



National Boreal Caribou
Knowledge Consortium

PROGRAM REPORT: National Boreal Caribou Knowledge Consortium, 2018-2026

Prepared by the NBCKC Secretariat
Environment and Climate Change Canada
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*Photo credit: Ryan Dickie,
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Executive Summary

The National Boreal Caribou Knowledge Consortium (hereafter the NBCKC, or the Consortium) was established by Environment and Climate Change Canada in 2018 to advance caribou recovery under the *Species at Risk Act* by improving how knowledge is shared, generated, and mobilized across sectors. Over eight years, the NBCKC brought together federal, provincial, territorial, Indigenous, academic, industry, ENGO, and consulting partners to address complex knowledge gaps that hinder boreal caribou conservation. Its success demonstrates a model for addressing complex multi-jurisdictional environmental challenges.

The Consortium's structure – comprised of a 50-seat main table, multiple technical working groups, and the Indigenous Knowledge Circle (IKC) – created a national forum for cross-sector collaboration and relationship building. The NBCKC codeveloped tools, guidance, and insights that are contributing to caribou management, policy, and stewardship.

Major Achievements

The NBCKC produced a suite of high-impact knowledge products, including the *Beyond Conservation Toolkit*, the *Boreal Caribou Monitoring Toolkit*, the *Boreal Caribou Ecological Model*, and an online national boreal caribou portal. These resources have become foundational references for practitioners, researchers, Indigenous partners, and governments across Canada.

Through collaborative engagement, the NBCKC contributed to international fora (e.g., COP15), supported multiyear Indigenous-led monitoring and research projects (30 projects funded; \$944K in Grants & Contributions), and enabled significant interdisciplinary research partnerships.

The Consortium also fostered new relationships and sector-spanning collaborations, serving as a catalyst for initiatives within Environment and Climate Change Canada, provincial/territorial governments, Indigenous organizations, academia, and industry.

Knowledge Synthesis and Insights

A major component of this report is the comprehensive knowledge synthesis compiled by the NBCKC. It consolidates published scientific literature, as well as unpublished Indigenous Knowledge, community perspectives, and expert insight from NBCKC members and others to identify:



- Emerging knowledge about the species itself, caribou habitat disturbance and restoration, the threats of Chronic Wasting Disease and climate change, and strategies for management and monitoring,
- Ongoing knowledge gaps related to habitat, monitoring, disturbance, and restoration
- Crosscutting issues such as capacity challenges, data sharing barriers, and the need for community-driven governance and monitoring approaches

The synthesis reinforces that solutions grounded in both Indigenous and western knowledge create a more complete, accurate understanding of caribou ecology and management needs.

Program Evaluation

A 2022 survey of NBCKC members found overwhelming support for the NBCKC’s mandate and impact. Key findings included:

- 96% of members agreed the NBCKC was unique and fulfilled its mandate
- 69% stated continuation beyond 2023 was “very important”
- Members’ top-valued outputs were: working group knowledge sharing, tools and guides, and the Boreal Caribou Portal

Members highlighted that strengthened Indigenous leadership, improved transparency, enhanced research coordination, and meaningful knowledge exchange are essential and impactful outcomes of the NBCKC.

Conclusion

From 2018–2026, the NBCKC created a trusted, collaborative environment that integrated diverse knowledge systems, generated influential tools and insights, supported Indigenous-led stewardship, and strengthened the evidence base for caribou recovery and policy. The Consortium built a foundation that will continue to support conservation efforts across Canada, demonstrating the power of inclusive partnership in addressing complex environmental challenges.



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1. Introduction

This report details the establishment and accomplishments of the National Boreal Caribou Knowledge Consortium (NBCKC). The NBCKC was created and coordinated by Environment and Climate Change Canada as part of its efforts to recover and conserve caribou under the *Species at Risk Act*. The report includes an overview of the purpose and structure of the NBCKC and a description of the tools and resources it produced. It also details other less tangible outcomes of the NBCKC that demonstrate the group's impact in the field of boreal caribou conservation in Canada. The second half of the report summarizes the key knowledge pieces shared and generated through the NBCKC's caribou knowledge synthesis work. These knowledge pieces reflect the research, lived experience, and expertise of the NBCKC's diverse membership and beyond, and can inform caribou conservation and stewardship moving forward.

