STATE OF KNOWLEDGE

Boreal Caribou | Medzih

Fort Nelson First Nation

Liard Basin Monitoring Initiative

DRAFT October 2019

ACKNOWLEDGEMENTS

Thanks and acknowledgements first go to Fort Nelson First Nation elders, knowledge holders, land users, staff and leadership who contributed. This report could not have been completed without their support and expert knowledge. Overall, our members are the experts:

> ***"[w]e are stewards of the lands and our teachings guide the ways we control, manage and protect our territory. The health of the territory relies on our voice and our actions."***

Our thanks also go to Natural Resources Canada, which has provided financial support for the Liard Basin Monitoring Initiative through the federal Cumulative Effects Monitoring Initiative.

STATE OF KNOWLEDGE: **BOREAL CARIBOU | MEDZIH**

DRAFT October 2019

Prepared and authored by Fort Nelson First Nation and the Liard Basin Monitoring Initiative Team.

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About the LBMI, FNFN Guardian Program, and State of Knowledge Series

THE FORT NELSON FIRST NATION (FNFN) Liard Basin Monitoring Program (LBMI) State of Knowledge series of documents is designed to provide FNFN, the public, industry and governments with information about conditions of the land and waters in FNFN territory, and to the extent possible, how these have changed and may in the future change further.

This information helps develop a meaningful current conditions set — a baseline — against which future change can be compared, to see if the health of FNFN territory is improving or getting worse. From this knowledge, action can be designed to protect our lands, waters and resources.

State of Knowledge documents published to date or forthcoming are:

- The LBMI Year 1 State of Knowledge report, published in 2017, including information up to 2016 on seven key FNFN values (shown at right);
- Beaver State of Knowledge report (August 2018);
- Moose State of Knowledge report (March 2019);
- FNFN Watersheds Report Card (May 2019); and
- this Boreal Caribou State of Knowledge Report (October 2019).

Each of these documents is available on the web or can be accessed by contacting the FNFN Lands and Resources Department at 1-250-774-6313.

Starting in 2019/2020, responsibility for the FNFN State of Knowledge series will transfer over to FNFN's Guardian Program. Additional State of Knowledge themes, including a greater focus on water quality and quantity, will be forthcoming in coming years. Existing State of Knowledge reports will be updated on an as needed basis, to track change over time.

Fort Nelson First Nation Guardian Program

FNFN's Guardian Program is a community-based monitoring program for FNFN's territory. The program is founded on FNFN cultural and ecological values, incorporating our Indigenous and Western scientific methods for the purpose of protecting our territory against all threats to our pristine air, land, food, and water.

GUARDIAN PROGRAM VISION:

We envision a future in which FNFN and our members are re-established as the primary stewards of our lands and resources, empowered to protect our rights and ecological and cultural values, and where our territory sustains future generations with healthy air, land, food, and water.

GUARDIAN PROGRAM GOALS:

- To better understand the current state of and trends of our cultural and ecological landscape;
- To re-establish FNFN members as stewards of the land by making them the primary developers and implementers of this monitoring and stewardship program;
- To understand and respond to ecological change and its causes (including climate change and industrial development) in time to make a difference; and
- To enable informed decisions about human activities and land use in our territory.

Starting in 2019, the FNFN Guardian Program will be actively sending FNFN Guardians out on territory for dedicated monitoring and management activities, guided by priorities set by the FNFN community.

BACKGROUND

Planning for Boreal Caribou Recovery

FORT NELSON FIRST NATION (FNFN) MEMBERS are Dene and Cree People of the Land and Rivers, who have lived in northeastern British Columbia since time immemorial. Our community members have actively retained our culture, including our language and our connection to and knowledge of the land. Community members were and continue to be hunters and gatherers within our traditional territory. FNFN joined Treaty 8 with the Crown in 1910, an agreement that affirmed FNFN's rights to our traditional lands and to pursue our ways of life.

In 2016, the FNFN Lands and Resources Department, with financial support from Natural Resources Canada, launched the Liard Basin Monitoring Initiative (LBMI). The initial focus of the LBMI was to identify priority FNFN values in northern BC Treaty 8 territory (the Liard and Hay River Watersheds in BC).[1] FNFN members identified boreal caribou, known as Medzih in Dene, as an important cultural and ecological value.

Northern BC Treaty 8 territory, which includes FNFN's territory, encompasses more than 80 per cent of the boreal caribou in British Columbia. FNFN members have a long history with caribou, as boreal caribou have provided us with sustenance, clothing, tools, and other necessities essential to our physical and cultural survival. In recent years FNFN members have been unable to harvest boreal caribou due to decreasing population levels. To reverse this trend, in 2017 FNFN researched and identified a number of key actions to be undertaken in the Medzih Action Plan (MAP) (FNFN 2017e). The MAP is different from other boreal caribou recovery plans because it is founded on the principle of protection as the key management action — ensuring some critical areas are completely off-limits to development.

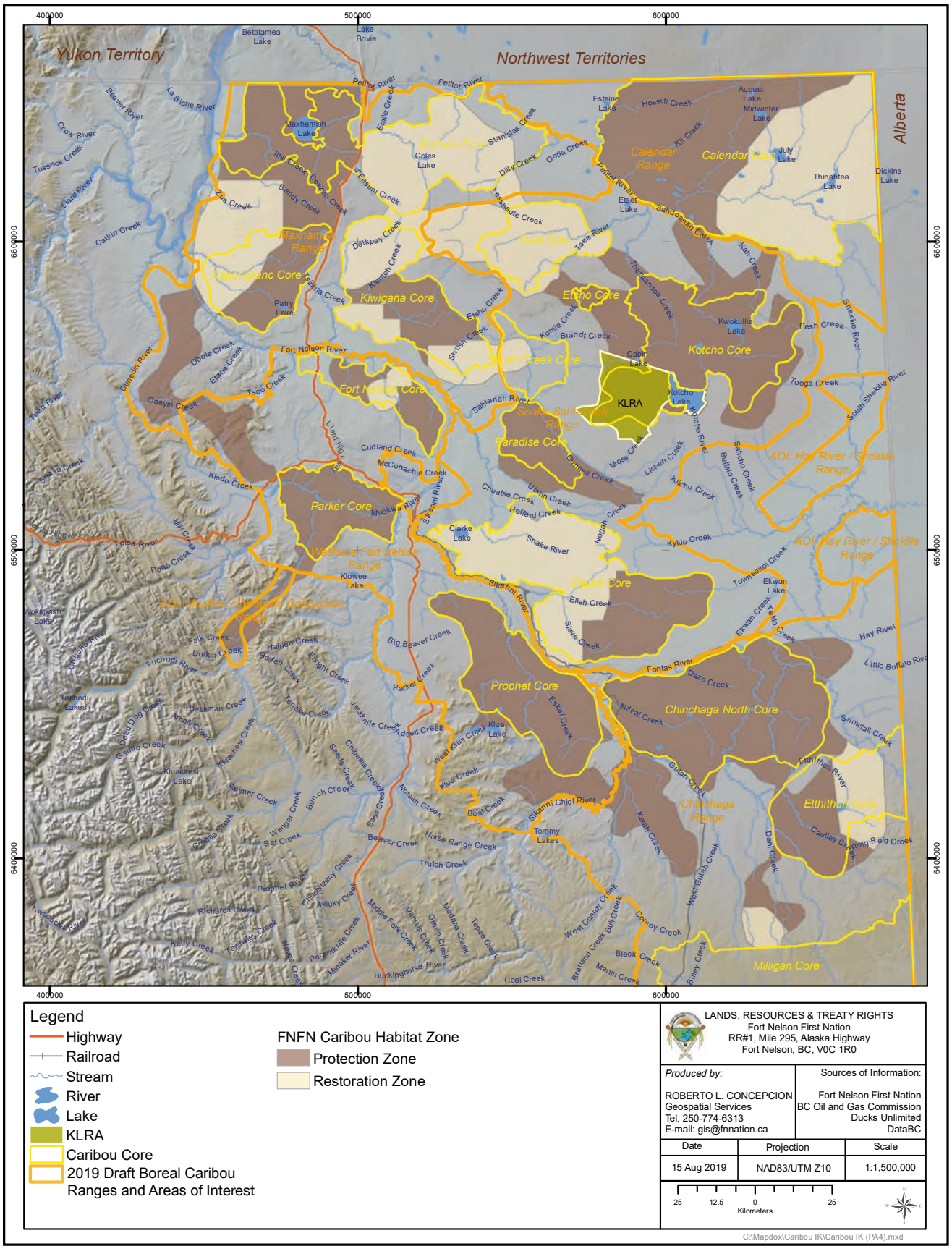
FNFN is presently working with the government of British Columbia to implement the recommendations within the MAP through a collaborative plan, which focuses on protecting intact land, restoring areas over time to increase the amount of undisturbed habitat in boreal caribou ranges, offsetting new industrial disturbances in boreal caribou habitat, and carefully monitoring the results of these actions to determine how caribou populations respond. This work will result in important changes to how and where industrial development is planned and managed within boreal caribou habitat in northern BC Treaty 8 territory.

Figure 1 on the following page shows the boreal caribou protection and restoration areas that were identified in the MAP, relative to boreal caribou ranges and cores in northern Treaty 8 territory.

1 See LBMI Year 1 State of Knowledge Report Community Summary, available at fortnelsonfirstnation.org/uploads/1/4/6/8/14681966/fnfn_sok_year_1_summary_jan_5_2018_web.pdf. Contact FNFN Lands and Resources Department for a copy of the full Year 1 State of Knowledge Report.

Figure 1: Boreal caribou habitat in northern BC Treaty 8 territory, showing proposed Medzih Action Plan zones, overlaid on 2019 ranges, areas of interest (AOIs) and cores

Also shown on this map is the Kotcho Lake Restoration Area (KLRA), FNFN's pilot area for boreal caribou habitat restoration.



Large format digital map is available from FNFN Lands and Resources Department

Habitat Restoration to Accelerate Recovery

Protecting areas from development and undertaking efforts to restore areas for boreal caribou are linked: areas where restoration efforts are initiated should also be "protectable" from industrial disturbance. Early in 2019, FNFN undertook a prioritization exercise to identify the best areas in our territory to begin restoration efforts. A 100,000 hectare (ha) area within the Snake-Sah-tenneh range, known as the Kotcho Lake Restoration Area (KLRA), was identified as the highest priority for restoration based on a structured decision-making process that incorporated known caribou use; habitat condition; petroleum and natural gas (PNG) tenure status; type of linear disturbance (prioritizing unused winter roads and seismic lines that are not regenerating); likelihood of future disturbance; and cultural importance.

As part of this identification process, FNFN's Guardian Program conducted fieldwork in 2018 to characterize existing disturbances and identify priority seismic lines for restoration work. Restoration efforts on the KLRA will begin in fall 2019, and will be closely monitored to understand and report back on the success of this program in meeting restoration objectives. These monitoring efforts will be used to promote the incorporation of Indigenous knowledge and science in making management decisions for caribou.

FNFN knowledge holders have repeatedly expressed concerns about some of the science-based approaches on which boreal caribou protection and recovery are based.

Role of Indigenous Knowledge in Boreal Caribou Recovery

In the last several years, as boreal caribou populations have declined precipitously, British Columbia and other jurisdictions have put considerable science-based effort into understanding why these declines are happening and how to reverse them (e.g., Culling and Cichowski 2017). Increasing our understanding of Indigenous knowledge related to boreal caribou is also critical for ensuring that decisions about how and where to recover caribou are made based on both knowledge streams. FNFN knowledge holders have repeatedly expressed concerns about some of the science-based approaches on which boreal caribou protection and recovery are based. Three of these concerns are:

- Large areas of boreal caribou habitat have been missed from the currently defined science-based ranges, due to the reliance on limited telemetry data, which leads to intensive sampling of some portions of caribou habitat over others;
- The current analysis of telemetry data to identify cores and ranges leads to an underestimation of actual boreal caribou use of habitat, potentially leading to inadequate spatial protections for boreal caribou in northeastern BC; and
- Science tends to partition caribou habitat into discrete ranges, which overlooks the importance of landscape level movement for boreal caribou. FNFN knowledge holders see all caribou populations as one, and note the importance of connectivity between all caribou populations, including between boreal and adjacent mountain caribou herds.

It is FNFN's perspective that our members are our experts — and their knowledge needs to underpin all of our work. Since 2009, FNFN has worked closely with our members to expand the Indigenous knowledge base for the boreal caribou planning processes. The efforts of this work are compiled in this report. Because so much effort has gone into researching and summarizing the scientific state of knowledge for boreal caribou, we have not repeated that effort in this document. Instead, this State of Knowledge report focuses on summarizing FNFN Indigenous knowledge of boreal caribou, a critical "missing piece" in the primarily science-based discussions about how to recover this iconic species. Where scientific research is cited in this report, it is used to augment FNFN Indigenous knowledge, as a way of showing the parallels and divergent perspectives from the two knowledge streams.

