



Beverly and Qamanirjuaq
Caribou Management Board



**Beverly and Qamanirjuaq
Caribou Management Plan 2013-2022**

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2013-2022

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Caribou Management Board

Produced by the Beverly and Qamanirjuaq Caribou Management Board (BQCMB)

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Beverly and Qamanirjuaq Caribou Management Board, Stonewall MB.

*This detailed Management Plan and
plain language Summary and Overview documents
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Summary

The Beverly and Qamanirjuaq barren-ground caribou (*Rangifer tarandus groenlandicus*) are two major herds of migratory caribou in northern Canada. Named after the lakes where they gave birth to their calves, the historic ranges of these herds include portions of two territories (Nunavut and Northwest Territories, NWT) and three provinces (Saskatchewan, Manitoba and Alberta). The two herds and their habitats are managed by the governments of four of these jurisdictions (Nunavut, NWT, Saskatchewan and Manitoba), as well as by the federal government.

Inuit, Dene, Cree and Métis people from about 20 communities depend on the Beverly and Qamanirjuaq caribou for food, clothing and handicrafts. The true value of caribou for these Aboriginal peoples is reflected in the strong traditional, cultural and spiritual relationship that exists between the people and these animals. This relationship is an essential part of the traditional harvester's identity which has been passed down through many generations. Harvesting caribou is not simply a means to provide food and income. However, the economic value of the harvest from the Beverly and Qamanirjuaq herds has been estimated to be about \$20 million annually based on harvest estimates for 2005-2006.

The Beverly and Qamanirjuaq caribou herds can be negatively affected by various factors including:

- Loss or reduction of habitat caused by climate change, wild fires and environmental contamination
- Reduced quality, quantity and availability of habitat and disturbance associated with commercial land use activities, including mineral exploration, mining development, and access roads.
- Disturbance from low-flying aircraft
- Increased harvest and wastage of caribou
- Disease, parasites and predation

Further research and monitoring is needed to determine how the individual and collective impacts from these factors, which will increase and accumulate over time across the caribou ranges, may harm the caribou herds. The cumulative effects of these factors pose a potential threat to the future of the herds.

The Beverly and Qamanirjuaq Caribou Management Board (BQCMB) is a multi-jurisdictional co-management advisory board whose 13 members all live and work in the north and represent communities, Aboriginal organizations and governments. The BQCMB provides a single forum for discussion and resolution of issues that may affect the caribou, their habitat, and caribou harvesters. The BQCMB has developed 12 guiding principles for caribou conservation that are to be followed when reviewing and implementing this management plan and when developing recommendations.

This management plan for the Beverly and Qamanirjuaq caribou herds outlines nine key goals for 2013-2022:

1. To conserve the Beverly and Qamanirjuaq caribou herds in a cooperative manner
2. To strengthen support for caribou conservation
3. To increase knowledge of barren-ground caribou and the caribou-human system

4. To monitor caribou population status over time
5. To monitor the harvest of caribou
6. To conserve the Beverly and Qamanirjuaq caribou herds within their natural range of abundance
7. To ensure adequate amounts of high quality habitat
8. To strive for the sustainable [wise] use of caribou
9. To influence commercial land use in a way that protects Beverly and Qamanirjuaq caribou and their habitats

Several objectives for each goal and numerous specific actions for implementing these objectives are also provided.

Much has changed since the last management plan was developed in the early 2000s, and challenges and concerns about the future of the caribou herds have continued to increase. Therefore the Plan embraces contemporary conservation and management knowledge, techniques and methods available for addressing current conservation challenges. The Plan has also incorporated input from caribou range communities on their conservation and management priorities and recommendations for action.

A new approach has been developed by the Board to identify priorities for conservation and management of each herd that change according to the herd's vulnerability level. The Board will conduct assessments of the vulnerability level of each herd by incorporating traditional and local knowledge held by caribou harvesters as well as scientific knowledge held by biologists and wildlife managers. The results of each herd's annual vulnerability assessment will be used as the basis for developing BQCMB programs and for making recommendations to governments, communities and others about activities such as:

- specific types and intensities of monitoring required, with greater intensity and frequency required for some types of monitoring when herds are at higher vulnerability levels;
- harvest management options, with more conservative harvest options for herds with higher vulnerability and more liberal harvest options for herds with lower vulnerability;
- management of commercial land use activities, with a primary focus on maintaining availability of important habitats so long-term habitat needs are met, where stronger limitations will be required for some types of land use activities when herds are at higher vulnerability;
- communication and conservation education activities, with some activities ongoing at all times but application of a greater intensity, number and variety of products when one or both caribou herds are highly vulnerable.

Successful implementation of this management plan is dependent on the continued commitment and partnership of Aboriginal organizations, governments, communities, scientists, managers, industry, non-government organizations and the general public. By incorporating both science and traditional knowledge, better conservation measures can be developed to support the Beverly and Qamanirjuaq caribou herds.

Dedication

The Beverly and Qamanirjuaq Caribou Management Plan 2013-2022
is dedicated in memory of:

Jerome Denechezhe (1953-2013)
of Lac Brochet, Manitoba

Billy Shott (1929-2014)
of Uranium City, Saskatchewan

and

David Vetra (1963-2014)
of Arviat, Nunavut

These men worked for many years for caribou conservation in the spirit of co-management with the Beverly and Qamanirjuaq Caribou Management Board (BQCMB), their communities and their governments. They were dedicated to the BQCMB's shared vision of a future with abundant, healthy caribou herds supporting traditional subsistence harvesters across the caribou ranges.

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Preface

This management plan (the Plan) was developed by the Beverly and Qamanirjuaq Caribou Management Board (BQCMB). The Plan is built on a base of knowledge and management approaches established by current and previous board members and staff over the first 30 years of the Board's tenure, which has been updated using contemporary conservation and management knowledge and methods to address current conservation challenges. The Plan has benefited from the knowledge and experience of many people.

Several drafts of this Plan were created by a working group between February 2012 and November 2013. The working group reported progress and received direction from the BQCMB on key elements of those drafts at each regular spring and fall BQCMB meeting during this period. The content of the detailed technical version of the Plan (this document) was approved at the November 2013 meeting and work on a plain language version of the Plan was initiated in fall 2013. Appendix 1 provides more details about how the Plan was developed and includes information about working group members, meeting facilitators and others who contributed ideas and guided creation of this Plan.

Supplemental funding provided to the BQCMB by the NWT Department of Environment and Natural Resources in 2011/12–2014/15 supported management plan work, paying for: meeting costs; contracts for project coordination, writing/editing, illustrations, design and mapping; and printing costs. The governments of Manitoba, Saskatchewan, Nunavut and NWT each provided additional support for board member's travel costs for working group meetings.

1 INTRODUCTION¹

1.1 About the Board

The Beverly and Qamanirjuaq Caribou Management Board (BQCMB) is a co-management board established to safeguard two herds of barren-ground caribou (*Rangifer tarandus groenlandicus*) - the Beverly and Qamanirjuaq herds - for present and future generations. Created in 1982 in response to perceived declines in the caribou herds, the BQCMB was the first caribou co-management board in North America. The Board provided a way to deal with the multi-jurisdictional nature of the caribou herds and the multiple cultures of the people who depend on them while including Aboriginal peoples in decision-making processes. The Board's strength results primarily from the cooperative relationships built over more than 30 years among individuals representing various Aboriginal groups, communities, and government agencies, and their willingness to work together toward a common goal.

The Board is now in its fourth mandate, which was formalized through the *Beverly and Qamanirjuaq Barren Ground Caribou Management Agreement for 2012-2022* (Appendix 3) among the governments of Canada, Manitoba, Northwest Territories (NWT), Nunavut and Saskatchewan. This 10-year agreement outlines the Board's mandate, responsibilities, membership, operational rules and procedures, and the financial obligations of government parties.

The BQCMB is based on co-operation among communities and governments and among Inuit, Dene, Cree, Metis, and non-Aboriginal peoples with an interest in the Beverly and Qamanirjuaq herds. The Board consists of thirteen board members, including eight community and five government members (Fig. 1). Two community members and one government member are appointed by each territorial and provincial government. Aboriginal Affairs and Northern Development Canada (Nunavut region) represents the federal government. All BQCMB members live and work in the North. As of 2013 the BQCMB contracts a part-time Executive Director and other professionals with specific areas of expertise as needed.

The mission of the BQCMB:

To ensure the long-term conservation of the Beverly and Qamanirjuaq caribou herds for Aboriginal communities who wish to maintain a lifestyle that includes the use of caribou, as well as for all Canadians and people of other nations.

¹ Explanation is provided in Appendix 2 for terms and abbreviations used in the Plan.

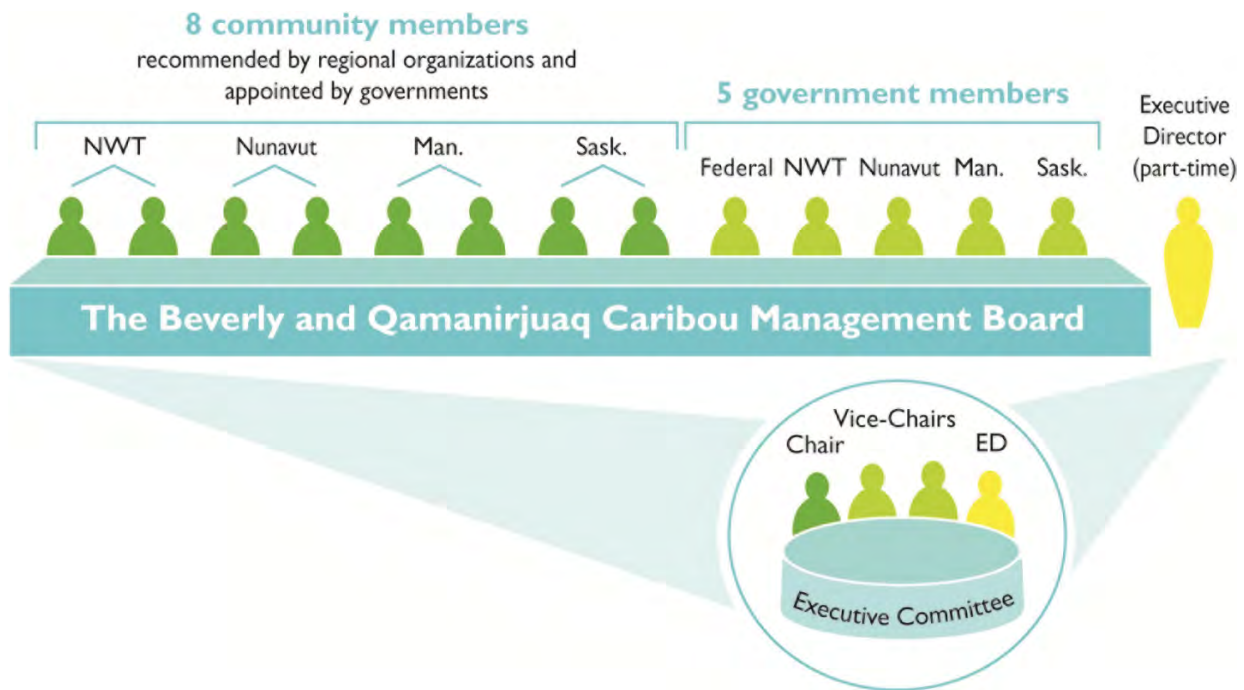


Figure 1. Organizational structure of the Beverly and Qamanirjuaq Caribou Management Board.

Since 1982, when the first *Beverly and Qamanirjuaq Barren Ground Caribou Management Agreement* was approved, the Board has emphasized local community input. Residents of communities across the caribou ranges have been involved in aerial surveys, caribou monitoring, interviews, mapping, sampling and reporting on caribou matters such as harvest, movements, distribution, health and relative abundance. For each management plan produced by the BQCMB since the initial plan, goals have included increasing involvement of caribou harvesters from communities across the caribou ranges as full participants in the management of the Beverly and Qamanirjuaq herds, and using knowledge held by traditional harvesters and other community members in decision-making for caribou management.

The mandate for caribou management remains with governments. Therefore the Board's primary responsibility is to make recommendations to governments and communities for the conservation and management of the caribou herds. Other key responsibilities are outlined in the Caribou Management Agreement (Appendix 3). The Board will also continue to urge governments to maintain an adequate level of funding for caribou management programs in keeping with their responsibilities.

1.2 The Management Plan

The purpose of this management plan (the Plan) is to outline the ways in which the BQCMB will work co-operatively with governments, communities and others to safeguard the Beverly and Qamanirjuaq barren-ground caribou herds, including what actions will be taken to address caribou conservation issues. The Plan applies to the Beverly and Qamanirjuaq barren-ground caribou herds, their habitats and caribou harvesters from Aboriginal and non-aboriginal cultures in two territories (Nunavut and Northwest Territories) and two provinces (Saskatchewan and Manitoba).

The BQCMB will use the Plan as a guide to make recommendations to communities, governments, regulatory boards, land use planning organizations, industry and other relevant parties whose actions or decisions may affect conservation of the caribou herds or availability of caribou for harvest, presently and in the future.

The Plan is intended to provide ongoing guidance for the duration of the Board's current 10-year term (to 2022), but also to be dynamic and adaptable to changing conditions. Input from board members and others will be received throughout normal board operations during meetings and via correspondence between meetings. Priority actions for certain time periods will be identified by the Board annually. This will include a "reality check" on specific actions, as well as their associated timelines and budgets, which will be adjusted as needed. The complete Plan will be reviewed by the Board mid-way through its current term (2016-2017), and again in the final year of the term (2021-2022), to identify any major revisions that need to be made and new issues that need to be addressed.

This Plan reflects the judgment and experience of the Board on challenges, issues and opportunities for caribou conservation and management. Although restrictions on funding, staffing or agency priorities have not been identified, these issues have been taken into account by the Board while developing what it believes are realistic objectives and actions. Appendix 1 describes how this Plan was developed and its many contributors.

The Board will use the Plan to guide its decisions for engaging in various tasks related to its goals and objectives, including:

- developing ways to use all forms of knowledge (local, traditional and scientific knowledge);
- communication to enhance the profile of the BQCMB and awareness of caribou issues;
- education for youth and others about conservation issues (such as wastage) and the importance of caribou to Aboriginal cultures;
- increasing knowledge of caribou ecology;
- scientific and community-based monitoring of caribou population status and trend ;
- monitoring of range quality, quantity and availability;
- harvest monitoring;
- monitoring and assessing the impacts of commercial land use and cumulative effects on caribou and habitats; and
- participation in environmental reviews, land use planning processes and reviews of plans, strategies and processes relevant to conservation of caribou and habitat across the Beverly and Qamanirjuaq caribou ranges.

It is the view of the BQCMB that government agencies with mandates for caribou and habitat management should use this Plan as the management plan for the Beverly and Qamanirjuaq caribou herds and their habitats and for identifying monitoring and research activities that are required to provide information for management. The Board also encourages non-government parties, including communities, environmental organizations and industry, to use the Plan as a reference. All groups and individuals whose actions or decisions may affect the caribou herds, caribou habitats or availability of caribou for harvest are urged to make their best efforts to support the Plan's goals and objectives (Sec. 3).

2 BACKGROUND

2.1 Current Context for Co-management of Beverly and Qamanirjuaq Caribou

The annual ranges of the Beverly and Qamanirjuaq barren-ground caribou herds have historically extended from the boreal forest in northern Saskatchewan, Manitoba and Alberta, north to the taiga, lakes and tundra of eastern NWT and mainland Nunavut (Fig. 2)². Thus the caribou ranges include portions of two Canadian territories and three provinces. The two herds and their habitats are subject to management by the governments of four of these jurisdictions, as well as by the federal government. The Nunavut Wildlife Management Board also has a role in some aspects of caribou management, as it is the main instrument of wildlife management in Nunavut. Appendix 5 provides more details about agencies with mandates for management of Beverly and Qamanirjuaq caribou and habitats.

Governments and communities on the Beverly and Qamanirjuaq caribou ranges are dealing with profound and rapid political, economic, and social changes. These changes are influenced by industrial development, land claims, establishment of self-government and transfer of federal authority to territorial governments. Economic development of the North is a major priority for governments on the Beverly and Qamanirjuaq caribou ranges. However, there are different opinions about the kind and pace of economic development that should occur and how much environmental protection is required. These different opinions about development can result in long-standing disagreements between governments and communities, regional Aboriginal organizations and other northerners. Caribou conservation issues are often a key element of the concerns raised by communities and regional organizations when considering economic development.

Challenges for Caribou Conservation and Management

Barren-ground caribou herds in Canada are known to have fluctuated in numbers over time, resulting in periods of caribou abundance and other periods with low numbers of caribou. This knowledge of barren-ground caribou population cycles is based on Aboriginal traditional knowledge and, since the 1950s and 1960s, on aerial surveys.

The BQCMB faces ongoing challenges due to not having enough information about the caribou herds, their habitats, and harvest levels on which to base recommendations for conservation and management. Information gaps have resulted from a lack of monitoring of the herds and their habitats, especially for the Beverly herd (see Appendix 6), and a lack of harvest data, especially for estimating Aboriginal subsistence harvest and allocating harvest to specific herds. Adequate plans and resources for monitoring various population parameters such as the size and condition of the caribou herds, harvest levels and impacts of environmental factors on caribou are crucial for clarifying the status of the herds and determining what conservation or management actions are needed to maintain healthy herds that will continue to provide for the subsistence needs of traditional caribou harvesters.

² Annual range maps do not show the seasonal distribution of caribou. Some seasonal range maps are provided in Appendix 4, and spatial analysis of the movements of collared Beverly and Qamanirjuaq caribou cows during other time periods are currently under development. (Adult female caribou are typically referred to as “caribou cows”.)

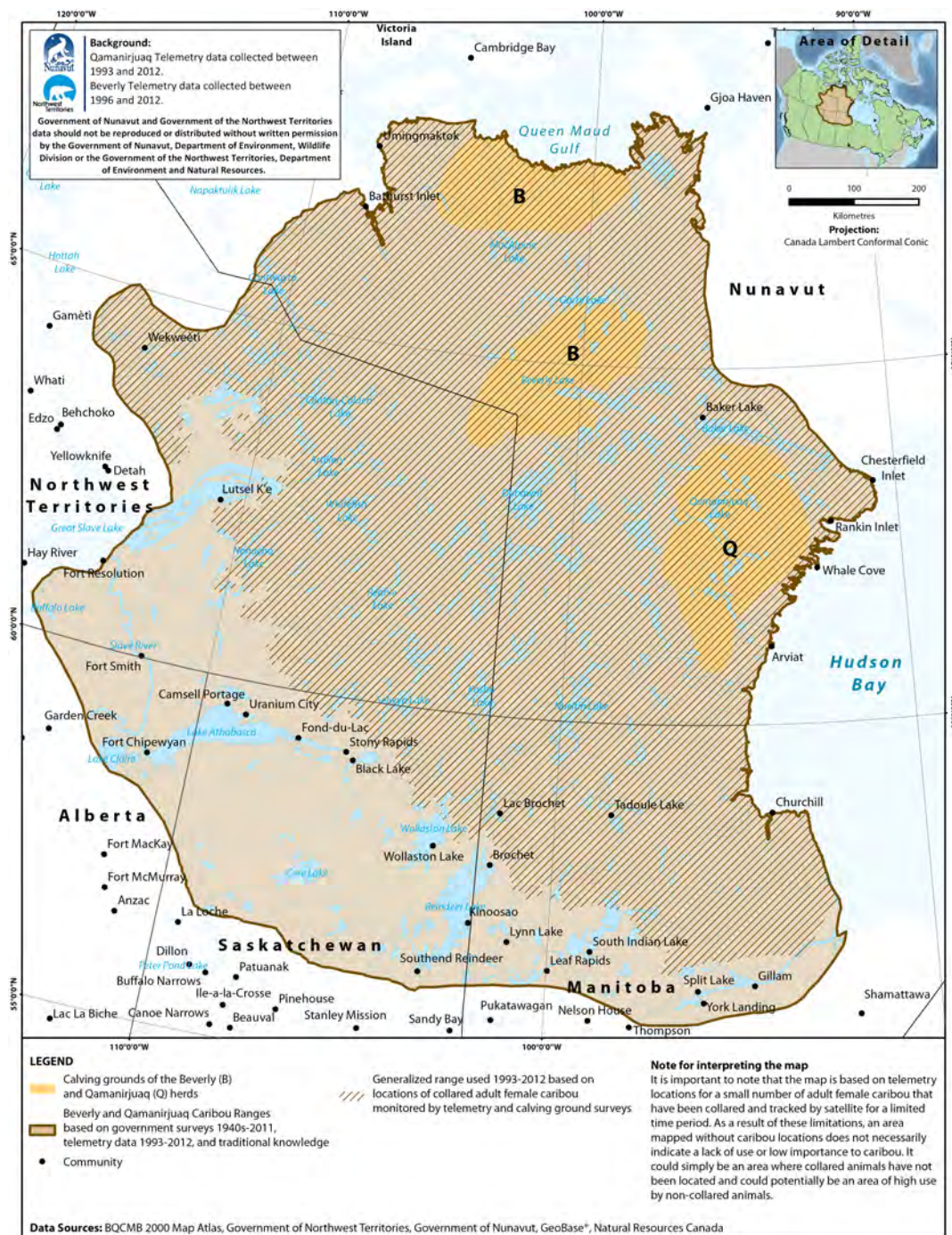


Figure 2.³ The Beverly and Qamanirjuaq caribou ranges⁴ based on caribou distribution information from government surveys (1940s-2011), tracking collared adult female caribou by telemetry (1993-2012) and traditional and local knowledge of caribou harvesters. (See also App. 4 Figs. 1-10.)

³ Higher resolution maps are available at www.arctic-caribou.com/maps.html.

⁴ Current distribution of caribou herds is not necessarily indicated by past range use patterns, as range use may change over time depending on population status and other factors. Overlap in range use by adjacent herds varies among seasons and years.

Wastage of caribou remains a major challenge for caribou management that affects all communities. Respectful caribou harvesting⁵ and other “on the land” practices include minimizing wastage and wounding loss, using all parts of the caribou, and treating caribou with respect. It is crucial that cultural and spiritual connections to the land and traditional customs and values be passed on to youth. This has become very challenging in recent years as the variety and availability of modern distractions have increased. The use of social media for barter and trade of caribou has recently emerged as a major issue that is causing an accelerating impact on the caribou herds.

Mineral exploration and development on the Beverly and Qamanirjuaq caribou range has been a major concern of the BQCMB since its creation. Exploration and development have occurred on the historic winter range of the Beverly herd in northern Saskatchewan for decades. Interest in extracting mineral resources from other parts of the caribou ranges and developing roads to access these resources has increased and expanded geographically over the past decade (Fig. 3, 4). Despite a clearly stated BQCMB position⁶ against exploration and development on Beverly and Qamanirjuaq calving grounds, post-calving areas and key migration routes and concerns voiced frequently by communities about these activities, mineral exploration has continued on these key habitats.

There was a 5-fold increase in the number of mineral tenures (prospecting permits, mineral claims and mineral leases) issued by the federal government on the calving ground of the Beverly herd south of Garry Lake between September 2005 and May 2011, with a peak of more than 700 tenures in effect on the calving ground in late 2008 and early 2009.

Large areas have been affected by wild fires across the Beverly and Qamanirjuaq winter ranges in the Northwest Territories, Saskatchewan and Manitoba (Fig. 5). The Government of the NWT has calculated that almost 30% of the forested winter range in the NWT (more than 6 million ha of a total of 21.5 million ha) was affected by fire during the 40-year period from 1973 to 2012. Although the intensity of fire varied within each affected area and not all of each area burned, many of the burned areas have experienced slow regeneration due to their location in the Taiga Shield. Areas that have burned in the past 50 years are considered by the BQCMB to have limited movements and distribution of wintering caribou and to have reduced productivity as caribou feeding areas⁷. A shift in caribou range use to areas farther away from southern NWT and Saskatchewan communities is associated with large wild fires on the winter range and is a key concern expressed frequently by harvesters. Recognizing that it is not always ecologically desirable to suppress wildfires and not always feasible due to human safety or resource availability issues, the BQCMB provided extensive recommendations to governments and firefighting managers in Saskatchewan, Manitoba and the

⁵ See also Sec. 5 – Sustainable Use of Caribou.

⁶ BQCMB 2004. Protecting Calving Grounds, Post-Calving Areas and Other Important Habitats for Beverly and Qamanirjuaq Caribou. A Position Paper by the Beverly and Qamanirjuaq Caribou Management Board. 31 pp.

⁷ BQCMB. 1994a. A Review of Fire Management on Forested Range of the Beverly and Qamanirjuaq Herd of Caribou. Technical Report 1. 64pp.

NWT in 1994 for maintaining Beverly and Qamanirjuaq caribou habitat⁸. Since then the Board has continued to encourage governments to consider important caribou habitats when assessing wild fires, to protect barren-ground caribou habitat from burning in areas where the majority of suitable habitat has been removed by fires in recent years and especially to maintain corridors of unburned forest to connect areas of productive caribou habitat. Research is needed to assess how wild fires at different intensities affect caribou range in terms of habitat quantity, quality and availability, and to determine after what time period and under what conditions forested habitat that has burned will become highly productive caribou range once again.

Wild fires are an essential component of the boreal forest ecosystem and are required to regenerate forest. Long-term control of wildfires has the potential to result in widespread, older forest areas that are more likely to result in larger, more intense wildfires when ignited. Large, intense fires sometimes result in drastic changes to large swaths of caribou winter range that can present challenges for caribou and caribou harvesters for up to several decades, depending on the size and location of the affected area and the condition of the surrounding habitat.

The **cumulative effects**⁹ of mineral exploration and development, roads, increasing harvest, wild fires on the winter range, environmental contaminants and the effects of climate change are a potential threat to Beverly and Qamanirjuaq caribou. These impacts may accumulate over time in combination with negative effects from other factors, such as weather, disease, parasites, and predation. How these combined factors may affect caribou is not well understood. The BQCMB will continue to communicate its management concerns about cumulative impacts on caribou related to the growth of mining exploration and development, particularly the establishment of new roads to facilitate development, as these roads provide greater access to caribou and caribou range.

