Bathurst Caribou Range Plan

Supporting Report:

Traditional Knowledge of Caribou and Caribou People

January 2018

Acknowledgements

The Bathurst Caribou Range Plan (BCRP) Project Team is grateful to community members and members of the Working Group who provided generous contributions of time, knowledge, insight, guidance, and encouragement. The Project Team is led by Karin Clark (Government of the Northwest Territories) and includes Dan Ohlson (Compass Resource Management), Shawn Francis (FSR Consulting), John Nishi (EcoBorealis Consulting) and Natasha Thorpe (Trailmark Systems/Thorpe Consulting Services).

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Disclaimer

Specifically, this report describes both Traditional Knowledge related to the Bathurst caribou and its habitat and the ways in which Traditional Knowledge was considered in the BCRP.

This report does not represent a comprehensive summary of the Traditional Knowledge of Indigenous communities related to the Bathurst herd and its range. Further, it does not reflect the results of community consultation and engagement nor Government policy direction.

Traditional Knowledge is a system or oral tradition and much knowledge has not been documented in writing. This report summarizes only Traditional Knowledge from documented and publicly available reports or other sources provided exclusively for use in the BCRP process. Knowledge of Indigenous peoples is intellectual property; recognition and respect for such knowledge is framed by the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP). Citing of quotes or material from Traditional Knowledge found in this report should be done so using standard academic citing practices. Communities and elders quoted should be contacted to ensure their consent if the materials in this report (including quotes) are used for other reports, processes or uses. Communities and elders may reserve the right to limit the use of this material. Use of this Traditional Knowledge by any other party does not infer comprehensive understanding of the knowledge, nor does it infer implicit support for activities or projects in which this knowledge is used in print, visual, electronic, or other media.

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DRAFT

TABLE OF CONTENTS

DRAFT

DRAFT

List of Figures

List of Tables

List of Appendices

DRAFT

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DRAFT

1 Introduction

1.1 Background on the BCRP

Calls to develop a strategy to balance the interests of caribou, people, and economics have been echoing through communities and meetings for decades. However, while there have been several starts in the past - in similar yet different formats - the Bathurst Caribou Range Plan (BCRP or the Plan) represents the first completed strategy that considers thresholds and evaluates cumulative impacts of natural and human factors of disturbance in this balance and seeks to find a thoughtful path forward. The process to develop the Plan began in 2014 and resulted in the completion of the Plan in 2018.

Indigenous peoples have always taken the responsibility of caribou guardianship across the range seriously, according to natural law and Traditional Knowledge**.** However, the relatively recent decline in barren-ground caribou in general and in the Bathurst herd in particular catapulted the need for the Plan to the forefront and inspired all parties into quick yet thoughtful action. The Plan itself is based on the hard work, dedication and innovation of multiple parties representing various organizations, jurisdictions, perspectives and more. This Plan and the supporting documents are available from the GNWT website at http://www.enr.gov.nt.ca/en/services/barren-ground-caribou/bathurst-caribou-range-plan.

The Plan aims to balance the diverse interests of governments, communities and stakeholders across the range in Nunavut, Northwest Territories and northern Saskatchewan. Detailed consideration and discussion of ecological, cultural and socio-economic values shaped the underlying framework, planning steps as well as the resulting management recommendations in the Plan. The Plan is advisory and all recommendations are non-binding.

The purpose of the Plan is to manage human-caused disturbance while considering natural disturbances such as fire in the Bathurst range and the effects on caribou, caribou habitat, and caribou people.[1] The Government of the Northwest Territories (GNWT) Department of Environment and Natural Resources (ENR) sponsored the development of the Plan in response to concerns expressed by northerners as well as recommendations from the Mackenzie Valley Environmental Impact Review Board (MVEIRB),[2] and Wek'èezhìı Renewable Resources Board (WRRB)[3] for government to take a leadership role in managing the cumulative impacts on Bathurst caribou.

[1] The term "caribou people" is used throughout the BCRP out of respect for the centrality of caribou to Aboriginal peoples across the range of the Bathurst herd. So important have caribou been to northern Aboriginal peoples that early explorers and anthropologists wrote about the Kivalliq Inuit as the "caribou Eskimo [sic]" and the Athabasca Denesǫłiné the "caribou-eaters" (Hearne 1795; Birket-Smith 1929; Hall 1989; Gordon 1996). Aboriginal peoples today continue to refer to themselves as "caribou people" (e.g. BCRP 2016; AD 2016).

[2] MVEIRB 2013; MVEIRB 2016

[3] WRRB 2016b

The Plan is also meant to complement management actions already in place for the herd such as traditional laws,[4] harvest restrictions in the Bathurst Mobile Conservation Core Area and predator management considerations. The Bathurst herd is among the most commonly and highly valued sub-arctic ecological, socio-economic and socio-cultural systems (i.e., keystone species). For this reason, declines in the population of caribou, including sharp declines in the Bathurst herd, present major challenges to northern communities. The Plan aims to provide greater clarity for land use decision-making across the range and to serve as a starting point to heal the relationship between people and caribou.[5]

1.2 Background about the Inclusion of Traditional Knowledge

Traditional Knowledge is a critical source of knowledge about caribou and caribou habitat. The GNWT "Traditional Knowledge Policy" as well as decision-making processes of the WRRB require that Traditional Knowledge be given equal consideration to science in the planning, management and monitoring of natural resources.

The Indigenous people of this region - sometimes referred to as "caribou people" - have strong values, beliefs and institutions (rules) that have been critical to the sustainability of the Bathurst caribou herd for many generations. By providing a summary of such knowledge, the aim of this report is to ensure that governments and other actors involved in the management of the caribou herd can address and improve the threats and balance management challenges that have developed for caribou, habitat and caribou people over the last two decades and may emerge in the coming years.

The purpose of this report is to summarize relevant Traditional Knowledge that has been previously documented and is publicly available about the Bathurst caribou herd, its habitat as well as human-caribou relations. The report specifically highlights Traditional Knowledge relevant to the management of caribou, caribou habitat and principles of respectful caribou-human relations; by doing so, we aim to more clearly explain how Traditional Knowledge has shaped the development of the Plan and may be useful in ensuring its effective implementation.

The intention of the Plan from the outset has been to equally value both Traditional Knowledge and western science so that the process and resulting Plan come from a place of seeing with two eyes[6] and having the strength of two people.[7] This report weaves together the diverse and interconnected knowledge of the Indigenous people of the Tłı̨chǫ region (Behchokǫ̀, Edzo, Whatì, Gamètì and

[4] Thorpe et al. 2001; Kendrick et al. 2005; TRTI 2016a; DNNLC 2016; LKDFN 2016; Parlee et al. 2013, 2017
[5] TRTI 2016b; BCRP 2016
[6] Two-eyed seeing was proposed by Mi'kmaw Elder Albert Marshall in 2004 based on the concept that we are all stronger by using one eye to see Indigenous knowledge and the other eye to see western science. Weaving back and forth between using each eye independently and then together will ultimately lead to integration. For more on this discussion, see: www.integrativescience.ca/Principles/TwoEyedSeeing.
[7] Tlicho Chief Jimmy Bruneau was a strong advocate of formal education, but not at the risk of his people losing their language and culture. In 1936, the words of Chief Jimmy Bruneau were famously translated to mean "strong as two people" highlighting the importance of learning both from Tlicho culture and traditions as well as the "whiteman" [sic] worldview to thrive in a changing world.

Wekweètì), the Yellowknives Dene First Nations (N'Dilǫ and Dettah) and the Denesǫłiné community of Łutsel K'e Dene First Nation. Also included are the knowledge of the Inuit of Kugluktuk and Cambridge Bay in Nunavut, the Athabasca Denesǫłiné First Nations at Fond-du-Lac, Wollaston Lake and Black Lake in Saskatchewan, as well as the many Metis communities throughout the Range (Figure 1). Communities within the range have not had equal opportunities to document their knowledge. Generally, those communities with settled land claims and who have been deeply involved in environmental assessment processes have tended to document more knowledge than elsewhere.

Traditional Knowledge is a cumulative body of knowledge about ecosystems and peoples relationships within those ecosystems. Throughout this document and the Plan process, the term "Traditional Knowledge" is used, but it is important to recognize that each Indigenous community and culture-language group refers to their own knowledge in less academic terms (e.g., Dene knowledge, knowledge about our way of life, what has always been known). Inuit beliefs, laws, principles and values along with Traditional Knowledge skills and attitudes are what the Government of Nunavut and others refer to as *Inuit Qaujimajatuqangit.*[8] Researchers and government documents also use Traditional Knowledge interchangeably with traditional ecological knowledge and Indigenous knowledge. While local knowledge is sometimes used to mean Traditional Knowledge, in this report it refers to the knowledge of non-Indigenous peoples who have shorter-term observations (i.e., years to a few decades). Such local knowledge does not offer the powerful multi-generational or cumulative nature of knowledge systems that is often shared by Indigenous peoples.

Much of the Traditional Knowledge shared offers parallel ideas about why and how the Bathurst range should be cared for, protected and watched; however, there are aspects of Traditional Knowledge shared in this report and elsewhere that are not in agreement with insights from science. Further, there are cases where the Traditional Knowledge of one community does not mirror the voices or knowledge of another community. Indigenous communities in the range with more observations and experience with mining activity in their traditional territory may have stronger perspectives and interpretations about the impacts on caribou than other communities with comparatively less experience.

Although Traditional Knowledge is sometimes confused with opinion on the one hand, or "data" on the other hand, it should be recognized as a system of knowledge, practices, beliefs and institutions (rules related to stewardship and taking care of caribou). While scientific insights about caribou are less than 50 years in scope, the perspectives of Indigenous peoples about caribou extend beyond the current generation and offer insights from hundreds - if not, thousands - of years of observation and experience.

Like science, much Traditional Knowledge is also based on systematic empirical observation. Although very similar to science, Traditional Knowledge is unique from science in that it offers insight about the non-physical world (spiritual) as well as the physical world.[9]

[8] Nunavut Social Development Council 1998
[9] Parlee and Caine 2017

FIGURE 1: COMMUNITIES ACROSS THE BATHURST CARIBOU RANGE.

Note the Bathurst herd historical range as identified by Traditional Knowledge.

1.3 Intellectual Property

The knowledge shared in this report was drawn from previously documented and publicly available Traditional Knowledge from Indigenous communities in the Northwest Territories, Nunavut and northern Saskatchewan. However, ownership of the knowledge (i.e., intellectual property) summarized remains in the hands of the individual knowledge holders and the communities, organizations and researchers involved in the research activities. Further or other use of the knowledge summarized in this report should be done in ways that respect original voices and knowledge holders. Those seeking to use this report or the content are encouraged to contact the Indigenous organizations as the original source of information and to follow their guidelines for respectful use of the knowledge shared. Readers are encouraged to refer to the disclaimer at the outset of this document for more detail.

1.4 Caribou People in the Bathurst Range

The Bathurst caribou range is a socio-cultural, economic and physical landscape that Inuit, Métis and other northerners share with caribou. The caribou were here before the people and are the lifeblood of the people. Many Dene cultures tell us, for example, that people were born from the caribou. As Herman Catholique, a Ni Hatni Dene watcher from Łutsel K'e explains, *"We are caribou people you know. That is what they call us."*[10] Together, these "caribou people" have relied upon and fostered a strong relationship with caribou for thousands of years.

Barren-ground caribou are defined in local languages and dialects as tuktu (Inuinnaqtun, Inuktitut), ʔekwę (North Slavey), ʔetthe̓n (Denesǫ́liné) and ekwǫ (Tłı̨chǫ). Because caribou are so important to the arctic ecosystem and arctic communities, scientists and governments call them a cultural keystone species. [11] [12] [13]

It is through the practice of respect (i.e., following natural and traditional laws and practices around behaviour, harvesting, knowledge accumulation and knowledge transfer) that caribou herds remain abundant and healthy and the relationship between caribou and Indigenous people is maintained.[14] This respect is grounded in a deeper and broader understanding carefully honed through direct observation and repeated story-telling from one generation to the next.

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[10] Catholique, Herman of Łutsel K'e in discussion with Natasha Thorpe, June 6, 2017, Bathurst Caribou Range Plan Traditional Knowledge Workshop, Yellowknife, NT.

[11] Garibaldi 2009; BCRP 2016; BCRP 2017.

[12] Legat 2008; Beaulieu 2012; EMAB 2012; Sangris 2012; Parlee et al. 2013; TCS 2014a, 2014b; Trailmark 2015; TRTI 2016a; DNNLC 2016; LKDFN 2016; YKDFN 2016; BCRP 2016; BCRP 2017; Parlee 2017

[13] "Throughout the world, people strongly identify with plants and animal species on which they depend for cultural and economic reasons. These species, CKS [cultural keystone species], comprise more than food or sources of raw materials. They permeate a culture's stories, spiritual practices, and language and daily practice. ... Just as ecologists have long recognized that some species, by virtue of the key roles they play in the overall structure and functioning of an ecosystem are essential to its integrity, certain plants and animals feature prominently in language, ceremonies, and narratives of Indigenous peoples," (Garibaldi 2009: 4).

[14] Parlee et al, 2013

2 General Approach to Developing the BCRP

Key outcomes of the Plan (highlighted in Section 8 of this report) include management recommendations addressing human-caused disturbance to caribou and caribou habitat in a manner that weaves in and draws upon Traditional Knowledge both alone and co-produced with scientists, governments, and northerners to support decision-making (Figure 2).

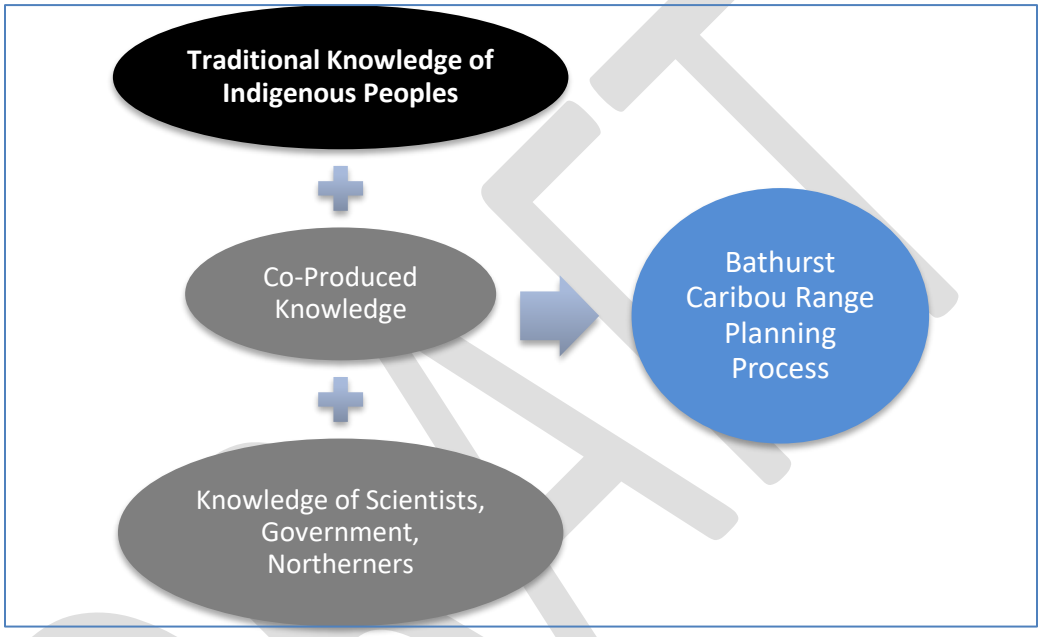

FIGURE 2: WAYS OF KNOWING WOVEN INTO THE PLAN.

2.1 Planning Steps

The following general steps were used to develop the Plan:

1. Gather Information - Understand the Range (people, land use and caribou):

- Information was gathered on people, land use and Bathurst caribou and caribou habitat through literature reviews, input of Working Group members and other experts, Traditional Knowledge submissions from Governments and organizations, and two Traditional Knowledge workshops.

2. Understand Major Factors Affecting Caribou:

- Traditional and scientific perspectives on factors affecting caribou were documented and compared.

3. Identify Key Issues and Management Concerns:

- Based on above, key issues or management concerns were identified that should be addressed within the scope of the range plan.

4. Explore Management Options to Address Management Concerns:

- The BCRP Working Group explored and evaluated management options, that consider the sometimes competing objectives related to caribou, cultural and economic values.

The Bathurst Caribou Range Plan[15] is structured around a goal, principles, objectives, range management tools and management recommendations.

This supporting document provides a summary of the Traditional Knowledge that was used to help inform each step of the planning process and each component of the Plan. Two other companion supporting reports to the BCRP describe the technical and scientific information (Caribou Technical Information and Range Assessment[16]) and land use and economic information (Land Use Scenarios and Economic Considerations[17]) used and considered by the BCRP Working Group.

2.1.1 Defining a Planning Boundary for the Bathurst Herd

Traditional knowledge tells us that caribou use of the landscape has always been dynamic, at times growing larger or smaller, depending on available food, herd numbers, wildfires, winter snow conditions, and the influence of caribou leaders on migratory routes.[18] For example, over the past decades, Inuit have watched the Bathurst herd calving ground shift from the east to the west side of Bathurst Inlet.[19] Łutsel K'e Dene First Nation hunters have also observed the fall/winter migration routes moving east over the last two decades.[20]

Although the Bathurst range is always changing, a well-defined area was required for the purposes of the Plan. As such, a planning boundary was adopted based on the overlapping area according to both Traditional Knowledge and scientific data (Figure 3). The annual range of the Bathurst herd derived from radio collared female caribou from 1996-2014[21] was modified slightly to account for recent observations discussed during several early Working Group meetings. This boundary allows the Plan to accommodate herd recovery and growth relative to its current status. The areas used by Bathurst

[15] BCRP 2018a.
[16] BCRP 2018b.
[17] BCRP 2018c.
[18] Hall 1989; Thorpe et al. 2001; Legat et al. 2001; Parlee et al. 2005a, 2005b; Wray 2011; Beaulieau 2012; Sangris 2012; Parlee et al. 2013; BCRP 2016, 2017; TRTI 2016a; LKDFN 2016; YKDFN 2016; Parlee 2017.
[19] Thorpe et al. 2001; Golder and KAA 2010; KIA 2012; TCS 2014a, 2014b.
[20] Parlee et al. 2015
[21] As described by Nagy 2011.

caribou since 1996 are the focus of planning efforts; however, the larger range identified through Traditional Knowledge is understood to be the potential range over a much longer time period. The Plan is intended to be a living document and the range planning area may be revisited as environmental and land use conditions change.

The range planning area, which is approximately 390,000 km^2, is large and diverse. Figure 4 identifies land management considerations in the range planning area.

Bathurst caribou have roamed from the taiga forests in northern Saskatchewan to the Arctic Coast tundra in Nunavut. Different types and intensities of land use occur in different parts of the range. The range is diverse such that some areas have been affected to a greater extent by wildfire while other areas experience greater human access.

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FIGURE 3: BATHURST CARIBOU RANGE ACCORDING TO TRADITIONAL KNOWLEDGE PLUS THE RANGE PLANNING AREA.

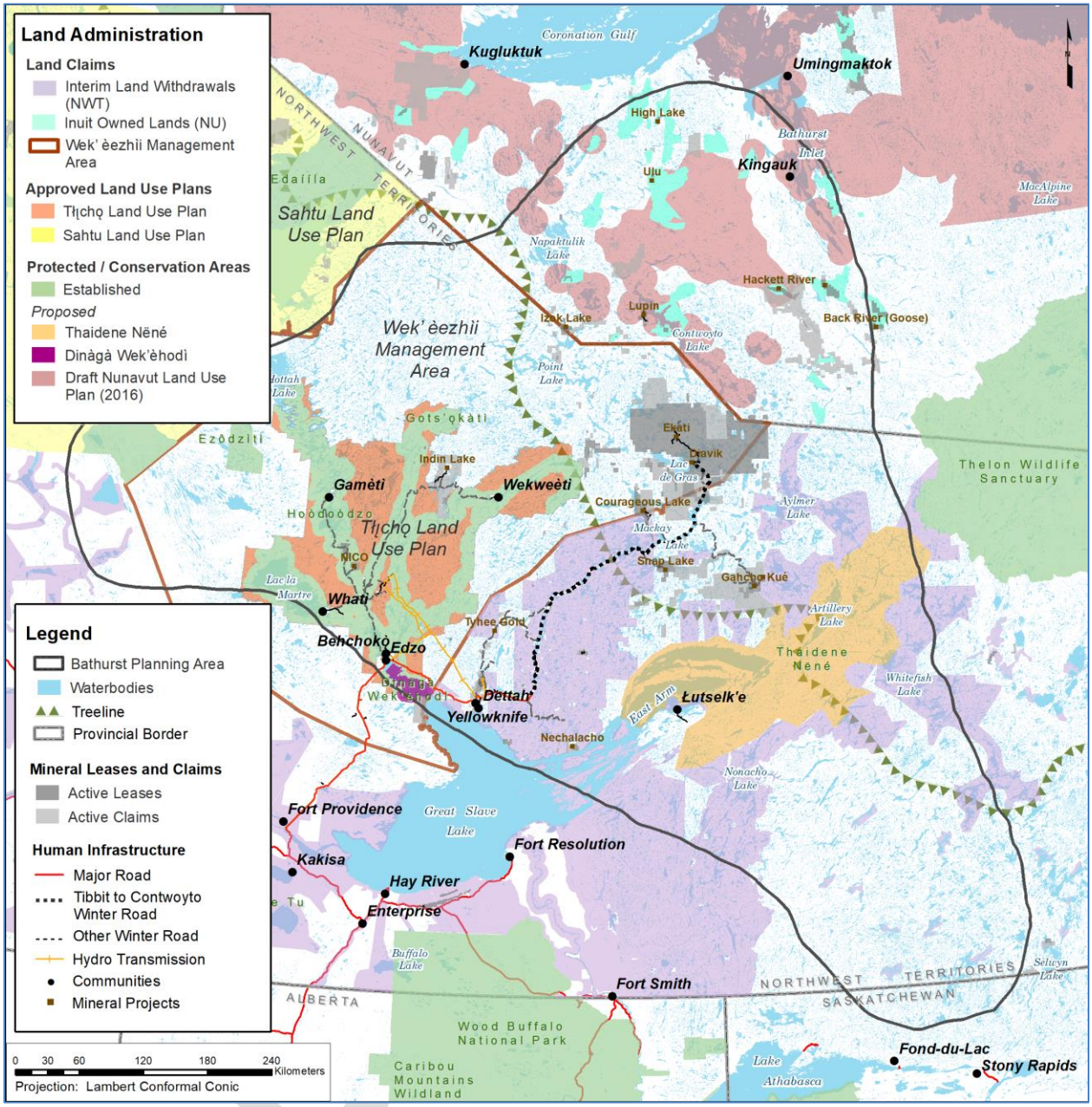

FIGURE 4: LAND MANAGEMENT CONSIDERATIONS IN THE BATHURST RANGE PLANNING AREA.

2.2 Summary

The Plan draws upon Traditional Knowledge both alone and together with knowledge held by scientists, governments, and northerners to support decision-making addressing human-caused disturbance to caribou and caribou habitat for the Bathurst herd.

The Plan is based on four key planning steps:

- Gather information – understand the range (people, land use and caribou)
- Understand the major factors affecting caribou
- Identify key issues and management concerns
- Explore management options to address those concerns

The Bathurst Caribou Range Plan is structured around a goal, principles, objectives, range management tools and management recommendations. More detail around the Plan planning steps, approach, participants and process can be found in Chapter 1 of the Plan itself.[22]

The range considered in the Plan (i.e., the range planning area) is the area where combined knowledge suggests the area is currently used by the Bathurst herd. This is a smaller area than the range caribou used historically according to both Traditional Knowledge and science.

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[22] BCRP 2018a.

3 Methods: Traditional Knowledge in the BCRP

> *Traditional knowledge is very different from scientific knowledge because you can use some of this stuff on the caribou but Traditional Knowledge is living, it's today, it's not something that you can pull out of a drawer like scientific knowledge where there is data written down. Traditional knowledge is alive, it's at the moment and every single species is different.* — Arthur Beck in BCRP Traditional Knowledge Workshop, March 30, 2016 in BCRP 2016)

From the outset, it was well understood that Traditional Knowledge held by caribou people would be vital to achieving the Plan's central goal of ensuring the Bathurst caribou herd range is in a resilient landscape condition. Traditional Knowledge derived from a literature review, workshops, meetings, reports, and community-based map data – as well as from Working Group members – formed the basis for developing key principles and processes to guide the Plan.

3.1 Gathering Information

The Project Team used five main pathways to gather Traditional Knowledge for the Plan as shown in (Figure 5):

- First, members of a Working Group provided critical and ongoing input, advice, suggestions, and direction on how, where and what understandings about caribou should be included.[23]
- Second, a literature review of publicly available documented Traditional Knowledge references was carried out.
- Third, new and existing information was synthesized into community reports by some Indigenous governments and organizations through two separate opportunities, once each in 2016 and 2017.
- Fourth, traditional land use information (e.g. spatial data) was shared by some participating groups.
- Fifth, two workshops dedicated to sharing, verifying and discussing Traditional Knowledge of Bathurst caribou were held with Elders and other knowledge holders in Yellowknife on March 30-31, 2016 and June 5-6, 2017.

[23] Note that any Traditional Knowledge shared during meetings was verified through the review of meeting notes by knowledge holders.

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FIGURE 5: AN OVERVIEW OF PATHWAYS TO WEAVE TRADITIONAL KNOWLEDGE INTO THE PLAN.

3.1.1 BCRP Working Group

The Bathurst Caribou Working Group has a total membership of 21 groups, including 11 Indigenous organizations and seven Indigenous groups. Each group selected their representative based on his/her caribou expertise to participate in 11 meetings between 2014 and 2017. During these meetings, members provided key guidance when reviewing the appropriateness, accuracy and comprehensiveness of Traditional Knowledge presented or reviewed. Rich discussions provided vital insights into areas of convergence and divergence in Traditional Knowledge and conventional scientific understandings of caribou, as well as different understandings from Traditional Knowledge either among or between Aboriginal groups. A review of meeting minutes shows that these discussions themselves represented – even embodied – the weaving of multiple ways of knowing.