2. Overview

2.1 Purpose

The NBCKC was established to bring together the diverse actors involved in boreal caribou conservation to share, generate, and mobilize their knowledge to greater advantage for boreal caribou and the people who depend upon them. For a wide-ranging species that occurs across the boreal region of the country, effective caribou conservation efforts require the concerted knowledge, efforts, and resources of diverse players. For example, numerous Indigenous nations have deep knowledge of caribou from living in relationship with them for countless generations. On lands that Indigenous Peoples currently or have traditionally used, agreements, treaties, and land claims affect decisions about caribou. Legal responsibilities for protecting caribou also fall to provincial and territorial governments on non-federal lands, and the federal government on federally regulated lands. A number of industrial sectors in Canada, while they have no legal authority over caribou, conduct population surveys and/or monitor caribou as part of impact assessments for development and resource extraction, as well as restore habitat that they have impacted through industrial activities. Many universities, environmental non-governmental organizations (ENGOs), and consulting firms are also involved in studies or projects related to boreal caribou conservation. The NBCKC facilitated increased interaction and knowledge-sharing among all these voices.



2.2 History

Environment and Climate Change Canada established the NBCKC in 2018 under Canada's federal action plan for boreal caribou as part of the recovery strategy for this species at risk. It ran for 8 years, coordinated by a central secretariat within Environment and Climate Change Canada's Science and Technology Branch.

2.3 Structure

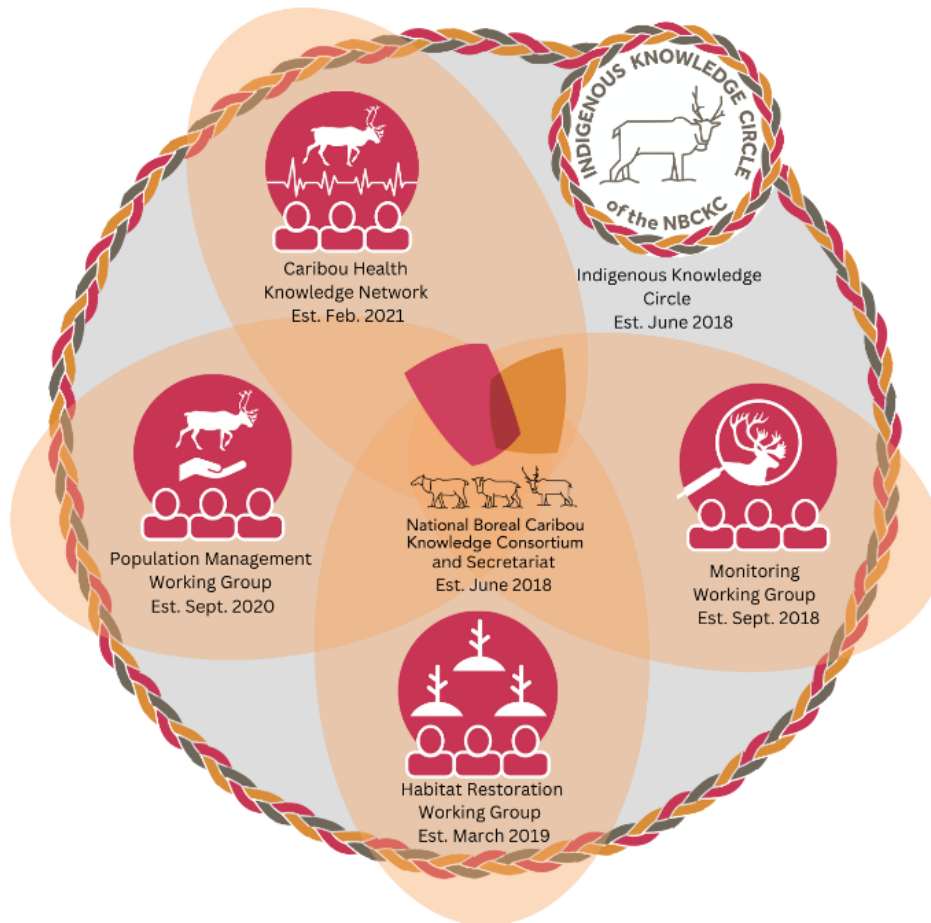


Figure 1: NBCKC Structure: Main Table, Working Groups, and Indigenous Knowledge Circle. The braid extending around the diagram indicates that Indigenous Knowledge is an overarching and foundational value of the NBCKC.