⁸Recommendations were outlined in two reports based on mapping community priority zones for caribou hunting areas on the winter range and establishing goals for fire management zones as proportions of productive range for caribou feeding (defined as forests older than 50 years since fire):

BQCMB. 1994a. See above.

BQCMB. 1994b. A Review of Fire Management on Forested Range of the Beverly and Qamanirjuaq Herds of Caribou. Management Report 1. 11pp.

⁹ See also Sec. 6 – Commercial Land Use and Cumulative Effects.

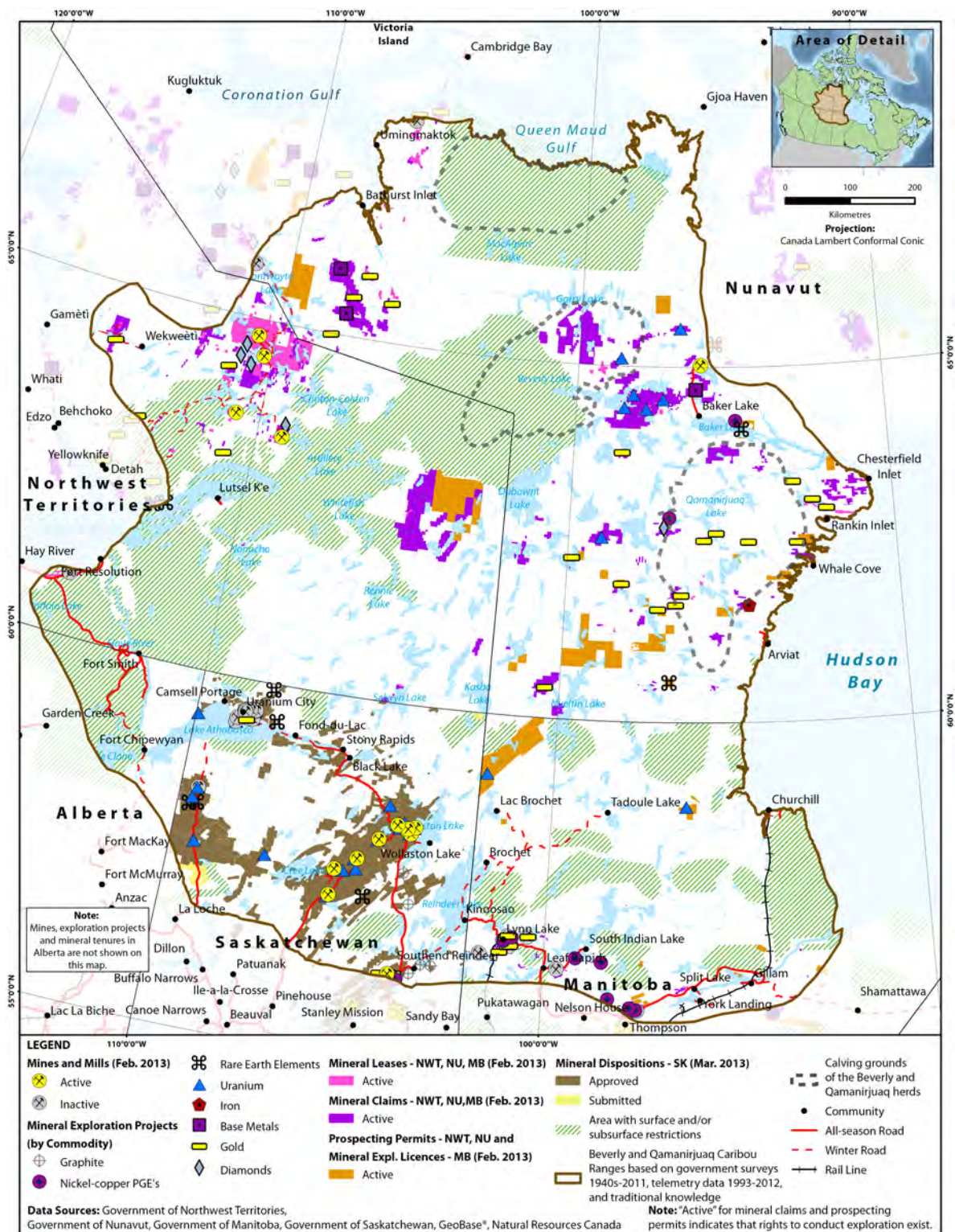


Figure 3. Mines, exploration projects and mineral tenures¹⁰ within the Beverly and Qamanirjuaq caribou ranges in 2013. (See also App. 4 Figs. 11-13.)

¹⁰ Mineral tenures indicate interest in mineral resources in an area that usually results in some exploration activity.

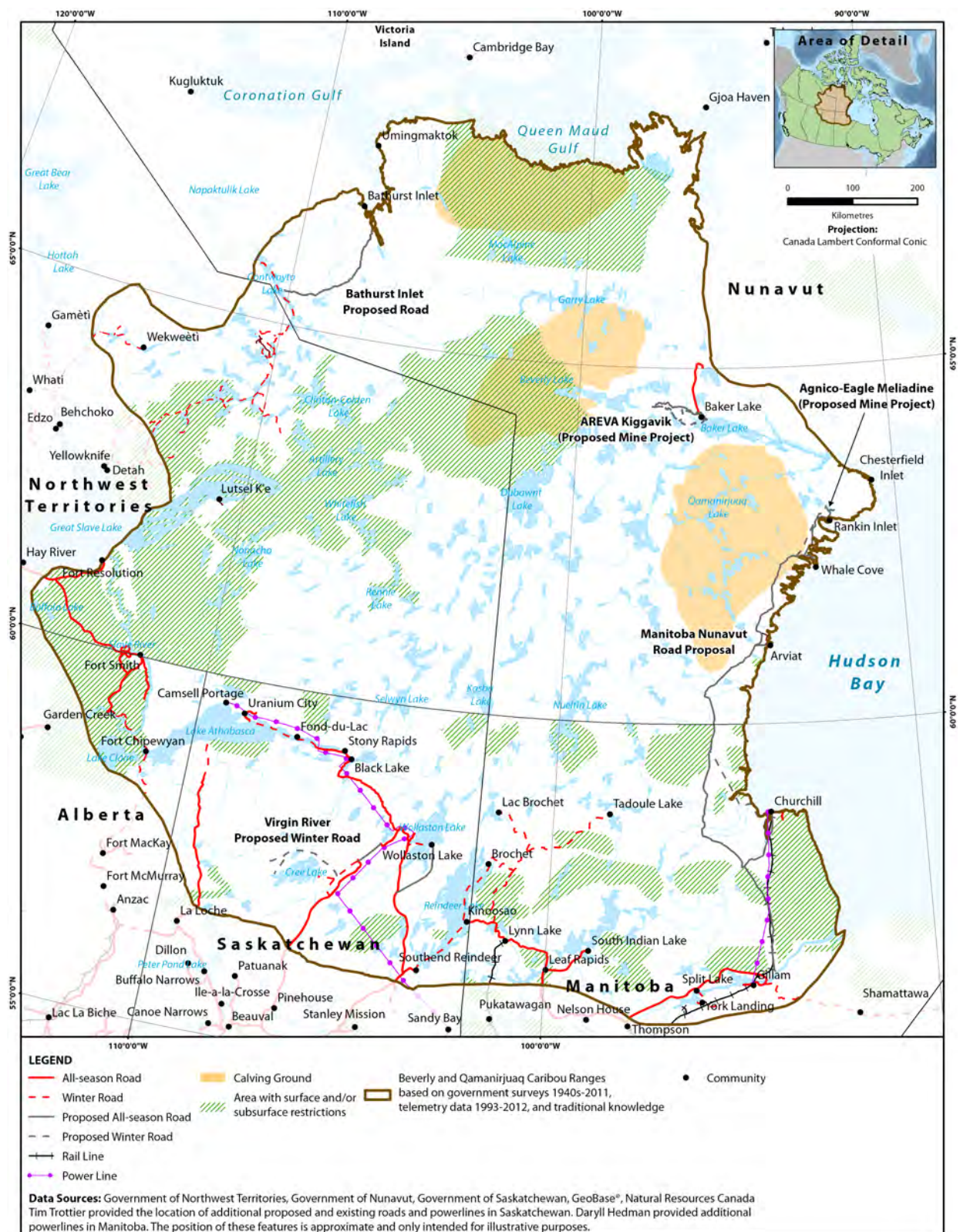


Figure 4. Existing roads, active road proposals, power lines and rail lines on the Beverly and Qamanirjuaq caribou ranges in 2013. (See also App. 4 Figs. 11-13.)

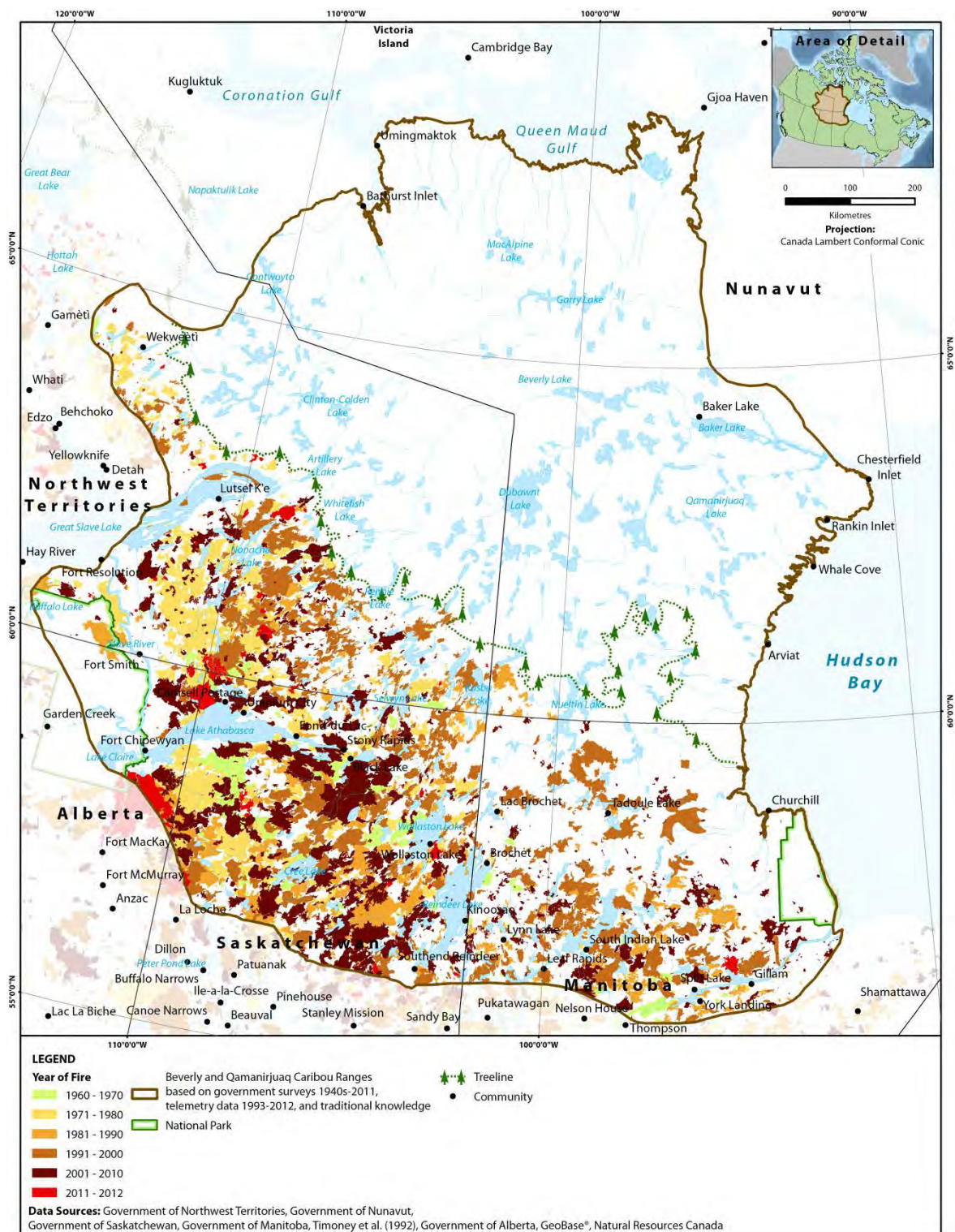


Figure 5. Fire history of the Beverly and Qamanirjuaq caribou ranges showing the outer boundaries of areas that were affected by fires from 1960 to 2012¹¹.

¹¹ Each area mapped contains a composite of areas within its boundaries ranging from completely burned to unburned. Many pockets of wildlife habitat that remained unburned were too small to show at this mapping scale.

Given the complicated context of contemporary northern caribou co-management, key challenges for the Board include determining how to:

- a) encourage governments and communities to make pro-active decisions for caribou conservation;
- b) ensure sustainable use of the herds;
- c) make best use of traditional and local knowledge in caribou management;
- d) address ongoing issues for which governments and communities have different perspectives, such as fire suppression on the caribou winter range;
- e) acquire sufficient capacity (human and financial resources) for addressing key issues, especially concerns raised by communities and caribou harvesters;
- f) deal with emerging requirements of new land claim agreements; and
- g) promote action by governments, regional organizations and communities in response to recommendations made by the Board in support of caribou conservation.

Key Recommendations

Based in part on input received from participants during a workshop held by the BQCMB in Saskatoon in February 2010, the Board developed six key recommendations which it has since promoted during community meetings and presentations on ways that governments, regulatory agencies, communities, hunters and others can help the caribou herds:

- 1) Governments and others should protect areas that are very important to caribou, including seasonally-important habitats like calving grounds and key migration corridors.
- 2) Governments and regulatory agencies should do more to help protect caribou from disturbance and habitat loss resulting from mineral exploration and development, and from fires on the winter range.
- 3) Hunters should take only what they need.
- 4) Hunters should prevent wastage.
- 5) Hunters should harvest bulls instead of cows¹² when herds are vulnerable.
- 6) Traditional harvest of predators, like wolves and bears, should be encouraged, especially on the calving grounds.

¹² Adult female caribou are typically referred to as “caribou cows”.

2.2 Caribou Herds and Ranges

Status of the Beverly and Qamanirjuaq Caribou Herds

Status of the Beverly Herd

In June 2011 the first successful Beverly population survey since 1994 was led by the Nunavut government. The survey documented numbers of caribou on Beverly calving grounds, both south of Garry Lake and in the Queen Maud Gulf area, producing an estimated herd size of about 124,000. The 2011 estimate is at the low end of the known range of herd sizes obtained since the 1980s, and is 55% lower than the 1994 population estimate of about 276,000 (Fig. 6).

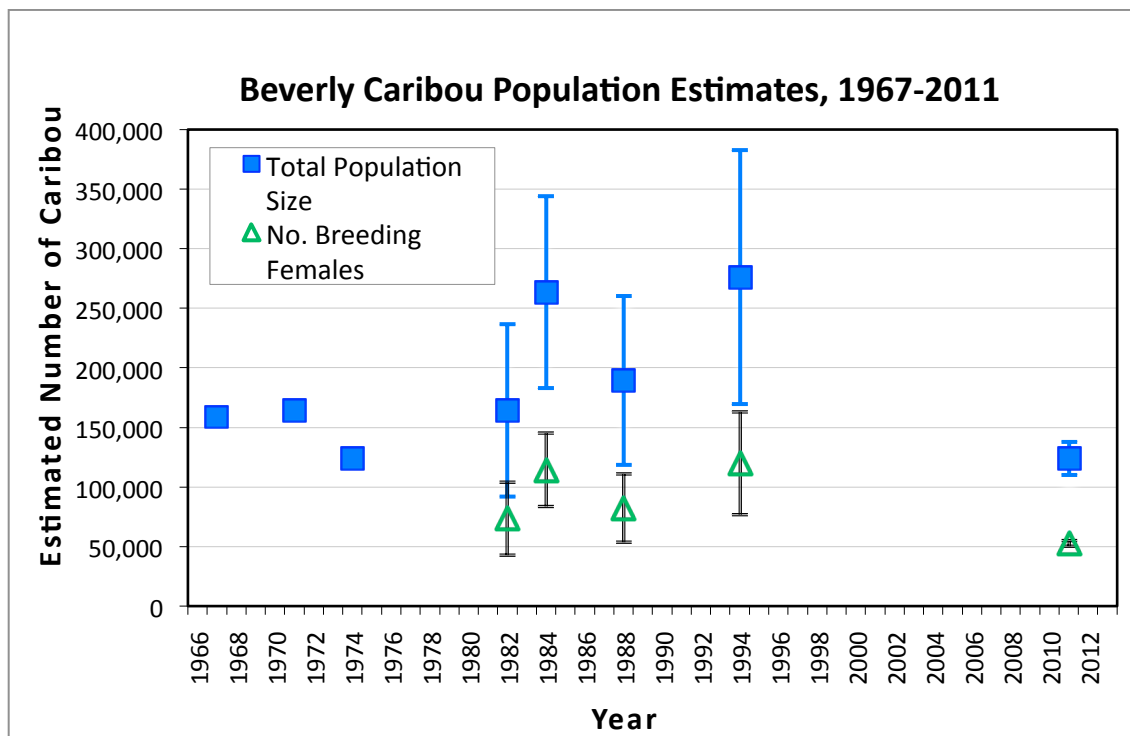


Figure 6. Population sizes estimated for the Beverly herd, 1967-2011, and estimated numbers of breeding female caribou on the Beverly calving ground during the calving period in June, 1982-2011. Error bars show one standard error (SE). SE values for the 2011 estimates were very small. Estimates and SE for earlier years are not as reliable or readily comparable to those for later years as a result of different survey techniques and SE are not provided for earlier surveys. (Data provided by Governments of NWT and Nunavut.)

There are many questions about the Beverly herd that cannot be answered with certainty, due in large part to a lack of monitoring for the herd between 1994 and 2002 and between 2002 and 2006, which occurred as a result of numerous interrelated factors (Appendix 6). In recognition of the changes that have occurred, the Board has revised the definition of the Beverly herd in the BQCMB *Caribou Management Agreement* (Appendix

3) to describe the herd as a “complex of barren ground caribou” that “gives birth to its young near Beverly Lake and the Queen Maud Gulf area in Nunavut”.

The NWT and Nunavut governments conducted annual calving distribution surveys in the southern Beverly calving area (south of Garry Lake) and the northern calving area (along western Queen Maud Gulf) from 2006 to 2011. Analyses of the relative density of caribou on the calving grounds indicated decreasing abundance from 2006 to 2009 and increasing abundance from 2009 to 2010. The GNWT’s spring composition surveys in 2008, 2009, 2010 and 2011 found high calf/cow ratios on the Beverly late winter range (between 31 and 57 calves per 100 cows) each year (Fig. 7). This may indicate that the herd was stable or increasing during this period if the adult cow mortality rate is low, as ratios above 30 calves per 100 cows are often associated with a stable or increasing herd. Additional information is required to determine the herd’s current trend.

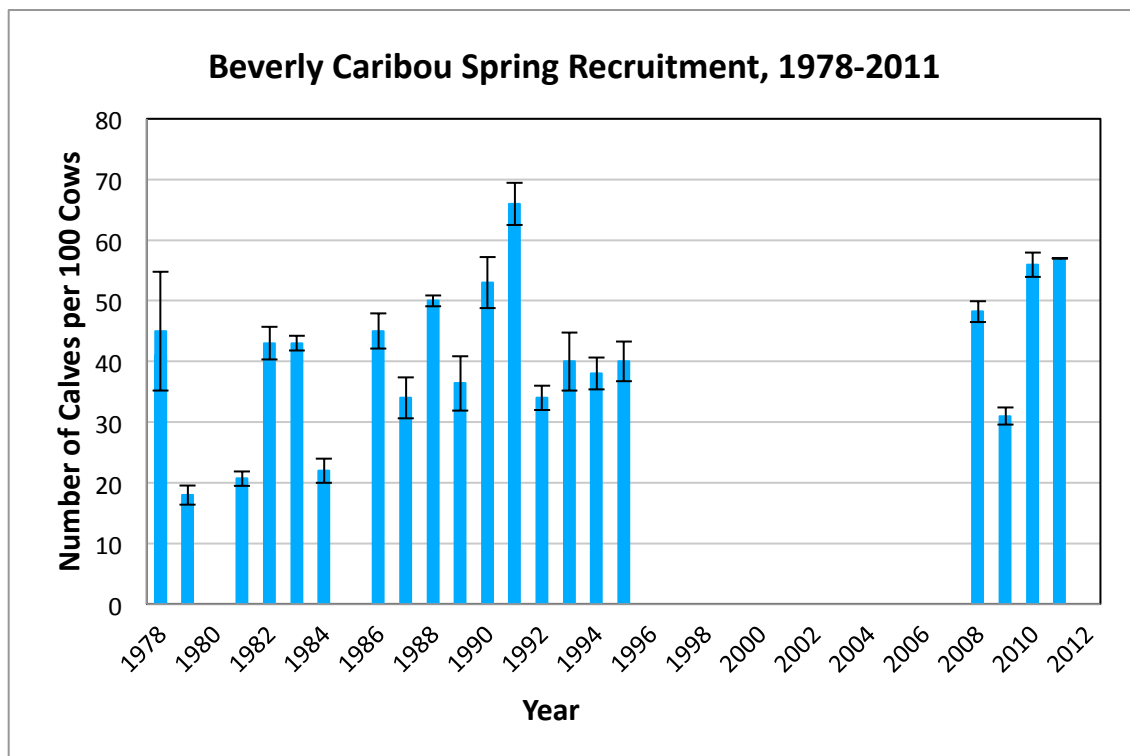


Figure 7. Spring calf recruitment (calves /100 cows) for the Beverly caribou herd, 1978-2011. Error bars show one standard error (SE). SE value for the 2011 estimate was very small. Estimates and SE for earlier years are not readily comparable to estimates for later years. (Data provided by Government of NWT.)

Status of the Qamanirjuaq Herd

A photo survey of the Qamanirjuaq herd's calving ground was conducted in June 2008 by the Nunavut government. This provided a population estimate for the Qamanirjuaq herd of approximately 349,000, about 30% lower than the previous estimate of approximately 496,000 produced by the NWT government in 1994 (Fig. 8). The amount of change in herd size and its trend (increasing, decreasing, or stable) is not clear because of the length of time between population surveys and the amount of uncertainty in the estimates, especially for 1994. A calving ground reconnaissance survey in 2012 indicated a decrease of 10-20% in the relative density of caribou on the calving ground compared to 2008.

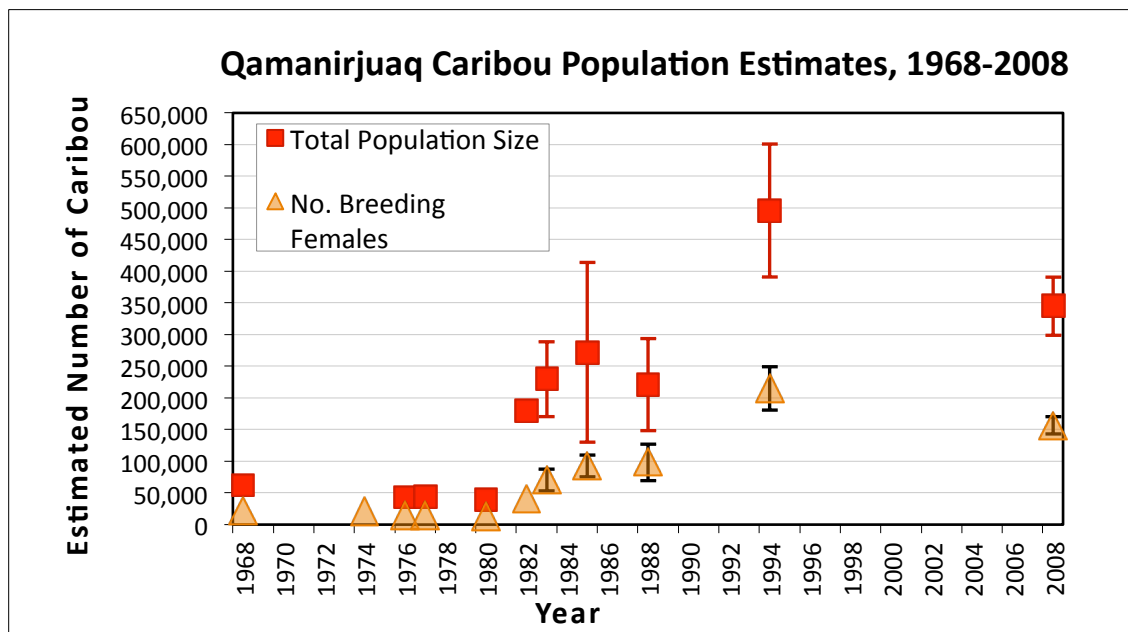


Figure 8. Population sizes estimated for the Qamanirjuaq herd and estimated numbers of breeding female caribou on the Qamanirjuaq calving ground during the calving period in June, 1968-2008. Error bars show one standard error (SE). Estimates and SE for earlier years are not as reliable or readily comparable to those for later years as a result of different survey techniques and SE are not provided for earlier surveys. (Data provided by Government of Nunavut.)

The Government of Nunavut's spring composition survey in 2010 found large numbers of healthy Qamanirjuaq caribou on the spring migration route and a calf/cow ratio of more than 30 calves per 100 cows, higher than ratios estimated since 2006 (Fig.9). Although such a ratio would be consistent with a herd that is stable or increasing (if the adult cow mortality rate is low), there has been no indication that this ratio has remained at or near this level since 2010. More recent information from multiple years is required in order to confirm the herd's trend.