3.1.2 Literature Review

As part of the BCRP planning process, key sources considered included:

- Key community collaborations and reports (Zoe et al. 1995; Dogrib Treaty 11 Council 2001; Parlee and LKDFN 2000, 2001; Legat et al. 2001, 2002; Thorpe et al. 2001; Ellis et al. 2002; Parlee et al. 2005; Legat et al. 2008; TRTI 2013, 2014, 2015; 2016b)
- Literature reviews of Traditional Knowledge related to the caribou (Parlee et al. 2013; Trailmark 2015) and state of knowledge in the West Kitikmeot Slave Study area (SENES 2008)
- Published literature (e.g. Kendrick 2005; Legat 2008, Parlee 2017)
- Academic theses (e.g. Thorpe 2000; Wray 2010; Bechtel 2011; Dokis-Jansen 2015)

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Emphasis was given to the literature reviews (e.g. Parlee et al. 2013) as well as the community summary reports described below (AD 2016; LKDFN 2016; NWTMN 2016; TRTI 2016a; YKDFN 2016). Additional references broadly informed the BCRP approach according to the following themes, but were not the main focus of the literature review:

- Caribou habitat and Traditional Knowledge (Dogrib Treaty 11 Council 1998; Dogrib Treaty 11 Council 2001, 2002; Legat et al. 2001; 2002; Thorpe et al. 2001)
- Community-based monitoring and Traditional Knowledge (LKDFN 2001; Lyver 2002; Kofinas et al. 2003; Lyver and Łutsel K'e Dene First Nation 2005; Legat et al. 2008; Padilla and Furgal 2010; EMAB 2012; Dokis-Jansen 2015)
- Cumulative effects and Traditional Knowledge (e.g., LKDFN 2001; TRTI 2016a; 2016b)
- Environmental change and Traditional Knowledge (Thorpe 2000; Lyver 2002; Wesche and Armitage 2010)
- Bridging Traditional Knowledge and Science (Gunn et al. 1998; Lyver 2000; Andrews 2002; Bateyko 2003; Nadasdy 2003; Anderson and Nuttall 2004; Berman and Kofinas 2004; Hawley et al. 2004; Moller et al. 2004; Armitage 2005, Berkes 2005, Ellis 2005, Huntington et al. 2002, 2004; Lyver and Gunn 2004; Stevenson 2006; Berkes 2008; Golder et al. 2010; Bechtel 2011; Bayha 2012)
- Co-management, resource management and wildlife (Thorpe 2000; Thorpe et al. 2001; Kendrick 2003; Wenzel 2004; Gilchrist et al. 2005; Kendrick et al. 2005; Manseau et al. 2005; Nuttal et al. 2005; Padilla 2012; Parlee 2012; Sangris 2012; Parlee and Caine 2017;)

Finally, a limited number of reports carried out as part of environmental assessment processes for proposed developments or reports from operating mines were reviewed (Terra Firma 2004; BHP Billiton 2007; EMAB 2008, 2012; Thorpe Consulting Services 2014).

3.1.3 Community Reports

All participating groups were funded to synthesize their Traditional Knowledge sources and databases to provide voice on what they deemed the most relevant understandings to inform the Plan.[24] A list of guiding questions was provided to each group to frame their reports, but this was shared as an invitation and not an imperative (see Appendix A).

The availability of published and non-confidential references related to Traditional Knowledge of caribou varies between communities across the range of the Bathurst herd. Some groups have had access to more funding to better develop their internal databases or to carry out Traditional Knowledge projects. For example, resource development within territories of some groups is more intensive than in others and so the number of Traditional Knowledge reports carried out as part of environmental assessment processes (and the associated funding) has similarly varied.

[24] Community reports submitted include: AD 2016; LKDFN 2016; NSMA 2016; TRTI 2016a; YKDFN 2016.

The fact that this sensitive information and knowledge was shared by many groups underscores the level of caring expressed by caribou people: the trade-off between holding Traditional Knowledge close to advance individual Nation interests was weighed with sharing this Traditional Knowledge with the Project Team. Further, that caribou people shared what was often highly sensitive or confidential, speaks to a dedication to helping the Bathurst caribou and the level of trust among Working Group and Project Team members. Understandings shared in these reports along with spatial data significantly improved the quality and scope of the BCRP in ways that would not have otherwise been possible.

3.1.4 Traditional Knowledge Databases and Traditional Land Use Mapping

At the request of the BCRP Project Team, the Kitikmeot Inuit Association, Tłı̨chǫ Government, Yellowknives Dene First Nation, Athabasca Denesǫłiné First Nation and North Slave Métis Association generously agreed to share critical insights into caribou from their respective community Traditional Knowledge databases. Key themes such as caribou harvesting trails, migration routes, calving grounds, habitat, and crossings were woven into the goals, principles, management objectives, tools and recommendations. These spatial files, overlapping in many areas, were then mapped together across the range and results combined with other information and integrated into the Plan. Understandably, not all groups (i.e., NWTMN, LKDFN) were comfortable sharing spatial information, likely due to data confidentiality issues or uncertainty in land claim negotiations and other land-based processes.

3.1.5 Traditional Knowledge Workshops

To build upon the literature review and community reports and to provide a forum to discuss and address Traditional Knowledge of caribou presented in the Plan, the next pathway to weave Traditional Knowledge into the Plan was through two workshops that were held in Yellowknife (see Appendix B for more detail on workshop methods). The 2016 and 2017 Workshop reports are included in Appendix C and Appendix D, respectively, and contain much important information that has informed this report and been woven into the Plan.

3.2 Criteria for Identifying Relevant Sources of Traditional Knowledge

The criteria for including Traditional Knowledge references included in this review were as follows:

- Written by Indigenous organizations;
- Co-authored and/or co-produced with community members;
- Demonstrated a clear review and verification process;
- A product of informed consent; and
- Focused on the Bathurst caribou herd.

Online blogs, newspaper articles and meeting minutes were not reviewed. Some reports prepared for environmental assessments were considered although they were not a focus of the review. Time and resources may have prevented some materials from being included.

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3.3 Reviewing, Sorting and Weaving Traditional Knowledge

Once Traditional Knowledge of caribou from the various pathways was reviewed, the next step was to identify key themes, sort them accordingly, and then weave them into the Plan (see Appendix E for methods details on this process).

3.4 Challenges in Weaving Traditional Knowledge into the Range Plan

Traditional Knowledge is being documented and woven into the Plan at a time when both the underlying context and current issues confronting this knowledge system are complex. For example, consider the challenges of an oral tradition; the complexities inherent in "being in relationship" with caribou; variations and differences in caribou behaviour, habitat, migrations, movements etc. across a vast area that spans traditional territories and political divides; and the realities of trying to speak with confidence about observations made within a time of rapid environmental change and the associated realities of living within profound uncertainties and extremes.[25] Further, there are additional complexities associated with weaving Traditional Knowledge into a system of range planning that is heavily influenced by government and scientific methods. The disconnect between science and Traditional Knowledge has been discussed at length by Indigenous peoples and in the academic literature.[26]

In considering the weaving of Traditional Knowledge into the Plan, it is important to realize the following:

- **Traditional Knowledge is more than Just Data –** Traditional Knowledge is embedded in the way of life of Indigenous peoples and includes local knowledge (data), as well as beliefs, practices and principles of stewardship and governance. Focusing only on the "data" (i.e., decontextualizing Traditional Knowledge to create science-like factoids) and limiting the social and political context of such knowledge renders it less meaningful than if taken together as a whole.

- **Oral Traditions -** Traditional knowledge is generated and passed on through oral tradition.[27] As such, much of it is undocumented. The controversial act of taking Traditional Knowledge from

[25] Krupnik and Jolly 2002; BQCMB 2011; Legat 2012; Parlee and Furgal 2012; Jacobsen 2013

[26] Cruikshank 1994; Agrawal 1995; Legat et al. 1995; Abele 1997; Duerden 1998; Nuttall 1998; Burgess 1999; Nadasdy 1999, 2003; Wenzel 1999; Faye 2001; Folliott 2004; Huntington et al. 2004; Berkes 2008; Hulan and Eigenbrod 2008

[27] Out of respect for the nature and quality of Traditional Knowledge, rather than simply review the literature, much of the original 'voice' of these primary sources was preserved through inclusion of direct quotes. However, documenting Traditional Knowledge in written form presents the wisdom, experience, and knowledge as static and neglects the fact that Traditional Knowledge is dynamic and evolving, continuously enhanced, and updated through ongoing observations.

the oral tradition into the written word and from there trying to summarize key themes is necessarily both imperfect and incomprehensive. The context in which Traditional Knowledge is conveyed is primarily oral, from person to person. Shifting from an oral to written form presents unique challenges as the meaning, issues and concepts raised by contributors may be compromised. Therefore, there are challenges in ensuring that there is equitable consideration of these oral histories in this report and in the Plan itself.

- **Translation and Transcription Introduce Error -** Observations communicated in Indigenous languages were translated into English, thereby creating potential for error, misinterpretation or loss of information. Also, it was observed and commented upon by participants that some interpreters provided near verbatim translations while others summarized key themes and topics in English. The general challenges of translation and interpretation are well documented.

- **Management Plan Structure creates Opportunities and Limits** – The Plan was initiated by the GNWT and is structured within and according to principles and processes of this government and its system of decision-making despite the uniquely progressive and collaborative approach undertaken. Indigenous peoples of the region have different systems of governance that reflect different values, principles and processes of decision-making. It is therefore important to recognize that there are opportunities associated with- but also limits to - the kinds of Traditional Knowledge that can be integrated into planning and management of the Bathurst range.

- **Players Present in the Room Matter to the Process -** Working Group members and the Traditional Knowledge Workshop participants may have been influenced by the nature, extent, and content of the discussions and the composition of the audience. For instance, it is possible that elders may have provided more detailed information when youth were present and been more tentative to discuss sensitive issues when certain parties (e.g., government) was present. During Working Group meetings, wildlife information provided by attending scientists may have also influenced the direction and nature of the discussions among workshop participants.

- **Gender Imbalance can affect Process and Products** - More men than women participated in the process and so there are elements of the female perspective that are missing. Likewise, input from the youth voice was limited. Where women and youth felt hesitant to contribute due to their minority in the room, some key Traditional Knowledge could have been missed.

- **Differences in Community Databases and Data Management Systems** - When reviewing maps, one must consider that each group is at a different stage of mapping their spatial Traditional Knowledge and developing their internal database management systems. Thus, while some areas within the range of the Bathurst herd may show more information than others, this may simply mean groups that have traditionally used that area have completed more mapping, and not that unmarked areas are less important for traditional use. Also, any Traditional Knowledge

DRAFT

map can only represent the specific Traditional Knowledge held by the particular Elders and land users who participated in the Traditional Knowledge mapping exercise.

- **Environmental Assessment Reports can have Different Purposes** - It was not possible to review hundreds of pages of consultant reports prepared for environmental impact assessments of resource development projects; although it is recognized that there may be additional information contained in these reports that could be relevant. Further, these reports are typically prepared with a specific goal related to a particular activity and so may not be relevant enough tor the BCRP. A selection of reports that were readily available is included in the present review (e.g. BHP Billiton 2007; KIA 2014; TCS 2014).

3.5 Summary

The Project Team used five main pathways to gather Traditional Knowledge for the Plan:

- Working Group meetings
- Literature review;
- Community reports;
- Traditional land use information (e.g. spatial data); and
- Traditional knowledge workshops.

Traditional knowledge references included in this review were prioritized when they were:

- Written by Indigenous organizations;
- Co-authored and/or co-produced with community members;
- Demonstrated a clear review and verification process;
- A product of informed consent; and
- Focused on the Bathurst caribou herd.

Once Traditional Knowledge of caribou from the various pathways was reviewed, the next step was to identify key themes, sort them accordingly, and then weave them into the Plan (see Appendix E for methods details on this process).

In considering the weaving of Traditional Knowledge into the Plan, it is important to consider the following challenges and limitations:

- Traditional Knowledge is more than just data;
- Traditional Knowledge is an oral tradition;
- Translation and transcription introduce error;
- Management plan structure created opportunities and limits;
- Players present in the room matter to the process;
- Gender Imbalance can affect process and products;
- Differences in community databases and data management systems;
- Environmental Assessment reports can have different purposes

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4 Gathering Traditional Knowledge: Caribou People and Caribou

The following section presents Traditional Knowledge gathered in order *to understand the range (people, land use and caribou)* and *to understand the major factors affecting caribou* as part of the first two planning phases of the Plan.

Caribou are the lifeblood of northern Indigenous communities across the circumpolar north, described by governments and scientists as a cultural keystone species because they have long sustained and shaped the cultural identity of Inuit, Dene and Métis peoples. Stories, lived experience and spiritual beliefs, economies and health patterns are inextricably linked to the sustainability of the Bathurst caribou herd.

Many of the communities within the Bathurst range have similar kinds of relationships to caribou; however, communities are also unique from one another and have different kinds of beliefs, histories and relationships to caribou. These unique attributes of culture, community and economy inform and shape the kinds of Traditional Knowledge available about caribou. Peoples living within the range of the Bathurst caribou include:

- Tłı̨chǫ communities of Behchokǫ̀, Edzo, Whatì, Gamètì and Wekweètì;
- Yellowknives Dene First Nation communities of N'Dilǫ and Dettah;
- Denesǫłiné community of Łutsel K'e Dene First Nation;
- Inuit communities of Kugluktuk and Cambridge Bay (as well as Bay Chimo and Bathurst Inlet) in Nunavut;
- Athabasca Denesǫłiné First Nation at Fond-du-Lac, Wollaston Lake, and Black Lake; and
- Metis communities throughout the Range.

In some communities, the relationship to caribou is woven together with Creation Stories (e.g., people were born from the caribou hoof). Many of the oral histories that are passed on from one generation to the next are grounded in place and particular kinds of histories of living with caribou. Stories of periods when the caribou did not come,[28] are common through the Northwest Territories and Nunavut as are stories when caribou returned to the people and there was much celebration. These periods of feast/famine, particularly during the early to mid-part of the 20th century offer lessons about how people can observe and cope with changes in caribou.

Remembrances of the imposition of government regulations to limit hunting in the 1950s are also part of the living memory of communities and affect how they participate in and interpret the process as well as the outcomes of this planning process.[29]

In the years when caribou came nearby, people were assured health and wealth in terms of food, clothing, tools and more.

[28] Parlee and Caine 2017
[29] Sandlos 2008

> *In fall time we go live with caribou. The good hunters, there are a lot of people like that. They go anywhere and they meet caribou right away because the animal knows that this person, the way it will be treated and taking care of it, is why the animals gives itself to him. This is how the elders were taught. This is the way my culture works in the past. (Joseph Judas in BCRP 2016)*

People and caribou live together across the Bathurst range within a networked set of social and ecological relationships. Caribou people across the Northwest Territories and Nunavut have established their camps and communities along well known-migration routes, water crossings and other areas frequented by caribou since time immemorial.[30] Still today, tent rings and caribou bones mark traditional migration routes.

4.1 Knowing Caribou

Knowing caribou means understanding their movements, migrations, body condition, and lifecycle: understanding how caribou think; respecting that caribou can transition from caribou to people and vice versa; and treating caribou with great reverence and gratitude. *Knowing caribou* could make the difference between survival and death and so this expertise was carefully developed and passed from one generation to the next. *Knowing caribou* and the responsibility for caribou guardianship that flows from this knowledge have combined to help shape recommendations and options within the Plan.

> *Hunting as an economy and culture, is based on a balanced relationship between the ndè and the people. The land and all beings within it are part of a social landscape. In Tłı̨chǫ culture, inanimate beings, such as the wind or lakes, are sentient beings with the ability to act and choose based on personal agency. Similarly, all animate beings, such as caribou, birds and fish, are also intelligent individuals with the ability to make conscious choices based on personal agency. The land is a social network with whom one can communicate and develop long-lasting social relationships. Animals are beings with personality and knowledge; they are not solely biological objects acting on instinct. This understanding makes the land more inclusive because all beings act socially towards each other, and to humans, in similar ways as humans relate to other humans. The concept of nature, then becomes a socio-natural landscape. (TRTI. May 4 2016: 61)*

Caribou have always been important to the diets, societies, cultures and health of Arctic Indigenous peoples; in previous years, when caribou migrations diverted or populations declined, there were times of great hardship. Because of the fundamental significance of caribou to people, the caribou are seen as leaders who take care of the people and find them on the landscape.

> *When you skin out the head of the caribou you will find writing on its forehead. No one can actually read this writing. However, in the past some elderly women would say it meant 'wherever the people are, that is where the*

[30] TRTI 2016

> *caribou will go.' The caribou would always eventually migrate towards the people. That is what they said was written there. (ML, 2000 in Kendrick et al. 2005:181 in Lutsel K'e Dene First Nation. April 2016: 9).*

Many of the Dene and Inuit oral histories talk of an ancient time when caribou and people spoke the same language and could understand each other or when people could become caribou and vice versa. In other oral histories caribou are referred to more like spiritual leaders who understand the future.[31]

> *The ɬekwö are not human. They are not human, but like prophets they can foresee everything that's on this part of the land. They don't talk, they don't understand one another but still, that's the way they roam on the land… As for the ɬekwö leader who they follow, she was born with the grace of God and it is like she knows what is up ahead of them. That's the way it is with the ɬekwö. In the old timer's way, they're like our relatives and we depend on them, so we are really happy. In the same way, they know they will not live but they are happy too… (Rosalie Drybones in Legat and Tłı̨ Chǫ 2001).*

> *A caribou herd turned a small boy into a caribou so that he could experience the life of a caribou on the barrenlands all the way to the big waters [ocean]. This change happened in the tree line. He followed the migration to the calving grounds and then back to the tree line again. After a year of living with the Caribou herd, he was allowed to be a boy again. The caribou told him that they know the people depend on them for food and clothing. That is why they migrate to the calving grounds and to the tree line so that the people can survive. Theresa Sangris 1997 in YKDFN 2017: 5)*

Use of the caribou range in a wasteful way (e.g., digging holes, building tailings ponds, abandoning mines), is similar to the kinds of disrespect of caribou that elders have said is against Dene law.

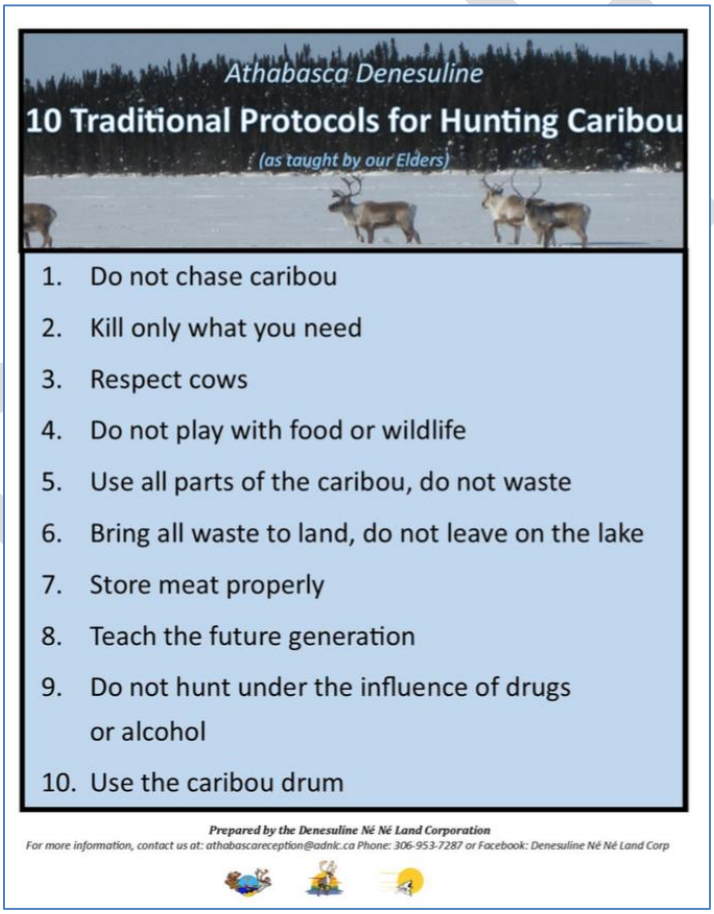
> *The Dene people when they kill caribou they always take good care of the meat and bones. Nothing is thrown away because everything is used. The people have a lot of respect for the caribou so nothing is thrown away. Today the white people shoot caribou, they leave the meat and bones scattered around (Therese Sangris 1997 in YKDFN 2016: 17).*

[31] Parlee and Caine 2017

Łutsel K'e Dene First Nation explains that there are several ways to follow traditional law in order to show respect for caribou:[32]

- Use as much of the animal as possible;
- Remove the tip from the caribou heart;
- Share meat with community members;
- Do not beat or poke the caribou with a stick;
- Do not chase caribou down with snow machines and run them to exhaustion;
- Women should not be involved in the hunting process while menstruating;
- Women should not step over the caribou's blood or the hunters' equipment;
- Treat the meat and animal products with respect once they are inside the home (i.e., not having blood on the floor or letting meat to bad); and
- Do not leave animals remains (e.g., bones) lying around outside.

Similarly, the Athabasca Denesǫłiné have published their traditional protocols for hunting caribou:[33]



[32] Kendrick et al. 2005
[33] Athabasca Denesǫłiné 2016.

4.2 Food Security and Health of Communities

Caribou meat has always been a fundamental source of food for the Dene, Metis and Inuit peoples of northern Canada. Cultural rules such as "after December, killing bulls is better" or "leave the cows"[34] or "respect cows, they will reproduce more" supported caribou people in encouraging caribou populations to thrive. [35]

During peak population periods, caribou meat represent very little to upwards of 70% of the protein consumed in the diet of northern communities.[36] While the harvesting of caribou and the caribou itself has invaluable cultural, spiritual and ecological significance, replacement value of meat in the Northwest Territories has been estimated in the millions of dollars per annum.[37] Although there are important traditional food alternatives (e.g., fish, moose), the disappearance of caribou is having significant adverse effects where meat is replaced with less healthy alternatives (e.g., store bought food). The associated rise in consumption of less nutritional foods has been linked to rising increases in lifestyle diseases such as Type II diabetes and chronic heart disease.

The disappearance of caribou in the region has also been linked to many other social, cultural and health impacts. Elders have been known to slip into depression and lose their health without caribou, not only because they lack caribou meat in their diet, but also because they 'miss being with them.[38] The experience of hunting, sharing meat with community members, and passing on knowledge of preparing hides is central to cultural integrity: these important experiences are threatened or lost when there are no caribou.[39]

4.3 Principles of Stewardship

> *Our youth are also not taught the law of the land. First I live by the Aboriginal law, then I live by the federal law. They are forgetting the first law. (Arthur Beck, June 5, 2017 in BCRP 2017: i)*

Indigenous peoples in the Bathurst range have lived with and depended on caribou for generations. Developing knowledge, practices and institutions to ensure the conservation of this and other caribou herds ensured the sustainability of the herd as well as their own communities.[40] Rules for managing and conserving caribou are therefore deeply embedded in the Metis, Dene and Inuit ways of life in this region. People of the range self-governed and managed caribou in ways that ensured their sustainability for generations.

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[34] While the ethic of not harvesting cows is typically a traditional law, this may not always be the case where people acknowledge a cow offering herself to a hunter. In addition, not everybody respects these traditional laws and so cows may be harvested.

[35] DNNLC 2016

[36] (Kuhnlein & Receveur, 2007)7

[37] (Natcher, 2009)

[38] BCRP 2016

[39] Condon et al. 1995; Parlee 2017

[40] Berkes 2005; Usher 2004; Parlee and Caine 2017

DRAFT

> *You know, native people were self-government before white people. Before white people they were self-governing, they looked after everything - wildlife, fish, fur animals, their land, with respect for the land. They don't try to kill everything in one part of the country that -- on the land there. They – they know it's getting less, they go to the other part. They don't stay in one place for years and years 'til they kill everything. Even the fish Lakes too, they keep moving, they're like animals the native people (Elder in SRRB 2001: 78).*
>
> *The animals have depended on the land for thousands of years and it is up to us to maintain this land for them, to protect them. We must also protect animals because we, the Weledeh, depend on them for survival (Fedirchuk and Penner 1997 in YKDFN 2016: 17).*

4.4 Summary

> *Where the people have been, how they have used their lands, and what changes the people have observed are remembered by the people: that is the essence of the Traditional Knowledge of peoples (born) to their lands. This knowledge is passed from an experienced generation to the next, so that the peoples learn accumulated patterns of change. They use this knowledge to plan the paths they need to take to ensure their survival. (YKDFN 1997a: 14)*

The first two steps in the Plan were to *gather information* and *understand the major factors affecting caribou*. This chapter has presented key insights into understanding caribou people, land use and caribou and linking these insights to the major factors affecting caribou.

Caribou people share a unique history and relationship with the Bathurst herd grounded in the following:

- Respect is at the core of the relationship between people and caribou, in part because thoughtful and deliberate treatment of caribou by humans ensures that caribou continue to offer themselves to people;
- Caribou are people and people are caribou, such that taking care of caribou is the same as taking care of oneself;
- Indigenous people are suffering with the decline of caribou (physically, economically, spiritually)
- Indigenous people are the original 'watchers' and 'monitors' and have historically cared for caribou as stewards of the land;
- Caribou people maintain a code of ethics;
- Lack of power or opportunity to protect the caribou in recent years has led to hopelessness, fear and depression in some communities;
- More than just life-giving or a food security issue, caribou are wealth: financial, material, nutritional, spiritual;
- Caribou represent the future, and so people must safeguard caribou for future generations.

Caribou are also central to Indigenous peoples' food security and health. People have experienced low numbers of caribou before owing to natural variability and developed strategies during these difficult times of scarcity (e.g. switching to an alternate food source). As in the past, the present disappearance of caribou in the region is linked to many other social, cultural and health impacts.

The relationship between caribou people and caribou has changed over time and there are emerging concerns about how to ensure cultures and livelihoods tied to caribou can be sustained for future generations. Finding ways to strengthen this relationship becomes increasingly important in times of caribou population decline.

Caribou people have always shared caribou expertise through oral tradition from one generation to the next, effectively establishing themselves as the original 'watchers' or 'monitors' of environmental change. In the last few decades, caribou people have also carefully documented Traditional Knowledge of caribou well-being, health, behaviour, movements, migrations, spiritual elements and other aspects through audio, video, mapping, and interviewing initiatives. Through these various processes, insights into traditional use and values have been identified, articulated, and integrated into wildlife management initiatives, educational programs, community-based monitoring initiatives, and other processes relevant to northerners. Stewardship initiatives must be strongly encouraged to support recovery of both the Bathurst herd and their habitat.

DRAFT

5 Gathering Traditional Knowledge: Caribou

The Bathurst herd is a population of migratory barren-ground caribou that migrates over thousands of kilometres annually, maintaining their relationship with First Nations, Inuit and Metis across the range. The calving ground is located near Bathurst Inlet in the Kitikmeot Region (i.e., central Arctic) of Nunavut. The summer, fall and winter ranges of the herd are located in the Northwest Territories in the traditional territories of the Tłı̨chǫ, Yellowknives Dene First Nations, Łutsel K'e Dene First Nation, the South Slave communities of Fort Smith and Fort Resolution and the Athabasca Denesǫłiné First Nations at Fond-du-Lac, Wollaston Lake, Stoney Rapids and Black Lake in northern Saskatchewan (Figure 1).

Indigenous peoples maintain a very detailed understanding of populations as well as caribou movements across the landscape, key trails and locations that are important culturally for travelling, camping and harvesting or watching overall caribou health and well-being. The Bathurst herd shares its annual range with at least three other migratory barren-ground caribou herds: the Bluenose East, Beverly-Ahiak and Dolphin Union (Figure 6). Typically, community members are largely unconcerned whether caribou are from one herd or another given their subsistence relationship with caribou.[41]

DRAFT

[41] Parlee et al. 2013; Laidler *forthcoming*

FIGURE 6: OTHER BARREN-GROUND CARIBOU HERDS OVERLAP WITH THE BATHURST HERD ANNUAL RANGE. (SOURCE: Government of Northwest Territories, Department of Environment and Natural Resources).

5.1 Caribou Populations and Lifecycles

Elders in the Indigenous communities of the Bathurst range have taught us that variability in the population and movements (migration patterns) of caribou is a part of the way of life of caribou and

people. Oral histories from this region are similar to other areas of the Northwest Territories and Nunavut where elders speak of periods when the caribou did not come.[42]

Although caribou have always varied in population according to elders, the most recent decline of caribou since the 1990s has been unprecedented for the Bathurst herd. Community members speak of fewer caribou than seen in living memory, caribou in poor health, and a damaged relationship between people and caribou. Further, as the relationship of respect between people and caribou fundamentally changes, so too does caribou numbers, behaviour, movements, migrations and more.

Tłı̨chǫ elders have indicated that the 1940s and 1980s were periods when there were lots of caribou. Community members across the north advise that numbers of caribou cycle from one year to the next or even from one decade to another, sometimes around a 30-year cycle.