The NBCKC had a 50-seat main table of representatives from all sectors: federal government, provincial and territorial governments, Indigenous Nations and organizations, industry, academia, ENGOs, and consulting firms. The main table typically met twice a year for members to keep informed of each other's work, to drive the strategic direction of the Consortium, and to convene working groups that operated throughout the year.



Working groups provided an opportunity for more in-depth participation than the main table and allowed subject matter experts to focus on specific themes and key knowledge gaps. The NBCKC Monitoring Working Group was the first to convene, followed by the Habitat Restoration Working Group, Population Management Working Group, and Caribou Health Knowledge Network. Coordinated by a member of the Secretariat and a subject matter expert, each of the NBCKC subgroups focused on different sets of issues concerning caribou, and like the full Consortium, welcomed members from all sectors to participate. The working groups developed guidance and resources related to their subject matters to mobilize their knowledge outward to the broader caribou conservation community.

The Indigenous Knowledge Circle (IKC) of the NBCKC operated in parallel to the Consortium. Its mandate was to advocate for, and provide the NBCKC with guidance and feedback on, its relationship with Indigenous peoples and Indigenous Knowledge Systems. The IKC had members representing Indigenous Nations and organizations and their close allies, many of whom also participated in the NBCKC main table and/or subgroups. The IKC met throughout the year so members could share knowledge to support Indigenous-led caribou conservation, provide feedback to the NBCKC and its working groups, and advance the group's own projects.

3. Outcomes and Achievements

3.1 Knowledge Products and Tools

Over eight years, the NBCKC produced valuable resources to aid practitioners, managers, and decision makers in the field of boreal caribou conservation.

3.1.1 The Boreal Caribou Portal of the Canadian Conservation and Land Management Knowledge Network

The NBCKC partnered with other organizations to create the Canadian Conservation and Land Management Knowledge Network (CCLM) website. This website is a national knowledge portal that centralizes information related to land management, wetlands, and boreal caribou conservation. The NBCKC Secretariat oversees the [Boreal Caribou Portal](#) of the website, where, with input from NBCKC members, it has curated:

- An [interactive map of caribou projects](#) across the country
- [More than 1000 caribou-related resources](#)
- [More than 1500 caribou-related contacts, news items, organizations, projects, and events](#)



- A set of webpages [about the NBCKC](#), its subgroups, and their work

Since its launch in 2020, the CCLM has welcomed more than 100,000 users, with more than 52,000 visitors in 2025. The CCLM allowed the NBCKC to share its knowledge products on a platform directed at practitioners and land users.

3.1.2 The Boreal Caribou Monitoring Toolkit

The NBCKC's Monitoring Working Group created the [Boreal Caribou Monitoring Toolkit](#) which contains resources to help users who wish to learn about many aspects of monitoring boreal caribou. It includes:

- A [bilingual glossary of terms](#) commonly used in caribou monitoring.
- A [report containing perspectives compiled from experts and knowledge holders](#) pertaining to monitoring techniques, data/knowledge sharing, capacity and budget, and roles of jurisdictions.
- A [decision tree](#) to help users determine which monitoring method is most suitable for their program or project, based on what question they wish to answer through monitoring, whether they are okay with directly touching/handling caribou, and whether they want to collect information about species other than caribou at the same time.
- A pair of suitability tables that compare nine different monitoring methods based on [which population parameters the user wishes to measure](#) (i.e. distribution, abundance, demography, and health) and [the constraints of the monitoring program](#) (i.e. spatial scale, data needs, community involvement, resources, and ethical considerations).
- [Detailed write-ups and summary factsheets for each monitoring method](#) (click link and scroll down page to Subsection 3: How to monitor)
- A [bibliography of guiding resources](#) on including data or evidence from multiple knowledge systems in a monitoring program.
- A [guide for how to analyze aerial photographs](#) to classify caribou.
- A [repository of caribou health monitoring guidance](#).

