction

The Wek'èezhìı Renewable Resources Board advocates management plans that consider both scientific and traditional knowledge. The boreal caribou study used a parallel process, in which both scientific and Tłı̨chǫ knowledge research methods were used. This process allows scientific and Tłı̨chǫ perspectives to be available to decision makers. The report has three sections: 1) an Overview and Recommendations, 2) the Tłı̨chǫ knowledge report, and 3) the scientific report.

Tłı̨chǫ Knowledge Summary

Tǫdzı (boreal caribou) are found throughout *nǫdìı* (taiga plain). Elders directed the research team to observe the state of tǫdzı habitat on ʔedèezhìì (Horn Plateau). They chose this location to allow comparisons between the current ecology and the state of habitat prior to the 1995 forest fire. The elders wanted to examine for themselves the state of re-growth and evidence of tǫdzı returning to the area. In September 2012, the research team, directed by the elders, found small stands of vegetation in tǫdzı habitat that were untouched by the fire, vegetation re-growth of approximately a decade, and evidence of tǫdzı throughout the area studied. There were also signs of moose and predators.
Although the 1995 fire spread over ʔedèezhìì, pockets of healthy *tsoo* (waterlogged soil, bogs, thick vegetation) and *whagweè* (sandy soil mixed with black dirt, sparse vegetation) were evident within walking distance west of the research team's campsite. The elders explained that tǫdzı prefer habitat where they can camouflage themselves amongst the thick bush. Tsoo meets these requirements, and provides easy access to nourishment. Tǫdzı also prefer hard ground where they can travel quickly without twisting their legs or harming their hooves. Much of the vegetation in whagweè is favoured by tǫdzı, and allows for quick movement. Elders emphasized that it is difficult to fully understand the state of tǫdzı habitat and use until a Tłı̨chǫ knowledge study of tǫdzı's winter behaviour and habitat use is undertaken.
Forest fire disturbances to nǫdìı have led to fewer tǫdzı in the area. The Tłı̨chǫ who harvest tǫdzı maintain that tǫdzı and their habitat are already at risk due to forest fires and that there is potential for increased impacts with industrial development and associated infrastructure.

Science Summary

The federal Recovery Strategy for the Woodland Caribou, Boreal population in Canada requires 65% of boreal caribou habitat within the range of a local population to be undisturbed. Disturbance is

considered a combination of natural processes such as fire (</= 40 years) and human disturbances such as roads or seismic lines.
The amount of fire disturbed habitat up to 40 years old in Wek'èezhìı (calculated through 2012) comprises 32.8% of the boreal caribou range. From previous analyses in 2011, human induced disturbance in Wek'èezhìı is minimal, an estimated 274 km^2 (or 0.6%) by Environment Canada. There are currently no spatial datasets that update the human induced disturbance. In the absence of any recent data, there is an estimated total of 33.4% disturbance within boreal caribou habitat.

While the GNWT, Forest Management Division tracks the number and extent of forest fires on an annual basis in a spatial format, there is no agency that tracks human induced land disturbance in a similar fashion. It will be very difficult to manage boreal caribou range within the disturbance threshold set out in the federal Recovery Strategy for Woodland Caribou, Boreal Population in Canada without these two complimentary datasets.

Conclusions

The goals of this project were to further our understanding of boreal caribou habitat and habitat use in Wek'èezhìi through gathering existing scientific and traditional knowledge.

Both Tłı̨chǫ and scientific knowledge and have shown that there is a great amount of disturbance to boreal caribou habitat due to large forest fires since the mid-1990s. While caribou seem to be resilient to these kinds of habitat changes either through distribution changes or utilizing areas of less fire severity, it is unclear whether caribou can maintain this type of resiliency when faced with long-term changes in habitat due to increased fires and industrial development.

Recommendations

1. Document tǫdzı winter habitat and behaviour before finalizing a management plan and Tłı̨chǫ land-use plan.
2. Document tǫdzı use of islands.
3. Track the number and extent of human induced land disturbances on an annual basis in a spatial format.
4. Both Tłı̨chǫ knowledge and science continue to be utilized in boreal caribou monitoring and management.
5. More in depth science and traditional knowledge research be conducted especially examining areas of fire of differing severity, how it is utilized by boreal caribou and how burned areas regenerate back to areas of preferred habitat.
6. More in depth science and traditional knowledge research be conducted to understand the relationship between predators and the boreal caribou especially with respect to predator and prey efficiencies and how that might change with habitat disturbance.

7. More in depth science and traditional knowledge research be conducted on the impacts of climate change on habitat quality, quantity, connectivity and mobility.

Boreal Caribou Habitat and Disturbance in Wek'èezhìı

-Tłı̨chǫ Knowledge Component -

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and

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In Collaboration with

Rita Wetrade, Tłı̨chǫ Knowledge Coordınator, Tłı̨chǫ Government

For

Wek'èezhìı Renewable Resources Board

And

Lands Protection Department, Tłı̨chǫ Government

March 2013

To all Tłı̨chǫ who know and love the land.

Cover Image

Tłı̨chǫ knowledge research camp on ʔedèezhìì where 1995 forest fire destroyed tǫdzı̨ (woodland boreal caribou) habitat. (Photograph © Allice Legat)

Abstract

Woodland boreal caribou (tǫdzı in Tłı̨chǫ) are nationally listed as threatened species under the Species at Risk Act (SARA). The Wek'èezhìı Renewable Resources Board and the Tłı̨chǫ Government have begun identifying boreal caribou habitat for land use and recovery planning as mandated in the Tłı̨chǫ Land Claim and Self Government Agreement. These animals remain an important resource. They are known to be secretive as they camouflage themselves in thick bush in many areas of the taiga plain, or nǫdìı as the area is referred to by Tłı̨chǫ. Forest fire disturbances to this eco-zone have led to fewer boreal caribou in the area. Climate change and industrial activities are cause for concern. Crucial to the land use planning and management process is Tłı̨chǫ knowledge of tǫdzı habitat needs; and tǫdzı behaviour as it reflects those needs. Critical to a future recovery strategy and management planning is a deeper understanding of tǫdzı behaviour and habitat needs in winter and in association to islands.

Acknowledgements

Wek'èezhìı Renewable Resources Board and the Lands Protection Department, Tłı̨chǫ Government express gratitude to Aboriginal Funds for Species at Risk, Environment Canada for their commitment to document Tłı̨chǫ knowledge of boreal caribou and their habıtat in Wek'èezhìı. Appreciation is also extended to the federal and the territorial governments who use traditional knowledge and scientific information in wildlife management. Acknowledgement and thanks to all those who provided input into this process.

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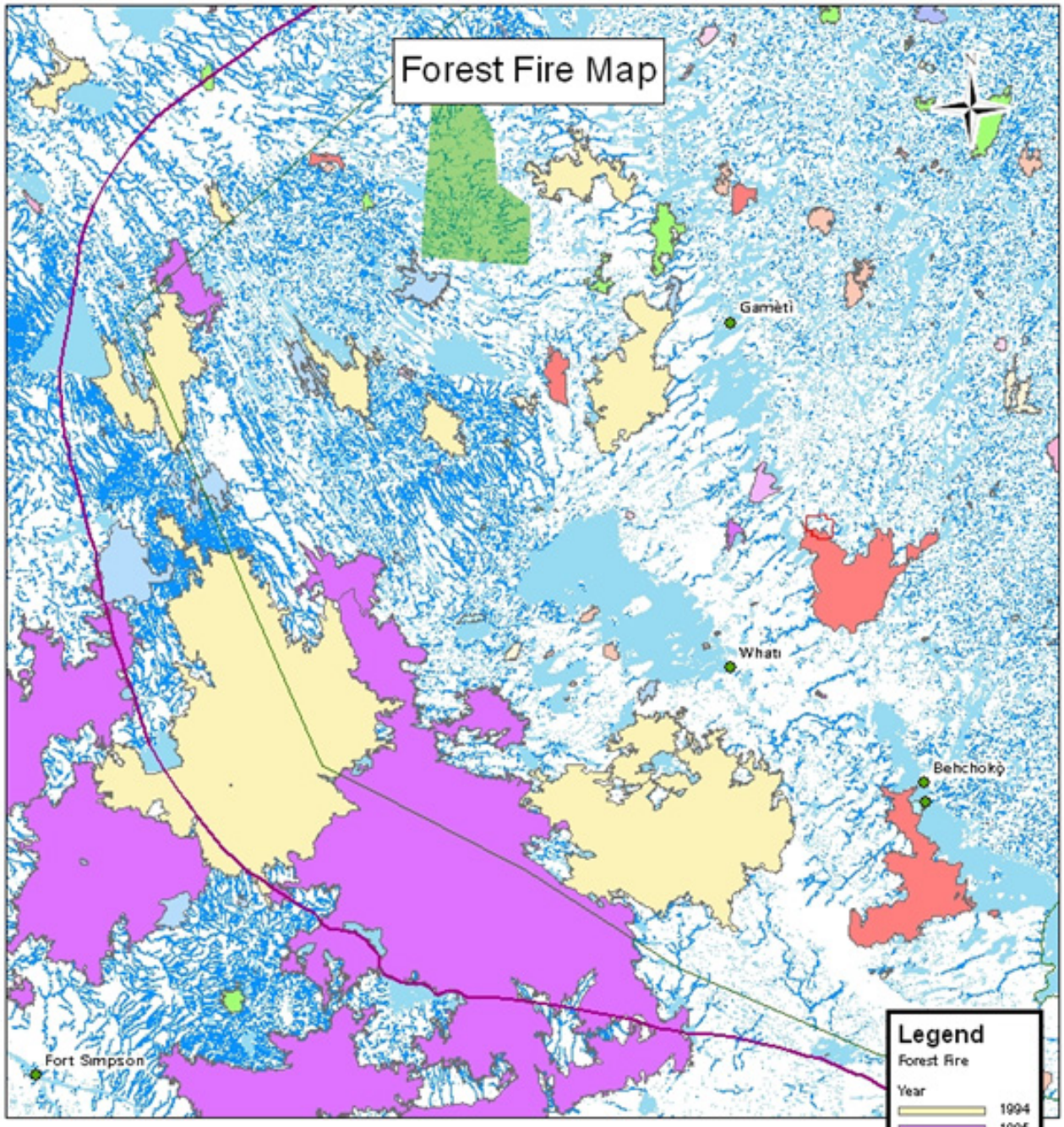

