NORTHWEST TERRITORIES

Traditional Knowledge Assessment of Boreal Caribou (Mbedzih) in the Dehcho Region

Prepared by Dehcho First Nations

January 2011

The document is a non-confidential summary of the Dehcho report. The maps and community appendices referred to in the document have been deemed confidential and are not included in the report.

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Prepared by Dehcho First Nations
For the Canadian Wildlife Service

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Cover photo: Boreal caribou swimming across Beaver Lake; Peter Redvers

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Terminology

In English, the term 'woodland caribou' refers to both 'boreal caribou' (those woodland caribou that do not normally reside in mountain areas) and to southern and northern species of 'mountain caribou'. In Dene Zhatie/Yati (the Dene language of the Dehcho area), the term 'mbedzih' refers to woodland caribou as distinct from barren-ground caribou (nódi) and generally refers to both boreal and mountain species of the animal, although distinctions between these groups of animals are acknowledged[1]. Given that this assessment focuses only on 'boreal caribou' and does not include 'mountain caribou', the term 'boreal caribou' is used as the primary term.

Introduction

Environment Canada, through the Canadian Wildlife Service (CWS), is currently mandated to develop a National Recovery Strategy and Action Plan to preserve and enhance declining boreal caribou populations across Canada and protect and maintain populations that are currently stable. Environment Canada determined that Aboriginal Traditional Knowledge (ATK, or TK) respecting boreal caribou should help guide and inform the development of this Recovery Strategy and Action Plan.

In the fall of 2010, Environment Canada entered into a contribution agreement with Dehcho First Nations (DFN) whereby Environment Canada would fund a series of harvester meetings in each of the Dehcho communities to gather TK information on boreal caribou in the Dehcho, review this information in relation to TK already documented by Dehcho communities, and prepare a summary report. DFN retained Crosscurrent Associates Ltd. of Yellowknife to coordinate this work and facilitate or co-facilitate harvester meetings in each of the Dehcho communities. This work was governed by the Dehcho First Nations' Traditional Knowledge Research Protocol (2004). Environment Canada provided Crosscurrent Associates Ltd. with an outline of the type of information required, a set of topographical maps (in hard copy and digital formats) to use for the meetings, and summaries of previous community meetings undertaken by CWS over the past year.

Prior to the harvester meetings, Crosscurrent Associates Ltd. gathered, reviewed, and summarized existing TK information regarding boreal caribou by community. This process helped identify information gaps that could be addressed through the harvester sessions. A group interview guide was developed (see Appendix 10), based on information needs provided by CWS. Then meetings were arranged through the respective First Nation councils or local resource management agencies and harvesters, co-facilitators/interpreters[2], and note takers were identified. The harvester meetings took place between October 16th and November 17th, 2010. Although West Point First Nation did not participate in these meetings, some data and information from previous TK work in this community has been presented in Appendix 9. Fort Liard, although still in the Dehcho Region, has withdrawn from the Dehcho First Nations' government and therefore did not participate in this assessment.

A total of forty-nine (49) harvesters participated in the community meetings, including a mix of elders and adult harvesters. Other community members -- such as youth observers, interpreters, co-facilitators, and/or resource managers – were also involved in varying degrees.

Based on notes taken at the sessions, information documented on topographical maps, and the previous TK information compiled, community summaries were prepared (see Appendices 1 through 9). These

[1] Mountain caribou are generally larger and in some instances have slightly darker shading.
[2] Some communities chose to use interpreters only while other had co-facilitator/interpreters.

appendices were circulated to their respective communities for review and feedback, and the regional summary was then prepared based on the information in these appendices.

A key item of consideration was the amount of detail to include on maps, given that locations of seasonal migratory paths, mineral licks (or wallows), calving areas, and rich lichen habitat are considered sensitive. Given that this level of detail is likely not required for the development of a National Recovery Strategy and Action Plan, information about these types of locations is presented in narrative form only rather than detailed in map form. The detailed information can be brought forward by communities and DFN during subsequent range-level planning activities in the Dehcho. Instead, the attached maps for each of the communities provide topographical names for narrative reference and, with the exception of Fort Providence[3], a generalized representation of active harvesting areas, and, therefore known habitat areas, based on Dehcho First Nation traditional land use data gathered in 1997 and 1998. This representation helps to scope out the general distribution of boreal caribou throughout the Dehcho region from a harvesting perspective. A more detailed explanation of the attached maps is provided below.

For the purposes of this report (to guide national Recovery Strategy and Action Plan development) English place names have been used, except where Dene place names make specific reference to boreal caribou (mbedzih). However, all of the geographic locations mentioned in the report, along with many other geographic features, have Dene place names and these names can and should be used for subsequent range-level planning activities in the Dehcho.

Description of Attached Maps

A regional map and a series of community area maps are attached to this assessment in the appendices for geo-referencing and to provide a form of visual representation of boreal caribou range within the Dehcho region. More detailed traditional knowledge (TK) map data regarding boreal caribou has been gathered by the individual Dehcho communities (including the locations of movement and migration routes, calving areas, mineral licks and wallows, and rich lichen patches), but publishing this information in map format in a public forum is considered sensitive. Furthermore, some of this data is more appropriate for community-based range management planning and not deemed essential by DFN at this time for the development of the National Recovery Strategy and Action Plan. For this reason, rather than publishing this data in this assessment report, it is referred to in more general terms in narrative form.

The attached maps provide an overview of boreal caribou harvesting areas based on historical kill-site data gathered by Dehcho First Nations as a component of a traditional land use study conducted in 1997-1998. This kill-site data does not include all active DFN harvesters, is for a limited time frame (ie. is within the memory of the informants as of 1997-1998), and likely under-represents actual harvesting activity and range because harvesters can forget specific hunts and also tend to underreport harvesting for cultural reasons. However, the data provides a reasonable representation of the geographical extent of Dehcho boreal caribou harvesting activities and therefore known boreal caribou habitat areas.

The attached maps were created by carrying out a density analysis of all kill sites documented in the 1997-1998 land use study, using ArcView GIS, based on the relative number of boreal caribou harvested per square kilometer, and broken into three gradients to better identify higher use areas. The total number of kill sites documented in the Dehcho was 2247 and the number of sites varied by community.

[3] The Fort Providence big game harvesting data was not broken down by species, so woodland caribou harvesting could not be isolated for density mapping purposes.

Although based on quantitative data, the polygons are representational only and the designations of low harvest, moderate harvest, and high harvest are as much qualitative as quantitative. In essence, what is being represented is a relative depiction of the pattern of woodland caribou harvesting over a fixed period of time among a time-limited sample of Dehcho harvesters based on memory. The sample size of 2247 is likely enough to conclude that the pattern is a reasonable representation of active harvesting areas. If this pattern is reasonable, then the areas in which more caribou are harvested likely represent better habitat areas. However, good boreal caribou habitat is likely under-represented on these maps given that most of the DFN harvesting occurs in the fall and winter, so spring and early summer habitat may not be fully represented. Furthermore, the maps only depict areas which are readily accessible to and are utilized by harvesters, so more remote or difficulty terrain, while harboring boreal caribou, may not be actively harvested. The data does show that boreal caribou are harvested throughout the entire Dehcho land use area, which highlights the extensive land base on which boreal caribou rely and the importance of boreal caribou conservation initiatives from a harvester and habitat protection standpoint.

It must be noted that the kill data for the Fort Providence area was not broken out by species (moose, boreal caribou, etc.) so no analysis was done for this land use area. Also, the data that extends into the Mackenzie Mountains likely illustrates 'mountain caribou' rather than boreal caribou harvesting areas, although there is some overlap in the foothills as discussed later in this assessment.

Dehcho Traditional Knowledge Assessment Summary

The categories used below for the analysis and presentation of the information gathered were provided by the Canadian Wildlife Service for the purposes of National Recovery Strategy and Action Plan preparation. Summaries for each category are drawn from the individual community information presented in the appendices.

Populations

Boreal caribou are common throughout the Dehcho region, although some areas tend to have higher concentrations of individuals. To some degree, population densities and trends can be inferred by traditional observations of average group sizes as well as by community harvesting levels. From this perspective, the boreal caribou population in the Dehcho is relatively stable in most areas, with a tendency toward a slow decline in others, particularly in those areas impacted by forest fires, introduction of bison, and/or high levels of sensory, hunting, and/or developmental pressures.

Boreal caribou feeding area northeast of Cameron Hills; Peter Redvers

Traditional knowledge information about boreal caribou recruitment activities (calving) is not extensive, likely given that boreal caribou spread out over large areas and generally stay in wetlands and burned areas that are difficult to access during the spring calving season. By the fact that populations are generally stable and that group sightings in fall and winter generally include a mix of adult and younger animals (with adults being the majority of the group), it is inferred that recruitment is stable.

In the Nahanni Butte area (Map A1), the population of boreal caribou along the Liard River valley and to the immediate west of the valley (between the river and mountains) is generally low but stable. Group sizes observed are generally in the range of 1 to 3 animals, but in late winter a group as large as 20 animals has been seen. The population of boreal caribou to the east of the Liard River, between the Liard River and Trout Lake (Sambaa K'e), particularly in and south of the Arrowhead Lake area, particularly, is considered high and stable.

It should be noted that, because of the possibility of some interaction between the boreal caribou to the west of the Liard River and the mountain caribou in the Mackenzie Mountains, the mountain caribou population (most of which are in Nahanni National Park Reserve) is considered strong, with up to 50 animals being seen in a single group.

In the Trout Lake area (Map A2), the population of boreal caribou is moderate to high throughout the entire area and is considered stable. Common group sizes range from 2-3 animals to 7-8 animals, with groups as large as 40 animals observed northeast of the community in late March.

In the Wrigley area (Map A3), the population of boreal caribou is moderate to high throughout most of the area and is considered stable in most areas, with some decline in the corridor between the Mackenzie River (Dehcho) and the Franklin Mountains. The strongest population is to the east of the Franklin Mountains. Group sizes of 6-7 animals are common in the fall through early winter with groups as large as 30-40 animals not uncommon in late winter, particularly east of the Franklin Mountains.

In the Fort Simpson area (Map A4), the population of boreal caribou is generally moderate and stable throughout the area, with certain areas, such as the Horn Plateau (Edehzhie) and the lowlands and foothills around Sibbeston Lake, harboring relatively strong populations. Groups sizes of 5-7 animals are not uncommon with groups of up to 17-19 animals observed during the mid to late winter months.

In the Jean Marie River area (Map A5), boreal caribou are common but not abundant, and the population appears to be in slow decline. The most common group size in recent years has been 2-3 animals, but group sizes of 5-7 animals are not uncommon and groups as large as 15 animals have been seen in late winter. Harvesters note that group sizes were larger in the past.

In the Fort Providence area (Map A6), the population of boreal caribou appears to be generally and slowly declining over the past number of years, likely due to pressures from forest fires, the expansion of the imported wood bison herd, and increased sensory disturbance. The population on the Horn Plateau (Edehzhie) remains the strongest, with a greater portion of the decline occurring south and southeast of that area, to the north of the Mackenzie River and in and around the Mackenzie Wood Bison Sanctuary. Group sizes are most commonly 2-3 animals and larger groups are less common today, although more common in the past.

In the Kakisa area (A7), the population of boreal caribou remains relatively high throughout the Tathlina Lake and Kakisa Lake areas, particularly in the area between and to the west of those lakes, but the population on the Cameron Hills plateau has clearly declined due to development pressures. Group sizes of 10-15 animals in the area northwest of Tathlina Lake during the mid winter months are not uncommon, while groups of 5-7 animals are occasionally sighted inland from the south shore of Beaver Lake.

In the Hay Rıver area (Map A8), the population of boreal caribou is generally considered stable with some recent decline noted in the area southwest of Buffalo Lake and the area to west of the community of Hay River[4]. Hay River harvesters also note a decline in the population inhabiting the Cameron Hills plateau. Group sizes of 2-3 animals, and up to 5-8 animals, are most common throughout the Hay River area, while groups as large as 40 animals have been observed in the past southwest of Buffalo Lake during late winter. Those areas showing some decline in population appear to be subject to increased access by skidoo, hunting pressure from both Aboriginal and non-Aboriginal hunters (see 'Overharvesting' below), and, in the case of the Cameron Hills plateau, oil and gas development.

Range Boundaries and Patterns

Specific information regarding range and movement for each Dehcho First Nation community is presented in the appendices, so this section of the assessment focuses on broader range boundary and pattern matters.

Boreal caribou tracks crossing muskeg prairie east of Sambaa K'e; Troy Marsh

It appears that the entire Dehcho region could be referred to as boreal caribou range, in that boreal caribou populations, in varying levels (likely dependent on habitat availability and habitat pressures), are found throughout the entire region. Although the Mackenzie Mountains are generally identified as mountain caribou range, there is also evidence from Nahanni Butte and Wrigley that there is some interaction between mountain caribou and the boreal caribou that inhabit the foothills and river valleys along the eastern edge of the Mackenzie Mountains, which means that the boreal caribou range in the Dehcho extends to some degree into the Mackenzie Mountains.

From a traditional knowledge perspective, the degree to which individual boreal caribou move throughout the entire Dehcho range and therefore interact is not known, but it is known that many groups of boreal caribou have relatively significant 'linear' seasonal movement or migration patterns while others remain for the most part in large multi-habitat areas and simply shift the pattern of use of those areas based on seasonal habitat preferences.

Significant 'linear' movements appear to occur in the Wrigley area (groups of boreal caribou cross the Mackenzie River south and north of the community on the ice from east to west in the late winter / early spring and return during the late summer / early fall); in the Fort Simpson area (groups of boreal caribou cross the Mackenzie River from the northeast to the southwest in early spring between Ebbutt Hills and Sibbeston Lake and return during the late summer and fall); in the Kakisa area (groups of boreal caribou cross the upper Kakisa River area from the western foothills of the Cameron Hills to the area northwest of Tathlina Lake in the fall / early winter and return in the early spring); and in the Hay River area (groups

[4] A decline in the area west of Hay River was also noted in previous documents by West Point First Nation.

of boreal caribou spend spring and summer in the Caribou Hills in Northern Alberta and return to the area north and northwest of Buffalo Lake in the fall).

In the Fort Providence area, groups of boreal caribou used to move between Beaver Lake and the base of the Horn Plateau (Edehzhie) in the late summer / early fall and then back to the Beaver Lake lowlands in the early spring, but this seasonal movement has diminished, possibly due to expansion of the bison population in that area.

The boreal caribou population on the Horn Plateau (Edehzhie) appears to remain on the Plateau year round, but shifts habitat use by season, although some interaction with neighboring populations likely occurs. On the Plateau, boreal caribou tracks are embedded in the moss from ongoing use. Boreal caribou also appear to remain year round in the area below the east and northeast edge of the Cameron Hills. This area contains a wide variety of habitat from rolling forested hills along the base of the Hills to open muskeg / mixed forest lowlands between the Hills and the Hay River. A similar pattern appears to exist north of Nahanni Butte along the east side of the Nahanni Range, with boreal caribou moving between the foothills of the Range and the wetlands / mixed forest landscape between the Range and the Liard River. Boreal caribou using the habitat surrounding the Jean Marie River essentially remain in the area to the south of the community but shift east-west and north-south (including across the Mackenzie Highway) seasonally, depending on habitat preferences. In the Trout Lake area, boreal caribou appear to move freely throughout the area, including around the lake, particularly to the north of the lake, but shift habitat preference by season.

The only definitive separation of populations occurs in the southern portion of the Hay River area, where boreal caribou on the west side of the Hay River and Mackenzie Highway (between the highway and the Cameron Hills) do not cross over to the east side of the Hay River where there is a concentrated population of boreal caribou north and north east of Swan Lake – and vice versa. These populations, although separated by only a few kilometers (along with a river and a highway), do not appear to mix.

In one area of the Dehcho, the Wrigley area east of the Franklin Mountains, there is considerable overlap between boreal caribou range and barren-ground caribou range in the mid-winter months. Groups of boreal caribou have been observed walking and feeding among large herds of barren-ground caribou, particularly around the Fish Lake area. The barren-ground caribou, which come down from the Sahtu so are part of what is referred to as the Bluenose West herd, only recently returned to this area after being away for approximately fifty years.

Overall, range and movement patterns appear to differ somewhat within the region (significant ‘linear’ movement versus less obvious ‘rotational’ movement), with varying degrees of overlap between community land use areas, such that it would be difficult to clearly identify separate populations (sub-populations) within the region, with the exception of the southern Hay River area and to some degree the Horn Plateau. The consistent factor is that all population groups move throughout the year in response to common seasonal habitat preferences, as summarized below.

Habitat

The general seasonal habitat trend is for boreal caribou to spread out throughout marsh and wetlands during the spring calving period; to stay close to and in areas with greater amounts of muskeg terrain throughout summer; to move more freely in fall and early winter throughout a range of habitats, while gathering into larger groups; and to overwinter in larger groups in areas that have higher amounts of thicker brush (both black spruce and pine) while remaining close to muskeg and ‘willow prairie’ areas that harbor ground lichens and sedge grasses. The Dehcho region generally appears to provide the wide

and diverse range of habitat types that woodland caribou use throughout the year along with ready access, in most areas, to both hanging and ground lichens and other foraging vegetation.

From a broad perspective, boreal caribou rely on ground and hanging lichens as well as sedge grasses for feed and remain close to habitat where this type of food is accessible. Areas with 'white muskeg' are known to be good habitat as well as areas with rich 'hanging moss'. Open 'bog' areas (a few large bogs are located in the Dehcho, particularly between Fort Simpson and Jean Marie River) are avoided. Boreal caribou generally do not congregate in the same areas as moose due to habitat preference and well as predator avoidance. There appears to be a correlation between boreal caribou presence and pine forested areas. There are a large number of 'endaa' (wallows or licks) throughout the Dehcho, but the location of these sites are kept confidential unless there is a specific threat from development . Communities may be willing to share this information for community-level management planning.

Boreal caribou feeding site northeast of Cameron Hills; Peter Redvers

For the most part, with the exception of the Cameron Hills and the Mackenzie Bison Sanctuary, there has been minimal change to boreal caribou habitat since oil and gas exploration was halted in the early 1970s. The Dehcho landscape, now that many seismic lines have grown in, remains relatively pristine habitat.

Spring (late March through May): Once the snow crust softens, boreal caribou move from their over-wintering habitat in relatively large groups and begin to travel to and spread out over calving areas, which are generally in wetlands, marshlands, or even burn areas that are difficult for predators to access. The largest concentrations of boreal caribou are generally seen in late winter / early spring, just before they disperse to calving areas.

Summer (June through early August): Throughout the summer, boreal caribou primarily utilize muskeg areas or areas with access to muskeg. They lay in heavy moss that has permafrost under it in order to stay cool. They appear to move around less frequently during the mid summer months but begin to move more in late summer / early fall.

Fall / Early Winter (late August through November): Fall is a transitional period, in that boreal caribou begin to move around over a wider and more diverse habitat area during the rutting and post rutting period. This is the time of year when boreal caribou are often seen along or crossing water bodies. Their primary habitat is 'open' country and they still spend considerable time in muskeg areas that harbor ground lichens as well as sedge grasses.

Winter (November through March): As winter progresses, boreal caribou tend to spend less time in open and muskeg areas and concentrate in larger groups on higher ground in thicker brush areas, where there is still access to open areas that harbor ground lichens. As the snow gets deeper and crusts (generally January through mid March), they remain more often in areas of dense pine or thickly wooded black spruce (referred to as 'dedłını' in Trout Lake) where snow is softer, where there is hanging lichen, and where there remains access to open, mixed vegetation for ground foraging. This particular mix of habitat, which supports larger groups in smaller habitat use areas, appears critical for over-wintering survival.

Harvesting

Boreal caribou hunt east of Sambaa K'e; Troy Marsh

Throughout the Dehcho, there appears to be a decline in the harvesting of boreal caribou by Dehcho First Nation members, although boreal caribou continue to be harvested. This decline is likely due to a few factors. First, harvesters do not spend as much time on the land today as previous generations did, which means that incidental contact with boreal caribou, and the opportunity to harvest them, is less frequent. Second, given that boreal caribou are shy animals and sensitive to sensory disturbance, the use of skidoos rather than dog teams decreases incidental contact. Decreased use of dog teams means that the need for harvested meat for dogs has also decreased. Third, the use of boreal caribou hides for snowshoe lacing and dog harnesses has diminished so there is less need for the special characteristics of this hide (it stretches less than moose hide). Fourth, most harvesters prefer moose to boreal caribou (moose provide more meat and are a preferred taste) so boreal caribou are mostly harvested on an opportunistic basis while doing other land use activities, such as trapping or moose hunting. Finally, some harvesters are aware that boreal caribou are at risk, having heard of significant drops in boreal caribou populations in southern Canada, and therefore have cut back on their harvesting of the animals.

Consistent with past practice, harvesting of boreal caribou generally takes place in the fall and winter months, when the animals are moving around more (fall / early winter) or are in larger groups in more concentrated areas (mid to late winter/early spring).