3.1.3 Boreal Caribou Ecological Model

The NBCKC's Habitat Restoration Working Group developed the [Boreal Caribou Ecological Model](#) to identify the ecological pathways that restoration should address. It is composed of 14 factors and associated relationships that generate pathways leading from a variety of landscape disturbance stressors to their ultimate effects on caribou survival and recruitment. Along with the model, the group developed:



- A [technical report](#) to explain the model, including how it was developed and supporting literature
- An [infographic](#) to summarize the model
- [Boreal Caribou Habitat Restoration Practices: Application and Outcomes](#), a report that provides a review of habitat restoration actions taken to date and their outcomes
- A [factsheet](#) to summarize the Applications and Outcomes report

3.1.4 Criteria and Indicators of Boreal Caribou Habitat Restoration

The Habitat Restoration Working Group also developed national [Criteria and Indicators of Boreal Caribou Habitat Restoration](#). Based on a broad and diverse knowledge base, this framework is intended to guide groups undertaking caribou habitat restoration, recognizing that there is significant variation across regions and groups. Each identified criterion has a series of core and supplementary/regional indicators, which themselves have associated rationales, objectives, and examples of approaches that have been used in certain areas. Regional leads are encouraged to use the indicators to inform their restoration projects, and to contribute regionally appropriate approaches for relevant indicators to improve the framework over time.

3.1.5 Beyond Conservation: A Toolkit for Respectful Collaboration with Indigenous Peoples

The Indigenous Knowledge Circle of the NBCKC created the [Beyond Conservation Toolkit](#) to help advance genuine, respectful, and productive collaborations between Indigenous and non-Indigenous people and organizations working to protect and restore lands, waters, and all living beings. While they initially developed the toolkit to help those involved in caribou recovery and management, the group realized that the toolkit applied to collaborative stewardship projects more broadly. The toolkit includes:

- [10 Guiding Principles for Cross-Cultural Collaboration](#)
 - A [personal accountability pledge](#) to help non-Indigenous individuals commit to meaningful and respectful relationships with Indigenous partners in conservation and stewardship work
- Practical steps and resources on:
 - [The historical and current context of Indigenous and non-Indigenous relationships in Canada](#)
 - [How to build collaborative relationships well](#), and



- [How to work respectfully with Indigenous Knowledge Systems](#)
- [A glossary of terms](#)

The Beyond Conservation Toolkit is the most visited resource on the IPCA Knowledge Basket website where it resides and was viewed more than 17,000 times in 2024.

3.2 Other Successes

3.2.1 NBCKC at COP15

Members of the NBCKC convened a panel discussion on an international stage at the UN Biodiversity Conference, COP-15 in Montreal. Their discussion was entitled, [The National Boreal Caribou Knowledge Consortium - Meaningful collaboration for conservation](#). NBCKC members representing First Nations, Métis, industry, and government used the NBCKC as a case study to provide insights and perspectives about why meaningful collaboration across sectors is key for positive conservation outcomes.

3.2.2 Textbook Chapter

The NBCKC's Secretariat, Indigenous Knowledge Circle, and Monitoring Working Group collaborated to write a chapter for a forthcoming textbook. They used the NBCKC as a case study for successfully weaving western and Indigenous knowledge in support of conservation. The textbook, titled, "Power With: Indigenous Knowledges, Environmental Practice and the Strength of Collaboration", is intended for use by university-level environmental science students and is expected to be published in June 2026.

3.2.3 Partner Projects

As an established group of experts, the NBCKC was asked to be a partner on several research collaborations related to caribou, funded by NSERC and Genome Canada. Project proponents shared progress and updates with members of the NBCKC and welcomed feedback. Partner projects included:

- **Innovative and Inclusive Research to Conserve Wildlife and Promote Indigenous Food Security in the Western Boreal Forest**, Phil McLoughlin, University of Saskatchewan
- [Caribou Genomics: A National Non-Invasive Monitoring Approach for an Iconic and Model Species-at-Risk](#), Micheline Manseau, Environment and Climate Change Canada
- **A Comprehensive Approach to Halt Chronic Wasting Disease Transmission**, Sabine Gilch, University of Calgary
- **Alberta's Caribou Social Network**, Carly Sponarski, Natural Resources Canada



3.2.4 Financial Support of Indigenous-led Caribou Conservation Work

For several years, the NBCKC was able to support Indigenous partners through \$944,000.00 in Grants and Contributions to build capacity within communities to develop caribou research/ monitoring projects. The NBCKC funded a total of 31 Indigenous-led projects, many of them multi-year in length.