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Georgina Chocolate, Lands Protection Department, Tłı̨chǫ Goverment
Created by: Mark Fenwick
Created on: March 10, 2012
Data Source: Tłı̨chǫ Elders, GeoGratis.com, GeoBase.com

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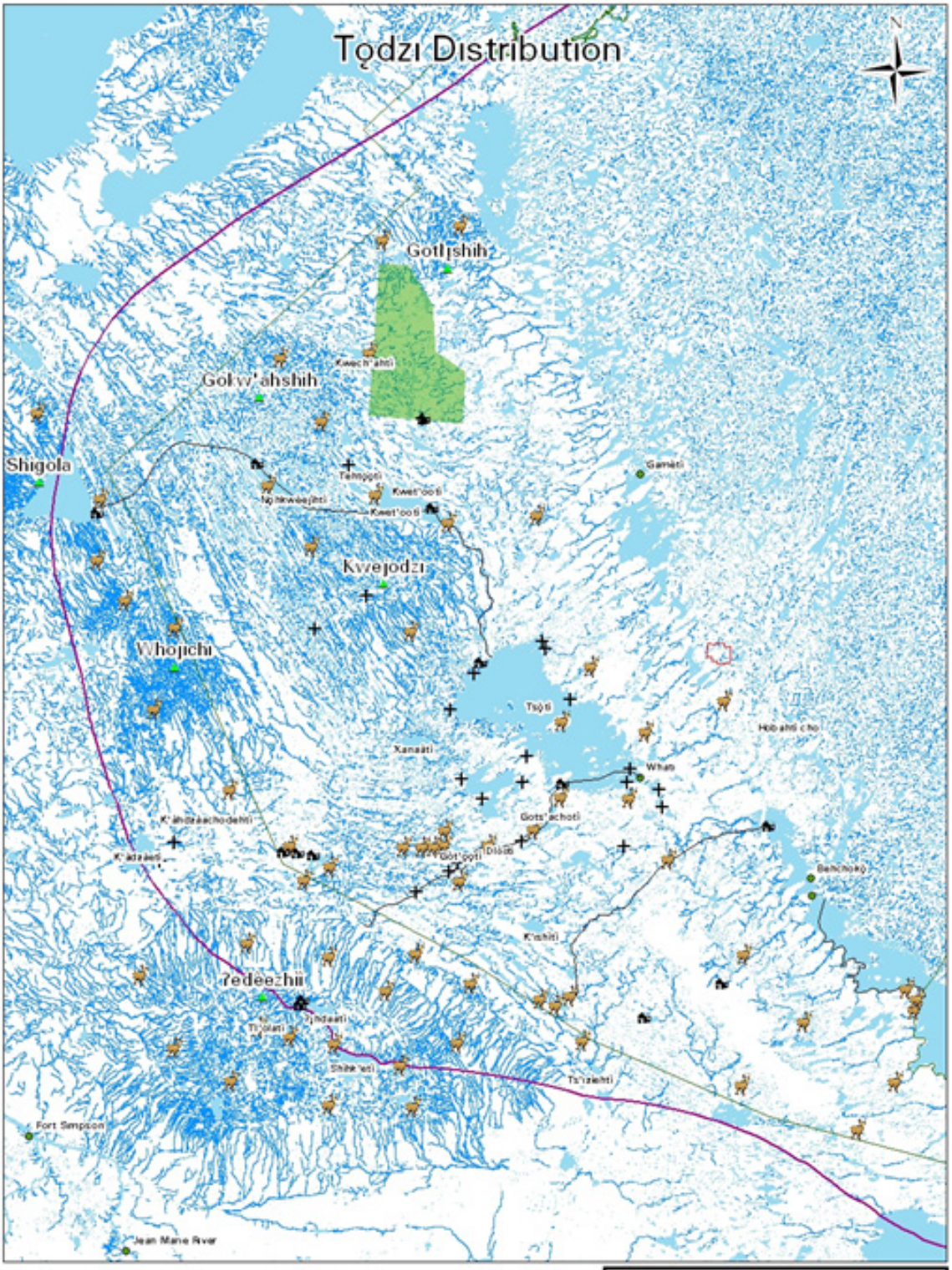
Tǫdzı Distribution
Gotłıshih
Gollv'ahshih
Shigola
Kwejodzı
Whojıchı
Tedeezhii
Fort Simpson
Jean Marie River
Gameti
Whati
Behchokǫ
Legend
Tǫdzı (Caribou)
Trapping Cabin
Grave Sites
Nǫdı (plateaus)
Fortune Minerals
Wek'èezhìi Boundary
Mǫwhì Gogha Dè Nıìtèè
Data Collected by:
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Created by: Mark Fenwick
Created on: March 10, 2012
Data Source: Tłı̨chǫ Elders, GeoGratis.com, GeoBase.com
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Figure 1
Jimmy Rabesca watching plane leave camp at ʔedèezhìì on September 25, 2012. (Photo © Allice Legat)

Introduction

Throughout the circumpolar north, woodland boreal caribou (*Rangifertarandus caribou)* are in varying degrees of risk due to loss or fragmentation of habitat. As discussed in the 2012 report *Boreal Caribou Habitat and Habitat Use in Wek'èezhìı: Tłı̨chǫ Knowledge Component*, boreal caribou in the Northwest Territories (NWT) seem to have fared better than in other parts of the country. The Dene who harvest this resource find that there is serious potential for industrial development and associated infrastructure to cause increased impacts on boreal caribou and their habitat in the NWT. The Tłı̨chǫ observe and hunt *tǫdzı* (boreal caribou) in the area between Great Bear and Great Slave Lakes, west to the Mackenzie River and east to the Canadian Shield. They continue to use *tǫdzı* for food and some clothing. They see that *tǫdzı* and their habitat are already at risk due to forest fires. The extent of these fires (see the map "Forest Fires") has caused tǫdzı to move north and west (cf. Clarke 2013; Legat and Chocolate 2012; Bensen 2011; McDonald 2010).

In 2011, the Wek'èezhìı Renewable Resources Board (WRRB) and the Lands Protection Department (LPD) decided to undertake a study to document Tłı̨chǫ knowledge (TK) of *tǫdzı* within Wek'èezhìı. Tłı̨chǫ Land Claim and Self Government Agreement mandates traditional knowledge be used when developing management plans for wildlife and habitat. Tłı̨chǫ knowledge is crucial to the development of Environment Canada's recovery strategy and management plan for boreal caribou. The information below complements last year's TK report, and will enhance understanding as both scientific and traditional knowledge information is considered.

This research undertook to describe the state of tǫdzı habitat on ʔedèezhìì (Horn Plateau) (see map 'Tǫdzı Distribution"), and to determine if tǫdzı have moved back into the burnt area. More specifically this report:

- Describes the area where the field camp was established, and explains why the elders chose that particular area.
- Discusses the Tłı̨chǫ vegetation community and land forms.
- Describes the state of the area burned in 1995.
- Describes any pristine tǫdzı habitat in the area.
- Discusses evidence of tǫdzı on ʔedèezhìì.
- Discusses evidence of other wildlife observed.

Four communities are located within the Tłı̨chǫ settlement area: Wekweètì, Gamètì, Whatì, and Behchokǫ̀. The TK research team worked with elders from Whatì and Behchokǫ̀. These elders, and their ancestors and descendants, have more knowledge of tǫdzı because they have more often watched and harvested them. Other Tłı̨chǫ also harvest tǫdzı when barren-ground caribou do not migrate to Wek'èezhìı.

The TK research team first focused on Tłı̨chǫ elders' oral narratives of their experiences with tǫdzı. During the 2012 workshops elders stressed the interaction that occurs and the vulnerability that tǫdzı feel within the conditions of their habitat. The oral narratives provided information on tǫdzı's diet—grazing on various types of lichen in the late fall and winter, and foraging on various plants such as sedges, grasses, leaves, and berries in the spring, summer, and early fall. When considering tǫdzı habitat requirements within a region, Tłı̨chǫ elders also emphasized the importance of understanding their character as it relates to tǫdzı movements and terrain use. Together these factors protect both adults and calves from predators such as humans, wolves, lynx, and bears.

The elders' oral narratives provided information on how tǫdzı camouflage themselves within thick bush, cover themselves with mud for protection from insects, travel in circles to avoid predators, run quickly if the terrain is hard, and use both high plateaus (uplands) and islands, depending on the season.

Tłı̨chǫ know tǫdzı, just as they know the character and behavioural traits of all that dwell within Wek'èezhìı. Knowledge is gained though listening to oral narratives, observing, and experiencing what others have shared (cf. Legat 2012). In this way, they learn about relationships within the environment. For the Tłı̨chǫ, knowledge is essential to understanding how to show respect while harvesting and using resources.

Figure 2
Narcisse Chocolate with fresh fish caught with net set night before. (Photo taken September, 2012 © Allice Legat)

Figure 3
White fish and trout drying. (Photo taken September, 2012 © Allice Legat)

Figure 4
Narcisse Chocolate and Harry Rabesca building raft for setting and checking fish net. (Photo taken September, 2012 © Allice Legat)

Methodology

The research team consisted of Rita Wetrade, Tłı̨chǫ Knowledge Coordinator, and Allice Legat, Roberta Bondar Fellow for Northern Studies. Georgina Chocolate, Tłı̨chǫ Knowledge Researcher, assisted with the verification meeting in February 2013 due to her involvement the previous year. Elders who participated in the first phase were asked to continue during the field research phase. At the elders' request, we established the research camp at ʔedèezhìì.