This State of Knowledge report focuses on summarizing FNFN Indigenous knowledge of boreal caribou, a critical "missing piece" in the primarily science-based discussions about how to recover this iconic species.

This report is one of several FNFN State of Knowledge reports on cultural and ecological values in FNFN territory. Part of FNFN's mandate is not merely to collect Indigenous and scientific knowledge, but to disseminate it in appropriate ways, to inform our decision-making and that of other parties such as our Treaty 8 neighbours, industry, and governments. These reports help fulfil that mandate, and also serve as an internal summary of the knowledge that is used to inform policy development and planning for protecting FNFN's values in our territory.

INTRODUCTION

FNFN believes that the entire historic range of boreal caribou must be considered potential caribou habitat for the future, and should be managed to be in sufficiently good condition to support healthy populations of caribou and all other species, including humans.

FNFN'S MEMBERS ARE DENE AND CREE People of the Land and Rivers. Our members have actively retained our cultures over time, against many obstacles. Many generations of FNFN men, women, and children have lived and thrived in the Liard, Fort Nelson and Hay River watersheds. Our members have always been, and continue to be, hunters and gatherers from the rich muskeg in the east and the mountains in the west of our territory. Our members' knowledge of their lands developed as generations — for thousands of years — moved around the territory with the seasons and animals that sustained our way of life and livelihood.

Traditionally, caribou was an important protein source and FNFN families used cabins and nomadic lifestyles to hunt caribou. Boreal caribou provided FNFN members with sustenance, clothing, tools, drums, and other necessities essential to physical and cultural survival. However, FNFN members have witnessed a dramatic decline in boreal caribou over the last several decades. Although not presently hunted, caribou remain an integral part of FNFN culture, and critical to the continuity of FNFN's way of life and the revitalization of our spiritual, recreational, and kinship traditions. The decline of caribou is seen as an indicator of an ecosystem that has been pushed well past the point of sustainability — with the cumulative effects of industrial development and climate change identified as the main culprits. FNFN believes that the entire historic range of boreal caribou must be considered potential caribou habitat for the future, and should be managed to be in sufficiently good condition to support healthy populations of caribou and all other species, including humans.

This document summarizes recent efforts by FNFN to document Indigenous knowledge of this species. The summary includes Indigenous knowledge derived from Indigenous land use studies as well as two recent studies: interviews conducted in 2017 on restoring FNFN values (FNFN 2017 ECCC and DFO interviews), and interviews conducted in 2018 specifically on boreal caribou, funded jointly by Environment and Climate Change Canada and the provincial government through the Strategic Forestry Initiative.

Following the collaborative planning work that is ongoing with the provincial government to develop an effective boreal caribou recovery plan, FNFN's immediate priority will be to begin the long-term and costly task of restoring degraded boreal caribou habitat. Efforts to prioritize the landscape for restoration and identify treatments for these areas are ongoing through a separate study. Because restoration is such a critical action to take once the "right" areas are identified for protection, the 2018 Indigenous knowledge study also focused on getting community members' perspectives on how this restoration work should proceed.

The Indigenous knowledge summarized in this report is integrally connected to the policies FNFN has developed to recover boreal caribou in the Medzih Action Plan, efforts that are continuing through collaborative planning efforts with British Columbia. The knowledge summarized in this document will also inform how and where to restore habitat — and where other management levers, such as predator control, may be needed in the future if caribou declines continue.

The sections that follow summarize FNFN Indigenous knowledge surrounding boreal caribou uses and cultural importance, how caribou use habitat across seasons and how they move across the landscape, the timing of observed declines in the species, the observed reasons for these declines, and FNFN perspectives on how to reverse these declines. The final section of this report provides a more detailed overview of current management actions being taken in northern BC Treaty 8 territory to improve habitat for boreal caribou.

The knowledge contained in this document has informed and will continue to inform ongoing planning and policy development, and provides important contextual information for effective monitoring, habitat restoration, and recovery of boreal caribou in FNFN's territory.

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FNFN POLICY REGARDING BOREAL CARIBOU RECOVERY

FNFN's 2017 Medzih Action Plan identifies the following goals for boreal caribou recovery:

- **Recover caribou populations to self-sustaining levels, and with sufficient resilience to allow subsistence and ceremonial hunting by FNFN, in accordance with their Treaty Rights.**
- **FNFN's desired timeframe for habitat and population recovery is within one human generation — 20 years. As a result of the pace of development and rate of decline of boreal caribou, one generation of FNFN members is already partially disconnected from this species, and further generational loss must not be allowed to occur. In addition, caribou populations are small and vulnerable, with little resilience. Caribou may not survive a longer time period of attempted recovery.**
- **Recover to a historic spatial distribution of caribou, based on Indigenous knowledge and science. Ensure that local populations are not isolated (i.e., there is a continuous distribution and movement of animals) between ranges. Expand caribou distribution towards the south and maintain linkages to north and east.**
- **Allow industrial development within FNFN territory that is compatible with these goals, and that supports stable and long-term FNFN and non-First Nations' community wellbeing.**

METHODS

Overview

Data and knowledge shared in this report were compiled from previous land use studies, a study conducted by FNFN in 2017, called "Healing the Land — Healing the People," and a 2018 Indigenous knowledge study of boreal caribou. Where this report refers to "the studies", it is referring to the 2018 Indigenous knowledge study of boreal caribou and the 2017 "Healing the Land — Healing the People" study. The methods for both studies are described below. The spatial area of interest for this study encompasses all of northern BC Treaty 8 territory where it overlaps with boreal caribou habitat (Figure 2).

Interviews

Healing the Land — Healing the People

For this study, 14 FNFN members were interviewed in 11 separate mapping interviews, between March 1 and March 31, 2017. The interview team consisted of two FNFN Lands Department interviewers and one FNFN mapper, and focused on the following topics: caribou, moose, elk, wolves, bears, furbearers, song birds, migratory birds, fish, wetlands, climate change, and other impacts. Notes about other values were compiled opportunistically. Lands Department interviewers took notes to capture the interview proceedings, and these notes were compiled into a comprehensive spreadsheet organized by topic.

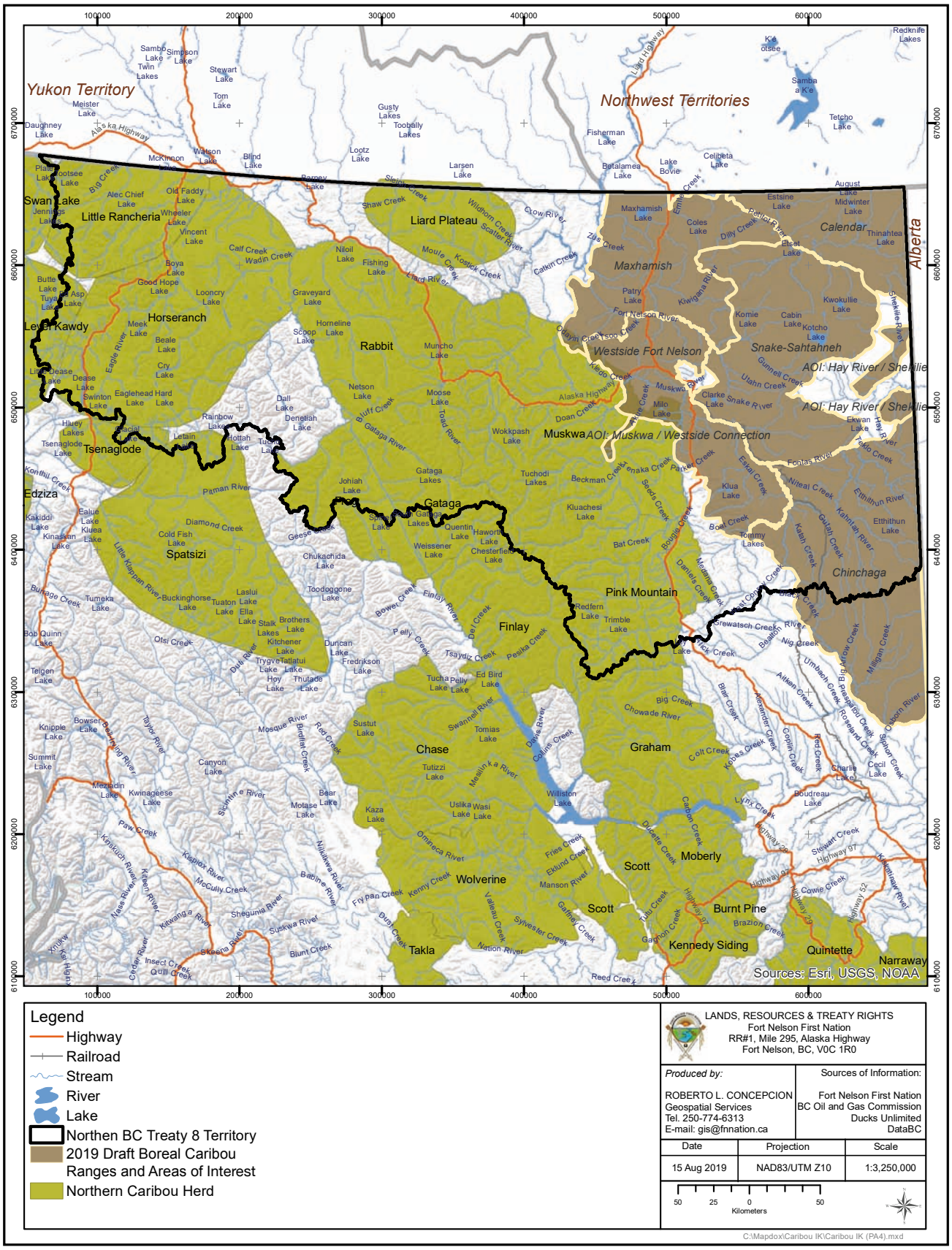
Boreal Caribou Indigenous Knowledge Study

For this study, 11 mapping interviews were conducted with 11 FNFN community members, between December 6 and 20, 2018. The interview team, which consisted of one external interviewer, one FNFN interviewer, and one FNFN mapper, prioritized the documentation of values that specifically related to FNFN knowledge and use of caribou. Additional values were documented where time and opportunity permitted. All interviews followed a semi-structured format with an interview guide; interviews were conducted in English, and all audio was recorded digitally and subsequently transcribed.

For all interviews, participants are chronologically assigned identifier codes in the form of F##, based on FNFN's overall Community Information System, which records all TUS interviewees over time using a unique identifier. These identifier codes are used to reference quotes in the remainder of the report.

Figure 2: Boreal and northern mountain caribou ranges in relation to the Northern BC Treaty 8 Territory

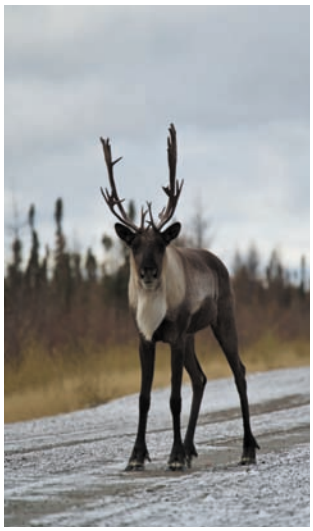
Boreal caribou ranges that fall within northern BC Treaty 8 Territory define the spatial boundaries for the collection of FNFN Indigenous knowledge for this study.



Qualitative Analysis

Qualitative data were collected during the mapping interviews conducted for the studies and analysed for important FNFN Indigenous knowledge based on the following themes summarized in this report:

- Caribou kinds and distributions;
- Cultural uses and importance of caribou, including FNFN terms for caribou and historic hunting practices;
- Caribou habitat use through the seasons;
- Important habitat areas (place names/descriptions);
- Status of caribou — historic and current distribution;
- The timeline for observed declines in boreal caribou;
- Threats to caribou populations; and
- Management and habitat restoration recommendations for caribou.



Quotes used in this report are taken from primary data collection transcripts and notes.

Site-Specific Data Analysis

Site-specific data are values reported by FNFN members that are spatially distinct and can be mapped. FNFN considers site-specific mapped Indigenous knowledge to be confidential and as such, maps of these data are not provided. Results of site-specific mapping are discussed generally in this State of Knowledge report and are used to refine habitat suitability modelling and identify management priorities. A high level summary of site-specific data is also provided in the results section, using six categories that were selected to reflect data type, caribou habitat use and FNFN's relationship with caribou:

- Animal travel;
- Calving habitat;
- Evidence of animals;
- General habitat;
- FNFN hunting area; and
- Visual sighting.