3.2.5 New Collaborations

Through their engagement in the NBCKC, many members gained knowledge and made connections that led to new projects, new project partners, or new sources of funding. Collaboration across the federal family with the NBCKC were noted as valuable. These initiatives may not have come about without the catalyst of the NBCKC. The NBCKC also had opportunities to collaborate on various initiatives by feeding into Environment and Climate Change Canada's caribou conservation processes.

- Members of Environment and Climate Change Canada's Canadian Wildlife Service, who write policy for boreal caribou, participate in the NBCKC and use the information they gain from NBCKC and working group meetings to inform their work.
- [Natural Resources Canada](#) noted the importance of collaboration of the NBCKC for complex cases like caribou management.
- Based on their roles as coordinators of the NBCKC, the NBCKC Secretariat received requests from various organizations within and outside the federal government to provide information and/or guidance on caribou conservation and working with Indigenous partners.

3.2.6 Knowledge-sharing Meetings and Presentations

The NBCKC hosted and co-hosted private community of practice meetings and public webinar series to spread information about caribou.

- The NBCKC's Indigenous Knowledge Circle hosted an [Indigenous Led Caribou Conservation Webinar Series](#) highlighting IKC members' work to protect and restore caribou and their habitat.
- Alongside the Alberta Biodiversity Monitoring Institute, the NBCKC co-hosted the [Caribou Ecology and Recovery Webinar Series](#).
- The NBCKC's Caribou Health Knowledge Network hosted internal knowledge-sharing meetings for that group, allowing members to learn about emerging research and knowledge related to Chronic Wasting Disease and other health issues.



- NBCKC Secretariat members presented about NBCKC products at the 2021 North American Caribou Workshop and the 2023 North American Caribou and Arctic Ungulate Workshop:
 - [More Than One Way to Count Caribou in Canada: Showcasing the NBCKC's Boreal Caribou Monitoring Methods Toolkit](#)
 - [Beyond Conservation: A Toolkit for Respectful Collaboration with Indigenous Peoples](#)

3.2.7 Draft Theory of Change

During annual meetings from 2020-2022, NBCKC members worked together to develop a Theory of Change. This piece of collaborative thinking mapped out the current state of caribou conservation and the future state we desire, including specific elements that the NBCKC could influence. Namely, the NBCKC could help reach the objective of a state where “Indigenous and non-Indigenous knowledge is widely accessible, regularly assessed and updated, and used by decision-makers to inform conservation and development.” Through the Theory of Change work, the NBCKC identified barriers to reaching this desired future state, developed strategies and actions to break down those barriers, and generated indicators of success for each step. The Theory of Change guided the NBCKC’s collective and individual work moving forward to ensure that it is most impactful in achieving the Consortium’s vision.

4. Caribou Knowledge Synthesis

Environment and Climate Change Canada’s Science and Technology Branch tasked the NBCKC Secretariat with gathering caribou knowledge and science to support future caribou planning and management. The objectives of this exercise were to:

- Highlight new relevant research and observations that are not currently being applied in caribou conservation or management practices, and explain their significance
- Elicit expert opinions on key strategies to make a difference to caribou populations and their habitat, and to identify what has been shown to be ineffective
- Identify important gaps in caribou knowledge

To compile the knowledge and science pieces for the synthesis, the NBCKC Secretariat reviewed all NBCKC materials (e.g. meeting minutes and reports, webinars, knowledge products, surveys, etc.) as well as key publications and invited boreal caribou experts (e.g. NBCKC members, Environment and Climate Change Canada and Natural Resources



Canada caribou researchers and conservation specialists, and members of other national boreal caribou committees and working groups) to contribute knowledge pieces and gaps.