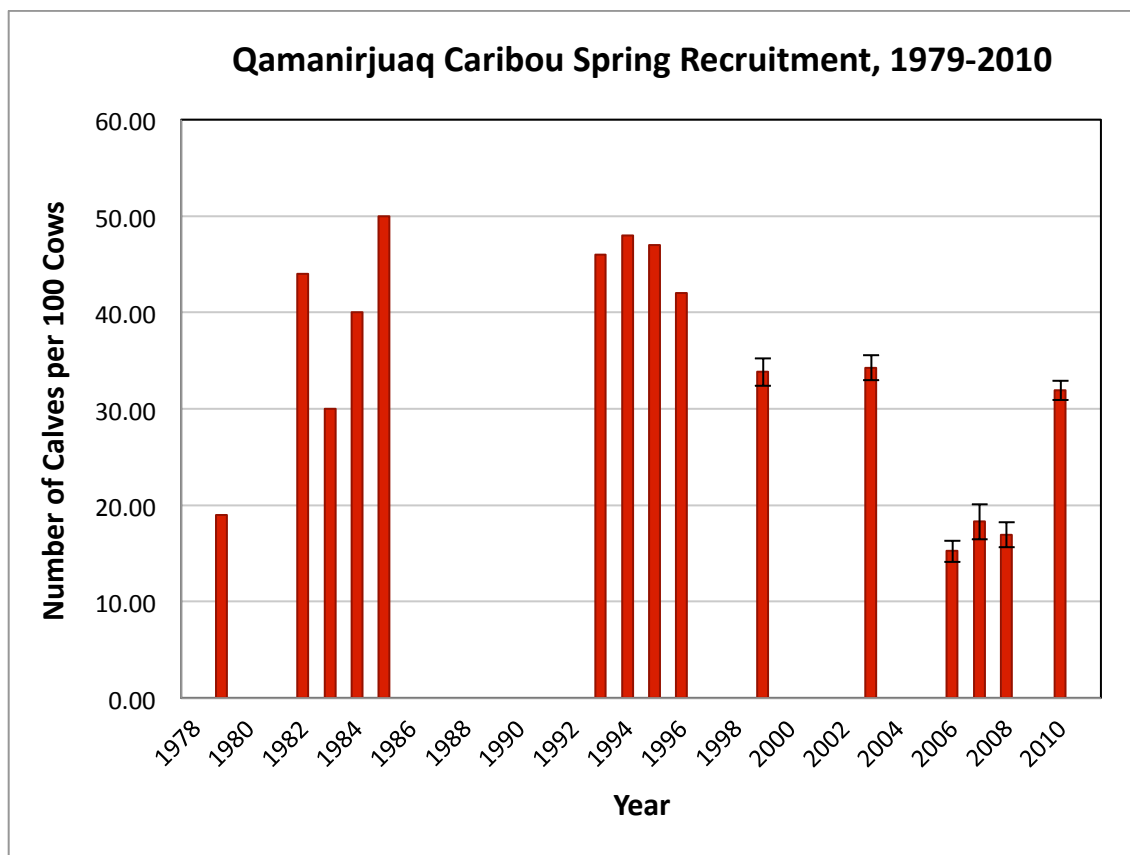


Figure 9. Spring calf recruitment (calves /100 cows) for the Qamanirjuaq caribou herd, 1979-2010. Error bars show one standard error (SE). Estimates and SE values for earlier years are not as reliable or readily comparable to those from later years and SE are not provided for earlier surveys. (Data provided by Government of Nunavut.)

Beverly and Qamanirjuaq Caribou Range Use

Government surveys since the 1940s and telemetry studies since the early 1990s have indicated that the Beverly and Qamanirjuaq historic winter ranges overlap considerably, primarily in southeastern NWT and northeastern Saskatchewan. During the rest of the year the herds are usually spatially separated, with the Qamanirjuaq herd primarily inhabiting the southern Kivalliq region of Nunavut along and inland from Hudson Bay, and the Beverly herd using range in NWT and Nunavut to the west and northwest of Qamanirjuaq range. The combined historic (1940s-2012) ranges of the Beverly and Qamanirjuaq herds total about 1.26 million km², almost as large as the NWT and twice the size of the province of Saskatchewan (Fig. 2). Additional maps in Appendix 4 show historic and recent range use (App. 4 Figs. 1-10) and the ecozones and ecoregions included in the Beverly and Qamanirjuaq caribou ranges (App. 4 Fig. 15).

Range Use by the Beverly Herd

Beverly caribou have migrated across the northern Canadian landscape for thousands of years, travelling as far as 2,000 km each year. Documented range used by the herd since the 1940s extends across a huge and diverse

area, from the boreal forests of Saskatchewan, across the subarctic taiga of the Northwest Territories (NWT), to the arctic tundra of northern mainland Nunavut (Fig. 2). The landscape through which the Beverly herd travels includes hundreds of remote rivers and lakes, two of the largest protected natural areas in North America, the Thelon Wildlife Sanctuary and the Queen Maud Gulf Migratory Bird Sanctuary (see map of protected areas: App. 4 Fig. 14). Depending on the season, the herd's range overlaps with the ranges of Bathurst caribou to the west and the Qamanirjuaq and Ahiak herds to the east.

Our understanding of the Beverly herd and its seasonal range use patterns has changed based on observations made by caribou harvesters from caribou range communities, recent government surveys, and information from tracking movements of collared Beverly caribou cows. Aerial surveys led by the NWT government between 2002 and 2010 found decreasing numbers of Beverly caribou on the calving ground south of Garry Lake during the calving period and determined that a relatively small area was used for calving in those years between the Thelon Wildlife Sanctuary and Garry Lake. Information from collared caribou tracked by satellites between 2006 and 2012 indicated that some Beverly caribou that calved in the early years of this period on the calving ground south of Garry Lake later calved in an area about 250 km farther north near the coast of Queen Maud Gulf. A calving ground survey led by the Nunavut government in June 2011 documented numbers of caribou on both Beverly calving grounds, south of Garry Lake and along the Queen Maud Gulf coast, and found the majority of caribou calving on the coastal calving area (Fig. 2; see also App. 4 Fig. 6)¹³.

Several factors have been suggested as possible contributors to the Beverly herd's changing range use patterns, including decreased use of winter range that has been made unsuitable by mineral exploration, mining and wild fires over several decades and avoidance of calving and post-calving range in response to disturbance from mineral exploration activities. Natural factors which may have also played a role include predation, insect harassment, disease, vegetation abundance and availability, and the effects of adverse weather.

Range Use by the Qamanirjuaq Herd

Historically Qamanirjuaq caribou have migrated from calving and post-calving areas on the tundra, south to the wintering ground, and back north for the next calving season. The distribution of this barren-ground caribou herd has been documented by government surveys conducted sporadically since the 1940s, and by tracking caribou cows using satellite collars since 1993.

The total area known to be used by the Qamanirjuaq caribou herd since the 1940s spans almost 1,000 km from north to south, from the southern Kivalliq region of Nunavut to northern Manitoba, and about 850 km east to west, from the west coast of Hudson Bay inland across the southern Kivalliq, northern Manitoba, northeastern Saskatchewan and southeastern NWT (Fig. 2). Telemetry information from collared caribou indicates that the Qamanirjuaq herd's cumulative annual range from 1993-2012 extends from Split Lake, Manitoba north to Baker Lake, Nunavut and west to Lutsel K'e, NWT.

Government surveys since the 1950s have documented the return of Qamanirjuaq caribou to the same general area for calving each year, although not to the same specific location. The herd's calving ground is located in

¹³ BQCMB consensus is that the Beverly herd currently calves near the Queen Maud Gulf coast. The Board recognizes that there are other theories as well.

the Qamanirjuaq Lake area of Nunavut's Kivalliq region, between the coastal communities of Arviat, Whale Cove and Rankin Inlet, and the inland community of Baker Lake (Fig. 2; see also App. 4 Fig. 6). Information obtained by using telemetry to track collared caribou over the past 20 years shows that the Qamanirjuaq calving ground extends beyond the area previously documented to the south, west and east.

The Qamanirjuaq historical winter range consists primarily of forested lands in southeastern NWT, northeastern Saskatchewan and northern Manitoba, as well as tundra in northern Manitoba and southern Nunavut (Fig. 2; see also App. 4 Fig. 1). Portions of the herd have often wintered on the tundra during the same year that other caribou groups have wintered in the forest. In most years in the 1970s and 1980s, the majority of the Qamanirjuaq herd wintered on the tundra in coastal regions of Hudson Bay. In other years, much of the herd wintered close to communities in northern Manitoba and northeastern Saskatchewan.

2.3 The Value of Caribou

The Beverly and Qamanirjuaq herds were historically available at different times each year to about 20 communities in Nunavut, Northwest Territories, Manitoba, Saskatchewan and Alberta (Fig. 2; App. 4 Fig. 1). Harvesters from these communities are predominantly Aboriginal people including Inuit, Dene, Cree and Metis peoples who continue to depend on these two caribou herds to fulfill economic, social and cultural needs.

The relationship of people with Beverly and Qamanirjuaq caribou is a fundamental part of traditional harvester's identities that has been passed down through many generations. Caribou provide a secure and reliable source of healthy and nutritious food for many people across the caribou ranges. Additional economic values are derived from the use of skins for clothing and bedding, and bones and antlers for handicrafts. However, harvesting caribou is not simply a means of providing food or income. The true value of caribou for Aboriginal people is reflected in the strong traditional, cultural and spiritual relationship that exists between the people and animals. Harvesting caribou and other activities associated with use of caribou (e.g., for ceremonies and community feasts) continue to have enormous social and cultural values for maintaining traditional cultures for both present and future generations.

A study commissioned by the BQCMB¹⁴ estimated that the net annual economic value of caribou harvested from the Beverly and Qamanirjuaq herds was about \$20 million, including about \$5 million for Beverly caribou and about \$15 million for Qamanirjuaq animals. This was based on an estimated total harvest in 2005-2006 of about 3,800 Beverly caribou (27%) and about 10,300 caribou from the Qamanirjuaq herd (73%)¹⁵. Most of these caribou (about 84% of total harvest) were taken for subsistence use by about 13,000 primarily Aboriginal people¹⁶ living on or near the caribou ranges across the five caribou range jurisdictions.

¹⁴ Intergroup Consultants Ltd. 2013. Economic Valuation and Socio-Cultural Perspectives of the Estimated Harvest of the Beverly and Qamanirjuaq Caribou Herds. October 2013 revised version (original May 2008).

¹⁵ Harvest estimates were made by government biologists, wildlife officers and community organizations based on information provided by communities.

¹⁶ Based on federal government information for 2001.

Total numbers and relative proportions harvested by each jurisdiction from the two caribou herds may differ substantially from year to year. Annual variation in range use by the herds changes their availability to communities and differing amounts of range overlap with neighbouring herds from year to year can change the proportion of harvest by a community from a given herd. Based on estimates for 2005-2006, the largest portion of the harvest from the Beverly and Qamanirjuaq herds was taken in Nunavut, the Saskatchewan portion was second largest and the Manitoba portion was third. Nunavut hunters accounted for approximately 60% of the Qamanirjuaq caribou harvest, and Saskatchewan hunters for about 75% of the Beverly caribou harvest.

The economic value of caribou as a meat source in 2005-2006 was estimated to range from about \$1,050 per caribou in the NWT to more than \$1,700 per caribou in Manitoba, and to be approximately \$1,200 in both Nunavut and Saskatchewan. The differences were primarily due to variable prices for high grade beef and resulting different replacement meat values for the animals harvested. The primary factor determining net annual economic value of the caribou harvest, however, was the number of animals harvested. Nunavut obtained the greatest net economic benefit from harvest of Beverly and Qamanirjuaq caribou (\$9.5 million; Fig. 10), with harvest from the Qamanirjuaq herd by far the greatest contributor (94%). The second highest harvest value was obtained by Saskatchewan hunters (\$5.9 million), with the majority (59%) from Aboriginal domestic harvest of Beverly caribou. Net value of caribou harvest in Manitoba was \$3.8 million, all from the Qamanirjuaq herd, and NWT harvest of Beverly caribou was estimated to have a net value of about \$0.8 million.

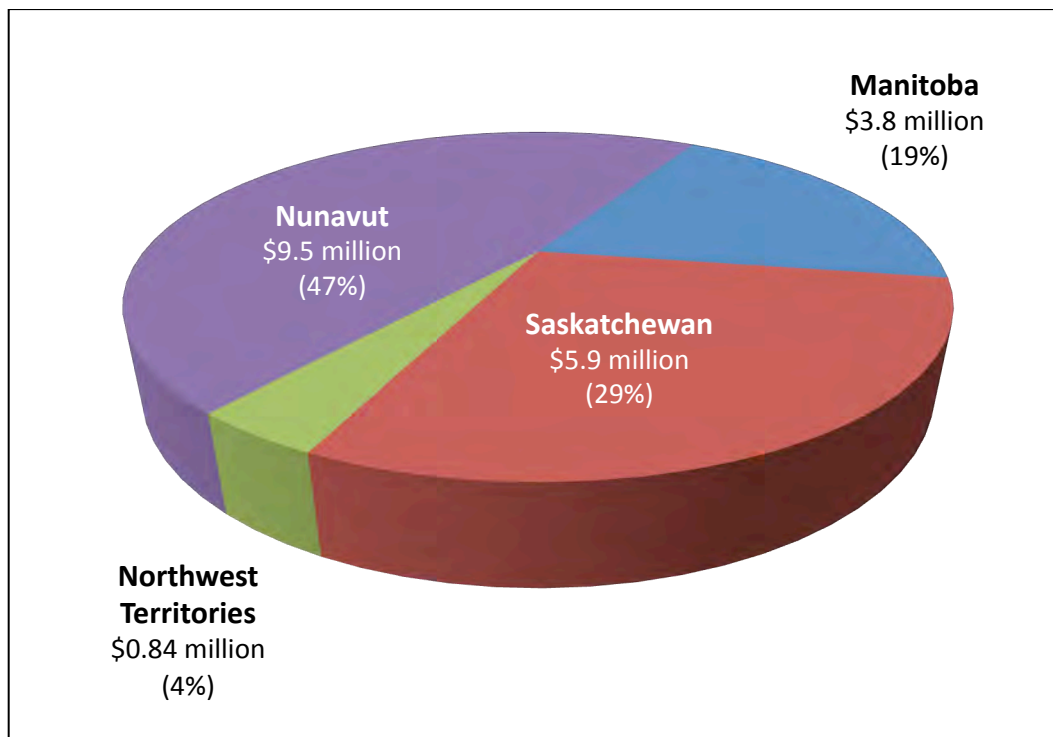


Figure 10. Estimated net economic value of Beverly and Qamanirjuaq caribou harvested in each jurisdiction in 2005-2006.

As Figure 11 shows, the class of harvest providing the greatest economic value in 2005-2006 was the domestic harvest valued at approximately \$14.8 million, followed by outfitting harvest (\$4.1 million), other commercial harvest (\$0.59 million) and harvest by licenced resident hunters (\$0.47 million).

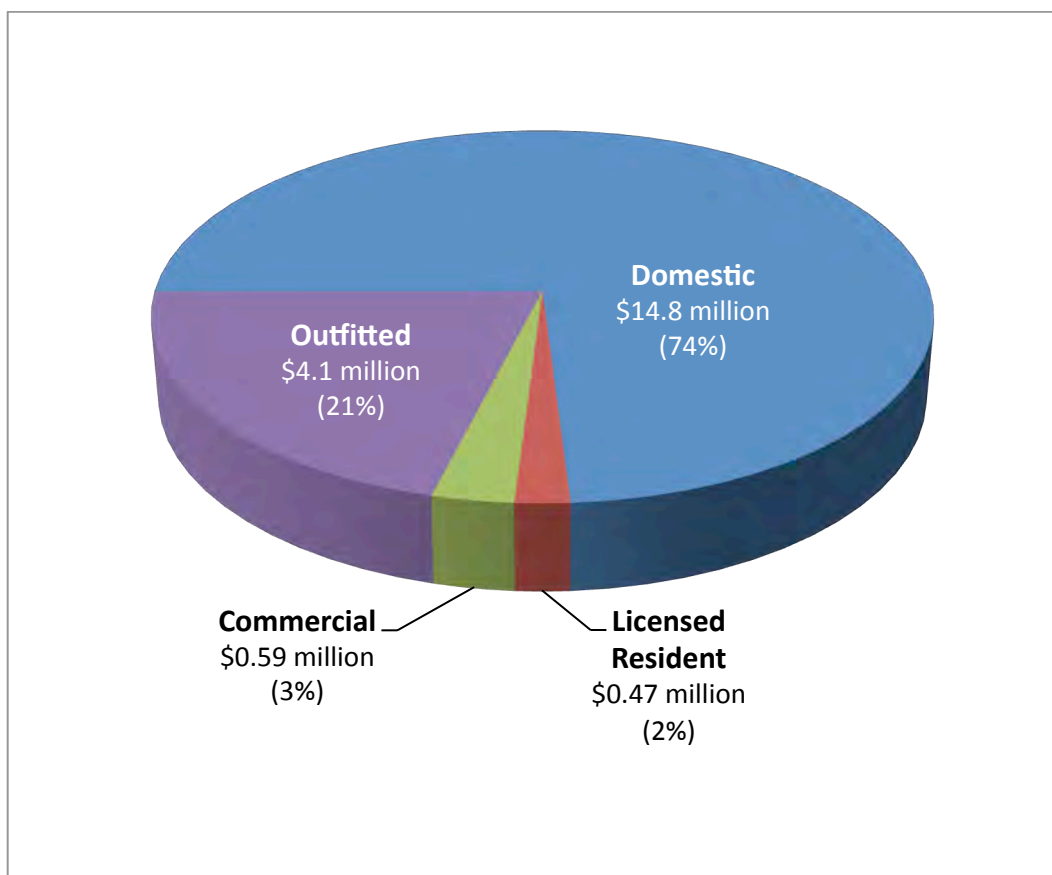


Figure 11. Estimated net economic value of Beverly and Qamanirjuaq caribou harvested in 2005-2006 by harvest class.

3 PRINCIPLES, GOALS AND OBJECTIVES

3.1 Principles for Caribou Conservation

The BQCMB will follow these principles during development, review and implementation of the management plan, and when making recommendations for caribou conservation.

- 1) The participation of communities on the Board and the implementation of the management plan shall be consistent with Aboriginal and treaty rights as recognized in the *Constitution Acts, 1867-1982* and in other legislation such as the *Nunavut Land Claims Agreement Act*, and other legislated land claim agreements.
- 2) Effective caribou management must be based on co-operation, participation and communication among communities and governments.
- 3) Management decisions affecting caribou or their habitats should be consistent with the **precautionary principle** (see sidebar).
- 4) All management decisions must be consistent with the interdependent principles of **sustainable development**¹⁷ that ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs.
- 5) Caribou management actions will make use of the best scientific information and local and traditional knowledge available.
- 6) The value of wildlife organizations, hunters' and trappers' organizations, band councils and individual community members in bringing local perspectives and traditional ecological knowledge to caribou management is recognized and will be encouraged.
- 7) Conservation decisions will take into account the fact that Aboriginal peoples depend on caribou not only for food but also because of their social, economic and cultural benefits to the communities.
- 8) Caribou conservation will recognize the complex relationship between caribou and their environment, including habitat, predators, insects, disease, parasites, wildfires, weather, climate and human activities.
- 9) The protection of caribou habitat and maintaining the ability of caribou to move freely through their ranges are essential.
- 10) Caribou conservation includes the need to limit the effects of commercial land use on caribou and their habitats.
- 11) Education, awareness and practice of sustainable caribou hunting are necessary.
- 12) Information and advice on caribou-related issues will be freely available to individuals and organizations.

The Precautionary

Principle - In the absence of complete information where there are threats of serious or irreparable damage, lack of complete information or certainty shall not be a reason for postponing reasonable conservation measures. (Adapted from the 2004 Bathurst Barren Ground Caribou Management Planning Agreement.)

¹⁷ Sustainable development - These principles, which are in harmony with the Board's mandate, include meeting human needs, maintaining ecological integrity and cultural diversity, and achieving equity, social justice and self-determination for Aboriginal peoples.

3.2 Goals and Objectives for the Next 10 Years

The BQCMB has identified nine key goals and several objectives to be achieved for each goal during its current 10-year mandate. Most goals are similar to those of past management plans with the exception of two goals concerning action on harvest monitoring and management.

Compared to the previous management plan, more specific objectives have been developed regarding information-sharing processes; monitoring caribou, habitat, and harvest; assessing range conditions and impacts of natural and human-caused factors on caribou and habitat; and supporting and contributing to land use planning, environmental assessment and range-wide conservation planning. Numerous specific actions have been developed for consideration by the Board for implementing these objectives (Appendix 7).

Goal 1: To conserve the Beverly and Qamanirjuaq caribou herds in a cooperative manner

Objectives:

1. Use all forms of knowledge, including Local and Traditional Knowledge (Aboriginal TK (ATK)/Inuit Qaujimajatuqangit (IQ)) and scientific knowledge.
2. Develop additional ways for residents of caribou range communities to be involved in monitoring and management actions.
3. Facilitate information sharing among harvesters from different parts of the range.
4. Promote processes for community and government board members to share responsibility for information exchange with caribou harvesters.
5. Strengthen relationships and information sharing processes with organizations that have a mandate for caribou or habitat conservation.

Goal 2: To strengthen support for caribou conservation

Objectives:

1. Increase awareness of caribou issues and the BQCMB by residents of caribou range communities, other northerners and other Canadians.
2. Strengthen support for caribou conservation and the BQCMB from federal and jurisdictional governments.
3. Enhance awareness of the BQCMB among governments, including senior government officials.
4. Improve understanding of the concept of cumulative effects and potential impacts on caribou.
5. Increase understanding of the value of harvest information in management.

Goal 3: To increase knowledge of barren-ground caribou and the caribou-human system¹⁸

Objectives:

1. Increase knowledge of barren-ground caribou ecology.
2. Improve knowledge of land use on the range and impacts on caribou and their habitats.
3. Enhance knowledge of cumulative effects on caribou, habitats and caribou harvesters.

¹⁸ All of the objectives under Goal 3 are meant to include all forms of knowledge (as listed under Goal 1 Objective 1).

Goal 4: To monitor caribou population status over time

Objectives:

1. Support design and use of low impact, respectful caribou monitoring methods.
2. Encourage governments to secure long-term funding to adequately monitor both herds.
3. Contribute to creation and implementation of a long-term monitoring plan for both herds.

Goal 5: To monitor the harvest of caribou

Objectives:

1. Promote standardizing a method for monitoring caribou harvest.
2. Encourage governments to undertake harvest monitoring regularly and consistently, whether caribou numbers are high or low.
3. Assist with development and application of systematic techniques for estimating harvest levels where direct harvest monitoring is not in place.

Goal 6: To conserve the Beverly and Qamanirjuaq caribou herds within their natural range of abundance

Objectives:

1. Encourage governments to regularly review geographic and demographic boundaries for the herds.
2. Estimate natural range in size of each herd.
3. Promote research to assess the impacts of hunting, predation, parasites and disease.

Goal 7: To ensure adequate amounts of high quality habitat

Objectives:

1. Encourage governments to identify caribou seasonal ranges.
2. Support programs to assess the condition of seasonal ranges.
3. Support creation of range-wide habitat conservation plans and assist with inter-jurisdictional coordination and implementation of those plans.
4. Promote protection of key habitats important to caribou.

Goal 8: To strive for the sustainable [wise] use of caribou

Objectives:

1. Identify and promote use of sustainable hunting practices.
2. Make harvest management recommendations following the Board's priority use categories.
3. Encourage governments to develop a harvest management plan that considers herd status and sustainability.

Goal 9: *To influence commercial land use in a way that protects Beverly and Qamanirjuaq caribou and their habitats*

Objectives:

1. Encourage all parties to monitor and assess the impacts of commercial land use and cumulative effects on caribou and habitats.
2. Promote and support establishment of disturbance thresholds for land use.
3. Encourage land use planning and contribute to land use plans across the caribou ranges.
4. Develop and recommend mitigation measures for commercial land use activities.
5. Review key land use proposals for potential effects on caribou and habitats and make recommendations for avoiding or minimizing those effects.

4 HERD MONITORING AND VULNERABILITY ASSESSMENT

Goal 4 of the BQCMB management plan, which is “**to monitor caribou population status over time**”, includes three objectives for monitoring the Beverly and Qamanirjuaq herds. The BQCMB recognizes that the widely used method of monitoring caribou range use patterns using telemetry (placing radio-collars on caribou cows and tracking their movements by satellite) has limitations and is not popular with some Aboriginal elders and others. Therefore the Board will encourage and support efforts to find alternative monitoring methods that have minimal impacts, are respectful of the animals and provide information required for management. At the same time the Board will work with governments, communities and others to develop plans for long-term monitoring of both herds and to promote adequate support for these plans that includes multi-year funding commitments.

Goal 6 of the Plan is “**to conserve the Beverly and Qamanirjuaq herds within their natural range of abundance**”. The size of barren-ground caribou herds fluctuates over time, and there will be periods of caribou abundance and other periods with much lower numbers of caribou. The challenge for caribou conservation is to ensure that herds do not decrease to levels so low that they cannot increase again, and also that they do not increase to higher levels than their habitat can support.

The size of a caribou herd results from many influences working together to cause caribou cycles through periods of abundance and low numbers. These may include human influences as well as natural factors such as weather, vegetation growth, and predation. When a herd is more vulnerable, the need to minimize additional stresses is greatest. Although many factors affect caribou and contribute to a herd’s vulnerability level (see sidebar), only a few can be managed directly, namely harvest and the effects of human land use activities on caribou and habitat.

When caribou are abundant and doing well, making decisions about caribou is easier. There is enough caribou for everyone, and people do not have to make tough choices about whether more funding should be provided for additional government surveys or if harvest should be reduced. It is much harder for co-managers to make these decisions when caribou herds are not doing well and when freezers and wallets are not full. But it is always necessary to make decisions, and those decisions should be based on a careful assessment of available information about the herds and the state of their ranges.

4.1 Why Assess Herd Vulnerability?

The BQCMB needs to know how the caribou herds are doing, including how large they are, whether they are increasing or decreasing, and what stresses they are facing. Monitoring of various indicators provides information necessary to determine the vulnerability level of each herd. This information is needed so the Board can identify priorities for conservation and management of each herd that are appropriate given the herd’s current vulnerability level. The Board will then make recommendations to governments, communities and others as well as developing its own programs in support of actions required to make sure that caribou will continue to be available to provide food and cultural well-being for people who share the herd’s annual range.

4.2 Process for Assessing Vulnerability

The BQCMB has developed a way to conduct a Vulnerability Assessment of each herd, using local and traditional knowledge and scientific information about the herds. This will allow co-managers to assess the ability of each herd to cope with additional stresses at specific times while changes occur in caribou abundance and in conditions on the landscape.