Dehcho harvesters are aware that non-Dene harvesting of boreal caribou appears to be steady or rising slightly, due to increased knowledge by non-Dene hunters of key winter caribou habitat areas and recent restrictions on the hunting of barren-ground caribou (forcing non-Dene hunters to hunt in less restrictive areas), but non-Dene harvesting numbers are not known. (This matter is addressed in more detail in the 'Overharvesting' section below.)

Estimating actual Dehcho First Nation harvest numbers is speculative at best, given that harvest information is not necessarily openly shared and is often under-represented (for both personal and cultural

reasons), but, based on harvester estimates, an estimate of 100-150 boreal caribou per year at the current time is not unreasonable. This does not include mountain caribou, which are commonly harvested in the fall time up the rivers flowing out of the Mackenzie Mountains.

Relationship / Values

> *Before we got out to the lake there... Bonıface paıd the water. We made a fıre there, made tea, we cooked out and he fed the fıre and he fed the lake too, tobacco and matches and some tea. He paıd the water and prayed that the weather stayed good as long as we remaıned huntıng ın the area. Man ıt was a beautıful tıme I remember back then because the lake was just calm, really calm, just looked lıke a glass. You could see way out on the lake, ducks movıng around, I see those lıttle rıpples, that's how I see the water. As long as we camped there, hunted around the area no wınds or storm came around. But we had a great hunt at that tıme, we got some carıbou, some moose, we shot three moose and a couple bıg carıbou. (Dehcho Elder)*
>
> *That's where ıt was saıd a talkıng carıbou used to lıve. People saıd a carıbou that talked lıke a human lıved there long ago... They saıd ıt would clımb trees and talked a lot about thıngs. He would sıt up there and look around but nobody would go close to ıt. People saıd that carıbou would talk to ıtself say thıngs lıke "I see smoke, there are people lıvıng there" and thıngs lıke that. The carıbou would clımb trees... That's why they call ıt Mbedzı̨ı̨ Gotsele. There ıs a place they call Mbedzı̨ı̨ Gotsele and Mbdzı̨ı̨ Gochoo. Mbedzı̨ı̨ Gochoo ıs besıde the bıg lake.(Dehcho Elder)*

Although boreal caribou are currently an 'incidental species' from a harvesting perspective -- and are not actively harvested in the same way as moose or even mountain sheep -- boreal caribou, mbedzih, are highly respected and valued by Dehcho harvesters.

The meat is valued for human consumption and the hide is valued for making specialized craft products such as snowshoe lacing, dog harnesses, and drums, because it doesn't stretch as much as moosehide. Traditionally, the hide, because it was thin and strong, was stretched across window openings in cabins to keep out cold but allow light through. In one community, the stomach contents of boreal caribou, given its high lichen content, was used for making a nutritional soup.

On a deeper level, Dehcho Dene have a spiritual relationship with mbedzih that carries with it certain obligations not to unduly harm or disrespect the animals. For this reason, most elders and many harvesters are very uncomfortable with the collaring that has been carried out for research purposes. They feel that collaring harms individual animals, affects the animal's relationship with other boreal caribou, and is simply not respectful toward the integrity of the animal. This disrespect will result in the Creator 'taking the animals away'.

Respect is shown ceremonially by making tobacco or other offerings before hunting in a particular area or, in the past, holding ceremonies at seasonal gatherings to thank the Creator for animals harvested over the past year. Taboos relating to the use of mbedzih hair and antlers are still followed in some communities today. In at least one Dehcho area, place names associated with mbedzih are still used, including place names associated with the cultural story of a talking caribou.

Harvesters feel that it is our behavior toward boreal caribou (and other animals) that is affecting their well-being and that we therefore have to be conscious of our behavior toward these animals if they are going to be sustained. Decisions affecting boreal caribou need to be made from a relationship-based, land-based perspective and not on the basis of paper research and reports.

Factors Affecting Sustainability

Calf Survival

As noted above, detailed information about calving is not well known given that boreal caribou tend to calve in isolation in inaccessible locations, but, based on harvesters' knowledge, factors affecting calf survival include the following:

- Minimizing disturbance to boreal caribou cows during the mid to late winter when energy conservation is important and relocation is difficult due to snow conditions;
- Protecting known and likely calving habitat and minimizing disturbances in wetland / marsh / and burn areas during late April through early June;
- Controlling known calf predator populations (wolves and bears).

Habitat Changes

Although, for the most part, boreal caribou habitat in the Dehcho is relatively pristine, extensive, and productive, the major habitat changes that have occurred in the Dehcho have been due to oil and gas development, introduction of bison, and forest fires. Changes in the use of productive habitat have also resulted from sensory disturbance. And new changes to habitat from climate change are beginning to be noticed. These matters are addressed in the sections below.

Forest Fires

Forest fires are known to damage boreal caribou habitat, particularly deep burning fires that destroy lichen cover. Once a fire has damaged a habitat area, boreal caribou generally do not go back into the area for foraging purposes and it can take decades for the land to recover. However, there is also evidence that boreal caribou use burned areas as travel corridors and that some foraging on fresh growth does occur. Boreal caribou do not frequent burned areas in the mid to late winter, even as travel corridors.

Forest fire in boreal caribou habitat east of Sambaa K'e; Peter Redvers

In the Dehcho, a few boreal caribou habitat areas have been impacted by forest fire, including the area south of Bulmer Lake, the area between Mills Lake and the base of the Horn Plateau (Edehzhie), and an area immediately to the southeast of Beaver Lake. Fires generally damage a portion of a habitat area but do not cause as much damage to open muskeg areas, which continue to host lichen cover.

Other areas in the Dehcho have been relatively fire free and habitat remains in good shape. This includes the rich habitat area east of the Franklin Mountains in the Wrigley area; much of the Jean Marie River area, particularly old growth forests to the immediate south of the community and northeast between the

Mackenzie River and Horn Plateau (Edehzhie); the area surrounding Kakisa and Tathlina Lakes; and the area around the Hay River Dene Reserve and surrounding the north and west sides of Buffalo Lake.

As noted in the management section below, particularly rich habitat areas, known to harbor quality lichen cover, need to be documented and listed under the GNWT's 'values at risk' protocol for fire protection decision-making purposes.

<u>Industry and Development</u>
Based on their collective experience of the major oil and gas exploration activities that took place in the Dehcho during the late 1950s through to the early 1970s, harvesters are particularly concerned about the immediate and cumulative impacts of development in the region. Seismic lines, sensory disturbance from oil and gas exploration activities, oil and contaminant spills, and use of seismic wire all resulted in immediate impacts to boreal caribou. Animals were driven away from development activities and did not return to these areas for many years; some animals became entangled in seismic wire and died; and elders expressed concerns about animals become contaminated through exposure to oil and other contaminants left on or under the ground.

Old cutlines southwest of Sambaa K'e; Dennis Deneron

Once this development stopped though, and once many of the seismic lines grew back in, boreal caribou appear to have re-adapted to the landscape and the re-grown lines do not appear to be a deterrent to use. It should be noted, though, that the level of seismic activity in the Dehcho remained for the most part at the preliminary level (ie. seismic lines were generally spread out) and that intensive 3D seismic was only carried out in a few areas of the Dehcho. Some elders have commented that since this extensive development, boreal caribou have become more wary and do not linger as long in open areas as they did prior to these disturbances.

The construction of the Norman Wells pipeline caused boreal caribou to leave the corridor area for a number of years before eventually returning. As well, in Wrigley, elders noted that boreal caribou that were harvested close to the corridor had the taste associated with stress (see Disease and Parasites section below).

Current and new developments remain a concern. Both Kakisa and Hay River Dene Reserve harvesters have noted that boreal caribou numbers have decreased on the Cameron Hills plateau due to extensive oil and gas development and production. Nahanni Butte is concerned about the impacts of a winter haul road to the Prairie Creek Mine on over-wintering boreal caribou to the east of the Nahanni Range and the community has proposed a road realignment to help mitigate impacts. Sambaa K'e and Jean Marie River have expressed ongoing concern about the impact of the proposed Mackenzie Gas pipeline on over-wintering boreal caribou along the corridor. Sambaa K'e and Nahanni Butte have ongoing concerns about expanded oil and gas development and production in the Arrowhead Lake area. Dehcho First Nations collectively are concerned about opening the Horn Plateau (Edehzhie) to potential mineral or

oil/gas development and have launched a court action to reinstall interim land protection in the area to protect the ecosystem, with a particular focus on the watershed and boreal caribou habitat. Jean Marie River harvesters noted that logging of old growth areas, which has been done selectively in the Jean Marie River area for a number of years, needs to be reviewed.

At this time, with the exception of the Cameron Hills, there is minimal resource development activity occurring in the Dehcho, although a few major projects are pending. Dehcho First Nations has strategically chosen to use this lull in activity (due in large part to Dehcho Process negotiations) to establish and implement a Dehcho Land Use Plan and establish a Dehcho Resource Management Authority to properly regulate new development, but negotiations with Canada and the GNWT have been proceeding very slowly. As noted in the management section below, the land use plan and resource management authority are seen as being the most effective tools for ensuring sustainability of existing boreal caribou populations.

Cutlines on Cameron Hills; Peter Redvers

In the interim, the establishment of a Dehcho Boreal Caribou Working Group to carry out range management activities is embedded in two existing regulatory licences -- the Cameron Hills expansion project licence (2004) and the National Energy Board certificate for the Mackenzie Gas Project (2010). However, this group is still in the process of being established.

<u>Predation</u>

Wolf populations throughout the Dehcho appear to be increasing, due in part to the fact that fewer of these animals are trapped or hunted today than in the past, for both cultural and socio-economic reasons. However, with the exception of the Fort Providence area, wolf pack sizes are considered to be normal for the area (generally 4-7 animals in a pack) and there is no evidence of increased killing of boreal caribou by wolves. The large packs seen in the Fort Providence area (in one case, 70 animals) appear to be due to the increase in the bison population and it is not known to what extent these large packs have impacted boreal caribou, although Fort Providence appears to have seen the most decline in boreal caribou in the Dehcho region and wolf predation may be a factor (disturbance to boreal caribou habitat by bison and forest fires have also been identified as reasons for this decline).

Wolf following boreal caribou tracks NE of Cameron Hills; Peter Redvers

Harvesters know that seismic and other lineal disturbances open corridors for wolves and can lead to an increase in predation of boreal caribou and other game animals and are concerned about this impact.

There has also been an increase in the bear population throughout the Dehcho. This past summer, it was not uncommon to see a sow bear with three cubs, which would normally be considered quite unusual. It is known that bears will kill boreal caribou calves in the spring time. The increase in bears is largely due to the fact that the harvesting of bears for meat and fur has declined considerably, as harvesters are uncomfortable harvesting and eating bears that may have been foraging in dumps or other contaminated sites.

Cougars have been increasingly seen (directly or through tracks) throughout the Dehcho region over the past decade and are suspected of harvesting boreal caribou, although there is no direct evidence to date of this occurring. This increase in cougars appears to be associated with a concurrent increase in whitetail deer (jumping deer) in the area and extensive oil and gas exploration activity occurring in northern Alberta and British Columbia (perhaps pushing cougars northward).

Increased predation of boreal caribou by wolves, bears, and cougars may be offset by the fact that other prey species are available. Moose populations remain high throughout the Dehcho, there has been a large increase in bison populations in the Fort Providence and Nahanni Butte areas, whitetail deer populations appear to be gradually increasing, and, in the past few years, signs of elk have appeared in the Mackenzie Mountains west of Wrigley and around Trout Lake. Beaver populations have also been increasing due to less trapping activity, and it is known that wolves and bear prey on beaver.

Wolf along Simpson Hwy; Peter Redvers

As noted in the management section below, ongoing monitoring of predator and prey species needs to be carried out, with a focus on boreal caribou predation rates. Measures to increase harvesting to more historical and traditional levels also need to be considered.

<u>Parasites and Disease</u>

Overall, boreal caribou in the Dehcho appear to be in good health. There are no reported incidents of unusual internal parasites or evidence of disease and animals are generally fat when harvested in the fall and winter. The only two health issues that harvesters express concern about are the handling and collaring of boreal caribou for research purposes and the appearance of two apparently stressed and unusually thin animals in the Trout Lake area.

Collaring remains a controversial issue. In spite of concerns by elders, most communities agreed to collaring in order to get baseline data for management purposes. Now that adequate data has been gathered, and given ongoing concerns about the negative impacts of collaring, the general consensus is that collaring should not continue. There are two main concerns: 1) that netting, handling, and collaring

of animals causes physical injury and weakening of collared animals, and 2) that netting, handling, and collaring of animals is culturally inappropriate and disrespectful. Harvesters have seen collared animals with open sores on their necks and at least one collared animal appears to have died either through starvation or disease because its remains were not scavenged. Elders are increasingly uncomfortable about the need to chase, net, and handle animals for collaring; about the weight and size of the collars around the animals' necks; and about the impact of begin disrespectful to the animals on the long term sustainability of the population. Other means of carrying out research, using less intrusive methods, need to be developed.

Harvesters know that boreal caribou (and other big game) that are highly stressed from sensory or other disturbances taste differently. In the Trout Lake area, two animals were killed within the past year that exhibited signs of stress and were also unusually thin. Aside from the taste being bad and having limited fat, the animals did not show signs of illness. There is no local explanation for this phenomenon, so it needs to be monitored.

Sensory Disturbance

As noted in the section on Industry and Development above, boreal caribou are particularly sensitive to sensory disturbance and have been affected by sensory disturbance from oil and gas exploration in the past (and currently in the Cameron Hills). The potential impact of pending and future development remains a major concern.

Harvesters also note that boreal caribou are sensitive to other localized disturbances, including increased use of skidoos, increased use of motorized boats, heavy truck traffic, and low flying aircraft. Finding means to reduce sensory disturbances would therefore benefit boreal caribou populations, especially reducing sensory disturbances at critical periods, such as during calving and over-wintering periods, needs to be a priority.

Over-Harvesting

Over-harvesting is of moderate concern at this time, with most concerns being expressed about the following areas: to the southwest of Buffalo Lake, to the west of the community of Hay River, along the river systems around Fort Providence, and around the Fish Lake and Willowlake River areas near Wrigley. Over-harvesting by Dehcho harvesters is not the issue, because traditional harvesting has clearly declined over the past few decades for a number of reasons (see Harvesting above), but there has been a slow increase in non-Dehcho and non-Dene hunters coming into a few reasonably accessible habitat areas in the Dehcho during the fall and winter months. It is not known how many animals these hunters are taking so this situation needs to be more closely monitored.

Closure / limiting of the barren-ground caribou harvest north of Yellowknife and increased access to rivers systems in the fall using jet boats has added to overharvesting concerns. Also, as favored boreal caribou habitat becomes more widely known over time, particularly winter habitat, these areas become more heavily targeted.

Harvesters in Jean Marie River are concerned about harvesting of 'mbedzihcho', the larger boreal caribou bulls, because these are considered the best breeders and they would like to see both voluntary and imposed restriction on the harvesting of large bulls. [A number of communities raised concerns about the harvesting of mature mountain caribou bulls as well, particularly by outfitters, and feel that this practice weakens population health.]

Harvesters support monitoring and, perhaps, changes to the non-Dene boreal caribou harvesting season to better protect over-wintering boreal caribou populations.

Vehicle Collisions
Even though there are a number of all season and winter roads crisscrossing the Dehcho region, and a reasonable number of boreal caribou sightings along these roads, there are no known incidences of boreal caribou been struck by vehicles. Sensory disturbance from large trucks, particularly on winter roads, is more of a concern.

Climate Change
The Dehcho region is clearly getting warmer and wetter overall, with more rainfall in August and September and even into October. This change is creating more incidences of ice crusting along the ground which may make it more difficult for boreal caribou to forage for ground lichens. Sudden thaws and melting during winter months also create crusts on the snow that make it difficult for boreal caribou to move around and escape predators. In some instances, frost heaves that harbor lichens are diminishing or melting entirely which reduces availability of this particularly rich habitat site. Wetter summers and falls are resulting in higher water levels on smaller rivers and streams, increasing boat access (particularly jet boat access) into boreal caribou habitat areas previously difficult to access at these times of year.

Climate change does not yet appear to be affecting ground or hanging lichens, although some monitoring of future changes to lichen due to climate change should be undertaken.

Dehcho Boreal Caribou Protection Recommendations

During this assessment, along with soliciting traditional knowledge information from Dehcho harvesters regarding boreal caribou, DFN asked harvesters to provide direction on management recommendations that would help guide protection and recovery planning and implementation activities. The community-specific recommendations brought forward and discussed by harvesters are listed in the community appendices.

The following regional recommendations are derived from these community-based recommendations and need to be considered by Canadian Wildlife Service in its development of a National Recovery Strategy and Action Plan. DFN also expects to be actively involved in the implementation of these plans in the Dehcho region, initially through CWS and the GNWT, but ultimately through the Dehcho Resource Management Authority. On an interim basis, these recommendations, along with the specific community-based recommendations and the other information provided in this assessment, can also guide the deliberations of the Dehcho Boreal Caribou Working Group once it is fully established.

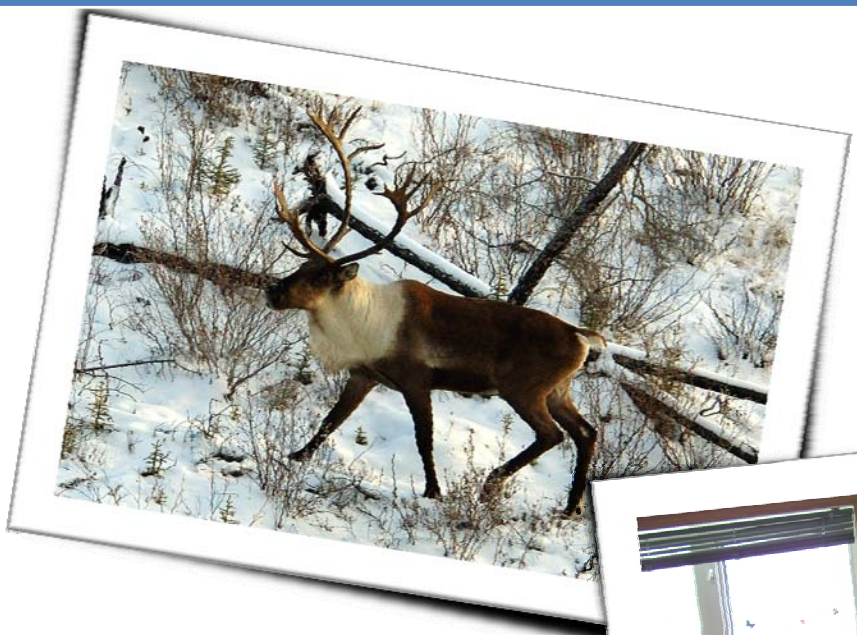
1. Finalize and approve the Dehcho Land Use Plan and formally establish the Dehcho Resource Management Authority to implement the land use plan and other wildlife and resource management activities as they relate to boreal caribou.
2. Finalize the establishment of current Candidate Protected Areas in the Dehcho, with full surface and sub-surface protection from industrial development, in order to preserve large undisturbed boreal caribou habitat areas.
3. Restrict and monitor industrial development generally during critical boreal caribou calving and over-wintering periods.
4. Halt new boreal caribou collaring research and work with harvesters to develop alternative research and population monitoring methods, including greater use of community-based monitoring, aerial surveys, and less intrusive technical monitoring devices.
5. Restrict further expansion of imported bison populations into boreal caribou habitat areas by opening these areas to bison harvesting.

6. Carry out more detailed analyses of critical habitat characteristics, with a particular focus on calving and over-wintering habitat as well as lichen availability, quality, density, and vulnerability (from development, airborne pollution, and climate change).
7. Verify special habitat sites / areas – such as wallows/licks, rich lichen areas, old growth forest areas, calving areas, etc. – and locate these sites / areas on GNWT 'values at risk' maps to guide forest fire management decisions.
8. Restrict non-Dene hunting for boreal caribou during the overwintering period and in locations where overhunting appears to be impacting populations (ie. shorten current season, review hunting zones, and protect mature bulls).
9. Identify and implement measures to encourage increased traditional harvesting of wolf and bear in order to limit population growth, while monitoring predator populations.
10. Ensure that Dehcho harvesters respect critical habitat periods and voluntarily maintain current harvesting levels rather than expanding or increasing harvest levels.

Fort Providence elders and harvesters meeting regarding boreal caribou; Peter Redvers

The appendices and maps for each community are confidential and have not been included in this report.

Gwich'in Traditional Knowledge: Woodland Caribou, Boreal Population



Boreal woodland caribou. Photo: John Nagy, ENR

Billie Lennie interviews Mary Teya in Fort McPherson. Photo: GRRB

Kristi Benson
Gwich'in Social and Cultural Institute
January 14, 2011

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Executive Summary

The GSCI and GRRB conducted a study to gather and present Gwich'in Traditional Knowledge on Woodland Caribou – Boreal population (woodland caribou). There is a stable population of woodland caribou in the Gwich'in Settlement Area and surrounding regions which are harvested by Gwich'in living in Inuvik, Aklavik, Fort McPherson, and Tsiigehtchic. However, the Canadian population is classified as threatened under the federal *Species at Risk Act*. Environment Canada supported the project in order to integrate Gwich'in Traditional Knowledge in the recovery planning process for woodland caribou. The study involved searching the digital archives of GSCI for relevant primary and secondary data, and conducting 20 interviews with Gwich'in hunters and Elders. Study results are presented in the following report.