The NBCKC Secretariat organized knowledge pieces into categories similar to those contained in the federal recovery strategy and the synthesis will be shared with boreal caribou policymakers within Environment and Climate Change Canada's Canadian Wildlife Service. Some insights are supported by evidence from peer-reviewed literature, while others reflect expert knowledge shared through meetings, presentations, and non-peer-reviewed reports. Examples of some of the key insights are included below.

These contributions are provided for information-sharing purposes and should not be interpreted as official recommendations of Environment and Climate Change Canada (ECCC).

4.1 Published Knowledge Pieces and Insights

The following are examples of insights from published literature that were contributed to the knowledge synthesis.

4.1.1 Species information

- Caribou fitness varies with landscape characteristics and population density. Males have more offspring in high-density areas, while females have fewer, and offspring disperse shorter distances when parents occupy denser habitats. High-density areas reflect good-quality caribou habitat, but decreased dispersal rates and lower female recruitment rates suggest that remnant habitat patches across the landscape may create population sinks (McFarlane et al. 2022).
- Population genetic structure results often do not align with either past or current caribou classification schemes, meaning that we may not be managing populations in a biologically meaningful way (Taylor et al. 2024; Michalak, 2023; Klutsch et al. 2016).
- There is evidence of genetic erosion along the southern edge of the boreal caribou range. High inbreeding levels are seen in Lake Superior caribou range where there is a lack of connectivity, habitat fragmentation, and demographic declines (Taylor et al. 2024; Fournier et al. 2024).
- Unlike other ungulates, caribou are at their lowest body condition in early summer, likely resulting from pregnancy/lactation. As nutrition could play a role in mortality risk, findings suggest a need to focus on availability of forage resources/habitat in late spring through early autumn (Cook et al 2021).



- The common assumption that caribou are lichen specialists can be simplistic and could misinform management decisions that fail to protect locally important foraging areas (Webber et al. 2022).

4.1.2 Critical Habitat

- The 65% undisturbed critical habitat designation in Canada's boreal caribou recovery strategy is generally a reasonable proxy for achieving self-sustaining caribou populations. Some populations may be more or less vulnerable, such as landscapes dominated by fire, or those with particularly low or high anthropogenic disturbance (Johnson et al. 2020). Where demographic parameters (adult female survival and/or sex ratio) are suboptimal, 65% may be insufficient (Rudolph et al 2017).
- Hotspots of high conservation value have been identified across boreal caribou habitat (Johnson et al. 2022). Strategic protection of:
 - o critical habitat in the NWT, northern SK and MB could protect areas of high carbon as well as species richness hotspots
 - o Hudson Bay Lowlands' peatland habitat could protect below ground carbon stocks and important watersheds/hotspots for native fish species
 - o large areas for boreal caribou in south-central QC and LB could bolster the representation of climate refugia in Canada's protected and conserved areas network, while enhancing the protection of hotspots for unique and/or at-risk species, and areas with higher taxonomic diversity.

4.1.3 Disturbance

- A top-ranked national landscape model for calf recruitment suggests that the negative effects of fire are 3 to 4 times smaller than are anthropogenic disturbances on caribou recruitment (Johnson et al. 2020).
 - o Despite this, climate change is anticipated to have increasingly deleterious effects on caribou populations. The adaptation of the forest sector will be crucial to mitigate these impacts in some areas. A broad range of measures such as reducing harvest levels, and halting harvest activities in highly suitable caribou habitats, should be explored to help maintain high-quality habitat even under the most intense climate change scenarios, and to help strike a balance among social, ecological, and economic values (Boulanger et al. 2023).



- The maximum density of linear features in caribou habitat considered acceptable is quite low (~ 0.6 - 1.8 km /km² have been estimated for different contexts- DeMars et al. 2025; Deh Cho Land Use Planning Committee, 2024; Prov. of BC & FNFN, 2025).