Note that FNFN also tracks visual sightings of boreal caribou during field work conducted by technicians. Because these observations are not considered Indigenous knowledge of important areas for caribou, these observations are shown on maps included in this report.

IMPORTANCE OF MEDZIH FOR FNFN

Cultural Importance of Medzih (Boreal Caribou)

Fort Nelson First Nation members have lived in the boreal forests and muskeg within their traditional territory since time immemorial — and boreal caribou have been part of the forest-muskeg ecosystem for that entire span of time. Over many thousands of years, ancestors of present day FNFN members developed a strong relationship with caribou, as they did with all of the creatures on which they depended for their food, sustenance, tools, clothing, and to fulfil other cultural needs.

Over many thousands of years, ancestors of present day FNFN members developed a strong relationship with caribou, as they did with all of the creatures on which they depended for their food, sustenance, tools, clothing, and to fulfil other cultural needs.

Boreal caribou are naturally elusive animals: they rely on remaining well-hidden and dispersed to avoid predation, particularly in the spring and summer, when their calves are very susceptible to predation. Despite that elusiveness, caribou have been and remain an important animal for FNFN members, and certain cultural practices can only be undertaken with materials from this animal. People recall that caribou were generally hunted in the winter, as FNFN members could access the muskeg to find them. One member remembered his father hunting caribou in the winter near his cabin:

> … *every time we go out there* [in the] *moonlight*, [my dad] *would be shooting already, then my mom fixed the hide and nail it and the wind would dry it in the winter. Just sit there and flesh it just lay it on the ground and after you're finished just throw it on the cabin.* (F2 2017[2])

In terms of the relative importance of caribou compared to other meat, FNFN knowledge holders explained that while moose is generally preferred over caribou for hunting because they are larger and have more meat, caribou were also hunted in the past to help sustain families. Hunting tends to be opportunistic, and people hunt whatever they can get:

> *But I know they weren't a primary source of nutrition and food for us seeing as there were so many moose around back in the day, so, they were definitely harvested in terms of sustaining daily lives…* (F125 2018)

2 Quote based on notes taken by FNFN lands staff during 2017 interview. This quote and subsequent quotes indicate the FNFN participant number and year of the study. As noted in the methods section, participants are assigned a unique identifier based on FNFN's Community Information System; these numbers are used over time to track the knowledge provided by individual FNFN members.

Why that is, is because they're a smaller animal than the moose and so we only… so maybe if there's none and the people are starving, or they will then. But not too many like, maybe two for us hunters or whatever. And there hasn't been that many. (F108 2018)

You know when you hunt, we don't go out and specifically I'm going to go shoot a moose or an elk, you just go down the river and you know what I mean it just doesn't matter if it's a beaver or three ducks or fish, you bring the bacon home basically for me. I never was specifically going to shoot something but I mean I got to go and I hunt… (F7 2018)

They used to like moose, caribou, bear and everything. That's how people support their families … Whatever is out in that bush that's what we, we eat, eh? You don't see no pork chops hanging on the river … Use every part of the animal, every part … You don't throw nothing away. Every part was used. (F26 2018)

…I know that when the people did see caribou, they obviously would try and get it. (F62 2018)

In the present day, even though moose are the most sought after protein source, some members still prefer the taste of caribou to moose:

…my wife prefers caribou meat over anything. (F7 2018)

And then I was using the skidoo — I shot one. I think it was about 1980… [19]*83? I shot one. I brought it home. That's how — I brought it home. I just scattered that. Because people really like caribou meat, eh? It didn't last … I put it at my mother's house and I went the next morning to get some, and Mum said everybody took it.* (F26 2018)

Some members shared strong recollections about the preferred ways to cook caribou:

We do most of that stuff fried, a lot of fried. We fry meat and stuff and you know. But we take the ribs and that and we boil the ribs. We roast the ribs or whatever. (F7 2018)

You see when you eat caribou if you cook it in margarine or pure lard — very tasty. And then you have to put onions or something in there because it hasn't got the protein, or what do you call that? It hasn't … No, it's beautiful eating. But it's like Chinese food, you can eat a great big frypan full, and then about a half an hour later you're hungry … very lean and not very much fat on it. (F108 2018)

In the past, caribou was used to make dry meat, and many members have recollections of eating caribou meat when they were living out on the traplines with their families:

For meat, for dry meat, and meat. They used it for when they went trapping so they had food. (F41 2018)

Members discussed various uses for the hides and the bones of caribou, some of which were specific to this animal:

The caribou hide — it was, the hide is really — you could, sometimes you could skin a caribou like, with your hand … It's so easy, it's so easy. (F19 2018)

While moose hides are tougher than caribou hides, caribou skins have particular uses, including for special clothing items:

We didn't hardly used it for food, but the odd time when Mum would ask for a caribou. Caribou was good for gloves, like fancy, fancy stuff like gloves, or maybe a vest. Things, things like that… I don't remember ever eating caribou. But I guess we did … for the hide. (F19 2018)

One member also remembers sleeping on caribou skins at his father's cabin:

My dad used to shoot a couple and we used to use the skin to sleep on to stay warm. …we used skin on spruce bows. (F2 2017)

Caribou hide was used to make rawhide for ropes, and in the making of sleds and toboggans. Strips of caribou rawhide were also used to make babish (webbing) for snowshoes.

> *…you cut it into this length, strips. And it has to be soaked in order for it to be worked on snow shoes. And when tighten it up a little bit, you tighten it up yourself.* (F42 2018)

> *They use the back and soak it and strip it and leave in water and use it for snowshoes; it's got to be done a certain way.* (F12 2017)

FNFN knowledge holders discussed the use of caribou hides for making drums, explaining that caribou hides make better drums than moose as they are lighter:

> *To my knowledge, they were used kind of in the same, same matter as moose would have been used. Particularly when it came to drum making, because of the hide being a little bit lighter.* (F125 2018)

> *And their caribou hide is specifically used for the Dene style drums. And you know, just that drum is such an integral piece of our culture that you know, it's getting harder and harder for the people that make these drums to find caribou hide. So we have to go to a, buy our drums from drum makers quite a ways away. And obviously with the shortage of, with caribou hides becoming harder to obtain, the price of the drums have gone up significantly. So that's a sign of the times are changing … it's a thinner hide and it's not as deep as a sound as compared to a moose hide* [better hide to use for drums] … (F26 2018)

"And their caribou hide is specifically used for the Dene style drums. And you know, just that drum is such an integral piece of our culture that you know, it's getting harder and harder for the people that make these drums to find caribou hide."

Decline of Caribou and Loss of Cultural Continuity

The loss of caribou to make drums discussed above has an adverse effect on an integral piece of FNFN culture. This is but one of many losses to FNFN culture and way of life associated with the current decline in caribou numbers.

During interviews conducted for this work, many community members expressed that when they see a caribou now, they will not shoot it. Subsequently, people have hunted and eaten less caribou over time as populations declined:

> *But obviously when people lived out on the land, the caribou, like I said when the opportunity arose, we definitely took advantage of it. But as time went on we kind of didn't use caribou as much as we used to.* (F63 2018)

> *Well one time I'm sure that it was one of the main food sources besides the moose, but I know with the populations going down, I know they weren't targeted as much.* (F62 2018)

Most people do not see caribou as an animal that is available for their use any more. Community members lament the associated loss of knowledge of the species, which they connect to changes in the ecosystem, greatly reduced numbers of caribou, and a loss of the Elders — the last generation — with whom much of this knowledge rested.

> *… they made tools out of the bones … I don't know if it's still carried on because the people that did do the tools have died…so I know there's a few but I don't know for sure … I don't think they* [hunt] *anymore because there's not enough to go around.* (F41 2018)

Cultural knowledge associated with caribou, such as tool and drum making, is subsequently being lost for future generations of FNFN members.

FNFN Moratorium on Hunting

As the Medzih Action Plan describes, FNFN members have voluntarily stopped hunting caribou because the populations have dropped too low. This moratorium has not been led by the Lands and Resources Department or imposed by Chief and Council, but rather is something that hunters decided to take on themselves.

While FNFN members do not currently report hunting caribou, they would very much like to harvest them once again, if and when the herds rebuild to a point where sustainable harvests can resume:

> *But anyway when it's early I will take a bull caribou and — but the last few years have been so few of them that when I see them I don't even pick up a rifle. Because there's just getting less and less of them all the time.* (F7 2018)

FNFN embraces both the right and the responsibility to protect boreal caribou and to ensure that caribou remain on the landscape to support the future health and well-being of the people and the ecosystems with which they are inextricably linked.

CARIBOU IN FNFN TERRITORY

Overview

More than 80 per cent of the boreal caribou in British Columbia are in the northern BC Treaty 8 territory where FNFN's territory is located. There are also caribou from the northern ecotype (called northern caribou or northern mountain caribou) in the mountainous western portion of northern BC Treaty 8 territory. Figure 2 on page 13 shows all of the identified caribou ranges in northern BC Treaty 8 territory, including boreal and mountain caribou ranges.

Western science divides boreal caribou herds into discrete ranges. Indigenous knowledge does not describe caribou use of habitat in that way, instead talking about connectivity between caribou and movement of caribou across the entire territory, including into the mountains. The concept of a discrete "range" and "core" is not one shared by FNFN knowledge holders. This is why FNFN's Medzih Action Plan connects all of the protection and restoration zones using connectivity corridors that are based on boreal caribou telemetry data.

As noted, Fort Nelson First Nation is currently working with the BC government on a revised boreal caribou protection and recovery plan for northern BC Treaty 8 Territory. In this plan, the emphasis on connectivity between core use areas is retained and more formally analysed by looking at the pathways of movement for individual caribou. Some connectivity corridors are also identified by Indigenous knowledge, including movement corridors between caribou living in the muskeg, and the mountain ecotype living in the western part of FNFN's territory. Indigenous knowledge also informed the intensity of caribou use in some areas, and was integral for identifying important caribou habitat areas outside of currently defined ranges. The combination of Indigenous knowledge and science has resulted in a much more comprehensive understanding of where areas need to be managed for caribou in FNFN's territory.

The concept of a discrete "range" and "core" is not one shared by FNFN knowledge holders. This is why FNFN's Medzih Action Plan connects all of the protection and restoration zones using connectivity corridors that are based on boreal caribou telemetry data.

Boreal Caribou Habitat Associations

General Habitat Preferences

Scientific studies of boreal caribou habitat preferences rely on telemetry data to show how caribou use habitat. These studies consistently show that boreal caribou prefer muskeg habitat and upland "islands" of conifer trees in the muskeg, more than adjacent mixed wood or deciduous forests. In general, there is little seasonal preference for specific muskeg habitat types, except during calving, when caribou show a strong preference for richer muskeg types[3] — areas that in the absence of linear corridors are very difficult for predators to reach, and have an abundance of food for caribou cows.

FNFN Indigenous knowledge supports these observations from science, identifying muskeg as the primary habitat for caribou:

> [Re: caribou sightings]: *Yeah it's just along the Elleh Creek. That's where…I can't really tell you the exact place but there's muskeg there and that's where they usually hang out…* (F42 2018)

> [Re: caribou sightings]: *Well going up in Kahntah, me and my dad used to go to Elleh and we used to go between Kahntah and Elleh, we used to see a lot, very big pack trails hey. There's just a leader and they're just going through the swamp area. Like the swamp by the muskeg … I don't even see them anymore.* (F42 2018)

> [In reference to a specific mapped area] …*this is the muskeg … just about every summer I would go over there; I saw caribou this last summer.* (F42 2018)

> *The moose, they're more like into willows and stuff like the long rivers and whatever but, caribou they're more like in the muskeg area.* (F26 2018)

Areas with a high density of lichen were also identified as important for caribou, especially in the winter. Outside of winter, they will eat other foods, including grasses and willows.

> [Re: caribou sighting]: …*usually in the muskeg area. Cause they like that white part of the muskeg. That's their food. That's what they live on, really.* (F26 2018)

> [Re: caribou sighting on Windflower road]: *Normally it would be in the fall time when I'm out there but yeah, normally in the fall time, and I'm just trying to think. I've run into a lot of tracks in the winter but not, I don't know if I actually bumped into a caribou. I know I've seen lots of tracks and droppings and the craters where they dig for the lichen.* (F62 2018)

FNFN Indigenous knowledge also identifies muskeg areas as affording protection from hunting and predators. FNFN knowledge holders have noted that the muskeg is difficult for humans and predators to travel through in the summer: it is too swampy for humans and predators to access the muskeg, and only caribou can live in there.