The elders chose ʔedèezhìì as the place to walk the land and look for signs of tǫdzı for the following reasons:

1. To determine the health of berry bushes, lichen, trees, and grasses as each of these plants tells them a story about the state of the land
2. To see the state of tǫdzı habitat that burned in 1995
3. To show us tǫdzı habitat that fire has not destroyed
4. To have us observe and experience the difference between pristine tǫdzı habitat and the various stages of re-growth in the area destroyed by fire in 1995.

ʔedèezhìì was also chosen because it is considered an excellent location to harvest fresh trout and whitefish, as is evident from the size of the fish in Figure 2 and the number of fish drying in Figure 3.

Six elders joined the research team there: Dora Migwi, Francis Williah, and Robert Mackenzie from Behchoko; and Dora Nitsiza, Jimmy Rabesca, and Sophie Williah from Whati. The elders also requested Narcisse Chocolate and Harry Rabesca as camp helpers since the camp site was in the location where Narcisse and his family had their trapping cabin prior to the 1995 fire. As in other bush camps where elders share their knowledge, these younger men do whatever it takes to ensure the elders safety and comfort. (Figure 4) They harvest fresh food, get firewood, assist the elders, walk with the research team if they go any distance from the camp, and watch for bears. Robert Mackenzie's son's wife Betty Anne Mackenzie was selected as cook.

The selected elders came together on two occasions for a total of ten days:

i) September 24 to 30, 2012 at a bush camp on ʔedèezhìì; and

ii) February18 to 20, 2013 in Behchokǫ̀[1] to verify that the information in the report reflected their knowledge.

During these times, the researchers documented information one-on-one with elders as well as in groups. Despite the fact that all of the elders are somewhere between their late seventies and mid-eighties, as Figures 5 and 6 show, the elders walked long distances, and, at times, found themselves in difficult situations. They did this not because we asked them to, but because they wanted us-the researchers-to observe and experience for ourselves the information contained in their stories. They are concerned about the protection of tǫdzı and tǫdzı habitat.

1 The verification meeting was to be in Whatì however the elders decided to meet in Behchokǫ̀ because Francis Williah could not travel due to a medical condition, and the other elders felt he was important to the process.

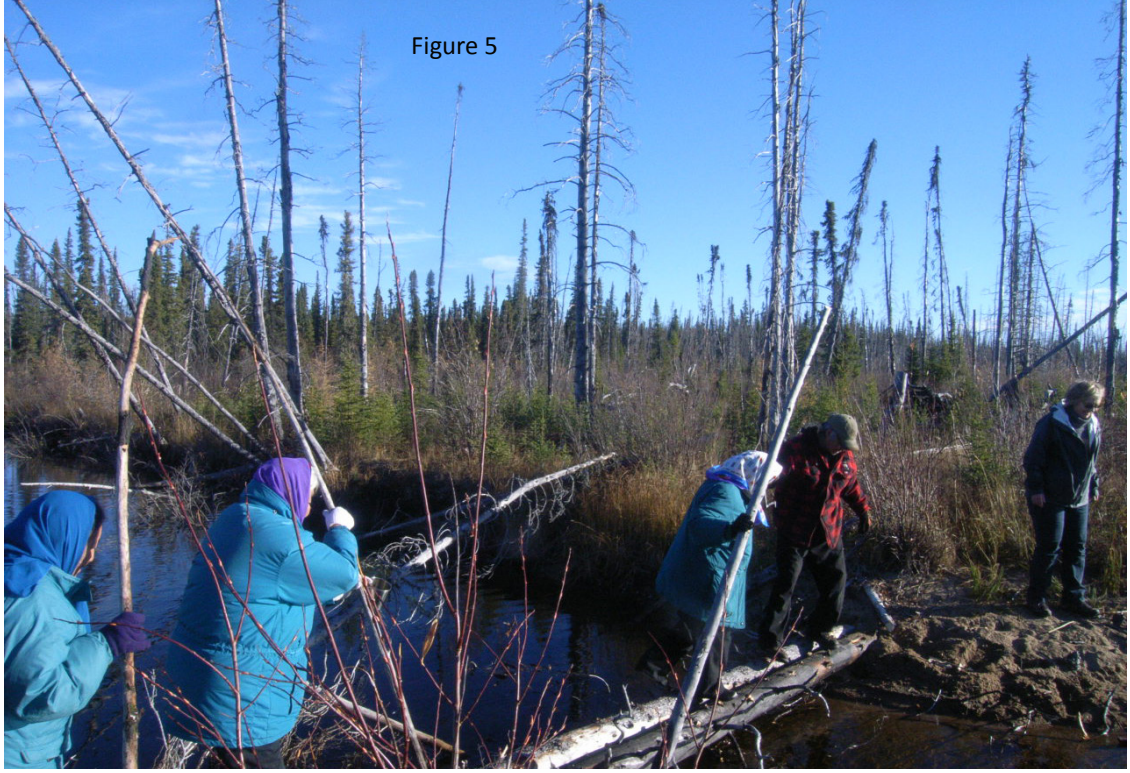

Figure 5
Narcisse Chocolate assisting Dora Migwi. Sophie and Dora Nitsiza starting to walk logs over stream. They want to inspect re-growth in tsoo after 1995 forest fire. Allice Legat on the far side. (Photo taken September, 2012 by Rita Wetrade © Allice Legat)

Figure 7
Rita Wetrade interviewing Jimmy Rabesca while standing beside a pine (goò) in a relatively healthy whagweè area where white lichen (ʔadzìidegoo) covers the ground. Jimmy was explaining how tǫdzı rub their antlers against trees when losing their velvet. (Photo taken September, 2012 © Allice Legat)

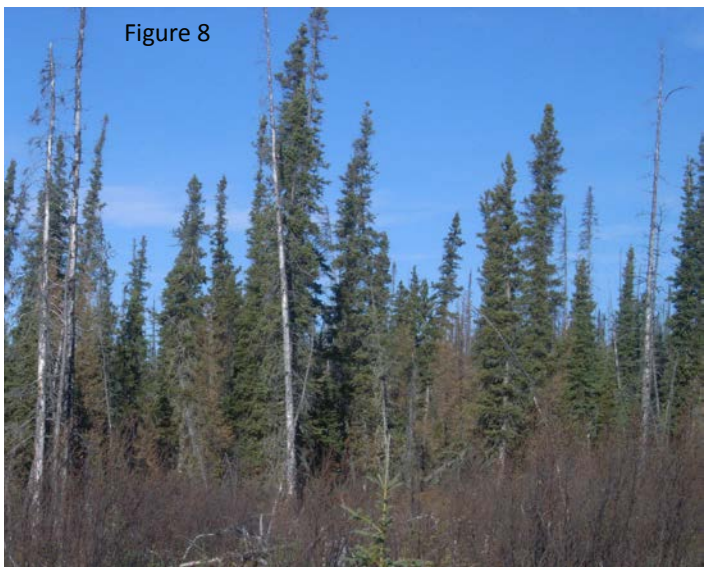

Figure 8
Tsoo at ʔedèezhìì. This stand was missed by the 1995 forest fire, leaving tǫdzı with some winter habitat. (Photo taken September, 2012 © Allice Legat)

During the field research we documented the following information:

- Specific places preferred by tǫdzı
- Vegetation communities and landforms associated with tǫdzı
- Vegetation preferred by tǫdzı
- Evidence of predators in association with tǫdzı
- Evidence of fire and re-growth
- Evidence that tǫdzı are using the rejuvenated burnt area
- Terminology associated with Tłı̨chǫ classification of habitat, vegetation communities, and landscape

While doing the research, we followed as close as possible the process that Tłı̨chǫ elders and harvesters use to pass on information. The research team listened to oral narratives about tǫdzı. While at ʔedèezhìì we walked with the elders as they pointed out evidence of tǫdzı within both the recovering burned habitat and areas of pristine habitat. The elders pointed out key vegetation communities and land forms that tǫdzı prefer or avoid; evidence of tǫdzı activity including rutting, and evidence of predators. As in figure 7, Rita Wetrade recorded the elders' comments and narratives; Allice Legat took photographs. At times it was difficult to document the comments, as groups of elders walked in different places and at different speeds. Elders told stories in the evening. The field work enhanced the information gathered during previous research.

Research Results

During the 2011-2012 seasons, the elders explained that, within Wek'èezhìı, "the place where tǫdzı belong" is called *nǫdìı* due to the number of plateaus in the area. These plateaus are ʔedèezhìì, Shìıgǫǫ̀làala,[2] Gokw'ahshìì,[3] Gohdlı̨ı̨shìì,[4] Kwechoozhìì,[5] and the mountain ridge Whojıhchıì. (see map 'Tǫdzı Distribution"). This eco-zone lies west of the ʔı̨hdaatılı, an important ancestral trail. This trail parallels the Camsell-Marion River system that runs between Great Bear and Great Slave Lakes. The scientific community knows this as taiga plain. It includes plateaus, muskeg, and upland slopes.

The elders' stories tell us that Tłı̨chǫ have always observed and harvested tǫdzı throughout nǫdìı, but that tǫdzı have preferred areas. They prefer thick bush as is shown in figure 8 year-round, but particularly in the winter when it is more difficult to remain camouflaged from potential predators such as humans, lynx, wolves, and bears. The elders explained that tǫdzı prefer to be around water in the summer to benefit from a greater abundance of food, to avoid bugs while cooling off, and to avoid wolves. Harvesters from the Little Red Cree River and Tallcree First Nations in Alberta made similar comments (Schramm and Krogman

2 Spelled Shìgola on *Tǫdzı Distribution* map.

3 Spelled Gokw'ahshìh on *Tǫdzı Distribution* map.

4 Spelled Gotłı̨shìh on *Tǫdzı Distribution* map.

5 Spelled Kwejodzı on *Tǫdzı Distribution* map.

2001). The elders further explained how tǫdzı travel over thin ice or swim to islands in the spring and summer with their calves. These islands include Tadłaadıì on the lake known as Whatì[6] and Dınàgà in the North Arm of Great Slave Lake. According to the elders, tǫdzı prefer the plateaus during the fall rutting season (late September or early October) and during spring calving[7] (May).