Contents

Figures

1. Introduction

1.1. Description of project

Woodland caribou, boreal population occur throughout a large portion of the Gwich'in Settlement Area (see Figure 1, below). They are larger than the barren-ground caribou and Porcupine caribou more often harvested by the Gwich'in. Although not harvested as often as other types of caribou they still form an important food source and are recognized as a culturally valuable species by the Gwich'in.

Woodland caribou are listed as a threatened species under the federal *Species at Risk Act* and Environment Canada is preparing a national recovery strategy and action plan. Gwich'in traditional knowledge (TK) will be integrated into the recovery planning process as appropriate. The purpose of this study was to gather and collate Gwich'in traditional knowledge for use in the recovery planning process. The GSCI and the GRRB used previously recorded Gwich'in traditional knowledge, and conducted interviews with holders of Gwich'in traditional knowledge to obtain TK about general observations, special significance, physical description, distribution, habitat, population size and trend, limiting factors and threats, and health of the woodland caribou.

1.1. Previous traditional knowledge work on boreal caribou in the region

A table showing previous traditional knowledge work on caribou in the Gwich'in area can be found as Appendix 3. When interview information from other studies is used in this report, a full citation can be found in this appendix.

2. Methodology

The GRRB and GSCI worked together to carry out this project, with assistance from Environment Canada to ensure the project met their requirements for recovery planning. A total of 20 semi-structured interviews were carried out by GSCI and GRRB, in all four NWT Gwich'in communities (Aklavik, Fort McPherson, Inuvik, and Tsiigehtchic). Eighteen interviews were recorded using a digital sound recorder, and two interviewees declined to be recorded. A (NAME OF RECORDER) was used to store the sounds in MP3 format files, which were later transcribed to GSCI standards. Information was drawn using Sharpie markers on a set of maps provided by Environment Canada. The mapped information was later digitized by Environment Canada into a Geodatabase. All data is held by GSCI and GRRB, and original research materials are in storage at the GSCI's storage area in the NWT Archives. Environment Canada also has a copy of the digital data with the exception of data from one interviewee who wished to remain confidential. Maps were scanned and saved in digital format as well. Interviewees were given the option of receiving a copy of the sound recording or typed transcript. An informed consent statement (Appendix 1) was read to the interviewees which governs the use of the information. A questionnaire was used by interviewers to guide the interviews (Appendix 2).

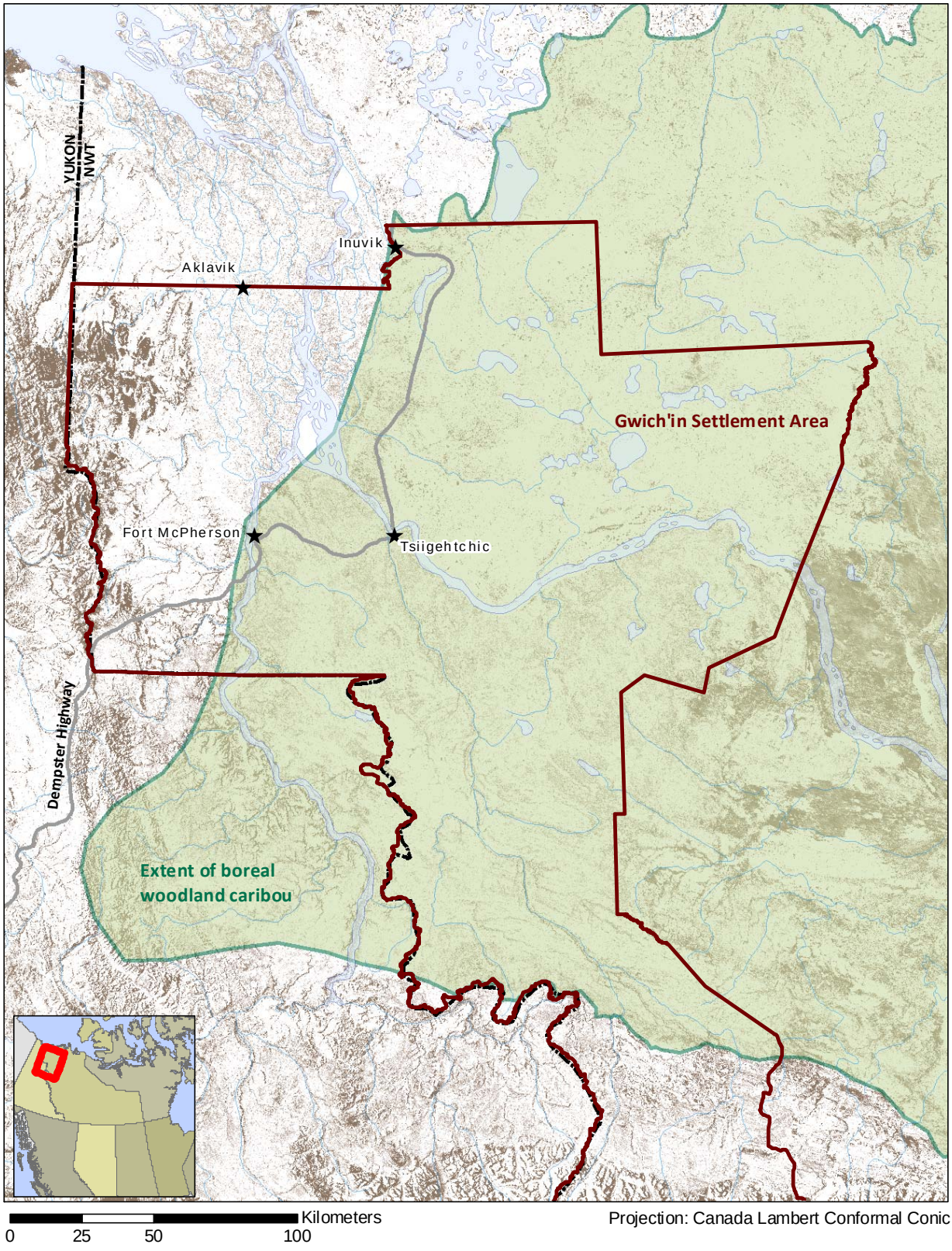

Figure 1: Map of Gwich'in Settlement Area showing extent of Boreal Woodland Caribou

3. Gwich'in Traditional Knowledge: Boreal woodland caribou

Gwich'in hunters and Elders have extensive experience on the land, and a remarkable ability to recall and categorize information about wildlife and other biophysical and cultural phenomena. In interviews, they provide information willingly and demonstrate a strong desire to preserve their way of life and share information for future generations. They generally state if information is from their own experience, and indicate if the information they are imparting is from a single occurrence or if it's a life-long pattern they have observed. They also clarify if they have heard it from another person. Often the name of the 'source' and their community is provided to contextualize any second-hand information. They constantly revise their information and share with other hunters judiciously, including updates on health and population trends. Many interviewees have worked with government caribou biologists and this information is woven deftly into their understanding of wildlife, and shared with other hunters.

Places mentioned in the text of this report are shown in Figure 2, below.

3.1. Special significance of woodland caribou

Like all animals harvested by the Gwich'in, woodland caribou are important because they are a food source (Mary Teya Oct 14, 2010). A common sentiment was that if a woodland caribou is seen while hunting or otherwise out on the land, it will be shot for food. The differences in behaviour (i.e. not migrating in large herds) and population (i.e. relatively small population over a large area) are implicated as the reasons why woodland caribou are generally not specifically sought when hunting.

Woodland caribou were noted by interviewees as being useful as a starvation food "according to say my dad, who died 15 years ago, like they'd look after all that too. It's [for an] emergency" (Ernest Vittrekwa Oct 15 2010). For example, for several years in the 1970s, Richard Ross travelled to Inuvik to hunt woodland caribou when there was no Porcupine caribou near Aklavik, "well that's all there was … so we went and hunted" (Oct 28 2010). Robert Alexie Sr. indicated that woodland caribou are important to his community as a back up when the harvest of Porcupine caribou is not sufficient, "well it's good...it's very important because if there's no caribou [and people are] hardly getting meat, people see it out there; they'll go for it" (Oct 13 2010). Emma Kay mentioned they'll take woodland caribou, "if we don't see our own caribou. Woodland caribou comes in handy to us because it's good eating too. My son shot about a couple one year and I didn't even know the difference. I just said…big caribou! He just laugh. He never told me it was woodland. [They were] out here on Deepwater Lake" (Oct 13 2010). An Inuvik interviewee indicated that there is also a spiritual aspect to hunting caribou for him – he feels his survival is connected to the animals' survival and taking care of the caribou is a part of this connection.

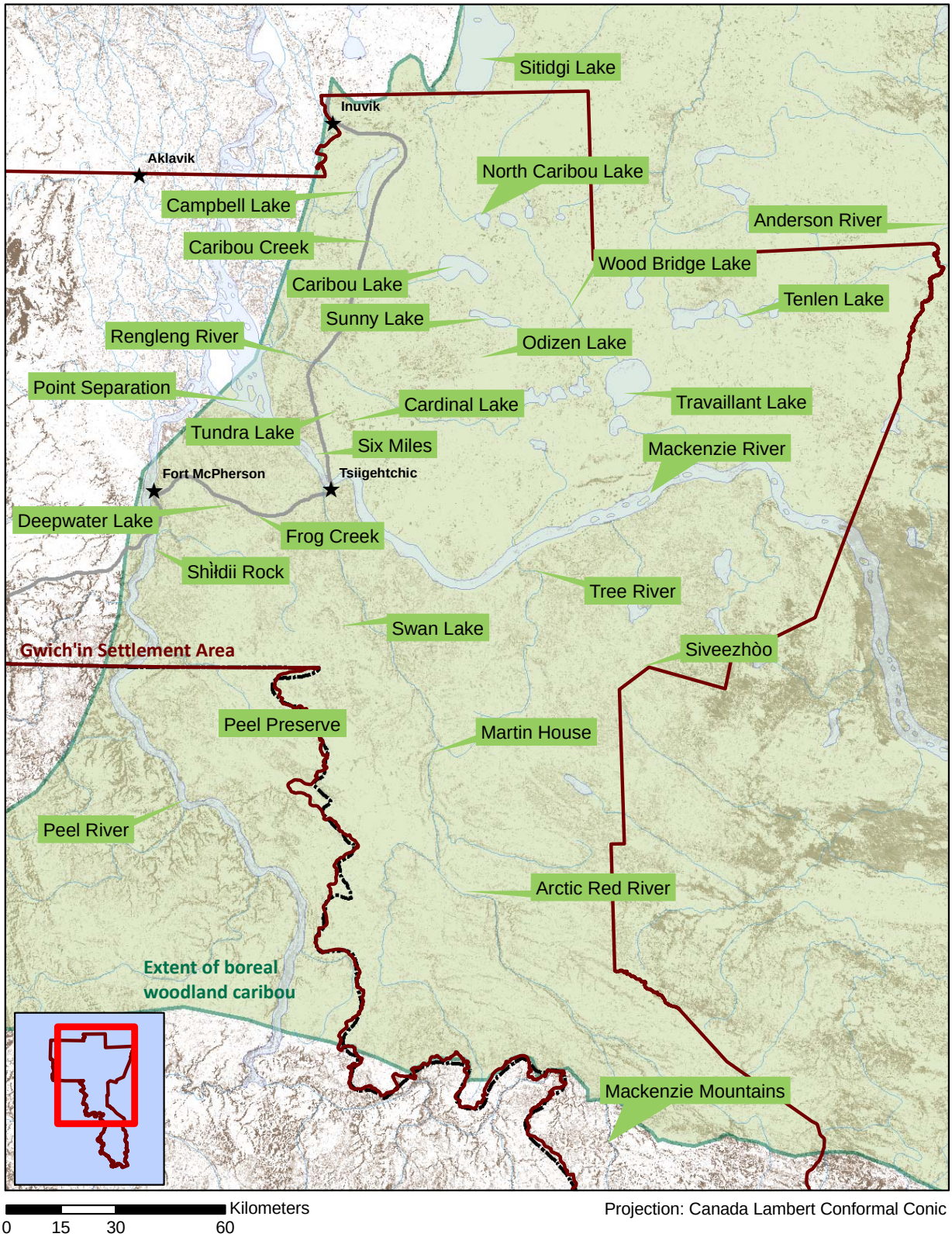

Figure 2. Place names mentioned in report.

Some interviewees also suggested that they are of increasing importance due to declining barren ground and Porcupine caribou. "They are getting more important as the days go by because the other ones [barren-ground and Porcupine caribou] are getting less; so ... people are going to be shooting them... everything is changing now" (Tom Wright Oct 12 2010). James Firth agreed that woodland caribou might become more important if other caribou are less available to hunters, and as such they need to be protected and conserved (Nov 3 2010).

Tom Wright

Photo: GSCI

However, a few interviewees commented on the low or lessening importance of woodland caribou as a food source. One Tsiigehtchic interviewee felt that the small population size meant that the woodland caribou are not important to his community compared to other caribou (Douglas Kendo Oct 18 2010). Another interviewee felt that the importance of woodland caribou has dropped in recent years, relating to a decline in their availability for hunters (Conrad Baetz Nov 12 2010).

The following table summarizes the differences between the woodland caribou, Porcupine caribou, and Bluenose caribou to the Gwich'in.

Table 1. Comparison between Woodland, Porcupine, and Bluenose caribou

	Species name	Gwich'in community	General location	Notes
Boreal woodland caribou	*Rangifer tarandus caribou*	Inuvik and Tsiigehtchic, mainly. Also used occasionally by Fort McPherson in recent years, rarely by Aklavik.	See map, above. West of the Mackenzie Delta and in the Peel Preserve.	Dispersed in small groups among a large territory.
Porcupine caribou (subspecies of Grant's caribou)	*Rangifer tarandus granti*	Very important for Fort McPherson and Aklavik, also used by Tsiigehtchic and Inuvik residents by travelling up the Dempster Highway.	Migrates from Arctic Coast into Yukon mountains, migrating by Fort McPherson and across the Dempster Highway to the west.	Most important caribou for Gwich'in. Easier to hunt than Woodland due to regular movement in large herds.
Bluenose caribou (herd of Barren-ground caribou)	*Rangifer tarandus groenlandicus*	Occasionally used by Tsiigehtchic residents, rarely others.	Migrates from the coastal areas of the Inuvialuit Settlement Region in the summer/calving time, into Sahtu area.	Used by Gwich'in although not as often as Porcupine caribou, due to access constraints.

3.2. Legends related to boreal caribou

As caribou have a place of great importance to the Gwich'in, it would be impossible to include all the legends which mention caribou or relate to caribou. Some stories are of a factual but historical nature, such as this account of near-starvation long in the past by Gwichya Gwich'in Elder Eliza Andre. The second part of this story (not included) ends with the lesson: "This is why, even today, the people still help and share with one another" (COPE story, Eliza Andre). This story does not specify which type of caribou referred to but is included to demonstrate the general importance of caribou to the Gwich'in.

Old Man and His Wife - Part #1

Once there was an old man and his wife who moved out into the bush. Early in the fall, we all understood that the caribou were all in good shape just before running *[rutting?]* season. It happened that this man was married to a very wise woman. In the fall people killed lots of caribou. That woman was very well known for her wisdom. Because the people had killed a few caribou, they figured they were well off for the winter, but the woman figured there would be a shortage of meat. She cut out a piece of caribou fat the size of her knife and put this in her bag. A little later on, the people were starving so they had to split up camp into groups. One group going one way and the other going in the other direction. This woman and her husband went by themselves.

The man was very hungry and didn't have the strength to even walk so his wife helped her husband until they stopped to make camp. Before they made this camp, they came across fresh caribou tracks. The woman, knowing her husband was very weak, took out the fat from her bag and cut the fat into small pieces to make ready a light soup for her husband. She gave this to her husband but he was so weak he could only take a little of the soup and return to sleep. When he awoke again she gave him another drink of the soup. This kept on until the morning. By morning, her husband told her, "I feel much better and I think I can go after the caribou now." He went out hunting and killed a bunch of caribou. When he came back to camp, he told his wife that he was going to go and look for the other hungry people that they had left. He gathered all those people and told them to return to his camp with him, that he had a bunch of caribou. The people wanted to buy meat off him but he told them, "If you want to buy meat, you can buy it off my wife, not me."

The following winter this same man and his wife moved into the bush. They were hungry, not having anything to eat. They made camp near two big mountains of snow. It happened that they now had a little boy who was so hungry he would ask his mom, "Mom, I want to eat caribou feet." His mom would ask him, "Where are we going to get it? We have nothing." They made a campfire near these two snow mountains and it happened that all the snow began to melt around the campfire and they discovered a moose leg. They began to shovel the snow and soon found two moose. What had happened was that two bulls had been fighting over a cow moose. As they fought with their horns, the horns became locked together. Yet now, they were still in good shape (having been preserved in the snow). The man went out in search of the other starving people and brought them back to camp. By this time it was getting warm, getting towards spring. It was just luck that this same man saved the other people who were in the need of food.

Other legends and stories reference how caribou meat, skins, and other parts were used in the day-to-day life and comfortable existence of the Gwich'in long in the past; use of the caribou for meat, drymeat, grease [edible fat], clothing, caribou leg skin sleds and mattresses, tents, blankets, babiche (sinew) and many others.

3.3. Place names and trails related to boreal caribou

Many place names in the Gwich'in area refer to caribou, although it is likely that they generally refer to the Porcupine herd, Bluenose herd, and even the mountain woodland caribou in the headwaters of the Arctic Red River in the Mackenzie Mountains. However, several Gwichya Gwich'in (Tsiigehtchic) names likely refer to woodland caribou:

- There are two lakes in the Gwichya Gwich'in area near Tree River, up the Mackenzie River, named Tatthał njj'ee choo and Tatthał njj'ee tsal [Translation: *Tatthał njj'ee* = a line of fence running (from lake to lake), *choo*= big (refers to the size of the lake); *tsal*=small (refers to the size of the lake). The names of the lakes refer to a possible caribou fence which may have been built between the large lake and the smaller lake. Gabe Andre indicated that woodland caribou are present in that area (Gwichya Gwich'in Place Names 1993 Tape 5). There is also another creek named Tatthał njj'ee near Point Separation (Gwichya Gwich'in Place Names Database).

- Caribou Lake and the creek flowing into Campbell Lake from Caribou Lake are both named after caribou in Gwich'in. Caribou Lake is Vadzaih van (literally caribou lake) and the creek is Vadzaih van tshik (caribou lake creek, Gwichya Gwich'in Place Names Database).

- The name Njhdàadąjj, refers to the lichen that the caribou eat, often called moss or white moss.

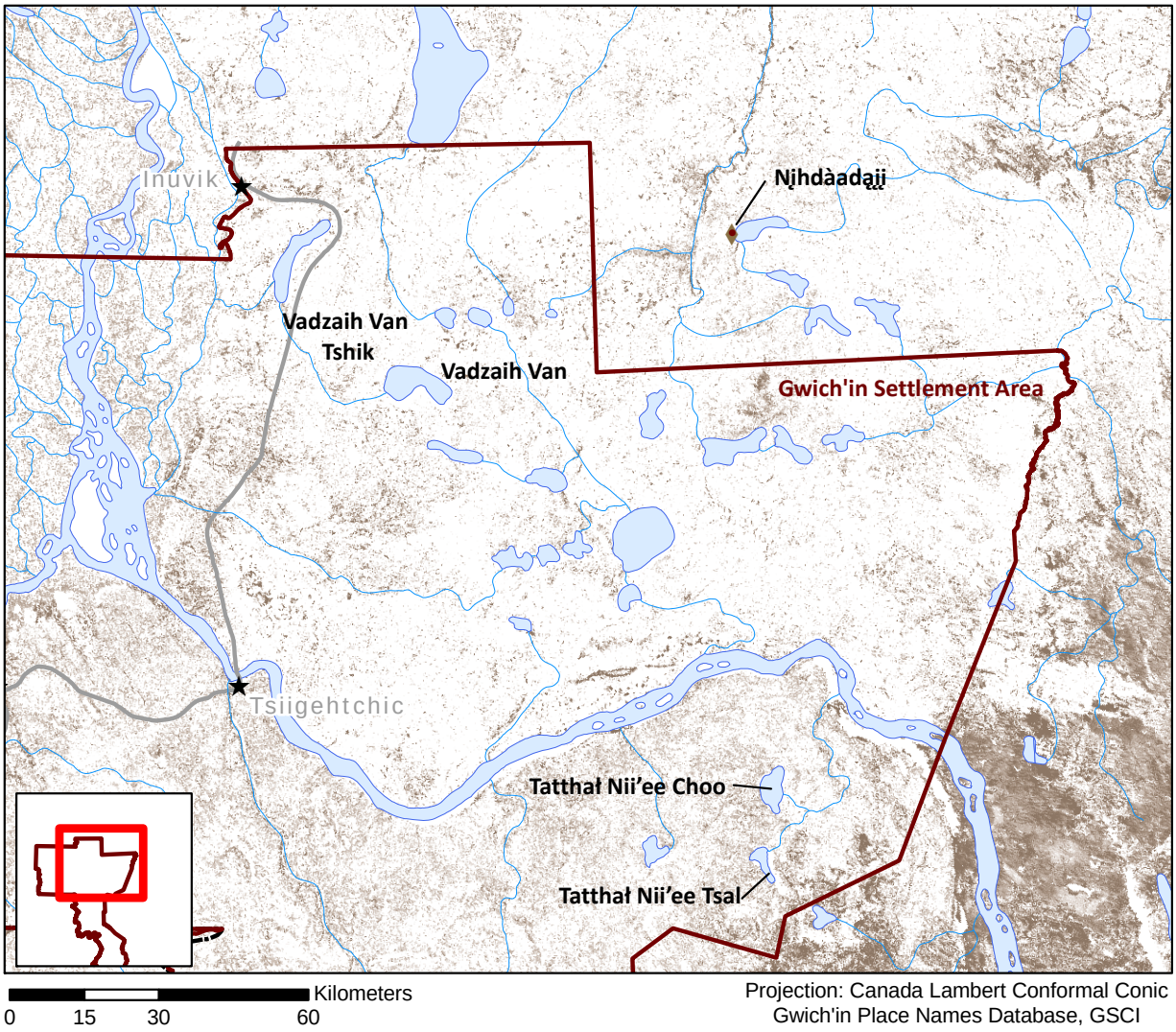

Figure 3: Gwichya Gwich'in Place Names referring to Woodland Caribou

Numerous Teetł'it Gwich'in (Fort McPherson) names refer to caribou but generally they refer to Porcupine caribou.

