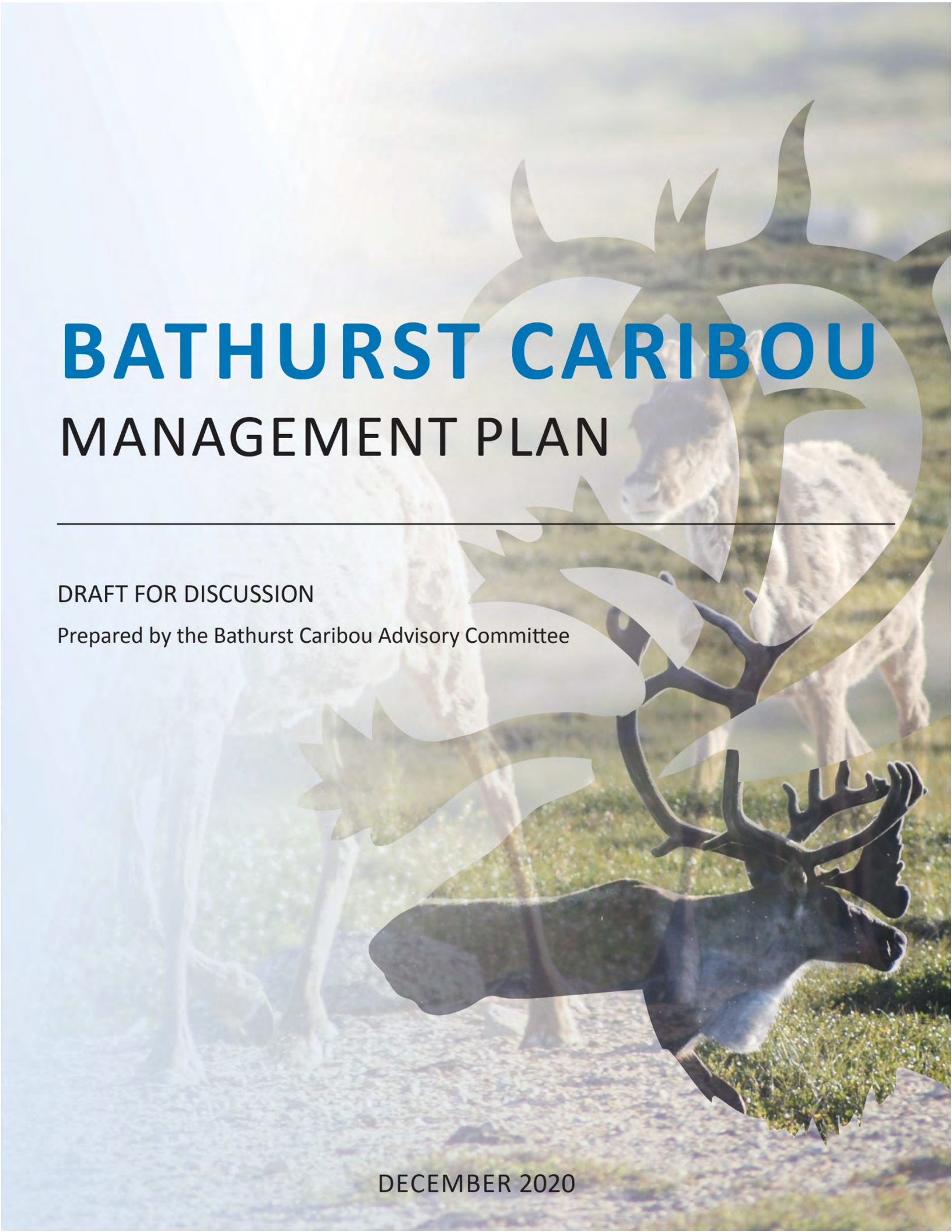
BATHURST CARIBOU
MANAGEMENT PLAN

DRAFT FOR DISCUSSION

Prepared by the Bathurst Caribou Advisory Committee



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Prepared by the Bathurst Caribou Advisory Committee (BCAC):

Other BCAC member organizations: Salt River First Nation, Umingmatok (Bay Chimo) HTO

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Disclaimer

The Bathurst Caribou Management Plan is a living document released for the purposes of guiding and supporting wildlife management decision-making processes in support of recovery of the Bathurst caribou herd.

Traditional knowledge shared throughout this document has been integrated from publicly available reports or provided exclusively for use in the BCMP process in keeping with the terms stated by participating groups. Knowledge of Indigenous peoples is intellectual property and is protected by international intellectual property rights of Indigenous peoples such as the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP). As such, Indigenous peoples reserve the right to use and make public parts of their traditional knowledge as they deem appropriate from time to time. 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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Executive Summary

This Bathurst Caribou Management Plan (BCMP, or Management Plan), developed under the direction of the Bathurst Caribou Advisory Committee (BCAC), provides a management framework and recommendations for the recovery and sustainable management of the Bathurst herd across the Northwest Territories, Nunavut, and Saskatchewan. The Management Plan reflects the diverse interests of governments (Indigenous, territorial, provincial, and federal), communities, and stakeholders across the herd's range.

Indigenous Knowledge shows that barren-ground caribou populations naturally fluctuate, and are normally self-sustaining through cycles from high to low abundance. However, increasing natural and human pressures have resulted in historically low population numbers for the Bathurst herd. In recent years, the Bathurst herd has exhibited a particularly significant downward trend as compared with other barren-ground caribou herds. In order to support the herd's recovery, the relationship between people and caribou in the North must be mended. This Plan is not about "managing" caribou; it's about understanding and regulating human actions such that the Bathurst herd may return to self-sufficient population levels across its natural range.

The BCMP is intended to provide guidance for the recovery and sustainable long-term management of the Bathurst herd. As the latest iteration of ongoing efforts to care for Bathurst caribou and their habitat, the plan provides a coordinated, collaborative approach to management of the herd that can be applied across jurisdictions. This integrated approach to caribou management incorporates the habitat and range recommendations from the Bathurst Caribou Range Plan (BCRP) with broader recommendations related to harvest, predator management, monitoring and research, and communication and education. It weaves together unique perspectives grounded in Indigenous Knowledge, community experience and ongoing Bathurst caribou science initiatives into an inclusive Management Plan, complete with clear management objectives. A set of status indicators are included to guide the determination of herd health and status and recommended management actions. The Plan is advisory in nature, with application of specific actions being subject to land claim and governmental review and approval processes specific to each jurisdiction.

Each year, the BCAC will hold an Annual Review on Bathurst Caribou to review and discuss any new information on the Bathurst herd and activities occurring within the herd's range. The BCAC will assemble information from community members, knowledge holders, scientists, representatives from community monitoring programs, and representatives from relevant governments and management authorities. During the Annual Review, the BCAC will determine the status of the Bathurst herd, and recommend associated management actions.

1 Introduction

1.1 Introducing the Plan

> *We are caribou people you know. That is what they call us.*
>
> – Herman Catholique of Łutsël K'é Dene First Nation in discussion with Natasha Thorpe, June 6, 2017, Bathurst Caribou Range Plan Traditional Knowledge Workshop, Yellowknife, NT.

Caribou are vital to the identity, culture, livelihood, and well-being of Northern communities. For millennia, the lives of Indigenous peoples have been inextricably linked to the annual movements of caribou across the land. Many Indigenous people and Northerners understand the North as a landscape within which animals and people form relationships of reciprocity and mutual respect. People rely on caribou for sustenance and well-being, and, in return, have a responsibility to care for caribou and protect their habitats.

There are nine overlapping barren-ground caribou (*Rangifer tarandus groenlandicus*) herds that are found partially or entirely in the Northwest Territories (Figure 1; see Figure 2 for a detailed map of the Bathurst range). Together once over 1.5 million animals strong, many of these herds are now experiencing widespread declines due to increasing human and natural pressures. The cumulative effects due to landscape-level changes such as increased habitat disturbance (e.g., wildfires, industrial activity), and predation, has likely contributed to rapid and significant population decreases, and possibly disrupted naturally fluctuating cycles of herd abundance. Indigenous knowledge holders understand these changes as threats to the respectful relationship between people and caribou and explain that when caribou are disrespected, they can move away or decline in abundance. The long-term persistence of barren-ground caribou is under threat.

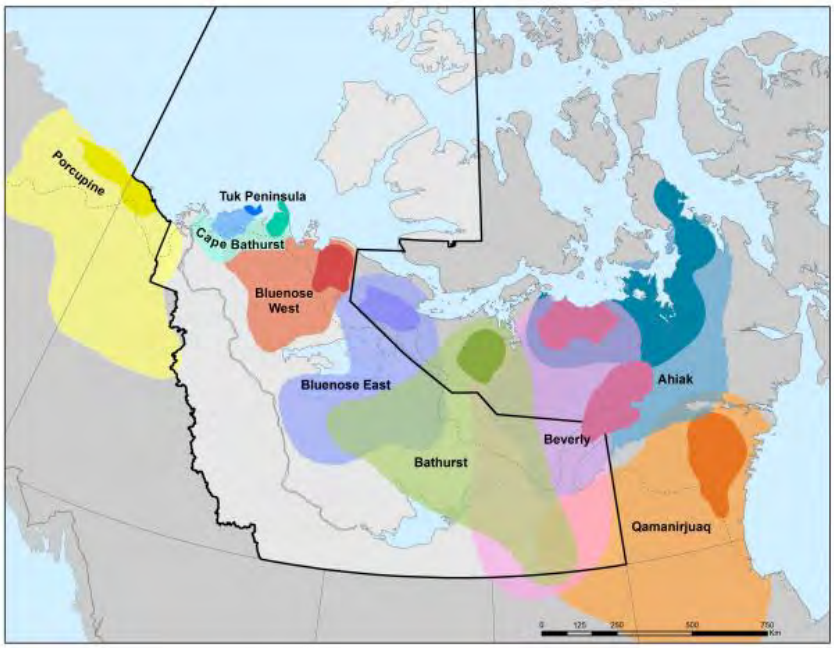

Figure 1. – Barren-ground caribou herds found partially or entirely in the Northwest territories. (Source: GNWT, 2018.)

The Bathurst herd has exhibited a particularly significant downward trend in recent years, as compared with other barren-ground caribou herds. Once numbering over 470,000 in the 1980s, only 8,200 animals were estimated in 2018.[1] Collaborative management efforts to address the decline throughout this period include herd Management Plans written in 1988,[2] 1996,[3] and 2004,[4] a 2019 Bathurst Caribou Range Plan (BCRP), and a co-management process implemented by the Wek'èezhìı Renewable Resources Board (WRRB), the Tłı̨chǫ Government (TG) and the Government of the Northwest Territories (GNWT) in the NWT. In Nunavut, collaborative management approaches have been implemented by the Government of Nunavut (GN), Kitikmeot Regional Wildlife Board, regional Hunters and Trappers Committees and the Nunavut Wildlife Management Board. Further, across the Bathurst range, Indigenous-led guardianship, monitoring, and research initiatives have been developed.

Bathurst caribou at Contwoyto Lake. (Source: Petter Jacobsen, Ekwǫ̀ Nàxoède K'è program; Tłı̨chǫ Government, n.d.)

This Bathurst Caribou Management Plan (BCMP, or Management Plan), developed under the direction of the Bathurst Caribou Advisory Committee (BCAC), provides a management framework and recommendations for the recovery and sustainable management of the Bathurst Herd through long-term natural abundance cycles across the Northwest Territories, Nunavut, and Saskatchewan. The Management Plan represents the diverse interests of governments (Indigenous, territorial, provincial, federal), communities, and stakeholders across the herd's range. The BCMP is advisory in nature, with application of specific actions being subject to land claim and government review and approval processes specific to each jurisdiction.

[1] GNWT, n.d.
[2] GNWT, 1988
[3] Case et. al, 1996
[4] GNWT, 2004

Figure 2. - The Bathurst herd annual range. (Source: GNWT ENR, 2021).

1.2 Who was Involved?

Bathurst caribou occupy a broad jurisdictional landscape, characterized by overlapping Indigenous, provincial, and territorial governments and overlapping federal, community, and stakeholder interests (see Figure 2). Ensuring the long-term well-being of this herd requires coordination and collaboration in good faith among management agencies, governments, and stakeholders. To that end, the BCAC was established in 2017 to guide the development of the BCMP. The BCAC has three broad objectives:

- To learn from and adaptively manage the physical, biological, and cultural relationship between people and caribou.
- To cooperatively provide advice for the management of the Bathurst caribou herd and its habitat to strive to ensure a healthy, viable herd capable of fulfilling harvesting needs.
- To promote and strengthen communication and sharing of information related to the Bathurst caribou herd and its habitat.

The BCAC includes member representatives from:

Public Governments

- Government of the Northwest Territories
- Government of Nunavut

Indigenous Governments and Organizations

- Tłı̨chǫ Government
- Nunavut Tunngavik Incorporated
- Athabasca Denesųłiné Néné Land Corporation
- Yellowknives Dene First Nation
- Łutsël K'é Dene First Nation
- Northwest Territories Métis Nation
- North Slave Métis Alliance
- Salt River First Nation
- Deninu K'ue First Nation

Other Management Authorities

- Wek'èezhìı Renewable Resources Board
- Kitikmeot Regional Wildlife Board
- Kugluktuk Angoniatit Association (Hunters and Trapper Organization)
- Umingmaktok Hunters and Trappers Organization (Bay Chimo)
- Burnside Hunters and Trappers Organization (Bathurst Inlet)
- Ekaluktutialik Hunters and Trappers Organization (Cambridge Bay)

Knowledge holders, scientists, subject matter experts and decision-makers from the BCAC membership provided technical expertise during the development of the plan by collecting, analyzing, and synthesizing understandings, input and data as required.

1.3 Guiding Principles

The BCAC developed the following principles to guide the development, implementation, and periodic review of the BCMP:

- **Biological and Cultural Diversity.** This Management Plan acknowledges the interconnectivity of cultural and biological diversity; when one declines, so does the other.[5] The management recommendations in this Plan seek to balance the recovery of Bathurst caribou and the revitalization of Indigenous culture and language related to caribou, recognizing that access to caribou through hunting is a fundamental element of community well-being.
- **Mutual Respect.** This Management Plan promotes respectful and reciprocal relationships between people and caribou. It acknowledges caribou as complex social beings. Sustainable and respectful interactions must guide our behaviour.
- **Shared Responsibility.** This Plan recognizes the shared responsibility for caribou among all communities and governments. Management recommendations within this plan promote respect for caribou, empower those communities most reliant on caribou, protect the land, and promote sustainable harvesting practices.
- **Natural Abundance Cycles.** While we are currently faced with historically low numbers of Bathurst caribou and a contracted range, the long-term intent of the BCMP is to manage Bathurst caribou through natural cyclical fluctuations in population and range. Thus, the management framework and management recommendations of the BCMP are geared not only to the current herd status but to varying future population levels.
- **Meaningful Consideration of All Forms of Knowledge.** The plan brings together Indigenous, community and scientific knowledge both in the development of plan objectives, approaches, and actions, and in ongoing herd monitoring and herd status assessment.
- **Precautionary Principle.** In the face of uncertainty regarding the impacts of stressors such as future land use, industrial development, climate change, where there are threats of serious or irreparable damage, knowledge gaps or uncertainty will not be a reason for postponing reasonable conservation measures.[6]
- **Adaptive Co-Management.** Adaptive co-management is an approach to resource and wildlife management that combines two key aspects – adaptive management and co-management. Adaptive co-management requires commitment to the principles of "shared decision-making" and "learning by doing".[7] The BCAC will engage in an ongoing and collaborative manner on the development, implementation, and periodic review of this Management Plan.

[5] Terralingua, 2014.
[6] Cooney & Dickinson, 2005.
[7] TG & ENR, 2010.

1.4 Indigenous Knowledge, Community Knowledge, and Science in the BCMP[8]

> *Science they tend to know a lot of things when they take an animal apart, anatomy of any animal, they know the science part of all the insides. But they have not lived out on the land like we have for thousands of years. We know the whole picture not just the inner parts of any animal. Scientists they learn that by looking at the scientific way of doing it, taking things apart, that's their way of doing it. We need to meld science and traditional knowledge at all times doing projects out on the land, especially mining companies who might be working out on the land. We need to work more closely together.*
>
> — 2A in BCRP Traditional Knowledge Workshop, March 30-31, 2016

Indigenous knowledge is a cumulative body of knowledge about ecosystems and peoples' relationships within those ecosystems, developed through rigorous, long-term empirical observation. It both informs and is informed by spiritual beliefs and traditional laws and stories. It is deeply connected to place.[9] Community knowledge is similarly connected to place and characterized by rigorous, on-the-ground observations over long time frames. Science, on the other hand, is generally conducted on shorter time frames, and often makes use of more quantitative methods and forms of data. However, it bears important similarities to Indigenous knowledge and community knowledge in terms of its goals, fundamental premises, and methods of knowledge acquisition. A recent special issue of *Arctic Science* summarizes much of the progress made in Indigenous and community knowledge, the co-production of knowledge, collaborative management, and co-monitoring in the North.[10]

The BCMP acknowledges that both Indigenous knowledge and community knowledge are living knowledge systems that must be braided into management planning alongside scientific knowledge. To this end, the BCMP brings together Indigenous knowledge, community knowledge, and scientific knowledge both in the development and implementation of the Plan:

- The BCMP's objectives, approaches, and actions were developed collaboratively between Indigenous knowledge, community knowledge, and scientific knowledge holders and caribou experts.
- The BCMP's herd status threshold levels, which are associated with a specific set of relevant management actions, are assessed in an ongoing manner through a suite of scientific, Indigenous, and community knowledge indicators (e.g., population size, caribou body condition, presence of caribou trails).
- The implementation of the BCMP's management recommendations will be guided by all forms of knowledge on an ongoing basis.

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[8] Many Indigenous communities have specific terms for their own knowledge (e.g., "Dene Knowledge", "Inuit Qaujimajatuqangit"). Further, local communities also maintain a wealth of knowledge. Throughout the BCMP, the term "Indigenous Knowledge and Community Knowledge" is used to describe the broad body of expertise and insight carried by Indigenous and non-Indigenous peoples across the North.