4.2 Insights Gathered from Lived Experience and Expert Contributions

Over the history of the Consortium, and through the caribou knowledge synthesis work described above, NBCKC members and outside contributors also shared many perspectives about boreal caribou conservation. They are valuable insights derived from the knowledge, experience, and perspectives of experts including Indigenous community members, scientific researchers, and practitioners in the field, among others:

4.2.1 Approaches: Indigenous leadership and collaborative approaches

- Indigenous Knowledge needs to stand on its own - when Indigenous and western science are “integrated”, Indigenous Knowledge too often loses out.
- More locally developed management that supports community and Indigenous leadership and decision-making is needed, not engagement that does not result in Indigenous-influenced policy or action. Indigenous Protected and Conserved Areas (IPCAs), Indigenous Guardians, and Wildlife Management Boards are positive examples.
- Financial resource limitations and excessive application and reporting requirements for obtaining government funds are major challenges to caribou monitoring.
- Until the issue of unequal capacity (i.e. lack of capacity for Indigenous governments/ communities/ organizations’ staff time and fiscal support to contribute to caribou conservation) is addressed, the full expression of Indigenous rights and leadership in caribou research and monitoring is bound to be limited, and caribou conservation as a whole will be less effective.
- The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) Act should influence how federal caribou recovery work is undertaken. We need to do better at valuing and including Indigenous Knowledge in our work and UNDRIP provides a roadmap to advance lasting reconciliation.
- Willingness to share monitoring information is conditional. It is important to balance the potential recovery benefits of sharing data publicly with risks to conservation and the need to respect cultural sensitivity.



- Extirpation (“running out of boreal caribou to monitor”), and funding are the primary concerns for future monitoring, as well as improving the use of high-quality data collected by diverse groups and building strong partnerships based on reciprocity where sharing and receiving information go hand-in-hand.

4.2.2 Approaches: Management and monitoring

- Initiatives to update range boundaries need to balance the advantages of better alignment with biological populations, and the risks associated with changing the way that ranges are organized and studied, potentially leading to a decrease in our ability to recognize and monitor longer term trends.
- We know less about anticipating problems for caribou on land that is not significantly disturbed, than we do for caribou on highly disturbed landscapes.
- Some Indigenous members suggest that non-invasive forms of monitoring that have the least impact on caribou should be prioritized (e.g. drones).
- Regulations imposed from the top down are not as effective as community-based policies- e.g. total harvest ban imposed by the government in Labrador led to illegal harvesting and loss of cultural practices.

4.2.3 Caribou Harvest

- Overharvesting caribou, driven by food insecurity and poverty, is a significant factor in caribou conservation in some communities, who often lack capacity to enforce restrictions. Curbing overharvesting requires more funds and capacity, and a need for a broad, multipronged approach to engagement (including addressing poverty and food insecurity).

4.2.4 Climate Change

- Increases in frequency and severity of fires in northern ranges, due to climate change, will lead to more forage for moose. Moose range is expanding northward in large part because food availability has increased, and spring snow is reduced. While many northern ranges appear less vulnerable to disturbance-mediated apparent competition due to lower primary productivity, this dynamic could change with a changing climate.
- Climate change will impact the availability of peat permafrost, a landform that caribou use frequently throughout seasons.



4.2.5 Restoration

- There's a current focus on restoring individual features; many see a need to develop policies to restore larger, more meaningful habitat. Some NBCKC members advise that our focus can't be limited to caribou; to effectively protect and restore the herd, we need to heal and restore the land, the waters, all the plants and animals, and cultural traditions associated with caribou. Others feel that given the urgency of the need for habitat restoration, a focused approach is more efficient and could lead to more areas ultimately restored.
- Restoration should be focused on mediating mechanisms of decline; our current ability to predict habitat recovery is limited.
- Roads are often the biggest challenge for restoration, one that we know little about, and one that is often overlooked.
- While some experts suggest deprioritizing restoration of areas with a higher chance of burning due to climate change, others have observed that unrestored seismic lines do not recover well after burning, but restoring lines prior to fire improves post-fire recovery.
- Remote sensing can do a comparable monitoring job to boots-on-the-ground when indicators being monitored are tree growth or density.