The BQCMB will use all of the information it has to do a Vulnerability Assessment for each herd, once each year. The Board's community and government representatives will contribute their knowledge about caribou, the land, other wildlife and human land use activities occurring on the caribou ranges. Information about the herds and their ranges will also be requested from other traditional harvesters, communities, developers, land administrators and wildlife managers. This includes knowledge about caribou distribution, range use and accessibility; health and condition of caribou harvested or observed; number of calves observed by hunters; number of calves born, overwinter calf survival and other information gathered during government surveys; snow and vegetation (food) conditions; evidence of predation and numbers of predators seen on the caribou range; weather; wild fires on the range; disturbance (from aircraft, vehicles, drill rigs); and land use such as mineral exploration and mining projects.

The Board will use a pre-arranged system to work through an assessment for each caribou herd to ensure the vulnerability of each herd is evaluated using the same methods each time. Each type of information (called an "indicator") will be ranked according to how it describes or contributes to a healthy growing herd, a herd that is decreasing in size, or a stable herd (not increasing or declining). Figure 12 provides information about the types of indicators used and illustrates how the assessment process provides a score indicating the overall vulnerability level of each herd. Five categories will be used for describing a herd's vulnerability level: very low, low, medium, high and very high.

Caribou Herd Vulnerability - When a caribou herd is "vulnerable", the herd as a whole is more likely to be negatively affected by things that would have less impact under better conditions. For example, caribou in declining herds are more likely to be in poor condition and to have less ability to tolerate stresses, so would be considered to be vulnerable at that time. In contrast, when most caribou in a herd are in good shape, they can use their good condition (stored energy and strong bodies) to deal with disturbances caused by natural and human-related events. A herd that is increasing with good calf productivity and range conditions may be in less danger from negative effects of localized or range-wide stresses, thus the herd is considered to be less vulnerable at that time.

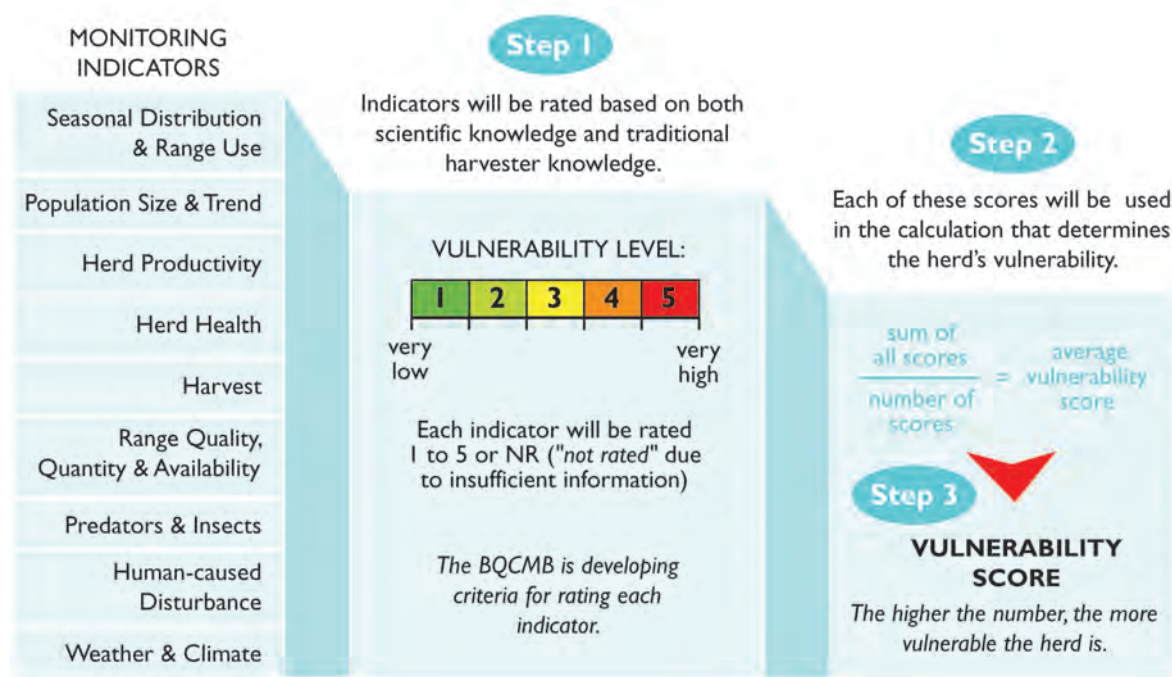


Figure 12. How monitoring information will be used to conduct a vulnerability assessment.

4.3 Monitoring in Relation to Herd Vulnerability

Monitoring and vulnerability assessment are closely linked. Figure 13 illustrates the flow of information from monitoring to the vulnerability assessment process, and how the results of the assessment will influence BQCMB recommendations about the actions appropriate for the caribou herds at different vulnerability levels, including type and frequency of monitoring, communication and education priorities, harvest levels and amount and location of commercial land use activities.

4.4 Monitoring Actions and Indicators

Monitoring programs are essential to collect information about caribou (such as herd size, condition of individual animals, productivity and health of the herd), habitat (such as availability of preferred forage species and range condition), harvest levels, and environmental factors that influence caribou numbers and herd health and distribution. In the past the focus of government monitoring programs was primarily on population surveys to assess herd size and trend and obtain information on productivity. More recently, the role of both formal community-based monitoring programs and other contributions of observations and knowledge by caribou harvesters and other community members have received greater recognition and support. In addition, the importance of the natural and human-caused factors that affect caribou and their habitat has received greater attention. Nowadays population surveys are still important, but the overall goal is to obtain a combination of scientific and community information on an array of factors to form the basis for making decisions for caribou conservation and management.

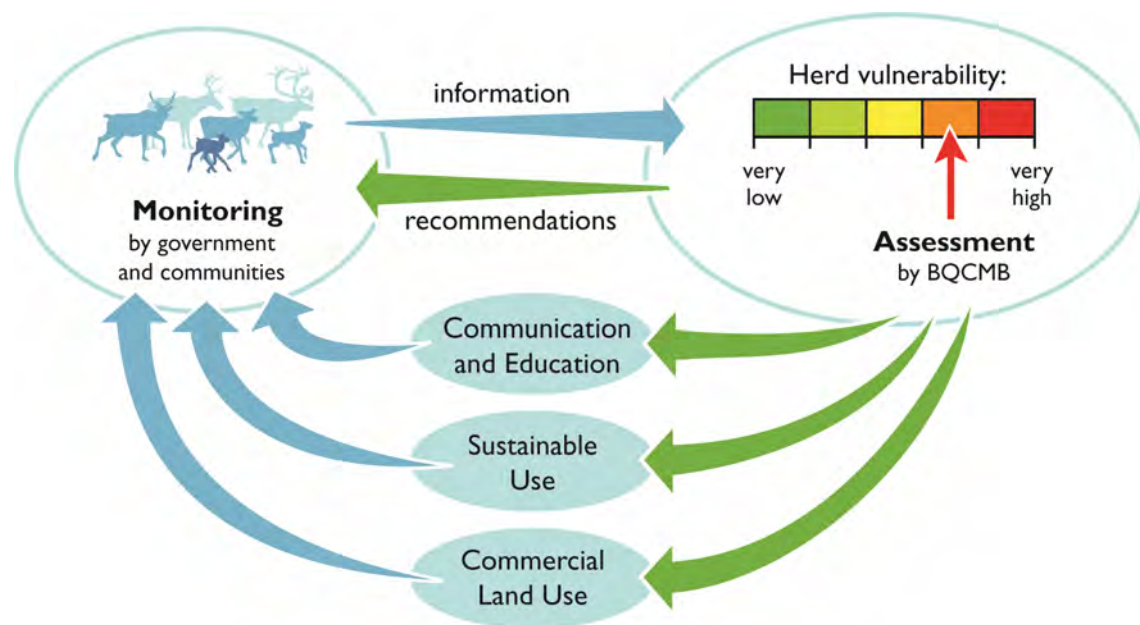


Figure 13. The relationship between monitoring, the BQCM vulnerability assessment and Board decisions and recommendations resulting from the assessment.

Regular population monitoring by means of surveys and tracking movements of radio-collared caribou by satellite are essential contemporary tools for determining the population status and trend and range use patterns of herds. Indicators can be used to monitor abundance and trend in periods between the more intensive and expensive population estimates, provided that indicators are calibrated with regular and precise population estimates. Accurate caribou population data, complemented by information about indicators of caribou population health and range condition, are key components for the Board to make credible and responsible management decisions and recommendations.

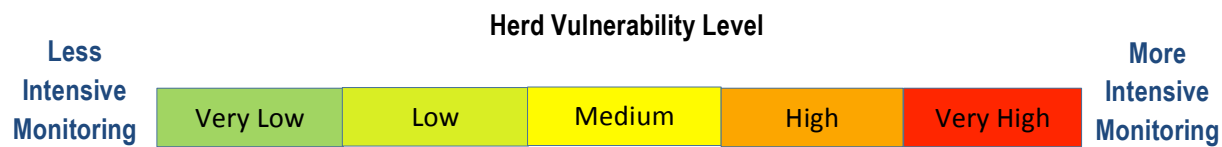
The BQCM has identified nine key categories of monitoring indicators and actions that represent the minimum monitoring requirements necessary to provide essential information for use in making decisions about conservation and management of the Beverly and Qamanirjuaq herds (Fig. 12). Monitoring and research activities are described in Appendix 8.

The BQCM acknowledges that information from additional monitoring activities and research programs could improve the Board's ability to provide useful management recommendations to governments and communities in a timely fashion. Therefore the Board strongly encourages additional monitoring, scientific research, and incorporation of local and traditional knowledge from caribou range communities where possible.

There is no certainty that monitoring of indicators, surveys or other research will identify the causes of population declines, as those causes are likely to be many and complex. However, all available information from surveys and indicators, in combination with local and traditional knowledge about the caribou herds, will provide the basis for recommendations made by the Board about needed management actions and conservation measures in relation to the vulnerability level of the herds.

4.5 Monitoring Intensity

The type and intensity of monitoring required to assess overall herd health depends in part on the vulnerability level of the herd. More intensive monitoring of many herd characteristics (such as size, trend and productivity) is required for herds at high or very high vulnerability, while less frequent monitoring of those characteristics is required when herds are at low vulnerability. Monitoring of some factors that affect herd vulnerability (such as weather and harvest) should be monitored frequently regardless of herd vulnerability, however. Figure 14 summarizes the monitoring methods and intensity recommended by the BQCMB for the nine categories of monitoring indicators according to the vulnerability level of the Beverly and Qamanirjuaq caribou herds.



Monitoring			Vulnerability Level				
Object	Method	Intensity	Very Low	Low	Medium	High	Very High
Seasonal Distribution and Range Use	Radio or GPS collars	At least 40 collars/herd	X	X	X	X	X
	Calving ground reconnaissance surveys	Less often (every 5 years)	X	X	X		
		More often (every 2 years or annually)				X	X
	Harvester observations	Every year	X	X	X	X	X
Population Size and Trend	Calving ground reconnaissance surveys	Less often (every 5 years)	X	X	X		
		More often (every 2 years)				X	X
	Calving ground surveys (visual or photographic)	Less often (every 5-6 years)	X	X	X		
		More often (every 3 years)				X	X
Herd Productivity ¹⁹	Spring composition surveys and harvester observations	Less often (3 of 5 years)	X	X			
		More often (4 of 5 years)			X		
		Every year				X	X
Herd Health	Monitoring by government and harvesters of body condition, diseases and parasites	Less often (every 5 years)	X	X			
		More often (every 2nd year)			X		
		Every year				X	X
Harvest	Data and estimates submitted by harvesters, communities	Every year	X	X	X	X	X
Range Quality Quantity and Availability	Various methods for key indicators	Every year	X	X	X	X	X
Predators and Insects	Various methods for key indicators	Every year	X	X	X	X	X
Human-caused Disturbance	Various methods for key indicators	Every year	X	X	X	X	X
Weather and Climate	Various methods for key indicators	Every year	X	X	X	X	X

Figure 14. Recommended monitoring method and intensity in relation to vulnerability level for the Beverly and Qamanirjuaq caribou herds. Recommendations assume monitoring will be done in all categories at required intensity levels; if not, greater investment may be needed in some categories²⁰.

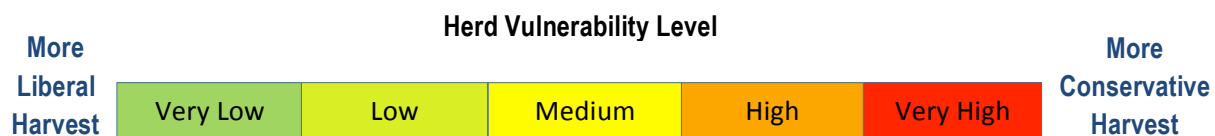
¹⁹ Some monitoring of herd productivity and health will be required annually regardless of a herd's vulnerability level, while frequency of other types of monitoring will depend on vulnerability level.

²⁰ For instance, calving ground reconnaissance surveys every 5 years would not be sufficient with fewer than 40 collared cows even when a herd is at low vulnerability; higher frequency of calving ground surveys would be required.

5 SUSTAINABLE USE OF CARIBOU

Goal 8 of the management plan is “**to strive for the sustainable [wise] use of caribou**”, in which use is defined as hunter harvest, recognizing that there are other uses of caribou.

This section provides information about the importance of caribou harvest across the Beverly and Qamanirjuaq ranges, the value of good harvest information, and the significance of harvest to caribou herds. It describes the BQCMB’s approach to recommending harvest management. In brief, the Board’s main approach is to tie recommended harvest to the herds’ vulnerability assessment, with more conservative harvest options for herds with higher vulnerability and more liberal harvest options for herds with lower vulnerability. The Board continues to place a high emphasis on respectful harvest of caribou, including the need to use all parts of caribou and to minimize wastage.



5.1 Management Context

Harvesters of the Beverly and Qamanirjuaq caribou herds in the past and today are predominantly Aboriginal peoples from about 20 communities on or near the caribou ranges. These harvesters include Inuit, Dene, Cree and Metis peoples in Nunavut, NWT, Saskatchewan, Manitoba, and Alberta. Limited numbers of animals have also been taken by relatively few non-Aboriginal resident hunters and non-resident hunters guided by commercial outfitters. The annual net economic value of the harvest of the two herds for 2005-06 was estimated to be about \$20 million, primarily Aboriginal domestic harvest. Economic and cultural costs for replacement of this important source of sustenance for Aboriginal peoples would be unacceptably high should caribou not be available, requiring substitution by southern foods shipped to caribou range communities.

Historically, if caribou were far from hunter communities dependent on caribou, hardship and sometimes famine resulted. Even in modern times, hardship can result when caribou do not return to areas near communities that people can access for harvesting. Recently caribou have been less accessible in some parts of the NWT, Saskatchewan and Nunavut and hunters have had to travel farther to harvest caribou.

Wildlife managers must always pay close attention to harvest levels in relation to the size and trend of caribou herds, but the relative importance of harvest increases as the herd declines. Experience has shown that a substantial harvest from herds that are declining and/or that reach very low numbers can accelerate a decline and make recovery difficult. Under these conditions, reliable monitoring of harvest is critical and harvest management may be necessary to prevent more serious continuing decline, allow for recovery and provide for current and future generations of hunters.

5.2 Uses of Caribou²¹

Management actions should always strive to ensure that caribou are accessible to people from the caribou range communities, and that the opportunity to harvest caribou remains part of their future. The use of caribou for food is recognized and accepted by the BQCMB as the most important use category that must not be threatened by other kinds of uses, including trophy hunting and other commercial uses.

An objective under Goal 8 of this Plan is to “Encourage governments to develop a harvest management plan that considers herd status and sustainability”, which will be based on Aboriginal and Local Knowledge as well as scientific knowledge (as directed by Goal 1). In the absence of such a plan, the BQCMB will continue to make harvest management recommendations following the Board’s priority of use categories for the allocation of caribou harvest. In descending order of priority, these categories are:

1. Traditional users - for domestic use
2. Resident users - for domestic use
3. Traditional or resident users - when guiding non-resident hunters
4. Local use - for commercial purposes
5. Export use - for commercial purposes

Caribou are used in many different ways. Traditional caribou-using people harvest caribou for food and clothing. They share with family and friends, and sometimes with other communities. Availability of social media and subsidized transportation of freight between communities has recently allowed for barter and trade of caribou in Nunavut at a level that was not previously possible.

Resident hunting is conducted by local non-Aboriginal people or Aboriginal people who do not have traditional harvesting rights in a jurisdiction and who require a special licence. Two types of licenced commercial use can occur: through outfitted and guided non-resident hunts (which has occurred in Nunavut, Manitoba and NWT); and when caribou meat and other parts are processed, inspected and sold to the public (which has taken place in Nunavut and the NWT, but is not currently occurring on the ranges of the Beverly and Qamanirjuaq herds).

5.3 Value of Harvest Information

One of the BQCMB’s responsibilities is to provide a summary of harvests by jurisdiction and community in its annual reports. The ability of the BQCMB to estimate harvest of Beverly and Qamanirjuaq caribou has been limited. Harvest information has historically consisted of annual estimates based on reports of harvest by resident licenced hunters and commercial operations from governments, and reports of Aboriginal domestic harvest from communities. However, there has been no territory- or province-wide systematic recording of Aboriginal harvest. In response to this situation, **Goal 5** of this Plan is “**to monitor the harvest of caribou**”, supported by three objectives for promoting regular harvesting monitoring and developing monitoring methods.

²¹ Definitions of caribou uses are provided in Appendix 2.

Communities need to be provided with information to promote understanding of the value of harvest information in management. Harvest information is required for many purposes, including:

- protecting herds from serious declines
- allowing the Board to recommend harvest allocations
- improving calculations of basic needs levels for communities
- calculating the economic value of caribou
- distinguishing between traditional and non-traditional uses of caribou, and
- enhancing the role and involvement of caribou-range communities in caribou conservation.

Sensitivity and respect are paramount for collecting harvest data from traditional caribou hunters. The Board will continue to support ongoing harvest data collection programs and to promote the value of harvest data to communities as part of its conservation education work (Sec. 7).

The subsistence needs level (SNL) is defined as the total number of caribou required to sustain the basic subsistence needs of traditional hunters harvesting from the Beverly and Qamanirjuaq herds. The total herd size required to sustain the SNL represents a critical level, below which management action may be required. Below this critical level, the Board recognizes that subsistence hunters will experience significant hardship.

5.4 Significance of Harvest to Caribou Herds

A number of factors influence how harvest affects a caribou herd. Key issues are:

- a) the herd's trend (increasing, stable, declining);
- b) harvest level in relation to herd size;
- c) the sex ratio of the harvest (proportion of caribou cows vs. bulls); and
- d) respectful hunting practices.

Harvest & Herd Trend: Increasing herds usually have high calf productivity and high adult survival rates, thus they are best able to withstand substantial hunter harvest. Conversely, herds with a declining natural trend usually have low calf productivity and low adult survival, thus are affected most strongly by the additional mortality of harvest.

Harvest & Herd Size: A relatively constant level of harvest over time can have a greater effect on a smaller herd than on a large stable herd. For example, a harvest of 5,000 caribou from a large and stable herd of 350,000 would likely have relatively little impact on the herd, since the harvest would be a small fraction (just over 1%) of the total number of animals. However, a harvest of 5,000 from a herd of 50,000 would be 10% of the herd, and would have a much greater effect. Harvesting about the same number of animals year after year will have the strongest effect on a smaller herd that is also declining.

Harvest of cows and bulls: Harvest of cows affects herds more strongly than harvest of bulls. Removing a breeding cow takes out the cow, the calf she is carrying, and all future calves she may have produced. Although over-harvesting bulls is also not desirable, a healthy bull can breed many cows in one season, while

each cow carries only one fetus each year. The effect of harvesting a high proportion of cows is strongest for declining herds.

Respectful hunting practices: Respectful hunting generally means fewer caribou are harvested because no more caribou are taken than are needed, all caribou shot are retrieved and all meat from harvested caribou is used.

5.5 Importance of Respectful Harvest of Caribou

The BQCMB has long advocated for respectful caribou harvesting practices that include effective marksmanship to minimize wounding losses, taking only as many caribou as needed, making use of all parts of harvested caribou, reducing harvest when caribou numbers are low, and taking bulls rather than cows when herds are vulnerable. Poor shooting, wastage of meat and harvesting more animals than are needed add to the numbers of caribou killed. Poor handling and storage of caribou parts puts more pressure on the herds, and on communities, which must spend more time and effort securing their supply of caribou. In this Plan, the BQCMB affirms its concern over the wastage of caribou by the poor practices of some hunters and will place a high priority in communication and education programs on educating hunters, particularly younger hunters, about the need to respect caribou and to harvest caribou in respectful ways (see Sec. 7).

5.6 BQCMB Approach to Recommendations on Harvest

The BQCMB's approach to recommending harvest options for caribou is to:

- a) define a size and sex ratio of total acceptable harvest based on the most recent vulnerability assessment for each herd and
- b) compare this to the reported or estimated harvest to assess whether harvest recommendations should be changed.

The Board recognizes that communities and governments must agree there is a problem before harvest restrictions are considered. The size of caribou herds will likely continue to fluctuate over time and harvest recommendations will be based on the herd's vulnerability level, taking herd trend and size into account. If a herd is assessed as highly vulnerable, then more conservative harvest recommendations will be considered. At exceptionally low herd size harvest could be limited to only a very small number of animals for social/ceremonial purposes. In contrast, if a herd is determined to be at a low vulnerability level, particularly at high and increasing numbers, then a more liberal size of harvest and a mixed sex ratio (bulls and cows) would be acceptable. Given how quickly caribou population trend can change, good management will always include monitoring of harvest and caribou herd status.

This approach represents an update on the harvest management recommendations outlined in the previous (2005-2012) BQCMB management plan, which emphasized calculation of Total Sustainable Harvest (TSH) as the total number of animals that can be removed from a population without risk of causing a decline. This approach, applied formally, would mean that no harvest could be taken from a declining herd as there is no sustainable harvest from a declining population. The Board instead recognizes that some harvest from a

declining herd may be considered, provided that the harvest level is determined cautiously and does not substantially increase the risk of more rapid decline compared to a system with no harvest.

The chart in Figure 15 provides a “rule of thumb” guideline approach to assessing an acceptable level of harvest based on the current assessment of a caribou herd’s vulnerability status. These guidelines are based in part on harvest recommendations in previous BQCMB management plans that outlined more liberal either-sex harvest for herds at higher numbers and more conservative bull-focused harvest for herds at lower numbers. It reflects the Board’s harvest allocation priorities for various caribou harvester groups, as well as a number of land claims and treaties protecting subsistence harvesting rights over resident and commercial uses. The chart also draws on harvest management plans or proposed harvest management for other herds²². Harvest modeling specific to individual herds under a particular set of conditions has been carried out for other herds²³ and could be conducted for the Beverly and Qamanirjuaq herds to determine more refined harvest recommendations.

For example, if the Qamanirjuaq herd was assessed as being at medium vulnerability and its size was estimated most recently at 250,000 with good recruitment, a recommended range of harvest would be 2-3% of the herd (5,000-7,500) with a moderate promotion of bull harvest over cow harvest. In this situation the BQCMB might recommend unrestricted Aboriginal harvest, a limited number of resident tags and possibly a small-scale commercial harvest.

Extra caution will be used by the Board when making recommendations about commercial tags due to potential effects on profitable businesses and the livelihoods of all those involved. The BQCMB also recognizes that decisions about resident and commercial harvest will primarily be dictated by land claim agreements and Aboriginal and treaty rights (see Sec. 3.1 Principle 1). The well-being of caribou herds and the traditional users who depend on them will always be the main factors on which the BQCMB bases its harvest recommendations.

²² The Porcupine, George River, Bathurst, Bluenose-West, Bluenose-East and Cape Bathurst herds. Harvest closure at very low numbers has been proposed and in some cases implemented for these herds.

²³ For example, harvest modeling was conducted for the Bathurst herd in 2009 when it was at a size of 32,000 and declining rapidly.


Herd Vulnerability Level		Recommended Acceptable Total Harvest (% of herd)	Recommended Aboriginal Harvest	Recommended Resident Harvest	Recommended Commercial Harvest
Very Low	<div>More Liberal Harvest Options</div>  <div>More Conservative Harvest Options</div>	5 % or higher	Unrestricted, Either Sex Harvest	Limited tags/hunter	Limited commercial tags
Low		3-5 %	Unrestricted, Promote Bull Harvest	Limited tags/hunter	Limited commercial tags
Medium		2-3 %	Unrestricted, Promote Bull Harvest	Limited tags/hunter; possible limit on tags	Either no commercial tags or small numbers of tags
High		<2 %	Promote Conservation, Voluntary Bulls Only Harvest	Limited tags/hunter; possible limit on tags	No commercial tags
Very High		<1 %	Consider Mandatory Bulls Only Harvest	No resident tags	No commercial tags

Figure 15. BQCMB guidelines for determining acceptable level of harvest based on the assessment of a caribou herd's vulnerability. Calculation of acceptable harvest levels will be subject to limitations based on the size of a herd and priority of use categories. When a herd is at a very high vulnerability level, the Board will consider recommending total harvest of 0.01% for social/ceremonial reasons only.

6 COMMERCIAL LAND USE AND CUMULATIVE EFFECTS

The BQCMB and communities are concerned about commercial land use activities occurring across the caribou ranges and the cumulative effects of these activities on the caribou herds (see sidebar). **Goals 7 and 9** of this Plan are “**to ensure adequate amounts of high quality habitat**” and “**to influence commercial land use in a way that protects Beverly and Qamanirjuaq caribou and their habitats**”. These goals include several objectives intended to improve monitoring, assessment and mitigation of land use impacts on caribou and caribou range.

Economic exploration and development activities pose unique concerns when evaluating caribou herd vulnerability. Caribou herds are more resilient to stresses when their vulnerability level is low, especially when herds are larger (but not overabundant) and when herd and environmental conditions result in good calf productivity and adult survival. However, even when caribou are abundant and doing well, it is critical to consider that some activities (e.g., mines, roads) create permanent changes to the landscape, and others (e.g., exploration activities) can create disturbance to caribou as well as the expectation that permanent changes will be allowed in the future. When these activities occur during a period when a herd is increasing, negative impacts may not be evident if they are masked by overall good herd productivity. But when a herd becomes more vulnerable due to a smaller size and/or larger level of stresses acting upon it, permanent landscape changes and disturbance may create additional pressure which can lead to changes in behavior and distribution and reduced productivity.