[9] Ban et. al, 2018.

[10] Peacock et. al, 2020; Johnson et. al, 2020.

The guiding principle to weave together Indigenous and scientific ways of knowing highlights that one of the BCMP's strengths is in seeing with two eyes – "To see from one eye with the strengths of Indigenous ways of knowing, and to see from the other eye with the strengths of Western ways of knowing, and to use both of these eyes together".[11] In the North, former Tłı̨chǫ Chief Jimmy Bruneau spoke of the need to be "strong as two people", highlighting the importance of learning both from Tłı̨chǫ culture and traditions as well as Western or scientific worldviews.[12] This perspective is acknowledged in Northern Canada – both the Northwest Territories and Nunavut have policies and guidance on the meaningful consideration of Indigenous Knowledge and values. For example, the GNWT's Traditional Knowledge Policy, requires that Indigenous Knowledge be given equal consideration to science in natural resource planning, management and monitoring.[13] Similarly in Nunavut, the GN's Inuit Qaujimajatuqangit Division guides the development and implementation of Inuit Qaujimajatuqangit and Inuit Societal Values.[14]

George St. Pierre teaches youth about caribou anatomy. (Source: Kyle Anderson, ADNLC, n.d.)

[11] Two-eyed seeing was proposed by Mi'kmaw Elder Albert Marshall in 2004. For more on this discussion, see: www.integrativescience.ca/Principles/TwoEyedSeeing.
[12] BCRP, 2018.
[13] GNWT, 2005.
[14] GN, n.d.

2 Background and Context

> *"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 Earth's work. But lately the changes that [have] been happening [have] nothing to do with the natural process."*
>
> – Denesųłiné Néné Land Corporation 2016: 10

2.1 Bathurst Caribou

2.1.1 Description

Barren-ground caribou are defined in local languages and dialects as tuktu (Inuvialuktun, Inuinnaqtun, Inuktitut), ʔekwę (North Slavey), ʔetthën (Denesųłiné) and *ekwǫ̀* (Tłı̨chǫ). They are a subspecies of caribou whose range spans from the northern Boreal forests to the Arctic tundra and from Alaska to Western Greenland. In one of the longest ungulate migrations on earth, barren-ground caribou travel in large herds through distinct seasonal ranges. They are considered both a cultural and ecological keystone species in tundra and taiga ecosystems.[15]

Barren-ground caribou are well-adapted to the Northern environment; their concave, sharp-edged hooves support their weight on snow, make them excellent swimmers, and help them paw through snow and ice to reach terrestrial lichens, their primary winter food source. Their coat and colours change throughout the seasons, from a creamy heat-storing winter coat to a brown summer coat with the characteristic lighter neckband. Both sexes have antlers, which males lose after rutting but reproducing females maintain until late spring to defend forage sites. They typically weigh between 90 kg (adult females) to 150 kg (adult males).[16]

INDIGENOUS NAMES FOR BARREN-GROUND CARIBOU:

There are many words for barren-ground caribou in Northern Indigenous languages and dialects. These include:

tuktu – Inuvialuktun, Inuinnaqtun, Inuktitut

ʔekwe – North Slavey

ʔetthën – Denesųłiné

hozi ekwǫ̀ - Tłı̨chǫ

Kokètì *ekwǫ̀* – Bathurst herd in Tłı̨chǫ

In the summer, caribou feed on lichens, grasses, sedges, shrubs and forbs. During winter months, they rely on terrestrial and arboreal lichens that grow in mature vegetation communities.[17] Extreme summer heat, insect harassment, ice layers blocking access to lichens, climate change resulting in changes to the

[15] COSEWIC, 2016; SARC, 2017; Kelsall, 1968.
[16] Ibid.
[17] Rickbeil et. al, 2018.

vegetation growing season, and wildfires, can directly and indirectly affect caribou food supply and strongly influence their chances of survival and overall fitness and reproduction.

2.1.2 Life Cycle & Behaviour

The Bathurst caribou migration is largely guided by the availability of forage across the landscape at key times of the year and group dynamics such as animals grouping together to protect against predators. While as many as 12 seasonal ranges have been identified for barren-ground caribou herds,[18] the Bathurst Caribou Range Plan grouped these into five seasonal ranges for planning purposes (Figure 3).[19]

	Caribou Activity Period	Date Ranges	Season	# Days	% of Year
1	Spring migration	20 Apr - 1 Jun	Spring migration	43	11.8%
2	Calving	2 - 16 Jun	Calving/Post-calving	27	7.4%
3	Post-calving	17 - 28 Jun			
4	Summer	29 Jun - 17 Aug	Summer	70	19.2%
5	Late Summer	18 Aug - 6 Sep			
6	Fall migration - pre-breeding	7 Sep - 16 Oct	Fall	85	23.3%
7	Rut/Breeding	17 - 31 Oct			
8	Fall migration - post-breeding	1 - 30 Nov			
9	Winter	1 Dec - 19 Apr	Winter	140	38.4%

Figure 3. – Lifecycle of the Bathurst caribou herd. (Source: GNWT, 2019.)

During the calving season in early June, cows gather near Bathurst Inlet. Females typically give birth to one calf each year, unless poor body condition prevents them from reproducing. The Bathurst herd moves southwest during the post-calving and summer seasons and within their centre of habitation (i.e., core use area), located between Contwoyto Lake, Lac de Gras, and Point Lake. Rutting and breeding occurs in October and precedes or coincides with a southwards migration to the Northern reaches of the boreal forests, where the Bathurst herd spends the winter months. During the spring migration, the herd makes its way back toward Bathurst Inlet in time for the return of calving season.

Indigenous knowledge, community knowledge, and scientific knowledge affirm that the Bathurst herd's range and migration behaviour has changed over time. Recent population declines have resulted in significant range contractions northward; though the Bathurst herd once wintered as far south as Lake Athabasca in Saskatchewan, their southernmost range limit is currently well North of Great Slave Lake. In some winters, including recent 2016-2020 winters, much of the Bathurst herd has wintered on the tundra. See Figure 4 for the annual and seasonal ranges of Bathurst caribou derived from satellite collar data from 1996 to 2014.

[18] Nagy et. al, 2011.
[19] GNWT, 2019.

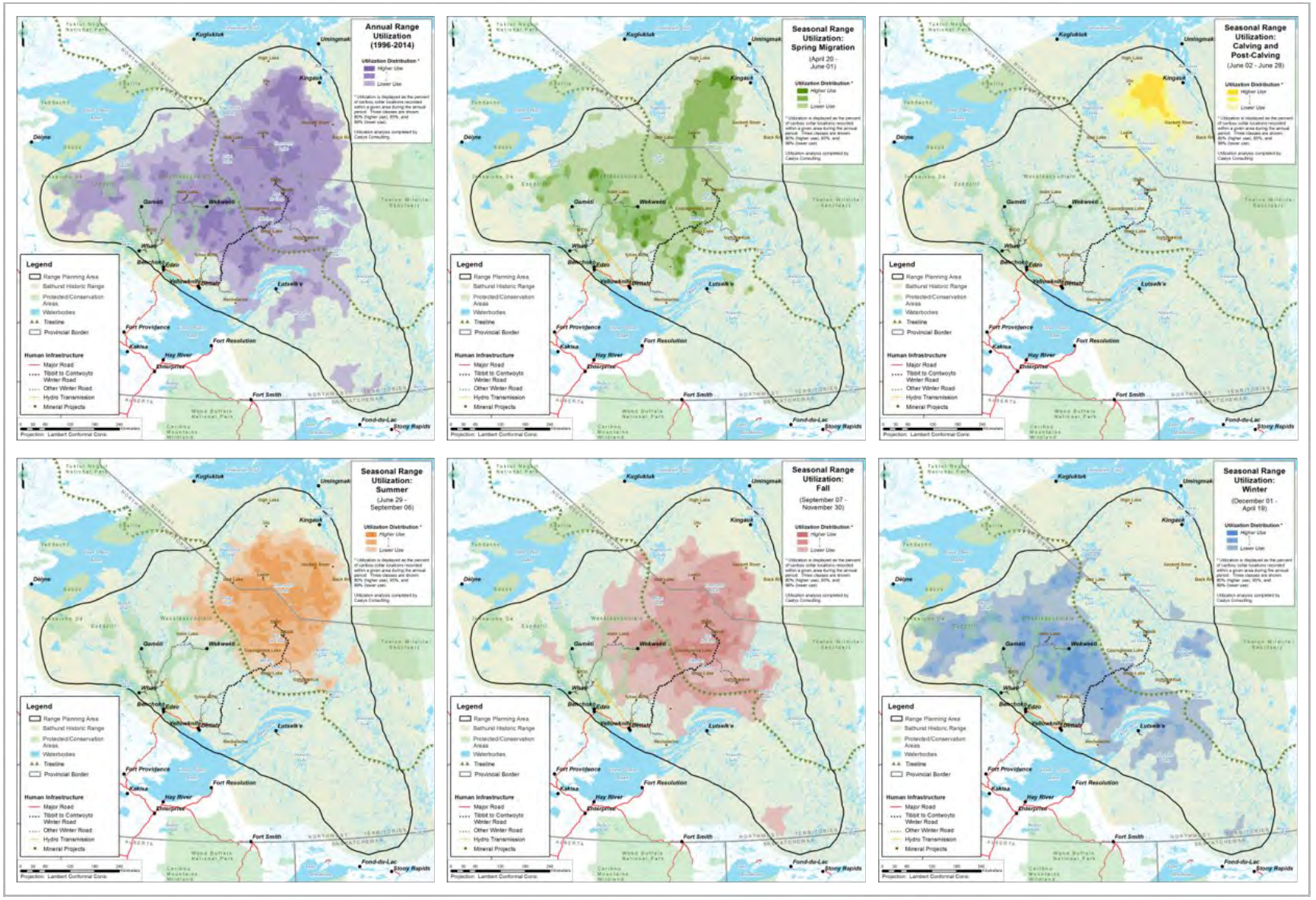

Figure 4. – Annual and seasonal ranges of the Bathurst caribou herd as defined by satellite telemetry data from 1996-2014. See Appendix A for larger versions of these maps. (Source: GNWT, 2019.)

2.1.3 Population Trends

> *For the last 30 years, caribou are changing where they used to go. They stopped coming now and they are stronger to the south side, they stick around there all winter. Jan /Feb. we know where the caribou are. Then they come back from south, people in small numbers… The caribou we don't see for anymore. Forest fires south side, east and west. For me, the Dene scientists knew what was going to happen in the past. They said you see all the caribou now, but the Dene scientists said one day you won't see caribou. You will have tears in your eyes because you won't see them anymore.*
>
> – August Enzoe in TCS 2020: TBA

The annual caribou migration between Arctic tundra in the summer and the Northern reaches of the boreal forest (i.e., taiga) in the winter historically provided Indigenous peoples with a dependable source of sustenance and livelihood. Prior to contact with European settlers, many Indigenous groups in the subarctic and Arctic followed a nomadic cycle, travelling across the landscape between barren lands and forested areas or between the coast and inland, and relying on an intimate knowledge of the land, waters, and their wildlife to survive. Many Indigenous communities today (e.g., Wekweètì) are located in their current position due to their historical importance as travel corridors for hunting caribou.[20]

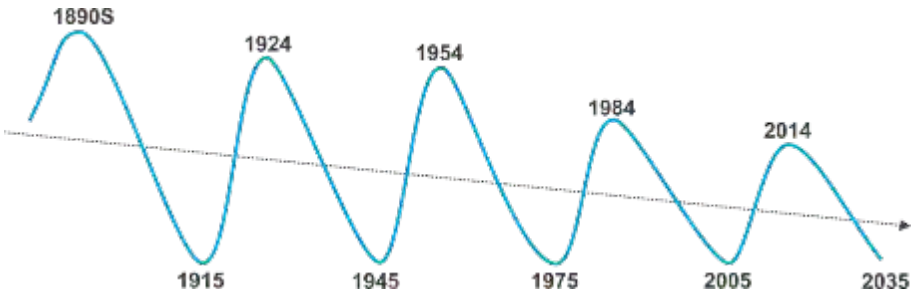

Figure 5. – Indigenous knowledge suggests that barren-ground caribou naturally fluctuate in cycles. However, the growth projected to begin in the early 2000s did not materialize, and the herd instead continued a steady decline. (Source: Beaulieu, Beaulieu, 2012).

According to living memory, barren-ground caribou always experienced cyclical population changes and range contractions and expansions, however, recent peaks haven't reached historical levels (see Figure 5). Caribou populations might fluctuate from vast herds of hundreds of thousands of animals to only thousands of animals, causing hardship amongst hunters and communities.[21] One elder recalls, "my grandfather said that there was no caribou during the First World War. That would have been around 1915. They all used dog team to travel, snowshoes, and there were many stories of hard times. Like stories of a father who would leave the family to go hunting on the barren lands and not come back."[22]

[20] Legat, 2012.
[21] Beaulieu, 2012; Parlee et. al, 2018; SARC, 2017.
[22] Beaulieu, 2012.

In the past, it was understood that these low population phases were natural, and that caribou populations would recover over time. However, this naturally fluctuating abundance cycle appears to have been interrupted by increasing human and natural pressures (e.g., modern hunting methods, industrial development, northern expansion of plant and animal species, increased predation, changes in peoples' relationship with caribou, and climate change).[23] Figure 5 demonstrates this fluctuating abundance cycle, and the overall downward trend for each peak due to cumulative effects. According to this source and previous projections, a new phase of population growth should have begun in the early 2010s. Instead, barren-ground caribou continued a prolonged downward trend, which for the Bathurst Herd has resulted in a concerning decrease to critically low population thresholds.

Current population estimates for the Bathurst herd continue to exhibit a downward trend (See Figure 6 for estimates of Bathurst caribou population size and number of breeding females from 1986 to 2018).[24] A June 2018 survey of the Herd estimated 8,207 caribou (+/- 3,008) – a marked decline since the 2015 survey, which estimated 19,769 caribou (+/- 7,420).[25] Neighboring and overlapping herds exhibit similar declines, including the Bluenose East Herd to the West (19,000 individuals, declining from 39,000 in 2015), the Beverly to the East (103,400 individuals, declining from 136,600 in 2011), and the Dolphin Union to the North (4,000 individuals, declining from 18,000 in 2015).[26] However, the most recent assessment of biological indicators for the Bathurst herd show improvement for several vital rates (e.g., calf to cow ratios, bull to cow ratios, survivorship of collared cows). Improvement in these vital rates may be a precursor for a stabilizing or increasing population.[27]

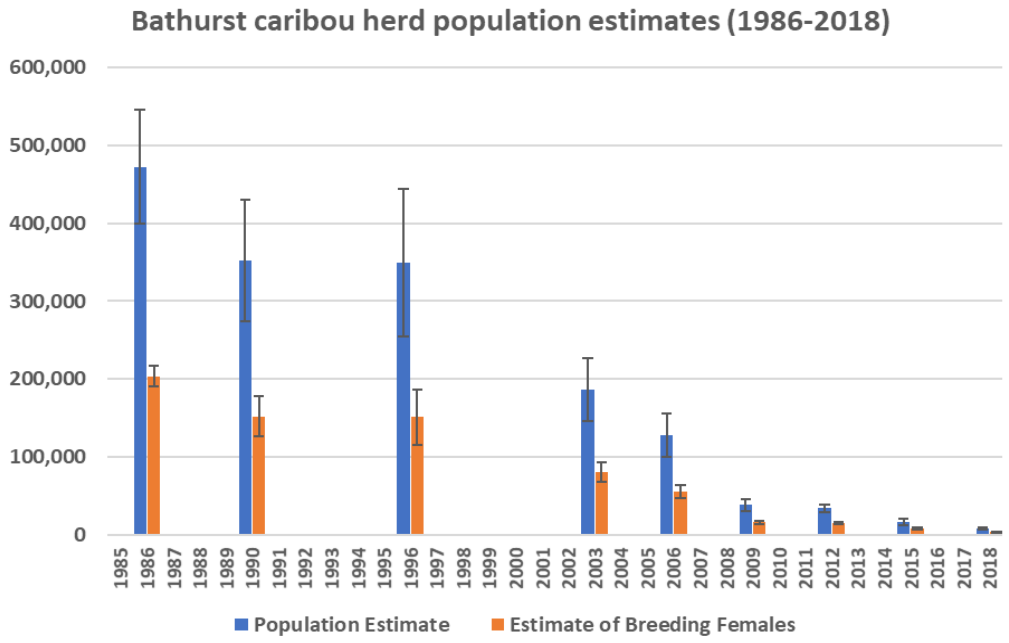

Figure 6. – Estimates of Bathurst caribou population size and number of breeding females from 1986-2018. (Source: GNWT, 2019.)

[23] Zoe, 2012.
[24] COSEWIC, 2016.
[25] TG and ENR, 2019.
[26] ENR, n.d.
[27] Jan Adamczewski, personal communication, December 2020.

2.1.4 Threats

Bathurst caribou have always faced threats from a range of natural and human pressures. Natural limiting factors – many of which have been increasing due to climate change and human factors – include predation, insect harassment, wildfires (specifically changes in frequency, size and intensity), and stochastic weather events. More recent human factors include habitat degradation through industrial development and road construction, sensory disturbance due to industrial activities, disrespectful harvesting practices, and climate change.[28]

Caribou react to these stressors with a wide variety of behaviors and responses. These may include shifting range use (e.g., in response to industrial disturbance), choosing different habitats (e.g., in response to food availability), and engaging in highly gregarious behavior (e.g., in response to predation). The cumulative effects of these interacting – and sometimes synergizing – stressors on Bathurst caribou, which are already experiencing historically low population numbers, result in unprecedented challenges for the herd.[29]

Bathurst herd attempting to migrate through Jericho mine infrastructure. (Source: Petter Jacobsen, Ekwǫ̀ Nàxoède K'è program, July 2017.)