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3 These muskeg types are known in the western science literature as "poor fens": wetland areas that have a thick peat layer and are more nutrient rich than bogs. For more information, see MacKenzie and Moran, 2004: URL: www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh52.htm

[Re: caribou habitat] …*The place that we occupied, we lived on, was always down in the river valleys and close to a bigger bodies of water that we could use for transportation and the caribou, their habitat was more out in the muskeg area. And nobody lives in the muskeg area in the summer except for the caribou.* (F63 2018)

Seasonally Important Habitat and Movement Patterns

As described in a recent science review (Culling and Cichowski 2017), scientific research suggests that boreal caribou in British Columbia do not generally migrate predictably between distinct winter and summer ranges. For the most part there is little seasonal variation in boreal caribou habitat preferences. Environment and Climate Change Canada's 2012 Recovery Strategy for the Woodland Caribou (ECCC 2012) outlines general boreal caribou habitat features, which include muskeg, open coniferous areas, close proximity to water sources and abundant lichens, sedges and mosses. DeMars (2018) conducted an analysis of boreal caribou seasonal habitat selection and found that the top-ranked land cover features for boreal caribou were upland conifer and conifer swamp during the summer, and bogs and fens during the fall and winter.

Boreal caribou show a relatively strong fidelity to calving sites between different years (ECCC 2012). DeMars and Boutin developed a spatial model of boreal caribou calving area selection and noted that calving females were disproportionately found near treed bogs, poor fens, rich fens and conifer swamps (2015). Watters and DeMars evaluated the migratory behaviour of a boreal caribou across several years and determined that the female caribou in question repeated a migration pattern from a previous year to travel to within 700 meters of her past calving location (2016). Culling and Cichowski further highlighted the observation that female boreal caribou show fidelity to general calving areas; finding that boreal caribou in the Snake-Sah-tenneh range in particular display strong fidelity to calving sites within areas with high habitat capability and suitability (Culling and Cichowski 2017). Culling and Cichowski (2017) also noted that female boreal caribou in the Snake-Sah-tenneh range avoided streams from spring to late-summer. DeMars and Boutin furthermore found that female caribou in BC's boreal forests displayed a preference for calving areas with substantial concealment cover (as cited in Culling and Cichowski 2017).

During interviews conducted for this study, FNFN knowledge holders were asked to identify and map areas of the territory that were important in different seasons.

During interviews conducted for this study, FNFN knowledge holders were asked to identify and map areas of the territory that were important in different seasons. The data indicate that caribou move around the territory with some predictable patterns and are consistently observed within muskeg habitat throughout the year. Based on the knowledge shared by FNFN members, caribou cows have fidelity to particular calving sites and will move to those sites each spring for calving.

Table 1 on the following page summarizes boreal caribou habitat preferences from both science and FNFN Indigenous knowledge. The scientific descriptions are reproduced from Environment and Climate Change Canada's Recovery Strategy (ECCC 2012); FNFN Indigenous knowledge is summarized from interviews conducted for this study.

Table 1: Biophysical attributes for boreal caribou critical habitat in the Taiga Plain ecozone

Type of habitat	Western science description (reproduced from ECCC 2012)	FNFN Indigenous knowledge (summarized from interviews conducted 2017 and 2018)
Broad scale	Mature forests (jack pine, spruce, and tamarack) of 100 years or older, and open coniferous habitat. Large areas of spruce peat land and muskeg with preference for bogs over fens and upland and lowland black spruce forests with abundant lichens, and sedge and moss availability. Flatter areas with smaller trees and willows, hills and higher ground.	Muskeg with abundant lichen was consistently identified as preferred caribou habitat at the broad scale.
Calving	Open coniferous forests, tussock tundra, low shrub, riparian, recent burned areas, south and west aspects and hills and higher locations. Muskegs, marshes, staying close to water sources. Caribou observed on small islands of mature black spruce or mixed forests within peat lands, in old burns at the edge of wetlands, in alder thickets with abundant standing water and on lake shores.	Muskeg was consistently identified as the most important habitat in this season. Caribou typically exhibit deliberate movement in the spring, pre-calving: *Seem like they would come through that area — Trail and Two Island Lakes area — in the spring, and then in the fall."* (F125 2018) *The ones I've seen, they are going east — like they're crossing the road going east…I'm pretty sure it was, about March time.* (F26 2018)
Post-calving	Muskegs or areas with access to muskegs, open meadows on higher ground, close to water (lakes and rivers) and mixed bush areas. Open coniferous forests with abundant lichens, low shrub, riparian, tussock tundra, sparsely vegetative habitat, recent burns and west aspects. Old burns and neighbouring remnant unburned forests selected in late spring and early summer.	Muskeg adjacent to water sources (lakes or rivers) was identified as the most important caribou habitat in the summer. *So when you see them towards the end there, I would imagine all that, that area* [Two Island Lake]*, it's all muskeg right so that lichen is all everywhere in the summer so that's their main food source right? So I'm sure that's why they're there.* (F62 2018) Caribou use water as a refuge from insect harassment and heat in the summer. *Yeah the last time I saw caribou was 3 years ago … it was middle of July and it was hot. And we were flying over the river and he was down to his neck in water. Whether he was trying to get away from the heat or the bugs, probably both.* (F63 2018) FNFN knowledge holders report that in they have seen caribou crossing the Snake River every summer (June/ July) but those sightings have not been reported for the last two years. [Near Trapline] *we always seen caribou across where we're talking about there … yeah and then they go to here* [down to Snake River] *and there's like a swamp and stuff that goes back around, so it just goes around … they always travel through but last year they didn't go through there … the time we see them is in like July* [late July] *… I haven't seen them for two years now…* (F125 2018)

Table 1 continued

Type of habitat	Western science description (reproduced from ECCC 2012)	FNFN Indigenous knowledge (summarized from interviews conducted 2017 and 2018)
Rutting	Open coniferous and mixed wood forests, low shrub, riparian, tussock tundra, recent burns and west aspect. Still use muskegs that harbour ground lichen and sedges, mixed bush areas, areas of higher ground. Regenerating burns and sparsely vegetated habitat.	Muskeg was identified as the most important habitat in the fall. Caribou show patterns of increased movement in the fall. Similar to the spring movements, knowledge holders observe that these movement patterns are intentional but not necessarily towards a specific habitat type: *"It seems like, yeah, in the fall they're moving that way …* [moving from 61 Hill to] *westerly in the fall, and then easterly back in the spring."* (F125 2018) Movements observed in the fall may be associated with congregating for the rut. *…because where our cabin* [Deer River] *is situated, you can see along the ways both directions and I remember once we sat there and a caribou came out on the other side of the river and walked all the way up the river bank right in front of us. And across the river in front of us and it kept on going. .A nice big bull actually. It was like he was determined, in the fall time mating season, he was determined. He was going somewhere.* (F62 2018)
Winter	Open coniferous forests (black spruce and pine) that provide adequate cover with abundant lichens, riparian areas. Caribou observed in muskeg areas in early winter. Spruce-lichen forests, fire regenerated, sparsely vegetated habitat, herbaceous and tall shrub habitat and sphagnum moss with scattered spruce. As snow depth increases, they remain more often in areas of dense pine or thickly wooded black spruce, with hanging lichen and remains access to open, mixed vegetation for ground forage.	Caribou are harder to find in the winter. FNFN knowledge holders have observed caribou tracks in muskeg areas in the winter, where caribou are cratering for lichen. *"I've run into a lot of tracks in the winter but not, I don't know if I actually bumped into a caribou."* (F62 2018)
Travel	Females show high fidelity to calving sites among years (i.e., within 14.5 km). Many caribou shift the pattern of use based on seasonal preferences, in large multi-habitat areas. Rates of movement increase during the rut and are greatest in winter.	Knowledge holders indicate that females move to preferred calving areas in the spring. Movement patterns seem to be highest in spring and fall. Though boreal caribou are non-migratory, being able to move around the habitat is important to their survival across seasons.

Mapped Boreal Caribou Sightings and Habitat Areas in FNFN Territory

During interviews conducted for this study, FNFN community members mapped caribou sightings and important habitat areas within the territory. In addition, FNFN staff have mapped 185 caribou sightings during field work. These visual sightings are shown in Figure 3. Important habitat areas and movement corridors are considered confidential Indigenous knowledge and are thus not shown on maps; however, this section provides a high level summary of key findings from these observations.

In total, 58 site-specific values pertaining to caribou were documented through the mapping interviews. These site-specific values are reported in Table 2, along with 185 visual sightings of caribou mapped in the field. The site-specific data show clusters of caribou sightings and habitat areas in certain parts of FNFN territory, notably those dominated by muskeg ecosystems. Areas with relatively high concentrations of site-specific values relating to caribou include Pouce Creek, Snake River, Clarke Lake, Kotcho Lake, Two Island Lake, Cabin Lake and Outaanetdey Lake. The multiple observations of animal travel by FNFN members highlight the importance of movement corridors for caribou.

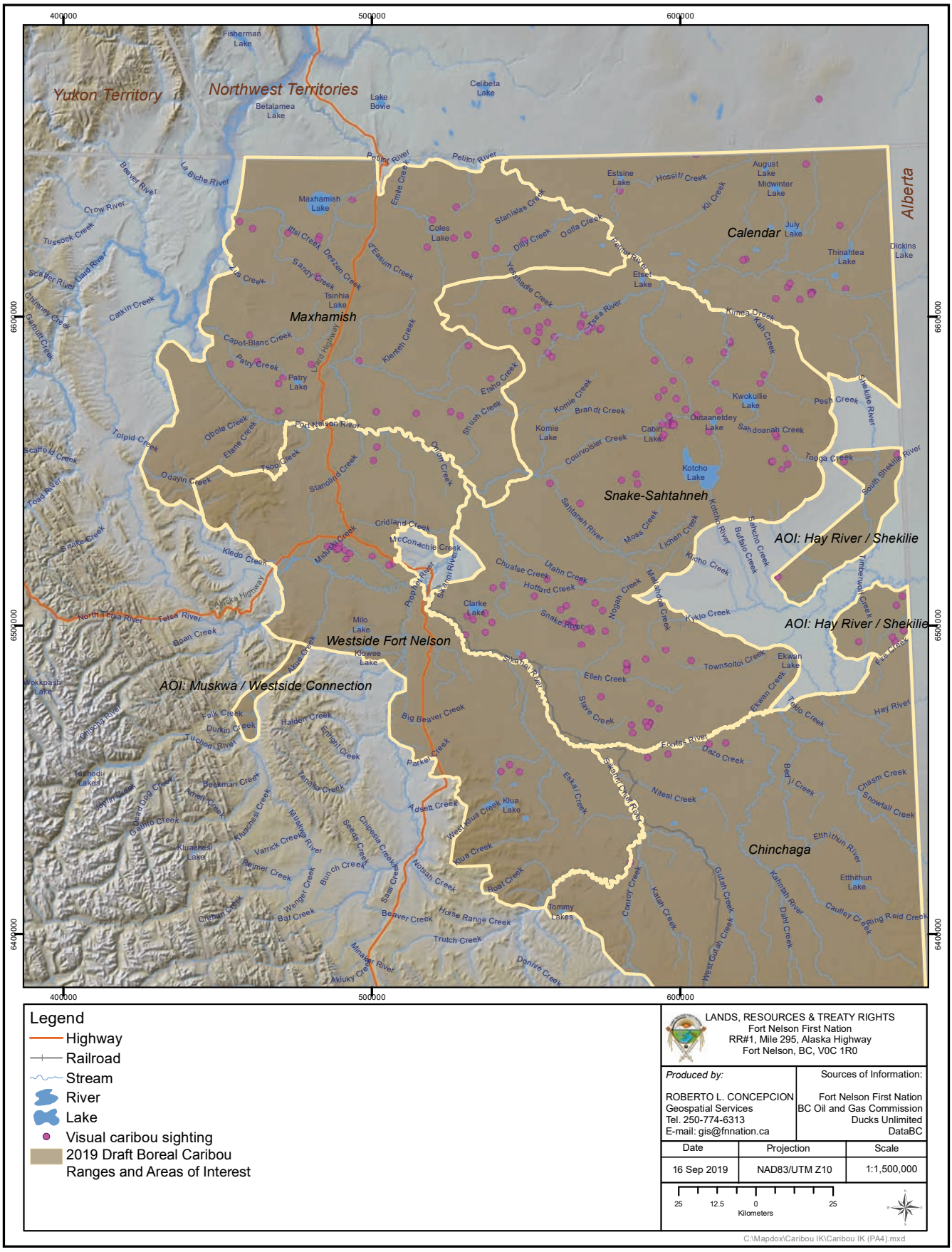
Note that there are important limitations to these data. In particular, in the interpretation of the site-specific data, an absence of data does not signify an absence of use or value and not all uses/values may be mapped (e.g., intangible values pertaining to spirituality, worldviews, identity, resource sharing, social relationships, etc.). In addition, sampling for this study is limited; not all FNFN knowledge holders were able to participate. Individual FNFN members tend to more regularly use specific areas of the territory based on the locations of their family traplines — in other words, lack of data in a specific area of the territory should not be taken to indicate that the area is not important to caribou.