The Board considers what the long-term impacts of land use activities are and how they will affect the caribou herds throughout the natural cycle of abundance and low numbers, and therefore considers ongoing and proposed commercial land use activities during times when herds are strong and healthy, as well as when they are more vulnerable. The Board believes that the cumulative effects of ongoing and proposed mineral exploration, mining development and roads, along with increasing harvest and the effects of climate change pose a threat to the future of caribou.

Cumulative effects are the combined environmental effects from a series of similar or related activities that accumulate over time and space (Figure 16). This can include the accumulating effects experienced by caribou as they migrate between seasonal ranges and encounter disturbance from multiple exploration and development projects. Another major concern is the addition of effects experienced by caribou from commercial land use activities to effects from other natural and human-caused factors that are causing changes to the landscape, such as wild fires on the forested winter range and climate change across the annual ranges, as well as changes to harvest levels. In addition, impacts from commercial land use also accumulate over time in combination with pressures felt by caribou from other environmental factors, such as disease, parasites, predation and environmental contaminants. Further research and monitoring is needed to assess how these effects interact and what amount or frequency of activities will cause effects to accumulate to the extent that they become harmful to caribou at the individual or herd level.



Figure 16. Cumulative effects and caribou.

6.1 Concerns about Commercial Land Use Activities

Following is a summary of the BQCMB's major areas of concern related to commercial land use activities occurring across the Beverly and Qamanirjuaq caribou ranges: mineral exploration and mining development, roads, and land use activities on calving and post-calving areas.

Mineral Exploration and Mining Development

Mineral exploration and mining developments are the most frequent commercial land use activities on Beverly and Qamanirjuaq caribou range, and have been underway on the southern winter range in northern Saskatchewan for decades. Until recently, however, Beverly and Qamanirjuaq caribou have not had to contend with too many obstacles or human-caused disturbances across the northern part of their range in the NWT and Nunavut. However, increasing interest in extraction of mineral resources from the caribou ranges has become evident over the past decade as mineral tenures were established, junior companies applied for permits and licences to operate exploration programs and establish camps and airstrips, international mining companies applied for permission to establish mines, and caribou range communities experienced an escalation in demand from companies for use of their services. A map showing the recent history of mineral tenures across the caribou ranges is provided in Appendix 4 (Fig. 13).

Ongoing exploration projects and mines and mineral tenures in effect in 2013 within the Beverly and Qamanirjuaq caribou ranges are shown in Figure 3 and Appendix 4 (Figs. 11 and 12). These maps illustrate the increasing potential for new mines and associated developments across the caribou ranges. However, the extent, intensity and location of exploration and development are difficult to anticipate, as they change in response to many factors including global demand for resources, financial support provided by company shareholders and information available about resource potential in newly mapped areas. Mineral tenures

indicate interest in mineral resources in a given area that usually results in some exploration activity but does not necessarily lead to advanced exploration or development of mines.

Activities associated with mineral exploration and mining that have potential negative effects on caribou include frequent low-level aircraft flights (during exploration and development), construction of roads and airstrips, frequent travel by supply trucks on all-weather and winter roads, mine construction and operation, and pollution of land and water by toxic substances. These activities can negatively impact individual caribou and the herd through loss or contamination of habitat; decreased forage quality and availability; increased human access; and disturbance, which can result in changes in behavior and distribution and decreases in energy intake, condition, overall health and productivity.

The possible negative impacts of mineral exploration and mining on caribou are difficult to predict and assess because of variability in: a) factors associated with land use, such as location, timing and frequency of sources of disturbance; b) caribou movements and responsiveness of individual animals; and c) other factors affecting caribou, such as weather. In addition, measurable effects of disturbance and contamination may take a long time to develop. This causes difficulties for assessing the cumulative effects from mining and other land use activities.

Roads

Figure 4 shows existing and currently proposed roads on the caribou ranges. Much of the Beverly and Qamanirjuaq caribou ranges are currently roadless areas. However, the increasing numbers of roads providing greater access to the historic caribou ranges has long been a concern for the BQCMB and other wildlife management boards and communities. Observations by BQCMB members and other people from caribou range communities have determined that roads that have been built over the past few decades have increased unregulated harvest of caribou, acted as barriers to caribou movement, resulted in frequent disturbance, and reduced habitat availability. There is a high potential for greater harvest levels resulting from increased access to caribou range that could be provided by various new roads and those that are currently proposed.

Roads of greatest concern are those that provide easier access to previously remote areas of caribou range for industry and hunters from southern Canada or those that provide easier access to caribou range for large numbers of local hunters. Permanent all-season roads generally have greater potential for negative impacts on caribou than temporary winter roads. The BQCMB recognizes that it is a serious challenge to manage harvest associated with increased access provided by roads into key habitats and migration routes. Restrictions on use of roads built to support exploration and development are very difficult to establish and enforce.

To indicate its ongoing high level of concern about potential impacts of new roads on Beverly and Qamanirjuaq caribou ranges, in November 2011 the BQCMB passed a resolution on roads that stated: “The BQCMB believes that anticipated expansion of road networks associated with development and accessing the caribou ranges in Manitoba, Saskatchewan, Northwest Territories and Nunavut will lead to the demise of mainland migratory caribou herds as known today.”

Land Use Activities on Calving and Post-calving Areas

The potential impacts on caribou and habitat from commercial land use activities occurring on caribou calving and post-calving areas have been a major concern for the BQCMB.

Exploration activities have continued to be permitted in these important habitats, despite clear opposition from the BQCMB and increasingly vocal opposition from caribou range communities and wildlife management boards. Although Caribou Protection Measures are included as conditions in land use permits and licences issued by the federal government and Kivalliq Inuit Association for mineral exploration on the Beverly and Qamanirjuaq calving grounds, the Board believes that the limited protection they provide is not adequate to protect the herds and their habitat from the effects of current and future land use activities (see sidebar).

The Board has therefore taken a position to recommend against exploration and development on Beverly and Qamanirjuaq calving grounds, post-calving areas and key migration routes. This position was described in detail in a BQCMB paper²⁴ distributed widely to governments, regional organizations and caribou range communities in 2004, as well as through recommendations submitted directly to federal and territorial governments and regulatory and land use planning agencies over the following decade. This position has been supported by community and regional organizations from across the caribou ranges during their reviews of proposed projects and draft land use plans.

What are Caribou Protection Measures (CPM)?

CPM are special operating conditions intended to minimize disturbance to Beverly and Qamanirjuaq caribou while they are located on calving grounds and post-calving areas, at designated water crossings, and along migration routes to calving grounds. They were developed in 1978 to place limitations on mineral exploration activities by regulating the timing and type of activities in specific areas, known as Caribou Protection Areas (CPAs), for a specific time period (currently from May 15 to July 15). CPM also apply during this period in areas outside CPAs where caribou calve, as well as during migration and within 5-10 km of designated water crossings. Recently CPM have been applied more broadly across the Kivalliq region of Nunavut.

What are the limitations of CPM? CPM provide limited protection for caribou because they do not protect caribou habitat or regulate mineral development. In addition, the annual monitoring program that was crucial for identifying areas used for calving each year was discontinued in 1990, so CPA boundaries have not been adjusted to account for changing caribou range use patterns. (The Qamanirjuaq CPA covers only about 55% of the herd's calving ground based on known calving locations from 1963 to 2012.) Although CPM have been included in numerous land use permits and licences, compliance with these conditions has not been adequately monitored or enforced.

More details on CPM and their limitations are described in the BQCMB's 2004 position paper. The relative locations of Beverly and Qamanirjuaq calving grounds, CPAs, mineral exploration and development projects, mineral tenures and roads are shown in Figure 17.

²⁴ BQCMB 2004. Protecting Calving Grounds, Post-Calving Areas and Other Important Habitats for Beverly and Qamanirjuaq Caribou. A Position Paper by the Beverly and Qamanirjuaq Caribou Management Board. 31 pp.

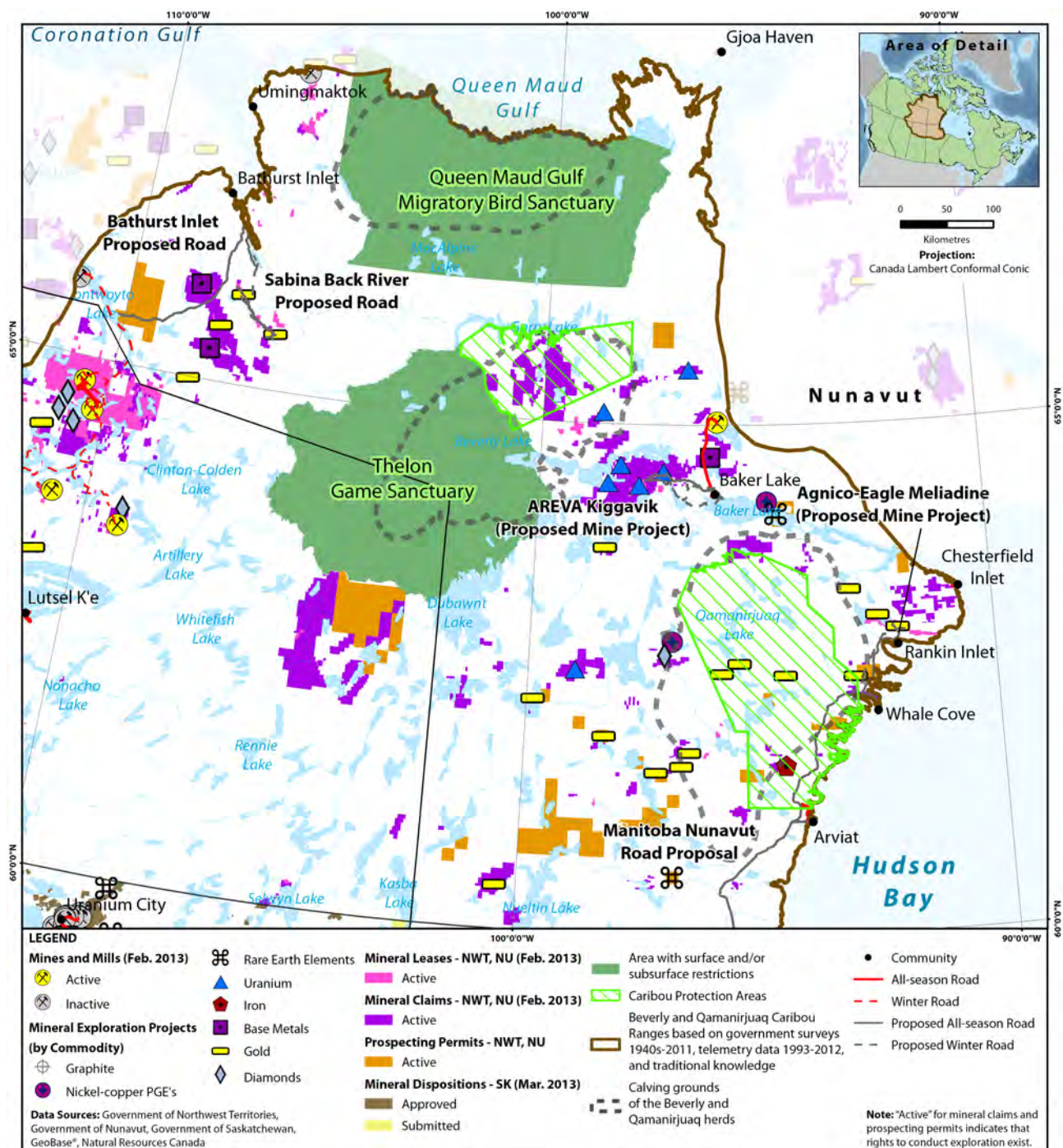


Figure 17. Locations of Beverly and Qamanirjuaq calving grounds and Caribou Protection Areas in relation to ongoing mineral exploration and development projects, current mineral tenures and existing and proposed roads (as of 2013).

The BQCMB tracked the number of mineral tenures (prospecting permits, mineral claims, mineral leases) issued on the Beverly and Qamanirjuaq calving grounds from fall 2005 to spring 2011. During this period many hundreds of tenures were granted by the federal government to numerous companies and individuals, and the number of active tenures steadily increased on the Beverly calving ground south of Garry Lake to a maximum in 2008 of more than 700 tenures, primarily mineral claims. In addition, at least three land use permits were approved for uranium exploration on the Beverly calving ground south of Garry Lake and exploration activity in the region increased the amount of aircraft traffic between the calving ground and the nearest community of Baker Lake. During this period Beverly caribou were documented to have calved about 250 km further north near the Queen Maud Gulf. This movement may have resulted in part from disturbance on the southern calving ground.

From 2005 to 2011, there were numerous mineral tenures in effect on the Qamanirjuaq calving ground at any given time. As well, land use permits were issued for more advanced exploration on the west edge of the Qamanirjuaq calving ground, including construction of an airstrip. The most troubling exploration approvals to date have been those granted in the heart of the Qamanirjuaq calving ground on both Inuit-owned and federal Crown lands in 2012 and 2013, respectively, despite strong objections from the BQCMB, Hunters and Trappers Organizations, Nunavut's regional wildlife boards and the Athabasca Denesuline.

6.2 Management of Land Use Activities on Caribou Range

For the most part, the BQCMB has been reacting to proposals for mineral exploration and mines, roads and other development on the ranges of the Beverly and Qamanirjuaq herds through environmental assessment processes. Due to its limited capacity, the Board has submitted comments to review boards primarily on exploration and development projects proposed on key habitats such as calving grounds, post-calving areas and key migration routes in Nunavut and the NWT. The Board has made a determined effort to raise concerns related to caribou and habitat on numerous occasions over the past decade so that potential impacts to caribou, habitat and harvesters are considered, and has also actively tracked exploration and development activities on the ranges. The BQCMB's input has influenced decision-making for the benefit of caribou, but this influence is limited. Prospecting permits and land use permits continue to be issued for exploration work on these key habitats, including the calving grounds (Figs. 3 and 17; see also App. 4 Figs. 11-13.)

The BQCMB considers potential effects of commercial land use activities, including disturbance and permanent changes to the herds' annual home ranges, in terms of how they may impact the herd over the long-term. It may be appropriate for limitations on some types of land use activities to be stronger when herds are at higher vulnerability and less strong for herds at lower vulnerability, but important habitats always need to be available so long-term habitat needs are met. Management plan objectives under Goal 7 are intended to ensure that adequate habitat will be available to support the caribou herds over the long-term.

The primary tool currently available for regulating land use activities on the Beverly and Qamanirjuaq caribou ranges is the Caribou Protection Measures (CPM), through which land use conditions are issued by the federal government (for federal Crown land) and regional Inuit organization (for Inuit-owned land) that place seasonal restrictions on mineral exploration activities on portions of caribou range in Nunavut (see sidebar). These

measures are intended to reduce potential for disturbance to migrating and calving caribou, but do not provide long-term habitat protection.

Land use planning and establishment of protected areas have the potential to provide some balance between development and conservation of Beverly and Qamanirjuaq caribou habitat, however the planning takes years and is regionally based. There are no land use plans at a scale large enough to take in the entire range of either herd. Little progress toward conservation of caribou habitat has been achieved to date through the Board's past participation in land use planning processes, although there is potential for influencing the ongoing Nunavut land use planning process to address caribou habitat issues.

Existing legislated protected areas and other areas with surface and/or sub-surface restrictions on land use provide variable types and degrees of protection for caribou and portions of the caribou ranges. This ranges from permanent year-round exclusion of exploration and development activities for about 15% of the caribou range, in areas such as the Thelon Wildlife Sanctuary and Wood Buffalo National Park, to limited restriction of certain activities during specified periods in the Caribou Protection Areas. (See map of protected areas: App. 4 Fig. 14.)

Land Use Management Actions to Protect Caribou and Key Habitats

As outlined in the objectives under Goals 7 and 9 of the Plan, the BQCMB will continue to participate in land use planning, protected areas planning and environmental assessment and review processes relevant to Beverly and Qamanirjuaq caribou to recommend that caribou concerns are addressed. The Board will use guidelines to recommend actions for managing commercial land use activities on the caribou ranges to protect caribou and habitat. These guidelines will be reviewed and revised periodically by the Board to incorporate any relevant knowledge that becomes available.

Two objectives under Goal 7 are to "promote protection of key habitats important to caribou" and "support creation of range-wide habitat conservation plans" and assist with their coordination and implementation. Until key habitats are protected and caribou range conservation plans are developed, the Board will apply the following strategies for protecting Beverly and Qamanirjuaq caribou and key habitats. These strategies have been developed based on Board meeting discussions, input from communities, scientific information, the Board's position paper on protecting important habitats and the results of the Board's caribou workshop held in February 2010²⁵.

Calving and post-calving areas:

- 1) Calving grounds should be protected from exploration and development activities. Periodic re-evaluation of recently used calving areas should be conducted for each herd, with provision for protection of calving areas outside traditional ranges (for instance when a herd shifts outside that area).

²⁵ BQCMB 2011. BQCMB Caribou Workshop February 2010 - Detailed Report: Commentary from Workshop Participants about Challenges Facing the Beverly and Qamanirjuaq Caribou Herds and Some Possible Solutions. 60 pp.

- 2) No new exploration or development activities should be allowed on calving and post-calving areas. No mineral tenures, federal land use permits or Inuit land use licences should be issued on calving and post-calving areas.
- 3) Seasonal shutdown of exploration and mining activities (including roads) should be required as part of established procedures at camps and mines in calving and post-calving areas.
- 4) The federal government should update and improve Caribou Protection Measures to increase their effectiveness for protecting caribou. Mobile Caribou Protection Measures should be considered, based primarily on tracking caribou locations by telemetry using an adequate sample of radio-collars, supplemented by survey flying.
- 5) No-activity buffer zones should be established around caribou during calving and post-calving periods regardless of the vulnerability rating of the herd, and should apply seasonally during other periods when a herd is considered to be highly vulnerable.

Roads:

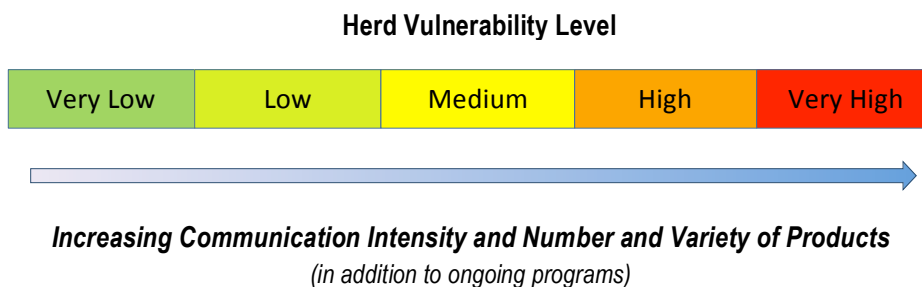
- 6) No new all-season roads should be allowed on the caribou ranges.
- 7) No new winter roads should be allowed on calving and post-calving areas or key migration corridors, and development of new winter roads should be minimized.
- 8) Plans for any new roads to temporary developments should include plans for active de-commissioning, including removal of planned temporary bridges over rivers.
- 9) Developers should be encouraged to limit public access to project-related roads, prohibit hunting from these roads and enforce moderate speed limits for all users (including workers and the public).

Other:

- 10) Enhanced protection of key caribou winter ranges from fire should be recommended when herds are considered to be highly vulnerable, recognizing that fire is a natural part of the ecosystem.
- 11) Periodic cumulative effects assessment of all exploration and development activities in each herd's range should be conducted using the most up-to-date tools, as well as periodic re-assessment of standard land use conditions (e.g., conditions issued in land use permits, licences and project certificates).
- 12) Key seasonal movement corridors (such as near traditional water crossings) should be identified, and roads or other linear corridors that could be potential barriers to caribou movement should be limited in these areas.
- 13) Effective enforcement to assess compliance with land use conditions and monitoring of ongoing commercial land use activities should be conducted to identify effects of activities on caribou and habitats and provide information for adaptive management.

7 COMMUNICATION AND EDUCATION

Communication and conservation education are the responsibilities of all partners involved in conservation and management of the caribou herds. Information needs to flow both ways between local knowledge holders and management agencies for effective communication and education. The BQCMB's communication and conservation education activities will be ongoing, however, they will be particularly emphasized during times when one or both caribou herds are highly vulnerable.



7.1 Communication Plan

The BQCMB's communication priorities for the 2013-22 term have been developed based on past programs and input provided by BQCMB community members and other caribou harvesters from communities across the Beverly and Qamanirjuaq ranges. These community representatives have repeatedly stated that the Board should increase its efforts to communicate with children, youth and hunters about caribou issues and good hunting practices. The BQCMB also recognizes the need to increase awareness and support for the Board and caribou conservation issues among various groups.

The BQCMB's communication activities for 2013-22 will address the following management plan objectives outlined under Goals 1 and 2:

- Strengthen relationships and information sharing processes with organizations that have a mandate for caribou or habitat conservation.
- Increase awareness of caribou issues and the BQCMB by residents of caribou range communities, other northerners, and other Canadians.
- Strengthen support for caribou conservation and the BQCMB from federal and jurisdictional governments.
- Enhance awareness of the BQCMB among governments, including senior government officials.

An effective plan for communication will require consideration of all groups of people who may be interested in conservation and management of the caribou herds and BQCMB activities. A variety of such groups, or audiences, identified by the Board are listed in Appendix 9.

Each audience may desire or require a slightly different method of communication. There are many communication and education tools and techniques, including local radio programs, visits to schools, public meetings, on-the-land gatherings, community workshops, posters, presentations, fact sheets, briefings (e.g., for developers or airlines), media releases and backgrounders, newsletters, websites and on-line social media.

The BQCMB will use tools and tactics appropriate for each intended message and audience, selecting from both traditional communication materials and social media strategies. Appendix 9 provides more details about a variety of communication tactics.

Communication tools and approaches that will be used during the current term will include:

- Updating the website to provide for easier navigation by users and implementation of social media components.
- Continuing to report on management activities through the BQCMB website, news releases, radio and information-sharing meetings.
- Developing posters or fact sheets to promote conservation of caribou with messages that include encouraging participation in monitoring and information-sharing by knowledgeable observers.
- Continuing to distribute the newsletter and other written materials to inform the public about conservation and management of the caribou herds.

The BQCMB's communication plan will describe the tools to be used to reach specific audiences and achieve desired communications goals and will include (at a minimum): communications goals and objectives; audiences to reach; messages to be communicated to the audiences; and tools to reach each audience. The chosen strategies, or communication tools, will allow flexibility and be based on ongoing management activities and available funding. Some of the tools chosen will meet an immediate need, while others will be selected or designed to meet long-term or future communication needs. The Board will assign the tasks to an individual or a team or seek additional support from others (e.g., non-government organizations, industry) as appropriate. Another option is to retain a part-time communications coordinator.

The communication plan will be reviewed annually to define whether the tools are being used effectively. The following benchmarks will also be used to help measure success:

- Information about visitors to the website
- Quality information shared from communities and caribou hunters
- Knowledge about Beverly and Qamanirjuaq caribou and caribou-related issues
- Annual applications for the BQCMB Caribou Research and Management Award
- Commitments to the BQCMB from governments and others
- Feedback survey
- Requests to BQCMB members and staff to attend meetings or present or provide information
- Head count of people who attend meetings
- Number of participants using BQCMB social media sites

7.2 Education Priorities

The BQCMB's educational programs for the 2013-2022 term will use existing resources and build on previous efforts. Some of the main educational programs that the Board has been involved in since its early years are outlined in Appendix 10. In 2009/10 the BQCMB developed educational priorities for helping the Beverly and Qamanirjuaq herds that focused on encouraging hunters to prevent wastage, take only what they need and harvest bulls instead of cows when herds are vulnerable. These priorities were endorsed by participants at the

BQCMB's 2010 Caribou Workshop, which brought together people from communities across the caribou ranges. Workshop participants also recommended that the BQCMB create hunter education programs, have outfitters assist with hunter training, and ask industry to financially support these programs; educate hunters about the importance of reporting wastage to authorities; develop more education campaigns using pamphlets and posters; and educate people about climate change. At other meetings community members have asked the BQCMB to help promote ethical hunting practices in communities and schools using posters, local radio and demonstrations.

Participants at the BQCMB's 2010 Caribou Workshop and community members at other BQCMB meetings have also recommended that the BQCMB educate the mining industry and air charter companies about the impacts on caribou and caribou harvesters from disturbance associated with low-level flights and the impacts of disturbance and access that new roads provide to the caribou ranges.

The BQCMB's primary educational activities for 2013-22 will address the following management plan objectives outlined under Goals 2, 3 and 8:

- Improve understanding of the concept of cumulative effects and potential impacts on caribou
- Increase understanding of the value of harvest information in management
- Increase knowledge of barren-ground caribou ecology
- Improve knowledge of land use on the range and impacts on caribou and their habitats
- Enhance knowledge of cumulative effects on caribou, habitats and caribou harvesters
- Identify and promote use of sustainable hunting practices

The Board's educational priorities will include an increased focus on: issues related to respecting caribou, good hunting practices and preventing wastage; making products available that are appropriate for use in schools; supporting both practical hands-on and academic learning about caribou and conservation issues; and providing information to commercial land users about their potential impacts on caribou, habitats and harvesters, and ways to minimize those impacts.

Education priorities for the current term will include those listed below.

- 1) Increase efforts to educate hunters about the wise use of caribou, with messages that include:
 - The importance of preventing wastage, taking only what they need and harvesting bulls instead of cows when herds are vulnerable.
 - Respect the caribou in uses of the caribou (the way they are harvested) and transfer that respect to younger generations by promoting youth learning from elders.
 - The importance of mentoring young hunters, encouraging good hunting, promoting good practices, and "positive peer pressure".
 - What are good hunting and meat handling practices and how to demonstrate them.
 - The valuable role communities can play in caribou management and conservation.