[28] Fauchald et. al, 2017; Mallory & Boyce, 2017; SARC, 2017.
[29] COSEWIC, 2016; SARC, 2017.

2.2 Past and Current Management Efforts & Initiatives

> *Mahsi, we did hear each other and we talked about wanting to work together and goals we want to reach, because if we stay together things might happen because our previous elders have been pushing that. We need to help one another and do it together.*
>
> — 7A in BCRP Traditional Knowledge Workshop, March 30-31, 2016

While Indigenous peoples have been practicing guardianship since time immemorial, more formalized management planning efforts for the Bathurst herd have been undertaken since the 1980s. The complexity of these initiatives has increased in tandem with elevated pressures on the Bathurst herd and increasing jurisdictional complexity. Early management plans were developed solely by the GNWT, however more recent initiatives have involved broader innovative collaborative approaches. The following sub-sections provide a brief synopsis of management efforts for the Bathurst caribou herd to date.

2.2.1 COSEWIC, SARC, & CMA Designations

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the NWT Species at Risk Committee (SARC), in 2016 and 2017 respectively, assessed all barren-ground caribou as "threatened".[30] Threatened species are defined as species which are "likely to become endangered if limiting factors are not reversed".[31] These assessments led the Conference of Management Authorities (CMA), the group of wildlife co-management boards and governments responsible for the recovery of NWT species-at-risk, to list barren-ground caribou as "threatened" on the NWT List of Species at Risk in 2018.[32]

A CMA "threatened" designation requires that a Recovery Strategy for barren-ground caribou in the NWT be developed within two years, which has been completed and accepted by the CMA. The goals of the Recovery Strategy are: to maintain or restore self-sustaining populations of all barren-ground caribou herds; to support unobstructed migration of barren-ground caribou across their historical range; and to promote the social, cultural, and environmental conditions necessary for recovery. To support the achievement of these goals, the Recovery Strategy recommends objectives (with associated approaches) related to collaborative management planning, monitoring and enhancing knowledge, protecting caribou populations and habitats, and educating and promoting respect for caribou.[33]

An assessment process is also underway for barren-ground caribou through the federal Species at Risk Act (SARA). If accepted for listing under this legislation (which is expected), there will be legal requirements to develop a Recovery Strategy and identify and protect critical habitat.[34]

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[30] COSEWIC, 2016; SARC, 2017.
[31] COSEWIC, 2019.
[32] CMA, 2020.
[33] Ibid.
[34] GNWT, 2019.

2.2.2 Previous Bathurst Caribou Management Plans

Partly in response to the rapid increase in mineral exploration and development that began in the early 1990s, a series of Bathurst Caribou Management Plans were developed. The first Bathurst Caribou Management Plan was developed in 1988. At the time, the most recent population estimate of the Bathurst Herd was 472,000 animals. The objectives of the plan were to safeguard Bathurst caribou for harvest by Indigenous users, and for the interests of residents of the Northwest Territories and Canada. The plan aimed to increase knowledge of caribou ecology and management, maintain populations to enable a 16,000 animal annual harvest, and ensure that human development would not threaten the Bathurst herd or its habitat. The Plan was developed by the GNWT Department of Renewable Resources at a time when the NWT still included Nunavut.[35]

The 1996 Bathurst Caribou Management Plan determined the Bathurst caribou herd and its range to be in "very good condition." Harvest levels varied between 14,500 and 18,500 animals per year, which was considered to be sustainable. The Plan maintained the target of a population level capable of sustaining a 16,000 animal annual harvest. Current and proposed industrial development was considered to be of minimal concern to the herd, although the Plan acknowledged that development must be evaluated on a cumulative basis. The Plan was also developed by the GNWT Department of Renewable Resources.[36]

Following the division of Nunavut and NWT, the year 2000 marked a shift toward more collaborative planning and management of the Bathurst herd. Representatives from Indigenous, federal and territorial governments signed the Bathurst Caribou Management Planning Agreement, in recognition that "the continued well-being of the Bathurst Herd […] and the maintenance of its habitat requires co-ordinated co-management, goodwill and co-operation amongst government, Aboriginal organizations, and institutions of public governments." The resulting *Draft Management Plan for the Bathurst Caribou Herd* (2004) established a Management Framework, with recommended management actions associated with herd status, and an Action Plan to guide the implementation of recommended management actions. At the time of the 2004 Management Plan, the Bathurst Herd comprised approximately 186,000 individuals and was believed to be in a trough of its natural cycle.[37] According to this cycle, a new phase of population growth should have started in the early 2010s. Instead, Bathurst caribou population numbers continued a rapid decline to below 10,000.

(Source: Ekwǫ̀ Nàxoède K'è program, n.d.)

[35] GNWT, 1988.
[36] Case et. al, 1996.
[37] BCMPC, 2004.

2.2.3 Collaborative Management

Since its establishment under the Tłı̨chǫ Agreement in 2006, the WRRB has been working to collaboratively manage wildlife and wildlife habitats in the Wek'èezhìı, an area established through the Tłı̨chǫ Agreement.[38] The WRRB makes recommendations to the Tłı̨chǫ Government and GNWT for the management of human actions related to the Bathurst caribou herd. Most recently, in recognition of the persistent decline of the Bathurst caribou, in January 2019 the Tłı̨chǫ Government and GNWT submitted a *Joint Proposal on Management Actions for the Bathurst ʔekwǫ̀ (Barren-ground caribou) Herd* to the WRRB. This resulted in the WRRB issuing management recommendations in five categories – harvest, predators, habitat and land use, education, and research and monitoring. A key determination by the WRRB was to maintain a total annual harvest (TAH) of zero for the 2019-2020 and 2020-2021 seasons implemented through the Mobile Core Bathurst Caribou Conservation Area (MCBCCA). Other recommendations included developing training and incentives for wolf harvest, endorsing and implementing the Bathurst Caribou Range Plan (BCRP), increasing public education and awareness, and increasing monitoring of the Bathurst herd.[39]

In other jurisdictions, similar processes have been followed to collaboratively address the decline of the Bathurst herd. In late 2020, the Nunavut Wildlife Management Board (NWMB) reduced the TAH on this herd from 30 to 10 bulls following a proposal submitted by GN and a public hearing in March 2020.

Some Indigenous governments and communities have also considered halting Bathurst caribou harvest. For example, the 2020 Łutsël K'é Dene First Nation (LKDFN) Stewardship Plan's nálze (harvest) policy measures include a community agreement that LKDFN members will not harvest Bathurst caribou, for at least the next two years.[40]

2.2.4 2019 Bathurst Caribou Range Plan

The 2019 Bathurst Caribou Range Plan (BCRP) was a collaborative effort by representatives from federal, territorial and Indigenous governments and organizations in the Northwest Territories, Nunavut, and Saskatchewan, as well as industry and non-government organizations. Through the braiding of Indigenous, community, and scientific knowledge, the BCRP addresses issues related to cumulative land disturbance with its goal to ensure the Bathurst herd annual range is in a resilient landscape condition.

Human disturbance on the Bathurst caribou range results in direct habitat loss from land use features (i.e., roads, settlements, exploration sites, and operational mines). There is also an associated area around the direct footprint – a zone of influence (ZOI). The ZOI, which is informed by both community members and scientists, corresponds to an avoidance response where caribou shift their distribution away from a land use feature or activity. The avoidance response may result in caribou reducing their presence within a ZOI or changing their migratory movements to move away from land use features. Furthermore, caribou within a ZOI may change their activity patterns by spending less time feeding, or the animals may change their selection and use of habitats.

The BCRP includes a Cumulative Land Disturbance Framework that provides over-arching landscape-level management benchmarks and associated management responses to mitigate impacts of human

[38] WRRB, n.d.
[39] TG & ENR, 2019; WRRB, 2019.
[40] LKDFN, 2020.

disturbance on the Bathurst caribou herd range. It recommends a suite of management actions intended to mitigate disturbance to Bathurst caribou and their habitat based on levels of cumulative disturbance.

BCRP recommendations are generally intended to support and influence a variety of land use, regulatory and wildlife management decision-making processes as well as guide community and industry-based initiatives. These include:

1. Land use planning
2. Community guardianship programs
3. Wildlife management recommendations and actions (governments and renewable resources boards)
4. Environmental assessment
5. Regulatory processes
6. Industry protocols and best management practices

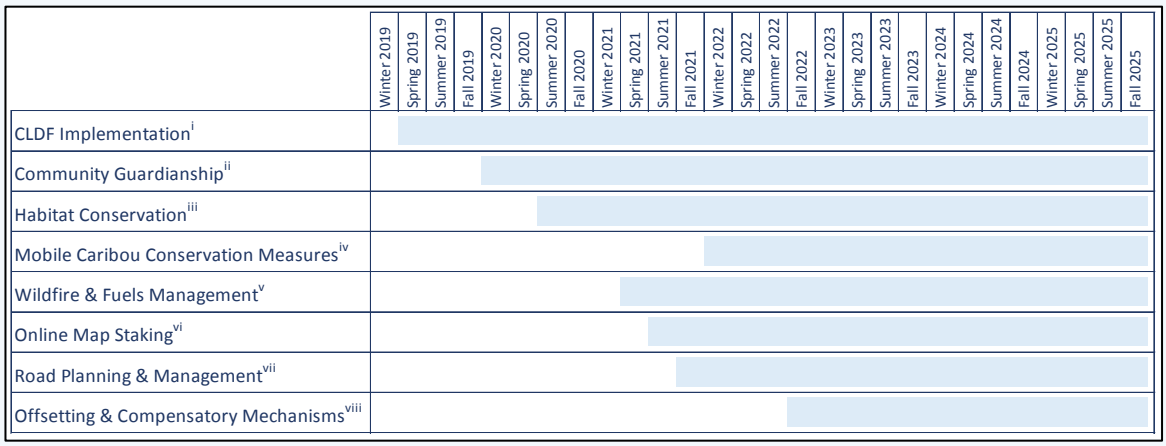
While the BRCP's management recommendations are a function only of the level of disturbance on the landscape rather than population status, the BCRP was developed in the context of the current critically low Bathurst caribou populations, and the recommended intensity of these actions reflects that context. The BCRP is the basis of the habitat and land-use component of this BCMP. The BCRP should be referred to for extensive detail on the analyses, supporting documentation and rationale for the habitat management recommendations.[41]

Four barren-ground caribou bulls. (Source: Aimee Guile, WRRB, 2020).

[41] GNWT, 2019.

Implementation Status of the Bathurst Caribou Range Plan

The Bathurst Range Plan was finalized in 2019. Since then, GNWT has taken steps toward its implementation. The table below summarizes the progress made so far and the schedule for future actions to implement the Plan.



I. New development permits are reviewed in relation to the range assessment areas and cumulative disturbance as identified in the Range Plan. In addition, ENR is launching a Species and Habitat Viewer website for developers to calculate the additional disturbance their project contributes to cumulative totals and be made aware of the resultant mitigations required in the Range Plan.

II. The Caribou Guardianship Coalition held its first planning meeting in January 2020 to initiate the collaborative development of an Indigenous Guardian network across the Bathurst Range. Three years of funding has been secured through Polar Canada to support development of the Guardianship Coalition. ENR continues to provide in-kind support as needed.

III. Indigenous governments have been supported to document important habitat for conservation purposes. Workshops will be held early 2021 to build consensus on areas to advance.

IV. A framework has been developed to implement MCCM in the NWT. ENR worked with a team of consultants and an industry partner in a Pilot Project in summer/fall 2020 and is developing a guidance document for developers.

V. Indigenous governments have been supported to document important winter habitat for consideration in the Wildfire management Values at Risk hierarchy. Workshops will be held early 2021 to build consensus on areas to advance.

VI. A new Minerals Resources Act for the NWT was enacted in 2018. The new Act doesn't expressly reference online map staking, but it does enable it to be implemented once the necessary regulations, technology and public awareness materials have been developed. This will likely take years and is consistent with other jurisdictions that have moved to online map staking. While transitioning to this system, the traditional system of ground-staking remains in place.

VII. Best Practices for Road Planning and Management will be compiled to guide implementation of this recommendation and prior to the environmental assessment, design, and construction of the proposed Lockhart All-Season Road. The proposed road is the first phase of the multi-phase Slave Geological Province Corridor Project.

VIII. GNWT has produced an offsetting assessment framework and held an offsetting workshop in September 2018 to inform development of an offsetting approach for caribou, including barren-ground caribou. Initial work has been completed towards development of a Guidance Document and future Offsetting Policy for the GNWT.

2.2.5 Guardianship, Community-Based Monitoring, and Local Initiatives

> *This traditional knowledge isn't going to be gone. Our traditional knowledge is within us. It won't be gone. We're all Dene. Our ancestors are our guardians. They're always there with us, guiding us. If we're going to do this monitoring [guard the land], it must come from our traditional knowledge. Our people know our traditional knowledge.*
>
> – Georgina Chocolate in Caribou Guardians Coalition, 2020: 14

Across the Bathurst range, community-based monitoring programs and Indigenous guardianship initiatives are being developed and implemented to increase understanding of the herd and inform efforts to ensure herd well-being. Some of these are described below. Other Indigenous governments in Northwest Territories and Nunavut are in the process of developing and implementing similar programs.

Caribou Guardians Coalition

Indigenous Elders and community members in Northwest Territories have for years been advocating for the development of formalized caribou guardian programs. Such a network was also a key recommendation in the 2019 BCRP. In response, with support from various Indigenous organizations, the Caribou Guardians Coalition (CGC) was established and held its first planning workshop in January 2020 toward the collaborative development of a guardian network across the Bathurst range. The focus of the first workshop was to prepare a vision statement and to start discussing strategic goals and priorities.

The vision of the CGC is for current and future generations of Caribou People to work together to guard and respect caribou and the land they need to thrive. The CGC takes an approach that considers caribou within a larger ecosystem comprised of humans, caribou predators, important plant species for caribou, and other animal species. The next steps for moving the program forward are to further define the governance, operational structure, workplan, implementation plan, training, and program evaluation for the CGC.[42]

Ekwǫ̀ Nàxoède K'è (Boots on the Ground)

Ekwǫ̀ Nàxoède K'è (Boots on the Ground) is a Bathurst caribou monitoring program based upon the Traditional Knowledge of Tłı̨chǫ and Inuit indigenous elders and harvesters. Started in 2016, the program has brought Tłı̨chǫ people to the ancestral Kokètì ekwǫ̀ (Bathurst caribou) harvesting locations on the land. The ekwǫ̀ monitoring area is geographically focused around Kokètì (Contwoyto Lake), Kwiìdlìachı̨ı̨ (Fry Inlet), and the surrounding land within one day's walking distance from these lakes. The basecamp at Kokètì, located in the northernmost region of Tłı̨chǫ traditional territory, is on the summer and fall range of the Kokètì ekwǫ̀; the place where ekwǫ̀ bring their newborn calves to spend the summer.

[42] CGC, 2020.

Ekwǫ̀ Nàxoède K'è is a program that bridges observations of biological indicators with the cultural knowledge of local hunters. The monitoring objectives are to examine the conditions of Kokètì ekwǫ̀ herd on the summer and fall range focusing on four key indicators: habitat, ekwǫ̀ condition, predators, and industrial disturbance. Through Ekwǫ̀ Nàxoède K'è, Tłı̨chǫ travel to their ancestral harvesting locations and hunting areas, where they revive the knowledge of placenames by reconnecting to cultural places and ekwǫ̀. This allows people to "go back to the original source to remember" the stories, language, traditional knowledge and ways of life, and maintain the relationship with the land and animals. Ekwǫ̀ Nàxoède K'è applies the Tłı̨chǫ research methodology, "We Watch Everything" to study current environmental conditions, cumulative impacts to ekwǫ̀ health and population numbers, and examine the ekwǫ̀ life cycle firsthand. The research methodology "Do as Hunters Do" is formed around traditional ways of traveling the land. Around Kokètì, Tłı̨chǫ travel the land by boat and on foot to key geographical features known as ekwǫ̀ nǫʔokè (ekwǫ̀ water crossings), where harvesters have always anticipated ekwǫ̀ herds' arrival. The monitors sit in position, in the same way a traditional hunting party would have done, to wait, and watch the ekwǫ̀ and their habitat. Using traditional hunting methods as wildlife monitoring methods, and traditional hunting locations as monitoring places, Tłı̨chǫ conduct research by doing what the ancestors did successfully to survive the harsh sub-arctic environment from time immemorial. The monitoring program aims to operate for three months (July, August and September) and employs between 30-40 Tlicho people each year. The program presents monitoring results to regional decision makers, such as the Tłı̨chǫ Chiefs, GNWT-ENR and WRRB, to apprise them of the current conditions of the herd and environmental situation.[43]

Łutsël K'é Dene First Nation (LKDFN) Initiatives

LKDFN has taken an active role in the conservation of Bathurst caribou through the 2020 Yúnethé Xá ʔetthën Hádı (Caribou Stewardship Plan) as well as the Ni Hat'ni Dene (Watchers of the Land) caribou monitoring program.

The Yúnethé Xá ʔetthën Hádı was developed as a community initiative, and reflects LKDFN beliefs, values and stories. The Plan focusses on nálze (harvest) policies and protocols, education and communication, monitoring, and enforcement. Through this plan, the community agreed not to harvest Bathurst caribou for the next two years due to the herd's critically low numbers. Yúnethé Xá ʔetthën Hádı is a living document and will continue to evolve as LKDFN's monitoring programs are further developed.[44]

The Ni Hat'ni Dene program, LKDFN's primary caribou monitoring program, has been running since 2008. Initially only a summer program, Ni Hat'ni Dene now has rangers on the land year-round with both traditional knowledge and monitoring experience. Rangers monitor the caribou, observe the health of the herd, and interact with hunters to learn about where caribou are being caught and any harvest compliance concerns. Hunters are also encouraged to record their own observations on the land using GPS devices, which allow for qualitative data to be recorded in various formats.[45]

[43] Tłı̨chǫ Research and Training Institute, 2017; Zoe, 2012.
[44] LKDFN, 2020.
[45] Prairie Desjarlais, personal communication, Nov. 2020.