4.3 Points of Convergence: Western and Indigenous Knowledges

When we bring knowledge together from different places- communities, Indigenous Knowledges, research, science, policy, lived experience- we can better see the areas of connection, alignment, and amplification. Our confidence increases in insights that are derived from multiple experiences and perspectives. Some insights in the knowledge synthesis that aligned among knowledge systems include:

- Boreal caribou ranges, as currently defined by the provinces and territories, do not necessarily reflect their biological or ecological reality. This has been observed by Indigenous Peoples on the ground, and by genetic studies. The implication is that current management boundaries may not reflect biological realities.
- Areas of boreal caribou habitat that are naturally regenerating will need protection to support recovery goals.



- Using Indigenous and local knowledge alongside western science to map spatial patterns of caribou land and water use provides a stronger picture of caribou habitat features at multiple scales than using either knowledge base alone.
- Chronic Wasting Disease may be a looming threat to boreal caribou. Community involvement in disease monitoring and response is essential for effectively addressing this challenge.
 - Prion protein gene (*PRNP*) variation can show degrees of genetic resilience, associated with the disease history across the landscape (Bubac et al. 2025).
 - Better understanding how ecological conditions and genetic variation shape disease spread could be valuable. For instance, a recent collaboration among academic, Indigenous, and government partners found that deer living along the boreal fringe—where wolf predation is high— appear to show significantly greater genetic resistance to CWD than deer in areas with lower wolf mortality (University of Saskatchewan, 2025). This raises compelling questions about how wolf control measures might influence CWD dynamics in regions where wolves, deer, and caribou coexist.
 - The threat of climate change on boreal caribou population recovery and conservation is increasing and goes beyond the threat of increased forest fires or threats mediated by predation. Indigenous community members shared observations of freeze and thaw cycles challenging caribou’s ability to access food, and unseasonable temperatures impacting their migration over ice and water. Scientific studies have shown relationships between temperature, seasonal variations, and calf recruitment and adult female survival in subsequent years. Bringing together the fine-scale, place-based observations from Indigenous communities with the broader patterns detected by western scientific monitoring provides a more comprehensive picture of climate impacts on boreal caribou population conservation.

5. Program Evaluation

In 2022, Environment and Climate Change Canada’s Audit and Evaluation Branch conducted a survey with NBCKC members. Results from the 66 respondents representing all sectors participating in the NBCKC indicated that the majority of them felt positively about the NBCKC. Most respondents agreed that the NBCKC was meeting its mandate and that it was having a positive impact on:



- Enabling Indigenous leadership
- Being inclusive of Indigenous Knowledge Systems
- Improving transparency across sectors
- Rapidly relaying lessons learned
- Coordinating conservation efforts
- Guiding research programs, and
- Informing policy

Sixty-nine percent of the respondents stated that it was very important that the NBCKC continues beyond 2023.

Respondents who saw the renewal of the NBCKC as very important overwhelmingly pointed towards the knowledge sharing and collaboration aspect as their key reasons.

The majority of respondents (96%) agreed that the NBCKC was unique and fulfilled its mandate.

Respondents identified the consortium's most valuable outputs as:

- Working group knowledge sharing presentations (72%)
- Knowledge products (tools, guides, etc.) (71%)
- The boreal caribou knowledge portal (68%)
- Knowledge sharing in a working group or knowledge circle (68%)

6. Conclusion

The 2018 federal action plan for boreal caribou included the following recovery measure under the subject of “Knowledge to support recovery”:

Engage with Wildlife Management Boards, Indigenous peoples, other federal departments, provincial and territorial governments, academics, industry and environmental non-governmental organizations to design and **establish a National Boreal Caribou Knowledge Consortium to share lessons learned, and pool capacity and capabilities to address key knowledge gaps.**

From 2018-2026, the NBCKC accomplished what it set out to. It increased information exchange among diverse actors in the realm of caribou conservation and produced valuable resources to strengthen caribou conservation and recovery. The NBCKC fostered connections among sectors and supported partnerships and projects that filled knowledge gaps and advanced collaborative solutions. By creating a respectful community based on



collaboration, it built a foundation for members to strengthen and connect their work together for caribou, their habitats, and the people who depend on them. It has created a successful model to continue conservation efforts across Canada as it demonstrated the power of inclusive partnership in addressing complex environmental challenges.



7. References and Supporting Documents

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