Table 1 explains each of the vegetation communities and soil types that elders and harvesters mentioned while on ʔedèezhìı are *whagweè* and *tsoo*.

Much of what the elders said the year before was re-iterated and enhanced as we walked on ʔedèezhìı or sat around the fire or in the tents at night. As we walked on the first day, Sophie Williah pointed out that in the summer tǫdzı lay in the shade for a while and then go in the water to get away from the mosquitoes as they cool themselves.

6 Traditionally known as Tsǫ̀tì as is shown on *Tǫdzı Distribution* map.

7 Based on McDonald's (2010) work it appears that the boreal caribou in the Sahtu region have similar movement patterns as in the Tłı̨chǫ region.

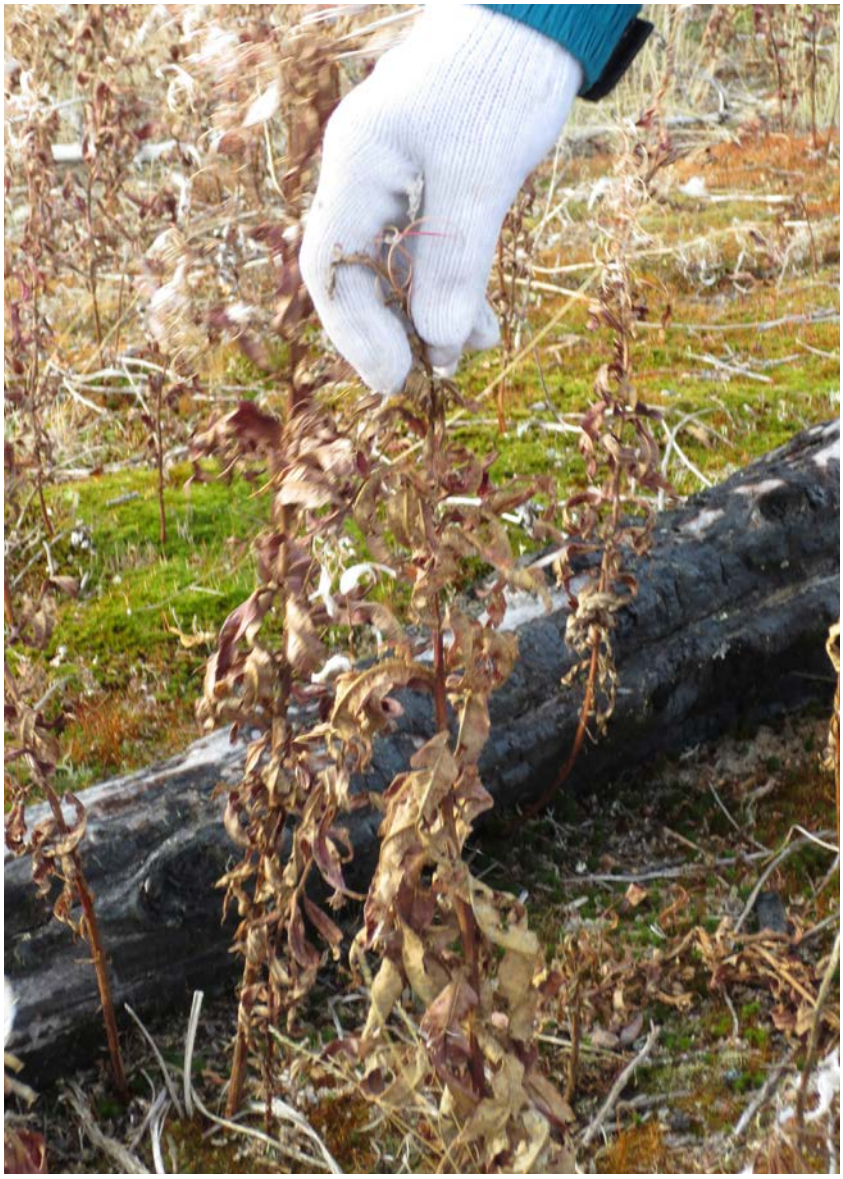

Figure 9
Nora Nitsiza pointing out dried fireweed (gooh) while commenting on what plants tǫdzı eat in each season. (Photo taken September, 2012 © Allice Legat)

Table I: Tłı̨chǫ Categorization of small Eco-regions associated with Tǫdzı at ʔedèezhìì

Eco-regions	Observed Vegetation	English Name	Latin Name
Whagweè	**Sandy soil mixed with black dirt and covered with sparse vegetation**		
	ʔadzìidegoo	white lichen	Not identified
	ʔìhk'aadzìì	bear berry	ERICACEAE Arctostaphylosrubra
	ʔìht'o	cranberry	ERICAECEAE Vacciniumvitis-idaea
	ʔıhdoo	kinnikinnick	ERICACEAE Arctostaphylosuva-ursi
	Daàghǫǫ	tree lichen	Not identified
	Dloodìì	mushroom	Not identified
	Dzìewà	blueberry	ERICACEAE Vacciniumuliginosum
	Goò	jack pine	PINACEAE Pinusbanksiana
	Gooh	fireweed	CHAMERION Angustifolium
	Goòka	not identified	Not identified
	Gots'agoò	labrador tea	ERICACEAE Ledumdecumbens
	K'ı	birch	BETULACEAE Betulapapyrifera
	K'òò	willow	SALICACEAE Salix
	Mǫhgwı̨dzìì	juniper	CUPRESSACEAE Juniperus
	Tł'o	grasses and sedges	Not identified
	Ts'ıwa	white spruce	PINACEAE Piceaglauca
	T'ooh	aspen/white poplar	SALICACEAE Populustremuloides
Tsoo	**Consists of waterlogged soil, bogs, thick vegetation. Translated as muskeg**		
	Ts'idaàghǫǫ	tree lichen on spruce	Not identified
	ʔedzo	black spruce	PINACEAE Piceamariana
	ʔıhdoo	kinnikinnick	ERICACEAE Arctostaphylosuva-ursi
	Tł'o	grasses and sedges	Not identified
	Dzìewà	Blueberry	ERICACEAE Vaccinium
	ʔìht'o	cranberry	ERICAECEAE Vacciniumvitis-idaea

Figure 10
Evidence of tǫdzı fighting and rolling on dried white lichen (ɔadzìidegoo). (Photo taken September, 2012 © Allice Legat)

Figure 11 (Opposite Page)
Evidence of tǫdzı fighting during rut. (Photo taken September,2012 © Allice Legat)

Dora Nitsiza usually pointed out the plants whose leaves tǫdzı foraged on during the spring and summer: grasses and sedges, fireweed, willow, and berry bushes. She explained that in the autumn many plants, such as the fireweed in figure 9, are too dry, and tǫdzı start foraging on white lichen and tree lichen. Dora Migwi was particularly interested in the state of the lichen and cranberry plants, as tǫdzı are drawn to them. Jimmy Rabesca and Robert Mackenzie focused on the state of the larger trees and their re-growth. Along with Narcisse Chocolate, they had trapped in the area before the fire. All the male elders stressed that it is difficult to know when the growth will return; that it is important to keep watching so you know what animals will use the land. Figure 10 shows the area where Jimmy Rabesca pointed out how tǫdzı rolled in the white lichen, an activity that seemed to be associated with the rut. Figure 11 shows where Robert Mackenzie drew our attention to the evidence of fighting and rutting activities nearby. Robert led the way further into the bush where we came to tǫdzı trails and a few tł'otìa—grassy ponds where tǫdzı sit for long periods to protect themselves from mosquitoes and other bugs. Tǫdzı emerge covered with a layer of mud, further protecting themselves from insect bites. Francis Williah was the main storyteller in the evenings. On seeing the bear tracks on the first day, it was Francis who later told of how bears kill tǫdzı from behind and wolves hunt tǫdzı in packs. Later, when looking at maps to orientate ourselves, Francis used a narrative to explain how in the spring ʔedèezhìì becomes full of grassy ponds.

Each elder added to others' comments as we walked along. Both Francis Williah and Dora Migwi emphasized that tǫdzı eat only the leave of berry plants, not the berries. On another occasion, it became apparent through their narration that they had differing opinions on whether or not tǫdzı graze on mushrooms.


Figure 12


Figure 13

Figure 12
Tǫdzı track was seen along this trail through tsoo. Robert Mackenzie explained that other animals use these trails. (Photo taken September, 2012 © Allice Legat)

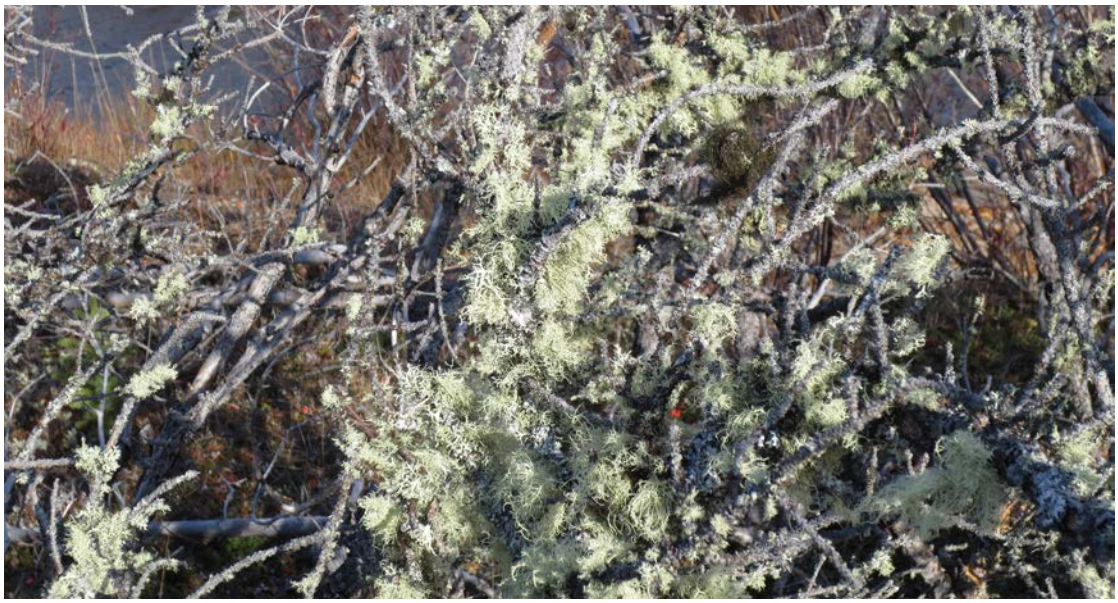

Figure 13
A grassy pond (tł'otìa) where tǫdzı are able to soak and cover themselves wıth mud which provides protection from mosquitoes and other bugs.