These efforts will use existing educational resources when they are available, including the BQCMB "Respect Caribou and the Land" poster series and other materials available from other co-management

boards and governments. Some of the key educational resources currently available for use by the BQCMB are listed in Appendix 10.

- 2) Produce a new “caribou comic book” by updating and adapting the 20-page colour caribou information booklet previously produced by the Board, and distributing it to schools across the Beverly and Qamanirjuaq caribou ranges.
- 3) Maintain the “On the Land” funding program to provide opportunities for youth to experience on the land activities and to learn good hunting practices from elders and others.
- 4) Maintain the “Caribou Research and Management Award” in association with the awards program of the Association of Canadian Universities for Northern Studies; continue to prioritize awarding scholarships to students from communities on the Beverly and Qamanirjuaq caribou ranges furthering their education in natural resource management and increase efforts to attract qualified applicants from those communities.
- 5) Work with representatives of the mining industry, other resource developers and aircraft charter companies to increase their understanding of the impacts on caribou of roads and disturbance from low-level aircraft flights, as well as the cumulative effects of these impacts in combination with impacts from other factors affecting the caribou herds and their habitats across the caribou ranges.

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Appendix 1. How This Plan was Developed.

Who Developed the Plan

This management plan (the Plan) was drafted by the Beverly and Qamanirjuaq Caribou Management Board (BQCMB). The members of the Management Plan Committee that conducted initial work on the Plan from February to November 2012 were: board members and alternates Alicia Kelly, Archie Catholique, Jan Adamczewski, Mitch Campbell and Tim Trottier; and BQCMB contract biologist and project coordinator Leslie Wakelyn. The initial committee was subsequently expanded into a working group. Contributions during almost two years of Plan development were made by the following Board members/alternates and staff:

- Jan Adamczewski, alternate member for the Government of the Northwest Territories (NWT)
- Mitch Campbell, member for the Government of Nunavut
- Archie Catholique, member representing Lutsel K'e Dene First Nation
- Florence Catholique, alternate member representing Lutsel K'e Dene First Nation
- Bruno Croft, alternate member for the Government of the NWT
- Earl Evans, BQCMB Chair and member representing the Northwest Territory Metis Nation
- Daryll Hedman, member for the Government of Manitoba
- Alicia Kelly, member for the Government of the NWT
- Dennis Larocque, member representing northern Saskatchewan communities
- Jeff Mercer, member for the Government of Canada
- Ross Thompson, BQCMB Executive Director
- Tim Trottier, member for the Government of Saskatchewan
- David Vetra, alternate member for the Government of Nunavut
- Leslie Wakelyn, contract biologist for the BQCMB.

The working group benefited from the knowledge and experience of many people, including staff of partner organizations. David Lee, of Nunavut Tunngavik Incorporated, assisted production of this Plan in many ways, including facilitating a series of meetings in 2012 and 2013 and contributing valuable ideas and advice. Alison Biese, of Saskatchewan's Public Service Commission, facilitated the first committee meeting in February 2012. Christine Tymchak, of Manitoba Conservation and Water Stewardship, contributed the communication section and conducted initial work on a plain language summary of the Plan, which was further developed by Lynne Bereza and Jim Peters. Nicole McCutchen and Michelle Swallow, of NWT Department of Environment and Natural Resources, provided helpful comments on later drafts of the detailed Plan. Extensive work to create numerous new maps of the caribou ranges was conducted by Caslys Consulting Ltd., coordinated primarily by Alicia Kelly, with assistance from Leslie Wakelyn during the final phase. Creative illustrations were provided by Tanya Handley.

Supplemental funding provided to the BQCMB by the NWT Department of Environment and Natural Resources in 2011/12 –2014/15 supported management plan work, paying for: meeting costs; contracts for project coordination, writing/editing, illustrations, design and mapping; and printing costs. The governments of Manitoba, Saskatchewan, Nunavut and NWT each provided additional support for board member's travel costs for management plan meetings.

Basis of the 2013-2022 Plan

The BQCMB published the first management plan for the Beverly and Qamanirjuaq caribou herds in 1987, and has since reviewed and revised the plan three times. The previous plan was in place for the period 2005-2012. This new Plan is built on a base of knowledge and management approaches established by current and previous board members and staff over the first 30 years of the Board's tenure, and has benefited from the knowledge and experience of many people.

However, much has changed since the last management plan was developed in the early 2000s, and challenges and concerns about the future of the caribou herds have continued to increase. The BQCMB decided that the management plan for 2013-2022 required a new approach that included an emphasis on identifying specific actions that need to be taken to achieve objectives. Another key element of the new approach is basing BQCMB recommendations for monitoring, harvest and land use on regular assessments of the vulnerability level of each herd, to be conducted by the Board.

The new Plan embraces contemporary conservation and management knowledge, techniques and methods available for addressing current conservation challenges that were brought to the Board by current board members and partner organizations. This includes knowledge gained through the ongoing Athabasca Denesuline-GNWT joint caribou monitoring project. Also, in recent years the BQCMB has initiated several activities intended to increase use of all forms of knowledge and involvement of communities in caribou management, including the following:

- *2010 Caribou Workshop.* - In February 2010 the BQCMB held a Caribou Workshop in Saskatoon, Saskatchewan to bring people who value the Beverly and Qamanirjuaq caribou herds together, in a spirit of co-operation, so that they could provide input on ways to conserve the herds. The workshop's 76 participants included elders, hunters, government staff, scientists and others from Saskatchewan, the Northwest Territories (NWT), Nunavut, Manitoba, Alberta, Yukon, British Columbia and Ontario. The Board produced several reports describing workshop presentations, discussions and recommendations that are available on the BQCMB website.

During discussion in small groups, workshop participants identified the main factors they believed were affecting the Beverly and Qamanirjuaq herds and actions needed to aid caribou. Numerous recommendations were made by the BQCMB members and workshop participants for conservation and management of the caribou herds.

- *2011 Information Exchange.* - As follow-up to the 2010 caribou workshop, the BQCMB sent letters to 25 communities and regional Aboriginal organizations across the caribou ranges to provide information about the BQCMB's caribou conservation priorities and actions being taking to address them. The letters also asked what action each organization and community was taking to deal with these issues and what conservation actions they believed should be given high priority.

Although the response rate was low (4/25), the community and regional organizations that responded were in support of the Board's caribou conservation priorities, and were also taking numerous actions that

directly address them. The responding organizations would like to see the Board taking a more active role in areas such as conservation education (for hunters, governments and developers), Traditional Knowledge studies and monitoring of land use activities. They would also like the Board to continue to make recommendations for protection of key habitats, land use planning, best practices for caribou conservation, and harvest allocation and reporting.

The Board used input received through these initiative when developing the current management plan to identify priority actions for working with communities and organizations on common concerns for caribou, caribou habitat, and caribou harvesters.

Stages of Plan Development

Between February 2012 and November 2013 various management plan working group members met in person several times, in association with regular bi-annual board meetings (May and November 2012, November 2013) and in separate multi-day meetings (February 2012, March 2013, June 2013), as well as by conference call. Discussions were guided by facilitators independent of the Board. The outline and direction of the technical version of the Plan was approved in principle by the Board at its regular fall meeting in November 2012. The preliminary draft plan developed by the working group was reviewed by Board members and the Executive Director in April-May 2013, and key issues and draft maps were reviewed by the Board at its regular spring meeting in May 2013. Following revision as per Board direction and further development of content by the working group, the plan was approved at the Board's November 2013 meeting. Work on a plain language summary of the plan was initiated in fall 2013 and continued through to March 2014.

Appendix 2. Abbreviations and Definitions.

Acronyms

AANDC	Aboriginal Affairs and Northern Development Canada (formerly known as DIAND, INAC)
BQCMB	Beverly and Qamanirjuaq Caribou Management Board
CARMA	CircumArctic <i>Rangifer</i> Monitoring and Assessment Network
CPA	Caribou Protection Area
CPM	Caribou Protection Measures
DIAND	Department of Indian Affairs and Northern Development (previously known as INAC; now AANDC)
ENR	Environment and Natural Resources, GNWT
GN	Government of Nunavut
GNWT	Government of the Northwest Territories
INAC	Indian and Northern Affairs Canada (previously known as DIAND; now AANDC)
MVEIRB	Mackenzie Valley Environmental Impact Review Board
NIRB	Nunavut Impact Review Board
NLCA	Nunavut Land Claims Agreement
NWT	Northwest Territories
PCMB	Porcupine Caribou Management Board
SNL	Subsistence Needs Level
WCED	World Commission on Environment and Development

Glossary²⁶

Aboriginal: Canada's Constitution Act, 1982 refers to all Indian, Inuit and Métis people in Canada as Aboriginal people.

Aerial Survey: A set of observations (usually counts) done from the air using fixed wing airplane or helicopter. In wildlife management, they are usually done to get a population estimate, particularly if the animals are spread over a large area. (After GNWT 2009)

Best Environmental Practices: The application of the most appropriate combination of measures, including the most economically feasible, the best available technology, and the best scientific information available, to all stages of the project for the goal of attaining sustainable development. (NIRB 2013)

²⁶ Sources used for definitions are listed at the end of the glossary.

Calving Area, Calving Ground:

- **Annual calving area** - An area used by calving caribou from a specific herd in any one year; often overlaps with annual calving areas used by that herd in other years. (BQCMB 2004)
- **Calving ground** - The total cumulative area known to be used for calving by a particular caribou herd. (After BQCMB 2004)

Caribou Uses:

- **Traditional Users** - Those persons recognized by Aboriginal communities on the caribou range as being persons who have traditionally and currently hunt caribou on that range for subsistence. (BQCMB 2012a)
- **Traditional or Resident Users when Guiding Non-resident Hunters** - When non-residents are outfitted and guided by traditional or resident users selling guided caribou hunts. (After BQCMB 2012a)
- **Resident Users** - Residents as defined by the applicable wildlife legislation and Aboriginal people who do not have traditional harvesting rights in that jurisdiction. (BQCMB 2012a)
- **Local Use for Commercial Purposes** is the harvest of caribou for processing and sale of meat within the Northwest Territories and Nunavut, subject to applicable legislation in these two jurisdictions. (BQCMB 2012a)
- **Export Use for Commercial Purposes** is the harvest of caribou within the Northwest Territories and Nunavut for processing and sale of meat outside the territory in which the harvest occurred, and is subject to applicable legislation. (BQCMB 2012)

Climate Change: A long-term shift in weather conditions measured by changes in temperature, precipitation, wind, snow cover, and other indicators that can involve both changes in average conditions and changes in variability (for example, changes in extreme conditions). Climate change can be caused by natural processes and can also be affected by human activities, particularly burning fossil fuels (coal, oil).

(After www.climatechange.gc.ca/default.asp?lang=En&n=3F11F818-1#wsA11F48BC; accessed 7 Nov 2013)

Collared Caribou: Caribou on which a neck collar has been placed for the purpose of tracking its movements over time by means of telemetry. See also “Radio-collars” and “Telemetry”.

Conservation: Managing and protecting wildlife and habitat to ensure survival of wildlife and healthy ecosystems. (GNWT 2012)

Contaminant: A substance that is found in a place where it should not be. The term is often used to identify types of non-living substances that can be harmful to air, water, land or living things, including plants, animals, and people. (After MVEIRB 2007, GNWT 2009)

Cumulative Effects: Generally, “cumulative effects” are the combined environmental effects from a series of similar or related activities that accumulate over time and space. Definitions used in environmental impact assessment include:

- All the changes to the land, water, air or living things over the years that happened in the past, present or future. (MVEIRB 2007)
- The accumulation of changes to the environment caused by human activities (e.g. past, existing and proposed activities). These changes occur over space and time and can be brought about by environmental effects that are additive or interactive. (After NIRB 2013)

Cumulative Impacts: Impacts on the biophysical and socio-economic environment that result from the incremental effects of a development when added to other past, present, and Reasonably Foreseeable Future Developments, regardless of what agency or person undertakes such other developments. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (NIRB 2013)

Disturbance: Any activity that interrupts the regular behaviour and routines of animals. Caribou response depends on the type and extent of the disturbance and where and when it occurs. (After Gov. Yukon 2010)

Ecosystem: A community of interacting biological organisms and their chemical and physical environment.

Environmental Assessment: Examination of a proposal for a development to systematically consider its potential effects on the environment (After MVEIRB 2004); specific assessment processes have been developed in each jurisdiction and are administered by governments and review boards.

Habitat: Any part of the environment upon which an organism depends, including all of the land, water and air that they inhabit, cross or utilize at any time and resources that provide food, water or shelter (After BQCMB 2012b, GNWT 2009)

Indicator: Monitoring of indicators over time is used to track the state of environmental components (such as caribou). Indicators may be either general or specific, and should be measurable, practical and sensitive, among other characteristics.

Mitigation Measure: A method used to control, reduce, eliminate or avoid an adverse impact of a development on the environment. (After MVEIRB 2004, 2005)

Monitoring: A consistent method of measuring or watching something to detect changes, using scientific or traditional knowledge; keeping track of changes that are happening to the land, water, air or living things. (MVEIRB 2005, 2007)

Radio-collars, Satellite Collars: Radio-collars are used to study the movements, habitat use and survival rates of individual animals. The first radio-collars sent signals from collared animals that could only be detected at short range, so needed to be re-located (usually from aircraft) for every animal location, which occurred periodically. A satellite collar is a more modern type of radio-collar that sends signals to satellites and then to receivers on the ground on a regular schedule, so the movements of collared animals can be tracked consistently from very remote areas. (After GNWT 2009) See also “Collared Caribou” and “Telemetry”.

Range: A caribou herd’s range includes all the area covered in the yearly movements and activities of all the animals in the herd over many years. (After GNWT 2009)

Reasonably Foreseeable Future Developments: Those future projects or activities which are currently under regulatory review or will be submitted for regulatory review in the near future, as determined by the existence of a proposed project description, letter of intent, or any regulatory application filed with an Authorizing Agency. (NIRB 2013)

Recruitment : Occurs when young animals in a herd survive to one year old and are then added to the adult population. (After GNWT 2009)

Sustainable Development: Development that meets the needs of the present generation without compromising the ability of future generations to meet their needs. (WCED 1987, NIRB 2013)

Telemetry: A technology that allows the remote measurement and reporting of information such as the location of caribou. The word is derived from Greek roots tele = remote, and metron = measure. (GNWT 2009) See also “Radio-collars”.

Traditional Knowledge:

- Cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission. (NIRB 2013)
- Knowledge and values which have been acquired through experience, observations, from the land or from spiritual teachings, and handed down from one generation to another. (GNWT 2005)

Inuit Qaujimajatuqangit - Inuit Traditional Knowledge and guiding principles of Inuit social values including: respecting others, relationships, and caring for people; development of skills through practice, effort and action; working together for a common cause; fostering good spirits by being open, welcoming, and inclusive; serving and providing for family and/or community; decision making through discussion and consensus; being innovative and resourceful; and respect and care for the land, animals and the environment. (NIRB 2013)

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WCED 1987. *Our Common Future*.

Appendix 3. Beverly and Qamanirjuaq Caribou Management Agreement, 2012-2022.

Beverly and Qamanirjuaq Barren Ground Caribou Management Agreement

THIS AGREEMENT made on the 1st day of April 2012 BETWEEN:

THE GOVERNMENT OF CANADA, as represented by the Minister of Aboriginal Affairs and Northern Development Canada

(hereinafter referred to as “Canada”);

and

THE GOVERNMENT OF MANITOBA, as represented by the Minister of Conservation and Water Stewardship

(hereinafter referred to as “Manitoba”);

and

THE GOVERNMENT OF SASKATCHEWAN, as represented by the Minister of Environment (hereinafter referred to as “Saskatchewan”);

and

THE GOVERNMENT OF THE NORTHWEST TERRITORIES, as represented by the Minister of Environment and Natural Resources (hereinafter referred to as “Northwest Territories”);

and

THE GOVERNMENT OF NUNAVUT, as represented by the Minister of Environment (hereinafter referred to as “Nunavut”)

WHEREAS the Beverly herd and Qamanirjuaq herd of barren ground caribou historically migrate across and within provincial and territorial boundaries;

AND WHEREAS the continued well-being of these herds requires coordinated management, goodwill and co-operation amongst the above governments and the TRADITIONAL USERS of these caribou;

AND WHEREAS the parties hereto recognize that, as well as the value of the caribou to all Canadians generally, a special relationship exists between TRADITIONAL USERS and the caribou, worth more than \$15 million annually in subsistence value alone;

AND WHEREAS trends in population size and herd movements require coordinated information and project management among governments, communities, industry, organizations and other stakeholders;

NOW THEREFORE THIS AGREEMENT WITNESSETH that the parties hereto under the authority of:

(a) The Northwest Territories Act (1985), The Nunavut Act (1993);

(b) The Manitoba Wildlife Act - section 84;

(c) The Saskatchewan Wildlife Act - section 9;

(d) The Northwest Territories Wildlife Act - section 27;

(e) The Nunavut Wildlife Act – section 175 (1)

agree that:

A. Definitions In this Agreement:

1. "Beverly herd" means that complex of barren ground caribou which utilizes range in Nunavut, the Northwest Territories, Saskatchewan and Manitoba, gives birth to its young near Beverly Lake and the Queen Maud Gulf area in Nunavut, and historically migrates into the Northwest Territories, Saskatchewan and Manitoba.
2. "Qamanirjuaq herd" means that herd of barren ground caribou which utilizes range in Manitoba, Saskatchewan, the Northwest Territories and Nunavut, traditionally bears its young near Qamanirjuaq Lake in Nunavut and historically migrates into Saskatchewan, Manitoba and the Northwest Territories.
3. "TRADITIONAL USERS" means those persons recognized by communities on the caribou range as being persons who have traditionally and currently hunted caribou for subsistence.
4. "HABITAT" means the whole or any part of the biosphere upon which the Beverly and Qamanirjuaq caribou herds depend, including all of the land, water and air that they inhabit, cross or utilize at any time.
5. "Complex" means an aggregation of caribou that could potentially include females from more than one herd sharing use of a calving area.

B. The Beverly and Qamanirjuaq Caribou Management Board

1. A joint management board shall be maintained to be known as the Beverly and Qamanirjuaq Caribou Management Board, hereinafter referred to as the "Board," having the following objectives:
 - (a) to co-ordinate management of the Beverly and Qamanirjuaq herds in the interest of TRADITIONAL USERS and their descendants, who are residents on the range of the caribou, while recognizing the interest of all Canadians in the survival of this resource;
 - (b) to establish a process of shared responsibility for the monitoring of the herds and for the development of management programs between the parties hereto and the TRADITIONAL USERS of the Beverly and Qamanirjuaq herds;
 - (c) to establish and enhance communications amongst TRADITIONAL USERS, between TRADITIONAL USERS and the parties hereto, and amongst the parties hereto in order to ensure coordinated caribou conservation and caribou HABITAT protection for the Beverly and Qamanirjuaq herds;
 - (d) to discharge the collective responsibilities for the conservation and management of caribou and caribou HABITAT within the spirit of this Agreement.
2. Support shall be provided by the parties hereto to the Board in its efforts to achieve coordinated management of the Beverly and Qamanirjuaq herds by responding promptly to recommended measures.

C. Board Responsibilities

Without restricting the generality of clause B of this Agreement, the parties agree that the Board shall have the following duties and responsibilities:

1. To develop and make recommendations to the appropriate governments and to the groups of TRADITIONAL USERS for the conservation and management of the Beverly and Qamanirjuaq herds of barren ground caribou and their HABITAT in order to maintain the herds, as far as reasonably possible, at a size and quality which will sustain the requirements of TRADITIONAL USERS. Such recommendations may include, but are not necessarily limited to:
 - (a) limitations on the annual harvest of the Beverly and Qamanirjuaq herds and the allocation of that harvest amongst the Northwest Territories, Nunavut, and the provinces of Saskatchewan and Manitoba.
 - (b) criteria for regulating the methods of harvest.
 - (c) methods of TRADITIONAL USER participation to assist in the management of the Beverly and Qamanirjuaq caribou herds.
 - (d) caribou research proposals.
 - (e) recommended standardized data collection and presentation.
 - (f) a herd management plan for the Beverly and Qamanirjuaq herds which will include consideration of traditional knowledge, where available; and will take into account the maintenance of the natural balance of ecological systems; the protection of wildlife HABITAT; and the maintenance of vital, healthy wildlife populations capable of sustaining lawful harvesting needs.
 - (g) plans, processes and permit conditions for land use and human activities on the ranges.
2. To monitor caribou HABITAT over the entire ranges of the Beverly and Qamanirjuaq herds so as to facilitate the maintenance and protection of productive caribou HABITAT.
3. To conduct an information program and hold such public meetings as are necessary to report on and discuss with TRADITIONAL USERS its responsibilities, findings and progress.
4. To assess and report on the operation of its herd management plan to appropriate governments and TRADITIONAL USER groups.
5. To submit to the parties hereto annual reports which shall include:
 - (a) a summary of Board activities, recommendations and responses by governments and TRADITIONAL USERS.
 - (b) a review of the state of the Beverly and Qamanirjuaq caribou herds and their HABITAT.
 - (c) a summary of harvests by jurisdiction and community.
 - (d) a financial statement for the operation of the Board.
6. To consider any other matters respecting the management of barren ground caribou that are referred to the Board by the parties hereto or Board members. The Board may also consider any other matters respecting

the management of the Beverly and Qamanirjuaq herds referred to the Board by any other person or organization.

D. Membership of the Board

1. Up to fifteen members shall be appointed to the Board as follows:

- (a) The Minister of Aboriginal Affairs and Northern Development, Government of Canada; The Minister of Conservation and Water Stewardship, Government of Manitoba; the Minister of Environment, Government of Saskatchewan; the Minister of Environment and Natural Resources, Government of the Northwest Territories; and, the Minister of Environment, Government of Nunavut and, each shall appoint one senior official from their respective ministries for a total of five members.
- (b) The Minister of Conservation, and Water Stewardship, Government of Manitoba, shall appoint two residents from the communities of Northern Manitoba for a total of two members.
- (c) The Minister of Environment, Government of Saskatchewan, shall appoint two residents from the communities of Northern Saskatchewan for a total of two members; and, may appoint a third resident from the communities of Northern Saskatchewan.
- (d) The Minister of Environment and Natural Resources, Government of the Northwest Territories, shall:
 - (i) where recommended by the Akaitcho Government, appoint one resident from the community of LutselK'e Dene First Nation, Northwest Territories.
 - (ii) where recommended by the Métis Nation of the Northwest Territories, appoint one resident from the communities in the South Slave Region of the Northwest Territories; for a total of two members.
- (e) The Minister of Environment, Government of Nunavut, shall, where recommended by the Kivalliq Wildlife Board, appoint two residents from the communities in the Kivalliq region of Nunavut and may appoint a third resident from the communities of the southern Kivalliq region of Nunavut.

2. The members of the Board shall be appointed for a term of five years, subject to the right of the parties to terminate the appointment of their respective appointees at any time and reappoint Board members in accordance with the above.

E. Board Rules and Procedure

1. The Board shall establish in writing from time to time rules and procedures for its functioning, provided however that:
- (a) the Chair and Vice-Chair shall be elected from amongst the members of the Board by secret ballot.
 - (b) the election and replacement of the Chair and the Vice-Chair shall be by simple majority.
 - (c) thirty days notice of meeting shall be given by mail, telephone, fax or e-mail, as appropriate.
 - (d) eight members shall constitute a quorum.

- (e) decisions of the Board shall be by consensus wherever possible, and shall always require a majority voting in favour, with each member having one vote.
- (f) no voting by a proxy shall be allowed.
- (g) the Board shall hold formal meetings twice yearly or more often as necessary at the call of the Chair.
- (h) the Board shall keep summary minutes and records of all its meetings and circulate them amongst its members.
- (i) the Board may establish or dissolve standing committees as it deems necessary to carry out its functions, and set the terms of reference for such standing committees.
- (j) the Board members unable to be present at Board meetings shall receive notice of Board recommendations thirty (30) days in advance of submission to any minister for action, except where there is consent of all Board members in which case recommendation to the Minister(s) can be made forthwith.

F. Finances

1. Subject to the terms and conditions of this Agreement and to funds being appropriated by the legislative authority in respect of each party on an annual basis, the parties hereto shall annually provide funds necessary to ensure the Board functioning in a manner herein before stated provided, however, that all costs for the Board shall not exceed \$125,000.00 annually and that all such annual costs shall be shared equally amongst the parties to this Agreement in accordance with section F-2 below. In extraordinary circumstances, if a party is unable to provide costs beyond \$15,000.00 annually, such party shall provide in-kind services or support not to exceed \$10,000.00, to assist with duties, responsibilities and annual expenditures in Sections C and F-3 below, provided that a majority of the parties and the Board approve, such understanding to be confirmed in writing.
2. Prior to the administrative costs for the Board being eligible to be shared by the parties hereto, the Board shall be required to submit to each party an annual estimate of the financial administrative costs, not exceeding \$125,000.00 in each year, and each party shall in writing within thirty days of receipt thereof, indicate its approval or disapproval for such budget and provide reasons therefore. In the event that a majority of the parties hereto approve the annual budget for the administrative costs, the budget shall be shared equally by all parties hereto.
3. Administrative costs to be shared amongst the parties hereto shall include expenditures related to:
 - (a) a secretariat to provide for and follow up on meetings, record and distribute minutes, provide members with informational support, maintain the operation of the Board between meetings, and undertake such other organizational arrangements as the Board may require.
 - (b) the production of an annual report and its distribution.
 - (c) a modest independent research review capability.

(d) the production and distribution of a newsletter, other informational and educational material, and production and maintenance of a website.

(e) such other costs as the parties may agree upon.

4. Each party shall be responsible for funding the expenses for salaries or honoraria and other incidental travel expenses, including transportation, meals, accommodation related to Board members appointed or confirmed by that party. The provisions for said expenses shall be in addition to the annual administrative costs provided in section F-1 above.
5. The Board shall annually account for all monies received and disbursed and said records shall be available to any of the parties for inspection upon thirty days written notice to the Chair.