Such variability is not unique to the Bathurst herd. Most Traditional Knowledge sources indicate that the majority of barren-ground caribou populations are presently in decline in the Canadian Arctic. By looking at the decline and recovery of other herds where there has been much less disturbance, it is easy to see the strength and power behind the elders' predictions. Over the last twenty years, many barren-ground caribou herds have experienced a decline; these declines first began in the west and have followed west-east into northern Quebec where declines are currently being seen in the George River – Leaf herds. Report of declines from the Porcupine range began in the early 1990s; most recent declines have been in northern Quebec with George River and Leaf herds. Interestingly, the Porcupine herd decline has not been as dramatic and numbers are presently increasing.

Although some variability in population is normal, Indigenous community members as well as other northerners are deeply concerned that such low numbers observed over the last decade are not like in the past. How did this happen? The environmental assessment hearings for the BHP and Diavik Diamond show that as early as 1996, elders from across the Bathurst range, warned that disturbance of the Bathurst range would lead to the disappearance of caribou. [43]

> *I know however, that sometimes there would be no caribou in the area. Elders understood this to be a time when the caribou had to go elsewhere to find its food. This was natural earth balance and replenishment and it is all part of Mother Earths work. But lately the changes that [have] been happening has nothing to do the natural process. There are changes in behavior and movement of the caribou. Compared to the past the caribou has evidently changed.* (Denesǫłiné Né Né Land Corporation 2016: 10)

Although it appears that cyclical patterns of abundance and scarcity occurred with some regularity over a long period of time (i.e., multiple decades spanning a human lifetime), the patterns in abundance

[42] Thorpe et al. 2001; Parlee et al. 2013; Parlee and Caine 2017
[43] Parlee et al. 2005a, 2005b, 2014; Parlee and Caine 2017; Legat et al. 2000; Thorpe et al. 2000

exhibited by Bathurst caribou in the past do not provide assurance that the herd will recover in the future.

> *This time is different, I don't think the cycle will come back like it used to because of the other things going on. When I first started [hunting] there were 430,000 caribou and it was going down, then one year we lost 200,000 they said that they died.* (Arthur Beck, June 5, 2017 in BCRP 2017*: i)*

5.2 Caribou Health

Elders are knowledgeable about different aspects of caribou health and the life. In some regions there have been detailed classifications made for the age structure of the population. Most Indigenous groups, including the Tłı̨chǫ and Denesǫłiné for example, have detailed descriptions of caribou at every part of their life cycle as well as their physiology (Table 1 and Table 2). Caribou have a well understood lifecycle defined by classifications; the integrity of this lifecycle affects both population and movements in the range.

TABLE 1: TŁı̨CHǪ CLASSIFICATION OF CARIBOU AGE.

Tłı̨Chǫ Taxonomies of Caribou Age	
dets'è	mature female caribou
dets'èa	young caribou cow
k'öôtsia	recently born in summer, first winter
ts'idaa	immature female caribou
Wedziaa	small bull caribou
Wedzih	biggest bull caribou
Wezhàa	mother caribou
Whaàtsia	second year caribou calf
yaagoa	third year bull caribou / next in size to yaagoo
Yaagoo	bull caribou next in size to yaagoocho
Yaagoocho	fourth year bull caribou/next in size to wedzih

(Whaèhdôö Nàowoò Kö 2001:34)

Barren ground caribou live up to sixteen years old. Adult males are the largest and most distinguishable, and breeding males have the largest antler racks. Cows calve in spring with calving dates ranging from May-June. The summer months are important for "fattening up" particularly for new calves, and nursing cows. During fall (late August – October) caribou make their way to wintering areas with the rut (breeding) occurring sometime in late September-October. The return to the calving grounds begins at the time of spring melt and the return to the fall and wintering grounds at the time of freeze up.

> *As for the wedzih, they start to migrate when all the snow melts and turns really slushy. ... And they have leaders for themselves as well. They have a leader for themselves just like we have leaders for us, right here. That's the way it is and when they feel that it is time, and when snow starts to melt and it gets really slushy, that is when they start to migrate last.*
>
> (Rosalie Drybones in Whaèhdôö Nàowoò Kö 2001: 41).

Knowledge holders from across the Bathurst caribou range report familiarity with all manner of caribou behavior, including: bulls fighting to mate with cows; experienced cows leading their herd north to the calving grounds; individual caribou prancing proudly or running in circles to the point of exhaustion to avoid insects; herds intermixing; migration routes shifting; and the overall population falling and then rebounding when conditions are favourable.[44]

Traditional Knowledge holders from Northwest Territories, Nunavut and Saskatchewan explain that caribou are smart, have sharp senses, good memories, spook easily, and are very curious.[45] Owing to their acute senses, caribou have always been known to be sensitive to noise, dust, light, pollution and contaminants.[46] Caribou are always learning and can recall migration routes and habitats so that they know where to travel and calve. Given that caribou are people and people are caribou, it is understood that caribou are attracted to people and will offer themselves to people, but only when they are respected and treated properly.

There are numerous ways in which Traditional Knowledge holders describe the health of caribou; body condition - "fat" - is a primary reference point. Body condition of barren-ground caribou varies among animals and between years. Aboriginal languages provide valuable insights into the categories through which harvesters identify and assess body condition.

TABLE 2: TŁĮCHǪ TERMINOLOGY FOR CARIBOU PARTS TO SHOW RESPECT.

Tlį Chǫ Terminology for Caribou Parts			
Deghô	caribou hair	ɔenôhgò	long and fatty part of stomach
detå'o	caribou hide with thick, bushy fur	ɔenöhgòwò	caribou intestine
ɔedza	hind legs	ɔekwôö	Bones
ɔedzekw'ôö	cartilage inside the caribou heart	ɔenôkw'ôö	Backbone
ɔedzets'ìì	tendons of the caribou heart	ɔet'oòkwö	nose meat from around the eyes
ɔeghatsiï	stubble on caribou hide	ɔetsïhta	breast meat of caribou
ɔeghohkwö	meat from the thigh and buttocks	ɔewò	caribou hide
ɔekè	caribou hoof		

(Whaèhdôö Nàowoò Kö 2001: 33)

Interviews with elders and active harvesters from Łutsel K'e Dene First Nation (2002) concluded that, in the Bathurst and Beverly caribou range:

- Brisket and back fat are the main indicators of body condition used; fat on back, kidneys and around the stomach were also used as indicators;
- Body condition of female / bull caribou varies between years;
- The amount of fat on caribou varies between years; and

[44] Dogrib Treaty 11 Council 2001; Thorpe *et al.* 2001; ACFN 2003; Kendrick *et al.* 2005; Łutsel K'e Dene First Nation 2005; Legat *et al.* 2008; Croft and Rabesca 2009; WRRB 2013; NSMA 2012; Beaulieu 2012; Judas 2012; Barnaby and Simmons 2013; ACCWM 2014; KIA 2014; LKDFN 2016; NSMA 2016; NWTMN 2016; YKDFN 2016
[45] BCRP 2016; 2017
[46] Legat et al. 2008; NWTMN 2016

- Harvesters favour cows in later winter because of higher fat.

Since late 1990s, elders from the Tłı̨chǫ communities have commented on caribou not being as fat as they used to be. For example, Philip Chocolate commented that: "Today the caribou are not fat and tasty," (in Legat et al. 2008: 26).

> *There are hardly any fat caribou around now. Even their bone marrow has no more taste to it. A lot has changed. (Moise Martin in Legat et al. 2008: 24).*

This observation has been echoed by other groups across the range including the Inuit, Dene and Metis.[47]

5.3 Caribou Movements

Few harvesters and elders are comfortable predicting exactly where and when the caribou are likely to travel, particularly in fall and winter months. Caribou are known to have their own mind. However, general patterns around movements and migrations are closely watched, learned and understood.

The reciprocal relationship between people and caribou often factors into explanation about why the caribou migrate to certain places year after year and why they suddenly might avoid some areas. For example, the late Denesǫłiné elder Zepp Casaway said that the caribou come to his area because they know the people miss them and need them. This seems consistent in other regions such as the Tłı̨chǫ; as expressed eloquently by a Tłı̨chǫ elder:

> *..it is said that; when they see the people for the first time, they are really, really happy* (Rosalie Drybones in Legat and Tłı̨chǫ 2001).

Bobby Algona expresses a similar idea:

> *The thinking about the relative coming to say 'hi' . . . there have been stories about the afterlife. They turn into an animal that is very sacred to them (e.g., lemming, wolf, or insect). When an animal is approaching (i.e., acting strange and not typical animal behavior), when they come to camp or too close to where you are, because of afterlife they turn into the animal. Some Elders talk to these animals and mingle with them when they do come. That is IQ about the afterlife. That is why I do not tease an animal in any way or harass, because of the afterlife that people turn into animals.* (Bobby Algona Sept 26, 2012 in TCS 2014a: 3)

For some people the movements of caribou are the result of prayer; when people pray of the caribou to the Creator, they will come.

> *…the caribou are like the Creator, when they know you need them they will come to you; when you are alone and you pray to them they will come and you will have food and clothing. Like the creator they take care*

[47] Thorpe et al. 2001; AD 2016; TRTI 2016, 2017; YKDFN 2016; BCRP 2016, 2017

of us. When they know you are in need they will help you (Georgina Chocolate in Legat and Tłı̨chǫ 2001).

Traditional Knowledge research suggests that harvesters know a great deal about distribution and movement patterns (e.g. see Kendrick and Manseau 2008). Some Tłı̨chǫ elders suggest the caribou movements are determined by factors such as the wind and the direction of the water flows.

> *When caribou migrate they go by the wind (to help them decide which way to go), and at the water crossing, it depends on how the water flows. (Jimmy Martin, Behchokö in Legat 2008).*

Detailed Tłı̨chǫ classifications for different stages of the Bathurst caribou migration illustrate the specifics of movement at different seasons of the year (Table 3).

TABLE 3: TŁı̨CHǪ TERMS ASSOCIATED WITH MIGRATION OF ɬEKWÖ

Terms Associated with Migration of ɬekwö	
Detsiììlàà ɬekwö	ɬekwö that winter in the boreal forest
Hozi ɬekwö	ɬekwö that winter in the barrenlands
Naèdaadii	ɬekwö that summer in the forest
Nadeɬà	Migrating ɬekwö
Nïïzaa	ɬekwö migrating towards the forest in the fall
Nadèezoô	ɬekwô migrating to the birthing grounds
ɬekwökeè	ɬekwö track

(Whaèhdôö Nàowoò Kö 2001: 24

Movement patterns are predicted by well known crossing sites, passes or habitats. For example, studies with the Denesǫłiné and Tłı̨chǫ peoples reveal detailed knowledge of river crossings such as ɬeda cho at Artillery Lake (ɬeda cho kué) or Piqqiq, Akunni'tuaq, and Qavvavaujarvik on the lower Kazan River.[48]

> *Louie Whane's father used to tell [him] a story. Louie's father used to canoe to Kokeghotì with birch bark canoe. And to ɬekatì (Lac de Gras) where there is a mine today around that area there used to be lots of ɬekwö (barrenland caribou). Because there's a place called Kwekaghotì (southern end of Point Lake) and that's where there is a lot of ɬekwö, that's where the water crossing is. That's why there's people living around that area. (Eddie Lafferty in Legat and* Tłı̨chǫ *2001)*

[48] Parlee et al. 2005a, 2005b; Steward 2004.

Major crossing sites such as “eda cho” or “Piqqiq” are known and well used. There are also many smaller sites, the detail and use of which suggest the various intervals of use over time. Although outside the range of the Bathurst caribou, there are understandings to appreciate from the case of the crossings on the lower Kazan used by the Baker Lake Inuit.

> *Akunni’tuaq, the “big interval,” alludes to its relatively weak or subsidiary location between two powerful crossing sites… Qavvavaujarvik, the “place of ghosts,” also suggests a kind of transitional existence. ... Oral accounts simultaneously support the notion of permanence of crossings like Piqqiq and the unpredictable element—the awareness that caribou may pass over a certain crossing in a given year to use another one, or that they might not come at all* (Stewart 2004: 205).

Another well referenced crossing site at “the Narrows” between Lac de Gras and Lac du Sauvage is referenced by the Denesǫłiné, Tłı̨chǫ and Inuit Elders who tell of times when different Indigenous groups would come together for the caribou and for one another.[49]

Photo 1: Caribou crossing at “the Narrows” between Lac de Gras and Lac du Sauvage showing caribou fur washed up along shore after a major crossing event from the 1990s. Picture used with permission from Fred Sangris, exact date unknown (YKDFN 2015).

[49] Thorpe et al. 2001; TRTI 2016a, 2016b; 2017a; YKDFN 2016.

Elders from Łutsel K'e Dene First Nation refer to well-worn caribou trails which serve as indicators of where the caribou have been in the past and where they are likely to migrate in the future. Denesǫłiné elders such as Madeline Catholique talk about caribou trails (described in Chipewyan as etth ë n hutł'a and etth ë n kun) as important to their ability to track caribou in the fall and winter, as well as old caribou trails (etth ë n ek ë lué) as the basis for understanding historical changes in caribou movements (Parlee and Łutsel K'e Dene First Nation 2012). Tree root scars are an indicator of caribou activity at crossings and may be correlated to oral histories of old caribou trails as was the case in a previous study in the Tłı̨chǫ region and a more recent study with Łutsel K'e Dene First Nation.[50]

Figure 7 displays the TK spatial data regarding migration paths as provided by participating organizations in the BCRP planning process.

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[50] Dokis-Jansen 2014; Zalatan et al. 2006

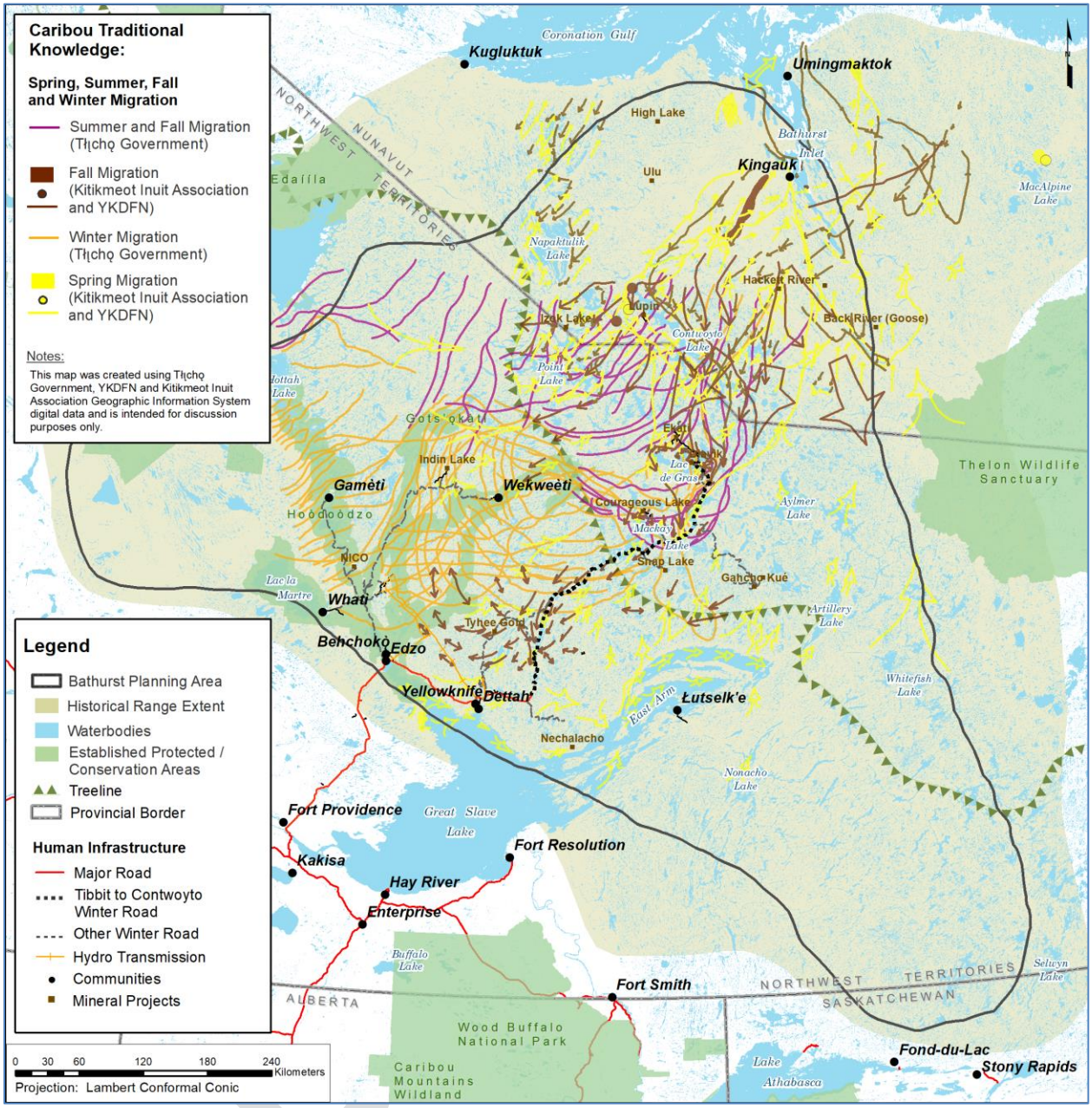

FIGURE 7: MIGRATION PATHS IDENTIFIED THROUGH TRADITIONAL KNOWLEDGE.

5.4 Summary

Indigenous peoples from across the Bathurst range have shared valuable knowledge about many aspects of caribou health, population, behaviors, movements and migration patterns. Most Aboriginal groups retain detailed classifications made for the age structure of the population, specifying every part of their lifecycle as well as their body parts, characteristics and more. In the past, close study of caribou movements and migrations were necessary for peoples' survival. Traditional Knowledge holders today continue to pay close attention to caribou movements and migrations, locating current trends within

the context of long-term observations. Today, as in the past, these close ties with caribou are part of cultural identity.

Caribou population levels are known to experience natural variability in the same way that caribou sometimes change their migration routes. This expertise is born to generations of peoples in relationship with caribou where long-term observations of overall caribou health and well-being are closely watched. A key issue of concern repeated throughout many communities across the range, is that disturbance over the last twenty years has led to severe declines in the Bathurst herd and changes in health that are outside of what elders know to be the normal cycle. Despite a history of expecting caribou population fluctuations, people worry that they won't see caribou population levels again similar to what they have seen in the past.

Population declines mean food security concerns and result in people feeling powerless in their chosen role as guardians. The amount of body fat has is a key indicator of a healthy caribou and caribou are thought to be skinnier today than observed in the past. Observed declines in overall population levels, health and body condition combined with changes in movements and migrations are changing the relation between people and caribou.

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6 Gathering Knowledge: The Range

This Section continues to present the key Traditional Knowledge understandings considered, reviewed and woven into the Plan as part of the first of four planning steps in the Bathurst Caribou Range Plan, namely, to *Gather Information - Understanding the Range (People, Land Use, and Caribou* (as outlined in Section 2.1.1).

Traditional knowledge holders explain that barren-ground caribou use their habitat in different ways through time, and the Bathurst annual and seasonal ranges represent an ever-changing process that is influenced by population size as well as the environment. For example, Bathurst caribou have not been seen in northern Saskatchewan for many years and community members talk about how they miss the caribou (AD 2016).

> *The migration of caribou changes, if they go in the same area all the time they will have no food, so they change they migration routes so that they always have food. Caribou have life cycles, it goes up and down, and right now we are in a down cycle. (Jayko Palongayak, June 5, 2017 in BCRP 2017: i)*

6.1 Critical Habitats in the Caribou Range

The Bathurst range in its entirety provides a foundation for caribou to survive over generations and in multiple ecological conditions. It is important to consider both the connectivity and integrity of the range as a whole as well as the many key habitats within the range.

For migratory barren-ground caribou, there is generally a part of the range that is most favourable and secure. Scientists call this the "center of habitation" while Traditional Knowledge holders might identify this as an area known to be good hunting grounds or where you can usually find caribou. Traditional Knowledge of migration routes, caribou crossings, land bridges or other habitat features helps to identify these important parts of the range. In the Plan, the center of habitation was defined by using results from caribou collar data modified by traditional knowledge shared by participating groups (Figure 8).

Some areas may be more sensitive areas for caribou. Within the Plan, sensitive areas were identified through the combined analyses of Traditional Knowledge and scientific information particularly around habitat, range use, and sensitivity. Important habitats are place-specific locations. Given the landscape-level focus of the Plan, site-level habitat quality and selection (e.g., specific vegetation communities or esker landforms) were not formally considered as part of the important habitat identification.

Healthy habitat is critical for the well-being of caribou herds as well as caribou people. When caribou habitat is lost or degraded, so is the land available to carry out cultural practices such as hunting, trapping and otherwise spending time on the land. The same circumstances that cause caribou populations to decline also cause the loss in opportunities for caribou people to practice their cultures and affirm their identities. As a result, the Plan represents an effort to preserve caribou people cultures as well as the herd and its habitat.

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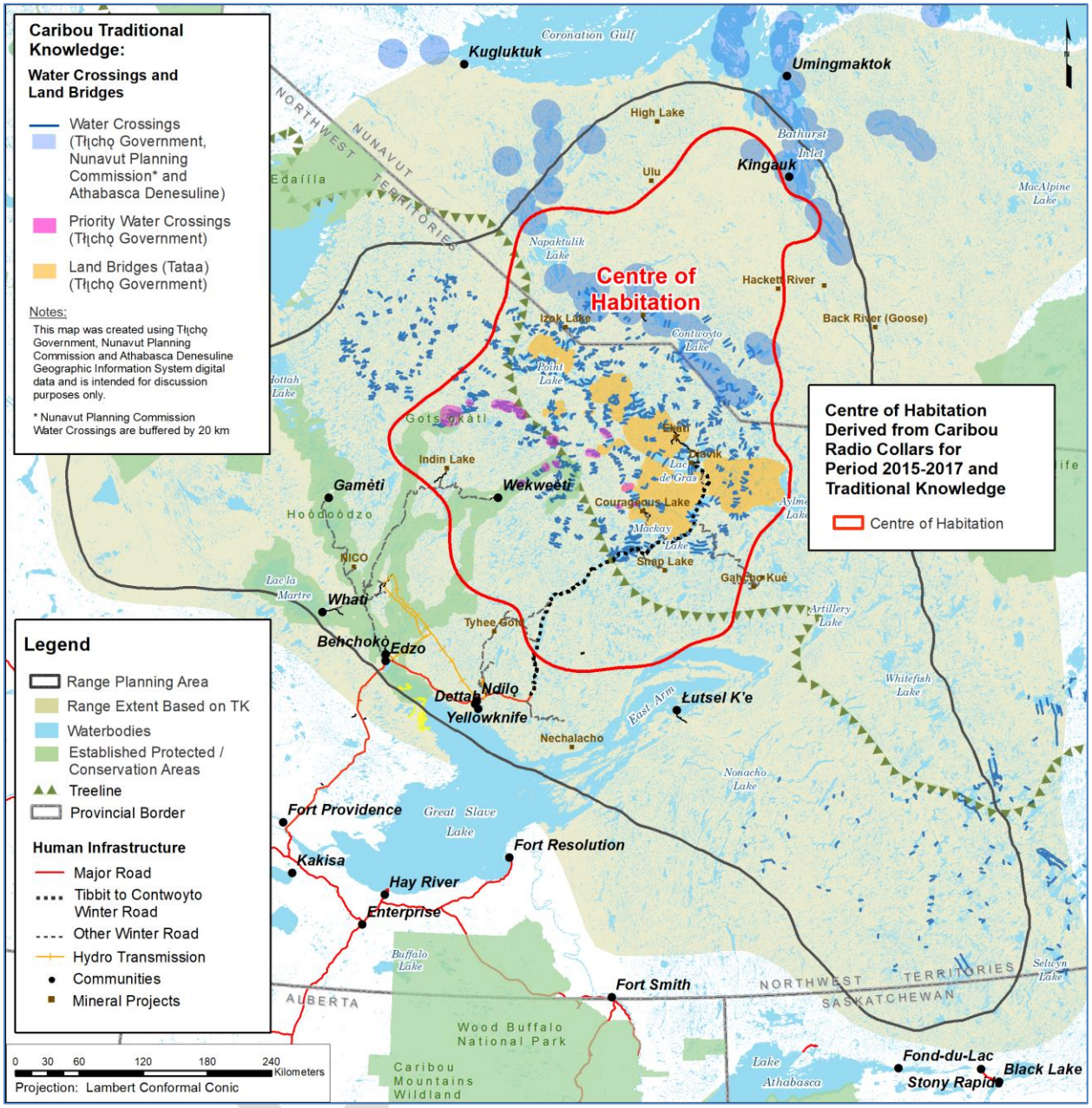

FIGURE 8: PROPOSED BOUNDARY FOR THE CENTRE OF HABITATION BASED ON RECENT CARIBOU SATELITTE COLLAR DATA AND TK OF MIGRATION ROUTES, KEY WATER CROSSINGS AND LAND BRIDGES.
(See BCRP 2018b for more detail on the development of the Centre of Habitation.)

6.2 Sensitive Areas with High Caribou Use

Drawing from Traditional Knowledge, the following sensitive habitats were considered:

- Calving and post-calving areas
- fall/winter range

6.2.1 Calving, Post-Calving and Core Areas within the Summer Range

Traditional knowledge sources indicate that calving grounds and post-calving areas are uniquely important places within the range because caribou are particularly sensitive during and immediately following their calving period, and any stress can lead to harm.[51] Caribou seek naturally protected areas for their calving grounds with environmental attributes that discourage predation as well as harvesting or other forms of human disturbance. Inuit elders have spoken about how caribou know they are safe from harvest during calving.[52]

Łutsel K'e Dene elders speak to both the fragility and importance of these areas:

> *Calving grounds are critical areas of habitat, which are unique in terms of climate (good weather), and the availability of rich plant life necessary for the nutrition and development of young calves and nursing cows. Highly exposed areas where snowmelt and vegetation growth is early and well developed are important. Shady areas where cows and calves can escape from the sun are also important. Landscape features within the calving region also offer protection from predators including wolves, grizzly bears and wolverine.* Parlee et al (2013:28)

Knowledge holders report their Elders compelling them to minimize even the slightest potential disturbances within these areas.

> *My late uncle used to tell me that his dad used to tell him not to make tea around the flat lands as he did not want the ground to be full of soot from the firewood. These areas are the calving grounds for the caribou . . . The area is south of Bay Chimo. My late uncle's dad used to tell him not to make tea around that flat land area but to make tea further away from the area. That was the rule long ago. (C13 in KIA 2014: 41)*

> *The Elders say you should never impact [calving grounds] in one form or another because they are really sacred. They care for these calving grounds, particular spots on the land where it's just like a large swamp, or swampy areas where the ground becomes yellow from the calves. After they calve. And they don't want to dirty that part of the land from all the ashes or any other thing. You can't camp there, or make fires. (C51 in KIA 2014: 41)*

Calving grounds are particularly sensitive. Reasons suggested for why caribou might not return to a particular migration route or calving ground include landscape changes, contaminants, and disrespect shown to the land.

> *The Tłı̨chǫ share two concepts drawn from their Traditional Knowledge that they use to explain and describe the caribou habit of abandoning formerly important places in the range when those places are disturbed or affected by mining. DÈ ɔǪ GOÈHSHÌ means caribou have thrown this land or area away and is generally used to refer to previously important foraging areas that no longer*

[51] Wray 2011; Beaulieu 2012; Sangris 2012; EMAB 2012; BQCMB 2011; GSCI 2015; Williams 2015.
[52] Thorpe et al. 2001

used because the food source is diminished in quality and/or quantity. EKWǪ YEKA AT'Į-LE ADZÀ means caribou do not walk on this land anymore, and refer to areas around mine sites that the caribou no longer go to TRTI 2013: 11).