3.4. Physical description

Most interviewees indicated that woodland caribou are easily distinguishable from Porcupine caribou, especially when viewed from nearby. "Well it depends on how far you are from them. Because they are quite a bit bigger ...They are half between a caribou and a moose ... I think they usually have smaller horns, you see a big animal with smaller horns" (Tom Wright Oct 12 2010). However, Conrad Baetz feels they have larger antlers (Nov 12 2010). They are also a darker colour (Albert Frost Oct 12 2010, James Firth Nov 3 2010). It may be more difficult to distinguish between woodland caribou and Bluenose caribou than woodland and Porcupine (Julie Ann Andre Nov 12 2010).

Caribou are known for their ability to move quickly across rough or snowy ground, "You know they can really go, ... it is just amazing how you can't hardly walk out there, there are humps and holes and just rough – and they run like they were on a highway." (Tom Wright Oct 12 2010).

There may be differences in size of individuals between herds in different areas – in other words, some areas have larger woodland caribou than other areas (Willie Simon Nov 4 2010).

Abe Peterson has heard that some Porcupine caribou have crossed the Mackenzie River and become essentially woodland caribou. He heard that they crossed the Mackenzie around Six Miles, which is six miles below Tsiigehtchic (Oct 14 2010).

3.5. Diet

> In spring time, you see them eating the lichen [and] they eat the green, little leaf grass. And then come fall and winter that is when [they] really go after the lichen.
> (James Firth Nov 3 2010)
>
> They eat willows and ...tamarack bark but that is mainly in the winter when they cannot get to the ground.
> (Julie Ann Andre Nov 12 2010)

Although generally not observed in the summer, woodland caribou eat 'caribou moss' or lichen, as do other types of caribou. They also eat willows, willow leaves, sedges, and grass in the summer. They eat aquatic vegetation from the lakes (Walter Alexie Oct 14 2010, Tom Wright Oct 12 2010, Albert Frost Oct 12 2010). Although they are known to eat a variety of foods all year, when they are hunted in the winter their stomachs seem to be full of lichen, "when you cut their stomach, it's just straight that white stuff" (Emma Kay Oct 13 2010). However, they will dig through the snow to get at other food as well, "lichens, and grass all around the lake. They dig lots, you know...they dig around the lakes you know, [for] grass" (Robert Alexie Oct 13 2010). They'll also eat tree buds in the winter (Conrad Baetz Nov 18 2010). They seem to have a special ability to find lichen, "and then, they just seem to know right where it is, too, [does not matter] how much snow it is...that's their scent. They just know where to go, ...and they dig down and there's their food right there" (Abe Peterson, Gwich'in Traditional Knowledge of the Mackenzie Gas Project Area tape 94). Robert Alexie Sr. has seen signs of them feeding in the water in the spring (Robert Alexie Oct 13 2010).

Caribou must keep moving from area to area as they will consume much of the available lichen. The area is then avoided by caribou until the lichen grows back. This can take a decade or more (Albert Frost Oct 12 2010).

Caribou are known to eat at muskrat push-ups or houses, "I think they just clean off the lake with rat houses. The rat makes houses down there on the lakes and they just clean it right off" (Richard Ross Oct 28 2010). They may eat these houses for the minerals and other food they contain. They go for muskrat push-ups in the winter on the lakes, according to Conrad Baetz (Nov 18 2010).

3.6. Behaviour

Woodland caribou in the Gwich'in area tend to be in small groups. "Two or three, or there might be a bigger bunch but not that many" (Tom Wright Oct 12 2010); "Maybe four or five together" (Emma Kay Oct 13 2010). Mixed groups have been seen with cows, calves, yearlings or young animals, and bulls. Woodland caribou may also be alone. Robert Alexie Sr. has seen a solitary bull in the winter, as has Walter Alexie (Oct 13 2010, Oct 14 2010). Walter observed that the small groups tend to be cows and calves with a single bull. Douglas Kendo has participated in tagging fly-overs between Tsiigehtchic and Tree River, where groups of cows and calves were seen (Oct 18 2010). There may occasionally be larger groups up the Arctic Red River, where seeing ten to 15 might be normal, and Ernest Vittrekwa has seen about 50 together (Oct 15 2010). Although small, the herds may have leaders like the larger herds – one interviewee in the 2001 GRRB boreal woodland caribou study indicated that if a hunter shoots leader, then the rest of the herd will not run. The landscape may affect the group size as well, "they seem to spread out more when they get into the timber areas" (Harry Carmichael Oct 28 2010).

Interviewees had not observed the migration habits of the caribou but generally felt they do move around. Although they do not follow a large-scale seasonal migration, interviewees did indicate that the ability to hunt them is seasonal, as travelling in some areas is restricted to winter due to ease of access. Additionally some interviewees indicated that caribou have seasonal behaviours such as seeking timbered hills in the winter and water in the summer. They may also move from area to area – Douglas Kendo noted that they approach the Arctic Red River in the winter "that Seven Mile Island down there? Or between say Tsiigehtchic and Martin House, there's going to be more caribou when they come to the shore, right? [After Christmas] they come to the river and islands, and then in the spring … they go back inland" (Oct 18 2010). Julie Ann Andre used to see woodland caribou on Travaillant Lake when she was young, and they would move away after several weeks, "but when we stayed out at Travaillant, like every single day, we would see caribou on the lake. And that would last for about two or three weeks. And they would be migrating probably up to Anderson River area" (Nov 12 2010).

Most interviewees indicated that there are not specific herds or groups that occupy a territory, although one Inuvik hunter described geographically-constrained small herds (Anonymous Nov 2 2010). His knowledge of these herds may relate to a greater hunting effort or time spent observing woodland caribou compared to hunters who more regularly go for Porcupine or Bluenose caribou. In general, interviewees indicated that woodland caribou are dispersed and seen irregularly. Woodland caribou are seen "anytime in the year, because it's all travelling here and there and they run around like" (Emma Kay Oct 13 2010). Conrad Baetz indicated that the small groups may intermingle, in particular during the rut when bulls may travel over long distances (Nov 12 2010).

Interviewees generally agreed that woodland caribou are 'wild.' They are known to run away before you see them, they will flee quickly, and are often considered to be hard to see and hunt.

Oh hard to hunt them things. Harder than our caribou, they are kind of wild eh? And once they take off, they go like crazy. They are real awkward to hunt, you know – they are very smart caribou. He'll go where it's real brushy and when you see them they take off. And they stay there until you come close to them and they take off again and you can't have a chance to get that, to me anyway (Michael Pascal Oct 14 2010)

… the only way I got caribou one time was it was spring time and the crusty snow, eh? And they don't want to step in that crust because it hurts them. … it's the only way I got them. But then the snow got soft and there's no chance in getting them because they can just take off (Ernest Vittrekwa Oct 15 2010)

Ernest Vittrekwa

Photo: GRRB

Interviewees often mentioned that woodland caribou will 'go and go' – however Richard Ross once hunted these caribou around Caribou Lakes and found they were quite cunning "we got them right on a lake, they were feeding. There was about 10, I think. They were feeding there and we went around the lake to them, and there they start going in the bush. Soon as they can't see you they will stop. But then as soon as they can see you they will take off again – they keep doing that" (Oct 28 2010). Several interviewees indicated that although many times the caribou will flee if they see you, sometimes they freeze instead, "sometimes they don't run away they just stand there" (Wally McPherson Oct 28 2010). This may be due to their curiosity (Louis Cardinal Gwich'in Traditional Knowledge of the Mackenzie Gas Project Area tape 4).

One Inuvik hunter felt they are easy to hunt, "they are very easy to hunt and if you follow them with ... a skidoo they will go in the trees, they stand like they are trying to hide." This is one behavioural difference with Porcupine or Bluenose caribou, who are more likely to try and outrun a hunter (James Firth Nov 3 2010). The herd may stop and start to stay together, by allowing slower members to catch up (Willie Simon Nov 4 2010). Conrad Baetz suggested that barren ground caribou are hunted more often and develop a habit of fleeing skidoos; whereas woodland caribou in areas where they are not hunted as much will be easier to hunt. But the learned behaviour to flee is not restricted to any type of caribou, it depends on the relationship between the caribou of an area and the hunters. Conrad also mentioned that barren ground caribou may be more cognisant of their surroundings and any danger due to a lack of trees to hide in (Nov 12 2010).

> "You see them at the edge of trees or edge of clearings"
> (Harry Carmichael Oct 28 2010).

In the winter, woodland caribou spend more time in treed locations, in particular if it's foggy. Spruce stands can be a cue to a hunter "if you were travelling along and you seen lots of willows but you seen spruce, you go to the spruce" (Tom Wright Oct 12 2010). The caribou may move between eating areas and forested areas "Right now [early November], they would be in open areas in the flats, feeding. But like

at night say [they] probably head up in the trees and more for protection I think" (James Firth Nov 3 2010). In the past when temperatures were colder in the winter, the tell-tale sign of steam rising from a timber patch would indicate that caribou were there (Walter Alexie Oct 14 2010). They can be found in timbered areas around Sitidgi Lake and Caribou Lakes (Albert Frost Oct 12 2010). Ernest Vittrekwa felt that the presence of hills and higher ground are more important to the caribou than tree cover, although trees are also important. He pointed out that the hills between Fort McPherson and Tsiigehtchic are prime woodland caribou locations (Oct 15 2010). Wally McPherson also indicated that woodland caribou are in flat areas with smaller trees and willows (Oct 28 2010). Caribou will use trees to rub the velvet off their antlers (Conrad Baetz Nov 12 2010).

James B Firth

Photo: GSCI

Interviewees generally agreed that woodland caribou, like most animals, will not necessarily be impacted by machines or industrial noise such as graders or pumping stations, or a skidoo driven at a reasonable pace (Tom Wright Oct 12, 2010, Abe Peterson Oct 14 2010). However, being chased at high speeds by a skidoo will stress caribou (Douglas Kendo Oct 18 2010), and unlike terrestrial disturbances, flights may disturb caribou (Wally McPherson Oct 28 2010). James Firth believes that low-flying planes at the Inuvik airport may unintentionally disturb caribou (Nov 3 2010). Some sudden novel sounds may frighten them, such as swooping planes – which should avoid wildlife areas as much as possible. The only good reason to disturb caribou is if the meat is needed. "...you shouldn't disturb [caribou]. Unless I want caribou... and need it, I'll get it; but [if you] don't need it, why should it be bothered?" (Robert Alexie Oct 13 2010). Walter Alexie indicated that in the past, animals including caribou and moose were more likely to be frightened by industrial or vehicular noises but have become accustomed over the years "because years ago when they use to hunt, they hear a little noise; they're gone" (Oct 14 2010). Abe Peterson remembered that when seismic work began around Fort McPherson there were fears that the caribou would be impacted negatively, but the caribou became used to the noises and disturbance (Oct 14 2010).

James Firth warns that there may be a point at which noise interference and vehicular disturbance is too great for caribou to adjust to. "Few years ago when Colt had their line up to Fort Good Hope, a lot of activity, a lot of trucks, a lot of noise in here, and they seemed like they pushed all the caribou. There was caribou all around my cabin now. And I think that was from all the noise that was further to the east." He did feel that caribou will adjust to pipeline noises, as seen around Alaska (Nov 3 2010). Some interviewees felt that all industrial and vehicular noises would be negative for the caribou and cause them to flee (Mary Teya Oct 14 2010, Albert Ross Oct 18 2010). One interviewee wondered if the sensitivity of caribou to lights and noise was why they are so rarely seen – they see and hear skidoos approach and are gone leaving only their tracks. The caribou may also have learned to associate skidoo noises with gunshots; whereas other loud noises are not followed by gunshots and are more easily accepted by caribou (Conrad Baetz Nov 12 2010).

Caribou will follow cleared seismic lines or other linear disturbance if it is heading in the direction of their travel, in particular in the summer months when they seem to use cut lines more (Tom Wright Oct 12, 2010). In general, the presence of linear disturbance does not impact caribou significantly, particularly if they are re-vegetated appropriately (Albert Frost Oct 12 2010). Linear disturbances however do create easy access for hunters, which will impact caribou. Seismic lines that are allowed to grow in will often have a lot of willows and attract moose, which can be considered a benefit (Ernest Vittrekwa Oct 15 2010).

Interviewees often reported seeing woodland caribou tracks rather than the caribou themselves. They are an elusive animal and not easy to spot, except for by chance. Willy Simon felt that the best way to hunt woodland caribou was to come upon them on foot, and to avoid detection by the caribou (Nov 4 2010).

Interviewees were generally not aware of where woodland caribou calve but generally agree that they calve throughout the area. Walter Alexie suggested that the cows would select a location where prevailing winds would keep flies and mosquitoes away. Albert Ross has recently seen tracks of caribou from the summer when they would have young calves, around the firebreak behind Tsiigehtchic (Oct 18 2010). Caribou may seek higher locations for the breeze, or they may stay close to water (Walter Alexie Oct 14 2010, Ernest Vittrekwa Oct 15 2010). James Firth has been told that in the Caribou Lakes region, the woodland caribou go up onto hills to calve. A hunter told him "they just go to the hills, where is it safe from predators and it is open and they have their young" (Nov 3 2010). Douglas Kendo has seen caribou with small calves, along the Dempster Highway north of Tsiigehtchic and towards Tree River. He suggests that woodland caribou will calve alone and then group together in the winters, "I think ... when they're calving they're probably separated and then in the winter they probably get together for protection against wolves and stuff" (Oct 18 2010). Julie Ann Andre was hunting woodland caribou around Swan Lake up the Arctic Red River in the spring time; they harvested two cows with young calves.

As the population is low and the use of the caribou is generally confined to non-calving times, interviewees generally did not comment on calf survival. However, Julie Ann Andre indicated that cows may not breed and calve if their body condition would not support it (Nov 12 2010).

3.7. Distribution

> "They're just here and there."
> (Emma Kay Oct 13 2010)

Interviewees had not seen woodland caribou in areas outside of the mapped area provided by Environment Canada (see Figure 1). They based their information on sightings while hunting, trapping, or otherwise travelling; and on experiences with fly-overs with caribou biologists. Interviewees generally see caribou when they are using the land in the winter for trapping and travelling. Only rarely did they head out to hunt woodland caribou specifically.

Many Fort McPherson interviewees were aware of woodland caribou sightings at Deepwater Lake near Fort McPherson, along the Dempster Highway between Fort McPherson and Tsiigehtchic, and in the Peel Preserve, "Just like I say on the [Peel] Preserve, it's way out around the lakes where it's trees, no

mountains. And same out this way. I never see woodland caribou around my mountains" (Emma Kay Oct 13 2010). Caribou are not seen in the delta (Tom Wright Oct 12 2010).

Robert Alexie Sr. sees signs of woodland caribou in the winter and spring up the Peel around his cabin at the mouth of Trail River – areas where the caribou have fed, and many tracks, in particular along the cutlines he travels upon when trapping. He only sees them on the east side of the Peel River (Oct 13 2010).

Douglas Kendo has seen woodland caribou between Tsiigehtchic and Tree River, around Tundra Lakes, and on the Dempster Highway between Tsiigehtchic and Rengleng River. His father would hunt woodland caribou around Cardinal Lakes as well (Oct 18 2010). John Norbert has also seen caribou around Odizen Lake and between Tsiigehtchic and Tree River (Oct 18 2010). Julie Ann Andre has seen woodland caribou in the summer along the Dempster between Tsiigehtchic and Inuvik, and in the winters up the Arctic Red River near Swan Lake.

According to Albert Frost, barren ground caribou and woodland caribou intermingle around North Caribou Lake, although in this area the woodland caribou are not too plentiful any more (Oct 12 2010). There are a lot of woodland caribou west of the CN line, a large decommissioned transmission line crossing from northwest to southeast across the GSA. They mingle with the Bluenose caribou in the Travaillant Lake/Anderson River region, and can be seen around Siveezhòo south of the Mackenzie near Tree River. The Bluenose caribou moved into the area in the 1960s and have recently changed their migration away from this region (Willie Simon Nov 4 2010). Woodland caribou will also share habitat with moose, based on tracks in the snow (Robert Alexie Oct 13 2010).

Willie Simon

Photo: GSCI

Most Fort McPherson interviewees indicated that woodland caribou sightings around town (and possibly even on the Peel Preserve) are a relatively recent – within the last one or two decades – phenomenon (Emma Kay, Robert Alexie Oct 13 2010). Walter Alexie indicated that there was not a noticeable population of woodland caribou on the Peel Preserve in the past, "I never seen that ... when I was young, never see woodland caribou around there" – he first heard of them in the preserve in the 1970s or 1980s. "They come from some place but I really don't know where they come from. But years ago you don't see those." Walter suggested that an increased rate of plant growth and more caribou food may be responsible for the change, or that they were hunted more previously. "People used to live on the land and they probably thin it down that time. Years ago I mean, 50s, I remember 50 and late 48, hardly any caribou" (Oct 14 2010). It is possible that the caribou have always been in the area and were just noticed more recently due to changes in their behaviour, as Emma Kay notes their tracks were always around, "Maybe four or five years, but last year that's when they see. I always heard they see tracks just not ah our caribou tracks, but must [have] been woodland caribou" (Oct 13 2010). In the last few years, woodland caribou have been seen

quite close to town – possibly related to the incidence of forest fires in the nearby areas. Emma Kay's father saw caribou crossing the Peel River while fleeing forest fires:

> *Many years ago, about ten, fifteen years ago my dad he stay at Shìłdii Rock and he see caribou coming across this way there's fires all over. He see caribou and they never see caribou for many years though. He grab his gun. He even shot it when he got to the shore and it was just good and it was so fat; good healthy caribou. And he said it was woodland. He know it, it's different caribou. See, he's running away from fire. So maybe woodland caribou up on the hills, we don't know it (Oct 13 2010).*

Several interviewees felt that woodland caribou have always been in the Peel Preserve area, "my dad used to get caribou up that way" (Ernest Vittrekwa Oct 15 2010).

Many Fort McPherson interviewees regularly see woodland caribou along the Dempster Highway between Fort McPherson and Tsiigehtchic, in particular in the winter. Summer sightings of woodland caribou seem to be rare, perhaps due to the increased travel on the land relating to the winter activities of hunting and trapping.

The following maps show woodland caribou mapped information from the interviews conducted in 2010 for this report, as well as caribou information as mapped during the 2001 GRRB woodland caribou study (Denise Auriat, 2001-2002), which included the mountain woodland population area in the Mackenzie Mountains at the headwaters of the Arctic Red River. 2010 map data indicates that caribou are seen and harvested along the Dempster Highway between Inuvik and Tsiigehtchic and to the south of the Dempster into the Yukon. Tracks, harvest areas, and sightings are noted as far south as the mouth of Trail River, where several interviewees have a camp. Harvest/sighting areas are also south of the Mackenzie River upriver from Tsiigehtchic to the GSA/Sahtu border; south and northwest of Travaillant Lake to Campbell Lake, and between Tsiigehtchic and Rengleng River. One caribou area is outside of the GSA along the Anderson River (Figure 4).

The 2001 project data shows winter hunting areas between Tsiigehtchic and Rengleng River as well as a concentration around Caribou Lake and northwest and east of Travaillant Lake. Winter hunting locations also were noted up the Arctic Red River and above the Forks of the Arctic Red and Cranswick Rivers and in the Mountain Woodland area. One spring harvest location was noted up the Peel River in the Yukon. Fall harvest locations were in a similar geographic spread as winter locations, and only two summer locations were mapped – north of Caribou Lake and on the right shore of the Mackenzie upriver from Tsiigehtchic (Figure 5). The 2001 study mapped more caribou sightings, which are shown in an intensity map in Figure 6. The greatest intensity of sightings is north of the Mackenzie River and east of the Arctic Red River.