Table 2: FNFN-reported site-specific values relating to caribou

Category	Within the study area	
	# of reported values	% of reported values
Travel corridor	6	2
Evidence of animals (prints, scat, hair)	4	1
General habitat	14	7
Calving habitat	3	1
Hunting area	2	1
Visual sightings (mapped during interviews and field work)	214[1]	88
TOTAL	243	100

[a] 29 visual sightings were mapped from memory during interviews; 185 visual sightings were made by FNFN field technicians during field work.

Figure 3: FNFN visual sightings of boreal caribou in northern BC Treaty 8 Territory



Areas with relatively high concentrations of site-specific values relating to caribou include Pouce Creek, Snake River, Clarke Lake, Kotcho Lake, Two Island Lake, Cabin Lake and Outaanetdey Lake.

Habitat Suitability Mapping for FNFN Territory

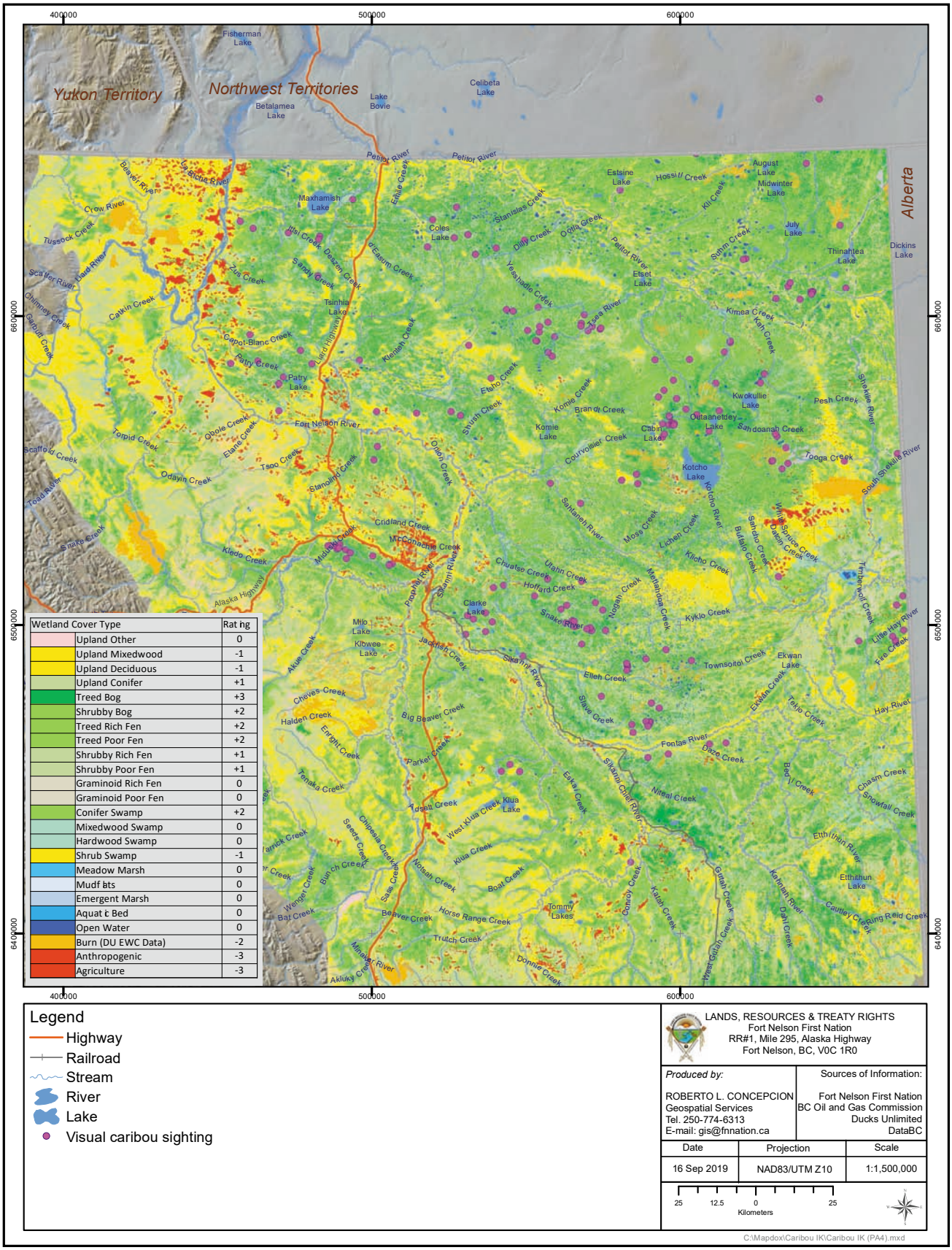
In the 2017 Medzih Action Plan, FNFN used both scientific information and Indigenous knowledge to map caribou habitat suitability in northern BC Treaty 8 territory, using a habitat rating system based on the Ducks Unlimited Enhanced Wetland Classification (EWC). The full habitat rating system for each identified ecosystem in the EWC is shown in Table 3. This approach generally follows the habitat ratings table developed by Arsenault (2014) for boreal caribou in Saskatchewan, with a reduced emphasis on "upland pine" ecosystems, since these areas are less important to boreal caribou in this part of their range. The approach also integrated recent disturbance into the ratings: recent fires and cutblocks were added to the habitat capability map where these disturbances were not already reflected in the EWC data, to ensure that the resulting map shows where habitat is currently suitable for boreal caribou. The final ratings map was used to identify protection and recovery zones in the Medzih Action Plan, and is also being used in ongoing joint planning with the provincial government to confirm new areas of boreal caribou habitat that are outside of caribou use areas based on telemetry data.

Figure 4 shows how the habitat ratings assigned for the Liard River Basin using this method align with FNFN visual sightings of boreal caribou in northern BC Treaty 8 territory. Visual sightings of caribou and confidential mapped habitat areas identified by FNFN knowledge holders generally overlapped with or were adjacent to wetland land cover types with positive ratings from +1 to +3. Wetland cover types with ratings in this range include shrubby bog, treed rich fen, treed poor fen, conifer swamp and treed bog. Several clusters of caribou-related sightings and identified locations are located near water features including creeks, rivers and lakes, which may also reflect the increased visibility of caribou at those sites and community members' preferred travel routes for accessing hunting areas.

Table 3: Boreal Caribou Habitat Preference Ratings for each of the EWC Covertypes; Reproduced from Arsenault 2014

Ducks Unlimited Enhanced Wetland Covertype	Caribou Preference Rating	Caribou Habitat Characteristics
Upland Pine	+1	Lichen-rich mature (>40 yrs old) upland pine for annual forage, predator avoidance, low mortality risk, spatial separation from higher density cervid populations.
Upland Other	0	Matrix.
Upland Mixedwood	-1	Low (conifer dominant) to High (deciduous dominant) predation risk.
Upland Deciduous	-1	High predation risk.
Upland Conifer	+1	Predator avoidance, low predation risk, spatial separation from higher density cervid populations.
Treed Bog	+3	Lichen-rich annual foraging habitat, predator avoidance, low mortality risk, spatial separation from higher density cervid populations.
Shrubby Bog	+2	Seasonal forage (spring, summer, calving), predator avoidance, low predation risk, spatial separation from higher density cervid populations.
Graminoid Bog	+1	Predator avoidance, low predation risk, spatial separation from higher density cervid populations.
Treed Rich Fen	+2	Calving habitat and foraging habitat.
Treed Poor Fen	+2	Calving habitat and foraging habitat.
Shrubby Rich Fen	+1	Calving habitat and foraging habitat.
Shrubby Poor Fen	+1	Calving habitat and foraging habitat.
Graminoid Rich Fen	0	Matrix.
Graminoid Poor Fen	0	Matrix.
Tamarack Swamp	+2	Winter foraging habitat, predator avoidance, low predation risk, spatial separation from higher density cervid populations.
Conifer Swamp	+2	Winter foraging habitat, predator avoidance, low predation risk, spatial separation from higher density cervid populations.
Mixedwood Swamp	0	Low (summer)-moderate (winter) predation risk.
Hardwood Birch Swamp	0	Low (summer)-moderate (winter) predation risk.
Shrub Swamp	-1	Low (summer)-moderate (winter) predation risk.
Meadow Marsh	0	Predator avoidance.
Mudflats	0	Moderate-high predation risk.
Emergent Marsh	0	Predator avoidance.
Aquatic Bed	0	Predator avoidance.
Open Water	0	Insect relief, winter travel.
Burn	-2	High predation risk (burns <40 yrs old).
Anthropogenic Influenced	-3	High predation risk.
Agriculture	-3	No habitat

Figure 4: Boreal caribou habitat suitability mapping based on Ducks Unlimited Enhanced Wetland Classification Data, with mapped FNFN visual sightings of boreal caribou



Caribou Population, Population Health and Trends

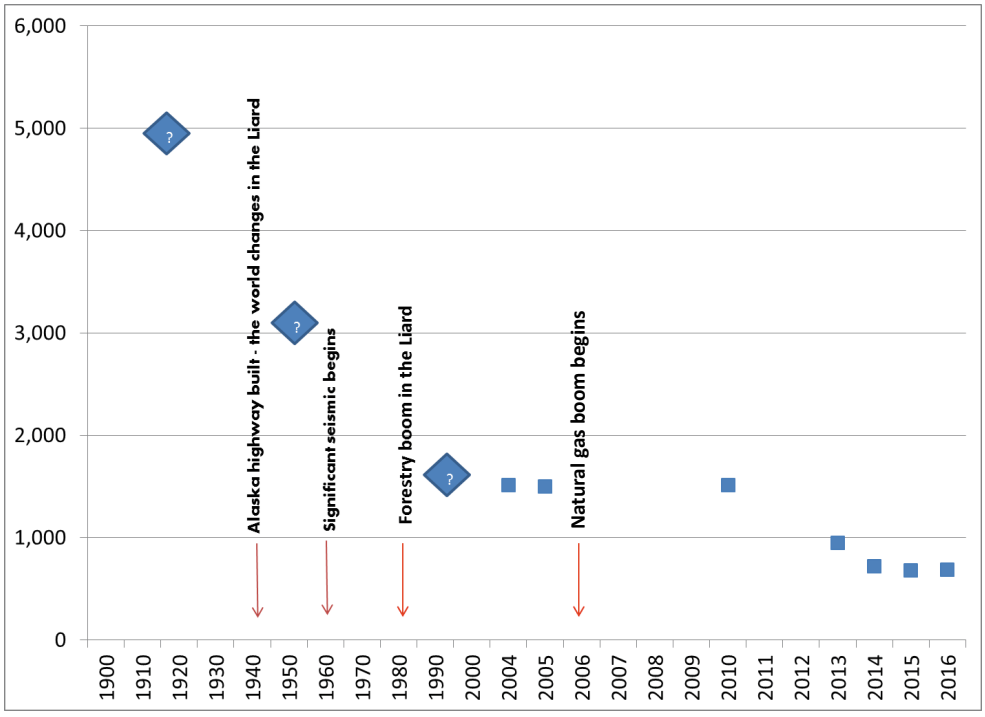
Timeline of Boreal Caribou Declines

I don't see any caribou at all. I see some moose and I see lots of wolves. (F19 2018)

Boreal caribou have declined dramatically over the last three generations of FNFN members, a downward trend that is documented in some detail in FNFN's Medzih Action Plan and in the Boreal Caribou Science Update (Culling and Cichoswki 2017). Both Indigenous knowledge and scientific studies point to historic numbers of caribou that were much higher than current numbers, and to a historic distribution of caribou that was much more widespread than it is today. Figure 5 below, reproduced from FNFN's Medzih Action Plan (FNFN 2017e) shows a schematic version of the decline in boreal caribou since the early 1900s.

Both Indigenous knowledge and scientific studies point to historic numbers of caribou that were much higher than current numbers, and to a historic distribution of caribou that was much more widespread than it is today.

Figure 5: Schematic of the potential shape of the boreal caribou population trend over an ecologically meaningful timeframe



The small squares in Figure 5 represent estimated and observed recent data. The large diamonds represent rough estimates about earlier population numbers based on recent density estimates of boreal caribou from cores. FNFN is not claiming to know the exact historic numbers nor the exact shape of this curve, but both Indigenous knowledge and science-based density estimates suggests this is a reasonable representation of true trends over time (note the change in units on the bottom axis from decades to annual time frames).

Historically, boreal caribou were distributed throughout and also further south of FNFN territory and roamed in a largely unbroken distribution across the boreal and taiga plains. Today, numbers are very low and continue to decline, with animals occurring in fragmented and isolated 'herds' or ranges, and caribou are extirpated from their former southern distribution. The vast majority of boreal caribou remaining in British Columbia today are in northern BC Treaty 8 territory.