Nunavut Wildlife Management Board (NWMB) Community-Based Monitoring Network

The NWMB Community-Based Monitoring Network empowers and enables harvesters to record field observations that inform wildlife management and conservation. Harvesters are trained to record wildlife sightings, harvests, and other environmental observations while on the land. This important Inuit and local knowledge can be used by the NWMB and other co-management boards to identify areas of high biological productivity and critical harvesting areas, to document species range and movement patterns, and to inform future wildlife research and management priorities. The program also benefits Nunavut communities by improving understanding of communities' conservation concerns, promoting participatory community research, and empowering individuals and communities to have a greater role in managing their diverse hunting areas. [46]

Athabasca Dene Caribou Management Plan (under development)

The Athabasca Denesųłiné First Nation communities of Fond du Lac, Black Lake and Hatchet Lake (Saskatchewan) are currently working on the development of a Denesųłiné Barren-ground Caribou Management Plan. The Athabasca Denesųłiné have been impacted by the decline of the Bathurst caribou herd as the herd has not migrated into Nuhenéné (Athabasca Denesųłiné traditional territory) for many years. Recognizing the need to formalize Indigenous Knowledge and harvesting protocols into a Caribou Management Plan, the communities will strengthen the Denesųłiné role in stewardship of the land and caribou. This will build on work done to date through a Barren-ground Caribou Community-based Monitoring Program which includes caribou harvest data collection, health monitoring, youth and Elder culture camps, Indigenous Knowledge collection, advocacy for habitat protection and education/awareness of traditional harvesting protocols.[47]

Kitikmeot Regional Wildlife Board Caribou Mapping and Monitoring Project

[Awaiting content]

Yellowknives Dene Caribou Monitoring Program

[Awaiting content]

NSMA Winter Monitoring Program

[Awaiting content]

[46] NWMB, n.d.
[47] Tina Giroux, personal communication, Sep. 2020.

Preparing a caribou hide. (Source: Tina Giroux, n.d.)

3 Goals & Objectives for the Bathurst Herd

> *If you see different people on the land, you meet and become friends. Every day, we just tell each other. They have a different story. Everybody has a different story and they fit together. How we can work together, that way, it's stronger. If you're there, talking, you get more stronger. It's really good.*
>
> – Leon Ekendia, TG, in Caribou Guardians Coalition 2020: Appendix B-1:7

The BCMP is intended as a guiding document for the recovery and sustainable long-term management of the Bathurst caribou herd. As the latest iteration of ongoing efforts to care for Bathurst caribou and their habitat, the plan provides a coordinated, collaborative approach to management of the herd that can be applied across jurisdictions. This integrated approach to caribou management incorporates the habitat and range recommendations from the BCRP with broader recommendations related to harvest, predator management, monitoring and research, and communication and education. It brings together unique perspectives grounded in Indigenous Knowledge and community experience and previous Bathurst caribou research and initiatives into an inclusive management plan, complete with clear, achievable management objectives and recommended actions. The plan is advisory in nature, with application of specific actions being subject to land claim and governmental review and approval processes specific to each jurisdiction.

The BCMP is structured according to a management framework with one overarching goal for the Bathurst herd supported by five specific management objectives, each of which is associated with a suite of management actions recommended for implementation at different herd status threshold levels.

BCMP Management Goal: Guide the short-term recovery and long-term resilience of the Bathurst caribou herd through management actions related to harvest, habitat and range management, predator relationships, research and monitoring, and communication and education.

- **Objective 1 – Harvest.** Strive for the sustainable and culturally respectful harvest of Bathurst caribou over time.
- **Objective 2 – Habitat and Disturbance.** Manage land use, including human-caused physical and sensory disturbance, such that Bathurst caribou are conserved within their natural range.
- **Objective 3 – Predators.** Manage predator-caribou relationships in accordance with Indigenous values and knowledge, and consider predator reduction when predators may be limiting stability or increase of the herd.
- **Objective 4 – Research and Monitoring.** Increase the state of knowledge of Bathurst caribou population dynamics, range, and ecology.
- **Objective 5 – Communication and Education.** Strengthen awareness and support for Bathurst caribou conservation and culturally respectful hunting and land use among people and communities.

4 Managing Human Actions for the Bathurst Herd

> *"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."*
>
> — Simon Qingnaqtuq in BCRP Traditional Knowledge Workshop, March 30-31, 2016

This Management Plan focusses on managing human actions. While increasing natural and human pressures have resulted in historically low population numbers for the Bathurst herd, Indigenous Knowledge shows that barren-ground caribou populations naturally fluctuate, and are self-sustaining through these abundance cycles. In order to allow the Bathurst herd to recover, the relationship between people and caribou in the North must be mended. In keeping with the approach laid out in the NWT SARC's *Recovery Strategy for Barren-Ground Caribou* (2020)[48] and this Management Plan's guiding principle of mutual respect, this Plan is not about "managing" caribou; it's about understanding and prescribing human actions such that the Bathurst caribou herd may return to self-sufficient population levels across its natural range. The Plan was developed with the understanding that different management actions, and varying intensities of those actions, are warranted depending on the status of the Bathurst herd.

A Bathurst caribou. (Source: Ron Robillard, ADNLC, n.d.)

[48] SARC, 2020.

4.1 The Bathurst Caribou Management Wheel

Inspired by the Ungava Peninsula Caribou Aboriginal Round Table (UPCART) strategy for the George River and Leaf River barren-ground caribou herds,[49] the BCAC developed the Bathurst Management Wheel (BMW) as a visual representation of the recommended management actions associated with different herd status levels (Figure 7). The BMW guides an adaptive co-management approach in which key herd status thresholds provide triggers for the implementation of various management actions for harvest, habitat, predator management, research and monitoring, and communication and education. The Bathurst herd status is determined annually by BCAC through discussion of all relevant Indigenous, community, and scientific information for the herd.

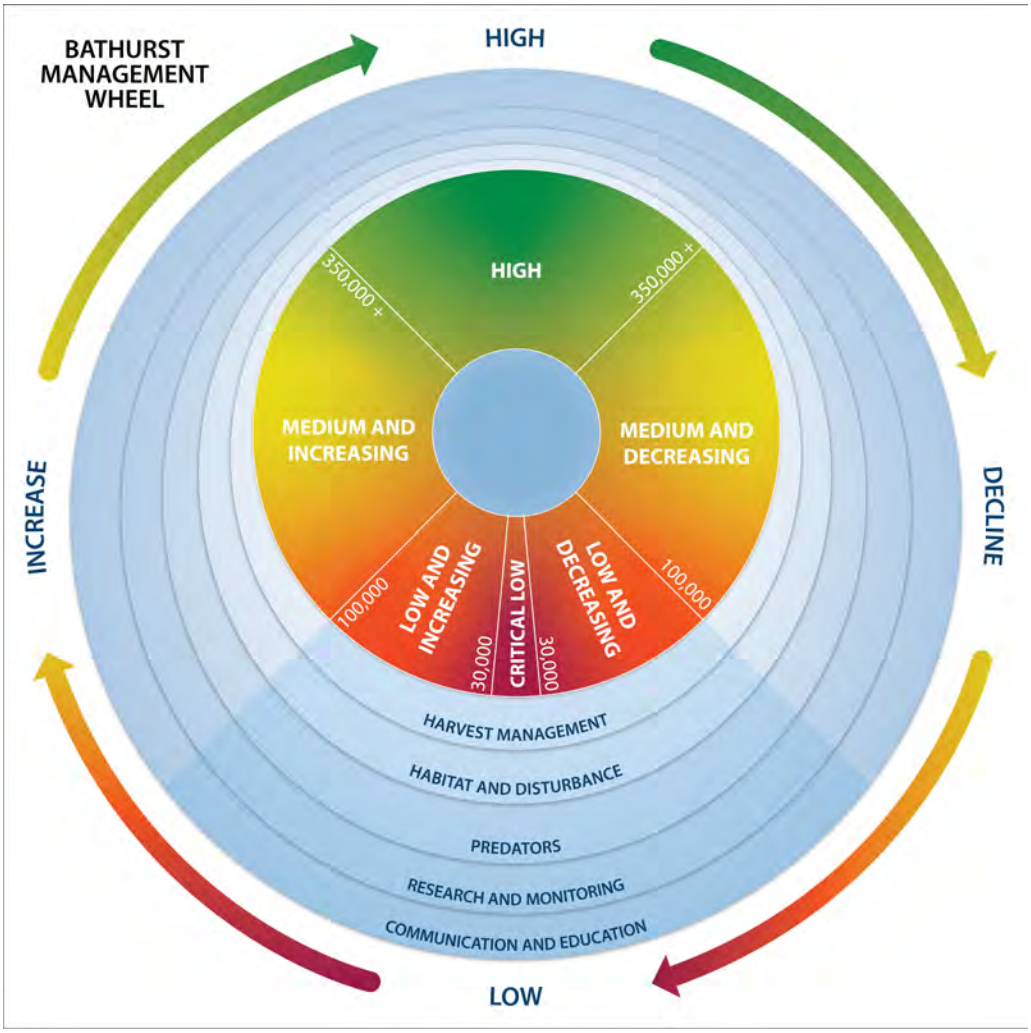


Figure 7. – The Bathurst Management Wheel provides a framework for identifying management actions at various herd status threshold levels. (Source: BCAC, 2020.)[50]

[49] UPCART, 2017.

[50] Note that the "Harvest" ring represents harvest restrictions, which decrease as herd status improves.

The central ring defines quantitative and qualitative herd status thresholds for the Bathurst caribou herd. Herd status levels are based on Indigenous knowledge, community knowledge, and scientific indicators (see below) that were developed by the BCAC after reviewing other management plans, community-based monitoring programs, and local initiatives for barren-ground caribou.[51] The quantitative population thresholds were determined through discussion by BCAC members based on review of a Zoetica report of recommended harvest levels for the Bathurst herd.[52] The colours distinguishing herd status levels are blurred to indicate there is discretion in the herd status assessment where all herd status indicators from all knowledge sources are considered and discussed. Each herd status level is associated with a set of recommended management actions, as represented by the concentric blue rings. Depending on status and trend of the herd, management actions may be triggered, intensified, decreased, or discontinued as indicated by the shading density and width of the management rings.

It is important to note that the Bathurst caribou herd will not always sequentially follow the progression of the abundance cycle depicted in this diagram. Currently, the Bathurst herd is in the Critical Low category; as the herd recovers, it may oscillate between Low & Increasing, Medium & Decreasing, Medium & Increasing, and other categories. In addition, both Indigenous Knowledge (see Figure 5) and biologists' surveys and research have shown that population highs and lows can vary. While the hope is that the Bathurst herd will recover to the high numbers of the 1980s (nearly 500,000), the next population high may be different from the last. Implementation of the BCMP will need to be flexible and adaptable to these fluctuating abundance cycles.

4.2 Herd Status Indicators & Threshold Levels

Six herd status threshold levels are used to determine the appropriate suite and intensity of management actions at a given time. Each herd status level is named after two primary indicators of herd status – population size and population trend: Critical Low, Low & Decreasing, Low & Increasing, Medium & Decreasing, Medium & Increasing, and High. However, a suite of modifying indicators informed by all forms of knowledge are considered in the determination of herd status level. These are described below. The management framework allows for some discretion in the assessment of herd status, acknowledging that all indicators may not always fall within one herd status threshold level. See Appendix B for a blank template for summarizing all herd status indicators that can be used for annual planning and documentation purposes.

[51] Management Plans reviewed included: *Bathurst Caribou Management Plan* (1988), *The Status and Management of the Bathurst Caribou Herd* (1996), *A Management Plan for the Bathurst Caribou Herd* (2004), *Beverly and Qamanirjuaq Caribou Management Plan* (2014), *Taking Care of Caribou: The Cape Bathurst, Bluenose-West, and Bluenose-East Barren-Ground Caribou Herds Management Plan* (2014), and *A Long Time Ago in the Future: Caribou and the People of Ungava* (2017). Other initiatives and programs reviewed included those described in Section 2.2.5.

[52] Zoetica, 2018.

Population Size, Trend, and Rate of Change

Population size and trend are primary indicators of herd status – i.e., how well the herd is doing. Biologists conduct photographic surveys of the calving ground to estimate abundance of breeding female caribou and population size. These aerial surveys are done in early June when breeding female caribou congregate to give birth to their calves. Indigenous knowledge and community knowledge also inform population size, as changes in herd distribution or herd expansions and contractions over time may be observed on-the-ground. Community members and harvesters often have intimate knowledge of long-term trends in the herd's population levels.

Population trend is an important indicator of herd status because it shows how abundance of caribou changes over time. It is determined through comparison of sequential population estimates and is also a primary indicator of herd status. It can be informed by science, Indigenous knowledge, and community knowledge. The rate of change is also important, as it provides insight on the urgency of management recommendations.

For the purposes of this Management Plan, thresholds for population size and trend have been identified for each of the six herd statuses (see Table 1). Note that these primary indicators are not absolute determinants of the Bathurst herd status; a number of modifying indicators (described below) are also considered in the determination of herd status. The shading from red to green in Table 1 reflects the discretion accorded to knowledge holders, and managers in determining herd status based on the full suite of indicators.

Table 1. – Thresholds for population size and trend for each Bathurst herd status. Information from the most recent herd surveys will contribute to the annual Bathurst herd status determination. The examples in the table below are **illustrative only**, to demonstrate the data that may be recorded.

	Critical Low	Low & Increasing	Medium & Increasing	High	Medium & Decreasing	Low & Decreasing
Population Size	Less than 30 000	Between 30 000 and 100 000	Between 100 000 and 350 000	More than 350 000	Between 100 000 and 350 000	Between 30 000 and 100 000
Population Trend	↓ or ↑	↑	↑	↓ or ↑	↓	↓
Annual Status Information	e.g., 16,490 animals ± 1,240; declining @ 14%	e.g., 64,930 animals ± 4,600; increasing @ 6%	e.g., 287,310 animals ± 8,920; increasing @ 2%	e.g., 482,400 animals ± 14,300; pop. stable	e.g., 112,520 animals ± 6,310; decreasing @ 11%	e.g., 36,120 animals ± 2,730; declining @ 13%

Caribou Vital Rates: Cow Survival, Pregnancy (Productivity) and Calf Survival

Population trend is the simple balance between the number of caribou that die in a year and the number of young animals that are born and survive their first year. Three key indicators of caribou population health can be measured and these will determine whether a herd is increasing, stable or declining. The survival rate of cows, the pregnancy rate or initial number of calves born, and the survival rate of calves all have a strong influence on population trend.

Cow Survival Rate

The annual survival rate of cows is the proportion of females that live through the year. Experience has shown that a stable herd has a cow survival rate of at least 83-87%/year, and herd trend is quite sensitive to this rate. Herds with a cow survival rate of less than 80% are likely to be declining, and herds with cow survival rates consistently over 90% are likely to be increasing. Cow survival rates can be estimated from the proportion of collared cows that survive the year, and from use of a population model that considers all information on the herd. Community-based monitoring programs and individual community members may also have insight into how many cows they are seeing and how this trend is changing over time.

Productivity & Pregnancy Rate

Productivity refers to the number of calves that are born each year, with the pregnancy rate indicating the highest potential productivity of the herd. Harvesters will observe number of harvested cows with calves in utero as an indicator of number of calves born. Pregnancy rate estimated from blood samples from cows captured for collar placement can also provide an index of herd pregnancy rate but it is determined only from a small sample of female caribou and may not be fully representative of the entire herd. Biologists are currently exploring the practicality of collecting fecal pellet samples during spring composition surveys to analyse for progesterone (high in pregnant cows, low in non-pregnant cows).

Biologists use the proportion of breeding females (or the number of female caribou that were pregnant) at peak of calving as an alternative for annual productivity. Proportion of breeding females is determined through composition surveys from the air and on the ground following a calving ground survey. Proportions of breeding females of 80% or more are considered healthy. Community-based monitoring programs, and individual community members may provide insight into productivity through on-the-ground observations of how many females have calves, and if there are any twin calves.

Recruitment and Calf Survival

Recruitment is determined from spring (March) composition surveys that estimate the calf:cow ratio. Calf:cow ratios are expressed as the number of calves counted per 100 cows. If cow survival rates are relatively constant these ratios are a reasonable indicator of calf abundance. In March, calves are 9-10 months of age and roughly represent calves being recruited into the adult population. Spring calf:cow ratios of 35-45 are considered good. Calf:cow ratios associated with a stable herd depend on adult (cow) survival rates: if adults are surviving at high rates (85-90%/year), then fewer calves are needed for a stable herd, while at lower cow survival rates, more calves are needed to replace caribou that die.

Community monitoring programs and community members may observe relative abundance of calves, and long-term trends in calf numbers while out on the land. Consistently low calf

numbers or calf:cow ratios are indicative of a declining trend, suggesting that cows may be under stress, habitat may be of lower quality, or environmental conditions have been poor. Consistently high values and potential of twin calves are signs of a healthy or growing herd.

Adult Composition

Adult composition refers to the ratio of male caribou (bulls) to female caribou (cows). As the natural death rate for bulls is higher than that of cows, a reduction in bulls may be an early indicator of a declining herd. Bull:cow ratios in the Bathurst herd were as low as 31-38 bulls: 100 cows during the most rapid decline, and ratios of 60 bulls: 100 cows or higher are associated with a stable or increasing herd. Biologists derive estimates of bull:cow ratios in the fall during aerial or ground-based composition surveys, while community monitoring programs and individual community members may make observations of relative numbers of bulls and cows in the fall. They may also provide insight into how many young bulls are observed in the herd.

Body Condition & Health

Information on body condition and health can inform predictions of herd size and trend, as body condition and health of caribou can affect their productivity and survival. Signs of a healthy animal include a smooth, full coat; layers of fat on the neck, back, and rump; and appearance of a short tail. Signs of an unhealthy animal include a discoloured or patchy hide, bony appearance, and a lagging head due to high amounts of fat on a rounded rump. Harvesters typically have a good impression of the condition of caribou through observation and harvesting practices (e.g., skinning and preparing meat), and can provide insight into how caribou's body condition is changing over time. Harvesters and biologists may also use sample kits to collect information such as age, body condition score, and disease and parasite testing.