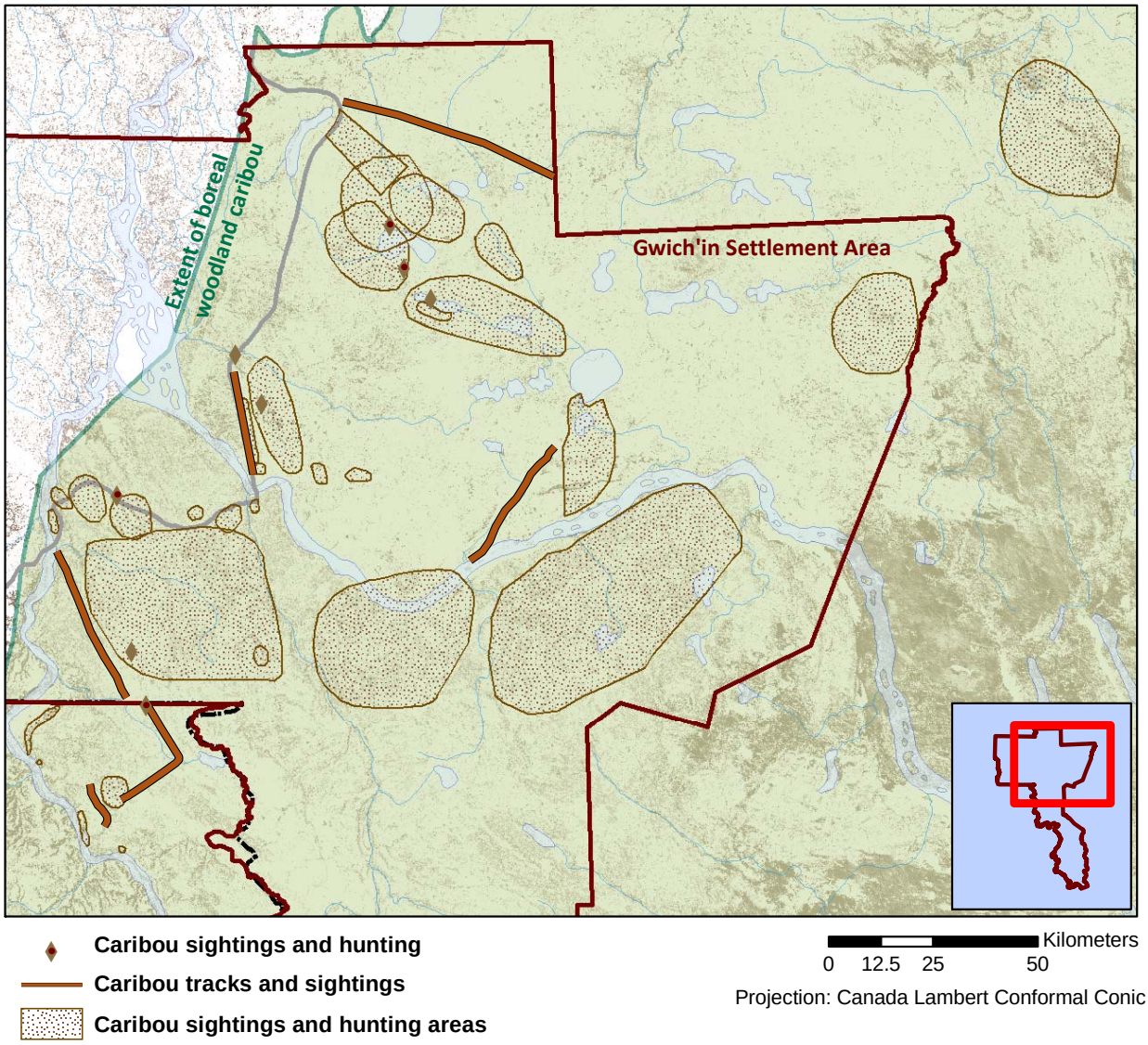

Figure 4. Caribou sightings, tracks, and hunting areas (2010 data)

3.8. Population size and trend

Interviewees had different opinions about whether or not the population of woodland caribou was stable, increasing or decreasing. Conrad Baetz felt this may relate to several factors;

> *One, they are elusive to begin with... Two, they come in smaller groups; they don't come in bigger herds. Three, they can be tougher to distinguish the difference between a Woodland and a barren ground caribou. Barren ground caribou have been known to come in that neck of the woods so to me it is really hard to tell whether or not their numbers are up or down or if you see more of them or see less of them or not, right? (Nov 12 2010)*

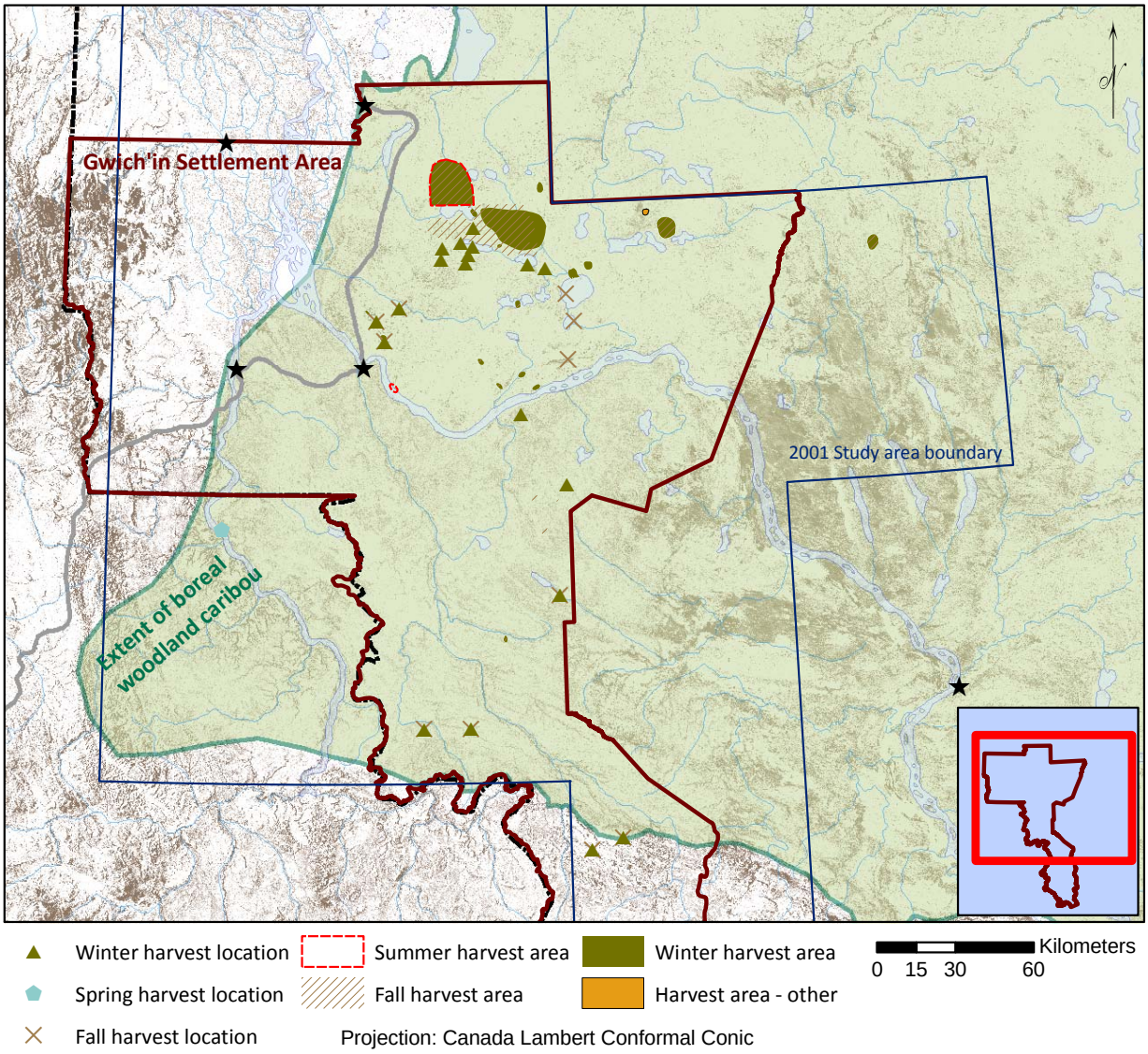

Figure 5. Hunting locations from GRRB 2001 study.

Abe Peterson felt that the woodland caribou may move away from areas where they experience hunting pressure, which may give the appearance of a declining population to hunters. Also, he guessed a four-year stay in one area was reasonable for the food the woodland caribou will eat, "And then every year growing, just like this. They move over here for four years and move back there another four years" (Oct 14 2010). Wally McPherson was told that the population or their presence nearby is cyclic, "I always ask the elders in McPherson and Tsiigehtchic and they tell me, they said [woodland caribou] are going make a comeback, they said. You won't see them for four years, five years, six years and all of a sudden they are going to come back. I always ask them where they go? Doesn't know he said. They are there but they will come back all of a sudden" (Oct 28 2010). They may also be pushed away from areas where melting permafrost and slumping is impacting their ability to eat (Douglas Kendo Oct 18 2010).

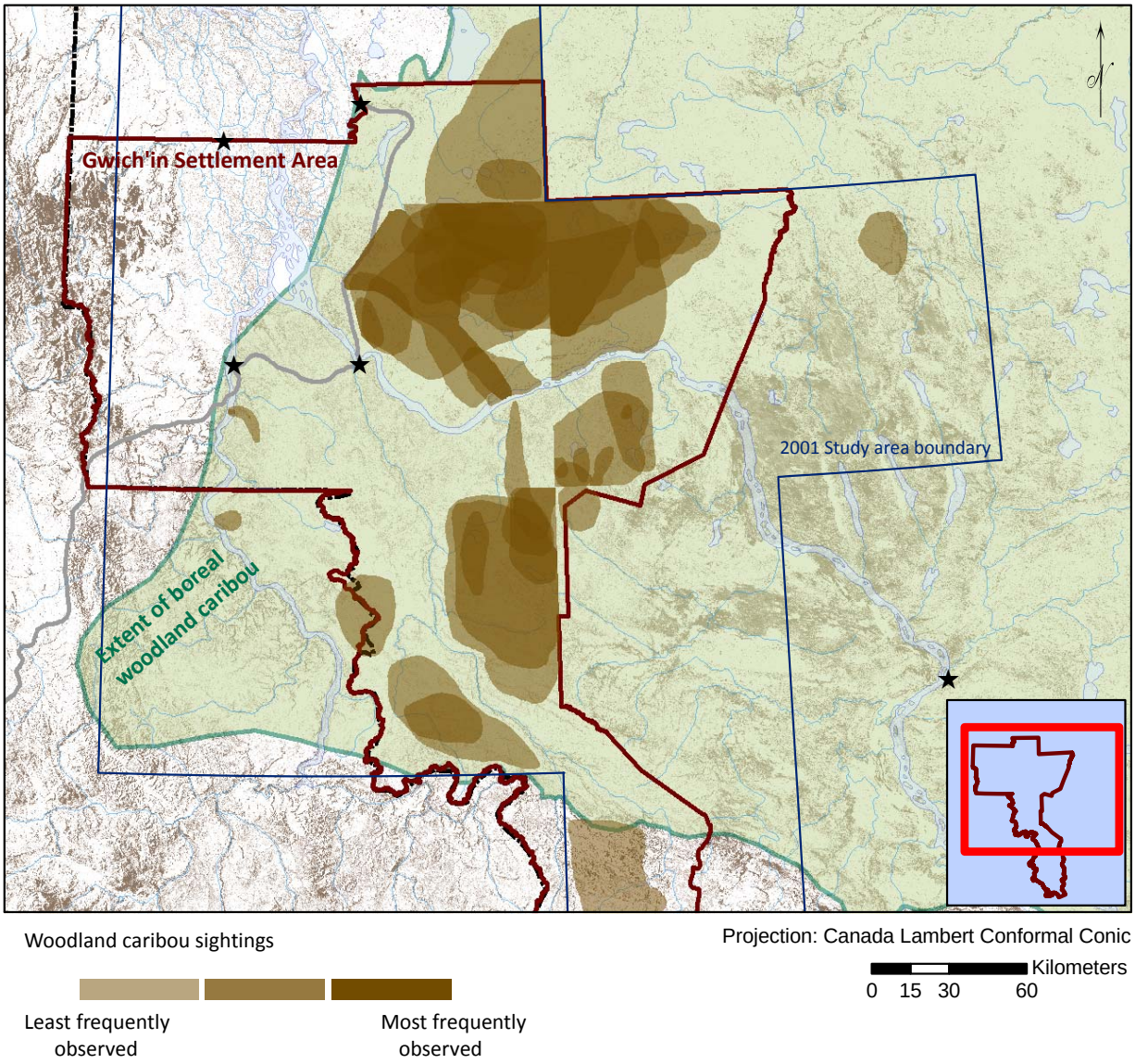

Figure 6. Caribou sightings intensity map from GRRB 2001 study.

Tom Wright felt that the woodland caribou population around Inuvik was stable or increasing in the last several decades. "A few years ago you could hunt caribou anyplace in here there was caribou all over" but they have declined in the last few years (Tom Wright Oct 12 2010). However, Albert Frost indicated that woodland caribou numbers were declining over the last two decades, in particular with ease of access into good woodland caribou habitat along the CN line. However, with recent bans on hunting, the caribou are making a comeback and moving back into areas where they were hunted from or left (Oct 12 2010). James Firth has seen an increasing number of woodland caribou from the Dempster Highway between Inuvik and Fort McPherson, although indicated that they are declining overall. He has trapped around Caribou Lake and Sunny Lake and said they are always in that general area, "you see them just about every time you go checking traps" (Nov 3 2010). Julie Ann Andre

remembered a population of around 200 near Cardinal Lakes when she was younger; which has been much reduced in recent years (Nov 12 2010).

Woodland caribou population around Fort McPherson is stable, according to Fort McPherson elder Ernest Vittrekwa (Oct 15 2010). Douglas Kendo of Tsiigehtchic believes that woodland caribou are decreasing in population. He sees them north and east of Tsiigehtchic, and believes they are being over-harvested. He mentioned increased access to Cardinal Lakes due to an ice road one year. "It was easier for them – that trail was made – so they were taking more than what they needed or could handle." (Oct 18 2010).

However, Albert Ross feels that the woodland caribou may be increasing in the area near Tsiigehtchic, despite increases in wolf populations – he has observed a wolf pack of 14 individuals across the Mackenzie River (Oct 18 2010).

Interviewees generally indicated that woodland caribou are not overharvested in the Peel Preserve area. However, several interviewees expressed concern that they could be hunted out of an area if conditions were right – and these interviewees were careful of who they spoke to about caribou for that reason. A Fort McPherson interviewee said "I don't say nothing about it, because if I said that, then [a] whole pile of people will go on my trapline. Kill the whole thing off...that's what's going to happen."

Oral history indicates that caribou and all large animals were extremely scarce long ago, "I was talking with old Hyacinthe Andre and he said that when he was young he said you had to go two hundred miles to get caribou" (Tom Wright Oct 12 2010). Albert Frost concurs that there are 'way less' woodland caribou now, compared to his grandparent's time (Oct 12 2010). Tsiigehtchic residents had to travel great distances for meat, including to the headwaters of the Arctic Red River in the Mackenzie Mountains. "When I was a kid going to school here, caribou and moose was very scarce. You had to go to the mountains, which is about three, four hundred miles, to go and get caribou" (John Norbert Oct 18 2010). Robert Alexie remembered a time in the 1950s when black bears were regularly shot for meat, which he said is nicest tasting when smoked. "Smoked, I like it, I like it when it's smoked, black bear anyway. We use to shoot black bear all the time, summer time. Any time of the year we used to get black bear, because [there was] no meat around. Can hardly get moose, hardly get meat. This is the 50s" (Oct 13 2010).

3.9. Limiting factors and threats

Wolves and humans were mentioned as the two most important factors in caribou population decline. Other predators were also noted, but wolf numbers are dramatically increasing; and they are having an effect on caribou numbers, according to most interviewees.

Wolves may hunt adults but can be particularly hard on young caribou (John Norbert Oct 18 2010). Wolves are known to hunt beyond what they need. "Doesn't matter to them they are funny... They'll kill caribou and eat the tongue, and go get another one. People have seen that over the years. I don't know why. Or they will get the liver out" (Tom Wright Oct 12 2010). Walter Alexie blames the increase in wolf population on a lack of hunting and trapping in recent times. He said that wolves are excellent

hunters. They generally stay in a pack of seven or eight family members, sometimes more, and can easily take a large moose or caribou and 'clean it right up' (Walter Alexie Oct 14 2010). Although the reason for the increase in wolf population was not clear to the interviewees, many felt that it might relate to a lack of population control by people in recent times. However, wolves are not that easy to control – Abe Peterson indicated that hunters "just don't see them. And they know trap too." He felt that the poison used by the Game Wardens in the past was effective (Oct 14 2010). In the past, people would hunt, trap, and poison wolves. Their fur was used as well – it is very warm (Mary Teya Oct 14 2010). There may be a bounty on wolves (John Norbert Oct 18 2010) – GRRB to confirm.

James Firth suggested that in the Caribou Lakes area, wolf population or distribution follows the Bluenose caribou herd – the Bluenose herd has not been around his area for about ten years, and he has noticed a drop in wolves (Nov 3 2010, also Conrad Baetz Nov 12 2010).

Other predators noted include grizzly bears who will hunt caribou, as well as scavenge from human hunters, drawn in by the sound of gunshots. Grizzlies will prey upon calves (Albert Frost Oct 12 2010). Wolves and bears were controlled in the past to some degree by people. Bear meat was harvested for dog feed; both bears and wolves were harvested for their furs (Tom Wright Oct 12 2010). "Black bears, they're all over too. We use to live on black bear but nobody bother with that now. After the highway went through, nobody, nobody eat bear" (Emma Kay Oct 13 2010).

Bear populations are increasing, and their behaviour may also be changing. Mary Teya indicated bears used to be shyer of people and camps, but their behaviour has changed,

Mary Teya

Photo: GRRB

...it seems that ... there's so much more of them around. I remember when we used to be out on the land and maybe because we always had a lot of dogs too and dogs are always barking and that kind of... kept the bears away. [These days] they're kind of tame, like you know, even if you're there. You try to threaten them, to scare them away, they just stay there and they just look at you, you know. Scary. ... it's just like they're not scared? ...It looks like they're depending on what they can get more easily. Long ago you never saw bears doing that, you know they're out feeding on berries and stuff like that. They [don't] even come around the camp really. But now it seems like, since ...sometimes people leave stuff around at their cabins or, oil company has used it, you know have garbage ... And they get after that, and that is more easy for them to get and it just looks to me like they're more dependent on what they can get ...from people. (Mary Teya Oct 14 2010)

Bears are not being hunted by people as often as in the past, and have lost their fear of humans. They will now be drawn to sound of gunfire and scavenge from a recent kill (Wally McPherson Oct 28 2010).

Wolverine and lynx are also known to predate upon caribou, although it is a rare occurrence. They would probably have the most success with calves (Douglas Kendo Oct 18 2010). Wolverine populations may be on the rise, according to Ernest Vittrekwa. "Wolverine too is getting more all the

time. I see it and I caught a few too. Usually it would be hard to get them" (Oct 15 2010). Lynx will jump onto a caribou and chew through the spinal cord, a caribou hunter told Albert Frost. Both wolverines and lynx will hide up trees to pounce on caribou. "Wherever there's caribou there's wolverine, wolves." (Oct 12 2010). Wolverine and lynx also scavenge (Mary Teya Oct 14 2010, Ernest Vittrekwa Oct 15 2010).

> In the spring time you see grizzly bear tracks. Winter I see wolf tracks too.
> (Ernest Vittrekwa Oct 15 2010)

Muskoxen are sometimes identified as competing for food resources with caribou, although specific overlap with woodland caribou was not described. "See, the muskox seem to thrive ... better than everything else. And then they kind of take over. I'm definitely sure that we are not going to change that, nature kind of regulates that" (Tom Wright Oct 12 2010). Emma Kay had heard that caribou will avoid areas where muskoxen have urinated. She heard of a small group of muskoxen appearing at the border. "And then when they eat ... they take big ground, and they could eat a big patch in one day. They really could eat." Emma and her daughter saw eleven muskoxen at a lake near the NWT/Yukon border on the Dempster Highway, around 2002 or 2003 (Oct 13 2010).

Global climate change may be impacting caribou populations in a variety of ways (see section on changes to the land, below).

Woodland caribou have been observed in proximity to barren ground caribou, with no apparent issues (Tom Wright Oct 12 2010). "But [woodland caribou] are in here and they mingle; because on the surveys we've seen woodland caribou and Bluenose caribou in the same herd, just feeding at that particular time" (Willard Hagen Gwich'in Traditional Knowledge of the Mackenzie Gas Project Area tape 60).