Compared to the long history FNFN people have with boreal caribou, their decline is relatively recent — but strongly felt by the people interviewed in this study. Most FNFN members recall that caribou were an important food source in the past — particularly in the winter — but very few people currently eat caribou meat or express a preference for it, and many people lamented the loss of knowledge about how to use caribou for cultural purposes. FNFN members interviewed for this study remember eating caribou when they were young.

> *No, I never had caribou meat for the longest time. …We* [were] *just small little babies, but my Dad used to bring back caribou meat and all that from the trapline, eh? … we always had caribou and moose and whatever …* [winter time] *that's the best time to eat it … it's just like, it's just the meat tastes better.* (F26 2018)

> *Like when I was growing up, my dad shot a caribou and we eat caribou meat, we lived on it.* (F42 2018)

These striking quotes about the absence of caribou in FNFN territory are mirrored by science-based studies of boreal caribou decline in northeastern British Columbia. In general, while exact population trends are not known for all of the boreal caribou ranges in BC, estimates rates of annual population change suggest that the overall boreal caribou population has declined dramatically and continues to decline at this time (Culling and Cichowski 2017). An analysis of population trends by caribou range is currently under development by the Province of BC.

FNFN Knowledge of Boreal Caribou Declines

Similar to what is shown in Figure 5 on the previous page, FNFN Indigenous knowledge suggests that three generations ago (~20 years per generation; prior to and into the 1960s) caribou were still relatively abundant.

> *I just used to see them — see, I trap. I used to trap with my Dad — I just to go out with my Dad. 1966. On Christmas holidays. And we were using a dog team, and we used to see them all over the place.* (F26 2018)

Figure 5 shows that this period represents the beginning of seismic exploration in FNFN territory.

Marked changes were felt in the 1990s, with the 1980s representing the last period of caribou populations being able to sustain harvesting. Many FNFN members have not been able to hunt caribou since then.

> [around Two Island Lake, near Marten Lake] *We're kind of hoping, because, we never seen caribou out there for the longest time … Like, I probably would have shot one in '83. That's probably the last time.* (F26 2018)

Declines observed in the 1990s coincide with the expansion of regional forestry operations identified in Figure 5. Some scattered larger herds were still being observed by FNFN members in areas that were less developed in the 1990s.

> *…we used to see more caribou, like when we were going down through some place, maybe sometimes we'd be 17 or 20 in a pack going across. But that's quite a years, quite a few years back … There wasn't so much activity down there that time. That's before the Red Bark Lodge was there … And then, that's say, about 20 years back.* (F19 2018)

> *Up in Shekilie we used to see herds and dozens of them* [caribou]. *One time we counted upwards to about 130 … that would've been right around 1992-, 1991-92 … where we spotted them … was on an old band near an airstrip. They were all congregated along the opening. Feeding on willow or whatever…* [Shekilie area] *I haven't been there for almost 25 years now.* (F63 2018)

You know I can remember being, you know, 10, 11, 12 years old in the mid 90's travelling between Fort Nelson and Fort St John and seeing — you'd lose count [laughing] *really — the amount of caribou between here and Prophet River even, along the highway.* (F125 2018)

FNFN knowledge holders also identify a rise in pressures on caribou in the 1990s such as oil and gas, roads, and increased access for non-indigenous hunters.

After the oil and gas, when the roads opened up that was holy smokes, quite a few years ago … first came out in the 90's something. (F41 2018)

FNFN members have noted further declines since 2010, confirming the downward slope in Figure 5 for this generation. However knowledge holders have noticed more caribou in the last year, perhaps reflecting the slow down in industry since about 2014.

Oh like I said, probably 15 years ago … And next thing you know they just vanished, like, decline I guess? … they started declining since. Yeah, until this, this year … (F108 2018)

We used to see lots all over the place there when we were growing up, eh? [inaudible]*… there's none. Like I said, I seen — when I was working out at the, out in the oil patch. Around kilometre 71…I seen — I seen about eight of them went by, across. That was the last time I seen them. I think that was 2005.* (F26 2018)

FNFN Indigenous Knowledge on the Health of Caribou Populations

FNFN Indigenous knowledge identifies both changes in the number of caribou over time and in indicators of population health such as an unbalanced bull-to-cow ratio in the last decade.

Somewhere something's taking all the smaller and lesser and the smaller and weaker animals out there because I didn't see any cow. I didn't see any cow caribou this fall, I seen cow caribou last fall. All I seen this year was bulls. (F7 2018)

Like right there [near the individual's cabin area], *I see them crossing. Like I mean say 10 years ago, I would see 6 or 8 of them, like they'd be mixed, like it should be. But it was cows and bulls and cows. But now, like I see, I guess I should say 17, the fall of 17, I only seen like I think I seen 3 cows and then now calves and you know, I seen several bulls and then last fall I think, all I seen was three bulls and that's it. No cows and no calves. And it's disturbing when you see that.* (F7 2018)

…most recently, there was 6 together. And there was no calves, there was only bulls — 4 bulls and 2 cows … (F125 2018)

FNFN members are also concerned with declining numbers and the survival of calves.

I haven't seen any young caribou for two years. (F7 2018)

I don't know if I've actually seen any calves. It's been awhile. (F62 2018)

The calf down in the Klua Lakes area was the only one I've seen … But I haven't seen any up there since, well it's been probably 10 years now … in terms of boreal caribou in years. (F125 2018)

Overall, FNFN Indigenous knowledge points to both a substantial decline in caribou numbers over the past three generations and an imbalance in the population of caribou today, in terms of the number of cows and calves that are surviving.

Pressures on Caribou

FNFN Indigenous knowledge identifies a number of pressures contributing to caribou population health and decline in northern BC Treaty 8 territory. Cumulative pressures identified include but are not limited to:

- Habitat loss due to industrial development with linear development (seismic activity, roads etc.) being a leading factor;
- Increased predation from wolves;
- Decreased caribou health due to diseases, pests and contamination from industrial development; and
- Environmental changes due to climate change, including decreases in water quantity.

Industry/Development

FNFN members see industrial development, particularly oil and gas, as the root cause of caribou decline. Industrial development in the last three generations has removed important habitat for caribou. Furthermore, FNFN knowledge holders have not seen adequate restoration/reclamation of areas where industrial operation has ceased, thereby prolonging the harm caused.

> *For our area specifically I think the catalyst is always oil and gas development — there hasn't been forestry in such a long time. And we don't have a whole bunch of recreational area where people are snowmobiling and making a bunch of noise and packing the snow down or anything like that. So, yeah, I think it's been an accumulation of years of development and a lack of reclaiming some of these access roads and seismic lines that are no longer in use, and might never be put back to use right?* (F125 2018)

> [Area around trap line] *Big time changes. And I can see that. It's, it's so — you go out there. To me, it's barren. Where the animal life, not really the caribou, but all kind of animal life has — they left. Because the trees are gone. You know, a lot of trees are gone, and they're putting saltwater down the fracking area. You know, and the habitat's changing. So, it doesn't only affect the human people.* (F19 2018)

> *There's been so many changes you know, to the land. And especially from the oil industry. And from, probably the smell and the water. And they can't get clean waters because the trucks, I see them lots. Taking fresh water out of ponds for, to water down the roads and our animals haven't got nothing to drink.* (F108 2018)

FNFN members are hopeful that if habitat is restored caribou could return. FNFN knowledge holders have observed caribou in areas that have been able to regenerate due to developmental slow-downs. Komie Road is an example of where FNFN members have seen a return of caribou in regenerated areas.

> *And every year in the fall and the spring you would see herds come through. And one time, I remember, there was about 13 at the peak that travelled through — both cows, calves and bulls. And I'd seen, like, every year it kind of just like declined in numbers and then we didn't' actually see them up there for a couple years. And recently this year we started to notice that they've been around again, so, yeah.* [at the end of Komie road] … *there hasn't been any activity in terms of new development up there since 2012 probably. Maybe just that slowdown has kind of helped them a bit, existing seismic lines growing back maybe helps too. I don't know. Yeah but for whatever reason they've come around again.* (F125 2018)

Positive effects have also been observed at Kledo.

Kledo. I call it Kledo camp. There's lots of muskeg, and it's quiet…Maybe they're starting to come back out because there's less oil and gas … [last sighting of caribou in the area] *that was in July … July of 2017 … There was a herd of them. I'd say maybe 10.* (F108 2018)

Linear Disturbance

Seismic activity and the expansion of roads in FNFN territory are identified by FNFN knowledge holders as leading contributors to caribou decline. FNFN knowledge holders associate linear disturbance with habitat loss and have observed that these features result in increased predation from wolves.

What I imagine they're definitely avoiding are any major corridors like this one here, and because the wolves just hammer those. Like, yesterday I was actually down here and you could see the pack of wolves — they travelled down, they hit the highway, they turned around and went right back the same way. And then they went down by our cabin and probably ended up on the river. But, so they might be just avoided those really open, open areas like Y corridors and basically ways they can travel through the bush… (F125 2018)

Caribou try to avoid open linear features but FNFN members are concerned that given the prevalence of linear features on the landscape there is less and less bush for caribou to escape to.

Roads

FNFN Indigenous knowledge suggests that an increase in roads over time has contributed to caribou traffic mortalities and improved access to non-Indigenous hunters. FNFN knowledge holders have observed caribou on the road and are concerned about vehicle accidents and mortalities.

FNFN Indigenous knowledge suggests that an increase in roads over time has contributed to caribou traffic mortalities and improved access to non-Indigenous hunters.

I think there was about six of them together that day that time we saw them. Sometimes we see one, sometimes we see two, sometimes we see more. So it's different times, he … [saw] *their babies. Those little babies aren't scared you know? They run right on the road. They want to play I think. They play chicken with people hey, they do. Leo always says watch out caribou! And then I'm keeping an eye out on my side and he's keeping an eye out on his side because those caribou they run right in front of you.* (F41 2018)

Roads have also increased access to hunters and increased hunting pressure. Even though non-Indigenous hunters are not permitted to hunt caribou, FNFN knowledge holders still expressed concern about the impact of traffic and noise on caribou.

There was no roads. Now there's roads all over the place. And there's hunters all over the place. And there's no way that anyone of us that own the trap line are going to keep those people out of there… (F41 2018)

Seismic Exploration

The expansion of seismic activity since the 1960s has been a major contributor to caribou habitat loss. FNFN Indigenous knowledge associates linear features such as pipelines and seismic lines with increased caribou predation.

> *If they* [wolves and hunters] *are chasing moose then I can see a caribou, which have nowhere to go. The amount of seismic lines being cut is the reason for it. All these areas are being developed by seismic, wells, fracking sites — they get pushed out of the areas where they normally feed and calve.* (F62 2017)

> *They're* [the wolves] *often on that main artery into the oil fields.* (F125 2018)

> *Yeah, you'll get, you'll fly into Fort Nelson and you notice that from above and it's* [pause] *— I can see how wolves have managed to master the art of using seismic lines and they're pretty smart, right? So, and caribou not being able to adapt as quickly have really struggled to stay ahead of them. Yeah.* (F125 2018)

> *You see the wolf can go through; they go through the bush off the seismic and go race through there and that's their nature to go race through there…* (F125 2018)

Given FNFN members' concerns, FNFN Indigenous knowledge emphasizes the importance of habitat restoration in old seismic areas for caribou recovery.

> *I think ultimately that's what it comes down to — restoring habitat and creating line-of-sight blocks. Because as it stands right now, some of these, I know we were involved quite heavily with seismic development over the years. Their claim was always that well, these you know, four or five years from now you don't even notice that there was a seismic project here. Like one of these 3-D grids. But I'm still driving around, and I remember the first project I was on 12 years ago you can still see the little corridor through the bush. Like, it's not that fast to regenerate itself, so…* (F125 2018)

FNFN Indigenous knowledge notes that wetter areas (preferred by caribou) are harder to restore and reclamation efforts in these areas in the past have not been effective.

> *The wet area is specifically where they just take longer to regenerate* [seismic lines]. *And they go in with mulchers and the mulch stays on the ground so it makes it even harder for regrowth to happen. But even in larger timber, yeah, you're still not really seeing the regeneration happen like they thought it would, I guess. You're getting a mulcher chewing up the ground in front of it and it creates about a foot of mulch over the top of the native soil and creates a barrier basically for regrowth, right? Yeah, I haven't noticed much of a difference in terms of impact compared to the old way they do it where they used to do it with just dozers and stuff like that, right? Hand cutting…* (F125 2018)

In addition to reclamation, FNFN Indigenous knowledge encourages companies clearing new seismic lines to employ better practices in reducing line of sight and access for wolves and hunters.