Depending on the scale considered, caribou are known to return to the same calving grounds along the same migration routes year after year. While these are generally the same, Traditional Knowledge holders explain that the location of the calving grounds shifts over time according to the availability and quality of food, presence of predators, environmental variables, and other conditions. In the late-1990s, the Bathurst core calving area shifted from the east side of Bathurst Inlet to its current location.[53]

Caribou tend to prefer these areas for calving grounds, because of this year's or last year's plants. It's not this year's plants; it is from years before plants. That's why they go there. If they don't find plants they might move to a different area, to a different calving area, it might be past Bathurst. Sometimes they would be on the east side of Bathurst Inlet and sometimes on the west side, all along there, and anywhere, all the way down to James Bay area (KIA 2012: 41).

From what I hear about calving grounds, they use that area for a few years and then there will be no food so they change until the food grows there again... they change until the place grows again. They don't just calve in one spot for life. They switch... to where there's food for them (C111 in KIA 2012: 42).

Traditional Knowledge information about calving areas shown and shared by KIA was collected as part of the Tuktu and Nogak Project in 2001. These data illustrate knowledge shared in the 1990s and extend back to the mid-1900s.[54] The Kitikmeot Regional Wildlife Board is commencing a new barren-ground caribou study in late early 2018.

Figure 9 displays the TK spatial data regarding seasonal ranges as provided by participating organizations in the BCRP planning process.

[53] Thorpe et al. 2000
[54] Thorpe et al. 2001

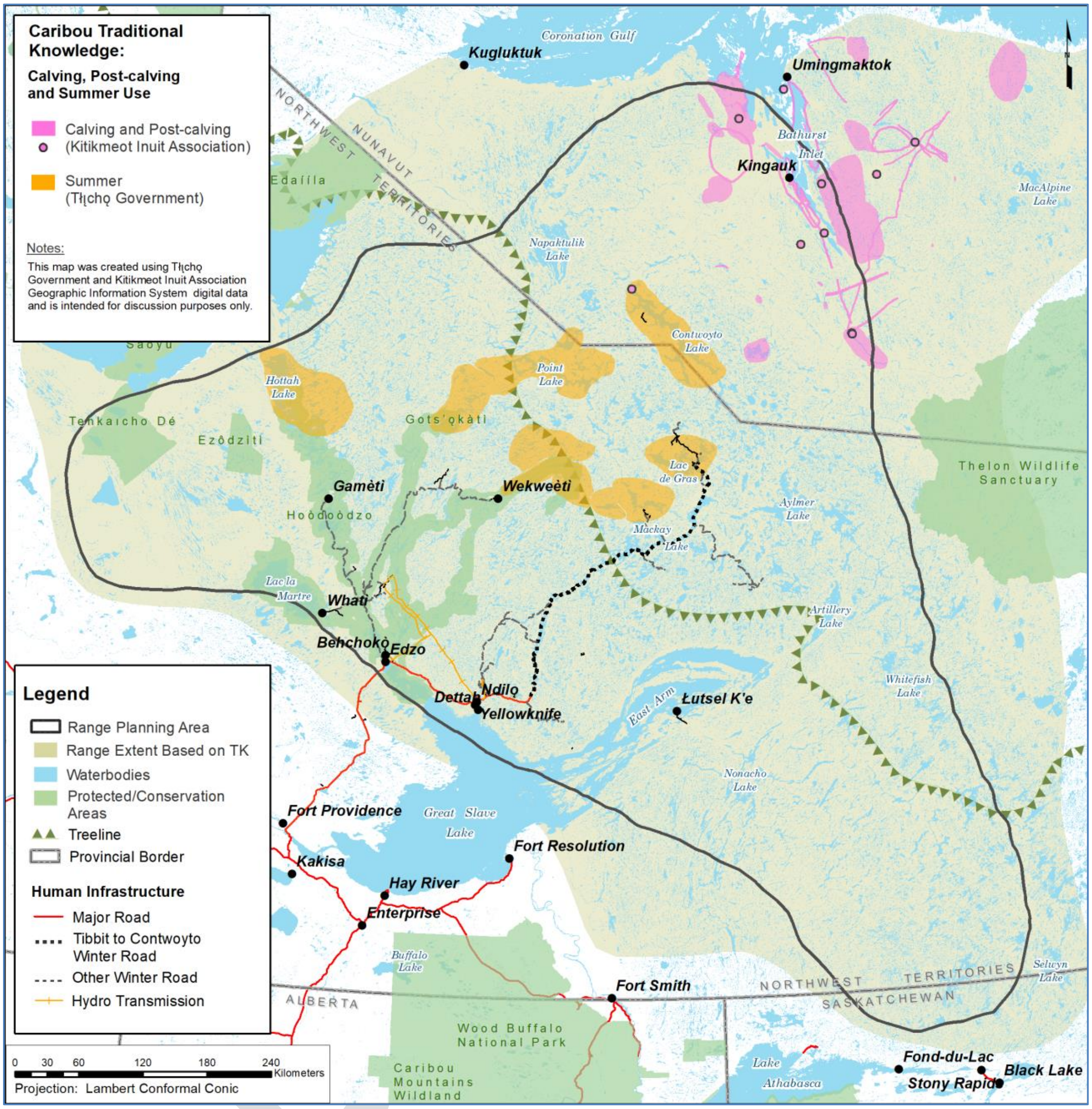

FIGURE 9: SEASONAL RANGES (CALVING AND POST-CALVING, AND SUMMER) IDENTIFIED THROUGH TRADITIONAL KNOWLEDGE.

6.2.2 Fall/Winter Range

The fall and winter range presently covers a vast area of the Northwest Territories and northern Saskatchewan. Traditional land use mapping and related research as well as oral histories provide detail about the extent of this range during historic periods. However, it is widely believed that the range no longer includes many areas in Alberta, Saskatchewan and Manitoba due to the degree of disturbance (e.g., wildfire, industrial development) in these regions.

Caribou need large areas of taiga and boreal forest areas throughout the fall and winter, particularly during periods of harsh winter conditions, and increasingly so given increases in wildfires. Caribou movements can be very unpredictable in this part of the range and thus land use decisions must be made carefully. In some years caribou can use areas further west in the range; in other years forage may be better further east or south.

Given caribou routes and distribution in the fall/winter range than in the spring and summer range, Dene communities historically used a variety of strategies to identify caribou movements including use of core caribou trails and water crossings (Parlee et al. 2005; Smith 1978). Harvesting and camping sites were selected accordingly (Stewart et al. 2004; TRTI 2016b). Many place names are biogeographical indicators that can be traced back to these key caribou crossing areas and trails (Stewart et al. 2004). Refer to Section 5.3 for more detail.

Forest fire is a critical driver of habitat change in the fall/winter area of the Bathurst range. According to some elders, when the land burns it is a way the Creator to cleanse the land and make it new again. However, other elders are concerned about the frequency of fire as well as the scale of fires being larger today than in previous decades; these forest fires may be contributing to population decline of the Bathurst caribou herd. Community members are concerned about the fact the many areas in the winter range have already been burned and suggest that unburned areas be protected for caribou (AD 2016; BCRP 2016). Figure 10 illustrates some of this disturbance by showing current human disturbance and wildfire history across the range (according to scientific data).

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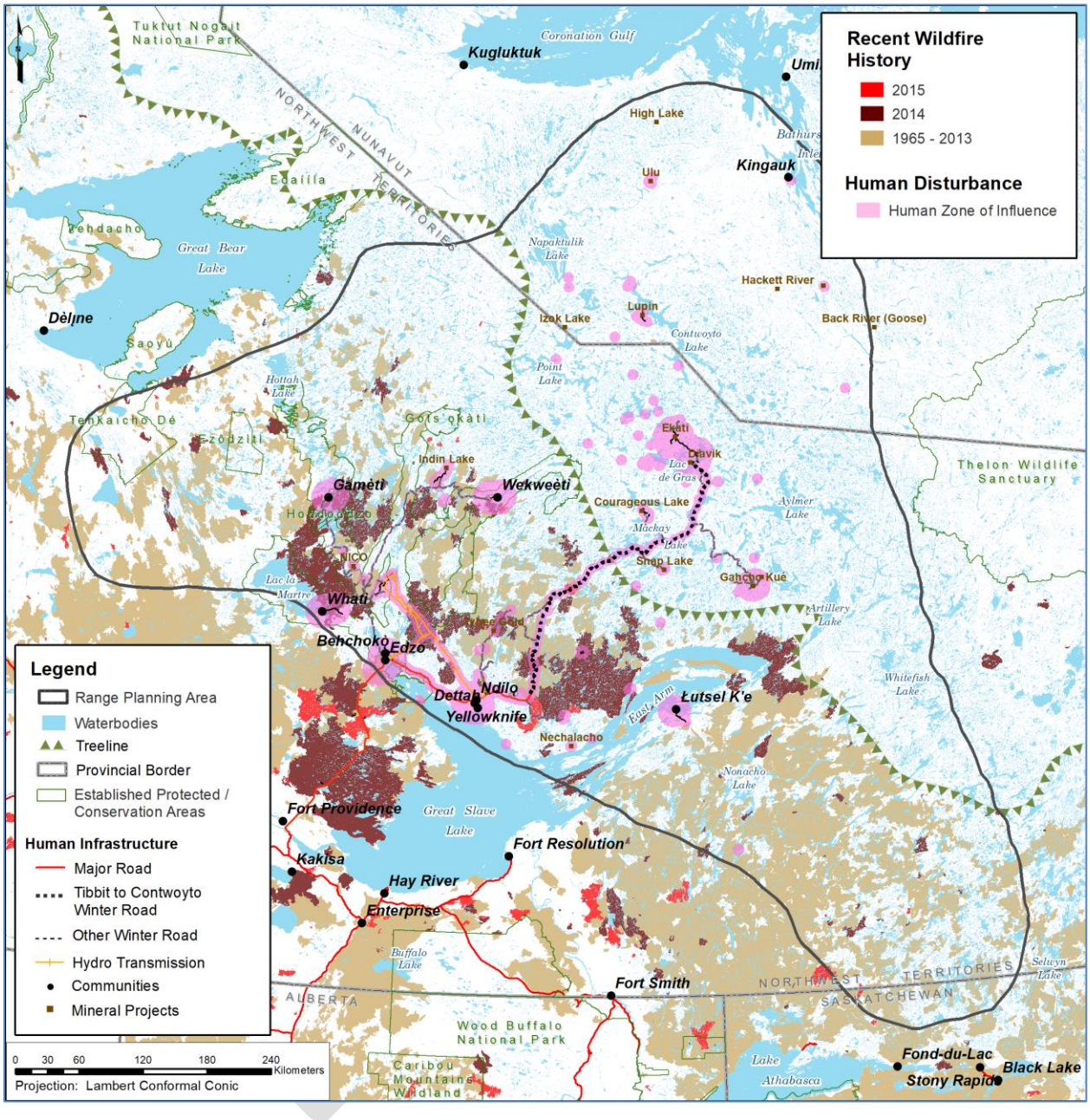

FIGURE 10: COMBINED HUMAN DISTURBANCE AND WILDFIRE ON THE RANGE OF THE BATHURST CARIBOU.

6.3 Key Habitat Features

In addition to the calving and post-calving and summer ranges as well as fall/winter areas, knowledge holders have consistently identified water crossings, land bridges and unburned winter range as important habitat features on the Bathurst range. Some water crossings and land bridges are used relatively consistently, and some have been used for very long periods of time—potentially thousands of years. As indicated by the numerous archaeological sites located near these crossing locations, many traditional and cultural values are associated with these features. Water crossings and land bridges allow caribou to pass over or around large water bodies or other physical barriers, allowing movement between their different seasonal ranges during the annual caribou-cycle. Mature forests within the winter range provide adequate forage and cover for caribou to persist through the long northern winter. These important habitats are described below.

6.3.1 Water Crossings

Water crossings refer to specific locations where caribou swim or wade across rivers or lakes. In the Bathurst range, water crossings have been identified and recorded through a number of different Traditional Knowledge initiatives and scientific sources. Figure 11 shows some of the water crossings identified by Traditional Knowledge in the central part of the range and Appendix F provides a detailed description of selected locations. Community members talk about many of these crossings being at narrows caused by peninsulas or other shoreline irregularities, or where there is water turbulence or exposed rocks and gravel bars in the water.

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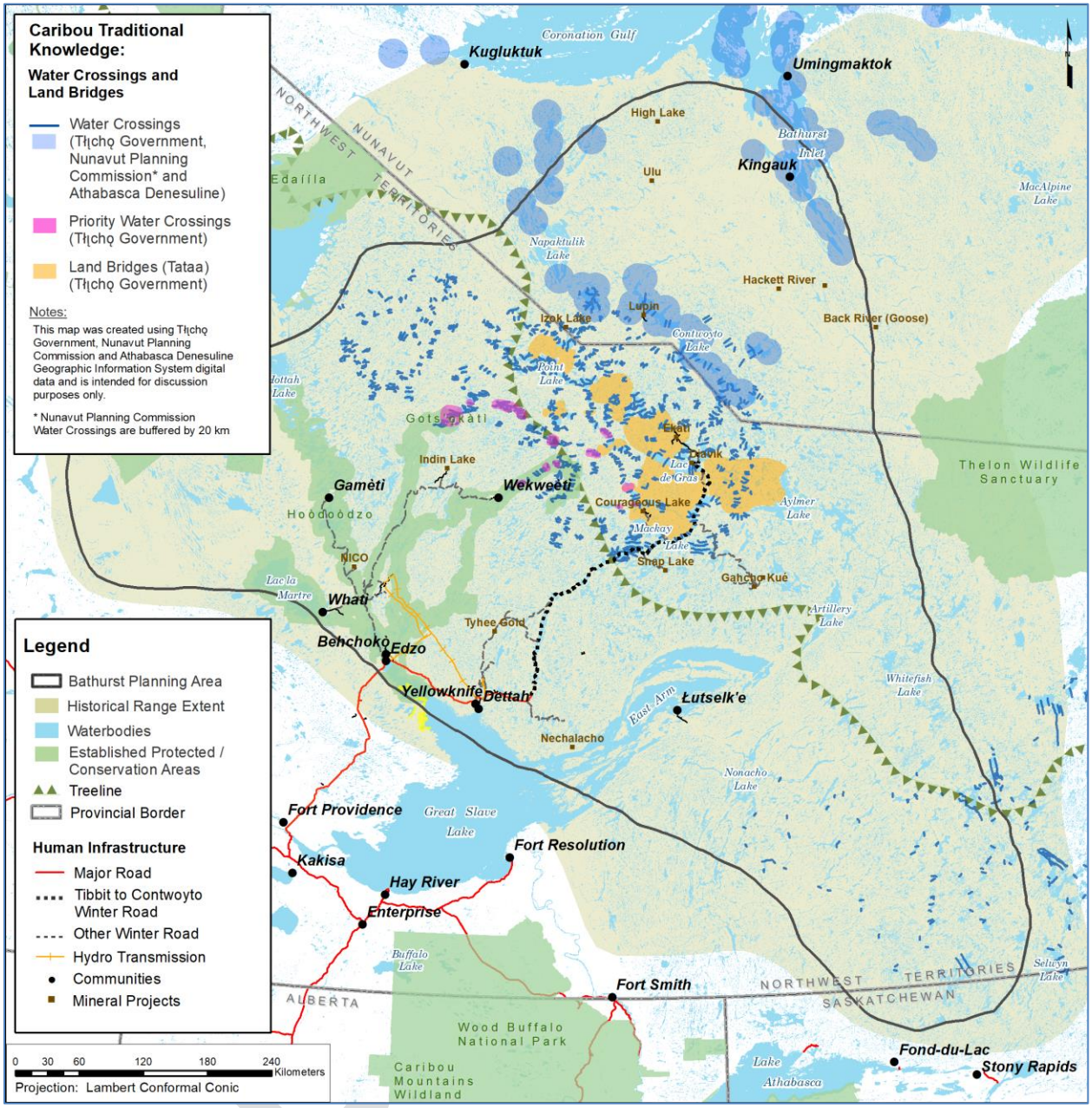

FIGURE 11: SOME KEY WATER CROSSINGS AND LAND BRIDGES IDENTIFIED THROUGH TRADITIONAL KNOWLEDGE IN THE CENTRAL BATHURST RANGE.

Well marked harvesting trails clearly follow migration routes and effectively link important places and critical habitat for caribou, such as water crossings, land bridges and calving and post-calving areas.

> *People used to camp at water crossings. They knew the [caribou] would come that way. For example, an area where there are two big lakes, the animals will cross at the narrowest spot between them (NWTMN 2016: 5).*

North bay on MacKay Lake [Gla da], where the caribou cross. This bay is significant for caribou because they cross MacKay Lake at this bay when they migrate. The area is a favourite camping place for the Weledeh people because there are many caribou and because there is a patch of trees for firewood. The Weledeh spent many winters here (Fishbone et al. 1997 in YKDFN 2016: 12)

The people would continue on to Wekweeti, using birch-bark canoes along here [checking the spot where caribou swim across the lake] and on to Be?aiti searching. If they did not find anything, they would go north to [check the water crossing at] Ts/oti [and from there they would travel to] they would go towards Deehhaatidethti… Again if there was nothing to be found there, they would proceed along the great route leading to Sodee … then the people would go north to Deehaati – all the way to Kwik….. They would continue to search hoping to find caribou. Then they would all assemble at one place by canoe. … Once they have canoed to one area and assembled and having said that they wanted to go to the great lake, my father said they would go to … Yabahti …. And they would camp and live at various bays, points, and along channels between islands. . .. Then at channels were the caribou swam across, the caribou would be killed by spearing. (Louis Whane 1995 in Dogrib Treaty 11 Council 1998: 13)

Every time there was a portage there would be caribou trails. It is assumed they swam across at select places. Sometimes places where caribou would be killed would be called ?edah [304 Living/Alive]. At Saemiti, Saemiti there is a place called ?edah. Our people worked in those areas where ?edah are located before us. My uncle Monfwi spoke this when he told us stories. He said that there are a lot of ?edaeti [307 Living Lakes]. There an ?edaeti is located; that is called ?edaeti ?Edaeti is called that because caribou swim across all those kinds of lakes, so he said (Moise Martin 1996 in Dogrib Treaty 11 Council 1998: 14).

Given the long-term, consistent use of some water crossing locations, maintaining these areas relatively free of human infrastructure and disturbance is important to successful migration. Tlicho elders have prioritized water crossing on the central barrens but more work needs to be done. Several important areas are known to be in the Courageous Lake [?ewaa nit'iitì], Lac de Gras, Contwoyto Lake, Mackay Lake [No?dìikahtì] and Artillery Lake areas. One such crossing of the Coppermine, known as "the Narrows," was described by Pike 1892 (67) as "an important spot in the history of [both] the Dog-Ribs and Yellow Knives [sic]."

It has always been a favourite swimming-place for the caribou, and many struggle took place for the possession of this hunting-ground in the old days when there was continual warfare between the two tribes. At present day it is a breach of etiquette for any Indians to camp here, as it is supposed that if the caribou are once headed back at this point they will not come south of Mackay Lake. This rule had evidently been broken lately, as we found signs of a recent encampment, and King considered that this amply accounted for our not finding the caribou before we reached the Lac du Rocher. (Pike 1892:67)

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More than a century later, many community members continue to recall this crossing as critical and worthy of protection:

> *The Narrows must be avoided by the mining companies. At the Narrows, the place is so old that even the rocks are all worn out (from the caribou crossing). (Alfred Baillargeon, March 24, 2015 in YKDFN 2016: 17)*

This important crossing continues to be the subject of discussion and concern amongst knowledge holders, particularly because of its location at the center of the NWT's diamond mining activities. A major concern by community members regarding the location of the diamond mines in the Lac de Gras area is the blockage of some important water crossings and land bridges, much like 'a dam or fence', resulting in changes in caribou migration routes.

6.3.2 Land Bridges

Land bridges refer to areas where caribou pass between major lakes. The Tłı̨chǫ word for land bridge is *tataa*. Many communities talk about the importance of migration corridors that connect crossings and these are described by TRTI 2016:

> *The elders explain how the caribou has a different way of knowing, and that all caribou have "one mind." As explained above, the caribou have a good memory of their land and of their migration routes. The herds know which tataa they must travel on to reach certain locations. Tataa are important corridors for them to follow on their way to better feeding grounds. Thus, the herds know the conditions on their migration routes and on their feeding grounds. (TRTI 2016b: 37)*

Research shows major land bridges identified by Traditional Knowledge in the central Bathurst range (TRTI 2016; YKDFN 2016). Similar to water crossings, maintaining these areas relatively free from disturbance and/or human infrastructure is important to successful migration. The Yellowknives Dene First Nation have also prepared a preliminary list of key caribou corridors - and are in the process of mapping these as part of their traditional knowledge database - as follows:

• Jolly Lake • Courageous Lake • Mohawk Lake • Mackenzie River • Lockhart Lake • Drybones Lake • Beniah Lake • Camsell Lake • Thstlethwait Lake • Guaisue Lake • northern areas of Discovery mines • along the Yellowknife River system	• Fishing Lake • Brown Lake • Gordon Lake • Sunset Lake • Desperation Lake • Gros Cap • Hearne Lake • Harding Lake • Jennejohn Lake • Prelude Lake • Prosperous Lake • Awry Lake

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The many tataa in the central tundra area highlights the importance of this feature for movement between the spring calving and post calving, summer and winter ranges. Selected land bridges are described in Appendix F.

6.4 Summary

The Bathurst range in its entirety provides a foundation for caribou to survive over generations and in multiple ecological conditions. It is important to consider both the connectivity and integrity of the range as a whole as well as the many key habitats within the range.

Healthy habitat is critical for the well-being of caribou herds as well as caribou people. When caribou habitat is lost or degraded, so is the land available to carry out cultural practices such as hunting, trapping and otherwise spending time on the land. The same circumstances that cause caribou populations to decline also cause the loss in opportunities for caribou people to practice their cultures and affirm their identities. As a result, the Plan represents an effort to preserve caribou people cultures as well as the herd and its habitat.

In addition to the calving and post-calving areas as well as fall/winter areas as sensitive habitats, knowledge holders have consistently identified water crossings, land bridges and unburned winter range as important habitat features on the Bathurst range. Together, knowledge of these places helps to define a center of habitation, the part of the range most favourable and secure for migratory barren-ground caribou, within which certain management recommendations can be applied. Some water crossings and land bridges are used relatively consistently, and some have been used for very long periods of time—potentially thousands of years. As indicated by the numerous archaeological sites located near these crossing locations, many traditional and cultural values are associated with these features. Mature forests within the winter range provide adequate forage and cover for caribou to persist through the long northern winter. Together, the integrity and connectivity of these features support a healthy range for the Bathurst caribou.

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7 Major Factors Affecting Caribou and Key Issues and Management Concerns

This Section continues to present the key Traditional Knowledge understandings considered, reviewed and woven into the Plan as part of the second and third planning steps in the Bathurst Caribou Range Plan, namely, to *Understand Major Factors Affecting Caribou* and *Key Issues and Management Concerns* (as outlined in Section 2.1.1).

While both traditional knowledge and science tell us that many natural and human factors affect barren-ground caribou populations, only traditional perspectives also consider the spiritual connection between people and caribou, and speak to the ways of being and behaving around caribou as underlying these factors. Building on the discussion of caribou people outlined in Section 4.1, Figure 12 illustrates a traditional perspective on how different natural and human factors combine to affect caribou and caribou people. The following sections describe how these same natural and human factors are affecting caribou today.

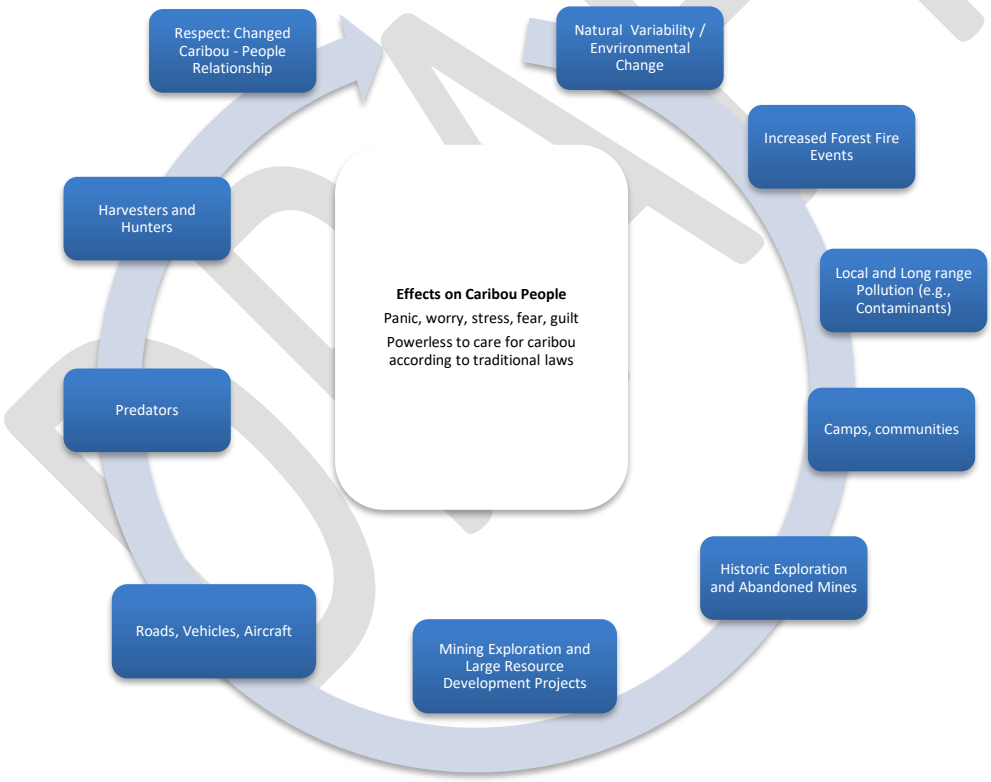

FIGURE 12: FACTORS AFFECTING CARIBOU AND CARIBOU PEOPLE FROM NATURAL AND HUMAN DISTURBANCE.

Figure 13 illustrates a traditional perspective of how land use and human disturbance affects caribou from an individual and small-scale effect (e.g., collapse) through to a herd wide large-scale effect (e.g., shifts in migration).

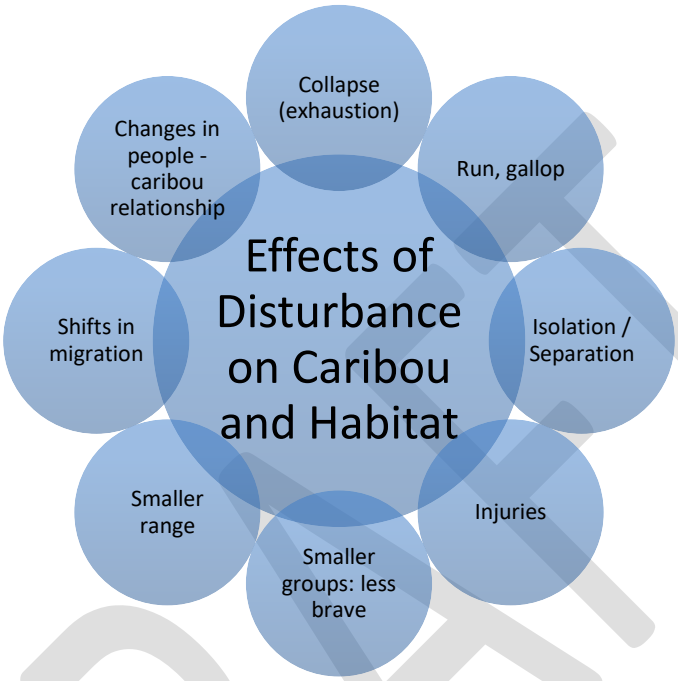

FIGURE 13: TRADITIONAL PERSPECTIVES ON HOW DISTURBANCE AFFECTS BARREN-GROUND CARIBOU.