Interviewees discussed two separate timelines for caribou re-entry into areas burned by forest fires. One was a short timeline of a few years; the other was a long-term timeline of between two and four (or more) decades. The two different numbers may relate to how quickly deciduous feed such as grass and browse are available, compared to how much time lichen may take to return; and may also relate to the intensity of the burn. A hotter burn will take all the lichen off which requires several decades to grow (Anonymous Nov 2 2010). Conrad Baetz categorized fires as slow, hot fires which burned most or all organic matter, compared to a fast-moving fire which may leave some food (Nov 12 2010). Willie Simon wondered whether some fires were set by people (Nov 4 2010). Many interviewees agreed that forest fires have a rejuvenating effect on the land, and will not prevent caribou from using an area for long. Caribou may return between one and four years after a burn, when the vegetation has grown (Tom Wright Oct 12 2010, Albert Frost Oct 12 2010). Michael Pascal indicated that although some vegetation flourishes quickly after a fire, the lichen that caribou reply upon takes longer to re-establish (Oct 14 2010). Ernest Vittrekwa agreed that that caribou may take much longer to return to an area – "my dad used to tell me when the place burned, the caribou move for about 30, 35 years" (Oct 15 2010). Willard Hagen indicated that woodland caribou in particular will avoid burned out areas, "But Woodland caribou, we noticed in the surveys we've been doing—it's the first time I've done surveys of

Woodland caribou—ah, they stay totally away from any burnt out area. Completely away from it" (Gwich'in Traditional Knowledge of the Mackenzie Gas Project Area tape 60).

Some species, like moose, may experience a population boom after a forest fire, relating to the increase in available food. However, woodland caribou population does not follow this pattern, possibly due to their habitat requirements (Tom Wright Oct 12 2010). Although interviewees knew of specific forest fires, it was recommended that the forest fire maps produced by the GNWT would be the best source for location and extent of forest fires. Several particularly large fires were noted – one that crossed the Peel River in the Yukon before it enters the NWT (Walter Alexie Oct 14 2010) and another that burned from Frog Creek towards Fort McPherson (Abe Peterson Oct 14 2010).

Abe Peterson

Photo: GRRB

Forest fires will impact caribou and other animals directly during the fire itself – and the effect may be amplified due to the dispersed nature of woodland caribou (John Norbert Oct 18 2010). It will burn small animals trapped within the burn area, and large animals may succumb to smoke inhalation even as they attempt escape (Abe Peterson Oct 14 2010).

Michael Pascal indicated that using calcium on the Dempster was affecting the land in general. "One thing that I really don't like about the way they treat the highway, [is] putting calcium on the road. ...Absolutely I am against that. Yeah, the dust control; because I think it is real harmful stuff, that. [It's] even killing trees along the highway so it got to be bad" (Oct 14 2010). Garbage such as wires or chemicals left out on the land could impact caribou if they come across it. A caribou may get tangled in wires or inadvertently consume antifreeze or other chemicals (Willie Simon Nov 4 2010).

An anonymous Inuvik interviewee identified habitat fragmentation as a concern. He also indicated that industrial activities that impact caribou could be mitigated by having seasonal restrictions on particular activities to lessen their effect on caribou (Nov 2 2010). Although many interviewees agreed that development like seismic lines would not necessarily impact caribou populations, increased access will allow greater hunting pressure – from people and wolves. James Firth felt that development would impact caribou, "definitely the pipeline, definitely the highway, definitely if there is going to be say, oil activity in that area. And they are just going to open up the country and just be a free for all, basically. And you are going to be going right through the habitat, right through it." James felt that the proposed Mackenzie Valley Highway and Mackenzie Gas Project will drastically alter the Gwich'in Settlement Area by creating access for many more people than now use the land. He felt that in anticipation for these changes, there needs to be strong Land Use Planning processes, trespassing protection and laws, and other policy and legal changes to protect animals. He used the example of the Colt line near Fort Good Hope, which allowed people to access new areas for fishing, firewood hauling, and woodland caribou hunting (Nov 3 2010). He considered this to be a negative impact.

Conrad Baetz has some specific examples of industry-related damages which will impact caribou. Activities which destroy or remove the vegetation layer will cause melting of the permafrost and damage the surface of the land. He also described several methods to prevent damaging the vegetation, such as mushroom shoes for cats (Nov 12 2010).

3.10. Animal health

There was general consensus that caribou in general and woodland caribou in particular are healthy animals. Woodland caribou may be healthier than Porcupine caribou as they don't migrate the same distance. Also, they do not experience the same hunting pressure, "because nobody bother them. They just eat out there." (Ernest Vittrekwa Oct 15 2010). There was only an occasional observation of spotted livers or a poor animal. Even some variation in the carcass quality was considered normal – infected portions, if not systemic, could be removed for example.

A hunter assesses caribou health before and after shooting it. From a distance, an unhealthy caribou will appear thin, with the ribs showing, or may appear wobbly (Tom Wright Oct 12, 2010). A good indicator of animal health is presence of subcutaneous fat – so important is this fat that hunters often use the word 'fat' to mean a good, healthy looking animal. From a distance, a hunter can assess the amount of fat in the rump area, where the appearance of the hip bones is an indicator that they are in poor shape (Julie Ann Andre Nov 12 2010). A sickly caribou might have an empty stomach and not be eating, and have no fat under the skin (Albert Frost Oct 12 2010, Walter Alexie Oct 14 2010). When skinning and butchering, hunters assess the organs against their knowledge of what healthy caribou look like, so any deviation from the norm in colour, firmness, or other condition can be noted. Unhealthy caribou are not generally harvested. However, some animals with minor spots or discolouration on the liver and lungs may be eaten as long as it is cooked properly. Also, if an injury or infection is only within one part of the body, the rest of the animal may be taken for meat.

Harry Carmichael

Photo: GRRB

Tom Wright once saw a caribou with a foot disease on the west side of the delta. The animal did not run when approached (Oct 12 2010). Albert Frost has seen an increasing trend towards unhealthy caribou. "There's a lot of things in a caribou that I never used to see. Parasites or fungus, lumps in the legs [and] meat once in a while – white, hard lumps, outside of the meat, between the skin and the meat. A lot of them, in the last 10 years. Their joints are full of yellow coloured fluid, you never see them before like that" (Oct 12 2010). Hunters like Abe Peterson, Douglas Kendo, and Ernest Vittrekwa indicated that they look to the caribou's coat for clues about their health. "If you're a really good hunter you'd know which ones [are] fat, you know, because they're all just like white like. There's your fat caribou there. You see a dark one, that's poor caribou" (Abe Peterson Oct 14 2010). If the caribou are shedding their coats at the wrong time of year, it may indicate they are not healthy as well (Harry Carmichael Oct 28 2010).

Also, animals are in poorer shape naturally during the rut or mating season. Generally people avoid hunting during this time for that reason, and because the meat may be tainted (Richard Ross, however, has heard that woodland caribou do not become poor-tasting like the Porcupine herd bulls, Oct 28 2010). Abe avoids hunting the larger males because they have used up their reserves; he prefers younger animals with small horns, "If you... get them big ones...it's spoiled already. All their good fat's gone away" (Abe Peterson Oct 14 2010).

Brucellosis has been seen occasionally in woodland caribou. It appears as a problem with the caribou's joints (Tom Wright Oct 12 2010). John Norbert has also harvested a single caribou with strange fluid in the joints, "I was up around Tenlen Lake, we shot two caribou one day and I was skinning it and I could see around the joints were pus and stuff like that." John did not take the caribou for eating (Oct 18 2010).

Parasites are found on caribou. In the spring, caribou may have parasites in their noses which they sneeze to expel. They also have warble flies in their coats, in particular on their backs (Tom Wright Oct 12 2010). Warbles are considered normal and are found in the spring; the holes are healed by the fall making fall-hunted skins nicer (Douglas Kendo Oct 18 2010). Wally McPherson indicated that warbles, which he calls bulldogs, do not spoil the caribou for eating. They emerge from the skin when temperatures warm up after the spring (Oct 28 2010).

3.11. Gwich'in language names for caribou

The Gwich'in name for caribou is *vadzaih*. For Gwich'in elders, *vadzaih* refers to all caribou – barren ground, Porcupine, and woodland. However, interviewees used geographic markers to identify different populations of caribou when asked. According to Emma Kay, Peel Preserve woodland caribou could be identified as such. Robert Alexie Sr. mentioned a mountain woodland population in the Yukon known as Hart River Caribou, and also referred to Snake River Caribou, the boreal woodland caribou in the Snake River area (Oct 13 2010). Walter Alexie indicated that woodland caribou could be called *Dachan tat gwavadzaih* which translates as 'amongst the timber caribou' (Oct 14 2010; William George Firth pers. comm. December 2010). Several interviewees called them *vadzaih choo* or 'large caribou' (John Norbert Oct 18 2010, Michael Pascal Oct 14 2010).

3.12. Changes to the land

> *And I noticed that the permafrost is melting. We used to... go for berries, use to go out on the land, and we could drink water from anywhere. ...Where we go for berries ... sometimes [there were] little holes with water in it [and we would] take the water out and as you feel inside there's ice, right there. That permafrost is that close to the surface. And now you don't even see that, and it's scary to drink water any place. (Mary Teya Oct 14 2010)*

Gwich'in have been noticing worrisome changes to the land and the climate. Although not a focus of these interviews, several interviewees commented on these changes as they are seen as inextricable from the well-being of the animals and plants harvested by the Gwich'in. Forest fire prevalence has increased since the 1960s, with one possible factor being increased lightening strikes (Tom Wright Oct 12 2010). Landslides are often mentioned as increasing in prevalence – Robert Alexie Sr. mentioned a large land slide along the Peel which happened in November 2009 (Oct 13 2010), and Mary Teya

Michael Pascal Sr

Photo: GRRB

indicated that the ground can absorb much more rainwater now that it used to, likely due to melting permafrost (Oct 14 2010). The amount of precipitation has changed, and summers are warmer and longer than before (Douglas Kendo Oct 18 2010). Michael Pascal also worried that warmer temperatures were changing freeze up and permafrost conditions,

> *Should have been frozen already almost [in mid-October]. It is minus 10, usually the river is plugged up with ice already. ...You know few years ago when we used to live out in the bush with my parents, we used to go out and if we have meat or something we just, we are always living by hill, [so we] just take it back, like lard or butter or something, cut the moss [in a] big square like that and you just unroll it, it is only this thin, but it is just solid ice there. Just put everything there and put that moss back on and just like in deep freeze, just freeze solid. Now you got to dig down about two feet or more to get to that ice. That is a big change – whereas we used to just cut with knife now you got to dig down damn near three feet before you hit ice. We're going to see lots of landslides pretty soon (Michael Pascal Oct 14 2010).*

The general warming trend may impact caribou's bodies as well – for example, the triggers that a caribou has to grow a winter coat might not relate to the actual weather conditions any more (Julie Ann Andre Nov 12 2010).

The melting permafrost is causing changes in the lakes as well, possibly due to increased ability of the ground to absorb water. Lower lake levels impact many animals including beaver, and caribou. "All them lakes going to dry out pretty soon maybe and the water goes through the ground and the caribou's going to have to move" (Ernest Vittrekwa Oct 15 2010). Caribou may also be impacted if increasing rainfall causes rivers that the caribou normally cross to be running more swiftly; and some interviewees did note that the amount of rainfall seems to be increasing (Douglas Kendo Oct 18 2010, Willie Simon Nov 4 2010).

Walter Alexie described how some of the changes to the land are impacting their ability to hunt. Areas where forest fires have burned grow in very quickly with brush, making it impassable. Even other timbered areas which used to be passable on snowshoe to track moose, are no longer passable due to willows and birch trees growing in profusion. Seismic lines are also growing in to a point where they are less useful for trapping. In the past, trails and traplines did not have to be cleared, but now clearing is required to keep them open (Walter Alexie Oct 14 2010). Wally McPherson also indicated that climate change is affecting the way people use the land – freeze-up is later and at a different pace than before, making conditions unsafe for travel (Oct 28 2010).

> Fall time weather – that is the biggest threat right now
> (James Simon Nov 3 2010)

Fall rain and freezing rain during early winter was mentioned by several interviewees. The freezing rain causes a thicker crust to form on the ice, making it difficult for the caribou to travel (Anonymous Nov 2 2010, James Firth Nov 3 2010). It impacts their ability to move freely which makes them easier

for predators as well (Julie Ann Andre Nov 12 2010). Late rains and winter rains can also freeze the food upon which the caribou rely (John Norbert Oct 18 2010). Richard Ross has heard of several instances of caribou and muskoxen perishing from fall or winter rains which have made winter feed unavailable to the animals; causing them to starve (Oct 28 2010). The frozen crust on the snow may cause groups of woodland caribou to leave an area, at least for a time (Douglas Kendo Gwich'in Traditional Knowledge of the Mackenzie Gas Project Area tape 11). The crust on the snow can also happen with warm winter winds, although it's unclear if these winds are related to climate change or happen with some regularity (Willie Simon Gwich'in Traditional Knowledge of the Mackenzie Gas Project Area Tape 62).

Animals have also changed in behaviour and distribution. Beavers are very common now, many say overpopulated, and building their dams and lodges in places where they haven't in the past. However, the beaver population does not seem to be impacting the caribou (Walter Alexie Oct 14 2010, Abe Peterson Oct 14 2010). Some interviewees indicated that otters are also expanding in numbers or extent and some consider them dangerous. Cranes have also been noted as possibly dangerous when protecting their young ones. Several people around Fort McPherson have seen a cougar in recent years (Emma Kay Oct 13 2010, Robert Alexie Oct 13 2010). Willie Simon may have seen a cougar in the 1960s and has also wondered if some tracks he's noticed recently in the delta might be coyote (Nov 4 2010).

Not all interviewees agreed that climate change was the root of the changes seen on the land. Some wondered if natural cyclical weather patterns were the reason for the freezing rain conditions seen recently and causing trouble for caribou (Conrad Baetz Nov 12 2010).

4. Management of Boreal Caribou

4.1. Subsistence use of boreal caribou

Woodland caribou are generally harvested incidentally. If they are seen while out on the trapline and the situation allows, they will be shot and the meat brought into camp or town. Participants have hunted woodland caribou from all areas within the known habitat where they trap and travel, see mapped locations in Figure 4, Figure 5, and Figure 6, above.

A few interviewees humorously said that a person is most likely to see woodland caribou when they are not carrying a firearm.

Albert Frost has changed the locations he hunts for woodland caribou based on population decline and subsequent hunting bans (Oct 12 2010). Conrad Baetz indicated that he has stopped hunting caribou over the last several years, out of concern for the population (Nov 12 2010). Julie Ann Andre has started to hunt only when the size of the herd allows it, "Well if I run into one caribou, I will not shoot it, but if I run into five or six, maybe I will get one" (Nov 12 2010).

If woodland caribou and barren ground caribou were both available to shoot, interviewees had different opinions of which they would take. Albert Frost would take a woodland caribou – he

indicated that the reason for this relates to the bans on hunting barren ground. There was some confusion expressed by interviewees about whether or not the population is declining.

In the past, caribou meat was prepared for storage by drying or smoke-drying, "they cut it up...out on the land and, just like half smoke it, and dry it." It is still made into drymeat today (Emma Kay Oct 13 2010). In the past, as much of the caribou was taken for food or other uses, as possible. The meat from the head was used, the skins were used including the legs, and even the tendons. "[In] hard times, you can soak it and ...cook it, and you can even make soup and a broth" (Mary Teya Oct 14 2010). The small hooves on the back of the legs were made into a noise-maker to attract caribou when hunting. "They take them off and they put strings through it. And they keep it for when they go out hunting, like in the winter, [when it's] cold. They take it with them and they kind of just shake it and...the caribou hear it, it's just like when they're digging for snow" (Mary Teya Oct 14 2010). Caribou hides were tanned and used for many purposes or sold, or dried with the hair on for their exceptional warmth (Mary Teya Oct 14 2010). Bones were pounded and boiled to make grease which was eaten with drymeat or boiled meat; and marrow was also saved. The marrow or grease was saved in one of the stomachs of the caribou.

In the past, hunters in the area north of the Mackenzie River may have had greater hunting success - Barney Natsie recalled a winter a long time ago when they hunted 40 woodland caribou by dog sled, around Wood Bridge Lake. Even though he had a large eight dog team, he was still only able to move two caribou at once in his sled (Gwichya Gwich'in Place Names study 1992 Tape 31).

Interviewees had different opinions on whether or not woodland caribou tastes different than Porcupine or Bluenose caribou; it seems to be a matter of personal taste. People who grow up eating Porcupine caribou are more likely to say they prefer those caribou. However, there was general agreement that all caribou are tasty. The difference in taste likely relates to a different diet (Walter Alexie Oct 14 2010). Michael Pascal indicated that the meat from the woodland caribou is tougher, and said that his family doesn't enjoy eating it compared to the Porcupine caribou. "Well I think they eat willow like moose, you know, taste more like moose meat" (Michael Pascal Oct 14 2010). Wally McPherson agreed that woodland caribou eat more willows and leaves, which imparts flavour to the meat (Oct 28 2010).

The Gwich'in Renewable Resource Board conducted a study of Boreal Woodland Caribou in 2001, which focussed on mapping. However, several Gwich'in interviewees indicated the following seasonal information about preferred animals to hunt: Bulls are hunted in September and October and again in January and February; cows from the end of October through December. Dry cows (cows without a calf for some reason) are hunted at any time and are often the 'fattest.'

4.2. Protection

It may be difficult to set aside a specific area to protect woodland caribou as they wander so freely over a large area. However, Albert Frost did indicate that an area just north of South Caribou Lake should be protected. Albert notes that in areas where caribou hunting has been banned, the caribou population seems to be increasing. Hunting in several areas around Inuvik is controlled through a tag system. Additionally, he notes that if an area is being hunted the caribou may move into other areas

(Oct 12 2010). Walter Alexie notes that the Peel Preserve is important woodland caribou habitat and should be protected (Oct 14 2010).

Ernest Vittrekwa indicated that woodland caribou make use of small hills in the Peel Preserve during winter, "wherever you see little hills. Because there's not much snow on them and it's easier for them to dig their food." He also felt that the area between Frog Creek and Point Separation was important summer habitat for the caribou (Oct 15 2010).

> [Elders] knew when to stop. They knew how to hunt. They just take enough to live on. But they don't, now it's like they're cowboys and that, and shooting just awful you know. Maybe now ... you going to see caribou limping around ... I see it that's why I talk. And it's not good.
>
> (Emma Kay Oct 13 2010).

Population counts by caribou biologists using planes may be inadequate, according to some interviewees. They may miss portions of the caribou herds and underestimate. A balanced perspective is important.

An anonymous interviewee indicated that he feels it is unethical to collar caribou for scientific research. Other types of research should be substituted for collaring projects (Nov 2 2010).

4.3. Traditional management practices

Traditional hunting practises were based on respect and meat was generally shared. In modern times when there is social turbulence, young people are not necessarily being taught the values of respecting caribou or other animals and may hunt in a fashion which is not acceptable – including shooting without a clear kill shot and wasting meat.

> *People, like myself, say we're not better than anybody. But we grew up where we were really dependant on meat, on caribou meat, on moose meat, whatever we could get, we depended on it. And, we have to survive so we really depended on it and we took care of what we got, you know. We took care of meat. Even now ...I save every little bit of meat (Mary Teya Oct 14 2010)*

Traditional Gwich'in practise was to kill respectfully, take all the animal for food, and share with your neighbours and family. A calve would only be shot if the cow was killed (GRRB Boreal Woodland Caribou Study 2001).

> *Now I wish I could help all my grandchildren. Teach them all what I know. Now what we do telling our stories and sharing our stories, all our children will learn from this in the future. We tell stories, from this they will learn. [Teach] your children. When... hunting is done and the game is killed, the food, the meat or the game used to be so respected and the meat was prepared with great care, with respect. Now I see that it is done differently also. At one time when we travelled the mountains and meat was prepared, the men went hunting and they kill their game and they prepare it. First they skinned it and butchered. It was done with the upmost care and respect. I used to go to the kill site and it was prepared so well. Not even a hair on the meat and first I used to put the skin in the sled then I put all the meat on the inside. (Eunice Mitchell, Elders Biography Project Tape 8 July 9, 2000)*

Additionally, the traditional family and inter-family system for establishing rules is not as it was in the past, and government regulations have taken the place of following the advice and direction of those who earned respect through experience. However, government regulations are not always followed.

"You can make all the rules in the world but if you don't enforce them, what do you doing?" (Tom Wright Oct 12 2010). In the past, necessity also guided the respectful harvest of caribou.