(Source: Ekwǫ̀ Nàxoède K'è program, n.d.)

Predator Populations

The relationship between predator populations (e.g., wolves, wolverines, grizzly and black bears, eagles) and caribou populations is complex. Predator numbers will typically decline as herd population declines, however there is likely to be a 1-2 year delay; if other prey species are available (e.g., moose) or adjacent and overlapping caribou herds are more abundant, predator numbers may initially remain constant. Further, when caribou populations are low or declining, the relative impact of predation may become greater. Predator abundance, condition, and predation rates are not part of the ongoing scientific monitoring program, but may be monitored through Indigenous and community-based monitoring programs. Community members can provide insight into the relationship between caribou and predators as well as how many predators are on the range, and how their abundance is changing over time. The Ekwǫ̀ Nàxoède K'è program specifically records predator tracks, kill sites, and the relationship between caribou and predators.

Range & Movement Patterns

Monitoring the presence and absence of caribou as well as how they move across their range provides insight into herd abundance and behaviour. The Bathurst herd has seasonally occupied extensive areas from Bathurst Inlet in Nunavut down to northern Saskatchewan when numbers were high and shown contraction to the centre of habitation when numbers are low. Observing interactions with industrial infrastructure such as roads, mines and camps can improve our understanding of caribou habitat selection and impacts of industrial development. This information can be gathered through Indigenous and community-based monitoring programs and scientific study with the aid of satellite collars. Community members may specifically provide insight into how caribou movement patterns are changing in relation to features on the landscape.

Habitat & Environment

Changes in habitat conditions (e.g. weather patterns and wildfire frequency) can provide insight into herd stressors and habitat available for caribou. The CircumArctic Rangifer Monitoring and Assessment (CARMA) network is developing climate indices that are relevant to barren-ground caribou and can be derived for seasonal ranges thus providing a broad-scale perspective of habitat conditions. These include indices for mushrooms, biting flies, drought, spring snow depth, ice on snow events and spring heat conditions for plant growth. The cumulative effects of human activities and other landscape-level changes can also be monitored by guardians and participants of community-based monitoring programs. Community members may provide insight into how burned areas affect caribou movement, or how changes to snow conditions affect caribou's ability to travel.

Bathurst caribou feeding on the east shore of Contwoyto Lake. (Source: Petter Jacobsen, Ekwǫ̀ Nàxoède K'è program, July 2019.)

For each of the indicators described above, Table 2 provides an illustrative example of the information and values that might be recorded for the Bathurst herd.

Table 2. – Indigenous Knowledge, Community Knowledge, and scientific information will be recorded for each monitoring indicator and will contribute to the annual Bathurst herd status determination. The examples in the table below are **illustrative only**, to demonstrate the data that may be recorded.

Monitoring Indicator	Indigenous & Community Knowledge	Scientific Information	Comments
Cow Survival	E.g., community members observed more cows surviving than in previous years	E.g., cow survival estimated at 84% (i.e., stable)	E.g., cow survival increased in past 5 years
Productivity & Pregnancy Rate	E.g., lots of calves and twins observed; almost every female had at least one calf	E.g., % breeding females: 82.5% Pregnancy rate of captured cows: 70%	E.g., this year's results suggest good productivity
Recruitment & Calf Survival	E.g., more calves survived the season than in previous years	E.g., calf to cow ratio: 35:100	E.g., this year's results suggest fair calf survival
Adult Composition	E.g., equal numbers of bulls and cows observed; many young bulls observed	E.g., bull to cow ratio: 38:100	E.g., monitored because bull dominated harvest is recommended at low herd status levels
Body Condition & Health	E.g., caribou harvested were mostly healthy, but some were thinner than in previous years	E.g., average condition of bulls: good; average condition of cows: good Average back fat: 1.2 cm	E.g., note that sample size for scientific information was low (7 cows, 5 bulls)
Predator Populations	E.g., more wolves and grizzly bears observed on the range than in previous years Many grizzly bears have 2 or more cubs	E.g., wolf harvest levels: 32 animals	E.g., note that changes in wolf harvest may not reflect changes in wolf abundance
Range & Movement Patterns	E.g., caribou are changing the way they move; not seeing herd near communities anymore Herd now migrates around the West side of the lake instead of the east	E.g., fidelity of collared cows to calving grounds: 92-93% Mapping of size and location of seasonal and annual ranges	E.g., note that the Bathurst herd sometimes mixes with the Bluenose East herd to the East
Habitat & Environment	E.g., there are more burned areas affecting how the caribou move Snow is softer, making it hard for caribou to travel There are more insects harassing the herd in the summer	E.g., fire season was moderate in severity Insect harassment is increasingly severe	E.g., note that new climate change modelling for the Bathurst range was completed this year

The following sections provide a brief description of each herd status category and associated recommended management actions. These recommendations are focused on managing human actions, such that the Bathurst herd may recover to self-sustaining levels and move unimpeded through its natural cycle of abundance in the future. They are not intended to be fully prescriptive; instead, they provide a guide for managing human actions toward the long-term well-being of the Bathurst herd. They should be used to inform discussions and specific management decisions at the Annual Bathurst Caribou Review (as described in Section 5 below).

Appendix C includes summary tables of the information described in the following sections. It will be useful to have this Appendix on hand as you read these sections.

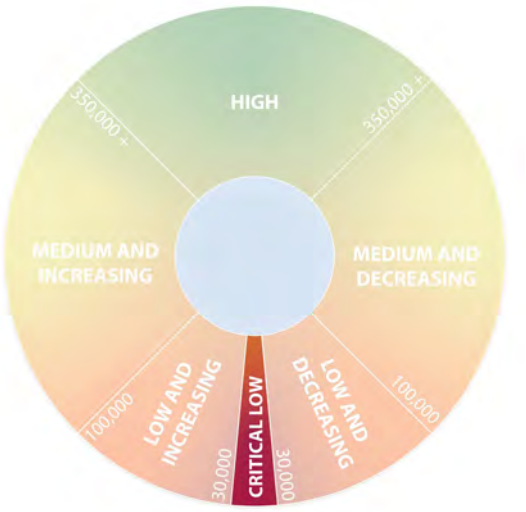
Wholdaia Lake, NWT. (Source: Tina Giroux, n.d.)

4.2.1 Herd Status: Critical Low

When the Bathurst herd is critically low, there are fewer than 30 000 caribou. The herd range use has contracted to the centre of habitation and spends a large part of its annual cycle above the treeline. Caribou trails may be faint or growing over. Caribou may show signs of poor body condition, such as a patchy hide or bony appearance.

Harvest

- Consider an annual harvest rate across the Bathurst herd range of zero or transitioning toward zero for all user groups
- Consider Mobile No Hunting Zones based on Bathurst caribou collars (in NWT)



Predation

- Consider a predation management program, including monitoring and review of predation levels and impacts across jurisdictions
- Consider increased support and incentives for harvest of caribou predators

Research & Monitoring

- Survey herd status every 2 years, or as determined at the Bathurst Caribou Annual Review
- Consider implementing Basic, Enhanced, and Intensive monitoring actions; see Table C 2 in Appendix C (Monitoring Strategies for the Bathurst Herd)
- Minimize research activities that cause additional stress

Habitat & Disturbance

- Disturbance-Based Responses – Recommended management actions for habitat are guided by the Bathurst Caribou Range Plan (BCRP) Cumulative Land Disturbance Framework (CLDF); see Table C 3 in Appendix C (BCRP CLDF)
- Population-based Responses – Consider additional actions to further limit physical and sensory disturbance on the Bathurst range, including:
    - Consider implementing elements of the BCRP CLDF's Intensive Management Response within the Bathurst centre of habitation; See Table C 3 in Appendix C (BCRP CLDF)
    - Consider applying the Mobile Core Bathurst Conservation Area to support the implementation of Mobile Caribou Conservation Measures

Communication & Education

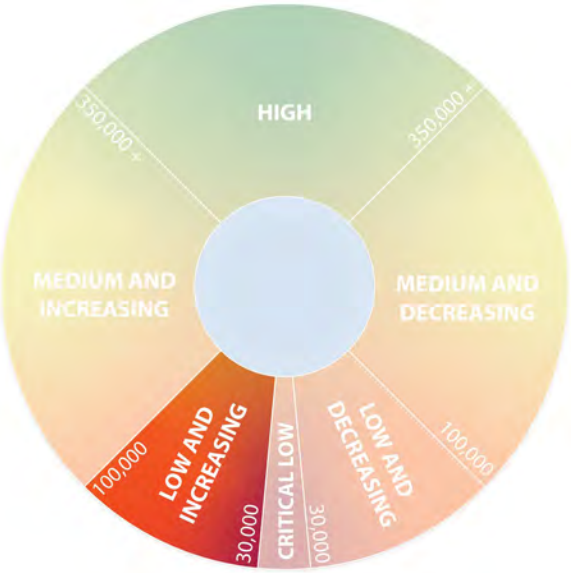
- Recommended Management Actions for Communication & Education are common across all herd status threshold levels; see Table C 1 in Appendix C (Recommended Management Actions)

4.2.2 Herd Status: Low & Increasing

Though the population of the Bathurst herd is between 30 000 and 100 000, the population growth rate and range size have been increasing for several years. Late summer, fall, and winter ranges may be shifting to the southwest. Caribou trails are becoming more noticeable across the landscape. Vital rates (cow survival rate, productivity and pregnancy rate, and recruitment and calf survival), may suggest an increasing population trend. Bull:cow ratios are likely ~60:100 or higher.

Harvest

- Consider an annual harvest of 1-2% of the population
- Promote bull harvest only
- Harvest is open to Indigenous peoples only



Predation

- Consider a predation management program, including monitoring and review of predation levels and impacts across jurisdictions
- Consider continuing increased support and incentives for harvest of caribou predators

Research & Monitoring

- Survey herd status every 2-3 years, or as determined at the Bathurst Caribou Annual Review
- Consider implementing Basic and Enhanced monitoring actions; see Table C 2 in Appendix C (Monitoring Strategies for the Bathurst Herd)
- Minimize research activities that cause additional stress

Habitat & Disturbance

- Disturbance-Based Responses – Recommended management actions for habitat are guided by the Bathurst Caribou Range Plan (BCRP) Cumulative Land Disturbance Framework (CLDF); see Table C 3 in Appendix C (BCRP CLDF)
- Population-based Responses – Consider additional actions to further limit physical and sensory disturbance on the Bathurst range, including:
    - Consider implementing elements of the BCRP CLDF's Enhanced Management Response within the Bathurst centre of habitation; see Table C 3 in Appendix C (BCRP CLDF)
    - Consider applying the Mobile Core Bathurst Conservation Area to support the implementation of Mobile Caribou Conservation Measures

Communication & Education

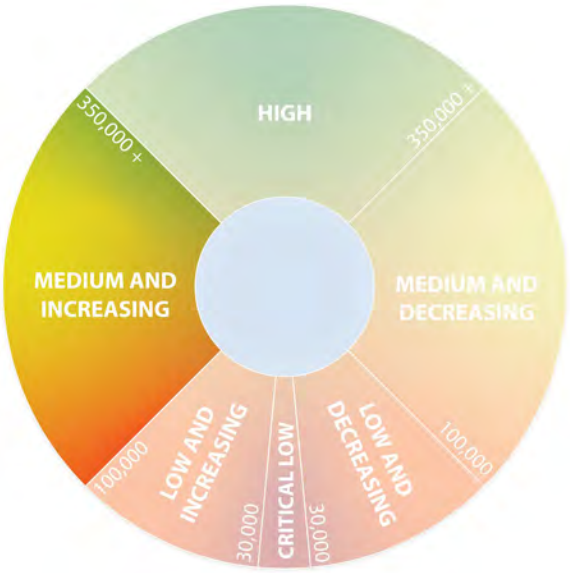
- Recommended Management Actions for Communication & Education are common across all herd status threshold levels; see Table C 1 in Appendix C (Recommended Management Actions)

4.2.3 Herd Status: Medium & Increasing

When the Bathurst herd is approaching the peak of its abundance cycle, herd population and range size have been increasing for many years. Population numbers are estimated between 100 000 and 350 000, and the herd range has expanded. The population trend is upward. There are many caribou trails across the landscape. Vital rates (cow survival rate, productivity and pregnancy rate, and recruitment and calf survival) may suggest an increasing population trend. Bull:cow ratios are likely ~60:100 or higher. Caribou may show signs of good health, including a smooth, full coat, and layers of fat on the neck, back, and rump.

Harvest

- Consider an annual harvest of 2-3% of the population
- Promote bull harvest only
- Harvest is open to Indigenous peoples and residents of NWT and NU
- Consider opening harvest to outfitting/ commercial operations



Predation

- Consider monitoring and review of predation levels and impacts across jurisdictions
- Maintain standard hunting and predation management regulations

Research & Monitoring

- Survey herd status every 3-4 years, or as determined at the Bathurst Caribou Annual Review
- Carry out Basic monitoring actions; see Table C 2 in Appendix C (Monitoring Strategies for the Bathurst Herd)
- Consider additional behavioural or ecological research when herd is in good condition

Habitat & Disturbance

- Disturbance-Based Responses – Recommended management actions for habitat are guided by the Bathurst Caribou Range Plan (BCRP) Cumulative Land Disturbance Framework (CLDF); see Table C 3 in Appendix C (BCRP CLDF)
- No additional population-based responses

Communication & Education

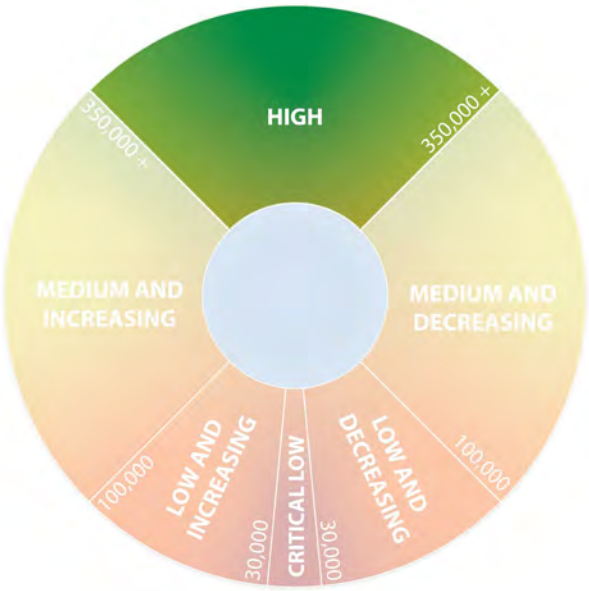
- Recommended Management Actions for Communication & Education are common across all herd status threshold levels; see Table C 1 in Appendix C (Recommended Management Actions)

4.2.4 Herd Status: High

When the Bathurst herd is at the peak of its abundance cycle, caribou are abundant and the herd range is large. Population numbers are estimated at above 350 000, and annual range is approaching the historical range size. There are many caribou trails across the landscape and caribou are observed frequently across the landscape. Caribou vital rates (cow survival rate, productivity and pregnancy rate, recruitment and calf survival) suggest a stable population. The bull:cow ratio is likely ~60:100. Caribou may show signs of good health, including a smooth, full coat, and layers of fat on the neck, back, and rump.

Harvest

- Consider an annual harvest of 3-5% of the population
- Harvest is open to Indigenous peoples, and residents of NWT and NU
- Consider opening harvest to outfitting/ commercial operations
- Consider setting a threshold above which Indigenous harvest is not limited



Predation

- Consider monitoring and review of predation levels and impacts across jurisdictions
- Maintain standard hunting and predation management regulations

Research & Monitoring

- Survey herd status every 4-5 years, or as determined at the Bathurst Caribou Annual Review
- Carry out Basic monitoring actions; see Table C 2 in Appendix C (Monitoring Strategies for the Bathurst Herd)
- Consider additional behavioural or ecological research when herd is in good condition

Habitat & Disturbance

- Disturbance-Based Reponses – Recommended management actions for habitat are guided by the Bathurst Caribou Range Plan (BCRP) Cumulative Land Disturbance Framework (CLDF); see Table C 3 in Appendix C (BCRP CLDF)
- No additional population-based responses

Communication & Education

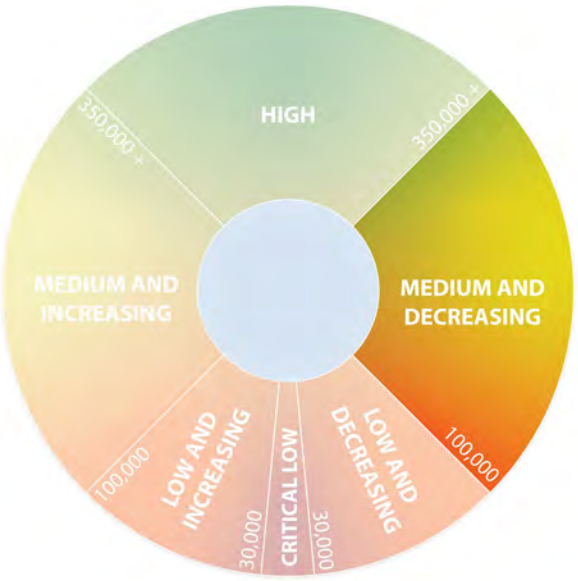
- Recommended Management Actions for Communication & Education are common across all herd status threshold levels; see Table C 1 in Appendix C (Recommended Management Actions)

4.2.5 Herd Status: Medium & Decreasing

When the Bathurst herd is in decline from the peak of its abundance cycle, herd population and range size have been contracting for several years. Population numbers are estimated between 100 000 and 350 000, and the population trend is downward. There is an observed decline in caribou trails across the landscape. Caribou vital rates (cow survival rate, productivity and pregnancy rate, recruitment and calf survival) may be showing signs of decline. The bull:cow ratio is likely lower than 60:100, and may be as low as ~35:100. Some caribou may be showing signs of poor health, such as a patchy hide or bony appearance.