G. General

1. All reports, summaries or other documentation prepared or otherwise completed under the terms of this Agreement shall become the joint property of all parties hereto and any and all income derived there from shall be jointly shared amongst the parties in proportion to expenditures incurred by each party in generating such income.
2. The parties are committed to taking all actions under this Agreement in a way that respects any Treaty or Aboriginal rights of Aboriginal peoples relating to the hunting of Beverly and Qamanirjuaq barren ground caribou.
3. This Agreement shall take effect on the 1st day of April, 2012, and shall terminate on the 31st day of March, 2022, unless sooner terminated, for any reason, by any of the parties hereto upon six month's notice in writing to the other parties.
4. In recognition of the importance of the Beverly and Qamanirjuaq herds and their HABITAT, the withdrawal of any of the parties from this Agreement shall not preclude the remaining parties from continuing with the objectives and processes set out in this Agreement.
5. This Agreement may be amended at any time by an exchange of letters following unanimous approval by the parties hereto.
6. This Agreement supersedes the Beverly-Qamanirjuaq Barren Ground Caribou Management Agreement made between Canada, Manitoba, Saskatchewan, the Northwest Territories and Nunavut on the 1st day of April, 2002.

Appendix 4. Maps of the Beverly and Qamanirjuaq Caribou Ranges²⁷.

*List of Maps*²⁸

Annual Caribou Ranges

- Figure 1. Beverly and Qamanirjuaq caribou ranges (2012) and changes from BQCMB 2000 Map Atlas.
- Figure 2. Beverly and Qamanirjuaq caribou ranges with 1993-2012 range based on telemetry of caribou cows.
- Figure 3. Beverly and Qamanirjuaq caribou ranges showing relative Beverly and Qamanirjuaq caribou density based on telemetry (1993-2012).
- Figure 4. Beverly and Qamanirjuaq caribou ranges showing relative Beverly caribou density based on telemetry of collared cows (1996-2012).
- Figure 5. Beverly and Qamanirjuaq caribou ranges showing relative Qamanirjuaq caribou density based on telemetry of collared cows (1993-2012).

Seasonal Caribou Ranges

- Figure 6. Beverly and Qamanirjuaq caribou calving grounds based on surveys (1957-2011) and telemetry of collared cows (1993-2012).
- Figure 7. Beverly caribou spring migration range based on telemetry of collared cows (1996-2012).
- Figure 8. Beverly caribou fall migration range based on telemetry of collared cows (1996-2012).
- Figure 9. Qamanirjuaq caribou spring migration range based on telemetry of collared cows (1993-2011).
- Figure 10. Qamanirjuaq caribou fall migration range based on telemetry of collared cows (1993-2011).

Land Use on the Caribou Ranges

- Figure 11. Exploration and development projects within the Beverly and Qamanirjuaq caribou ranges in 2013.
- Figure 12. Mineral tenures and development (mines, mills, roads and rail lines) within the Beverly and Qamanirjuaq caribou ranges in 2013.
- Figure 13. Mineral tenure history and development to 2013 within the Beverly and Qamanirjuaq caribou ranges.
- Figure 14. Protected areas and other areas with restrictions on land use within the Beverly and Qamanirjuaq caribou ranges in 2013.

Ecozones and Ecoregions of the Caribou Ranges

- Figure 15. Ecozones and ecoregions within the Beverly and Qamanirjuaq caribou ranges.

²⁷ Higher resolution maps can be viewed at <http://www.arctic-caribou.com/maps.html>

²⁸ Information about the maps and map references are provided below.

Information about the Maps

Spatial analyses and mapping were conducted by Caslys Consulting Ltd. using ArcMap and ArcMap's Spatial Analyst extension between February 2013 and March 2014 under contract to the BQCMB. Following is a simplified summary of the data and methods used. For details see Caslys (2014).

Data used:

- Data layers used to create the maps and their sources are listed in Caslys (2014) under the following categories: base data, protected areas, caribou data, development and wildfire history.
- Data layers describing distribution and range use of caribou were obtained from the BQCMB (2000) Map Atlas, GNWT - Department of Environment and Natural Resources (ENR) and GN - Department of Environment (DOE).
- Information about land use occurring across the caribou ranges was obtained from Aboriginal Affairs and Northern Development (AANDC) and the governments of Manitoba and Saskatchewan.
- Protected areas boundaries were obtained from Natural Resources Canada, GNWT - ENR, GN- DOE and the governments of Manitoba and Saskatchewan.
- Wildfire history data were provided by GNWT - ENR.

Methods:

- Maps showing relative caribou density were created using a grid-based density approach, in which a 10km x 10km grid was applied across the caribou range, the number of collared caribou locations in each cell was counted, and cells with similar values were grouped.
- Seasonal range maps created using telemetry data were based on caribou life cycle periods described in the BQCMB Map Atlas (BQCMB 2000). Seasons for maps included in this Plan were defined as:
 - o Spring migration: 16 March to 25 May
 - o Calving: 26 May to 25 June
 - o Fall migration: 16 September to 31 OctoberDistribution maps for other seasons can be produced from the data but are not included in this Plan.
- Spring and fall migration corridors were mapped using data for individual collared cows (and migration start and end dates) analyzed in combination with yearly migration corridors for each herd to determine relative use of areas during the migration period.

Map References:

BQCMB 2000. Protecting Beverly and Qamanirjuaq caribou and caribou range - Part 2: Map atlas and documentation. Available on-line at: www.arctic-caribou.com/

Caslys 2014. Beverly and Qamanirjuaq Caribou Management Board 2013-2022 Management Plan - Spatial Analyses Summary Report. Submitted to Beverly and Qamanirjuaq Caribou Management Board by Caslys Consulting Ltd., Saanichton BC. March 2014. 8 pp. + Appendix.

Timoney, K.P., G.H. La Roi, et al. 1992. The high subarctic forest-tundra of northwestern Canada: position, width, and vegetation gradients in relation to climate. *Arctic*, 45(1):1h 9.
www.aina.ucalgary.ca/scripts/minisa.dll/144/proe/proarc/se+arctic,+v.+45,+no.++1,+Mar.+1992,*?COMMANDSEARCH

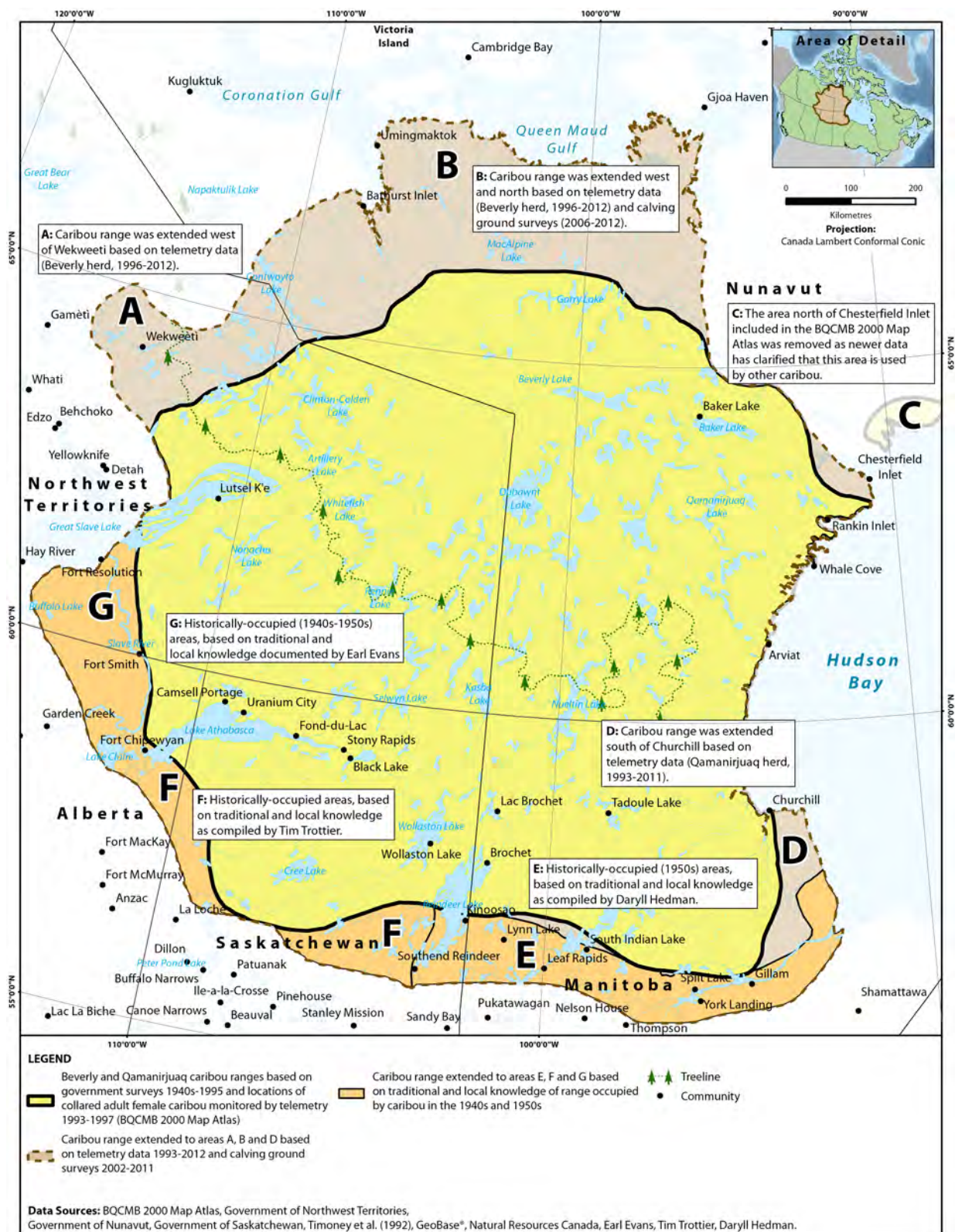


Figure 1. Beverly and Qamanirjuaq caribou ranges (2012) and changes from BQCMB 2000 Map Atlas.

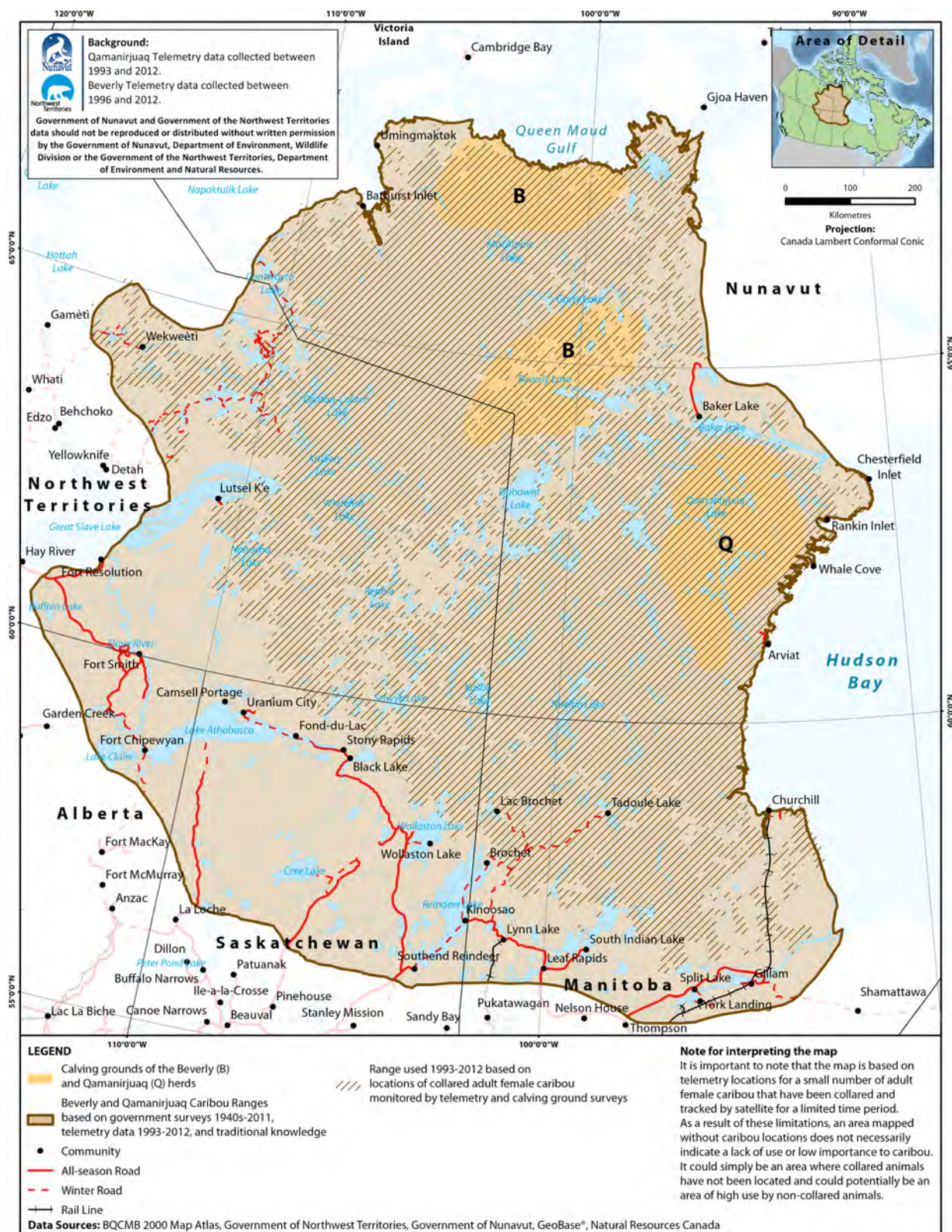


Figure 2. Beverly and Qamanirjuaq caribou ranges with 1993-2012 range based on telemetry of caribou COWS.

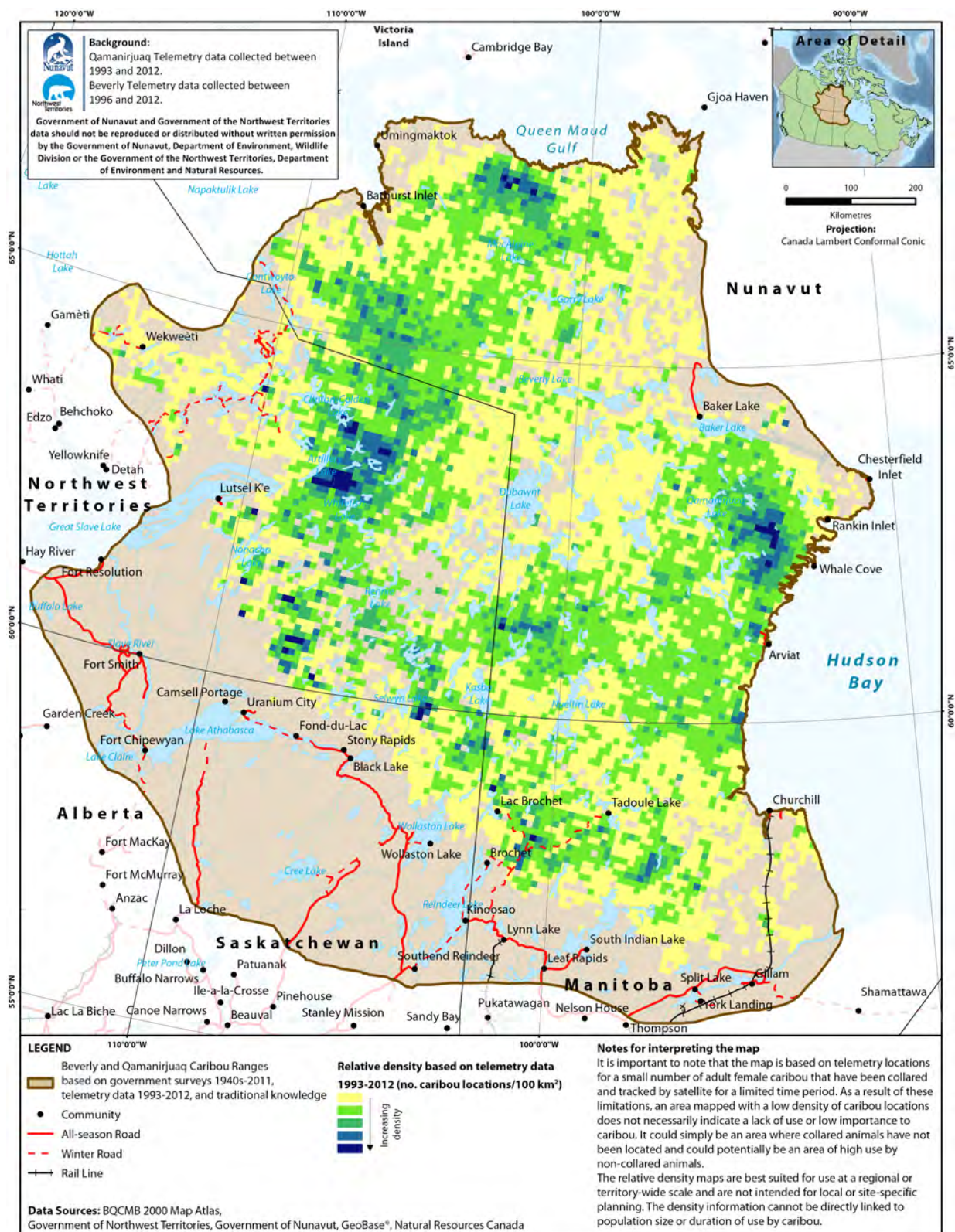


Figure 3. Beverly and Qamanirjuaq caribou ranges showing relative Beverly and Qamanirjuaq caribou density based on telemetry of caribou cows (1993-2012).

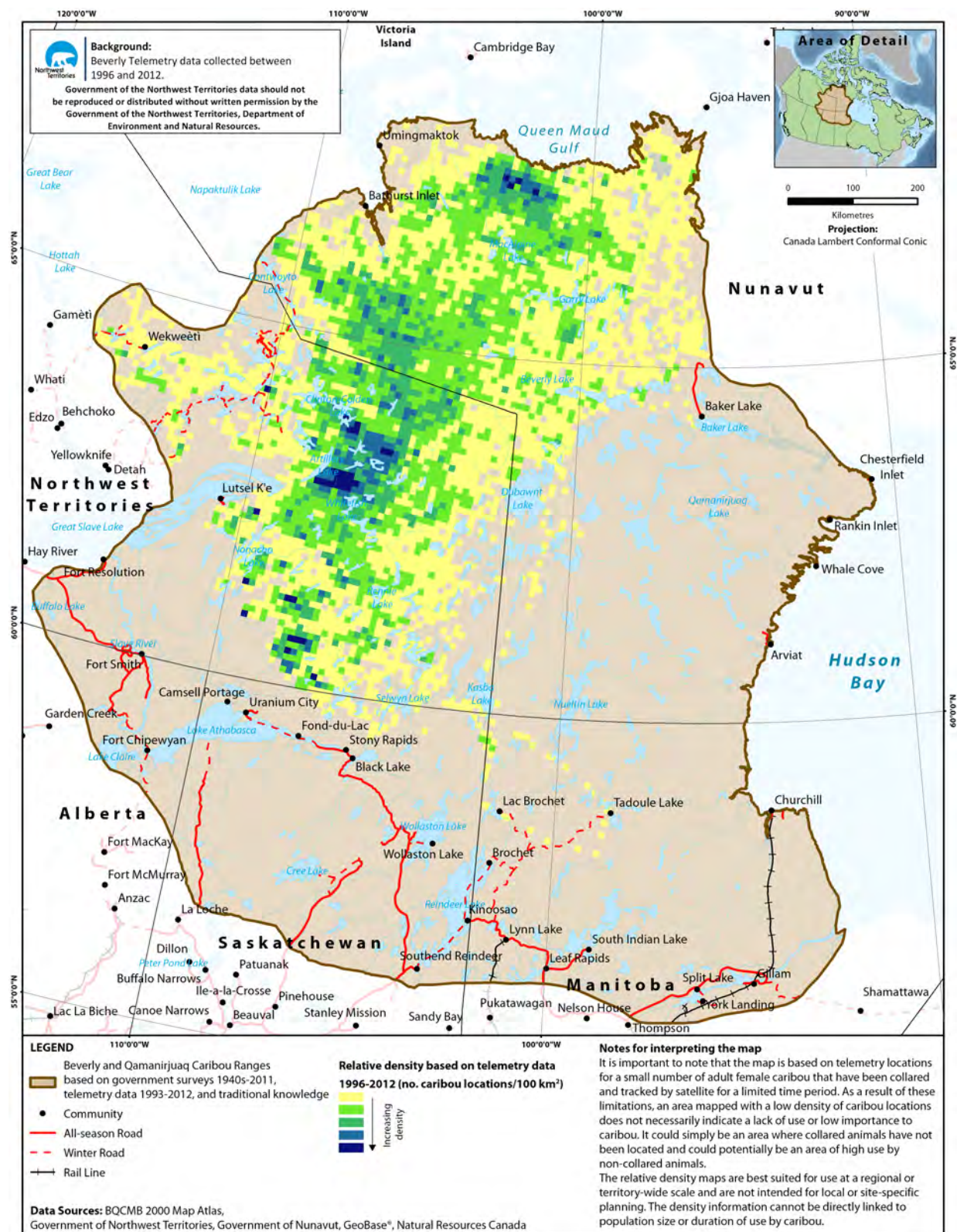


Figure 4. Beverly and Qamanirjuaq caribou ranges showing relative Beverly caribou density based on telemetry of caribou cows (1996-2012).

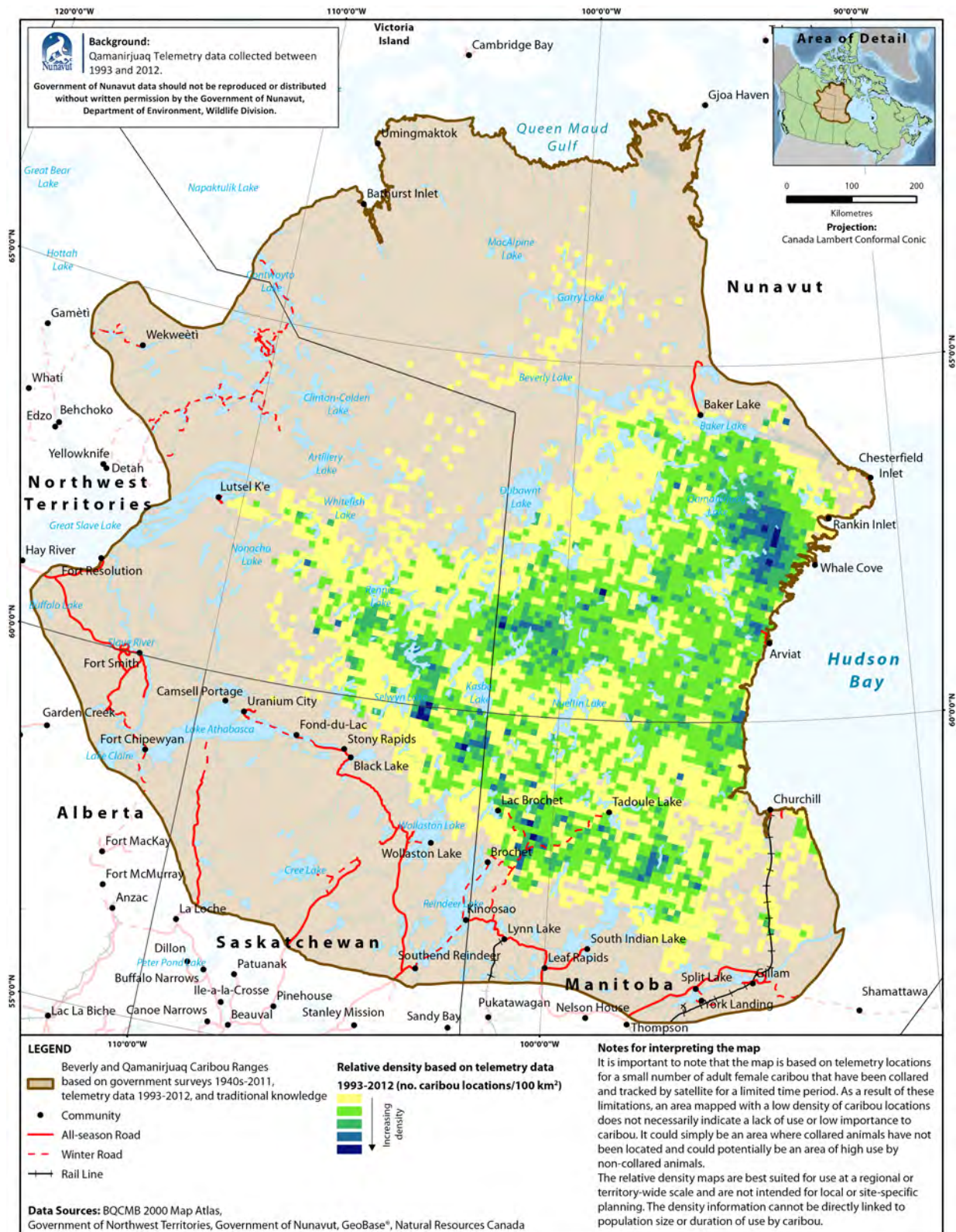


Figure 5. Beverly and Qamanirjuaq caribou ranges showing relative Qamanirjuaq caribou density based on telemetry of caribou cows (1993-2012).