7.1 Natural Variability and Disturbance Factors

Indigenous peoples within the Bathurst range have always known natural variability in the movements and population of the Bathurst caribou and have also experienced different kinds of natural variability in the range over their lifetimes or heard stories from previous generations. Some key examples of natural variability in the range are associated with variable weather conditions, forest fire events, and the rise/fall of other wildlife in the range such as muskoxen, wolves and grizzly bears.

> *Every animal has a population cycle. There is an inverse relationship between caribou and wolves. People are experiencing a lot less caribou, because of bigger wolf populations. In the 1940s, we had to cull wolves, and then the caribou population came back. Now, we are experiencing this again. The wolf population has increased in the last 20 years. As such, the caribou population has declined. I live right on the caribou migration route. I have experienced that a lot. The wolf population follows the caribou herd. Every day wolf packs come from the north. I know the wolves do not migrate, so they must be different packs along the caribou migration route. It is not only noise pollution and mining that there are fewer caribou. In one*

> *day, my wife and I counted 30 wolves in one pack near Pellet Lake. Other times, we have seen three to four wolves together. Packs of wolves are tailing caribou herds more often. The lemming population has also increased in the 1940s, 50s, and 60s. Back then, rabies started to become more prevalent. A lot of our dogs got rabies. We were losing a lot of dogs through rabies. Animal populations increase and then decrease again, especially if one species is taking over the landscape. Also, what the caribou are feeding on, the bees pollinate plant life, which affects what the caribou eat. There are not many bees, then there are fewer plants, then caribou decrease, because the bees are not pollinating the plants. This is how caribou and bees are connected.* (Bobby Algona on Sept 25, 2012 in TCS 2014a: 7)

Leaders, elders, hunters, and other community members as well as wildlife biologists explain that barren-ground caribou as well as their habitat quality and amount is declining across northern Canada due to climate change, wildfire, and human development and land use. The cumulative impact of these factors and activities on caribou habitat has not gone unnoticed by people who share their lands, waters, and worlds with barren-ground caribou.[55]

Much Traditional Knowledge - including longitudinal perspectives on migration patterns over hundreds of years are clear - migration routes in the spring/summer as well as fall/winter range are largely determined by habitat including forage quality; threats to habitat quality and integrity through increased forest fires and human disturbance are the fundamental drivers of population dynamics as well as distribution in the range. Although some people suggest the land is resilient, for many Aboriginal elders throughout the multiple Environmental Assessment hearings for the three current diamond mines have argued that the degradation of habitat including losses of critical forage areas are irreversible. For example, the disturbance of sensitive plant species such as reindeer lichen may come back within 30-40 years, but some elders argue that if lost the lichen will never come back, or not come back for many generations.[56]

Traditional knowledge of impacts to caribou resulting from natural and human factors is discussed in this chapter. Natural factors affecting caribou include:

- Climate change
- Wildfire
- Predation
- Insects and parasites

[55] (Dogrib Treaty 11 Council 2001, 2002; Thorpe *et al.* 2001; ACFN 2003; Kendrick *et al.* 2005; Łutsel K'e Dene First Nation 2005; Parlee and Manseau 2005; Dumond 2007; Legat *et al.* 2008; Croft and Rabesca 2009; Sahtú Land Use Planning Board 2013; WRRB 2013; North Slave Métis Alliance 2012; Beaulieu 2012; Judas 2012; Barnaby and Simmons 2013; ACCWM 2014; GSCI 2015; Trailmark 2015; AD 2016; TRTI 2016b LKDFN; 2016; NSMA 2016; NWTMN 2016; YKDFN 2016).

[56] BCRP 2017; Parlee and Caine 2017

7.1.1 Climate Change

Arctic ecosystems are especially vulnerable to global climate change as temperature and precipitation regimes are altered. Community members - as 'watchers' - were first to notice warming temperatures and the effects on caribou habitat and caribou.[57]

> *It is not only predators wreaking havoc on caribou, there is also increasing insects (due to global warming). The south wind is blowing in grasshoppers. We also see different birds, ducks, and other insects. There are also some unusual/never-seen-before insects and eating the caribou feed and harassing the caribou. For example, grasshoppers (pikligiat) along the coast in Kugluktuk as well as horseflies! Grasshoppers are not just at the treeline, but also in the tundra. They eat a lot of caribou food. We are also seeing birds. We do not know words for these birds; they are strangers to us.* (Bobby Algona in MMG Sept 25: 8)

Community members talk about how migratory caribou prefer regions with lichen availability in the fall and winter. In the summer, caribou prefer cooler and windier areas with fewer insects. In winter, caribou avoid or use disturbed and recently burned areas less frequently. These ecosystems are altered with climate change.

Both scientific and Traditional Knowledge sources consider the direct and indirect consequences of climate change on migratory caribou as including changes in in habitat use, migration patterns, foraging behaviour, and demography. For example, a direct consequence may be that there are more forest fires whereas an indirect consequence may be that caribou lose habitat because of these increased forest fires. In addition, changing climatic conditions may have very real implications on social and economic stress to Arctic and Subarctic peoples in relationship with caribou.

> *The herds that are left are getting decimated from the predators also more and more hoof rot. Everything is thawing out, the permafrost is thawing and everything is wetter and the hoofs can't dry out*. – 6B, BCRP 2016: 16

> *When we think about Bathurst herd you have to look at the whole ecosystem that is suffering. All the pressures that are part of the world like climate change, jet stream carrying dust from all over the world. It all drops down in Nunavut, NWT and all over Canada and the world. Think about the whole ecosystem not only the caribou we should be mindful of. The smallest microorganism to the biggest animal, we live off and depend on the other animals. The whole ecosystems are suffering. It tells me that animals and not only caribou are suffering*. – Bobby Algona in BCRP 2016)

Traditional Knowledge holders explain many of the indirect consequences such available forage may be lessened by wildfire leading to skinnier caribou; ice at crossings may be too thin causing caribou to fall through and die; or overheating caribou may suddenly lie down and not get up again. Further, Elders

[57] Thorpe 2000; Riedlinger and Berkes 2001; Krupnik and Jolly 2001; Thorpe et al. 2001; Nakashima et al. 2012

talk about climate change is causing shifts in the timing of migrations, extent of ranges, quality of habitats (and body condition), and behaviours of other animals that can lead to competition with the Bathurst caribou for key habitat (e.g with muskox), particularly during times of intense fire activity. In addition, caribou are known move away when other animals (e.g. moose) encroach on their range.

Many community members have explained that changes in habitat caused by environmental change has led to skinnier caribou:

> *There used to be lots of fat in the intestines, but not these days. The caribou are also not as fat and there are no soft fat in the stomach. There used to be thick fat in the large intestine but that too is not there.* -- Johnny Boline in TRTI 2016:

7.1.2 Wildfire

> *Forest fires are more severe now than in the past. In the past there would so many caribou, but now there are not as many because of the forest fires. Forest fires also kill a lot of the wildlife like insects, birds and small furbearing animals. A lot of things have gone. There were not as many forest fires in the past, (ML 2000 in Kendrick et al. 2005: 181)*

Community members have become very concerned about the amount of recent wildfire in the Bathurst winter range, particularly resulting from the 2014 fire season (AD 2016; NWTMN 2016). While wildfire has occurred before, for many residents 2014 was the most extreme fire season in recent memory. Compounded with human disturbance resulting from mineral exploration and mining, transportation, direct mortality from hunting and predators, and a changing climate, communities are concerned that the high level of recent fire has resulted in inadequate suitable winter range habitat to support a recovering Bathurst caribou population.

Traditional knowledge suggests that it can take at least 30 years for caribou to return to a burned area,[58]

> *There will be no caribou if there is nothing for them to eat. Moss takes about 30 to 40 years to grow back [from fires] and the trees will grow back in about 25 years but they don't eat the trees the grass will grow back but their main source of food is moss*. -- Denesuline Né Né Land Corporation, 2016: 5

> *Lichen takes 50 years to mature before the caribou stomach can digest that. Now in the 2000s and late nineties this whole area burned in north slave. Caribou moved away because all that food is burnt*. – 6A in 2016

> *A lot of the caribou range is burnt, but there are green strips here and there. And the caribou are following those narrow strips. Some of the strips go along ways near Manchester Lake.* – 6B in BCRP 2016

[58] BCRP 2016; Parlee and Caine 2017; AD 2016

Documented Traditional Knowledge suggests that caribou migration is strongly affected by wildfire and resulting burned areas. Knowledge holders report that even after fire-damaged areas along their migration route have recovered and the lichen has regenerated, caribou do not always return (ACFN 2003).

> *This summer we were thinking that we want to bring those people over to the place near to where all my [ancestors] come from and study all the food for the caribou and the routes the caribou used but today the caribou don't go the way they used to, the routes are all bushy now. Forest fire areas the caribou used to use those areas for food and now it is all burned so they stay north. — Joseph Judas (BCRP 2016: 15)*

With warmer temperatures and longer growing seasons predicted for northern Canada under a climate change scenario, forest fires are expected to increase in frequency, duration and ultimately increase the area burned on an annual basis (Flannigan et al. 2005). As knowledge holders observe, Bathurst caribou herd shifts its distribution in the winter range in response to burns and its ability to move across the landscape to select unburned areas is an important adaptive strategy. It is uncertain how a change in fire frequency, duration and area burned might affect the Bathurst herd in the future.

7.1.3 Predation

Predators are a significant source of direct mortality for Bathurst caribou according to both Traditional Knowledge and science.

> *Traditions nowadays, young people are not trapping anymore. Predators are the most that are killing off the caribou. Too many wolves and grizzly bears back home……In the past I always tell people that we control wolverines, wolves and grizzly bears through use of furs.* – 2B in BCRP 2016

Predation by wolves is the predominant source of natural mortality in migratory barren-ground caribou. Due to the continued recent decline of the Bathurst herd and its current critical state, the Wek'èezhìı Renewable Resources Board (WRRB 2016a) recommended that GNWT and Tłı̨chǫ Government conduct a collaborative feasibility assessment of options for wolf management. Tłıchǫ communities have reported that wolves are abundant and increasing in and around communities, and are concerned about potential conflicts with people and pets (including working dogs) as well as high levels of predation on caribou (WRRB 2016d). If conducted effectively for several years and in combination with harvest management and community participation, the rationale for reducing wolves is to increase caribou survival, which would contribute to increased caribou herd growth (WRRB 2016c). Inuit Qaujimajatuqangit explains there are more wolves and grizzlies preying on caribou nowadays than in recent memory.

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7.1.4 Insects and Parasites

Community members have commented on how stressful insects can be for caribou, explaining that animals can run around "crazy" until they suddenly collapse.[59] This wasted energy spent escaping the insects means that the caribou need to eat more. Insect harassment is closely linked to summer temperature, wind conditions, and other environmental variables. Combined with variation in summer forage quality, harassment from biting insects is an important natural factor that influences summer body condition and fall pregnancy rates in migratory barren-ground caribou. Traditional Knowledge tells us that caribou are skinnier in the years when there are many insects. [60]

7.2 Human Disturbance Factors

In addition to the natural phenomena introduced above, human caused disturbance affects caribou. The types of human factors discussed most in traditional knowledge sources reviewed include:

- Respect
- Hunting
- Land Use (Development, Roads, Aircraft and Vehicles)

7.2.1 Respect

Respect has always been at the core of the relationship between people and caribou. That recent times have brought a fundamental change in this relationship because caribou are no longer being treated with respect factored heavily throughout the sources reviewed and was the main topic of discussion during the workshop held in 2016. Accordingly, respect was celebrated as one of key principles in the approach of the Plan.

Traditional knowledge asserts that the relationship between caribou and people is suffering and, there is a need to help people learn and understand the historic relationship between people and caribou and how traditional laws maintained the integrity of that relationship.

> *We don't show the caribou we love them because we don't harvest them anymore*. – Eddie Sangris, BCRP Meeting, April 2015
>
> *My job is to get the view out that caribou is a person, something that needs to be respected. This used to be caribou habitat, right here. Need to think about caribou as intelligent, sentient beings. Treat the meat, the blood, and the bones with respect because caribou is a smart animal. Caribou will not come to us because it is a smart animal. Talking about it like a person to person. We as persons need to take that upon us. Feed the water, give back to the land. We have been reviving old trails where people used to go to get caribou; where people used to intersect with caribou*. — Petter Jacobsen, BCRP 2016: 17

[59] There is a term in Inuinnaqtun to describe this specific behaviour meaning "caribou running because of insects" *Tuktuk poihoaktot*.
[60] Thorpe et al. 2001.

We survive by the animals: all our ancestors lived by the animals on the land, and the animals were healthy. If we don't take care of the animals, if the mining starts up and the animals get contaminated, the people will also (Weledeh Yellowknives Elder Joseph Charlo).

Knowledge holders explain that human caused disturbances affect caribou because they are symptomatic of the disrespect that has led to population decline, altered migration routes, and diminished health, among other noted impacts.[61]

When I was a young man I lived in Whatì. There used to be ekwo around there at that time. But someone had hit the ekwo with the stick, and the elders said 'if you guys [the older elders] are right, next year there will be lots and lots of ekwo.' Sure enough that next year there was ever lots of ekwo. But that next year after that, there was no more ekwo. Because the ekwo was hit, that why. Now I'm over seventy years old...From then on [and] for the next 30-40 years thereabouts, only then will the animals return they say. Johnny Eyakfwo, April 17th, 1997 (West Kitikmeot Slave Study Society 2001: 27)

Caribou people have a deep understanding of the complex and inter-connected ways to respect caribou, most of which are tethered to traditional law (Figure 14).

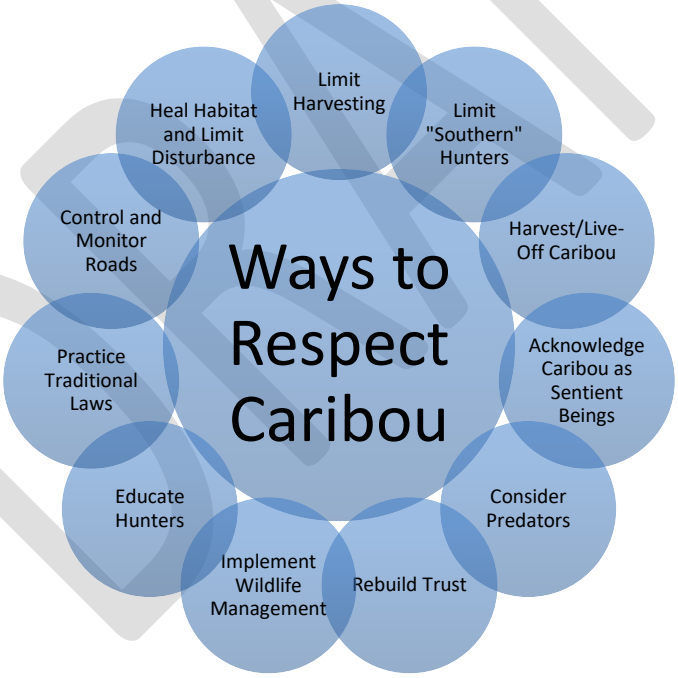

FIGURE 14: WAYS TO RESPECT CARIBOU ACCORDING TO TRADITIONAL KNOWLEDGE.

Northerners often speak to the importance of healing the relationship between people and caribou and advocate for respect as a key first step:

[61] TRTI 2016b

> *We are talking about how to heal the relationship between people and caribou but I also think we need to heal the relationship between the land and the people. If you look at the map there is stuff all over the place and you see that we haven't respected the land in a way that will sustain caribou. The Athabasca Dene are caribou people, that's who they are, I know there are other communities that are as well. So everyone suffers when the caribou suffer*. — Tina Giroux in BCRP 2016: 6

Disrespecting cultural codes around hunting may also lead to a decline in overall fitness or survival of caribou. From a Traditional Knowledge perspective, a loss of respect by people explains recent changes in well-being and status of the Bathurst herd.

> *The problem right now is that we have to go back to our relationship with the caribou. We have to go back to the land with our young generations, teach them and give the culture back*. — Napoleon Paquette in BCRP 2016: 5

> *As a Native, the way I was taught, the traditional way, respect the animals and respect the land and they will respect us back. Need to pass this onto younger generations. Want caribou for your son or grandson? Then respect the animals. If you like caribou meat and you want your kids to have caribou meat, then respect the wildlife*. — Simon Qingnaqtuq in BCRP 2016: 5

> *Way in the past when elders talked to me, if you are taking care of animals right, they will come back in spirit and the spirit will come back to life. If you are not doing the right things, they will not come back. Today we are getting to that. We want caribou and we kill them but bones are going to the dump and the caribou numbers are going down. — Simon Qingnaqtuq in BCRP 2016:8*

> *You cannot hit and you cannot point the paddle to a caribou like a stick. If you do, then the caribou go down. Last time caribou came around 2009? I heard in my community that someone beat up a caribou with a stick. This is how our culture works. This is the way our elders have been telling us. Same with the berries, blueberries, cranberries on the barren grounds cannot be brought back to places like Wekweètì or the caribou will not come back. A lot of people pick berries and bring them back. I say don't do that, there may not be caribou but they don't believe me. We are suffering because we are not following what our elders have told us. A friend of mine says this morning, if you listen to elders what they say is powerful and strong. They don't write, they know. They look way ahead*. — Joseph Judas in BCRP 2016: 20

> *They have disappeared and 30 years later we are starting to spot them again. For Bathurst herd, if we continue to hunt without respect it will take another 30 years for the population to go up. – Simon Qingnaqtuq in BCRP 2016: 20*

Disrespect for caribou and caribou habitat has threatened caribou well-being and fractured the relationship between people and caribou. Traditional knowledge tells us the many ways in which respect can be shown to caribou (Figure 15).

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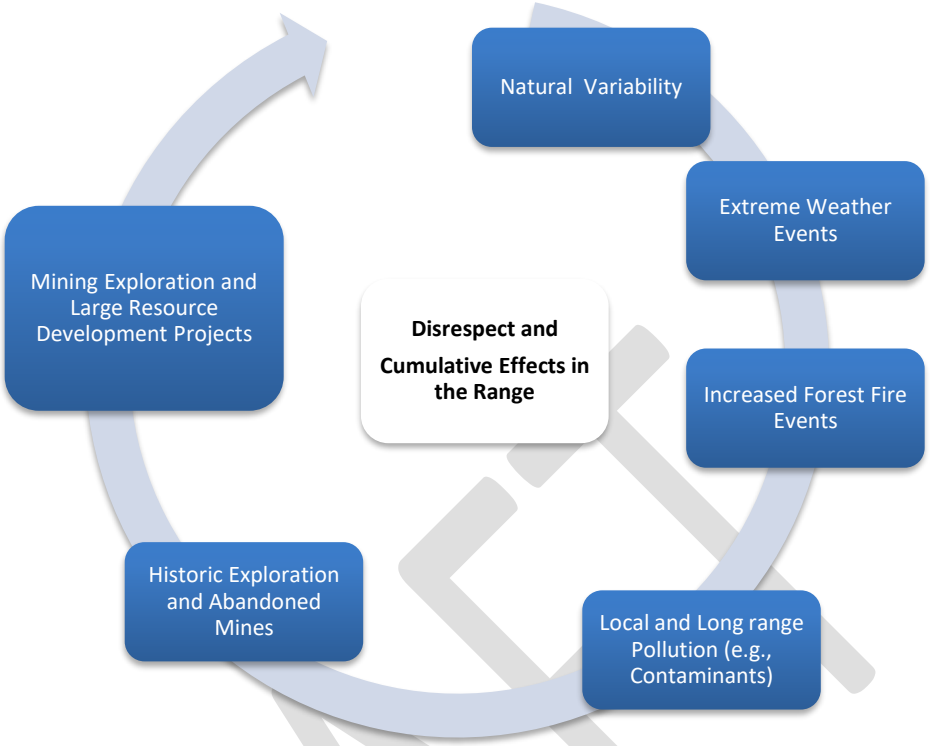

FIGURE 15: DISRESPECT AND CUMMULATIVE EFFECTS ACROSS THE RANGE: TRADITIONAL PERSPECTIVES ON FACTORS AFFECTING BARREN-GROUND CARIBOU AND CARIBOU HABITAT, AND THE HUMAN-CARIBOU RELATIONSHIP.

When people disrespect caribou, people are known as "pitiful", lose their caribou "luck" and are not successful in their harvests. When caribou are respected, they will give themselves to people. In many cases, caribou "luck" comes through respect demonstrated towards caribou:

> *The luck has ignored us. We are not taking care of caribou right. In order for me to talk about this and how it will come back and be lucky, it is a lot of work that has to be done*. — Joseph Judas in BCRP 2016: 7

Without being able to harvest caribou, people are not "wealthy" in an emotional, spiritual, cultural, materialistic and subsistence way.

> *In my youth, my father would take me to the barrenlands every year just after I got out of school. He said, 'I'm going to teach you, so that you will be knowledgeable. Before you harvest animals, you have to learn to understand them. The way they think, their habitat, the way they live, what they eat. Before you harvest ʔekwǫ̀ you must understand them first. You must understand the names of ʔekwǫ̀ and the reason they're doing what they do, migrating, going to the forest from the Arctic barrenlands and back again.' And there are traditional laws that come with ekwǫ̀. Every child has to understand the laws pertaining to ʔekwǫ̀ (Fred Sangris 2012: 75).*

The caribou will know if a nation took care of them and they will come back, if they were abused they will not come back. If we are going to change the behaviour of the caribou we need to change our behaviour. We need to respect caribou, we can't butcher and get blood all around. Traditionally woman couldn't step over caribou blood, the men must ensure that they don't leave blood on the ground (and make things difficult for women) and we must re-establish our traditions of having a sacred place to put the bones (Chief Charlie Football in Barnaby and Simmons 2013: 10).

The disrespect shown to caribou responsible for the decline of caribou and shifts in migration routes, has direct implications for caribou people. Today people live in settlements and no longer show the same level of respect to caribou their ancestors exhibited, back when caribou and people could speak the same language. Traditional knowledge holders explain that caribou are creatures of habit, and are so sensitive that any changes within the range and herd are inevitably sources of stress. Because people are caribou and caribou are people, when caribou experience stress, people are necessarily and intimately affected (TRTI 2016b).

7.2.2 Hunting

For Bathurst herd, if we continue to hunt without respect it will take another 30 years for the population to go up. Elders have to be listened to. – Simon Qingnaqtuq in BCRP 2016: 20

In the boreal forest and on the tundra, caribou hunting has been the basis of traditional economy and culture for millennia. Most groups across the range of the Bathurst herd have published their traditional rules around hunting caribou.[62] As an example, the Athabasca Denesǫłiné rules around hunting caribou are shown in Section 4.1.1.

7.2.3 Land Use

Human land use includes the physical features that people build and the activities of people on or around them. Many traditional and scientific perspectives about how land use affects caribou are similar, with each perspective corroborating the other. While the following provides a description of traditional perspectives on land use, many of these are echoed in the scientific information.[63]

During this recent population decline, there was a boom in mineral exploration in the early 1990s in the range of the Bathurst herd, and the construction and operation of four new diamond mine projects from the late 1990s to present in the Northwest Territories (Diavik, Ekati, Snap Lake and Gahcho Kué). Similar to other regions of Canada, there is general belief that that improved road and trail access led to increased harvesting, however, there are no data available about harvest levels in this region. The combined effects of increasing development and perceived harvesting pressure led community members, industry, governments and agencies alike to recommend establishing and implementing a

[62] Legat et al. 2001; Thorpe et al. 2001.
[63] See BCRP 2018b.

cumulative effects monitoring and management strategy (i.e., a watching program) that would minimize negative impacts to caribou as part of the northern ecosystem. In response to the sharp population declines seen in the Bathurst herd and other northern Canadian barren-ground caribou herds, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) recently designated barren-ground caribou as a threatened species.

As mineral exploration and development increased in the 1990s, many community members predicted that caribou would decline, concerned that more activities in the range would be the cause. This fear is still held strongly by many individuals.

7.2.3.1 Effects of Development

Throughout the literature, community members identify resource exploration, extraction and development (e.g. mining and their associated infrastructure), as the main sources of impacts on Bathurst caribou. As explained by Dettah Chief Edward Sangris during technical sessions for the Jay project environmental assessment held in Yellowknife in April 2015:

> *The caribou don't have a navigational aid like the humans do; we cannot direct them to go here and there. No matter how many precautions they put into the traffic management consideration, it will always have an effect on caribou. In my view the footprint for development is getting bigger and the footprint for caribou is getting smaller (CBC News North 2015).*

The elders who predicted declines in caribou populations in the 1990s are now especially frustrated that their fears were realized. Some people assert that the steep declines in these areas are coincidental while others suggest that the decline have been caused by the level of disturbance of these ranges since the 1990s. Still others explain that it is the combination of all factors influencing the range that is responsible.

These population declines are also associated with changes in the distribution of caribou over the last thirty years. Several Elders and hunters from Łutsel K'e as well as the Kitikmeot communities have been clear and vocal about their observations and interpretations that caribou are moving further away because of the mines. Work by the Tlicho Research and Training Institute suggests that caribou migration routes have shifted owing to similar effects (Figure 16).

> *When our elders had a meeting before the mines, [they questioned] what are we going to do when the caribou are gone? Well it is today and the caribou are gone. The caribou send to move to the north in the springtime. In the last 5 years the caribou are all moving to the east because they are all getting away from the mines* (Antoine Michel in BCRP 2017: 14).