Harvest

- Consider an annual harvest of 1-2% of the population
- Promote bull harvest only
- Harvest is open to Indigenous peoples and residents of NWT and NU



Predation

- Consider monitoring and review of predation levels and impacts across jurisdictions
- Consider increased support and incentives for harvest of caribou predators

Research & Monitoring

- Survey herd status every 2-3 years, or as determined at the Bathurst Caribou Annual Review
- Consider implementing Basic and Enhanced monitoring actions; see Table C 2 in Appendix C (Monitoring Strategies for the Bathurst Herd)
- Consider additional research into causes of herd decline

Habitat & Disturbance

- Recommended management actions for habitat are guided by the Bathurst Caribou Range Plan (BCRP) Cumulative Land Disturbance Framework (CLDF); see Table C 3 in Appendix C (BCRP CLDF)
- No additional population-based responses

Communication & Education

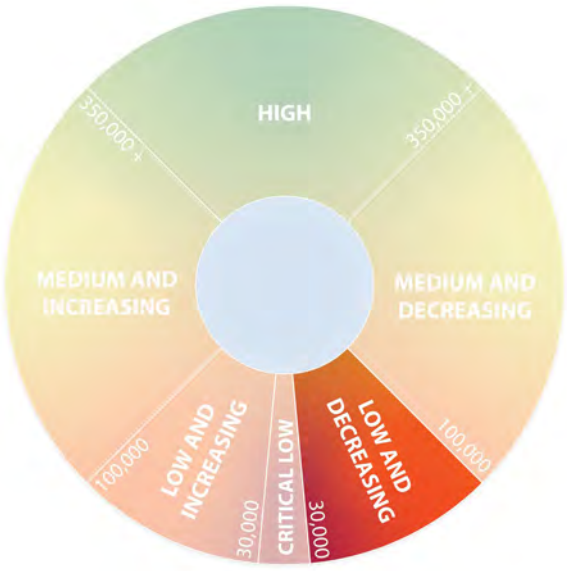
- Recommended Management Actions for Communication & Education are common across all herd status threshold levels; see Table C 1 in Appendix C (Recommended Management Actions)

4.2.6 Herd Status: Low & Decreasing

The population of the Bathurst herd is between 30 000 and 100 00, and the population trend and range size have been in steady decline for many years. When the Bathurst herd is in decline from the peak of its abundance cycle, herd population and range size have been contracting for several years. Late summer, fall and winter seasonal ranges may be shifting towards the northeast. There is a significant decline in caribou trails across the landscape. Caribou vital rates (cow survival rate, productivity and pregnancy rate, recruitment and calf survival) are likely showing signs of decline. The bull:cow ratio is likely lower than 60:100, and may be as low as ~35:100. Caribou may be showing signs of poor health, such as a patchy hide or bony appearance.

Harvest

- Consider an annual harvest rate across the Bathurst herd range of zero or transitioning toward zero for all user groups



Predation

- Consider a predation management program, including monitoring & review of predation levels & impacts across jurisdictions
- Consider increased support and incentives for harvest of caribou predators

Research & Monitoring

- Survey herd status every 1-2 years, or as determined at the Bathurst Caribou Annual Review
- Consider implementing Basic, Enhanced, and Intensive monitoring actions; see Table C 2 in Appendix C (Monitoring Strategies for the Bathurst Herd)
- Minimize research activities that cause additional stress
- Consider additional research into cause of herd decline

Habitat & Disturbance

- Disturbance-Based Responses – Recommended management actions for habitat are guided by the Bathurst Caribou Range Plan (BCRP) Cumulative Land Disturbance Framework (CLDF); see Table C 3 in Appendix C (BCRP CLDF)
- Population-based Responses – Consider additional actions to further limit physical and sensory disturbance on the Bathurst range, including:
    - Consider implementing elements of the BCRP CLDF's Enhanced Management Response within the Bathurst centre of habitation; see Table C 3 in Appendix C (BCRP CLDF)
    - Consider applying the Mobile Core Bathurst Conservation Area to support the implementation of Mobile Caribou Conservation Measures

Communication & Education

- Recommended Management Actions for Communication & Education are common across all herd status threshold levels; see Table C 1 in Appendix C (Recommended Management Actions)

5 Implementing the Plan

> *"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 … you see that we haven't respected the land in a way that will sustain caribou … everyone suffers when the caribou suffer."*
>
> — Tina Giroux in in BCRP Traditional Knowledge Workshop, March 30-31, 2016

The following section describes the process by which the BCAC, communities, management authorities, and governments will work together to implement the BCMP. The implementation of the BCMP is structured through an adaptive co-management framework and monitoring strategy which help the BCAC to assess the Bathurst caribou herd and recommend management responses to relevant management authorities across the Bathurst range. Throughout the implementation of the BCMP, BCAC members will embody this Plan's guiding principles and endeavor to manage human activities such that Bathurst caribou can recover and persist across their natural range.

5.1 Adaptive Co-Management Strategy

Adaptive co-management, in its simplest form, is about collaboratively learning from what we do and changing our practices accordingly.[53] It is an approach to resource and wildlife management that combines two key aspects – adaptive management and co-management. Adaptive co-management requires commitment to the principle of shared decision-making and the Indigenous ethic of learning by doing.[54] By acknowledging environmental change and uncertainty and the resulting need to observe, learn and respond, adaptive co-management is consistent with many Indigenous practices and management systems. In practice, adaptive co-management consists of:

- A structured, iterative process for planning, implementing and learning from management actions
- A dedicated monitoring program to implement the plan, assess effectiveness and learn more about the system being managed
- Ongoing review and update of plan elements and future management actions

An Adaptive Co-Management Framework has been developed for the BCMP (see Figure 8), adapted from the Adaptive Management Framework of the BCRP.[55] The framework includes provisions for periodic review and adaptation and a comprehensive monitoring strategy. The following sections provide additional detail on the "Plan", "Do", and "Evaluate, Learn, and Adjust" elements of the Adaptive Co-Management cycle.

[53] GNWT, 2019.
[54] TG & ENR, 2010.
[55] GNWT, 2019.

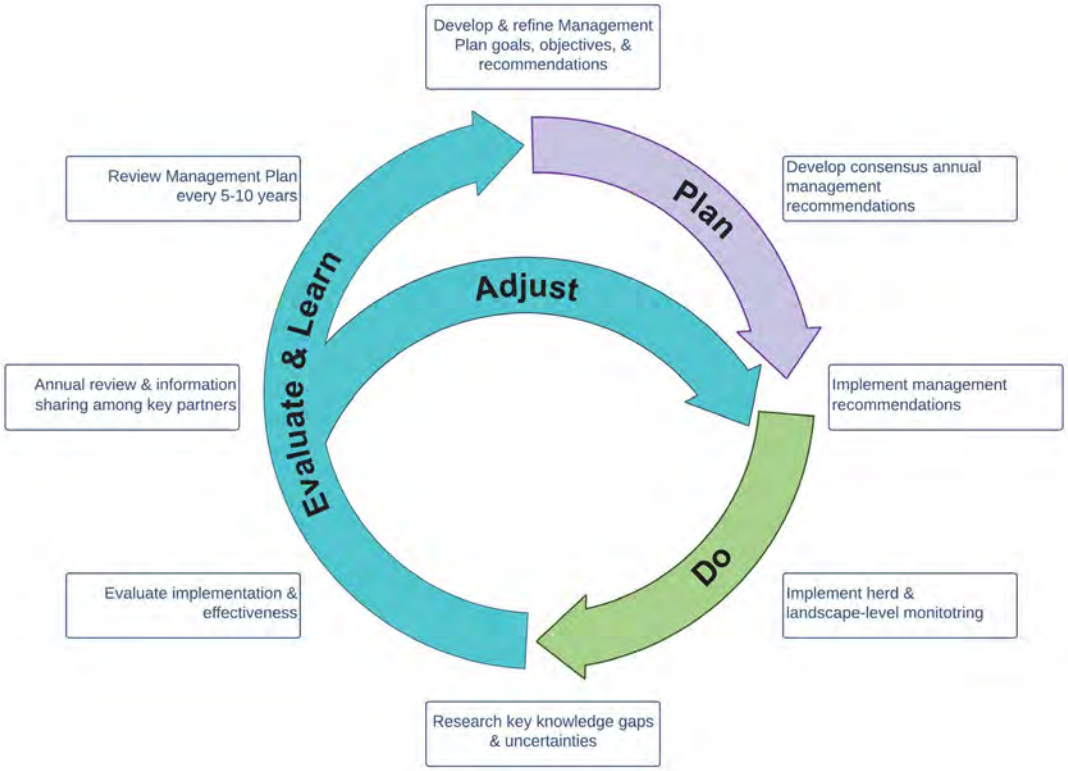
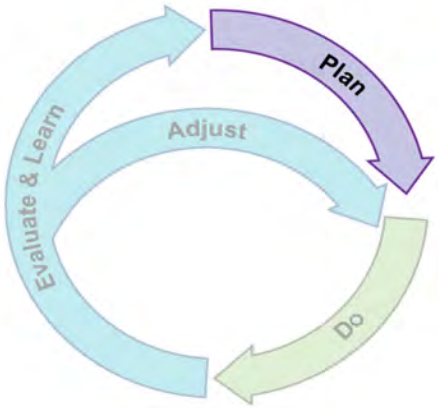


Figure 8. – An Adaptive Co-Management Framework for the BCMP. Adapted from the BCRP (Source: GNWT, 2019).

5.1.1 Plan



Following the finalization of the BCMP, the BCAC will hold an Annual Review on Bathurst Caribou to review and discuss any new information on the Bathurst herd and activities occurring within the herd's range. The BCAC will assemble information from community members, knowledge holders, scientists, representatives from community monitoring programs, and representatives from relevant governments and management authorities for the Annual Review to encourage a diversity of perspectives and ensure that the best available knowledge is shared.

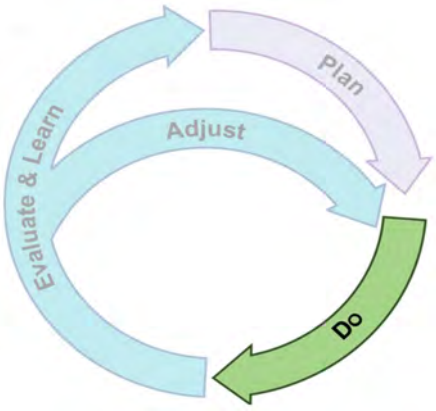
An important outcome of the Annual Review will be the determination of the Bathurst herd's status and recommended management responses for the coming year. Community-based monitoring programs will be a key source of knowledge for the range of monitoring indicators used to determine herd status. Indigenous Knowledge and community knowledge from these programs, and from individual community members, will be braided with scientific monitoring and survey results to inform decision-making about the status of the Bathurst herd and appropriate management responses.

The purpose of the Annual Review is to:

- Review and discuss the Bathurst herd's population, trend, and status. Appendix B of this Management Plan provides a template for the determination of herd status which can be used to inform these discussions.
- Seek consensus on recommended management actions and monitoring actions to be carried out over the coming year. Appendix C as well as Sections 4.2.1 – 4.2.6 of this Management Plan, can be used to inform these discussions.
- Recommend an implementation schedule for management actions and monitoring activities for the coming year.
- Reflect on the effectiveness of the BCMP to date and discuss lessons learned and potential revisions to the Plan.
- Develop a publicly-available summary report on the proceedings and outcomes of the Annual Review.

5.1.2 Do

Effective implementation of the BCMP will require collaboration across jurisdictions and at both local and territorial scales to carry out management actions and herd- and landscape-level monitoring for the Bathurst herd. Governments (Indigenous and territorial), management boards, and communities all have important roles to play.



Following the Annual Review on Bathurst Caribou, the BCAC will develop an Action Plan to guide implementation of recommended management and monitoring actions for the Bathurst herd. This Action Plan will be recommended for implementation by relevant governments and management authorities across the Bathurst range. The role of Indigenous governments, territorial governments and co-management boards in the implementation of the BCMP is to provide the authority, resources, and other support needed to implement recommended management actions and monitoring activities within their respective jurisdictions. Governments and management authorities are encouraged to collaborate with communities to design and implement research and monitoring initiatives that incorporate Indigenous Knowledge and community knowledge.

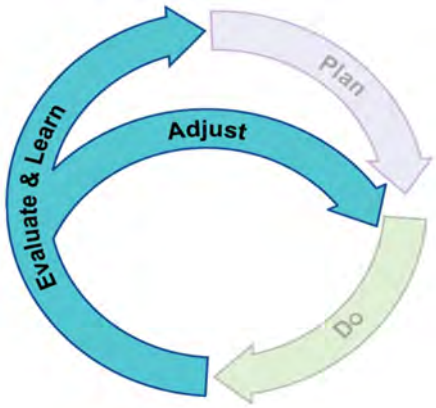
Communities and community-based guardianship and monitoring programs are critical to the successful implementation of the BCMP. On-the-ground monitoring programs such as those described in Section 2.2.5 of this Plan are a key source of knowledge for the Bathurst herd. In particular, the Caribou Guardianship Coalition, which brings together community monitoring and guardianship programs across the Bathurst range, will provide important information about the Bathurst herd while building Indigenous communities' capacity to develop and carry out caribou monitoring programs. Indigenous Knowledge along with wildlife and environmental observations recorded through these programs will provide important input to inform the determination of the Bathurst herd status. These programs ensure that herd and landscape monitoring is conducted in a way that reflects the values, objectives, and priorities of communities across the Bathurst range. They also have concrete economic and wellness benefits for communities in terms of building capacity, engaging youth and elders, connecting

community members to their traditional lands, and bolstering Indigenous Knowledge and community knowledge.

Research into key knowledge gaps and uncertainties related to the Bathurst herd and range are also needed to inform management actions and future revisions to the BCMP. As described in Section 4.2 and Appendix C (Recommended Management Actions), appropriate research actions may vary according to herd status. When the Bathurst herd is at low herd status levels, research activities that cause increased stress to the animals should be avoided. Conversely, periods of medium or high herd status levels may provide opportunities to carry out additional ecological or behavioural research. Finally, periods of herd decline can be used to research the mechanisms that cause decline (e.g., human disturbance, predation, etc.).

5.1.3 Evaluate, Learn, & Adjust

The BCMP requires a strategy to reflect on the BCMP itself, address any challenges with its design, and document lessons learned throughout its implementation. As part of this important component of the adaptive co-management cycle, there are several questions to consider in monitoring the BCMP's implementation, effectiveness, and collaborative relationships. These should be reviewed and discussed at the Annual Review on Bathurst Caribou, and may result in recommendations to improve the effectiveness of management actions, monitoring programs and collaboration among BCAC member organizations.



Implementation & Effectiveness

- *Have we done what we said we would (i.e., have we implemented our agreed-upon management actions)?*
- *What challenges did we encounter in implementing management actions?*
- *Did our actions contribute to meeting our management goal and objectives?*
- *Are we on schedule?*

Collaboration

- *What have we learned about how we work together? How will we apply these learnings?*
- *How can we improve our relationship to better support the well-being of the Bathurst herd?*
- *What opportunities are there to expand collaboration with community-based monitoring and guardianship initiatives?*

In addition to this annual learning and reflection, the BCMP will also be reviewed and revised every 5-10 years, to incorporate new information and adjust to changing circumstances. This review will take a participatory approach to ensure that all communities, management authorities, and governments (Indigenous and territorial) have a voice in guiding the management of human actions for the long-term well-being of the Bathurst herd.

5.2 Preparing for Change

All barren-ground caribou will face ongoing challenges and disruptions to their habitat in the future. Climate change, ongoing industrial and natural resource development, and the expansion of human settlements and infrastructure are all factors that will increasingly come to affect the Bathurst herd. Building resiliency, particularly in the face of climate change, will require adaptation planning and efficient collaboration between communities, management authorities, and governments.

5.2.1 Evolving Relationships

Northern Canada has in recent years been a leader in collaborative management, especially for wildlife. Northern Indigenous communities have long affirmed their rights to govern their lands and resources, and some have regained authority over their traditional lands (e.g., through settlement agreements). Others have worked with territorial governments to design and implement collaborative management processes. Many other initiatives are currently underway to develop new management and governance relationships between Indigenous and territorial governments. Further, all of the community-based, on-the-ground initiatives as described in Section 2.2.5 are working to involve communities in caribou monitoring and increase the use of Indigenous knowledge and community knowledge in monitoring and planning processes. As these relationships continue to evolve and progress, there will be some inherent uncertainty associated with the future jurisdictional landscape and management authority over the Bathurst caribou range. In implementing this Management Plan, governments, management authorities, and communities must adapt to these changes as they come, and continue to seek opportunities for leadership, collaboration, and knowledge exchange. In future years, it may be valuable to establish a formal Bathurst caribou management board with delegated authority over management of the Bathurst herd.

Preparing caribou meat. (Source: Ron Robillard, ADNLC, n.d.)

5.2.2 Climate Change

Any planning initiative in Northern Canada must account for the reality of a rapidly changing climate. Average air temperatures and annual precipitation are both projected to increase over the coming decades, resulting in shorter periods of snow coverage, a longer growing season, changing ecotypes, permafrost degradation, and an increase in extreme weather events such as wildlands fires. These changing climatic conditions are already being observed by community members and they will have a wide range of direct and indirect effects on ecosystems and communities in the North. Various scientific papers have also documented observed impacts of changing climate and weather patterns on caribou in the North.[56]

Community-based tools and resources will be critical for building communities' capacity to monitor and adapt to climate change. Several programs have been developed that bring together Indigenous knowledge and scientific approaches to research climate change, record environmental observations, and help communities adapt and build resilience to climate change. These include:

- The Indigenous Guardians Pilot Program, which provides Indigenous peoples with opportunities to exercise responsibility in stewardship of their traditional lands, waters, and ice; and
- The Indigenous Community-Based Climate Monitoring Program, which offers funding for Indigenous communities to design and implement long term climate monitoring projects.