Figure 14
Evidence of browsing on tree lichen (daàghǫǫ) in front of a small grassy pond. (Photo taken September, 2012 © Allice Legat)

Tǫdzı on ʔedèezhìì

Being a secretive animal, the elders explained that tǫdzı prefer habitat where they can camouflage themselves amongst the thick bush. Pristine tsoo meets these requirements, and provides easy access to nourishment. Tǫdzı also prefer hard ground where they can travel quickly without twisting their legs or harming their hooves. Despite whagweè having sparse vegetation it meets these requirements. Although the 1995 fire spread over ʔedèezhìì, pockets of healthy tsoo and whagweè were evident within walking distance west of the research team's campsite.

Evidence of tǫdzı in tsoo

Trails and fresh tǫdzı tracks, signs of foraging, and recent browsing on the leaves of berry bushes in association with two grassy ponds were observed. Elders pointed out that other animals such as wolves, fox, marten, and wolverine were also evident in the area and used these trails. Tǫdzı tracks were also seen on the sandy beaches adjacent to the tsoo. Interestingly, in the tsoo area, all evidence was seen where the fire had swept through and there was vegetation re-growth. Figures 12 through 14 show the trails and small pond where evidence of tǫdzı were observed but not captured on film.

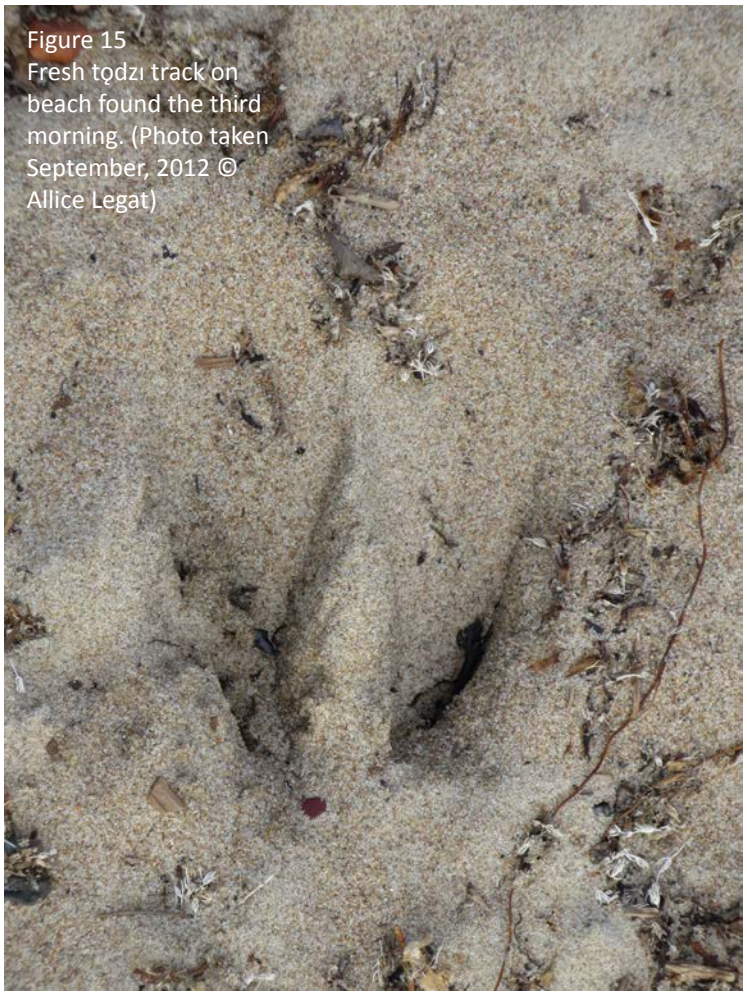

Figure 15
Fresh tǫdzı track on beach found the third morning. (Photo taken September, 2012 © Allice Legat)

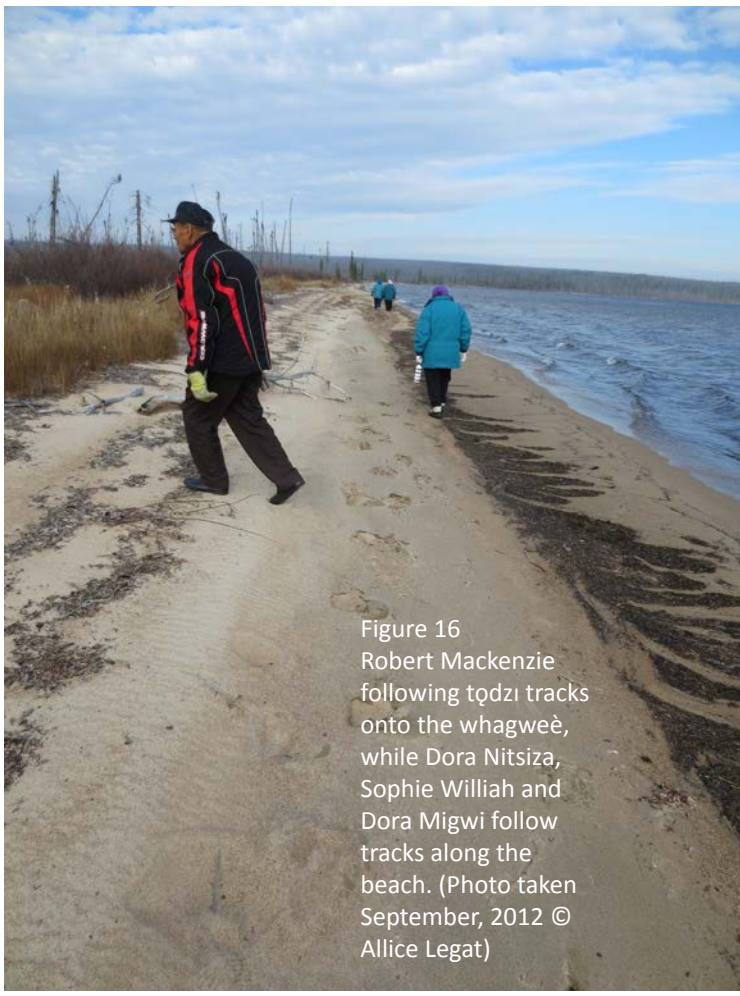

Figure 16
Robert Mackenzie following tǫdzı tracks onto the whagweè, while Dora Nitsiza, Sophie Williah and Dora Migwi follow tracks along the beach. (Photo taken September, 2012 © Allice Legat)

Evidence of tǫdzı on whagweè and along the sandy beaches

Figure 17
Jimmy Rabesca pointing to tǫdzı tracks going into the stream and coming out the other side. (Photo taken September, 2012 © Allice Legat)

Francis Williah explained when we first arrived that we would probably not see tǫdzı in any of the open areas, but would see tracks[8]. Both fresh and day-old tracks were evident on the beach around the camp, but few were as clear the one in figure 15. The tracks appeared to belong to both adult and young tǫdzı. Each day when inspecting the beach for tracks—as the elders are in figure 16—we found the tracks were further from the camp, with some leading into and across streams, as shown in figure 17.

As we walked on whagweè, a tǫdzı track (figure 18) was seen in the dry, burned ground near old wolf scat (figure 19). As figures 20 and 21illustrate, there was evidence of todzı as they grazed on grasses growing near the open meadows of the whagweè and along the sandy beaches. As stated above, there was evidence of recent rutting and tǫdzı rolling in the dried lichen of the whagweè.

8 Moreover, the elders stressed that in spite of seeing their tracks, tǫdzı travel in circles covering their tracks. They are very difficult to spot because they hide, standstill, and stay quiet. They rarely stand in the open. For these reasons, hunters in the past used dogs to find them, and hunters learned to track their circular movements, and to spot them through small cracks in thick bushes.

Figure 18
Tǫdzı print in extremely dry area of burned whagweè. (Photo taken September, 2012 © Allice Legat)

Figure 19
Wolf scat in extremely dry area of burned whagweè. (Photo taken September, 2012 © Allice Legat)

Figure 20
Grass that had been grazed on fairly recently. (Photo taken Septembe,r 2012 © Allice Legat)

Figure 21
Grass that shows tǫdzı had been in the area grazing. (Photo taken September, 2012 © Allice Legat)

1995 Forest Fire and Tǫdzı Habitat

During the 2011-2012 workshops, Jimmy Rabesca said, “Forest fires are our main concern because most often these fires burn all the animals’ food on the land” (February 13,2012)[9]. Jimmy further explained that tǫdzı have moved northwest. Other First Nations have also noticed a change in boreal caribou distribution. The Cree trappers who hunt boreal caribou around James Bay have noted that boreal caribou in their region have moved south to areas of thicker bush, thereby avoiding the disruption from large scale logging and forest fires (Herrman et al 2012).