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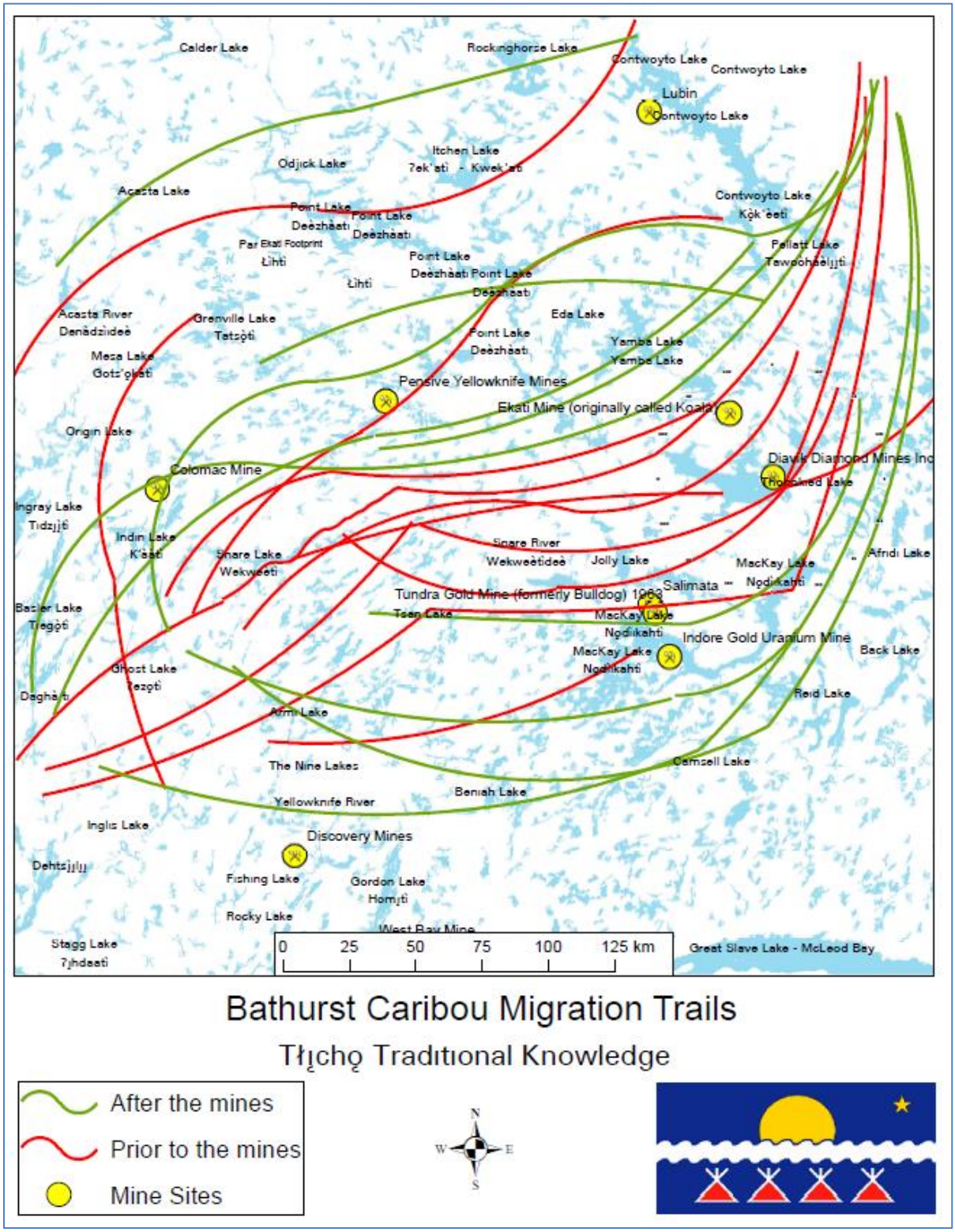

FIGURE 16: MAP SHOWING CHANGES IN MIGRATION TRAILS ACORDING TO TŁĮCHǪ TRADITIONAL KNOWLEDGE. Source: (TRTI 2016b: 38)

Caribou are known to be particularly sensitive to noise, dust, and disturbance, especially when in small groups which is more often the case with dwindling population numbers. While mineral exploration and development has boomed across the range since the 1990s, caribou populations across Canada have generally declined. Starting over twenty years ago, some Traditional Knowledge holders predicted a that caribou would decline as development increased across the range: these same community members now assume a causal relationship and carry the burden of feeling like they somehow should have prevented this occurrence. Other traditional knowledge holders see the cumulative impact of natural and human disturbance as the reason for caribou decline, citing that it can be difficult to isolate one particular type of disturbance. Noise, light, dust, pollution, and physical structures, among other impacts, are reported as significant threats to Bathurst caribou causing disturbances, shifts in migration patterns, habitat destruction, injuries, contamination, and changes in the overall health of the herd.[64]

> *The Tłı̨chǫ who participated in the study identify the establishment of large-scale mines and associated industrial activities on the Bathurst caribou habitat as the main factor behind caribou health defects and changes to their behaviour and migration. Relying on Tłı̨chǫ concepts of the human-caribou relationship, the study has showed how human activities on caribou habitat have negatively affected the herds. In response, caribou have chosen to avoid centers of mining activities, due to poor-quality forage and noise and dust pollution. The activities of the resource extraction industry around the Ek'atì (Lac de Gras) area, have established a 'wall' blocking the main caribou migration route, the Ek'atì tataa. Since there are obstructions on their trail, the caribou have chosen to migrate to other areas, and thus the migration routes have divided at Ek'atì. The elders name this avoidance as inǫ̀ dè ʔǫ̀goèhshì which correlates to the zone of influence, as documented in scientific studies. (TRTI 2016b: 2)*

> *Depending on the weather, the noise travels very far. When I am having tea with my wife outdoors, every once in a while, we can hear the blasting due to cooler air and greater pressure. It will cause the sound to reverberate a long way (imiayok – which also means the echo on top of a mountain). You can hear a skidoo 10 miles away when the pressure is high. When it is cool, it is pressurized. The sound does not disperse up high; it stays on the ground.* (Bobby Algona in TCS 2014a: 3)

Traditional knowledge holders have been able to predict and/or directly attribute impacts to caribou from human development, roads, vehicles and aircraft.[65]

> *It's kind of interesting what the elders were predicting in the 1990's and 2000's about the impacts of the mines. It predicts the effects of the mines and the last couple years. We have been*

[64] KHTO and Golder 2011; Beaulieu 2012; Sangris 2012; EMAB 2012; Parlee *et al.* 2013; GSCI 2015; Trailmark 2015; TRTI 2016a, 2016b; LKDFN 2016; NSMA 2016; NWTMN 2016; YKDFN 2016

[65] (Dogrib Treaty 11 Council 2001; Thorpe *et al.* 2001; Kendrick *et al.* 2005; Łutsel K'e Dene First Nation 2005; Legat *et al.* 2008; KHTO and Golder 2011; Judas 2012; LKDFN 2016; NSMA 2016; NWTMN 2016; YKDFN 2016).

documenting the health effects and migration routes and we can see the great correlation between their predictions and what happened. (Petter Jacobsen, in BCRP 2016: 27)

Human disturbance can cause caribou to run and gallop, which may lead to injuries and the separation of groups of animals. Intense disturbances can cause animals to collapse from exhaustion and stress, potentially leading to death. As groups of animals become split and get smaller, animals are less brave and stay away from people, leading to smaller ranges.

Human expansion and development across the Bathurst herd range (itself said to be an act of disrespect) has changed the relationship between people and caribou such that caribou fear and are no longer happy to see people. Caribou have started to move away when communities, roads and development came to the North. Traditional knowledge explains that caribou are known to be extremely smart and have learned to avoid stresses but increased development and stress has affected female caribou health and pregnancy rates:

All the females are supposed to be having a baby but some of them are not like that, they have no babies! They are supposed to have it but it didn't happen. But before those [mines] being established, almost all the females used to have babies to go back to the Barrenlands. So in that case it's a really big change from those times till today. -- Jimmy Kodzin, February 12th, 2015 in TRTI: Tłı̨chǫ Research and Training Institute. May 4 2016.

As discussed, mine infrastructure can act as complete or partial barriers influencing or hindering caribou movements and preventing groups of animals from reaching important calving areas or feeding sites, effectively serving as a "wall" (TRTI 2016a, 2016b) or "dam" (BCRP 2016).

The migration route has changed. The caribou go northeast now to avoid the disturbances. The roads and the mine sites block their migration routes. The dust from the mines cover the lichen. The dust can easily travel 1—km or more as a result of the wind, which impacts the food supply (NWTMN 2016: 3).

Traditional knowledge informs Working Group members' understandings of how and when caribou avoid, are drawn towards, or remain minimally affected or completely unaffected by development. Indigenous community members have reported that mining infrastructure can attract caribou seeking refuge from the sun, predators, and insects or deflect caribou in terms of both their small-scale movements and large-scale migrations (KHTO and Golder 2011). At the same time caribou are known to avoid developments, behavior which causes them to alter their migration routes initially in response, and thereafter out of memory and habit (NWTMN: 2016).

After a few years, caribou learn to avoid the mines. They will travel 30 to 50 miles out of their way to avoid disturbances (NWTMN 2016: 3).

Still, others explain that the instinct to migrate is so strong that nothing gets in the way; caribou simply follow their leaders (Padilla 2012; Padilla and Kofinas 2012). Particularly

in the spring, the first few caribou in a group have long been recognized as leading the herd in their migration and so cannot be harvested:

> *When my dad and I went hunting and grass was really green. It was hard to eat the caribou stomach liner. Caribou cannot smell when hunters are approaching because they can only smell the grass because it is really green. My dad told me not to shoot the caribou leader. If we shoot the leader, the caribou will lose their way and never come back.* (Alice Ayalik in MMG Sept 25 2012: 11)

> *[Mining companies] should not disturb the leaders, because they are showing the others the way. They have some sort of gland in their foot, and they leave a scent in the sand and the rest of the herd follows it.* – Floyd Kaitak in MMG Sept 25 2012: 12

Although not reported as often, some Traditional Knowledge holders report that the caribou's instinct to migrate drives them through any obstacle:

> *There's no way you can keep an animal out of its migrating route when it's migrating somewhere. It's either going north or coming back south. There was always a different route they use. No matter if there is a tailings line, they'll go over it. Just like the mountains, they go over that mountain. They'll even cross a strong river (John Ivarluk in EMAB 2012: 22).*

Some knowledge holders reported that caribou can adapt to physical disturbances on the landscape:

> *These caribou are growing accustomed to mines like a landmark…now they are using them in their travels. (Anonymous in KHTO and Golder 2011)*

> *There were caribou around the tank farms. They were hanging around in the shade. They love it! Hiding from the big tanks and building, I was surprised. (Colin Adjun in KHTO and Golder 2011)*

> *With human activity, they sometimes change their migration routes. Lac de Gras, before the diamond rush, caribou used to migrate through there in great big herds…today it is totally different. Only a few in a group, not like hundreds. (Anonymous in KHTO and Golder 2011).*

> *In a few years, the caribou will change their route again. They will go a different way; they will be disturbed by the winter road, planes, and blasting. You will see [these changes] in three to five years from now. (Louis Abel of Łutsel K'e in Parlee et al. 2005: 35).*

7.2.3.2 Historic Periods of Mining and Abandoned Mines

Repeatedly, Elders have expressed concerns about the number of abandoned mines in the range that pose hazards to caribou. The legacy left behind from many operations has left people weary of future mining, even when legislation and enforcement today much better protects the environment. The effects of extreme cases (e.g. Giant Mine) mean that people are quick to blame mining operations for any change in caribou populations, well-being, behavior, etc. This history combines with human

DRAFT

perceptions around risk to continue to affect the present: this legacy should factor into all messaging around the Plan and into discussions with community members.

7.2.3.3 Effects of Roads

Building on living memory of how small camps and other land disturbances affect caribou, Traditional Knowledge holders today have provided insight into the impacts of roads on caribou. Review of the Traditional Knowledge literature indicates that linear features such as roads can affect caribou by increasing disturbance, creating partial barriers to movement, increasing access for harvesting, and altering migration.[66]

> *There's roads and mines and all activities where all the caribou pass, I mean, that block the caribou...elders said that when something like that happens, caribou don't go there again. (Harvester in Parlee and Furgal 2012: 37)*

Some Elders suggest the impact may be seasonal; during peak periods of migration, the road may be less of a barrier than during other parts of the year.

> *Although we have all seen ʔekwö in association with the ice road, the ʔekwö do not like to cross roads unless they are in the migration mode. They become very skittish when trying to cross roads, as they can smell the human scent. When they are not in migration mode and simply foraging during the winter, if the ʔekwǫ̀ sniff our scent, they will turn back (Romie Wetrade of Gameti in Dogrib Treaty 11 Council 2001: 13).*

Roads were discussed at length at the BCRP Traditional Knowledge Workshop (BCRP 2016) and have been a key issue documented in multiple reports. Some of the common understandings related to roads and caribou include:[67]

- Caribou avoid busy roads;
- Roads are barriers to migration;
- Roads fragment habitat;
- Caribou won't cross steep snow banks;
- Roads create "easy walking";
- Roads allow good look-outs for predators;
- Roads provide escape from insects due to the wind;
- Caribou behaviour depends on the time of year;
- Roads can open up otherwise undisturbed areas for more hunter access;
- Roads can be areas of noise, pollution and contaminants.

[66] Parlee et al. 2005a, 2005b; EMAB 2012; Tłı̨chǫ Government 2013; Sangris 2012; Jacobsen 2013; Trailmark 2013; NWTMN 2016

[67] Kendrik et al. 2005; Parlee et al. 2005a, 2005b; Trailmark 2015; AD 2016; TRTI 2016a, 2016b; LKDFN 2016; NSMA 2016; NWTMN 2016; YKDFN 2016

Community members have either observed direct effects or make predictions on what effects may happen as a result of the effects of roads linked to mineral exploration and development:

> *No matter what you do, caribou will be affected by these mines and roads. The only way to not affect the caribou is to have no mines and roads. If there is a mine, there will be roads. And if you have a road, there will be trucks on it. If they put it through, you can't stop everything for the caribou. But maybe that is what the caribou need. (Pierre Catholique in Parlee et al. 2005: 35)*

> *Now that there are mines with roads and high snow drifts on the sides, the caribou won't cross and their migration route is disrupted. The old people said if you pile up snow into drifts, the caribou would not cross them. They just move alongside of it. This is what is happening with the winter roads. They don't teach kids about this anymore. The white man does not know this. The way the caribou migrate has been disrupted. The roads bisect the migration routes and disrupt the natural behaviour of the caribou. (Liza Enzoe in Kendrick et al. 2005: 183)*

7.2.3.4 Effects of Aircraft and Vehicles

In addition to roads, vehicles and aircraft are understood to affect caribou through the following ways:

- Caribou become stressed and may run or gallop which can cause injuries or death;
- When caribou have been stressed, the taste of the meat changes;
- Disturbance can cause caribou to become isolated, dispersed or clustered in small groups which can make them more vulnerable to predators or feel more stressed (NWTMN 2016);
- Vehicles can lead to direct collisions causing injury or death.

Individual caribou can display specific behaviour when disturbed. Indigenous knowledge holders explain that stressed caribou raise their noses into the air, lifting them higher and higher the more alarmed they become.

> *The caribou are running in front of the helicopter. When a caribou gets scared or surprised or threatened, that's what they do. They put their nose up and sometimes they jump and then they go on a really fast gallop because they don't know what's going on and they're threatened. (Fred Sangris in EMAB 2012: 20)*

Given that caribou are sensitive animals and react to noise, smells and movement, community members reported that vehicles and planes can affect caribou.

> *Planes and helicopters are flying too low and scaring the caribou. They are unable to rest and eat properly. They are very sensitive to the noise. This is especially an issue with the magnetometer surveys. They fly at 250 metres and the grids are really tight. This disturbs the caribou when they attempt to feed. This especially impacts the cows. If they don't feed, they don't put on weight which makes it difficult for them to get pregnant and have healthy calves. (NWTMN 2016: 2).*

DRAFT

Long-Term Effects of Land Use

An overarching concern held by many northern Indigenous groups is that mining development will "spoil" or "ruin" the land such that caribou - along with other animals - will never return even long after an area is reclaimed.

7.3 Summary

In the context of the Plan, the major factors affecting the Bathurst caribou come from the cumulative effects of natural variability and human disturbance. Natural factors affecting caribou include climate change, wildfire, predation, insects and parasites. Human disturbance factors include respect, hunting, and land use (i.e. development, roads, aircraft and vehicles). Findings from Traditional Knowledge played a critical role in identifying each of these factors (including the direct and indirect effects they produce) and providing an understanding of the multiple forces at play that threaten both caribou and caribou habitat for the Bathurst herd.

Regardless of these other factors, Traditional Knowledge holders have identified disrespect as a major factor that has caused declining caribou, and this seems to be the one factor of which people have the most control. Traditional laws around respect are not being practiced as much or in ways that they should, and the results have been profound.

Some ways to demonstrate respect – and thus start healing the relationship with caribou – include:

- Limit harvesting limit southern hunters;
- Harvest / live off caribou;
- Acknowledge caribou as sentient beings;
- Consider predators;
- Rebuild trust;
- Implement wildlife management;
- Educate hunters;
- Practice traditional laws control and monitor roads; and
- Heal habitat and limit disturbance.

As this Section has illustrated, caribou insights documented in the Traditional Knowledge literature, shared at the Traditional Knowledge workshops, contributed through Traditional Knowledge reports assembled for the BCRP, and recorded in the spatial databases, show much repetition, consistency and congruity across Indigenous groups and traditional territories. Very similar stories repeat, grounded in knowledge of caribou held, shared and realized since time immemorial: Indigenous peoples across the Bathurst range are making the same observations and are guided by similar Traditional Knowledge. In the western scientific view, this "repeatability" speaks to the level of confidence that can be entrusted in Traditional Knowledge as "these are things that are really happening." At the same time, differences in viewpoints expressed both within and between communities mean that healthy dialogues take place thereby bringing forth a more comprehensive understanding.

DRAFT

Although the challenge of reducing Traditional Knowledge to a few key themes is itself problematic, the BCRP was grounded in many key themes shared at the Traditional Knowledge workshop in 2016:

1. The relationship between people and caribou is suffering and needs to be renewed and healed;
2. Respect is at the core of the relationship between people and caribou: lack of respect is why caribou are in decline and the caribou-people relationship is changed;
3. People understand caribou and are their guardians;
4. People depend on caribou for their way of life: people are caribou and caribou are people;
5. Many threats (roads, development, predators, forest fires/current burn policy, climate change, wasteful harvesting, cumulative effects, etc.) have changed the relationship between people and caribou and caribou well-being;
6. Caribou are smart and can adapt: they learn to avoid people and predators; they know where to go for good food, etc.;
7. caribou people have always known the places important to caribou (crossings, calving grounds, land bridges, calving grounds) as evidenced by the overlap between traditional camps and caribou migration routes;
8. Youth must be taught how to respect caribou and given opportunities on-the-land to learn the caribou way of life;
9. People predicted caribou populations would decline;
10. People feel strongly that Traditional Knowledge should have been accepted as fact earlier; and
11. Everybody must all work together: all people of NU and NWT as well as community members, biologists and other resource people.

Finally, the Working Group and Project Team has tried to alternately sew together and individualize Traditional Knowledge and science—two ways of knowing—without necessarily crediting the knowledge collected to one system or the other. For the most part, findings from Traditional Knowledge and scientific research affirmed and confirmed each other (e.g. caribou populations are declining; caribou health is compromised; forest fires are burning caribou habitat) even when the process or rationale for recording observations differed (e.g. caribou populations are declining due to disrespect and fractured relationships with people, versus cumulative impacts or climate change).

DRAFT

8 Coming Together: Assessment, Management Options and Recommendations

The BCRP planning steps and approach are grounded in understandings of caribou and its habitat, people living within the range and engaging with the Bathurst herd, important land use and economic activities occurring within the range, levels of range disturbance, how different natural and human factors may affect caribou, and sensitive or important areas of the Bathurst herd range. This assessment then led to the development of key issues and management concerns. From there, management recommendations to address those concerns were explored.

The last planning steps in the Bathurst Caribou Range Plan, as outlined in Section 2.1.1, involved *Identifying Key Issues* and *Assessing Management Options*. This Section seeks to present the key understandings considered, reviewed and woven into the Plan to advance this planning step and to demonstrate how these recommendations are tethered to Traditional Knowledge. Based on the assessment of key issues and the management tools available, nine recommendations were put forth which together are meant to achieve the goal and objectives of the BCRP. Understandings shared by scientists, northerners, and governments as well as Traditional Knowledge holders were combined in this iterative process.

The central question of how much is enough? or how much is too much? when it comes to human disturbance on the range of the Bathurst herd has Traditional Knowledge holders wondering whether a threshold has been crossed. People observe that clustering of developments is causing a wall in the migration path and has caused significant shifts in age-old migration routes. At the same time, some Traditional Knowledge holders assert that the instinct to migrate is so strong that nothing can stand in the way of the migrating caribou.

In keeping with this stewardship ethic, some principles for taking caribou and the caribou range proposed at the 2017 Traditional Knowledge Workshop included:

1. The caribou range is a dynamic landscape and caribou use of the landscape, particularly in the fall/winter range cannot be easily predicted. To ensure there is enough habitat for caribou, enough land must be set aside and conserved without disturbance including calving grounds, summer range and fall/winter range.
2. No further development should occur in the range until caribou herds recover to 150 000 + animals; nor should any other development be approved in the herd falls below 150, 000 animals.
3. Previously disturbed sites must be cleaned up and reclaimed (e.g., abandoned mines) to ensure that the land is healed and plants valued as caribou forage can regenerate in these areas.

DRAFT

4. In the long-term, disturbance of the remaining land in the Bathurst range must be managed with caribou being the primary value.
5. Caribou movements patterns and critical habitat features such as land bridges and areas of key water crossing must be protected and respected as sacred ecological places (i.e., no-go zones for development).
6. The land should be monitored by Indigenous peoples to watch for unexpected changes and ensure that no other work or rules are needed to manage the Bathurst Range.
7. Everybody must work together (NU and NWT peoples as well as community members, biologists and other resource people).

Within this context, specific understandings from traditional knowledge have been woven into the BCRP purpose and principles (Table 4), goal and objectives (Table 5), and the management tools (Table 6).

DRAFT

TABLE 4: KEY UNDERSTANDINGS FROM TK WOVEN INTO THE BCRP PURPOSE AND PRINCIPLES

BCRP Purpose:	**To manage human-caused and natural (fire) disturbance in the Bathurst range and the effects on caribou, caribou habitat, and Caribou People.**
• *Answer the community question: How much is enough?* • *Respond to responsibility as caribou guardians* • *Respond to declining populations* • *Respond to increasing disturbance* • *Heal the caribou-human relationship* • *Apply traditional laws*	
BCRP Principles:	
1.	**Respect Caribou**
• *Heal the human-caribou relationship* • *Live off caribou: respect for caribou will bring "caribou luck" to hunters* • *Educate hunters and practice traditional laws* • *Harvest caribou that generously offer themselves to people* • *Acknowledge caribou as sentient beings* • *Acknowledge caribou as your relatives: people are caribou and caribou are people* • *Rebuild trust* • *Consider predators* • *Consider over-harvesting; Limit "southern" hunters* • *Implement fire-management* • *Control and monitor road access* • *Recognize that lack of respect is the main reason why caribou are in decline* • *Recognize that disrespect has caused: migration shifts, calving grounds to shift, herds to mix and a decline in overall health and wellbeing for caribou (and therefore caribou people)* • *Support intrinsic value of caribou as inseparable from land, water, air, and every other part of the northern ecological, cultural and socio-economic system* • *Acknowledge respect as the basis of a sustainable relationship that connects people and caribou in the past, present and future* • *Heal habitat and limit disturbance*	
2.	**Bring Together Traditional, Local and Scientific Knowledge**
• *Consider equally multiple ways of knowing* • *We must work together even when we have different knowledge, opinions, perspectives and goals* • *Practice two-eyed seeing; Be strong like two people (i.e., Consider traditional knowledge, knowledge of scientists, governments, locals plus the combination of co-produced knowledge)* • *Respect for caribou means respecting one another* • *Sometimes different ways of knowing say the same thing but in different ways* • *Not all scientists' knowledge is the same (or in agreement) just like there can be differences shared by traditional knowledge holders*	
3.	**Practice Guardianship, Stewardship and Management to Care for Caribou**
• *Acknowledge that guardianship depends upon people working together for caribou well-being* • *Engage youth in guardianship activities and learning opportunities with Elders* • *Care for caribou, in keeping with traditional practice and laws* • *Empower Indigenous people to once again protect caribou and avoid hopelessness, fear, depression, etc.* • *Build on and expand upon existing "watching" programs* • *Safeguard the future means safeguard caribou*	
4.	**Achieve Balance**
• *Consider and respect ecological (caribou), cultural, social and economic values in decision-making* • *Implement the elements of traditional laws that are grounded in the ethics of balance* • *Make tough choices that everybody can live with* • *Work within 30-year caribou cycles* • *Live by the Aboriginal law followed by the federal law*	

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TABLE 5: KEY UNDERSTANDINGS FROM TK WOVEN INTO THE BCRP GOAL AND OBJECTIVES

BCRP Goal: Ensure the Bathurst caribou herd annual range is in a resilient landscape condition.
• Heal the caribou habitat: healing caribou will heal people • Consider/ balance the factors affecting caribou habitat • Understand cumulative impacts on caribou habitat • Apply traditional laws • Help caribou to become "fat" again through healthy habitats • Honour that people depend on caribou for subsistence, cultural wellbeing and more
BCRP Objectives:
1. **Ensure the integrity of important habitats.**
• Respect and maintain integrity ("wholeness") of caribou habitat (land, air, water, etc.) • Protect key habitat used for forage, migration, calving, post-calving, over-wintering • Consider fighting fires in key caribou habitat • Understand that lost or degraded habitat for caribou means less land available to caribou people to carry out traditional practices: healthy habitat for both caribou and caribou people • Think about caribou as part of many ecosystems: all need to be healthy and are presently suffering
2. **Ensure connectivity between seasonal ranges.**
• Make sure there is "enough" healthy habitat for caribou assuming the future brings more threats such as wildlife and climate change • Protect water crossings, land bridges and other key migration pathways
3. **Ensure the amount of human-caused land disturbance is kept below certain levels.**
• *Reduce and limit human caused land activities that threaten caribou and their range* • *Consider if "too much" disturbance is already happening* • *Heal the land from disturbance (i.e. clean up and reclaim land so that plants can regenerate and caribou have the option to return)* • *Ensure enough habitat for caribou is set aside, healed and/or protected so that caribou can continue their dynamic (i.e. changing) use of the landscape* • *Prevent caribou from avoiding key habitats* • *Honour that caribou can adapt to some degrees of disturbance but that this is limited*
4. **Ensure the development, design and use of roads is managed with consideration to caribou.**
• *Respect and practice traditional laws around harvesting, especially where roads have opened in peoples' traditional territories* • *Design, site, manage and watch roads to respect caribou behaviour and movement*

DRAFT

TABLE 6: KEY UNDERSTANDINGS FROM TK WOVEN INTO THE BCRP MANAGEMENT TOOLS

BCRP Management Tools:
1. **Community Guardianship**
• Recognize that guardianship depends upon people working together for caribou well-being • Engage youth in guardianship activities and learning opportunities with Elders • Care for caribou, in keeping with traditional practice and laws • Protect sensitive areas to fulfil responsibility as guardians • Build on and expand upon existing "watching" programs • Support Aboriginal communities to empower themselves through roles as rightful guardians • Financial and other support must be directed towards guardianship programs • Guardianship programs should include education on respectful harvest practice • Reconcile that community members predicted caribou would decline, starting in the 1990s, and feel partially responsible that their predictions have been realized • Recognize that as wildlife resources decrease, the spatial scale and scope required for monitoring increases either for direct observation or sharing with other communities
2. **Habitat Conservation**
• *Designate areas for protection, conservation and special management that are important to caribou across their range* • *Celebrate that calving grounds are sacred and once disturbed can lead caribou to go elsewhere, disappear and/or affect their health and wellbeing* • *Leave caribou alone while calving; protect calving areas* • *Feed the land* • *Protect sensitive areas: calving and post-calving areas, caribou crossings and land bridges*
3. **Mobile Caribou Conservation Measures (MCCMs)**
• *Minimize disturbance to caribou when they come close to disturbed areas, particularly during sensitive times* • *Ensure monitoring through watching programs*
4. **Road Planning / Access Management**
• *Minimize disturbance from roads: noise, pollution, contaminants; change migration routes; act as barriers to movement; create dust; and remove habitat* • *Consider that roads can create easy walking areas, predator lookouts and escape from insects for caribou* • *Manage roads that allow access to previously remote areas resulting in disturbance from road traffic, injury or mortality through collisions and increased harvesting* • *Respect and reinstate traditional rules around hunting on neighbouring traditional territories*
5. **Offsetting / Compensatory Mitigation**
• *Heal the relationship with caribou and caribou habitat*
6. **Wildfire and Fuels Management**
• *Protect caribou habitat, particularly over-wintering areas rich in caribou food (e.g. lichen)* • *Acknowledge and plan for increases in climate change impacts (e.g. increased wildfires) to key caribou habitat* • *Explore replanting through traditional knowledge of key plant species and caribou food*
7. **Online Staking**
• *Limit physical impacts to caribou from mineral exploration* • *Acknowledge that caribou have acute senses and are sensitive to disturbance from aircraft noise, etc.*

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8.1 Caribou are Smart: How Caribou Adapt

Traditional Knowledge suggests that some caribou can adapt to changes in the environment by migrating along different paths or greater distances.[68] Inuit and Dene alike have explained that shifts in migrations occur as caribou adapt to changes occurring in their range, habitat, population, and body condition. However, there is a limit (or threshold) beyond which caribou can no longer adapt.[69]

> *Caribou has its own way to survive, they are like human beings. How will they survive? They will probably change what they eat (Dora Nitsiza in TRTI 2013).*

8.2 Giving Caribou time to Recover - Thresholds for Development

There have been many kinds of changes in the Bathurst range during the last twenty years that elders in many communities consider to be the cause or the biggest cause of the sharp decline of the Bathurst herd. Land use decisions made for the range have given priority to mining and not to caribou and the caribou livelihoods of northern Indigenous communities. Community members assert that although there have been some jobs from the mining activity and related benefits, decisions to approve new mines have not been made with caution or consideration for the caribou.[70] Thresholds have been set on other activities in the range; for example, hunting bans and no-hunting areas to limit harvest pressure on the herd. Although some of the Kitikmeot Inuit have been focused on the opportunities that new mines might offer, many other Inuit as well as Indigenous leaders from the Yellowknives Dene First Nation and Łutsel K'e Dene First Nation have strongly voiced opposition to new development until the caribou herd recovers to a more sustainable level. In many cases, such differences within and between communities can cause division and upset. These are the types of challenging trade-offs as well as the balance sought throughout the Plan.