At the territorial level, GWNT is incorporating climate change into its planning and decision-making processes through the Department of Environment and Natural Resources' 2030 NWT Climate Change Strategic Framework, and through the development of a Wildlife Climate Change Vulnerability Assessment for species at risk in NWT. The Vulnerability Assessment shows a high level of vulnerability to the effects of climate change for barren-ground caribou. As a species that depends on old-growth forests, sensitivity to forage availability, fidelity to key habitats, predation, insect harassment, and the need for habitat connectivity inform barren-ground caribou's high degree of vulnerability.

A group of young caribou bulls in July. (Source: Jan Adamczewski, GNWT ENR, 2015)

[56] Johnson et. al, 2018; Joly et. al, 2011; Mallory & Boyce, 2017.

6 Conclusion

> *"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

The Bathurst herd is vital to ecological and cultural well-being in the North. Indigenous people and Northerners rely on caribou for their livelihood and sustenance, and in turn shoulder the responsibility to care for caribou and protect their habitats. This Management Plan represents the latest iteration of formalized collaborative efforts to manage human actions such that the Bathurst herd may recover and thrive across its natural historical range. The Plan brings together the knowledge and perspectives of Indigenous peoples and other Northerners with scientific knowledge, and provides a management framework to guide recommendations for the long-term sustainability and well-being of the Bathurst herd.

A post-calving aggregation of caribou in July. (Source: Jan Adamczewski, GNWT ENR, 2020)

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Appendix A – Annual and Seasonal Range Maps

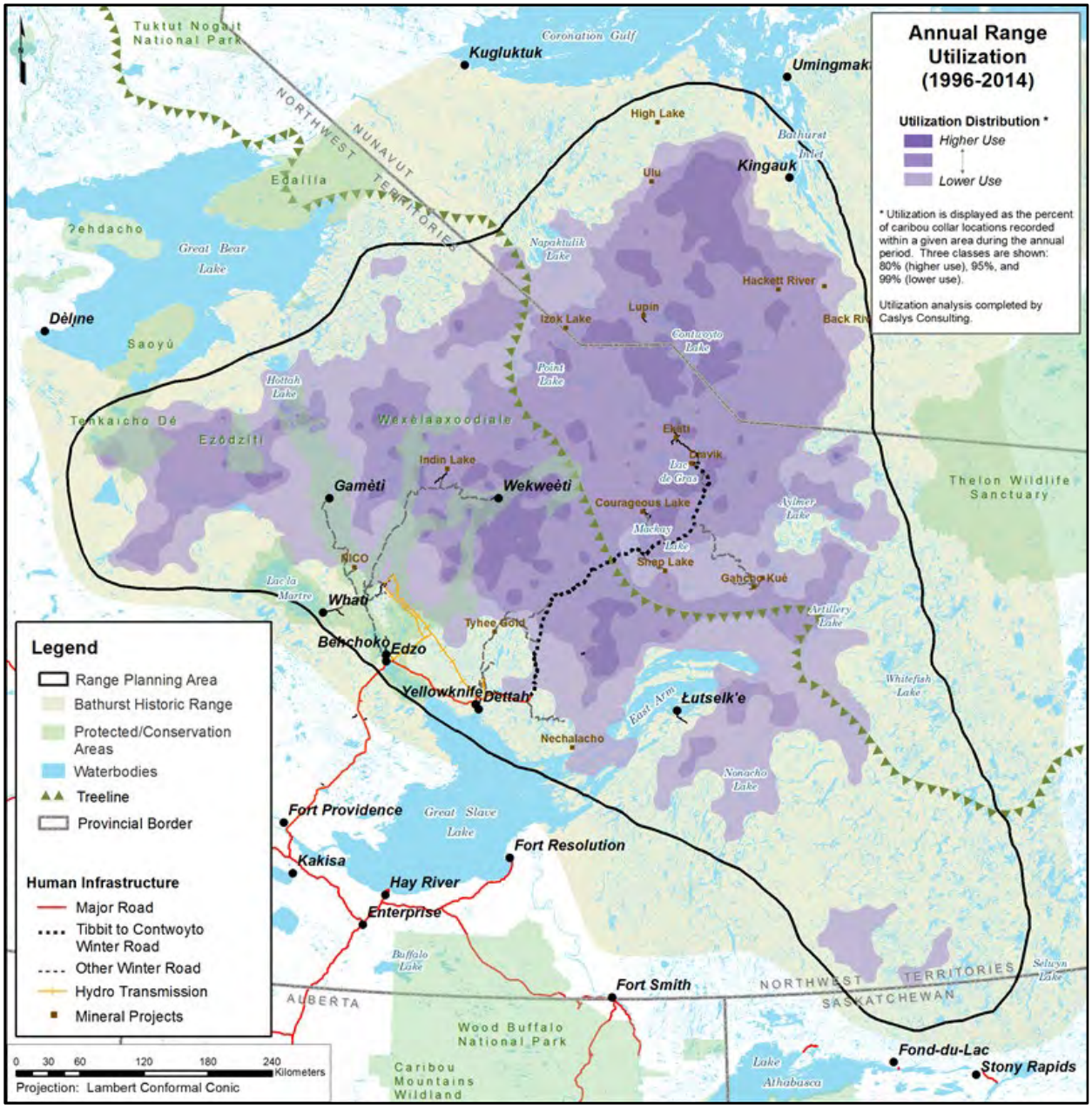

Figure A 1.- Annual range of the Bathurst caribou herd based on satellite telemetry data from 1996-2014. Darker colours indicate higher use by caribou. (Source: GNWT, 2019.)

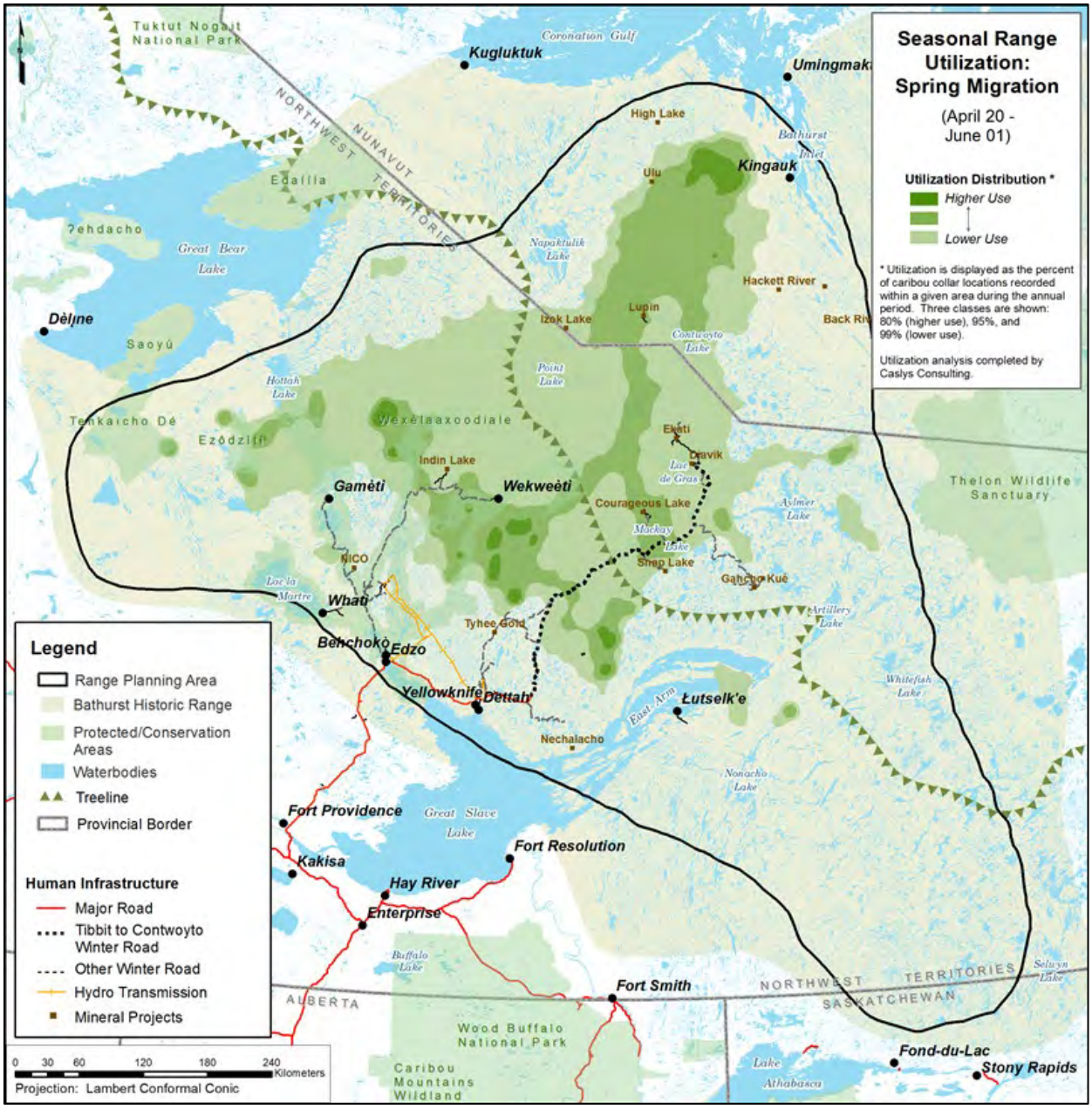

Figure A 2.- Spring migration range of the Bathurst caribou herd based on satellite telemetry data from 1996-2014. Darker colours indicate higher use by caribou. (Source: GNWT, 2019.)

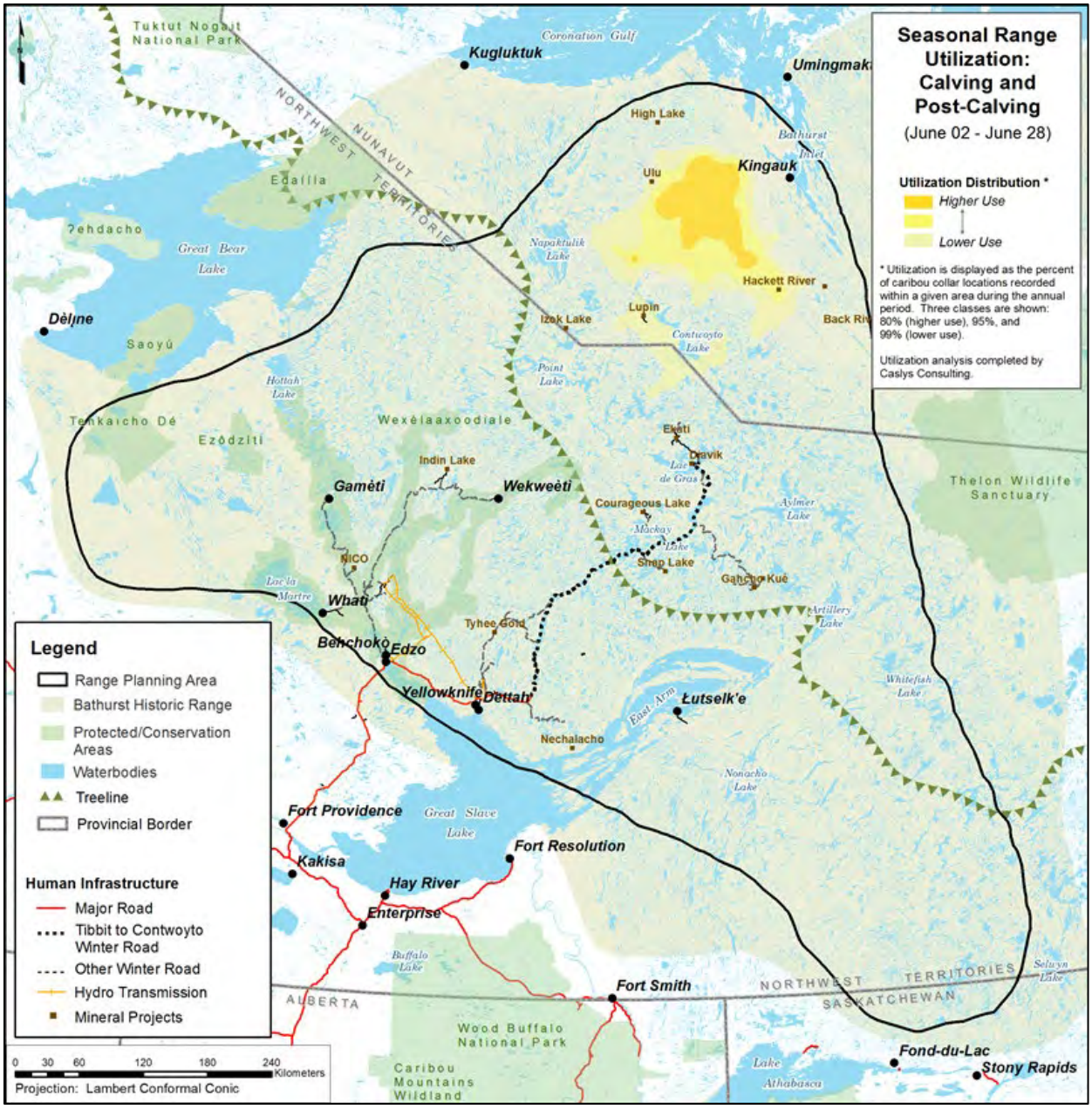

Figure A 3.- Calving and post-calving range of the Bathurst caribou herd based on satellite telemetry data from 1996-2014. Darker colours indicate higher use by caribou. (Source: GNWT, 2019.)

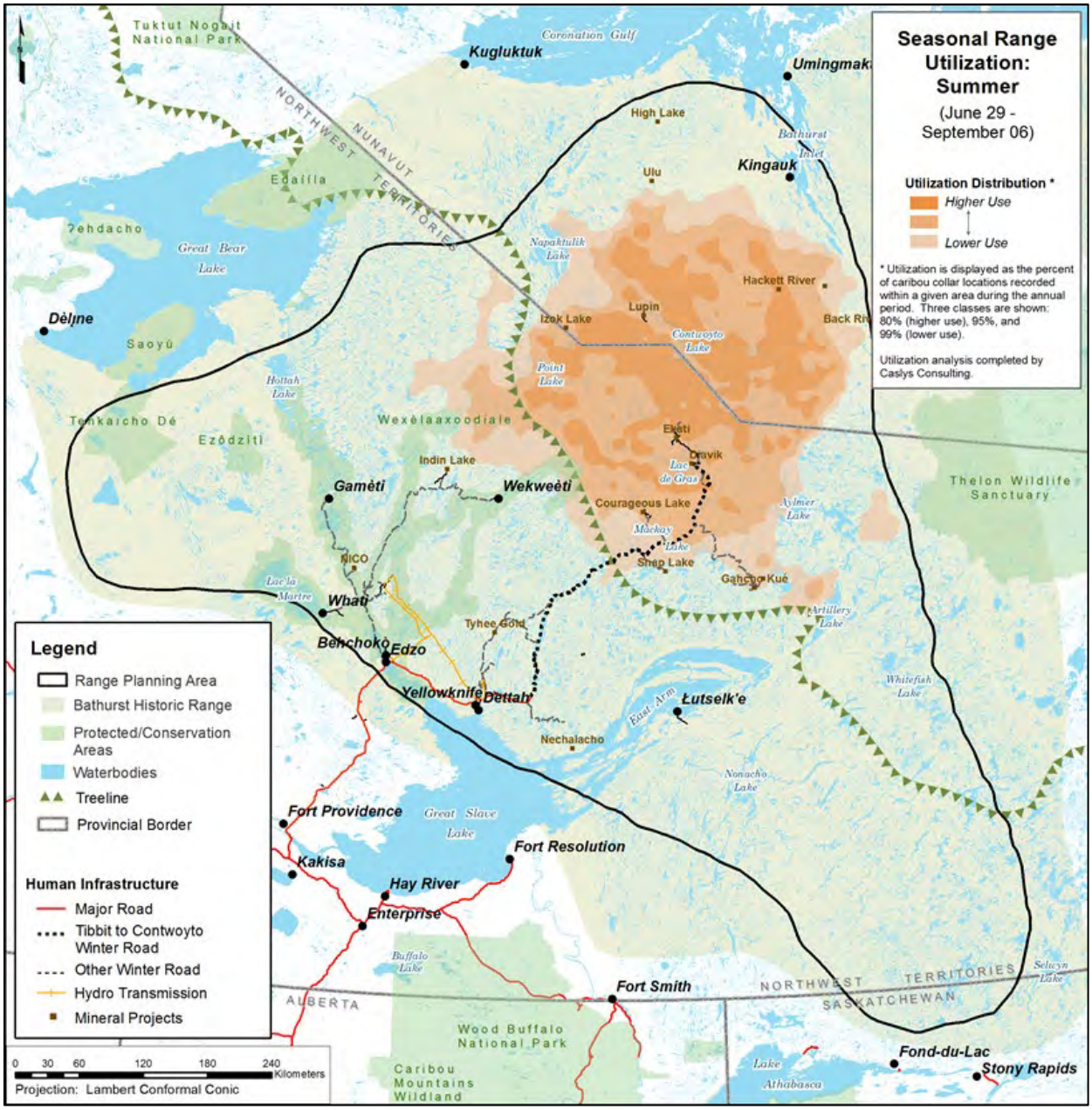

Figure A 4.- Summer range of the Bathurst caribou herd based on satellite telemetry data from 1996-2014. Darker colours indicate higher use by caribou. (Source: GNWT, 2019.)