The forest fire of 1995 destroyed almost all of the vegetation associated with tsoo and whagweè on ʔedèezhìì. Both the vegetation communities and landscape are critical to tǫdzı survival. Whagweè and tsoo surrounding the research camp were destroyed, but are in varying stages of regrowth. The elders and harvesters emphasized that not all of ʔedèezhìì burned in the same way, nor would it grow back in the same way. They are, as mentioned earlier, concerned about the state of ʔedèezhìì; they wanted to see if tǫdzı and other animals had returned. They wanted us to observe and experience the difference between pristine tǫdzı habitat and the various stages of re-growth after the 1995 forest fire.

The elders pointed out how some trees and bushes survive while the fire burns the ground in other areas. They emphasized that what is burned always varies between forest fires and between locations within the burn area. This depends on wind, ground moisture, and other factors.

9 As stated in Legat and Chocolate, 2012

Figure 22
Robert Mackenzie telling Rita Wetrade and Allice Legat about re-growth after a major forest fire. (Photo taken September, 2012 © Allice Legat)

Figure 23
Jimmy Rabesca taking a break from watching Narcisse Chocolate and Harry Rabesca putting up their wall tent. (Photo taken September, 2012 © Allice Legat)

Figure 24
Whagweè destroyed by the 1995 forest fire. Elders discussed re-growth and put the trees at approximately 10 years. (Photo taken September, 2012 © Allice Legat)

Figure 25
Grasses in burned whagweè near camp site. (Photo taken September, 2012 © Allice Legat)

Figure 26
Francis Williah building a bridge so other elders can cross stream (Photo taken September, 2012 © Allice Legat)

Whagweè

When walking and observing the extent of damage to whagweè, as Robert Mackenzie is in figure 22, or when doing other activities as Jimmy Rabesca is in figure 23 and as Francis Williah is in Figure 26, the elders noted the re-growth. They commented that the grasses in figure 24 are "good", and discussed the approximate age of the trees. Narcisse Chocolate, Jimmy Rabesca, and Robert Mackenzie—the most recent users of the area—pointed to trees in figure 25, stating that they thought they looked about ten years old while they thought the trees in figure 26 were probably not touched by the fire. Dora Migwi found small, but healthy patches of white lichen, as in figure 27, on whagweè where the fire had not burned the ground cover. Also, when walking the whagweè Sophie Williah and Dora Nitsiza located producing cranberry bushes, as seen in Figure 28.

Figure 27
White lichen (ɔadzìidegoo). (Photo taken September, 2012 © Allice Legat)

Figure 28
Cranberry bush (ɔɻt'ǫ̀ɬɻtłǫ̀). (Photo taken September, 2012 © Allice Legat)

Tsoo

When walking, observing, and pondering the state of tsoo, a key habitat area for tǫdzı in the winter, the elders' comments mostly focused on re-growth. Dora Migwi, Dora Nitsiza, Sophie Williah, and Betty Anne Mackenzie (the cook) located areas with cranberry bushes in the tsoo behind the camp (See Figure 29). Robert Mackenzie studied where tsoo had been burned to the shoreline as in figure 30, and was concerned at the limited re-growth. The elders did note new growth where they took a rest, commenting that it was difficult to determine the age of the trees in figure 31. Sophie commented that the black spruce (ʔedzo) in figure 32 was too young for tǫdzı to use as camouflage or to lie under when wanting shade. She emphasized as she did earlier in the week that they alternate between lying in the shade and going in the water in the summer.

Evidence of tǫdzı predators

Robert Mackenzie, Jimmy Rabesca, and Francis Williah all comment on signs of predators such as fox, wolves and bear. Figure 33 shows bear tracks on the beach.

Evidence of moose

Figure 34 shows fresh moose scat that was seen in a burned area with limited re-growth. Moose tracks were also noted along the beach.

Figure 29
Tsoo-behind campsite-burned in 1995 forest fire. (Photo taken September, 2012 © Allice Legat)

Figure 30
Tsoo-Tǫdzı habitat-burned down to rocky shoreline, making walking extremely difficult as numerous trees had fallen over the rocks. (Photo taken September, 2012 © Allice Legat)

Figure 31
Dora Migwi, Sophie William, Dora Nitsiza, Robert Mackenzie and Rita Wetrade taking a rest after walking several hours over rocky shoreline and through tsoo. (Photo taken September, 2012 © Allice Legat)

Figure 32
Black spruce (ɔedzo). (Photo taken September, 2012 © Allice Legat)

Figure 33
Bear tracks near campsite. (Photo taken September, 2012 © Allice Legat)

Figure 34
Moose scat. (Photo taken September, 2012 © Allice Legat)

Figure 35
Sophie Williah, Dora NItsiza, and Dora Migwi sitting after a long walk. Robert Mackenzie walking and observing the land. (Photo taken September, 2012 © Allice Legat)

Summary

Throughout Canada boreal caribou are in decline due to their fragmented and discontinuous habitat. The federal government has developed a draft recovery strategy based on the outcome of traditional knowledge and scientific research underway. Tǫdzıı (boreal carıbou) are found throughout nǫdìı (taiga plain). Elders decided to observe the state of tǫdzı habitat on ʔedèezhìì (Horn Plateau) as the 1995 forest fire was intense. The fire was massive, but small stands of vegetation key to tǫdzı were untouched. The elders wanted to see for themselves the state of re-growth. Evidence of tǫdzı was present throughout the area walked by the research team and elders in September 2012. There were also signs of moose and predators. Elders emphasized that it is difficult to fully understand the state of tǫdzı habitat and use until a TK study of tǫdzı's winter behaviour and habitat use is undertaken.

Future Tłı̨chǫ Knowledge Research

- Document tǫdzı winter habitat and behaviour before finalizing a management plan and Tłı̨chǫ land-use plan.
- Document tǫdzı use of islands.

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Boreal Caribou Habitat and Disturbance in Wek'èezhìı

- Scientific Component –

Feb 28, 2013

Wek'èezhìı Renewable Resources Board

Acknowledgements

We'd like to acknowledge the Government of the Northwest Territories, Department of Environment and Natural Resources and the Government of Canada, Department of Aboriginal Affairs and Northern Development for providing data for our use and analysis. In addition, we are appreciative of our primary funder, the Aboriginal Funds for Species at Risk, which allowed us to undertake this project.

Contents

Figures

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Introduction

A recent review of caribou and reindeer populations across the circumpolar north concluded that caribou and reindeer are in a global decline primarily due to climate warming and anthropogenic landscape change (Vors and Boyce 2010). Similarly, of the 51 boreal woodland caribou ranges in Canada, only 27% are considered to support self-sustaining populations (Environment Canada 2012). Boreal caribou (*Rangifer tarandus caribou*) were listed as Threatened under the federal Species at Risk Act (SARA) in 2003 due to population declines of more than 30% in 3 generations. Declines in boreal caribou populations are thought to be the result of habitat loss and fragmentation due to changing land use, resource development and increased predation facilitated by these changes (Environment Canada 2008, 2011). The federal Recovery Strategy for the Woodland Caribou, Boreal population in Canada requires 65% of boreal caribou habitat within the range of a local population to be undisturbed by fire in the last 40 years or from human induced disturbance.

The Northwest Territories (NWT) boreal caribou range covers an area of 441 665 km^2 and supports a continuous distribution of caribou. The population is considered self-sustaining, however, it is not free from risk (Environment Canada 2012). The NWT General Status Ranking Program ranks boreal caribou in the NWT to be "sensitive", requiring special attention, but not in danger of becoming extinct or extirpated. Boreal caribou have not been designated under the NWT Species at Risk Act, which came into force in 2010, but have been assessed by the Species at Risk Committee as Threatened. The designation will be considered and approved by the Conference of Management Authorities prior to it having official status under the Act.

The Recovery Strategy requires range specific management plans to be developed in the next 3-5 years to guide the protection and management of critical habitat and maintain it within the threshold of 65%. Habitat planning and management is further recommended in the NWT Boreal Caribou Conservation Action Plan as a tool to help address threats to boreal caribou (GNWT 2009). The Wek'èezhìı Renewable Resources Board has responsibility under the Tłı̨chǫ Agreement (s. 12.11.2) for developing a Comprehensive Proposal for the management of boreal caribou in Wek'èezhìı.

The work described herein along with a companion document based on traditional knowledge research, builds on the data and knowledge collected in 2011/2012 under the title of, "Boreal Caribou and Boreal Caribou Habitat in Wek'èezhìı". Together these reports provide the basis for management planning processes and decision-making related to boreal caribou.

Methods

The bulk of efforts in data collection and analysis for this project occurred with respect to the gathering and documentation of traditional Tłı̨chǫ knowledge of boreal caribou in Wek'èezhìı. The approach taken for the scientific component of this project was to build on the assembled datasets from last year's project in an attempt to create a baseline of available scientific information. In our previous year's project we examined natural and anthropogenic disturbance layers and calculated total disturbance in the range of boreal caribou in Wek'èezhìı in relation to the threshold set in Environment Canada's Boreal Caribou Recovery Strategy. This year we will update the fire disturbance dataset, add a land use dataset developed by Aboriginal Affairs and Northern Development Canada (AANDC) and recalculate the overall disturbance on the boreal caribou range. The datasets collected in the current and previous year's project are shown in Table 1. They included data on the range, disturbance (including fire) and land use.

Table 1- Datasets gathered for Wek'èezhìı

Year	Agency	Dataset
2011/2012	Government of Northwest Territories	Boreal caribou range
		Ecosystem Classification
		Fire History
		Boreal caribou density
		Aerial survey observations
		Resident harvest survey 2000-2011
		Tłı̨chǫ community observations and habitat
	Canadian Wildlife Service	Natural and Human Disturbance in Boreal Caribou Habitat
	John Nagy	Boreal caribou habitat- Risk, Secure-burned, Secure-unburned
		Seasonal activity periods
2012/2013	Aboriginal Affairs and Northern Development Canada	Land use
	Government of Northwest Territories	Fire History

Results

The datasets examined, represent elements of habitat change within the boreal caribou range in Wek'èezhìı. Fire is the predominant natural disturbance phenomenon while the small amount of anthropogenic change is related to settlements, exploration and resource extraction.