Cumulative effects ongoing throughout the Range were consistently identified by community members as the most concerning impact to Bathurst caribou. Recently, the environmental assessment of the Gahcho Kué Project highlighted ongoing concerns voiced strongly by Indigenous communities that numerous impacts on Bathurst caribou are not being addressed by any regulator or government other than through harvest restrictions. Correspondingly, one of MVEIRB's (2013) recommendations was a measure for governments to establish and implement a cumulative effects monitoring and management framework so that cumulative effects on caribou could be managed and mitigated effectively.

Similarly, with the Jay Project, the Review Board recommended measures to manage "cumulative impacts of development and other human activities that are otherwise likely to combine with the cumulative effects of the Jay Project to worsen the situation," (p. 136, MVEIRB 2016). It suggested that

[68] Dogrib Treaty 11 Council 2001; Katz 2010; EMAB 2012; Sangris 2012; Tłı̨chǫ Government 2013; Jacobsen 2013; GSCI 2015
[69] Golder and KAA 2011
[70] BCRP 2016, 2017

the BCRP Working Group produce interim thresholds for development and other human activities within the range of the Bathurst caribou herd.

> *The elders do not see these as separate projects [minesites] because combined, the sites and the associated activities form a "wall" surrounding the Ek'atì area that blocks ek'atì tataa, the Bathurst caribou herd's main migration route (TRTI 2013). Hence, the elders prefer to view the resource extraction industry as one activity that cumulatively impacts caribou health, behaviour, population dynamics and migration patterns. TRTI: Tłı̨chǫ Research and Training Institute. May 4 2016: 18*

People recognize that have caribou have and can adapt, and those born recently have never known migration routes without disturbance. It is their ability to learn that explains how caribou can adapt to a changing landscape, although there are said to be limits (i.e. thresholds) to how much change caribou can handle (Golder 2011; BCRP 2016).

In response, the Plan recommends a cumulative land disturbance framework based on range assessment areas. There are multiple ways in which sensitive habitats and habitat features identified through the Plan process can be managed respectfully for caribou well-being. The interim cumulative land disturbance framework which considers boundaries and management thresholds and links these to the current status of the Range, responds to community concerns.

There are three cumulative disturbance categories. Each one is based on the amount of disturbance already present and how sensitive the caribou are when they are in that area., and indicates the types of actions required to take to address the effects of both new and existing disturbances.

The three cumulative disturbance categories are:

1. Healthy – indicates an acceptable amount of disturbance in the area and simply requires the use of best practices to limit effects on caribou.
2. Cautionary – indicates the amount of disturbance may already be causing effects on caribou and stricter management of any new effects will be required.
3. High risk – indicates the area is already affected by existing disturbances that must be dealt with or removed before any new disturbances can take place.

The herd's sensitivity to disturbances varies throughout the year. For instance, caribou are more sensitive when they are in their calving grounds than in their winter range. This means the effects of disturbances in an area vary according to the time of year too.

Thus, the first recommendation in the Plan is as follows:

> **Recommendation 1: Cumulative Land Disturbance Framework**
> The first recommendation is to establish the framework of disturbance categories that are considered acceptable in each area of the Range and adjust management approaches to these categories. This was described above.

8.3 Community Guardianship

Caribou people have always shared caribou expertise through oral tradition from one generation to the next, effectively establishing themselves as the original 'watchers' or 'monitors' of environmental change. In the last few decades, caribou people have also carefully documented Traditional Knowledge of caribou well-being, health, behaviour, movements, migrations, spiritual elements and other aspects through audio, video, mapping, and interviewing initiatives. Through these various processes, insights into traditional use and values have been identified, articulated, and integrated into wildlife management initiatives, educational programs, community-based monitoring initiatives, and other processes relevant to northerners. Stewardship initiatives must continue to be strongly encouraged to support recovery of both the Bathurst herd and their habitat.

> *Monitoring is scientific word. I like the word 'watching,' our ancestors are watching with us. I am so happy to be here and listen to everything. We are all teaching each other so let's keep this going. When we use Traditional Knowledge it's about our ancestors. When we go home we should sit with our elders and our leaders and talk to them.* (Georgina Chocolate, June 6, 2017 in BCRP 2017: i)

For many Indigenous peoples, practices and institutions around stewardship are the result of systematic observation and interpretation of changes in caribou and related ecological conditions. Ecological variability, which has always been characteristic of barren-ground caribou, necessitated the development of systematic methods of observation and communication. These practices are still in place today; an elder or harvester will look for caribou in the same places using the same indicators, and employing the same methods year after year after year. As resources become less abundant, there is an increase in the scope and spatial scale of either direct observation or sharing of observations with other communities. Over time and when communicated and interpreted by others, such knowledge provides the cues by which harvesters and or communities adapt. For example, when caribou are no longer found in areas where they were known to be abundant (e.g., major water crossings), it triggers changes in the scope of observation and a decrease in harvest. In these cases, other country foods may be harvested instead. This adaptation is more than a mechanistic response; people make changes to their harvesting activities based on concern for caribou and for future generations. As previously explained by the late Denesǫłiné elder Maurice Lockhart, "people who didn't care so much would not notice the changes."[71]

For community members, perhaps the most important recommendation put forth by the Plan is the following:

> **Recommendation 2: Community Guardianship**
> Support Aboriginal groups in the development and use of Community Guardianship Programs across the range of the Bathurst herd. Such programs would watch and report on activity

[71] Parlee, Manseau, & Nation', 2005

associated with industrial development and harvest in combination with the movements, numbers, health and condition of caribou and caribou habitat.

This recommendation underlies all of the recommendations and provides opportunity for hands-on engagement in rebuilding a relationship of respect with caribou to ultimately enhance caribou well-being and a healthy range.

In summary, the success of this recommendation in the context of honouring Traditional Knowledge and rebuilding the relationship between people and caribou will depend upon the following actions:

- Recognize that guardianship depends upon people working together for caribou well-being
- Engage youth in guardianship activities and learning opportunities with Elders
- Care for caribou, in keeping with traditional practice and laws
- Protect sensitive areas to fulfill responsibility as guardians
- Build on and expand upon existing "watching" programs
- Support Aboriginal communities to empower themselves through roles as rightful guardians
- Financial and other support must be directed towards guardianship programs
- Guardianship programs should include education on respectful harvest practice
- Reconcile that community members predicted caribou would decline, starting in the 1990s, and feel partially responsible that their predictions have been realized
- Recognize that as wildlife resources decrease, the spatial scale and scope required for monitoring increases either for direct observation or sharing with other communities

8.4 Habitat Conservation

There are multiple ways in which sensitive habitats and habitat features identified through the Plan process can be managed respectfully for caribou well-being. Management response recommendations, as follows, include establishing habitat conservation areas.

Recommendation 3: Habitat Conservation – Water Crossings and Land Crossings
Using the right tools, define the level of protection around important water crossings and land crossings (narrow areas between large lakes) in a specified area. The boundaries should be adjusted when TK, science and other land users identify changes in caribou distribution and range use.

Recommendation 4: Habitat Conservation – Calving and Post-Calving Grounds
Using the right tools, define the level of protection for calving and post-calving areas of the Range. The boundaries should be adjusted when TK, science and other land users identify changes in caribou distribution and range use.

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8.4.1 Water Crossings and Land Bridges

Water crossings and land bridges have been consistently identified as some of the most important place-specific habitats for barren-ground caribou. Most water crossings have been used for very long periods of time—potentially thousands of years – as told through oral tradition and demonstrated through place-name and archaeological study. Cultural values associated with these features are the link between people and caribou. Key water crossings allow caribou to pass over or around large water bodies or other physical barriers, allowing movement between their different seasonal ranges during the annual caribou-cycle. Figure 11 illustrates the location of some water crossings and land bridges identified through Traditional Knowledge. Tłı̨chǫ have prioritized crossings in the central barrens but more work needs to be done by other Indigenous groups and in other parts of the range. While many water crossings are identified (see Appendix F), others may not be known or recorded.

If some crossings or land bridges can be prioritized, establishing small, place-specific conservation/protected areas may be practical, or it may be possible to use timing windows so human land use activities avoid times when caribou are using these areas.

8.4.2 Calving and Post-Calving Areas

The Plan considers the potential benefits and challenges associated with different management options and opportunities in the calving and post-calving range in Nunavut. The calving grounds are considered to be the most sensitive part of the range and are of particular spiritual significance for many caribou people. It is for this reason that many communities have called for a ban on land use activities within the calving grounds dating back to the 1990s.

> *Weledeh Yellowknives Elders strongly recommend that all caribou calving grounds become Protected Areas (YKDFN 1999a, #2-B-11: 88).*
>
> *I agree with everyone about protecting the calving grounds if we want to have a chance of bringing the numbers back up (Sam Kapolak in BCRP 2017: 10).*
>
> *I love this animal. We need to protect the birthing ground. It is sacred where the caribou give birth. When [they are at the calving grounds] we have to watch it (Georgina Chocolate in BCRP 2017: 10)*
>
> *In the North where ʔekwǫ̀ [caribou] are thinning out, we have to take action. We must protect those calving grounds, the home of ekwǫ̀. There are people who are exploring for gold at the calving grounds. If we don't put some kind of protection on the calving grounds, those ʔekwǫ̀ are going to have problems. It's like disturbing a bird nest. If you disturb a bird nest, the birds don't come back. Same thing with ekwǫ̀. If you disturb the calving ground, they'll go elsewhere. They may decide to disappear (Sangris 2012: 78).*
>
> *The elders suspect that ʔekwǫ̀ have probably gone east because there's been too much exploration or drilling going on in the calving grounds. And at the same time, the calves are not strong. And heavy sports hunting is going on for big game, so for years and years the mature bulls have been taken out. The elders believe the cows might have sensed something is wrong*

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and gone to join other herds (Sangris 2012: 78).

Recommendations to protect the calving grounds, however, come with the knowledge that finding the balance between caribou, people and economics is a challenge:

> *We are working with the mines and we don't see that as a problem. Us Inuit people need work. If you put a number on how many people are on welfare, out of 32,000, 5,000 people are on welfare, depending on our government. And you are telling me that we don't need work? The GN is not giving us any work. We try to find work through industrial development where our people can get trades. (Jayko Palongayak in BCRP 2017: 11).*

In summary, the success of this recommendation in the context of honouring Traditional Knowledge and rebuilding the relationship between people and caribou will depend upon the following actions:

- Designate areas for protection, conservation and special management that are important to caribou across their range
- Celebrate that calving grounds are sacred and once disturbed can lead caribou to go elsewhere, disappear and/or affect their health and wellbeing
- Leave caribou alone while calving; protect calving areas
- Feed the land
- Protect sensitive areas: calving and post-calving areas, caribou crossings and land bridges

8.5 Minimizing Disturbance when Caribou are Present

Mobile Caribou Conservation measures are one way to protect caribou from disturbance. Essentially, these measures provide a "protection bubble" that travels with caribou and require restrictions during a particular time period within a certain distance from a land use activity. While they do not protect habitat, they do provide some protection for caribou. These measures are already in use at multiple land use activity sites across the range of the Bathurst herd, for example, at mines or along roads. Given the important role of guardianship programs, community members would provide important contributions to developing, monitoring and enforcing mobile caribou conservation measures grounded in Traditional Knowledge.

The Plan looked at caribou collar data and overlayed this with areas of high use known from Traditional Knowledge to find the parts of the range considered to be of "core use" considered most favourable and secure for the Bathurst caribou. This centre of habitation reflects the population's need for space to persist over the long term and also aligns with the lifeways of Caribou People and their traditional hunting areas. As community members deepen their spatial databases, the boundary for the centre of habitation can be revisited.

Accordingly, the Plan makes the following recommendation to be applied within the centre of habitation:

> **Recommendation 5: Mobile Caribou Conservation Measures**
> This recommendation would see Mobile Caribou Conservation Measures used in the area of core caribou use. These measures would shut down some project activities when caribou are nearby to reduce disturbance to caribou and provide flexibility to operators.

Other groups have suggested that mobile protection measures or other more flexible options applied during the late-spring and summer period would be adequate to mitigate potential impacts of human land use activity on caribou in the calving and post-calving range. Community members explain that compliance and enforcement with these measures is important:

> *Animals go right by the mines, all the mines that we have here. The migration is coming through them and they should stop their work for that time so the animals can go by. Because there are lots of questions about whether or not machines are stopping when animals are passing like they are supposed to. We should try to tell them to stop until the animals pass but it is true, who is going to enforce that? (Joseph Judas in BCRP 2017: 8).*

In summary, the success of this recommendation in the context of honouring Traditional Knowledge and rebuilding the relationship between people and caribou will depend upon the following actions:

- Minimize disturbance to caribou when they come close to disturbed areas, particularly during sensitive times
- Ensure monitoring through watching programs

Minimizing human disturbance across the range is a key step towards rebuilding respect for caribou. Online staking programs can help in this way by ensuring that there is no physical disturbance to the range or to caribou. Managing online staking programs within traditional territories could be another way in which to build capacity within communities and build bridges to guardianship programs. Accordingly, the Plan put forth this final management recommendation:

> **Recommendation 9: Online Staking**
> During the development of the new legislation, consideration should be given to allowing online staking to reduce sensory disturbance to caribou.

In summary, the success of this recommendation in the context of honouring Traditional Knowledge and rebuilding the relationship between people and caribou will depend upon the following actions:

- Limit physical impacts to caribou from mineral exploration
- Acknowledge that caribou have acute senses and are sensitive to disturbance from aircraft noise, etc.

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8.6 Road Planning and Management

Community guardianship programs also have a role in road planning and management, ranging from enforcement of traditional laws on roads to helping to shape road planning to minimize effects to caribou. Accordingly, the following management recommendation was put forth:

> **Recommendation 6: Road Planning and Management**
> When planning and developing new roads in the Bathurst caribou range, best approaches to road construction, routing and traffic management that reduce impacts to caribou should be given consideration.

The large amount of road and trail access in the central part of the winter range makes the Bathurst herd one of the most accessible herds of barren-ground caribou in the NWT. Roads and trails facilitates human access into new or difficult to travel to areas, and generally results in higher hunting pressures on wildlife populations. Construction of the Tibbit to Contwoyto Lake Winter Road in the mid-1990s resulted in increased hunting pressures on the Bathurst herd, and likely contributed to its rapid population decline. The construction of new roads or routes may also have a similar effect.

In summary, the success of this recommendation in the context of honouring Traditional Knowledge and rebuilding the relationship between people and caribou will depend upon the following actions:

- Minimize disturbance from roads: noise, pollution, contaminants; change migration routes; act as barriers to movement; create dust; and remove habitat
- Consider that roads can create easy walking areas, predator lookouts and escape from insects for caribou
- Manage roads that allow access to previously remote areas resulting in disturbance from road traffic, injury or mortality through collisions and increased harvesting
- Respect and reinstate traditional rules around hunting on neighbouring traditional territories

8.7 Offsetting / Compensatory Mitigation

At first glance, the concept of offsetting or compensatory mitigation may seem like a scientific approach however, Indigenous peoples have always practiced stewardship such that certain areas were cared for in ways different than other areas on the land. For example, Inuit from the Bathurst Inlet area speak of years where they brought “caribou food” (e.g., lichen) to migrating caribou trapped on islands where they had over-grazed. Many people also talk about taking the initiative to clean up abandoned or contaminated sites themselves, for example, hauling spent fuel drums back to communities for disposal. In other words, taking from one area to enhance another is not a foreign concept. Building upon this age-old practice, the following recommendation is put forth:

> **Recommendation 7: Offsetting / Compensatory Mitigation**
> Use Offsetting to make up for impacts that remain after all actions are taken to avoid and minimize impacts to caribou. The goal is to have no net effect on caribou by replacing, restoring, enhancing or preserving habitat within the project area, or in other parts of the range.

It can also include the contribution of funds and resources to guardianship, TK and science based research and monitoring programs.

Community guardianship programs will have a significant role to play in designing, recommending, implementing and monitoring these measures.

In summary, the success of this recommendation in the context of honouring Traditional Knowledge and rebuilding the relationship between people and caribou will depend upon the following actions:

- Heal the relationship with caribou and caribou habitat
- Empower community members as guardians, watchers, decision-makers

8.8 Wildfire Management

Wildfire is a natural part of the ecological cycles; however, recent wildfires (e.g., 2014) have burned key caribou habitat across large parts of the central and southeastern part of the winter range, especially since 1965. Community members are concerned the declining amount of unburned forest in the winter range may be contributing to the population decline of the Bathurst caribou herd. Caribou have been observed to use recent burns less frequently than unburned areas. Accordingly, the Plan put forth the following:

Recommendation 8: Wildfire Management
Each year, add large patches of mature forest in the winter range to the GNWT fire management "Values at Risk" database. Responding to fires in these areas would be based on resources in each year.

Throughout the Plan process, community members and resource boards have questioned whether wildfire should be actioned in the remaining unburned areas.

I am just thinking about what the forest fires left behind. In the Tłı̨chǫ area, we can't always just look at forest fires in the summer time and try to only protect the places. We should talk about it and protect all the green ones that the animals can use and let it go the burned part so that should be relooked at. It should be protected, ... There are some areas that caribou use a lot and we don't want the caribou food to be gone so we should really look at that. Joseph Judas, BCRP 2016.

Given the vast areas and distances involved, it may not be feasible to protect unburned parts of the winter range from future wildfire—the amount of financial resources needed to marginally increase fire suppression effectiveness is likely prohibitive, and under extreme fire weather conditions would likely ineffective (and these conditions account for the majority of the total burned area). Also, in the long-term, there may be negative ecological consequences to attempting to maintain old forests. The Plan implementation will need to consider these multiple perspectives.

DRAFT

In summary, the success of this recommendation in the context of honouring Traditional Knowledge and rebuilding the relationship between people and caribou will depend upon the following actions:

- Protect caribou habitat, particularly over-wintering areas rich in caribou food (e.g., lichen)
- Acknowledge and plan for increases in climate change impacts (e.g., increased wildfires) to key caribou habitat
- Explore replanting through traditional knowledge of key plant species and caribou food

8.9 Summary

How can the caribou recover? Many communities in the range offer lessons about respecting the caribou including specific rules that people must follow to take care of caribou. Setting limits to further development a as well as ongoing monitoring (watching) of the herd and the range is important to recovery and healing of the range, the caribou and the losses and damages experiences to Dene, Metis and Inuit peoples who have experienced economic, nutritional, cultural and spiritual impacts.

Building on these insights, Traditional Knowledge is at the foundation of understanding ways to heal the relationship between caribou and people and to map out ways in which the range can be "managed" to support overall caribou health.

DRAFT

9 Adaptive Management and Implementation

The Range requires a strong commitment to adaptive management, a value which is well known to and practiced by Indigenous peoples across the range of the Bathurst herd: “learning from what you do and changing practices accordingly.” How the Plan is actually put into place and practiced (i.e., implemented) will depend on commitment and follow through from governments, organizations, industry, communities and individuals. The Plan sets out a strategy for implementation that considers monitoring (i.e., land disturbance and range use, implementation, compliance, effectiveness), review and research. However, as many Elders have recommended throughout the Plan, we need to work together and to practice two-eyed seeing.

In considering adaptive management and implementation, the various players must be aware of the many concerns and recommendations put forth by community members and, where appropriate, respect these calls to action.

A path ahead that implements the management recommendations presented in this Plan is grounded in both Traditional Knowledge and science that requires that we look backwards on the trails we have traveled and learn from our teachings as well as our mistakes. In the case of the Plan, it means we must be true to the Plan purpose, goal and principles while implementing the recommendations.

Traditional Knowledge holders assert that we must heal the caribou-human relationship: healing caribou habitat will heal caribou as well as caribou people. We must restore balance and continue to understand cumulative impacts. Restoring respect where it has been lost will be critical, as will honouring that people continue to depend on caribou for subsistence, cultural well-being and more: acknowledging respect as the basis of a sustainable relationship that connects people and caribou in the past, present and future is imperative.

Respecting caribou will require rebuilding trust, not only between people and caribou, but also between peoples across the range who must come together to find a common ground and purpose. Courage to consider and address the multiple factors affecting the Bathurst caribou is required, which will be a challenge in this time of uncertainty and reconciliation. Competing land uses necessitates that guardians assert their rightful role by providing leadership along a sustainable path forward. All knowledge holders must come together to appreciate the intrinsic value of caribou as inseparable from land, water, air, and every other part of the northern ecological, cultural and socio-economic system.

Finally, we must consider equally multiple ways of knowing and work together even when we have different knowledge, opinions, perspectives and goals: we must practice two-eyed seeing – or maybe even three-eyed seeing! - and be strong like (at least!) two people by considering traditional knowledge, knowledge of scientists, governments, locals plus co-produced knowledge. Ultimately, respecting caribou means respecting one another even when sometimes different ways of knowing say the same thing but in different ways. The future for the Bathurst herd depends on engaging youth as guardians so that the next generation of caribou – and people – can seek a continued balance.

DRAFT

10 References

Abele, F. 1997. Traditional knowledge in practice. Arctic 50(4): iii–iv.

Advisory Committee for Cooperation on Wildlife Management. 2014. Taking care of caribou: the Cape Bathurst, Bluenose-West, and Bluenose-East barren-ground caribou herds management plan. Yellowknife, NT.

Athabasca Chipewyan First Nation Elders, Tanner, J. and A. Rigney. 2003. Footprints on the Land: Tracing the Path of the Athabasca Chipewyan First Nation. Fort Chipewyan, AB.

Athabasca Denesuline. 2016. Bathurst Caribou Range Plan – Traditional Ecological Knowledge Report. 10 pp.

Agrawal, A. 1995. Dismantling the divide between indigenous and scientific knowledge. Development and Change 26(3): 413–439.

Anderson, D.G. and M. Nuttall. 2004. *Cultivating Arctic Landscapes: Knowing and Managing Animals in the Circumpolar North*. Oxford: Berghahn Books.

Andrews, Tom, 2002. The Land is Like a Book. Pathways: The Ontario Journal of Outdoor Education, 14, 1: 18-20.

Armitage D. 2005. Adaptive capacity and community-based natural resource management. Environmental Management 35(6): 703–715.

Barnaby, J. and. D. Simmons. 2013. Bathurst Caribou Harvesters' Gathering. Wek'èezhìi Renewable Resources Board,Yellowknife, NT, Tłı̨chǫ Government & Wek'èezhìi Renewable Resources Board.

Bateyko, Darwin, 2003. Evaluating Co-management: A Framework for Analysis. Diss., Faculty

of Environmental Design. Calgary: University of Calgary.

Bathurst Caribou Range Plan. 2016. Report on Bathurst Caribou Range Plan Traditional Knowledge Workshop. March 30-31, 2016. Yellowknife, NT.

Bathurst Caribou Range Plan. 2017. Respect Caribou, Manage People: Report on the 2017 Bathurst Caribou Range Plan Traditional Knowledge Workshop. June 5-6, 2017. Yellowknife, NT.

Bathurst Caribou Range Plan. 2018a. DRAFT Bathurst Caribou Range Plan. Yellowknife, NT. January 2018.

Bathurst Caribou Range Plan. 2018b. Supporting Report: Caribou Technical Information and Range Assessment. Yellowknife, NT. January 2018.

DRAFT

Bathurst Caribou Range Plan. 2018c. Supporting Report: Land Use Scenarios and Economic Information. Yellowknife, NT. January 2018.

Bayha, W. 2012. Barren-ground caribou management in the Sahtu Region: Bridging traditional knowledge and science. Rangifer 32(20): 37.

Beaulieau, D. 2012. Dene traditional knowledge about caribou cycles in the Northwest Territories. Rangifer 32(20): 59–67.

Bechtel, R. 2011. A Cross-Cultural Comparison of Scientific Language Use: Indigenous and Eurocentric Discourse on Issues Regarding Caribou in the North. PhD, Univeristy of Alberta, Edmonton.

Berkes, F. 2005. Traditional ecological knowledge. In: Encyclopedia of Religion and Nature (B.R. Taylor, ed.) Thoemmes Continuum, London and New York, pp. 1646-1649.

Berkes, F. 2008. *Sacred Ecology. Traditional Ecological Knowledge and Resource Management*. London: Taylor & Francis.

Berkes, F., Huebert, R., Fast, H., Manseau, M. and A. Diduck. 2005. *Breaking Ice: Renewable Resource and Ocean Management in the Canadian North.* Calgary: University of Calgary Press.

Berman, M. and G. Kofinas. 2004. Hunting for Models: grounded and rational choice approaches to analyzing climate effects on subsistence hunting in an Arctic community. Ecological Economics 49: 31–46.

Beverly and Qamanirjuaq Caribou Management Board (BQCMB). 2011. BQCMB Caribou Workshop February 2010- Detailed Report: Commentary from Workshop Participants about Challenges Facing the Beverly and Qamanirjuaq Caribou Herds and Some Possible Solutions. M. Soublière. Stonewall, MB, Beverly and Qamanirjuaq Caribou Management Board.

BHP Billiton Diamonds Inc. 2007. Caribou and Roads: Implementing Traditional Knowledge in Wildlife Monitoring at the Ekati Diamond Mine. Project #820-2. Prepared by Rescan Environmental Services Ltd. 2006 Annual Report. September 2007.

Birket-Smith, K. 1929. *The Caribou Eskimos : Material and Social Life and Their Cultural Position, Volume 2 Thule Expedition 5, 1921-1924*. Copenhagen, Denmark. 419 pp.

Burgess, P. 1999. Traditional Knowledge: A Report prepared for the Arctic Council Indigenous Peoples' Secretariat. Copenhagen: Arctic Council: Indigenous Peoples.