> *So going forward if we could maybe work with the producers to do something like that, where they won't you know interrupt the line of sight for you know every couple of kilometres or something. Dogleg the line or leave a patch of right away that's fully treed in for something right? We have the technology now to drill under creeks or rivers and valleys. There's no reason why we can't do it here right? And that just breaks up the line of sight.* [Interviewer suggested planting trees, berry bushes, etc. to interrupt the line of sight.] *You're hindering the line of sight for the wolves and you're also discouraging the hunters from going down those lines.* (F63 2018)

Contamination, Diseases and Pests

FNFN members are concerned about caribou suffering from contamination from oil and gas activity. This concern is widespread and applies generally to all wildlife living within FNFN territory.

> [regarding caribou]: *They're all dying off. So some of them probably poisoned but most of them stepping into that hole. That's what's killing most of them because they're wounded already so the wolves just get them really quick … they lick off the pipes…* (F125 2018)

FNFN members have identified that caribou are presently vulnerable to pests and disease. FNFN members are concerned about the number of ticks found on caribou in the spring. Ticks can get in caribou noses and under their skin affecting their health (FNFN 2018). FNFN harvesters have also found worms in caribou.

> *I shot one caribou as I was right by Clarke Lake there, used that road when I was younger. And we cut the neck off and we seen worms inside the throat. And inside the throat area… actually yeah he wasn't very healthy, like he was so slow like you know when we shot him.* (F42 2018)

Pests can add to the stressors already experienced by caribou from other pressures. The potential interactions between climate change and increases in disease in caribou have been identified by FNFN knowledge holders as a key area for research and monitoring.

"All these areas are being developed by seismic, wells, fracking sites — they get pushed out of the areas where they normally feed and calve."

Predators

FNFN Indigenous knowledge holders have observed an increase in wolf pack sizes in the last decade. FNFN knowledge associates an increase in the wolf population with easier access to both moose and caribou through linear features.

> *And there's no change in the wolves, if anything there is more. I know two years ago we were out there looking around …and on our way back we seen a big pack of wolves and a bunch of fresh caribou tracks and so obviously they're doing what wolves do, hunt them…* (F63 2018)

> *And I think that the caribou that I used to see are not there anymore because the wolves …* [trap line] *starts from Gutah and goes all the way to SYD.* (F42 2018)

FNFN Indigenous knowledge holders have noted that larger wolf pack sizes also contribute to greater hunting success.

> *But I think with everything, when the pack gets bigger, everything they chase into it, is history.* (F7 2018)

FNFN Indigenous knowledge identifies that wolf packs are not only bigger but also more common than before.

> *We all see pack of wolves like in there* [up the Alaska Highway]. *There's always one or two sometimes together, sometimes there's about six or eight. I think they always have seem to have moose or caribou. They look pretty healthy anyway.* (F42 2018)

> *So, they're all in here. And then we have an access road here that we operate on and they're always in there, so like, they're condensed. And they're into here, little pockets … Yeah, but you just wonder where they can go for refuge* [the caribou]. (F125 2018)

According to FNFN Indigenous knowledge, larger wolf packs distributed across a greater area in FNFN territory are increasing caribou mortality.

> *Wolves do have a place in the system but when they, when they get too large in their numbers, the balance is too far one way.* (F63 2018)

> *But the problem is the wolves are there all the time too. So these animals are dropping calves every year and the wolves are preying on them so that right there is keeping the herd from expanding like it should.* (F63 2018)

FNFN Indigenous knowledge holders see this as an imbalance and internal discussions are ongoing about potential human responses to this imbalance.

> *… Most people are quick to point their finger at wolves, but I mean, things have slowed down — there hasn't been any new development in this area in three or four years now. But I mean, the damage is done and nobody's reclaiming these things. Wolves are basically — and hunters. Hunters use all these roads the same way wolves do. They just drive down and look for moose and they access seismic lines off these corridors and so these have basically become super highways for predators, both hunters and wolves. And a few — a lot of them have been abandoned, well they haven't been totally abandoned because they haven't been reclaimed. They're just these deteriorating resource roads that are falling apart…* (F125 2018)

Climate Change/ Changes in Water Quantity

FNFN Indigenous knowledge also identifies environmental changes associated with climate change as impacting caribou. Drying and changes in water quantity have degraded caribou habitat.

> *I see a lot of dead trees. A lot of dead fall. Like, you just see a lot of, where there used to be really lush forest? You can just see that a lot of things are just drying out. Sometimes you see, like a pond? With just dry all over, it's dry all over, eh? And I don't know why that is.* (F19 2018)

According to FNFN Indigenous knowledge, changes in snow conditions are also affecting caribou.

> *… and weird winters too … I was looking at photos from this time last year and we barely had any snow and* [pause] *so that makes their life a little bit tougher when it comes to outrunning, you know, wolves and stuff like that.* (F125 2018*)*

Given the cumulative effects of these pressures, FNFN knowledge holders emphasize the importance of taking action now to reduce these pressures and recover caribou population.

MANAGEMENT OF BOREAL CARIBOU IN FNFN TERRITORY

> *You know I can remember being, you know, 10, 11, 12 years old in the mid 90's travelling between Fort Nelson and Fort St John and seeing — you'd lose count* [laughing] *really — the amount of caribou between here and Prophet River even, along the highway…So, you're seeing declines happen, you know, fairly rapidly from 20 years ago to now, definitely. In my lifetime I've seen significant decline.* (F125 2018)

Practicing a cyclical existence with the land, maintaining berry patches, and ensuring no waste or overkill of animals ensures that the land and animals, and our interaction with the natural world, remains healthy.

FNFN Traditional Management Practices

Our ancestors believe, "if we care for the land, the land will care for us" (FNFN 2015). Animals have a right to our respect, and a right to clean water and safe food. Overhunting and wasting meat or animal parts goes against traditional practice and Dene and Cree beliefs and values. FNFN members respect taking only what is needed and never more. Only taking as much as you need for yourself, your family or to share to prevent starvation ensures there will be enough food for future generations.

> *The old people say if you kill a moose and continue to kill more if it is not needed, the next time you are hungry there will be no place for you to hunt.* (FNFN 2001, 2)

FNFN understands that in order for our Nation to both continue its reliance on the land, and to thrive, certain ecological standards must be maintained, such as healthy water for drinking and safe food to harvest.

Our ancestors and current members have developed a number of management practices to maintain ecological standards. Practicing a cyclical existence with the land, maintaining berry patches, and ensuring no waste or overkill of animals ensures that the land and animals, and our interaction with the natural world, remains healthy. When our lands are impacted by development, and the animals and waters are unhealthy, we know the balance our members strive to practice has been threatened.[4]

4 The RELAW Project: Revitalizing Indigenous Law for Land, Air and Water, wcel.org/program/relaw

Importance of Caribou Stewardship for FNFN

> *As a nation here, I think what we should do is take it upon ourselves and you know help protect the caribou.* (F63 2018)

Fort Nelson First Nation has constitutionally affirmed rights and responsibilities under Treaty 8 to ensure that boreal caribou populations are protected and restored across FNFN's traditional territory. Over the course of several years of reviewing industry development plans, FNFN identified major gaps in the BC government's boreal caribou implementation plans that allowed for the continued degradation of boreal caribou habitat in British Columbia (FNFN 2017f).

FNFN supports economic development but wants to see protection for areas so lands and waters can continue to thrive and support the community.

FNFN supports economic development but wants to see protection for areas so lands and waters can continue to thrive and support the community. Community members have pointed to the decline of boreal caribou as an indicator of an ecosystem that has been pushed beyond its limits, and are concerned that other animals — like moose — will eventually decline precipitously in a similar way that caribou have:

> [On moose and caribou] *But if we don't manage this properly, moose are going to go the same way as the caribou. And that will be a crisis because like I said this community…the Fort Nelson First Nation, we depend on moose. Unequivocally for… food and clothing and things like that right? And we have half a dozen or more ladies here in our Nation that sell their traditional crafts. You know moccasins, clothing and foot wear, so …So I think what we're doing here with the caribou is going to come in handy further down the road when the moose requires the same attention. We can say well look at what we did with the caribou. Let's take some of the practices with that and transfer it to the moose.* (F63 2018)

> *They should be protected really* [the caribou]. *There's not very many of them left…* (F41 2018)

The importance of caribou stewardship has been passed down from previous FNFN generations.

> *And so they probably know too that our parents told us not to destroy them* [caribou] *cause they're here for a reason, you know? It's, it's our. Our parents used to tell us what not to shoot, you know? And if you're not going to eat it you do not shoot it, you see?* (F108 2018)

> *My parents had said that every animal that exists on this earth is meant for -- they're there for a reason. And they told me too that a caribou, when they do their droppings, they nourish the earth.* (F108 2018)

FNFN's responsibilities to the land and animals — including caribou — are tied to FNFN ancestors and critical for future FNFN generations.

There needs to be a greater recognition and respect for FNFN Indigenous knowledge in caribou stewardship. FNFN Indigenous knowledge promotes the need for habitat connectivity for caribou: all caribou herds need to be connected and not managed in isolation. As already stated in this report, FNFN knowledge presents a different perspective from the scientific delineation of ranges. Based on both telemetry data and FNFN Indigenous knowledge, all caribou "cores" and "ranges" are connected; some caribou move between them quite regularly. FNFN knowledge indicates that the concept of stand-alone ranges does not represent how caribou used the landscape prior to industrial development.

Government Stewardship of Boreal Caribou Recovery

Boreal caribou are listed as threatened under the Canadian Species at Risk Act (SARA), which triggers requirements for the identification and protection of critical habitat. While the Ministry of Environment and Climate Change Canada (ECCC) is responsible for leading the recovery of boreal caribou on federal lands, all boreal caribou habitat in BC falls on non-federal Crown lands. British Columbia is therefore delegated with the task of protecting boreal caribou critical habitat that falls within provincial boundaries.

The 2012 Federal Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal population, in Canada (ECCC 2012) identifies critical habitat for the majority of boreal caribou ranges across Canada.[5] Critical habitat is defined under the SARA as "the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified in a recovery document or action plan for the species." For boreal caribou, critical habitat is identified by a disturbance threshold: 65 per cent of the range must be kept as "undisturbed habitat". This threshold is considered a minimum: based on modelling that is described within the recovery strategy, at 65 per cent undisturbed habitat, a local population within a range has a 60 per cent chance of being self-sustaining — in other words, the population still has a significant risk (40 per cent) of not being able to survive.

As of 2019, all of the ranges in northern BC Treaty 8 Territory are considered not self-sustaining, based on the levels of habitat disturbance within the range.

As of 2019, all of the ranges in northern BC Treaty 8 Territory are considered not self-sustaining, based on the levels of habitat disturbance within the range. Developing an effective plan to protect critical habitat in northern BC Treaty 8 territory and restore it to the 65 per cent undisturbed threshold is necessary for meeting the goal of the 2012 recovery strategy. In the absence of an effective plan to protect and achieve this threshold,

5 The SK1 range in Saskatchewan is the only range for which this definition of critical habitat does not apply; the 2019 amended recovery strategy provides a definition of critical habitat for this range (ECCC 2019).

the federal government has certain obligations to recommend federal intervention into the management of critical habitat.[6]

To date, British Columbia's efforts to recover boreal caribou have included developing draft boreal caribou 'implementation plans' (including the 2011 Boreal Caribou Implementation Plan, the 2016 Boreal Caribou Implementation Plan, and the 2017 Boreal Caribou Recovery Implementation Plan) and funding research through the BC Oil and Gas Research and Innovation Society (BC OGRIS). While the funded research has greatly increased the available scientific knowledge of how boreal caribou use habitat and are impacted by oil and gas disturbance in northeastern BC, the implementation plans for boreal caribou recovery in BC have generally been weak, relying on protection measures that allow oil and gas development to proceed as long as certain best practices (called Interim Operating Procedures) are followed.[7] A leaked 2014 audit of oil and gas practices in northeastern BC, conducted by the BC Oil and Gas Commission, showed that these measures did little to prevent ongoing incursions into boreal caribou habitat, both because the measures were not strong enough and because many oil and gas companies simply did not follow them.[8] Furthermore, a joint Federal-BC assessment of the effectiveness of protection measures for caribou habitat has shown that the protection measures used by BC are generally not strong enough to really protect critical habitat (Governments of Canada and BC 2017).[9]

Real protection for critical habitat comes in the form of protection measures that prevent development from occurring. Only 11 per cent of FNFN territory is currently fully protected from development, which is much less than the levels likely needed to conserve ecosystems over the long-term. And this protection is heavily concentrated in the mountains to the west, outside of boreal caribou habitat (see FNFN's Watersheds Report Card for further details; FNFN and the LBMI Team, 2019). Overall, less than 1 per cent of the muskeg region in central to eastern FNFN territory is functionally protected area, a fact that is made more critical with recognition that this muskeg region is the one facing the greatest pressure from industrial development (FNFN 2017b) and is the home to boreal caribou.