Land Use

The land use dataset obtained from AANDC was compiled from records of land use permits and water licences held at the Mackenzie Valley Land and Water Board along with other point data housed in AANDC. It is aspatial and so does not contribute to our understanding of total amount of disturbance in boreal caribou range. The attributes of the dataset include: location, source, owner, period of authorization, whether a camp is associated and

type. Limitations of the data include: little to no metadata for much of the records and often no datum provided with the coordinates. There are a total of 45 land uses of 8 different types identified within boreal caribou range in Wek'èezhìı (Table 2). Contaminated sites make up the majority of the land uses identified (62%).

Table 2- Types and number of land use on boreal caribou range in Wek'èezhìı

Type	Number	Percent
Community	2	5
Contaminated site	28	62
Mineral exploration	2	5
Park	1	2
Quarry	2	5
Staging area	4	8
Tourism/fishing	2	5
Woods operation	4	8
Total	45	100

The land use locations are generally scattered within boreal caribou range in Wek'èezhìı and are shown in figure 1.

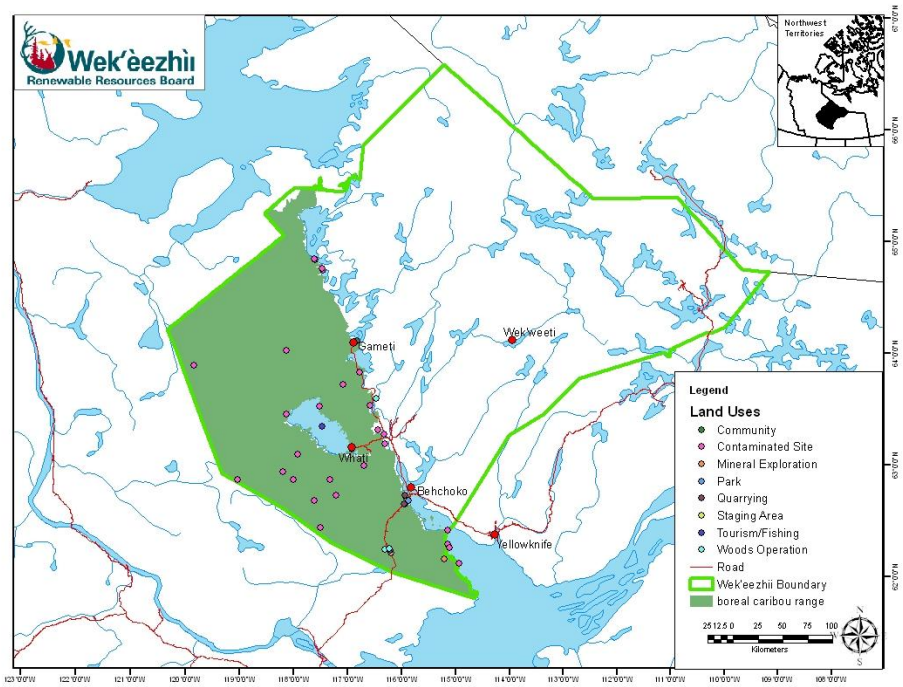

Figure 1 – Land use within Boreal caribou range in Wek'èezhìı

The land uses overlap areas of traditional hunting (figure 2) and identified important habitat for boreal caribou as identified in previous research (figure 3). Of the six land uses that overlap important habitat areas, all are contaminated sites owned by AANDC.

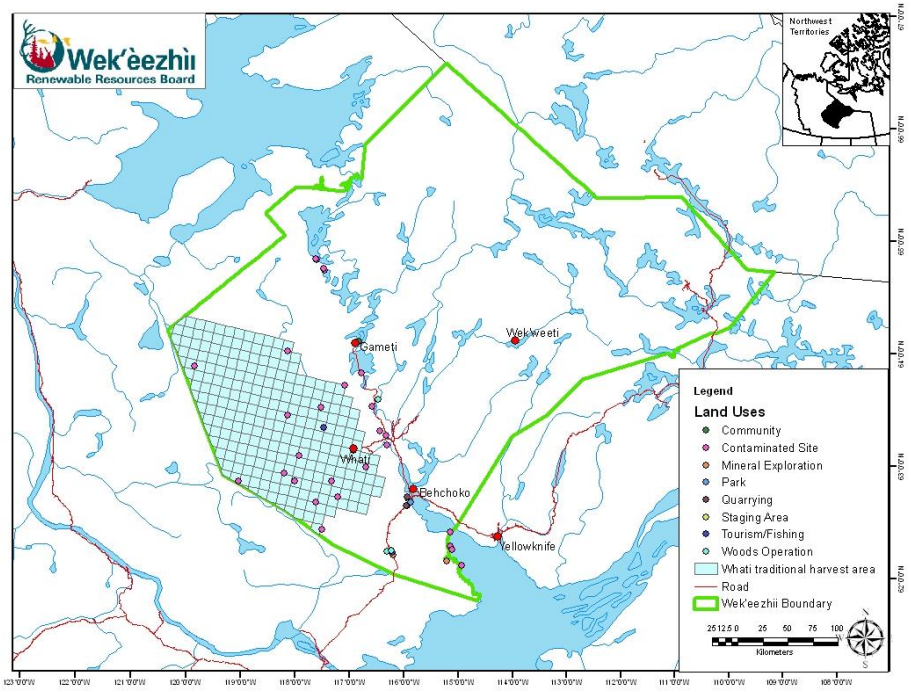

Figure 2 - Land use and traditional harvesting areas for boreal caribou (adapted from Cluff and Hillis 2006, 2006a, 2006b).

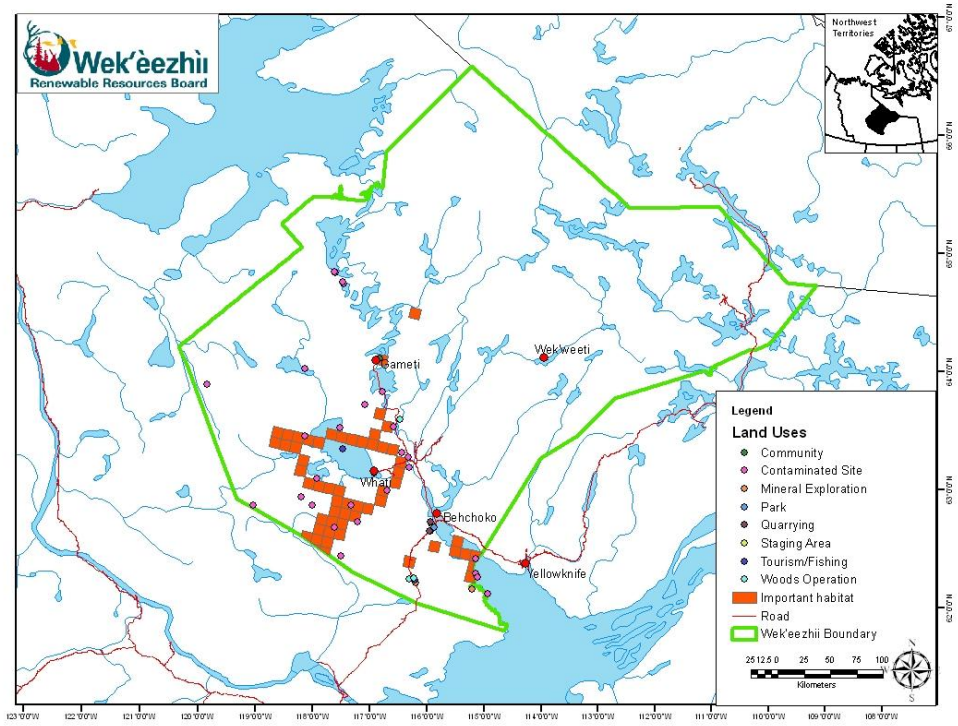

Figure 3 - Areas of land use and important boreal caribou habitat at TłĮchǫ community workshops in 2005 (adapted from Cluff and Hillis 2006, 2006a, 2006b

In relation to Environment Canada's (2011) classification of disturbance in boreal caribou habitat, the majority (82 %) of the land uses fall outside of previously disturbed boreal caribou habitat in Wek'èezhìı, (figure 4).

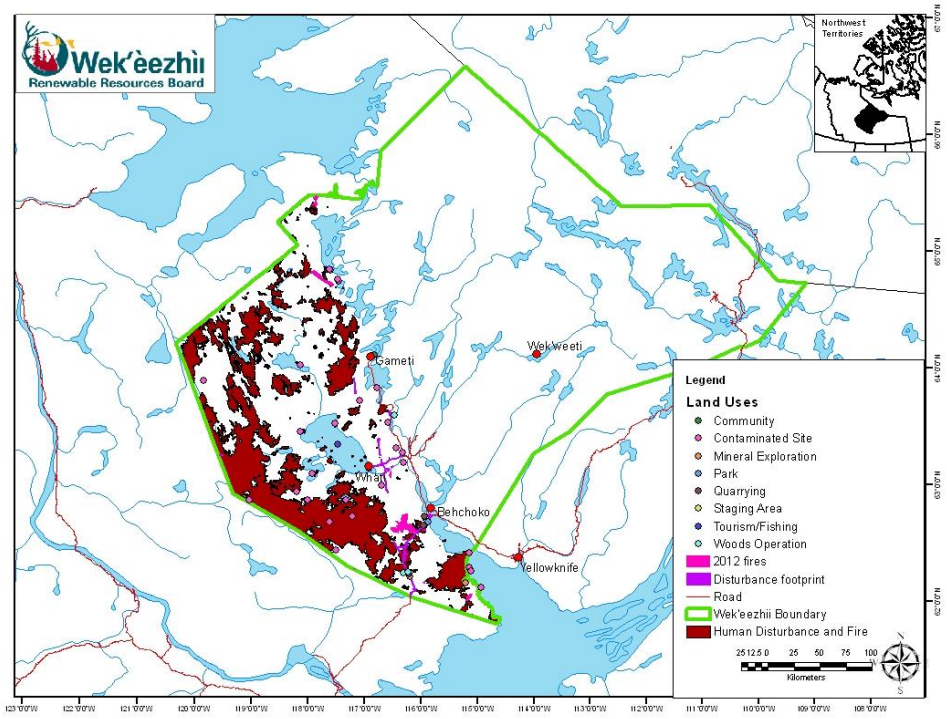

Figure 4 - Land uses in boreal caribou range within Wek'èezhìı as it relates to previously disturbed habitat (as defined by Environment Canada 2011)

Fire History

ENR has tracked and mapped the extent of all forest fires in the NWT on an annual basis from 1965 onward. Figure 5 shows the extent and location of fires grouped by decade that fall within boreal caribou range in Wek'èezhìı including the most recent 2012 fires.