> *..[I saw] an old guy in McPherson like he would have been 75 years old at least. He goes to the hills with three or four ... dogs. He has three shots. He goes to the hills with three bullets; come back with four caribou. He is going to let them line up and then kill, shoot them. I mean people used to be really good at doing stuff, a lot of that is gone. They don't care, it's too easy now. (Tom Wright Oct 12 2010)*

Some hunters do not follow traditional practises when hunting. They may chase the caribou on skidoo and shoot recklessly injuring caribou or shooting too many. These practises must be curtailed for the health of the caribou populations, according to several interviewees (Tom Wright Oct 12, 2010, Albert Frost Oct 12 2010). "I see one year, what I didn't like to see – somebody chasing caribou with big skidoo. It's not right for them to do that, because, these caribou, their tongue was just hanging out" (Emma Kay Oct 13 2010). Wally McPherson thought that undisciplined eagerness of young hunters also had a role in their hunting style – instead of a measured approach and consultation between hunters, they speed towards caribou with their skidoos. Their less-than-careful approach also ensures their hunting success is lower than it could be, and he has seen injured caribou with infections left alive but in poor shape after being hit with a bullet. Wally has also seen people poaching caribou illegally from the highway, and has seen evidence that people are only taking the saddle and hindquarters of caribou leaving a large amount of the carcass to rot (Oct 28 2010).

Mary Teya spoke of a lack of respect for caribou she sees and hears about from members of her family who hunt. She mentioned wasted meat left out on the land, and was saddened to hear about how people do not follow traditional practises of respecting the caribou. She expressed that if people do not follow the Gwich'in principles of respecting the caribou – take only what is required, don't hunt if you already have meat, don't hunt just to sell it, don't leave meat to waste – then the caribou may change their migration or areas of use and not be available any longer. "If they want to continue to have caribou they're going to have to use respect in every way. How they handle it, how they hunt it" (Oct 14 2010).

> And I believe that if I don't use the whole animal, I am going to get bad luck next time.
> (Julie Ann Andre Nov 12 2010)

In the past, the requirement of many caribou skins for clothing and methods of preserving meat would have also limited the time available for hunting (Douglas Kendo Oct 18 2010). Old time hunters and their families would move to new areas and food resources frequently – which would alleviate hunting pressure. "They never used the same place too long, like maybe two years, and then they moved to a different area. Like I say, up the Red? People would go up there and then… next year, maybe they'd move down to the Travaillant Lake area where there's lots of fish and everything like that." People also processed, saved, and used much more of the carcass – including the tendons of the foot inside the hoof, which could be dried and used in times of hunger (John Norbert Oct 18 2010). Inedible portions of the carcass may have been used for tools or clothing, or as bait for traps or dog food (James Firth Nov 3 2010).

> *You even go back to the days of [when] the snowmobiles became popular, and the older skidoos, they were slower and more rough to travel on, you beat the heck out of your kidneys to*

go from Inuvik up to Parsons Lake and back. I mean that is a long day. And you would only be able to haul back maybe five caribou in a tub sled. Nowadays, in the last ten or fifteen years, you got these big 800 liquid cooled snowmobiles that can pull a house and can get you from Tuk to Anderson River for example in an afternoon. So back in the really old days, caribou always had a chance to kind of recover... when they don't come around a community. Now, if they don't come around a community, people will log on to the internet and find out where the satellite collars are maybe and they will say there is a bunch out at Anderson River and then in an afternoon, they are out there but [by] the time of night is over they are back with a toboggan full of 25 caribou. Maybe not 25 but it is an exaggeration. The bigger more powerful snowmobiles, the fact that we have got more people in our communities, has just added hunting pressure to the caribou that I don't believe is truly recognized (Conrad Baetz Nov 12 2010).

John Norbert

Photo: GRRB

John Norbert suggested that both caribou's importance as a traditional food and the importance of conserving the animals for the future must both be balanced;

Caribou is our food. But then again, we have to learn how to manage also. ...In some area, the caribou are going down, and then they say you could only shoot one. Well, go ahead and shoot one, only. Because you'll have to learn how to manage your animals and your land. You know, so, you can't say just because I eat caribou, if the law says you're only allowed one caribou in a certain zone, you could still just because caribou is your food, you could shoot ten. Then you're breaking the law and on top of that... you're taking too much (Oct 18 2010).

Interviewees suggested that training and educating young people, with on-the-land programming in schools, life-long education by parents, and apprenticeship-type requirements for young people to learn from elders, might be a good way to reinvigorate the traditional harvesting patterns of the Gwich'in and to promote respectful use of caribou.

5. Knowledge Experts Consulted

The following hunters and Elders were interviewed for the Gwich'in traditional knowledge of woodland caribou study in 2010.

Tommy Wright	Inuvik
Albert Frost	Inuvik
Emma Kay	Fort McPherson
Robert Alexie Sr	Fort McPherson
Walter Alexie	Fort McPherson
Michael Pascal Sr	Fort McPherson
Mary Teya	Fort McPherson
Abe Peterson	Fort McPherson
Ernest Vittrekwa	Inuvik
Doug Kendo	Tsiigehtchic
John Norbert	Tsiigehtchic

Albert Ross	Tsiigehtchic
Harry Carmichael	Aklavik
Richard Ross Sr	Aklavik
Wally McPherson	Aklavik
ANONYMOUS	Inuvik
James B. Firth	Inuvik
Willie Simon	Inuvik
Conrad Baetz	Inuvik
Julie Ann Andre	Inuvik/Tsiigehtchic

APPENDIX 1: Informed Consent Statement

Gwich'in Traditional Knowledge of Woodland Caribou (Boreal Population)

Interviewee: _____

Interview Number: _____ Date: _____

Community: _____

Location: _____

Interviewer(s):_____

Translator: _____

Others Individuals Present: _____

This consent form will be read by or to the interviewee and/or translated, as needed, to participants at the beginning of the interview session. The interviewer will ensure that the participants fully understand the project before being asked to give their consent.

Background

Environment Canada is preparing a national recovery strategy for Woodland Caribou, boreal population (woodland caribou), which are listed as a threatened species under the federal S*pecies at Risk Act*. Environment Canada believes that traditional knowledge can play an important role in recovery planning for woodland caribou.

The Gwich'in Renewable Resource Board and the Gwich'in Social and Cultural Institute are interviewing holders of Gwich'in traditional knowledge, on behalf of Environment Canada, to gather information that will be used in recovery planning for woodland caribou. Recovery planning includes both the preparation of a recovery strategy and one or more action plans.

Study Goals

The objectives of this study are to collect community knowledge about woodland caribou including observations on the land, special significance, physical description, distribution, habitat, population size and trend, limiting factors and threats, and animal health. This knowledge will benefit the communities in that it will be a permanent record available for future generations and that it will be useful in recovery planning and resource management.

Recording of interview

With your permission, the interview will be recorded and a transcript made. The transcript is a typed record of the interview and is useful for report writing and extracting information later on. The information marked on the maps will be digitized or traced into a computerized mapping system.

Verification of information
The interviews will be transcribed and a summary report will be completed. Following the interview you will receive a copy of the transcript if you wish and will have opportunity to correct any of the information that was recorded. There will be a verification meeting at a later date to go over the TK study results, which will include caribou hunters from all Gwich'in communities. Corrections and changes can be made at the meeting.

Language
If you would prefer to be interviewed in Gwich'in, we can arrange for a translator.

☐ YES (I need a translator) ☐ NO (I don't need a translator)

Data Storage
Original materials, which may include audio files, written notes, transcripts, translations, maps, videos, and photographs, will be kept at the Gwich'in Renewable Resource Board office in Inuvik. A copy of the final report will be distributed to each organization identified by the Aurora Research Institute for consultation. According to the Gwich'in Traditional Knowledge Policy (GTC 2004), a copy of the community interviews will be supplied to the Gwich'in Social and Cultural Institute for its archives and for their use in future heritage or traditional knowledge studies, if you agree. The GSCI will also be supplied with any reports, maps, posters, etc. that come out of this research. Environment Canada will receive a summary report and paper and digital maps for use in the recovery planning process for woodland caribou, which will be housed in the Yellowknife office and also provided to the team drafting the national recovery strategy for woodland caribou.

A copy of all research materials will also be deposited in the GSCI section of the Territorial Archives, for safekeeping in the case of fire.

Use of information
The information collected in the study will be used to write a report that will be distributed to community organizations and will be made public.
This summary report will then be shared with Environment Canada for use in the recovery planning. The summary report may also be shared with the relevant province or territory so that they can benefit from this knowledge and avoid asking knowledge holders for the same information. In the future, other researchers may be interested in using this information. Access to the original materials will be controlled by the GRRB and GSCI (holders of the original materials).

Funding
The funding for this study has been provided by Environment Canada, with in-kind support from GRRB and GSCI.

Payment

You will be paid an honorarium of $50 per hour for your time and knowledge. You will be paid by cheque from the GRRB office in Inuvik, and it will be mailed to you within a week. An invoice will be filled out at the end of the interview.

Confidentiality

The names of interviewees will remain confidential unless permission has been obtained. However the GSCI suggests that Gwich'in Elders and participants interviewed provide their names in the research. GSCI finds Gwich'in like to know who provided traditional knowledge information and their names on tapes and/or transcripts and final reports will add credibility to the traditional knowledge provided.

Participation

Your participation in this interview is completely voluntary. You have the right to refuse to answer questions you are not comfortable with. You also have the right to stop the interview at any time and withdraw your participation from the study at any time, even after the interview is complete.

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

May we interview you for this report? ☐ YES ☐ NO [INTERVIEW ENDS]

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

☐ I want to be acknowledged specifically (such as at the end of quotes).

☐ I want to be acknowledged generally: my name will not be associated with specific comments but I will be acknowledged as a contributor.

☐ I do not want my name used or associated with the information I give or included in the report; I want to remain anonymous.

May we record this interview?	☐ YES ☐ NO
May the GSCI and GRRB use the audio tapes and the transcripts in future for other purposes such as publications, reports, website, etc.?	☐ YES ☐ NO
May we take your photo for use in this report?	☐ YES ☐ NO
May we use these photos in future for other purposes such as publications, reports, posters, website, etc.?	☐ YES ☐ NO

Would you like a copy of the taped interview?	☐ YES ☐ NO
Would you like a copy of the transcript of the interview?	☐ YES ☐ NO

By signing below, you give informed consent for this interview. We respect the choices you made filling this consent form.

X_____ Witness _____

Date: _____ Date: _____

APPENDIX 2: Interview questionnaire

Questionnaire for Gwich'in Traditional Knowledge Interviews on Woodland Caribou

INTERVIEWERS TO BRING:
Large maps to draw on
Coloured markers
Map showing extent of woodland caribou
Questionnaire
Informed consent statement

The following questions have been developed to gain information and understanding of the Woodland caribou related to the following areas: their range boundaries and population information; habitat use and population trends and threats. It is expected that interviews with knowledge holders will follow their own course depending on the person being interviewed and not every question will be posed to the knowledge holder. Rather, these questions are provided to the interviewer so that they can raise the appropriate questions as the interview unfolds. It is required that the interview address, to some extent, the main areas identified above. To assist the interviewer a number of sections and questions have been highlighted below which, if asked, would draw out the key information that is required.

Review Informed Consent statement. Interviewee to sign Informed Consent statement

Rapport Development/Background Information:

Inform interviewees that interview may take one hour or more.
What year were you born? (if they would like to share it). *This will give some sense of temporal scale to relate to the information they share with us on boreal caribou.*

Have you always lived in _____? If not, where else have you lived?

How much time do you spend on the land each year? What months do you usually spend on the land?

What types of activities do you do on the land now? What types of activities did you do on the land when you were younger?

When/how/what time of year do you usually encounter/observe caribou?

Can you easily tell if the caribou you see are woodland caribou, compared to either the Bluenose or Porcupine herds?

Is there a separate name for woodland caribou in Gwich'in? What is it?

How important are woodland caribou to you and your community?

Mapping Exercise:

Can you mark on this map (fine-scale map of the local area):

- the areas where you spend time on the land, now and in the past? Outline the areas that you know best. If the areas are discreet, indicate how long your experience is in each.
- SPECIFY WOODLAND VS. OTHER CARIBOU
- areas that you see caribou use now and in the past during the winter. Would you consider any of these areas important to caribou during the winter?

- areas that you see caribou use now and in the past during summer. Would you consider any of these areas important to caribou in the summer?
- areas that you see caribou use now and in the past during calving . Would you consider any of these areas important to caribou during calving?
- any areas that have been burned by a forest fire within the last 50 years (since the 1960s).
- any areas that have been burned by a forest fire more than 50 years ago (before the 1960s).
- any areas that you feel are the most important to protect for woodland caribou

Range Boundaries

Do woodland caribou stay in groups or herds?
If so, can you tell which group is which?
What herds or groups do you know of in your area?
How do you differentiate these from other woodland caribou?
If there is more than one herd, do they intermix or overlap?
Could you draw on the map the ranges of local populations that you are aware of?

Have you seen woodland caribou outside the known or mapped range shown on this map?

Habitat Use

What types of plants do caribou eat in the summer? Fall? Winter? Spring?
Do they use plants or trees for anything other than eating?
Is there any landscape features (provide example) that caribou use? For what, and when?

Population Trends:

Have the number of woodland caribou in your area changed over time?

a) Do you see more or less caribou now than you did when you were younger?
b) Compared with what your parents/grandparents said, would you say there are more or less caribou now?

Did you hunt woodland caribou in the past? If so, have you changed your hunting practices because of a decline or increase in woodland caribou?

Do you still hunt woodland caribou? Are they easier or harder to hunt now? Do you prefer to hunt other species – which ones and why?

Calf survival (specific to a given area, based on information from the Scientific Review)

Do you have any information about calf survival for woodland caribou?

Factors that have led to increased/decreased local populations (threats)

Habitat

What kinds of activities alter or destroy caribou habitat?

What changes have you observed on the land in your lifetime that may have changed the way caribou use the land?

Forest fires

How do forest fires change the way woodland caribou use the land?

Do woodland caribou return to burned out areas? If yes, how long does it take for the caribou to come back? What are they doing there?

Industry and Development

Have you observed woodland caribou using or avoiding areas that have been altered by industrial activity or developments? Can you provide specific examples? For example, seismic lines, roads, etc.?

Predation

Are there more predators (such as wolves, bears, or lynx) in areas where there are woodland caribou than there were in the past in your area?

Have you seen changes in the populations of other prey species, such as beaver, muskox, moose, or barren-ground caribou, in areas shared with woodland caribou?

Are any of these prey species new to your area?

If there is a change in the number of predators, do you think these changes are having an effect on woodland caribou?

If there is a change in the number of beavers, moose, or other 'prey' species, do you think these changes are having an effect on woodland caribou?

Caribou parasites and disease

How do you know if a caribou is healthy? Have you seen a change in caribou health in your region? Are there other indications of caribou health, (such as size, behaviour, parasites, or increased mortality) that you have noticed changes in?

What do you think is the cause?

Have you seen a relationship between caribou health and the arrival of new species?

Noise and light disturbance

Have you observed noise or light disturbance from aircraft, skidoos, ATVs, or industry affecting woodland caribou in your area?

If so, how is it affecting the caribou?

Do you notice areas where it is more of a problem?

Do you have suggestions for how to address this?

Over-harvesting

Are woodland caribou being over-harvested in your area?

Have there been changes in hunting pressure on woodland caribou in your area? (that is, how much woodland caribou hunting there is)

Vehicle collisions

From your experience or observations, are vehicle collisions or crashes with woodland caribou occurring in your area?

To what extent are these collisions occurring? For example, how many or how often are they occurring?

Are there particular areas where vehicle collisions are more of a problem? If so, where are they?

Do you have suggestions for addressing this problem?

Climate change

Have you observed any changes related to climate change such as changes in snow condition, temperature, or precipitation in your area?

If so, have you noticed if these changes have affected woodland caribou or their habitat in your area? How?

Threats - general

From your experience or observations, are there any other things that negatively affect caribou that we haven't already discussed? If so, what are they?

Which of these threats stand out to you as having the most impact upon woodland caribou in your region?

Are there potential solutions to these threats?

Other observations or beneficial practices

Do you know of any traditional Gwich'in conservation practices or activities to conserve woodland caribou now or in the past?

EXTRA QUESTIONS ABOUT PORCUPINE CARIBOU
To help with the Species At Risk Act process concerning other caribou – the Gwich'in Renewable Resources Board would also like to ask the following questions.

What are the differences between Porcupine and woodland caribou?
What are the differences between Porcupine and Bluenose or other herds?
Can you easily tell just by looking? Is there any other clues, for example from the organs? Do they act differently?
Does the Porcupine herd mix with any other herds? With Woodland caribou?
Does the Porcupine cross the Mackenzie?
Have you ever heard, even long ago, that the Porcupine herd mixed with other herds or crossed the Mackenzie?

Gwich'in Social and Cultural Institute: Gwich'in Traditional Knowledge of Boreal Woodland Caribou 2010

The following table outlines previous studies that gathered Gwich'in traditional knowledge about caribou. Many of the studies were not specific to caribou; and the studies that focused on caribou tended to focus on barren-ground or Porcupine caribou.

APPENDIX 3: Previous studies including Gwich'in traditional knowledge of caribou.

Year	Project name	Organization/Ownership	Content (weaknesses and strengths)	Access constraints
Various	Ethnographic Literature	Various	Mention of caribou hunting in ethnographic literature is generally limited to historic traditional use. Ethnographic literature focuses on the Teetł'it Gwich'in.	Public documents include various academic papers and ethnographies. See list, below table.
1970s-1980s	Committee on Original People's Entitlement (COPE) Stories and recordings	Gwich'in Social and Cultural Institute	Life stories and legends include references to caribou and caribou hunting. Not specific to woodland caribou.	Stories and transcripts are confidential and available only with permission of GSCI.
1970s-1980s	Dene Mapping Project	Dene Nation/Gwich'in Tribal Council	GIS files of mapped trails and traplines, including caribou hunting, over entire Mackenzie Valley in NWT. No distinction between sub-species of caribou.	GIS files: Only with permission of GTC. Transcripts from Delta Report and Land Research interviews are confidential and available only with permission of the GSCI.
1975-1976	Berger Community Hearings Transcripts	Unclear. Prepared by AllWest Reporting from original transcripts.	Information from residents of Mackenzie Valley about concerns of proposed pipeline. Includes references to caribou. Not specific to woodland caribou, and often not spatially oriented.	Hearing transcripts are public – see www.allwestbc.com

1992-2007	Gwichya Gwich'in Place Names projects and History Project	Gwich'in Social and Cultural Institute	Project focus was much broader than caribou, although some information about hunting is included in transcripts. Not specific to woodland caribou. Tsiigehtchic area.	Transcripts are confidential and available only with permission of GSCI. Reports are publically available but don't have much information on caribou hunting. General history book Gwichya Gwich'in Googwandak is available from GSCI and has some information from these studies: Heine, Michael, Alestine Andre, Ingrid Kritsch, Alma Cardinal and the Elders of Tsiigehtshik 2007 Gwichya Gwich'in Googwandak: The History and Stories of the Gwichya Gwich'in Revised Edition. Gwich'in Social and Cultural Institute. Originally published 2001. 405 pp.
1994-2010	Northern Yukon/ Arctic Borderlands Ecological Knowledge Co-op database	Borderlands Co-op (www.taiga.net)	Database of ecological observations recorded in workshops. Focuses on Porcupine caribou area.	Database confidential. Unsure of access constraints.
1994	Gwich'in Territorial Park (Campbell Lake) Oral History & Place Names Project	Gwich'in Social and Cultural Institute	Project focus was much broader than caribou, although some information about hunting is included in transcripts. Not specific to woodland caribou.	Transcripts are confidential and available only with permission of GSCI.

1995-2008	Teetł’it Gwich’in Place Names projects	Gwich’in Social and Cultural Institute	Project focus was much broader than caribou, although some information about hunting is included in transcripts. Not specific to woodland caribou. Fort McPherson area.	Transcripts and draft report are confidential and available only with permission of GSCI.
1997-2001	Gwich’in Environmental Knowledge Project (GEKP Database)/ Gwich’in Words About the Land	Gwich’in Renewable Resources Board	Interviews were conducted about caribou (and many other species). Includes information about habitat and use. Not specific to woodland caribou. Gwich’in-language words about caribou also recorded.	Filemaker Pro database is confidential and may be used with permission at the GRRB office in Inuvik. Books are publicly available: Nành' Kak Geenjit Gwich'in Ginjik (Gwich'in Words About the Land) Gwich'in Elders. 1997. 212 pp. (Out of stock, but available for viewing at GRRB office) Gwìndòo Nành' Kak Geenjit Gwich'in Ginjik (More Gwich'in Words About the Land) Gwich'in Elders. 2001. 184 pp.
1997-2002	Gwich’in Ethnobotany Project	Gwich’in Social and Cultural Institute	Project focus was of human use but some relevant data about plants included. Whole GSA.	Gwich’in Ethnobotany book is available publically: Andre, Alestine and Alan Fehr 2002. Gwich’in Ethnobotany: Plants Used by the Gwich’in for Food, Medicine, Shelter and Tools. 2nd Edition. Published by Gwich’in Social and Cultural Institute and Aurora Research Institute. 68pp.