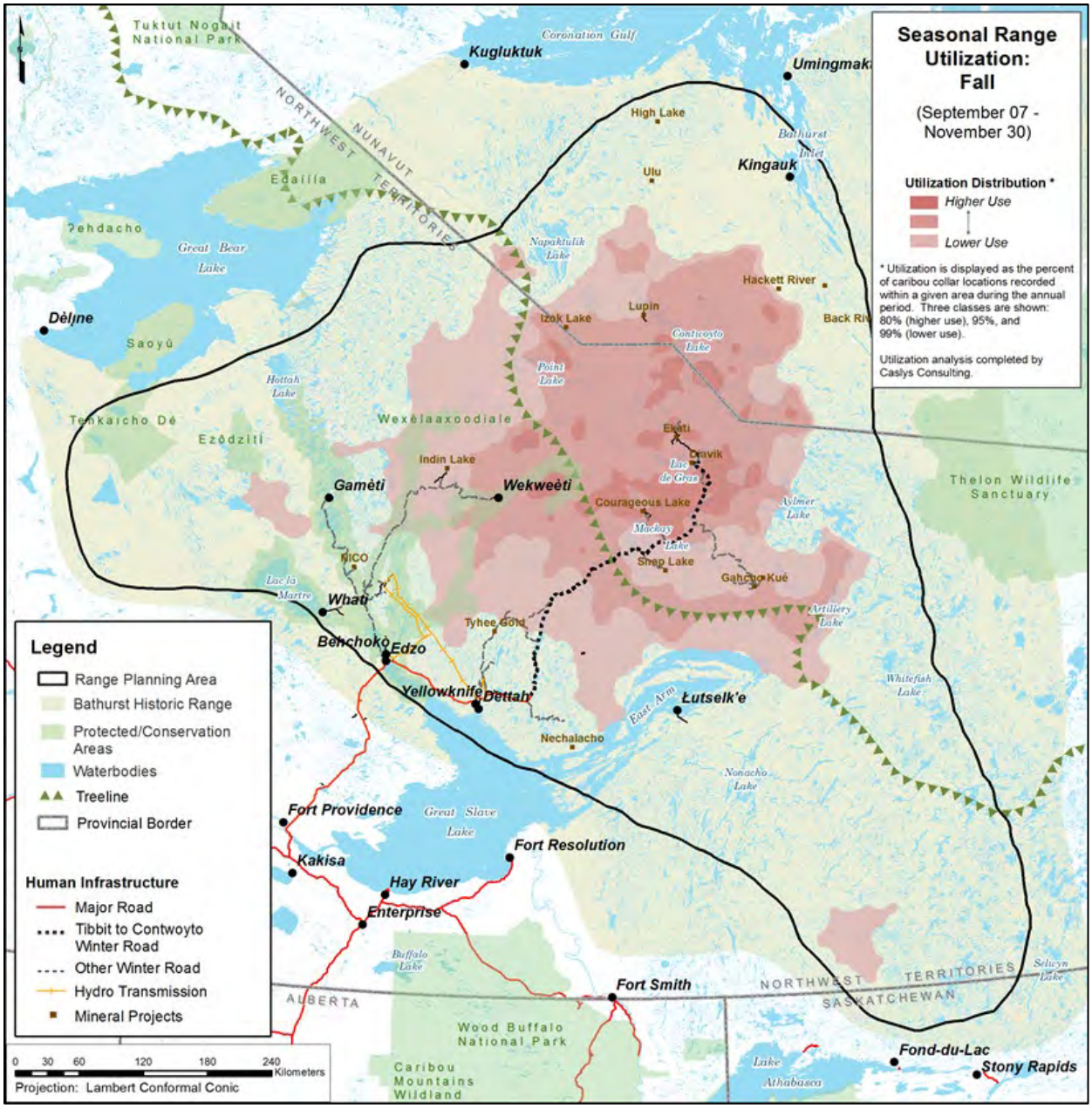

Figure A 5.- Fall range of the Bathurst caribou herd based on satellite telemetry data from 1996-2014. Darker colours indicate higher use by caribou. (Source: GNWT, 2019.)

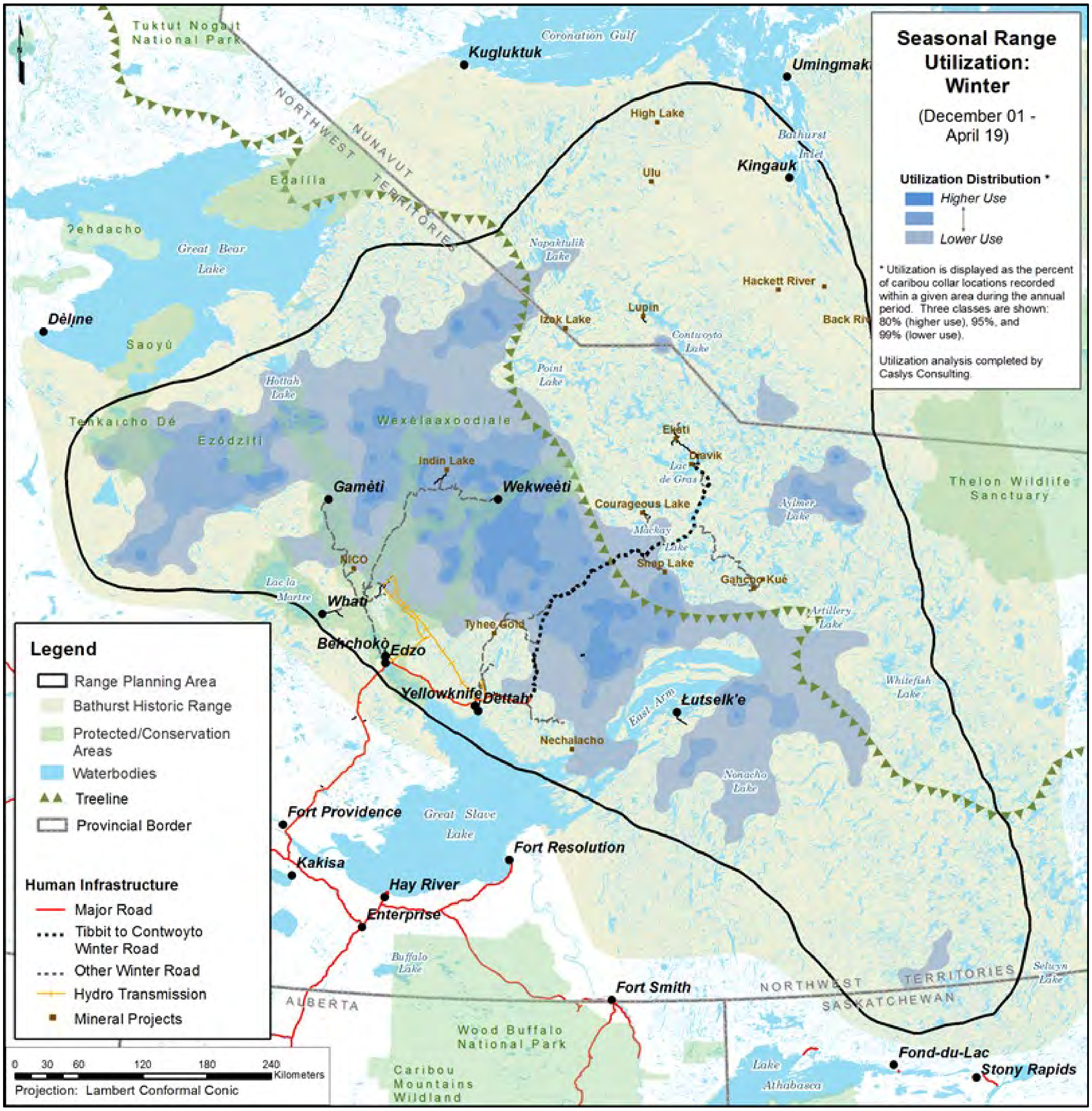

Figure A 6.- Winter range of the Bathurst caribou herd based on satellite telemetry data from 1996-2014. Darker colours indicate higher use by caribou. (Source: GNWT, 2019.)

Appendix B – Template for the Determination of Herd Status

Primary Indicators

	Critical Low	Low & Increasing	Medium & Increasing	High	Medium & Decreasing	Low & Decreasing
Population Size	Less than 30 000	Between 30 000 and 100 000	Between 100 000 and 350 000	More than 350 000	Between 100 000 and 350 000	Between 30 000 and 100 000
Population Trend	↓ or ↑	↑	↑	↓ or ↑	↓	↓
Annual Status Information						

Modifying Indicators

Monitoring Indicator	Indigenous & Community Knowledge	Scientific Information	Comments
Cow Survival			
Productivity & Pregnancy Rate			
Recruitment & Calf Survival			
Adult Composition			
Body Condition & Health			
Predator Populations			
Range & Movement Patterns			
Habitat & Environment			

Additional Information

Additional Information:

Appendix C – Recommended Management Actions (Tables)

Table C 1. – Recommended management actions for harvest, predators, habitat, research & monitoring, and communication & education.

	Critical Low	Low & Increasing	Medium & Increasing	High	Medium & Decreasing	Low & Decreasing
Objective	**Management Recommendations**					
Harvest	- Consider an annual harvest rate across the Bathurst herd range of **zero or transitioning toward zero** for all user groups - Consider **Mobile No Hunting Zone** based on Bathurst caribou collars (in NWT)	- Consider an annual harvest of **1-2% of the population** - Promote **bull harvest only** - Harvest open to Indigenous peoples	- Consider an annual harvest of **2-3% of the population** - Promote **bull harvest only** - Harvest open to Indigenous peoples, residents of NWT & NU - Consider opening harvest to outfitting/ commercial operations	- Consider an annual harvest of **3-5% of the population** - Harvest open to Indigenous peoples, residents of NWT & NU - Consider opening harvest to outfitting/ commercial operations - Consider setting a threshold above which Indigenous harvest is not limited	- Consider an annual harvest of **1-2% of the population** - Promote **bull harvest only** - Harvest open to Indigenous peoples, residents of NWT & NU	- Consider an annual harvest rate of **zero or transitioning toward zero** for all user groups
Predators	- Consider a predation management program, including monitoring & review of predation levels & impacts across jurisdictions - Consider **increased support and incentives for harvest** of caribou predators	- Consider a predation management program, including monitoring and review of predation levels & impacts across jurisdictions - Consider **increased support and incentives for harvest** of caribou predators	- Consider monitoring & review of predation levels & impacts across jurisdictions - Maintain **standard hunting and predation management regulations**	- Consider monitoring & review of predation levels & impacts across jurisdictions - Maintain **standard hunting and predation management regulations**	- Consider monitoring & review of predation levels & impacts across jurisdictions - Consider **increased support and incentives for harvest** of caribou predators	- Consider a predation management program, including monitoring & review of predation levels & impacts across jurisdictions - Consider **increased support and incentives for harvest** of caribou predators

	Critical Low	Low & Increasing	Medium & Increasing	High	Medium & Decreasing	Low & Decreasing
Objective	**Management Recommendations**					
Research & Monitoring	- **Survey herd status every 1-2 years**, or as determined at the Bathurst Caribou Annual Review - Consider implementing **Basic, Enhanced, & Intensive monitoring** actions (see Table C 2) - Minimize research activities that cause additional stress	- **Survey herd status every 2-3 years,** or as determined at the Bathurst Caribou Annual Review - Consider implementing **Basic & Enhanced monitoring** actions (see Table C 2) - Minimize research activities that cause additional stress	- **Survey herd status every 3-4 years**, or as determined at the Bathurst Caribou Annual Review - Carry out **Basic monitoring actions** (see Table C 2) - Consider additional behavioural or ecological research when herd is in good condition	- **Survey herd status every 4-5 years**, or as determined at the Bathurst Caribou Annual Review - Carry out **Basic monitoring** actions (see Table C 2) - Consider additional behavioural or ecological research when herd is in good condition	- **Survey herd status every 2-3 years**, or as determined at the Bathurst Caribou Annual Review - Consider implementing **Basic & Enhanced monitoring** actions (see Table C 2) - Consider additional research into causes of herd decline	- **Survey herd status every 1-2 years**, or as determined at the Bathurst Caribou Annual Review - Consider implementing **Basic, Enhanced, & Intensive monitoring** actions (see Table C 2) - Minimize research activities that cause additional stress - Consider additional research into causes of herd decline
Habitat & Disturbance	**Disturbance-Based Responses – Implement the BCRP Cumulative Land Disturbance Framework** (CLDF) as the overarching framework to guide land and resource decision-making, and identify habitat and range-level management responses based on the importance of habitat areas and levels of habitat disturbance (see Table C 3) **Population-Based Responses –** When herd status is critically low or in the low phases of its natural abundance cycle, **consider additional actions to further limit physical and sensory disturbance** on the Bathurst range, including: - Critical Low herd status: Consider implementing elements of the BCRP CLDF's Intensive Management Response within the Bathurst centre of habitation - Low abundance phases: Consider implementing elements of the BCRP CLDF's Enhanced Management Response within the Bathurst centre of habitation (if not already required under the Range Assessment CLDF status) - Low and Critical Low herd status: Consider applying the Mobile Core Bathurst Caribou Conservation Area (MCBCCA; the "mobile zone") to support the BCRP implementation of Mobile Caribou Conservation Measures (MCCM; the "mobile measures") and highlight the area being utilized by Bathurst caribou through all seasons of the year					

	Critical Low	Low & Increasing	Medium & Increasing	High	Medium & Decreasing	Low & Decreasing

Objective	Management Recommendation
Communication & Education	- Provide opportunities for **knowledge exchange between elders and youth** (e.g., on-the-land camps or programs) - Organize an **annual "Harvester Meeting & Elder Gathering"** to share Indigenous and scientific knowledge on the status of the Bathurst caribou, and provide an opportunity for community members to interface with governments, organizations and management authorities involved in herd management - Develop & maintain education & information sharing programs to **promote safe, respectful, and sustainable harvesting practices.** Specifically, educate hunters about safe hunting practices along winter roads. - **Develop a communications strategy** for communicating the BCMP and disseminating research, monitoring, annual harvest rates, and other updates on the Bathurst herd to the public (possible components: social media strategy, website, townhall series, etc.) - **Develop a youth education program** to educate future leaders, including opportunities for elder story-telling in schools and use of existing curricula-based materials - **Increase community understanding and appreciation of Bathurst caribou** through educational programs based on Indigenous Knowledge, community knowledge, Inuit Qaujimajatuqangit and science - Consider the coordination of **conferences or seminars to collaborate and share knowledge** amongst scientists and Indigenous Knowledge holders from outside organizations

Table C 2. – Monitoring Strategy for the Bathurst Herd.

Status of Herd	Monitoring Response
Throughout Natural Cycle of Abundance	**BASIC MONITORING ACTIONS** The minimum level of monitoring required for the Bathurst herd - recommended for implementation throughout the Bathurst herd's natural cycle of abundance. • Collaborate with the Caribou Guardianship Coalition and other community-based monitoring programs to collect information on the indicators described in s. 4.2. Develop community capacity to engage in monitoring processes • In addition to collecting information on the indicators from s. 4.2 the following should also occur throughout abundance cycles: o In times when harvest is supported, facilitate health and condition sampling and reporting on other relevant indicators by all harvesters. Obtain annual estimates of harvest levels and locations; increase accuracy and rigor of harvest monitoring o Compare herd distribution and harvest locations to identify relative harvest proportions of Bathurst and neighbouring herds o Investigate cause of death for any deaths of collared cows
Herd Declining in Size	**ENHANCED MONITORING ACTIONS** Recommended for implementation in addition to "Basic" monitoring actions when surveys and other indicators (e.g., pregnancy rates, body condition, calf survival) suggest that the herd has started to decline in size. • Monitor wolf and grizzly bear productivity / abundance • Enhanced sampling for detecting trends in the level of disease • Review alternative low-impact options for monitoring (e.g., remote cameras)
Low Point in Abundance Cycle	**INTENSIVE MONITORING ACTIONS** Recommended for implementation in addition to "Basic" and "Enhanced" monitoring actions when herd size is at the low point in the cycle and indicators suggest the herd is unlikely to increase in size without intervention. • Investigate predation rates of grizzly bears and wolves on caribou

Table C 3. – The Bathurst Caribou Range Plan Cumulative Land Disturbance Framework. The intensity of management is dependent on levels of cumulative disturbance on the landscape, not changes in caribou abundance. See the BCRP (GNWT, 2019) for further detail on the Cumulative Land Disturbance Framework.

Amount of Disturbance	Status of Range	Management Tools and Response Level
Low	**Desirable**	**BASIC MANAGEMENT RESPONSE** **Community Guardianship –** support Indigenous communities to watch (monitor) caribou and habitat conditions and support education regarding respectful harvest practice. **Habitat Conservation** – use legislation to protect the most important habitat areas: water crossings, land bridges, calving areas/post-calving. **Mobile Caribou Conservation Measures** – for land use activities that occur within the centre of habitation, implement Mobile Caribou Conservation Measures (i.e., restrict non-essential project activities when caribou are present) and associated monitoring, compliance and enforcement. **Road Planning / Management** – manage routing, timing of construction, design, and consolidation of routes across all users. **Offsetting / Compensatory Mechanisms** – counteract, or make up for, residual impacts on caribou considering: • **Habitat Offsets** – at a minimum 1:1 ratio (restoration, enhancement, preservation) (include legacy land disturbance); and/or • **Compensatory Mechanisms** – if offsets are not feasible, use financial and in-kind contributions to science and TK research and monitoring, community guardianship programs. **Wildfire and Fuels Management** – identify large patches of undisturbed winter range annually for the GNWT wildfire Values at Risk database that is used to prioritize wildfire response. **Online Map Staking** – use online staking to reduce the potential for caribou disturbance during the early phases of mineral exploration and thus increase caribou well-being through respectful practices.
Moderate	**Cautionary**	**ENHANCED MANAGEMENT RESPONSE (in addition to all recommendations in the BASIC level)** **Increased requirements for:** • **Road Planning / Management –** consider enhanced traffic management and design features. • **Offsetting / Compensatory Mechanisms –** habitat offsets at higher ratio and/or compensatory mechanisms (e.g. financial and in-kind contributions to science and TK research and monitoring, guardianship programs).
High	**High Risk**	**INTENSIVE MANAGEMENT RESPONSE** Land activities resulting in new disturbance are allowed only when active disturbances are minimized, removed or reclaimed such that total disturbance remains below the high-risk threshold.