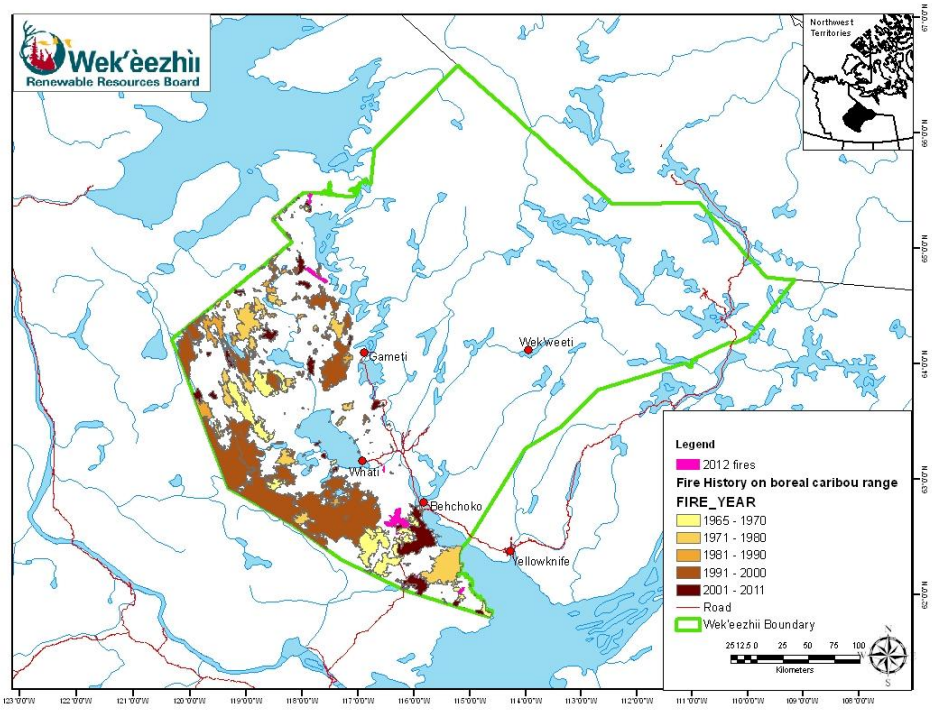

Figure 5- Location and extent of fires categorized by decade within boreal caribou range in Wek'èezhìı updated with fires from 2012

Table 3 provides the area and percent of boreal caribou range burned in fires grouped by decade. Records begin in 1965 and therefore document fires as old as 48 years. In 2012, 387 km^2 of boreal caribou habitat burned. The area of fires burned annually within boreal caribou range in Wek'èezhìi from 1965 to 2012 are found in Appendix 1.

Table 3- Area of fires in each decade within boreal caribou range in Wek'èezhìi

Decade	Area of Fire	% of range
1965-1970	438 km^2	1
1971-1980	4443 km^2	10
1981-1990	1962 km^2	4
1991-2000	9445 km^2	20
2001-2011	1887 km^2	4
2012	387km^2	1
Total	18 562 km^2	40

If we consider Environment Canada's classification of habitat disturbance as areas that burned up to 40 years ago, 2012 would have seen 1057km^2 of burned area returned to suitable caribou habitat (i.e. that area burned in 1972) and 387km^2 removed (the area burned in 2012) for a net gain of 670km^2. The overall percent of range disturbed in Wek'èezhìı by up to 40 year old fire then would be 32.8%, a decrease of 1.4% since 2011.

Discussion

The national Recovery Strategy for the Woodland Caribou, Boreal Population in Canada has set the goal of "...achieving self-sustaining local populations in all boreal caribou ranges throughout their current distribution in Canada, to the extent possible" (p. 19, Environment Canada 2012). To do so, the Recovery Strategy sets a threshold of 65% or more undisturbed habitat across the range. Disturbance is considered a combination of natural processes such as fire (</= 40 years) and human disturbances such as roads or seismic lines.

The amount of boreal caribou habitat disturbed in the past 40 years by fire in Wek'èezhìı has decreased slightly in 2012 as compared to 2011 (from 34.2% to 32.8%). This is the result of a fairly small number and extent of fires in 2012 with a relatively large amount of burned area from 1972 becoming older than 40 years and therefore returning to a condition that is considered suitable habitat (Environment Canada 2012). The amount of fire disturbed boreal caribou habitat in Wek'èezhìı is higher than that observed across the NWT range (estimated at 24% in 2011) but is comparable to many boreal caribou ranges across Canada (Environment Canada 2012)

It is unclear how the amount of human disturbance has changed from 2011 to 2012. AANDC has compiled a new land use dataset for many regions in the NWT including the North Slave region, within which Wek'èezhìı falls. The dataset does not report on the spatial extent of land uses and therefore does not contribute to our understanding of the overall amount of human induced disturbance on the landscape. We know from previous analyses that human induced disturbance in Wek'èezhìı is minimal, an estimated 274 km^2 (or 0.6%) by Environment Canada (2011) or 11 km^2 of "Risk" habitat (defined as within 400m of a seismic line, road or other human disturbance by Nagy 2011). These datasets have not been updated nor are the mechanisms currently in place to do so. The amount of human induced disturbed boreal caribou habitat in Wek'èezhìı is much lower than that reported for the NWT range as a whole (8% in 2011) and most of the other ranges in Canada (Environment Canada 2012).

Boreal caribou range in Wek'èezhìı remains predominantly unburned (67.2%) with essentially no risk habitat. However, 82% of the newly documented land uses fall within unburned boreal caribou habitat. Most disturbances documented are contaminated sites falling under the jurisdiction of AANDC. Further, many of these sites overlap areas of documented important habitat for boreal caribou and areas used for traditional harvesting of this species (Cluff and Hillis 2006, 2006a, 2006b). As the spatial extent of these land uses has not been provided it is impossible to say to what extent they might be affecting boreal caribou habitat quality and quantity. If one uses the 2011 estimate of human induced disturbance, total disturbance on boreal caribou range in Wek'èezhìı is 33.4%. This is within the threshold established in the Recovery Strategy of 35% total disturbance within the range of a local boreal caribou population.

Conclusion

The federal Recovery Strategy for the Woodland Caribou, Boreal population in Canada requires 65% of boreal caribou habitat within the range of a local population to be undisturbed by fire in the last 40 years or from human induced disturbance.

The amount of fire disturbed habitat up to 40 years old in Wek'èezhìı (calculated through 2012) comprises 32.8% of the boreal caribou range. There are currently no spatial datasets that update the human induced disturbance calculated by Environment Canada in 2011. In the absence of any recent data we estimate a total of 33.4% disturbance within boreal caribou habitat.

While the GNWT, Forest Management Division tracks the number and extent of forest fires on an annual basis in a spatial format there is no agency that tracks human induced land disturbance in a similar fashion. It will be very difficult to manage boreal caribou range within the disturbance threshold set out in the federal Recovery Strategy for Woodland Caribou, Boreal Population in Canada without these two complimentary datasets.

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Appendix 1 –Areas of fires burned annually within boreal caribou range in Wek'èezhìi from 1965 to 2012

Year	Area of Fire (ha)	Area of Fire (km^2)
1965	1045.148798	10.45148798
1966	38428.08398	384.2808398
1967	1555.853767	15.55853767
1968	2559.01343	25.5901343
1970	726.718658	7.26718658
1971	19122.44219	191.2244219
1972	105714.1014	1057.141014
1973	126176.9212	1261.769212
1974	3390.067918	33.90067918
1975	108724.5497	1087.245497
1976	13448.95221	134.4895221
1977	37751.06963	377.5106963
1979	88437.65241	884.3765241
1980	43.864869	0.43864869
1981	92621.27827	926.2127827
1982	15675.17153	156.7517153
1983	6686.690526	66.86690526
1984	1561.480017	15.61480017
1986	208.727847	2.08727847
1987	58986.21832	589.8621832
1988	1861.567282	18.61567282
1989	24166.7334	241.667334
1990	25743.64472	257.4364472
1991	5953.269138	59.53269138
1992	44.151381	0.44151381
1993	25571.89686	255.7189686
1994	1053469.807	10534.69807
1995	944157.1445	9441.571445
1996	4499.879657	44.99879657
1998	205.668664	2.05668664
1999	2773.309741	27.73309741
2000	22351.64537	223.5164537
2001	14.042799	0.14042799
2003	6274.878736	62.74878736
2004	14180.54461	141.8054461
2005	36544.22341	365.4422341
2006	5595.783348	55.95783348
2007	9878.519507	98.78519507
2008	187652.5174	1876.525174
2009	100.541154	1.00541154
2010	7811.027395	78.11027395
2011	37956.32095	379.5632095
2012	38660.61435	386.6061435