1999	Ehdiitat Gwich'in Place Names Project	Gwich'in Social and Cultural Institute	Project focus was much broader than caribou, although some information about hunting is included in transcripts. Not specific to woodland caribou. Aklavik area.	Transcripts and draft report are confidential and available only with permission of GSCI.
1998-2008	Gwich'in Traditional Caribou Skin Clothing Project	Gwich'in Social and Cultural Institute	Project focus was on repatriating sewing skills, but information about caribou skin preparation was also gathered. Not specific to woodland caribou. Whole GSA.	Transcripts are confidential and available only with permission of GSCI. Book publicly available: Thompson, Judy and Ingrid Kritsch 2005. Yeenoo Dài' K'è'tr'ijilkai' Ganagwaandaii: Long Ago Sewing We Will Remember. Mercury Series. Canadian Ethnology Service Paper 143. Canadian Museum of Civilization. 61 pp.
1989-1999	Beaufort Delta Self Government Traditional Governance Project	Beaufort Delta Self-Government Office	Project focus was on traditional governance but interviews mention caribou hunting in passing.	Interview transcripts are confidential. Permission to use from GSCI / GTC.
1999-2003	Elder's Biography Project	Gwich'in Social and Cultural institute	Project focus was on life stories but some information on caribou harvesting is included. Not specific to woodland caribou. Whole GSA.	Transcripts and stories are confidential and available only with permission of GSCI. Several calendars about Elders were produced and are now out of print, but information is available on the GSCI website (www.gwichin.ca). An Elder's biography book is in progress.

2000-2002	Sustainable Forestry in the Gwich'in Settlement Area	University of Alberta Sustainable Forestry Management Network	Project focus was on forestry and history, but several publications include references to caribou. Not specific to woodland caribou, and more focussed on Teetł'it area.	Publications are publicly available from: www.sfmn.ales.ualberta.ca.
2002	Devlan Oral History Project	Gwich'in Social and Cultural Institute	Project gathered traditional use and knowledge about Tree River area along Mackenzie, included some information about caribou hunting. Not specific to woodland caribou.	Transcripts and report are confidential and available only with permission of GSCI.
2002	Snowchange Project in Tsiigehtchic	Snowchange Project/Kaisu Pulli Mustonen	Project gathered traditional knowledge information about climate change from Tsiigehtchic elders. Some information in general about how climate change is affecting caribou. Not specific to woodland caribou.	Transcripts are confidential and available only with permission (to be determined – possibly from interviewee, from Snowchange, or from GSCI). Bachelors' thesis: Pulli, Kaisu 2003. There is a big change from way back – traditional knowledge of ecological and climatic changes in the community of Tsiigehtchic, Northwest Territories, Canada. Unpublished manuscript.

2003-2005	Gwich'in Traditional Knowledge of Mackenzie Gas Project Area	Gwich'in Social and Cultural Institute	Project gathered biophysical TK and TLU of area to the north of the Mackenzie River. Information gathered about caribou, including some information specifically on woodland caribou. However, the focus was on general use and information relating to the potential impact of the proposed pipeline.	Transcripts, report, and map booklet are confidential and available only with permission of the GSCI.
2004	Local Knowledge of Fish Movements and Habitat Use in the Travaillant Lake System, and Arctic Red River fish study	Gwich'in Renewable Resources Board	Projects focussed on fish harvest, but contain some reference to areas where caribou were hunted, and other passing caribou references.	Report may be public, transcripts are confidential. Permission from GRRB required.
2004-2007	Headwaters of the Arctic Red River: Gaps Analysis (Phase I) in 2005, Cultural Assessment - Interviewing Elders (Phase II) in 2006, and Heritage and Cultural Assessment (Phase III) in 2007.	Gwich'in Social and Cultural Institute	The interview questions and map work in Phase II related to traditional use, names places, old time trails, gravesites, etc. plus traditional environmental knowledge (terrestrial). The animals reports in the study area include: caribou, moose, sheep, grizzly bear, etc. and habitat for caribou, moose, sheep, grizzly bear.	Transcripts and GIS data are confidential and available only with permission of the GSCI. Report may be obtained from GSCI.

2004-2005	Using Hunter Observations and Ecological Knowledge Together With Science to Understand Past and Current Occurrence of Wildlife Diseases in the North	Canadian Cooperative Wildlife Health Centre, Western College of Veterinary Medicine (and GRRB)	Workshops (?) to gather TK about animal disease, including caribou disease. (Data not currently held by GSCI)	Transcripts and reports (?) held by Canadian Cooperative Wildlife Health Centre, Western College of Veterinary Medicine and/or GRRB. Contacted Susan Kutz for further information.
2006-2007	Repatriating Traditional Gwich’in Skills and Knowledge	Gwich’in Social and Cultural Institute	Workshop with Teetł’it Gwich’in on traditional skills includes some information on processing caribou hides. Not specific to woodland caribou. Includes Gwich’in words for various items, some made from caribou hide.	Report is available from GSCI: Lyons, Natasha, 2007. Repatriating Traditional Gwich’in Skills and Knowledge 2006—2007: Report on a Pilot Project with Gwich’in Elders from Fort McPherson. Report prepared for the Gwich'in Social & Cultural Institute. Report on file with the Gwich'in Social & Cultural Institute. 23pp.
2007-2008	Ways We Respect the Caribou: Hunting in Teetl'it Zheh.	Brenda Parlee and Kristine Wray	Research on Porcupine herd, focussing on: 1) documenting elder/hunter perceptions of caribou health and population, 2) documenting traditional practices for respecting caribou and 3) exploring the extent to which harvesters draw upon local knowledge, TK and/or scientific data or other info to make decisions about where, when and with whom to harvest.	Forthcoming.

2008-2009	Vegetation – Caribou-Wolf Food Chain Project	Aurora Research Institute, Gwich'in Social and Cultural Institute	Interviews with Gwich'in (and other) harvesters about caribou and wolves. Focussed mainly on Porcupine herd, but includes recording of Teetł'it Gwich'in dialect words for caribou and parts of the caribou.	Transcripts are confidential and available only with permission of the GSCI. Report available from ARI: Katz, Sharon. 2010. Traditional Knowledge on Caribou Ecology: Vegetation -> Caribou -> Wolf Food Chain. Aurora Research Institute, Inuvik.

December 2010

Boreal Caribou Traditional Knowledge Collection Study

Sahtu Settlement Area

Boreal Caribou Traditional Knowledge Collection Study

The Sahtu Settlement Area

Prepared by

Rhea McDonald

and edited by

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The Sahtu Renewable Resources Board

For the Canadian Wildlife Service

Environment Canada

December 2010

Cover Photo: Hammar Mountain, Norman Wells - Boreal Woodland Caribou

Photo taken by Boyan Tracz- GNWT

Table of Contents

1. Executive Summary

As their name implies, boreal woodland caribou reside in old-growth boreal forest environments that stretch across Canada's northern regions and rely upon predictable food reserves during winter months to survive. Negative impacts to this environment, whether through meteorological or humanly induced changes, are of great concern to the people of the Sahtu Settlement Area (SSA). While these animals played a larger role in the past as a prey species (principally due to modern human distribution), they remain an important harvest species. The elders and hunters of the SSA have long known that boreal woodland caribou were different from the vast barren-ground herds and are often referred to as the "Secret" animals, as they are stealthy and often opportunistic kills. Boreal woodland caribou habitat supports many other important harvest species including marten, fox, wolverine and wolf. Disturbances to this habitat will lead to reduced productivity. This will have a serious impact on subsistence trapping practices of the Sahtu Dene and Métis peoples and could lead to economic instability in many households. Moreover, boreal forest habitat supports watersheds that are necessary for clean water and healthy subsistence fish species. There is a general consensus that boreal woodland caribou populations in the SSA are currently healthy. However, they caution that many changes are occurring that could impact these populations and cite climate change and industrial activities as causes for concern. Boreal woodland caribou do not like noise or activity and all attempts should be made to avoid disturbing the animals and their habitat.

2. Introduction

2.1 Description of Project

Boreal woodland caribou are found throughout Canada and are currently listed as a threatened species under the Species at Risk Act (SARA). The following study was undertaken to gain traditional knowledge from the Aboriginal people living in the Sahtu Settlement area in the Northwest Territories of Canada. The traditional knowledge obtained from this study is crucial as it will be used to help with the development of the national recovery strategy and future recovery planning for the boreal woodland caribou.

There are 5 communities located in the Sahtu Settlement area, Colville Lake, Fort Good Hope, Norman Wells, Deline (formerly Fort Franklin) and Tulita (formerly Fort Norman). This study consists of fourteen participants, including elders, harvesters and key knowledge holders from the Sahtu communities. Interviews were conducted in Norman Wells, NT with an interpreter present to translate and relay information gathered back to the interviewer. The participants were asked a series of questions to gain knowledge about the boreal woodland caribou and its habitat. Maps were also available for participants to identify important areas related to caribou distribution.

2.2 Previous traditional knowledge work on boreal caribou in the region

Title: Historic and Current Movements and Distribution of Boreal Woodland Caribou Below Treeline in the Sahtu, Gwich'in, and Inuvialuit Settlement Areas, *(8 August, 2002)*
Authors: Denise Auriat (Gwich'in Renewable Resource Board, Inuvik), John Nagy (Department of Resources, Wildlife & Economic Development, Inuvik), Arianna Zimmer, Richard Popko, and Alasdair Veitch (Department of Resources, Wildlife & Economic Development, Norman Wells)
Public document
Access available on SRRB website (www.srrb.nt.ca)

3.1 Aboriginal Names for Boreal Woodland Caribou

Each Sahtu Settlement Area (SSA) community has a descriptive North Slavey name for boreal woodland caribou. Slight differences in dialects are reflected in the pronunciation and inflections used to describe the animal.

Deline	T'onzi
Tulita	Tohzi
Fort Good Hope/Colville	T'ondzi

Norman Wells interviewees used the English name throughout the interviews.

3.2 Special Significance of Boreal Woodland Caribou

All the interviewee's considered boreal woodland caribou to be very important. The families in the communities use the hides for clothing and the meat is used as a food source.

In the Tulita District of the SSA there are several families known as the Mountain Dene. They traditionally resided on the West side of the Mackenzie River in the foothills of the Mackenzie Mountains. They hunted boreal woodland caribou during the winter months and utilized the hides for clothing. The harvest of Boreal woodland caribou took place in the Stewart lake area southward towards the mouth of the Keele and Redstone Rivers. This practice no longer occurs.

3.3 Legends related to Boreal Woodland Caribou

There were no legends provided by interviewees

3.4 Place Names and trails related to Boreal Woodland Caribou

There were no place names or trails provided by interviewees

3.5 Physical Description

The participants described boreal woodland caribou as being smaller in size than mountain woodland caribou and larger in size than the barren-ground caribou. The elders said that long ago, "They did not call the caribou either mountain woodland or boreal woodland." "They just knew they were different in their markings, color and hoof prints." (Tulita elder)

3.6 Distribution within the Sahtu Settlement Area

Tulita District

Boreal woodland caribou can be found in two general areas on each side of the Mackenzie River. The east side of the river includes areas around Kelly Lake, Lennie Lake and Oscar Lake. Boreal woodland caribou are also found on the west side of the Mackenzie River between Stewart Lake, Tate Lake and Rusty Lake to the south along the Keele River. Participants identified two other lakes by name (Clarke Lake and Fish Lake). However, their locations were not provided so they cannot be included with the others. Both, elders and active hunters stated that these groups tend to stay away from cut lines and roads.

Deline District

Small groups of boreal woodland caribou have been observed around the community of Deline on occasion. Several groups have also been seen along the North Shore of Great Bear Lake. These boreal woodland caribou have been observed in association with the Bluenose-east barren-ground caribou herd in the late fall and early winter months. At least one small group, if not more, have always lived on Ehdaila (Caribou Point) along the northeast end of Great Bear Lake.

K'asho Go'tine District

Boreal woodland caribou in the K'asho Go'tine District occur mostly in small groups and occupy the area along the Mackenzie River on the west side from the Ramparts south of Fort Good Hope, down river to McBride Lake, and then east towards Muskeg Lake past Colville Lake. This area seems to be the prime habitat for boreal woodland caribou in the Sahtu Settlement Area and an area where the majority of the opportunistic kills occur. Elders from Colville Lake reported seeing signs of boreal woodland caribou south and west of Lac de Bois on a regular basis.

3.7 Habitat


Glen Guthrie(SRRB), 2006

According to the participants, the primary food consumed by boreal woodland caribou includes willow tips, grasses, white lichen, and spruce tree moss. Salt licks are also actively sought out by the caribou. The Sahtu boreal woodland caribou groups do not migrate very far during any time of the year. Primary habitat has remained fairly stable in recent years due to the low incidence of disturbance by fire and the populations have remained fairly stable. In the mid 1990's however, there were drastic habitat losses due to abundant forest fires. Old habitat that was burnt has now been taken over by new and expanded moose populations.

Small populations can be observed within the Tulita area during the summer months. These are located in open meadows on high ground, where they forage for mosses. They are also found near rivers and lakes during times of high insect infestation. Elders reported that there is a resident group of 10-15 animals in the Kelly Lake area that are present throughout the year. They are seen near rivers in the spring when they seek out salt licks. During winter, they travel wherever there is adequate cover provided by forest growth and hard ground. During the fall time, they go to the high ground and come together for the annual rut, but not in large numbers.

3.8 Population size and trends

The general consensus of the people interviewed is that there are more caribou within the region now. All interviewees reported seeing more signs of groups of caribou. This is attributed to a decrease in industrial activities throughout their habitat in recent years; as caribou tend to avoid developed areas including roads and seismic lines. Lots of tracks are evident throughout the year and caribou are only hunted when opportunistically encountered by hunters.

3.9 Limiting factors and threats

a) Habitat

Noise is given as a major factor that impacts boreal woodland caribou. These disturbances include drilling, seismic cut-line activities, slashing, and machines including helicopters and All-terrain vehicles that conduct work during the summer. Caribou prefer old growth areas and have a tendency to stay away from winter roads because of noise pollution. Weather also plays a significant role in the health and well-being of boreal woodland caribou. Increasing extremes in annual temperatures and flooding negatively impact herds.

b) Forest Fires

Forest fires lead to the destruction of the boreal woodland caribou habitat and seriously impacts their ability to acquire food. These events force caribou to relocate to more desirable locations. Some interviewees stated that boreal woodland caribou return to burned areas once there is new growth; while others stated that caribou will never return to these sites again.

c) Industry & Development

Industry and general development are major factors that affect caribou. Noise pollution produced by these activities precludes animals from taking advantage of resources in these areas.

d) Predation

People from all SSA communities have observed an increase in wolf populations in recent years. This increase appears to be linked to a decrease in wolf trapping activities by SSA residents in recent years. Other observations include a general increase in the abundance of moose, muskox and beavers. The elders are adamant that there is a connection between the numbers of kinds of

prey species and the availability of food resources. Muskox are a fairly new inhabitant in many parts of the SSA. An increase in the number of prey species like muskox and moose results in less caribou being taken by predators. This is definitely having an effect on the boreal woodland caribou populations. If there is a decrease in the number of prey species like muskox, then predators will hunt caribou.

e) Caribou Parasites & Disease

Participants noted a change observed on collard caribou. The area around the neck where the collar sits is worn raw and may become infected.

f) Noise & Light Disturbance

Noise and lights disturb caribou. Any development should not occur during the calving season or near caribou habitat.

g) Over Harvesting

Over harvesting is not a concern in the SSA as they are mostly opportunistically harvested.

h) Vehicle Collisions

Boreal woodland caribou are typically found in old growth forested areas and stay away from winter roads because of the noise pollution. Therefore motor vehicle collisions with boreal woodland caribou do not occur in the SSA.

i) Climate Change

Recent changes in climate are significant which include warmer temperatures, increased rain in November, milder winters and increasing summer storms. Boreal woodland caribou food sources are affected by precipitation. During colder times, food becomes less accessible as it is covered by more snow, making it harder for caribou to access.

j) General Threats

Several general threats were identified. Both winter road and boat access to the SSA by non-resident hunters' may impact populations. However, climate change, development, industry and predation were cited as the most significant impacts to boreal woodland caribou populations. Suggested mitigations include less development, encouraging trapping of predators, regulations, and avoidance.

3.10 Animal Health

The boreal woodland caribou populations are healthy according to the participants. The caribou have also been observed to have a healthy fat content.

4. Management of Boreal Woodland Caribou

4.1 Subsistence use of boreal woodland caribou

Boreal woodland caribou are used as a subsistence food source throughout the Sahtu region. However, not many people actively pursue these animals and most are harvested opportunistically when encountered while hunting other species.

4.2 Traditional management practices

When groups of boreal woodland caribou are encountered, only a few caribou from each group are harvested. More bulls are harvested than cows and calves.

5. Acknowledgements

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Aurora College

Sahtu Renewable Resource Board

Colville Lake Renewable Resource Council

Deline Renewable Resource Council

Fort Good Hope Renewable Resource Council

Norman Wells Renewable Resource Council

Tulita Renewable Resource Council

6. Literature Cited

Historic and Current Movements and Distribution of Boreal Woodland Caribou Below Treeline in the Sahtu Settlement Area by Arianna Zimmer, Alasdair Veitch and Richard Popko, Department of Resources, Wildlife & Economic Development, Norman Wells, NWT.

7. Knowledge Experts Consulted

Frank Pierrot, Fort Good Hope

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David Etchinelle, Tulita

Richard Kochon, Colville Lake

Edward Oudzi, Norman Wells

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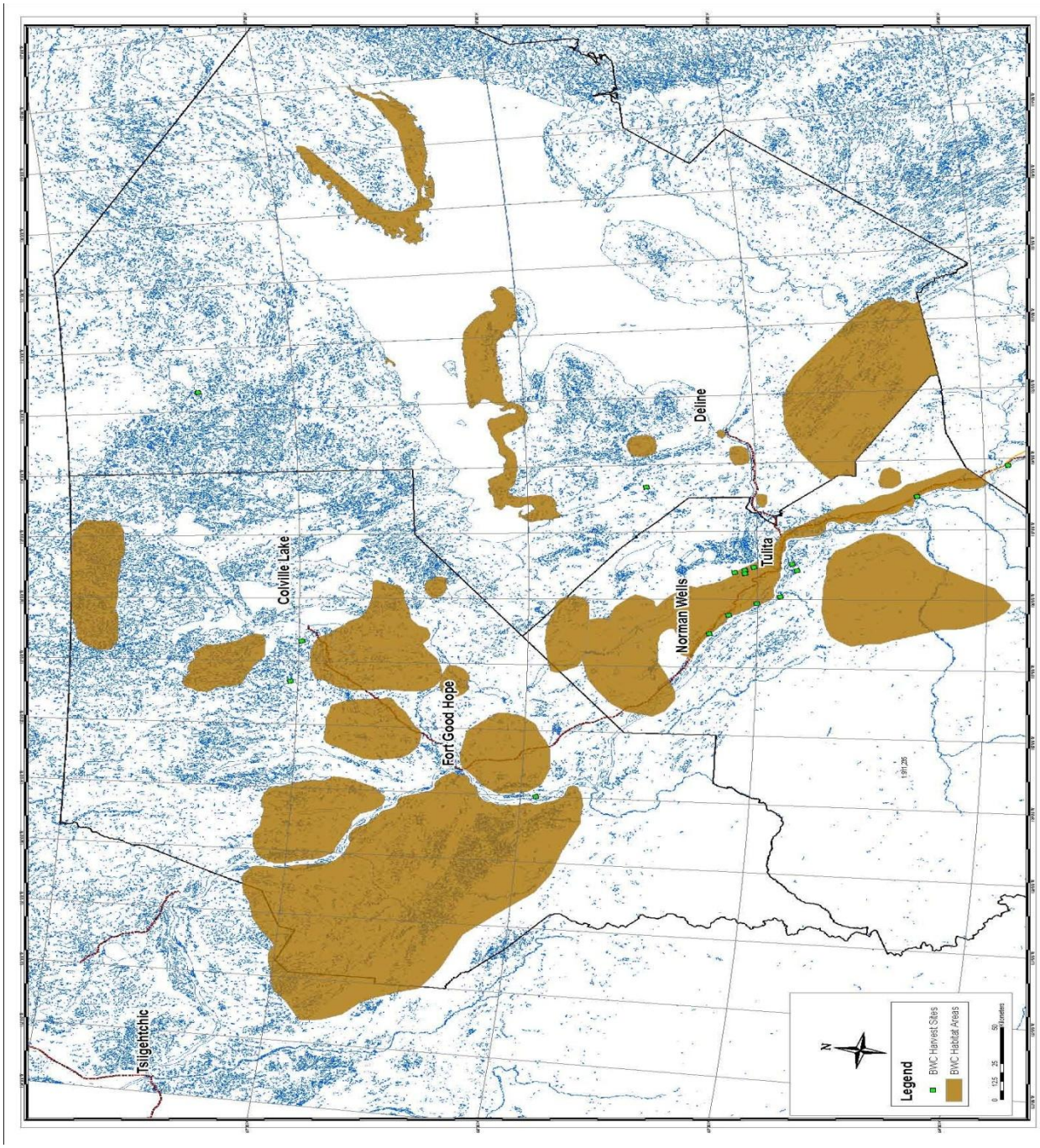
8. Maps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