As witnesses to the ongoing degradation of boreal caribou habitat, Fort Nelson First Nation repeatedly expressed concerns to both the province and the federal government that measures to protect boreal caribou habitat in BC were not sufficient. As a result of these efforts, FNFN is now taking a lead role in identifying a new approach for boreal caribou recovery in British Columbia, through collaborating with the provincial government and focusing on habitat protection and restoration as key measures to prevent further degradation of boreal caribou habitat in northern BC Treaty 8 Territory.

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6 Federal intervention into critical habitat protection can include a requirement for the ECCC Minister to ask the Governor in Council to create a safety net order under Section 61 of the SARA to protect critical habitat on non-federal lands, if they deem that it is not being effectively protected by the laws of the responsible province or territory. This has never been done for critical habitat for boreal caribou, despite the fact that little action has been taken in most jurisdictions to reverse the impacts to critical habitat since 2012.

7 Note that forestry practices are also covered by the 2011 Boreal Caribou Implementation Plan and the 2017 Boreal Caribou Recovery Implementation Plan; however, since 2008 forestry activity has been very low in the Fort Nelson Timber Supply Area and oil and gas development has been by far the more prominent development pressure. As this changes in the future, additional measures will be needed to ensure that forestry activity is not adversely impacting boreal caribou in northern BC Treaty 8 territory.

8 For example, see "Leaked audit suggests rules to reduce impact of energy industry on caribou in B.C. being ignored," Canadian Press, May 28, 2018, theglobeandmail.com/canada/british-columbia/article-leaked-audit-suggests-rules-to-reduce-impact-of-energy-industry-on/.

9 BC relies on habitat protection tools called Wildlife Habitat Areas (WHAs) and Ungulate Winter Ranges (UWRs) to protect caribou habitat. These tools can be effective in some circumstances (e.g., some types can prevent forestry activity) but are very weak in their protection measures for other industry, particularly oil and gas, and generally allow exploration and development to continue for other industries. Note that the cited document covers southern mountain caribou (central group) but that the identical protection measures are currently used for boreal caribou in BC.

FNFN Management Guidelines for Recovery of Boreal Caribou

As leaders for protecting caribou, restoring habitat, and monitoring caribou recovery in our territory, FNFN sees an important role for our community in a number of measures including:

- Working collaboratively with government to establish clear guidelines for industrial development in caribou habitat, including no development in at least some portions of boreal caribou habitat, and improved spatial planning for forestry and oil and gas development in areas where development is permitted;
- Restoring old "low impact" seismic lines — these include legacy seismic lines that were considered low impact at the time, many of which show very poor regeneration;
- Ensuring that these measures over time result in the recovery of habitat to at least 65 per cent undisturbed across all of the boreal caribou ranges in FNFN territory, improved survival and recruitment of young caribou into the population, and eventually an increase in caribou numbers to levels that allow for cultural practices to be restored; and
- Reviewing plans and outcomes annually through a joint decision-making process with government to ensure that results of monitoring can be considered within an adaptive management framework, and new measures can be introduced if they are need.

As witnesses to the ongoing degradation of boreal caribou habitat, Fort Nelson First Nation repeatedly expressed concerns to both the province and the federal government that measures to protect boreal caribou habitat in BC were not sufficient.

FNFN's 2017 Medzih Action Plan identifies critical strategies and associated actions for boreal caribou protection and recovery, including immediate changes to the way that recovery plans are implemented in British Columbia. Table 4, below, identifies each of the strategies and actions, and provides an update on the status of these actions as of August 2019.

Table 4: Current Status of FNFN Boreal Caribou Recovery Strategies from the Medzih Action Plan

Strategy 1: Action is needed now to reduce existing pressures on boreal caribou	
Actions	**Current Status**
Spatially identify core Protection Zones and immediately implement a moratorium on any additional industrial disturbance within these areas. Protection Zones are areas with the biophysical features that are preferred by caribou. They currently have a lower level of development, and tend to be areas prioritized by caribou today based on limited telemetry data. These Protection Zones would contribute to the legal protection of critical habitat as required by SARA.	FNFN is working with the BC government on a revised set of protection and restoration zones, which are planned for implementation by spring 2020. The revised approach identifies the best remaining habitat, assesses where protection is possible, and implements strong protection measures in these areas. Areas that cannot be fully protected due to existing industrial licenses will be subject to strong mitigation and offsetting measures to ensure a positive habitat trend occurs in those areas. With funding from the Habitat Conservation Trust Foundation, FNFN has developed a structured approach for prioritizing boreal caribou habitat for restoration, and will begin restoring the highest priority area (the Kotcho Lake Restoration Area) in fall 2019.
Spatially identify Restoration Zones and plan how and in what order these areas will be restored to meet federal recovery goals within FNFN's stated timeframe of one generation. Restoration Zones are located where there is limited intact area within a range, and are of sufficient size to add additional habitat to Protection Zones to result in likely caribou recovery.	
Undertake active functional and ecological restoration of the legacy footprint on the landscape — particularly linear corridors — in Protection and Restoration Zones to exceed the minimum 65 per cent undisturbed target, within one generation.	Restoration prescriptions have been developed for linear corridors in the Kotcho Lake Restoration Area, for implementation over the next three years (2019-2022).
Establish a fund from the province and industry with existing tenure in caribou habitat to allow immediate functional and ecological restoration of caribou habitat on legacy development areas.	This is an important component of the implementation process for restoration work in FNFN's territory. A workshop to discuss First Nations leadership in habitat restoration took place in May 2019 in Fort Nelson; recommendations on restoration priorities are expected by fall 2019.
Prevent industrial contamination of caribou and other species on the landscape, by requiring fencing on all facilities where interaction with industrial pollution could occur.	The BC Oil and Gas Commission has introduced requirements for fencing on industrial facilities.
Strategy 2: Create a positive habitat trend within caribou distribution	
Establish a moratorium on further tenure sales in all FNFN Protection and Restoration Zones, and including all parcels currently deferred through updated provincial Resource Review Areas.	Included in collaborative plan with government.
Examine options for voluntary tenure trading or tenure returns to reduce immediate pressures on Protection and Restoration Zones, and to promote industrial development in less critical areas for caribou; this strategy applies to all industrial activities.	These options are being considered in ongoing collaborative planning with government and will be included in some form.
Promote gas and forestry development in less critical areas for caribou (outside Protection and Restoration zones), with a minimum of a 4:1 mitigation ratio.	
Require any future development in Restoration Zones to adhere to a mitigation ratio of 10:1 to promote more rapid recovery of large intact blocks of habitat, and to promote development patterns that avoid priority restoration areas.	Offsetting ratios for some areas are being considered, to allow some development to take place while driving restoration activities in areas that can be protected.
Develop finer-scale habitat mapping to ensure that restoration actions are employed most efficiently in Protection and Restoration Zones. Focus restoration on areas that are spatially adjacent to Protection Zones to gradually improve these areas for boreal caribou. Use zones to further develop fine-scale restoration priorities.	FNFN has identified priority areas for restoration in northern BC Treaty 8 territory; fine scale habitat mapping is an important priority, which has yet to be undertaken.

Table 4 continued

Actions	Current Status
Spatially plan potential forest harvest areas and management priorities across all caribou areas with a goal to identify and spatially maintain large patches of intact habitat over space and time. Develop and implement stand level best management practices to maintain caribou values in harvest areas. Use zones to further develop fine-scale restoration priorities.	Through collaborative planning with government, zones for spatially constrained forestry are being considered in the Fort Nelson timber supply area, whereby forestry activity will be constrained within a particular spatial area for a set period of time, after which road access will be removed and the entire area will be restored. This approach is thought to be more "caribou-friendly" than dispersed forestry across the landscape.
Model rate of habitat recovery, including uncertainties, to understand timeframe for recovery. Where timeline goals (one generation) are not met, increase restoration activities accordingly.	This task will be completed once the collaborative plan is in place.
Strategy 3: Improve population trends for at risk local populations	
Contemplate the need and logistical possibilities to employ methods to increase calf survival through year 1 of life (fences, maternity penning in critical areas).	FNFN has identified that these measures may be required in areas where spatially harvesting is permitted, during the harvesting period.
Confirm Wolf Management Zones in areas with very high wolf densities and large pack sizes. Employ traditional approaches to predator control, if and when all other protection mechanisms are in place (i.e., protection zones and restoration zones are implemented).	FNFN has identified a priority area to pilot wolf management, but has yet to begin incentivizing wolf management for our members. Internal discussions are ongoing.
Strategy 4: Change the management paradigm	
Approach land management using a framework that errs on the side of caution for the ecosystem, including caribou. Where science wavers, ensure decisions are precautionary as set out in the federal Boreal Caribou Recovery Strategy.	The FNFN–BC Government collaborative plan for boreal caribou recovery will rely heavily on monitoring key parameters to ensure that the decisions made and additional measures taken are precautionary, and allow caribou populations to slowly recover over time.
Ensure protection of critical habitat meets the SARA definition — i.e., it is legal and permanent to avoid triggering the federal safety net.	The FNFN–BC Government collaborative plan will use strong measures where possible to protect habitat.
Strategy 5: Monitor results and adapt	
Continue to monitor caribou population parameters to understand population dynamics and trends.	Ongoing through the province of BC.
Employ monitoring strategies to ensure functional success of restoration before additional disturbance is allowed in any critical habitat areas.	Ongoing through funding from the BC Habitat Conservation Trust Foundation (HCTF).
Investigate restoration potential in fens and treed bogs and other wet ecosites — favourable habitat for caribou, which are very prevalent in FNFN territory but are notoriously di cult to recover appropriate vegetation.	Ongoing through funding from HCTF.
Continue to gather and compile FNFN Indigenous knowledge about habitat use and distribution for caribou, to fine-tune this Action Plan..	This report fulfils this management directive.
Identify additional critical assumptions and ensure appropriate monitoring or sensitivity analysis.	Ongoing joint planning between FNFN and the province of BC.
Strategy 6: Build a stable economic future	
Create a task force between FNFN, the provincial government and industry to identify barriers and opportunities to ensure economic development in FNFN territory leads to economic stability. The current boom / bust approach to development does not lead to social well-being, and promotes a dichotomy between jobs and the environment that has unacceptable outcomes for environmental values and people, jobs and communities.	This is an important strategy that has yet to be explored. Fort Nelson needs stable employment to continue being a viable community.

Boreal Caribou Monitoring Requirements

FNFN has been critical of government for failing to enact plans that adequately recover boreal caribou habitat and prevent the ongoing degradation of habitat. With the collaborative boreal caribou protection and recovery plan being jointly developed by FNFN and the province of BC, FNFN has been clear that robust monitoring of the strategies used in this plan must be undertaken. FNFN has identified the following measures that must be taken to ensure that effectiveness monitoring is rigorous and government is held accountable for changing management practices if boreal caribou populations continue to decline:

- The province of BC needs to commit to continued monitoring of caribou populations until they are considered secure.
- More effort to manage wolf populations is needed, particularly in key areas of FNFN's territory identified by knowledge holders as high in wolf numbers.
- Monitoring the effectiveness of boreal caribou habitat recovery is critically important. To this end, FNFN will be monitoring changes in animal movement following habitat restoration treatments using camera traps, and the recovery of seismic lines following treatment using fixed vegetation plots.
- Establish restoration standards for wells that are orphaned or will be orphaned, to ensure that these standards are strong enough to actually encourage the surrounding habitat to regrow.
- Develop a mechanism to make sure that implementation of the plan is subject to ongoing input from FNFN knowledge holders. To that end, FNFN recommends the establishment of a joint decision-making body (BC and FNFN) to review monitoring results and identify new management strategies if desired outcomes (population and/or habitat) are not being achieved.

The Future

> *Oh, I hope they* [the caribou] *come back. Anyway, I hope so.* (F26 2018)

FNFN envisions a future in which the Nation's inherent rights to protect, manage and access the lands and resources according to our own laws are respected and upheld. FNFN members require healthy populations of animals in preferred hunting, fishing and trapping areas to support the meaningful and ongoing practice of FNFN's treaty rights. Caribou are an integral part of FNFN culture and critical to the continuity of FNFN's cultural revitalization and survival. Abundant and healthy caribou herds are considered indicators of a healthy land. As the Medzih Action Plan notes, there is no lack of data, including local knowledge to document the decline of caribou across the boreal — but there continues to be a lack of real action.

It is time for that to change, for ecological limits to be acknowledged, and for real action to be taken to prevent the ongoing degradation of our lands and resources. Fort Nelson First Nation believes that this is possible in parallel with moderated and planned economic development, and that these opportunities will benefit communities living in northern BC Treaty 8 territory for the long term.

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FORT NELSON FIRST NATION

RESPECTING OUR PAST

SUSTAIN OUR FUTURE

WILL