Condon, R.G., Ogina, J. and the Holman Elders. 1996. *The Northern Copper Inuit: A History*. Toronto: University of Toronto Press.

DRAFT

Croft, B. and J. P. Rabesca. 2009. Caribou Harvest Reporting Pilot Project Conducted in the Tli Cho Communities in the Winter of 2007/2008 and 2008/2009: Preliminary Results. Yellowknife, NT, Government of the Northwest Territories, Department of Environment and Natural Resources: 14 pp.

Cruikshank, J. 2004. Uses and abuses of 'traditional knowledge': perspectives from the Yukon Territory. In *Cultivating Arctic Landscapes: Knowing and Managing Animals in the Circumpolar North*. D.G. Anderson and M. Nuttall (Eds). Oxford: Berghahn Books.

Denesuline Né Né Land Corporation (DNNLC). 2016. Athabasca Denesuline. Bathurst Caribou Range Plan – Traditional Ecological Knowledge Report. 10 pp.

Dokis-Jansen. 2015. "These trees have stories to tell" Linking Denesoline knowledge and dendroecology in the monitoring of barren-ground caribou movements in the Northwest Territories, Canada. Thesis. University of Alberta.

Duerden, Frank. 1998. Scale, context, and application of Traditional Knowledge of the Canadian North. Polar Record 34(188): 31–38.

Dumond, M. 2007. Western Kitikmeot Caribou Workshop, Final Wildlife Report, No. 19. Kugluktuk, NU, Department of Environment, Government of Nunavut.

Ellis, S. C. 2005. Meaningful Consideration? A Review of Traditional Knowledge in Environmental Decision Making. Arctic 58(1):66-77.

Ellis, S. C., with N. Casaway, Basil, M. and Lutsel K'e Dene First Nations. 2002. Traditional Ecological Knowledge in the Kache Tue Study Region. Yellowknife: WKSS. Accessed 2012 August via: www.enr.gov.nt.ca/_live/.../WKSS_TK_Kache_Tue_Region_2002.pdf

Environmental Monitoring Advisory Board. 2008. Fencing at Diavik Diamond Mine. In Report of Workshops (Sept. 8-9, 2012 and Sept. 30 - Oct. 2, 2012). Yellowknife: Diavik Environmental Monitoring Advisory Board.

Environmental Monitoring Advisory Board. 2012. A Way of Life: Bridging Science and Aboriginal Knowledge in Caribou Monitoring at Diavik Diamond Mine. SENES Consultants Limited. Yellowknife, NT.

Faye, Jefferson. 2001. Revealing the Storyteller: The Ethical Publication of Inuit Stories. The American Review of Canadian Studies, 31: 1-2.

Flannigan, M., Logan, K., Amiro, B., Skinner, W. and Stocks, B. 2005. Future area burned in Canada. Climatic Change 72: 1–16.

Folliott, Jadah Elizabeth, 2004. Evaluation of Approaches to Depicting First Nations, Inupiat

DRAFT

and Inuvialuit Environmental Information in GIS Format: Options for the Handling of Spatial Information in the Arctic Borderlands Ecological Knowledge Co-Op Database, Diss. Ryerson University and University of Toronto, Toronto. 134p.

Garibaldi, Ann. 2009. “Moving from Model to Application: Cultural Keystone Species and Reclamation in Fort McKay, Alberta.” Journal of Ethnobiology 29(2): 323-338.

Gilchrist G., Mallory, M. and F. Merkel. 2005. Can local ecological knowledge contribute to wildlife management? Case studies of migratory birds. Ecology and Society 10(1): 20.

Golder Associates Ltd. and Kugluktuk Angoniatit Association. 2011. Effects of Development on Barren-ground Caribou: Insight from IQ and an Ecological Model. Report Number: 10-1328-0042.

Gordon, B.C. 1996. People of Sunlight People of Starlight: Barrenland Archaeology in the Northwest Territories of Canada, Mercury Series, Paper 154, Hull Québec: Archaeological Survey of Canada, Canadian Museum of Civilization.

Gregory R., Failing L., Harstone, M., Long, G., McDaniels, T. and D. Ohlson. 2012. *Structured Decision Making: a Practical Guide to Environmental Management Choices.* New Jersey: Wiley-Blackwell.

Gunn, A., G. Arlooktoo, and D. Kaomayok. 1988. The contribution of the ecological knowledge of Inuit to wildlife management in the Northwest Territories. In Traditional Knowledge and Renewable Resource Management in Northern Regions, edited by M. M. R. Freeman and L. N. Carbyn. Edmonton: Boreal Institute for Northern Studies.

Gwich’in Social and Cultural Institute [GSCI] (2015). Gwich'in Knowledge of Bluenose West Caribou: A part of the Nin Nihłinehch’ì’ – Łi’ hàh Guk’àndehtr’inahtìi (Animals at Risk - animals we are watching closely) Project. K. Benson. Fort McPherson, NT: 61.pp.

Hall, E. 1989. People and Caribou in the Northwest Territories. Department of Renewable Resources, Government of Northwest Territories, Yellowknife, Northwest Territories, Canada.

Hawley, A.W.H., Sherry, E.E. and C.J. Johnson. 2004. A biogist’s perspective on amalgamating traditional environmental knowledge and resource management. Ecosystems and Management 5(1): 36–50.

Hearne, S. 1795. A journey from Prince of Wales’ Fort in Hudson’s Bay to the northern ocean. London, England: A Strahan and T. Cadell.

Hulan R, Eigenbrod R. 2008. A Layering of Voices: Aboriginal Oral Traditions. Aboriginal Oral Traditions: Theory, Practice, Ethics. Halifax & Winnipeg: Fernwood Publishing. Huntington et al. 2002

Huntington, H.P., Brown-Schwalenberg, P.K., Frost, K.J., Fernandez-Gimenez, M.E., Norton, D.W. and D.H. Rosenberg. 2002. Obervations on the workshop as a means of improving communication between holders of traditional and scientific knowledge. Environmental Management 30(6): 778–792.

Huntington, H.P., Suydam, R.S. and D.H. Rosenberg. 2004. Traditional knowledge and satellite tracking as complementary approaches to ecological understanding. Environmental Conservation 31(3): 177–180.

Jacobsen, P. 2013. Tłı̨chǫ Knowledge of Environmental Changes: Implications for Caribou Hunting. Behchokǫ̀ , NWT, Tłı̨chǫ Government.

Judas, J. 2012. Tłıçhǫ stories for Ekwò management. Rangifer 32(20): 49–51.

Katz, S. 2010. Traditional Knowledge on Caribou Ecology: Vegetation -> Caribou -> Wolf ->Food Chain. Inuvik, NT, Aurora Research Institute.

Kendrick, A. 2003. Caribou co-management in northern Canada: Fostering multiple ways of knowing. In Navigating Social-Ecological Systems, edited by F. Berkes, J. Colding and C. Folke. Cambridge: Cambridge University Press.

Kendrick, A. and M. Manseau. 2008. Representing traditional knowledge: resource management and Inuit knowledge of barren-ground caribou. Society and Natural Resources 21(5): 404–418.

Kendrick, A., Lyver, P.O., and Lutsel K'e Dene First Nation. 2005. Denésôliné (Chipewyan) Knowledge of Barren-Ground Caribou (*Rangifer tarandus groenlandicus*) Movements. Arctic 58(2): 175–191.

Kitikmeot Inuit Association. 2012. Inuit Traditional Knowledge of Sabina Gold & Silver Corporation's Back River (Hannigayok) Project. Naonaiyaotit Traditional Knowledge Project, Kitikmeot Inuit Association. Compiled by V. Banci and R. Spicker. Kugluktuk NU. December 7 2012.

Kitikmeot Inuit Association. 2014. Naonaiyaotit Traditional Knowledge Project Hannigayok (Sabina Gold & Silver Corp. Proposed Back River Project). Results from Data Gaps Workshops. Final Report. B. C. Ltd. and S. G. Services. Kugluktuk, NU.

Kofinas, G., Lyver, P., Russell, D., White, R., Nelson, A., & Flanders, N. 2003. Towards a protocol for community monitoring of caribou body condition. Rangifer, 23(5), 43-52.

Krupnik, I. and D. Jolly .2002. The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change Fairbanks, AK, Arctic Research Consortium of the United States.

Kuhnlein, H.V. and O. Receveur. 2007. Local cultural animal food contributes high levels of nutrients for Arctic Canadian Indigenous adults and children. Journal of Nutrition 137(4): 1110–1114.

Laidler G., Robertson S., Mearns R. and S. Okpakok. 2016. Results summary report for community organizations and contributors for the project "Connecting Inuit Elders and Youth: learning about caribou, community, and well-being in Gjoa Haven, Nunavut (2011–2016).

Legat, A., Zoe, S.A. and M. Chocolate. 1995. The Importance of Knowing. In *NWT Diamonds Project Environmental Impact Statement (Appendices)*. Yellowknife: BHP Diamonds Inc.

Legat, A. 1998a. Caribou migration and the state of the habitat. Dogrib Renewable Resources Committee/WKSS., Yellowknife.

Legat, A. 1998b. Habitat of Dogrib traditional territory: place names as indicators of biogeographical knowledge. Dogrib Renewable Resources Committee/WKSSS. Yellowknife.

Legat, A. 2013. Walking the Land, Feeding the Fire: Knowledge and Stewardship Among the Tlicho Dene. Tucson, AZ: University of Arizona Press.

Legat, A., Chocolate, G., Mackenzie-Scott, G., Sprecher, D., and S.A. Zoe. 2000. A Tłı̨chǫ Perspective on Biodiversity. Prepared for BHP Diamonds.

Legat A., Chocolate, G., Gon, B., Zoe, S.A. and M. Chocolate. 2001. Relationship between caribou migration patterns and the state of caribou habitat - Final Report from Dogrib Treaty 11 Council. Yellowknife: West Kitikmeot Slave Study Society.

Legat A., Chocolate, G., Chocolate, M., Zoe, S.A., Council Dogrib Treaty, and West Kitikmeot Slave Study. 2002. *Habitat of Dogrib traditional territory: placenames as indicators of biogeographical knowledge: final report*.

Legat, A. Chocolate, G. and Chocolate, M. 2008. Monitoring Caribou: The Relationship between Tłı̨chǫ Laws and Indicators of Change. Report presented to the West Kitikmeot Slave Study Society by Tłı̨chǫ Government.

Lutsel K'e Dene First Nation. 2001. Ni Hat Ni - Watching the Land: Cumulative Effects Assessment and Management in the Denésǫłine Territory. Yellowknife: West Kitikmeot Slave Study Society.

Łutselk'e Dene First Nation and Wildlife Lands and Environment Department. 2005. Ni hat'ni - Watching the Land: Results of 2003-2005 Monitoring Activities in the Traditional Territory of the Łutselk'e Denésoliné.

Lutsel K'e Dene First Nation. 2016. Summary Report of Traditional Knowledge Research on Bathurst Caribou and Mining. Prepared by Lauren King and Kelsey Dokis-Jansen. Submitted to Bathurst Caribou Range Plan. 18 pp.

Lyver, P. 2000. The use and comparison of traditional environment knowledge and ecological science in the assessment of barren ground caribou herd condition in Canada's Northwest Territories.

Lyver, P. 2002. Use of First Nations Dene Knowledge to Monitor Changes in Barren Ground (Rangifer tarandus groenlandicus) body condition. Winnipeg: University of Manitoba.

Lyver, P. O., and A. Gunn. 2004. Calibration of Hunters' Impressions with Female Caribou Body Condition Indices to Predict Probability of Pregnancy. Arctic 57(3): 233–241.

DRAFT

Lyver, P., and Lutsel K'é Dene First Nation. 2005. "Monitoring Barren-Ground Caribou Body Condition with Denésǫłine Traditional Knowledge." Arctic 58(1):44-54.

Manseau, M., Parlee, B. and B. Ayles. 2005. A Place for Traditional Ecological Knowledge in Resource Management. In Breaking Ice: Integrated Ocean Management in the Canadian North, edited by F. Berkes, R. Huebert, H. Fast and M. Manseau. Calgary: University of Calgary.

Mackenzie Valley Environmental Impact Review Board. 2013. Report of Environmental Impact Review and Reasons for Decision: Gahcho Kué Diamond Mine Project, DeBeers Canada Inc. EIR0607-01. Yellowknife, NT 207pp.

Mackenzie Valley Environmental Impact Review Board. 2016. Report of Environmental Assessment and Reasons for Decision: Dominion Diamond Ekati Corp. Jay Project. EA1314-01. Yellowknife, NT 350pp.

Moller, H., Berkes, F., Lyver, P.O. and M. Kislalioglu. 2004. Combining science and Traditional Knowledge: monitoring populations for co-management. Ecology and Society 9(3): 2.

Nadasdy, P. 1999. The politics of TEK: Power and the "integration" of knowledge. *Arctic Anthropology* 36(1-2):1-18.

Nadasdy, P. 2003. *Hunters and bureaucrats: Power, knowledge, and Aboriginal-state relations in the southwest Yukon.* Vancouver: UBC Press.

Nagy, J. 2011. Use of Space by Caribou in Northern Canada. PhD Thesis, University of Alberta, Edmonton, AB 184pp.

Nakashima, D., Galloway McLean, K., Thulstrup, H., Ramos Castillo, A. and J. Rubis. 2012. Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation. Paris: UNESCO and Darwin: UNU, 2012.

Natcher, D. C. 2009. Subsistence and the social economy of Canada's Aboriginal North. Northern Review 30: 83–98.

North Slave Métis Alliance Alliance (NSMA). 2012. North Slave Métis Alliance Traditional Land Use, Occupancy and Knowledge of the Thor Lake Project Area. Yellowknife, NT, North Slave Métis Alliance.

North Slave Métis Alliance Alliance (NSMA). 2016. Summary of Traditional Knowledge about Bathurst Caribou in NSMA. 6 pp.

Northwest Territory Métis Nation (NWTMN). 2016. Caribou Range Plan Traditional Knowledge Interview Report: Interviews with Earl Evans and Arthur Beck. 10 pp.

Nunavut Social Development Council. 1998. *A Discussion Paper: Towards an Inuit Qaujimajatuqangit (IQ), Policy for Nunavut*, Iqaluit, Northwest Territories, Nunavut Social Development Council.

DRAFT

Nuttall, M. 1998. Critical reflections on knowledge gathering in the Arctic. In Aboriginal Environmental Knowledge in the North, edited by L. J. Dorais, M. Nagy and L. Muller- Wille. Laval, PQ: Université Laval.

Nuttall, M., Berkes, F., Forbes, B., Kofinas, G., Vlassova, T. and G. Wenzel. 2005. "Hunting, Herding, Fishing, and Gathering: Indigenous Peoples and Renewable Resource Use in the Arctic." Arctic Climate Impact Assessment: 649-690.

Padilla, E. 2012. Caribou Leadership: A Study of Traditional Knowledge, Animal Behaviour and Policy. MSc, University of Fairbanks, Fairbanks Alaska.

Padilla, E. and Kofinas, G. 2012. Documenting Traditional Knowledge of Caribou Leaders for the Porcupine Caribou Herd in Dawson City, Old Crow, & Fort McPherson. Whitehorse - PCMB. Accessed 2012 June via: http://www.uaf.edu/files/rap/Caribou-leaders--Report-to- the-Porcupine-Caribou-Management-Board.pdf

Padilla, E. and C. Furgal. 2010. Communities and Caribou Workshop Summary Report. In Arctic Peoples, Culture, Resilience and Caribou. Edmonton: University of Alberta.

Parlee, B. 2012. Finding Voice in a Changing Ecological and Political Landscape: Traditional Knowledge and Resource Management in Settled and Unsettled Land Claim Areas of the Northwest Territories, Canada. *Aboriginal Policy Studies* 2(1):56-87.

Parlee, P. and K. Caine (eds.) 2017. When the Caribou Do Not Come: Indigenous Knowledge and Adaptive Management in the Western Arctic. UBC Press.

Parlee B. and Lutsel K'e Dene First Nation 2000. *Traditional Ecological Knowledge in the Kache Kue Study Region.* Yellowknife: West Kitikmeot Slave Study Society.

Parlee, B. and Lutsel K'e Dene First Nation 2001a. *Traditional Ecological Knowledge in the Kache Kue Study Region – Final Report.* Yellowknife: West Kitikmeot Slave Study Society.

Parlee, B. and Lutsel K'é Dene First Nation. 2001b. *Final report: community-based monitoring.* Yellowknife: West Kitikmeot Slave Study Society.

Parlee, B. and C. Furgal. 2012. "Well-being and environmental change in the Arctic: a synthesis of selected research from Canada's International Polar Year program, Climatic Change." Climatic Change.

Parlee, B., Manseau, M., and Lutsel K'é Dene First Nation. 2005a. "Using Traditional Knowledge to Adapt to Ecological Change: Denésôliné Monitoring of Caribou Movements." Arctic 58(1):26-37.

Parlee, B., Manseau, M., & Lutsel K'é Dene First Nation. 2005b. Understanding and communicating about ecological change: Denesoline indicators of ecosystem health. In F. Berkes, R. Huebert, H. Fast, M. Manseau, & A. Diduck (Eds.), *Breaking Ice: Integrated Ocean Management in the Canadian North* (pp. 165-182). Calgary: University of Calgary Press.

Parlee, B., Thorpe, N., and T. McNabb. 2013. Traditional Knowledge: Barren-ground Caribou in the Northwest Territories. Unpublished study. Available at www.brendaparlee.ca. Accessed March 2016.

Pike, W. 1892. The Barren Ground of Northern Canada, Macmillan and Co., London.

Riedlinger, D. and F. Berkes. 2001. Contributions of traditional knowledge to understanding climate change in the Canadian Arctic. Polar Record 37(203): 315–328.

Roby, D.A. 1978. Behavioural patterns of barren-ground caribou of the Central Arctic Herd adjacent to the Trans-Alaska Oil Pipeline. M.S. Thesis, Univ. of Alaska, Fairbanks. 200 pp.

Sahtu Renewable Resource Board. 2013. Public Hearing. Bluenose-West Management Hearing. November 21, 2007. Fort Good Hope, NWT. *Accessible via:* http://www.srrb.nt.ca/index.php?option=com_docman&view=document&alias=1364-srrb-hearing-transcript-nov-21-07&category_slug=hearing-transcripts&Itemid=697

Sahtu Land Use Planning Board. 2013. Final Sahtu Land Use Plan. Fort Good Hope, NT, Sahtú Land Use Planning Board.

Sandlos, J. 2008. Hunters at the margin: Native People and Wildlife Conservation in the Northwest Territories. Vancouver: UBC Press.

Sangris, F. 2012. "Renewing Our Traditional Laws through Joint Ekwǫ (caribou) Management, The 13th North American Caribou Workshop." Rangifer 32(20): 75–80.

SENES Consulting Ltd. 2008. West Kitikmeot Slave Study State of Knowledge Report – 2007 Update. Prepared for West Kitikmeot Slave Study Society. Yellowknife, NT. April 2008

Smith, W.T. and R.D. Cameron. 1983. Responses of caribou to industrial development on Alaska's Arctic Slope. Acta Zoologica Fennica 175: 43–45.

Smith, W. T. and R. D. Cameron. 1985. Reactions of large groups of caribou to a pipeline corridor on the Arctic Coastal Plain of Alaska. In: Cameron, R.D., W.T. Smith and K.R. Whitten. 1985. Distribution and movements of caribou in relation to the Kuparuk 76 Development area. Progress Report. Alaska Department of Fish and Game. Juneau, Alaska. 35 pp.

Stevenson, M.G. 2006. The possibility of difference: rethinking co-management. Human Organization: Summer 2006 65(2): 167–180.

Stewart A.M., Keith D., and J. Scott. 2004. Caribou crossings and cultural meanings: placing traditional knowledge and archaeology in context in an Inuit landscape. Journal of Archaeological Method and Theory 11(2): 183–211.

DRAFT

Terra Firma. 2004. Fencing at the Diavik Diamond Mine - Report of Workshops Sponsored by the Environmental Monitoring Advisory Board. Yellowknife: Environmental Monitoring Advisory Board.

Thorpe, N. L. 2000. Contributions of Inuit Ecological Knowledge to Understanding the Impacts of Climate Change on the Bathurst Caribou Herd in the Kitikmeot Region, Nunavut, School of Resource and Environmental Management, Simon Fraser University.

Thorpe Consulting Services Ltd. 2014a. *The Caribou is the Boss of the Mine: Izok Corridor Project Caribou Inuit Qaujimajatuqangit Report*. Results from Interviews and a Workshop carried out in *Qurluqtuq* (Kugluktuk) in 2012. Prepared by N. Thorpe and K. Scott with contributions from M. Kakkianiun and G. Angulalik for MMG Ltd. Vancouver, BC. January, 2014.

Thorpe Consulting Services Ltd. 2014b. *We are Saying Something Everybody can Understand: Marine and Land Inuit Qaujimajatuqangit Report for the Izok Corridor Project (Inuit Version). Results from a Workshop carried out with Inuit and Inuvialuit in Iqaluktuuttiaq (Cambridge Bay) in March 2013*. Prepared by N. Thorpe and K. Scott with contributions from M. Kakkianiun and G. Angulalik for MMG Ltd. Vancouver, BC. March 2014.

Thorpe Consulting Services. 2016. TK Panel Report, Session #9: Focus on Caribou. May 13-16, 2016 at Diavik Diamond Mine, NT. 12 pp.

Thorpe, N., Hakongak, N., Eyegetok, S. and The Kitikmeot Elders. 2001. Thunder on the Tundra: Inuit Qaujimjatuqangit of the Bathurst Caribou. Tuktu and Nogak Project. Vancouver, BC. Douglas and McIntyre.

Tłı̨chǫ Research and Training Institute. 2013. Tłıçhǫ Use and Knowledge of Ewaànıt'ıtı. Tłı̨chǫ Government.

Tłı̨chǫ Research and Training Institute. 2014. K'àgòò tıl̨ıìDeè: Traditional Knowledge Study for the Proposed All-Season Road to Whatì. Tłı̨chǫ Government.

Tłı̨chǫ Research and Training Institute. 2015. K'ıchıı̀ (Whitebeach Point) Traditional Knowledge Study: For the Husky Oil Chedabucto Mineral Exploration. Tłı̨chǫ Government.

Tłı̨chǫ Research and Training Institute. 2016a. A Summary Report of Tłı̨chǫ Traditional Knowledge of Ekwò (Barren-ground Caribou) for the Bathurst Caribou Range Plan. Petter Jacobsen May 4, 2016.

Tłıçhǫ Research and Training Institute. 2016b. Ekwò zò gha dzô nats'êdè "We Live Here For Caribou" Cumulative Impacts Study on the Bathurst Caribou. Behchokǫ̀, NT.

Tłıçhǫ Research and Training Institute. 2017. We Watch Everything: A Methodology for Boots-on-the Ground Caribou Monitoring. Behchokǫ̀, NT.

DRAFT

Trailmark Systems Inc. 2015. Review of post-2010 Literature on Human Effects on Barren-Ground Caribou: Focus on Traditional Knowledge, Western Science and Caribou Protection Measures Prepared for the Nunavut Wildlife Management Board.

Usher, P.J. 2004. Caribou crisis or administrative crisis? Wildlife and aboriginal policies on the Barren Grounds of Canada, 1947–60. In Cultivating Arctic Landscapes: Knowing and Managing Animals in the Circumpolar North. DG Anderson and M Nuttall (Eds). Berghahn Books, Oxford

Wekèezhii Renewable Resource Board (WRRB). 2016a. Report on a Public Hearing Held by the Wek'èezhìı Renewable Resources Board, 23-24 February 2016, Yellowknife, NT., & Reasons for Decisions Related to a Joint Proposal for the Management of the Bathurst ek (Barren-ground caribou) Herd - PART A. Wek'èezhìı Renewable Resources Board, Yellowknife, NT. 41 pp + Appendices

Wekèezhii Renewable Resource Board (WRRB). 2016c Bathurst Caribou Herd Public Hearing - Transcript February 23, 2016 (Day 1 of 2), pp. 115-118; pp. 141-144, and pp. 164-166. Online [URL]: http://www.wrrb.ca/sites/default/files/WRRB%20re%20BATHURST%20CARIBOU%20%2002-23-2016.pdf

Wenzel, G.W. 1999. Traditional ecological knowledge and Inuit: reflections on Traditional Knowledge research and ethics. Arctic 52(2): 113.

Wenzel, G.W. 2004. From TEK to IQ: Inuit Qaujimajatuqangit and Inuit cultural ecology. Arctic Anthropology 41(2): 238–250.

Wesche, S. and D.R. Armitage. 2010. 'As long as the sun shines, the rivers flow and grass grows': vulnerability, adaptation and environmental change in Deninu Kue Traditional Territory, Northwest Territories. Community Adaptation and Vulnerability in Arctic Regions 163–189.

West Kitikmeot Slave Study Society. 2001. Final Report: Includes Annual Report 2000–2001. pp 87.

Whaèhdôö Nàowoò Kö and Dogrib Treaty 11 Council. 2001. Caribou Migration and the State of their Habitat. Yellowknife: West Kitikmeot Slave Study Society.

Whaèhdôö Nàowoò Kö and Dogrib Treaty 11 Council. 2002. Dogrib Knowledge on Placenames Caribou and Habitat. Yellowknife: West Kitikmeot Slave Study Society.

Williams, A. 2015. Governmentality and Mining: Analyzing the Environmental Impact Assessment for the Mary River Mine, Nunavut, Canada. Master of Arts, Carlton.

Wray, K. 2011. Ways We Respect Caribou: Hunting in Teetł'it It Zheh (Fort McPherson, NWT), University of Alberta. M.A. Thesis.

DRAFT

Wek'èezhìı Renewable Resources Board (WRRB). 2016. Report on a Public Hearing Held by the Wek'èezhìı Renewable Resources Board 23-24 February 2016 Yellowknife, NT.

https://wrrb.ca/sites/default/files/WRRB%20re%20BATHURST%20CARIBOU%20%2002-23-2016.pdf

Wek'èezhìı Renewable Resources Board (WRRB). 2017. Wolf Technical Feasibility Assessment: Options for Managing Wolves on the Range of the Bathurst Barrenground Caribou Herd. Wolf Feasibility Assessment Technical Working Group. Yellowknife, NT. 10 November 2017.

https://www.wrrb.ca/sites/default/files/FINAL%20Wolf%20Feasibility%20Assessment%20-%2010nov17.pdf

Yellowknives Dene (YKDFN 1997a). "Weledeh Yellowknives Dene: a traditional knowledge study of Ek'ati". Prepared and approved in 1997 by Yellowknife Dene First Nation, Elders Advisory Council. Dettah, NT.

Yellowknives Dene First Nation (1997b). "Weledeh Yellowknives Dene: a history". Dettah: Yellowknives Dene First Nation Council.

Yellowknives Dene First Nation, Land and Environment. 2016. Preliminary TK of the Yellowknives Dene First Nation to support the Bathurst Caribou Range Plan. March 31, 2016. 23 pp.

Zalatan, R., Gunn, A., & Henry, G. H. R. (2006). Long-term abundance patterns of barren-ground caribou using trampling scars on roots of Picea mariana in the Northwest Territories, Canada. *Arctic, Antarctic, and Alpine Research*, *38*(4), 624-630.

Zoe, S. A., Football, C., Chocolate, M., Legat, A., Institute Dene Cultural, Committee Dogrib Renewable Resources, Council Dogrib Treaty, and Resources Northwest Territories. Department of Renewable. 1995. *Traditional methods used by the Dogrib to redirect caribou*.

DRAFT