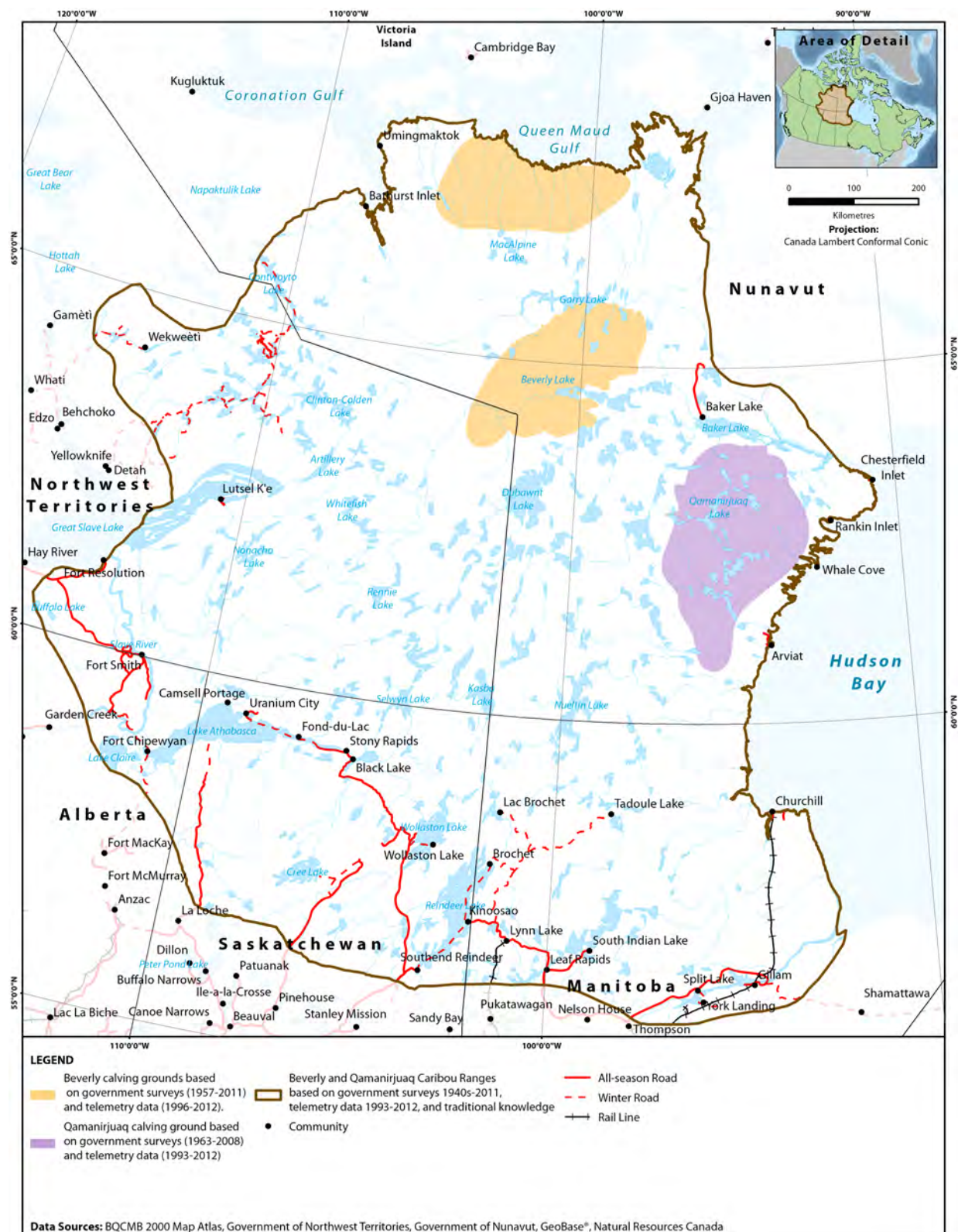


Figure 6. Beverly and Qamanirjuaq caribou calving grounds based on surveys (1957-2011) and telemetry of caribou cows (1993-2012).

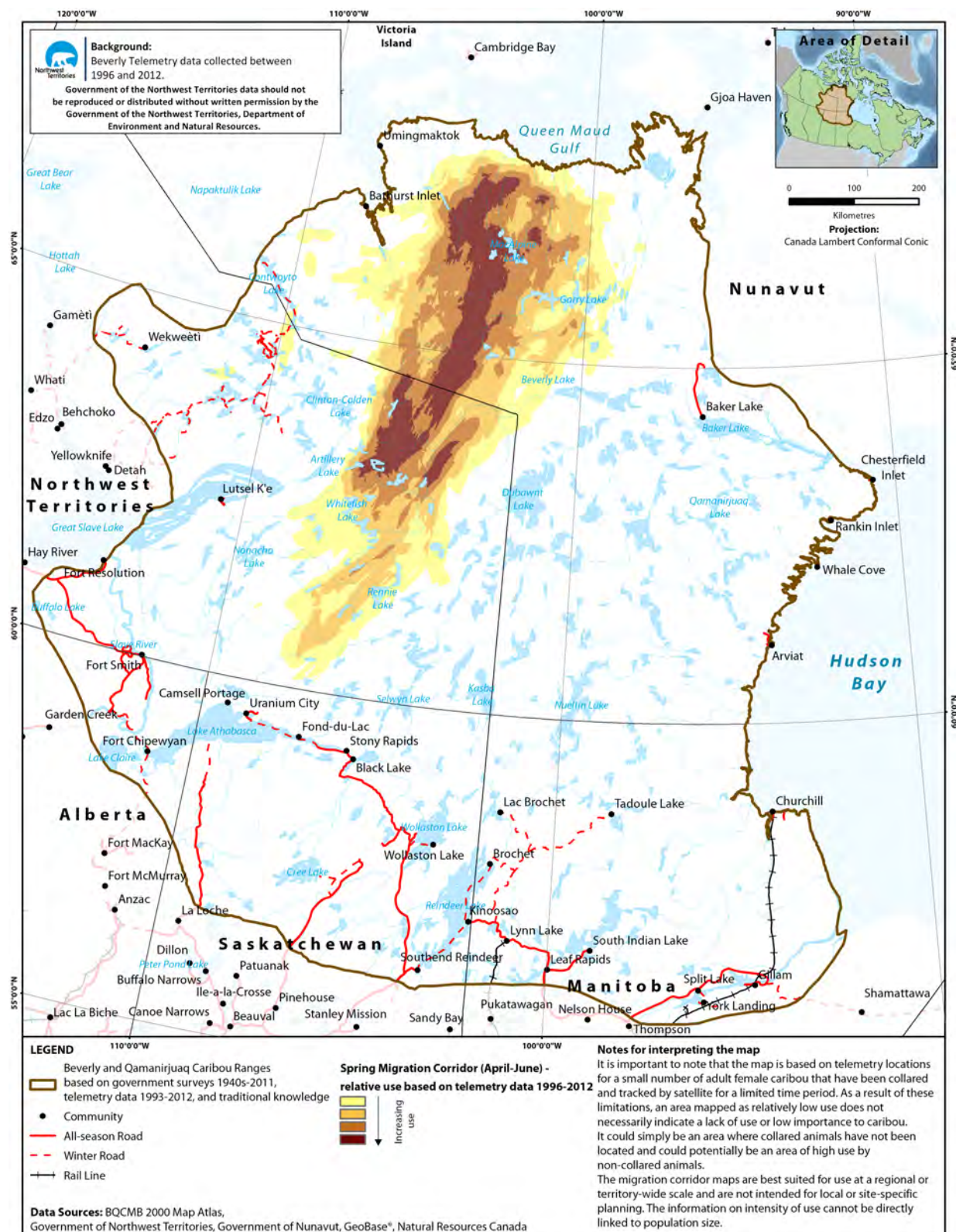


Figure 7. Beverly caribou spring migration range based on telemetry of collared cows (1996-2012).

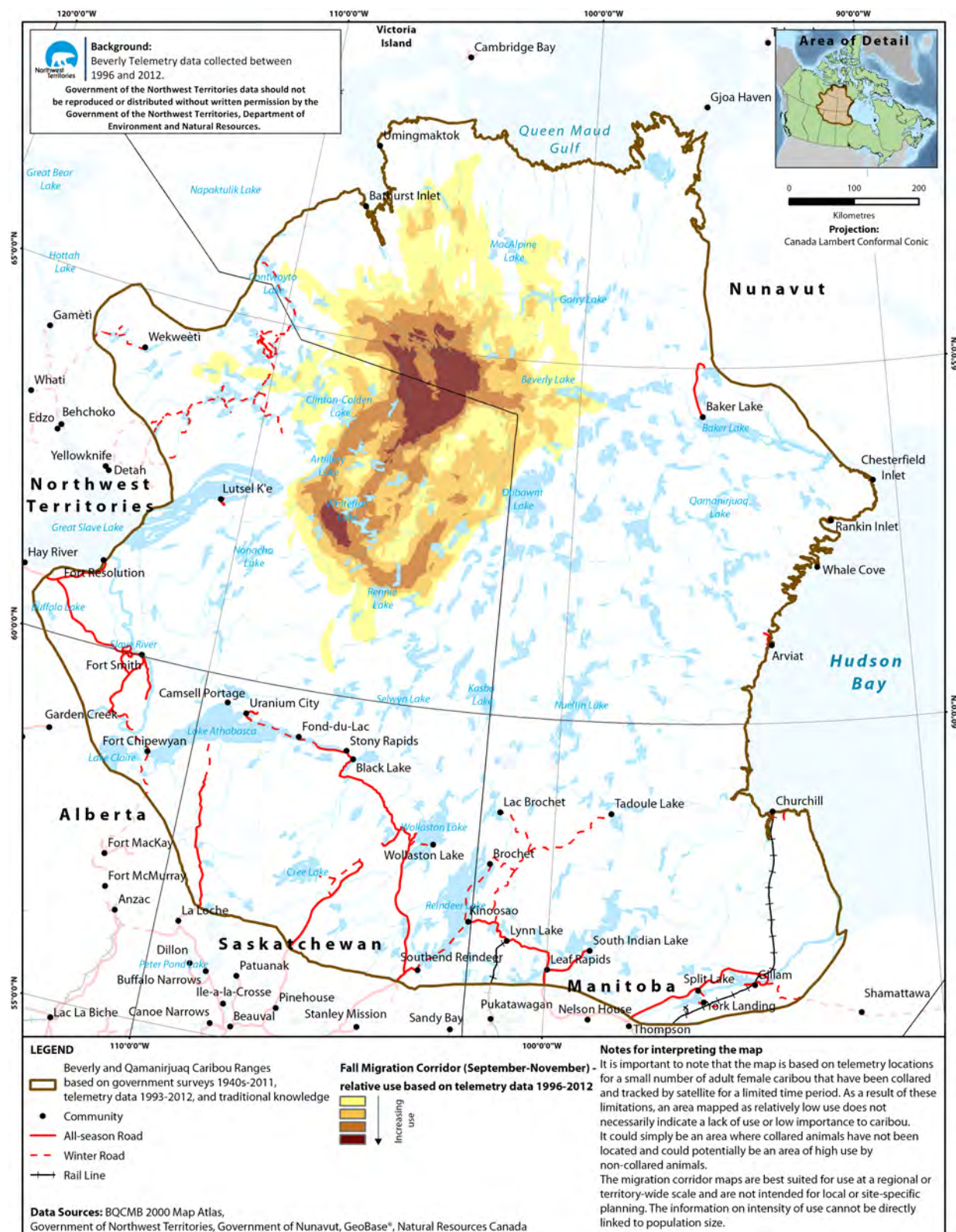


Figure 8. Beverly caribou fall migration range based on telemetry of collared cows (1996-2012).

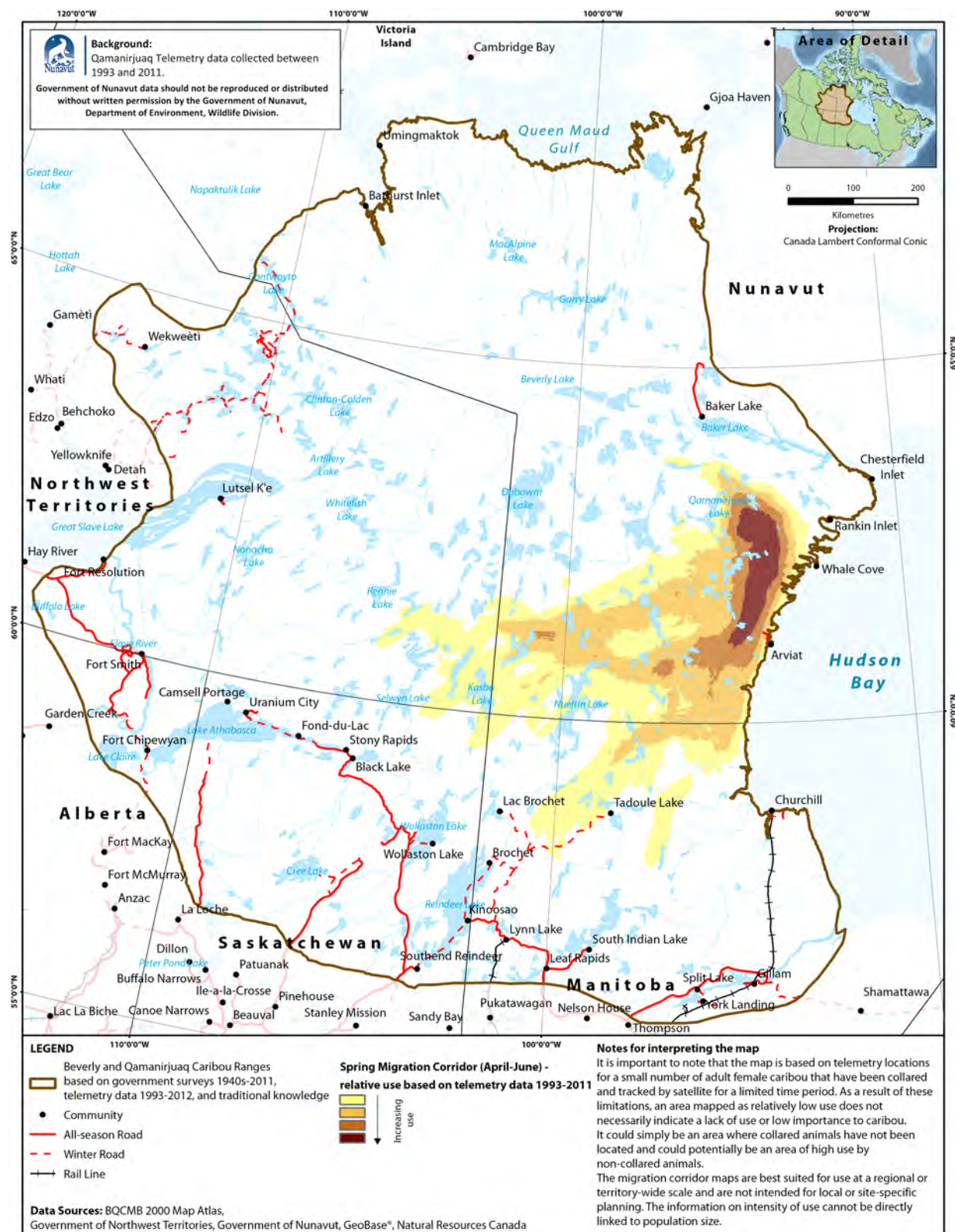


Figure 9. Qamanirjuaq caribou spring migration range based on telemetry of collared cows (1993-2011).

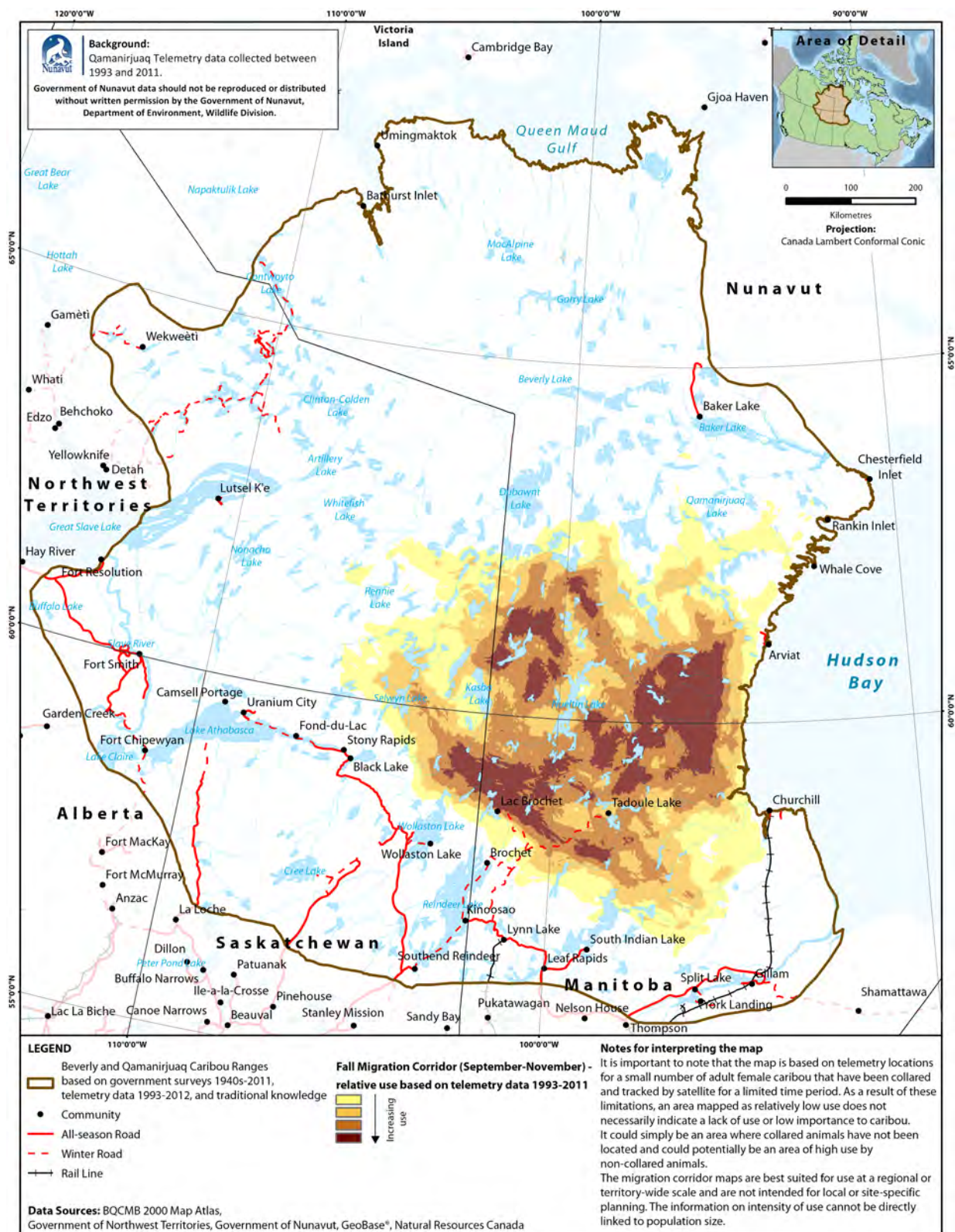


Figure 10. Qamanirjuaq caribou fall migration range based on telemetry of collared cows (1993-2011).

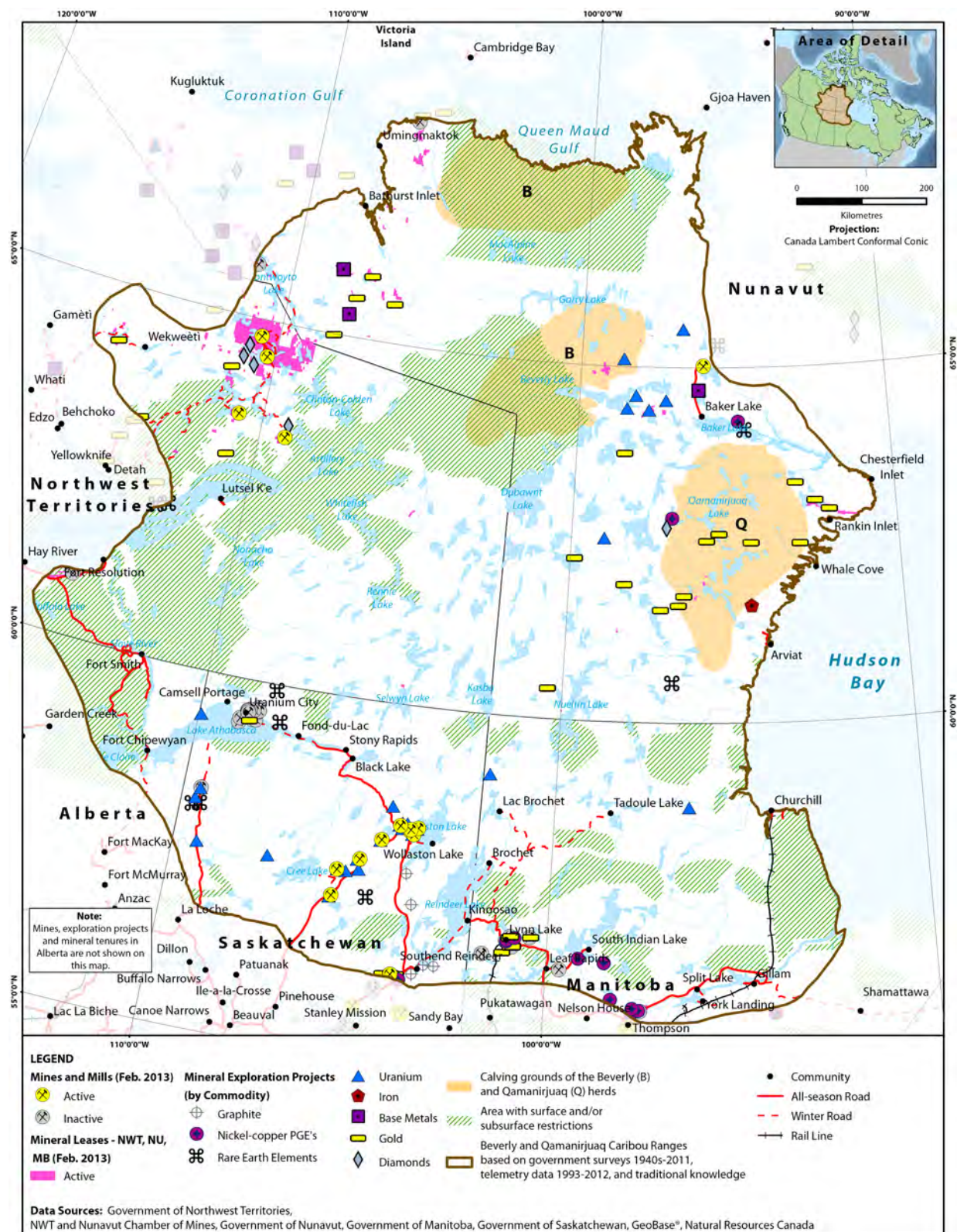
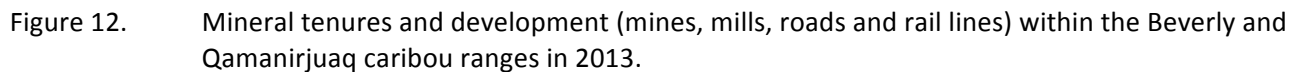


Figure 11. Exploration and development projects within the Beverly and Qamanirjuaq caribou ranges in 2013.



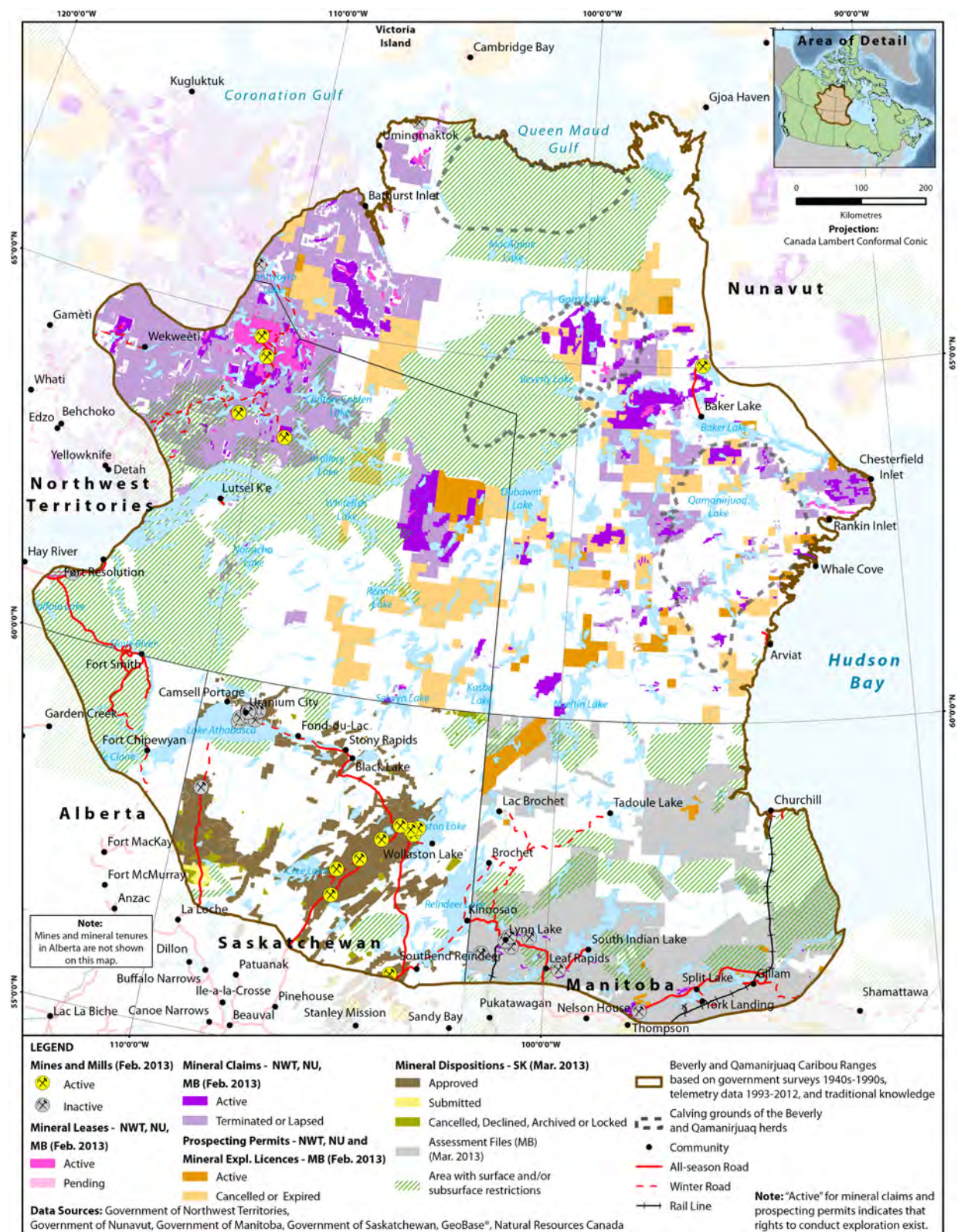


Figure 13. Mineral tenure history and development to 2013 within the Beverly and Qamanirjuaq caribou ranges.

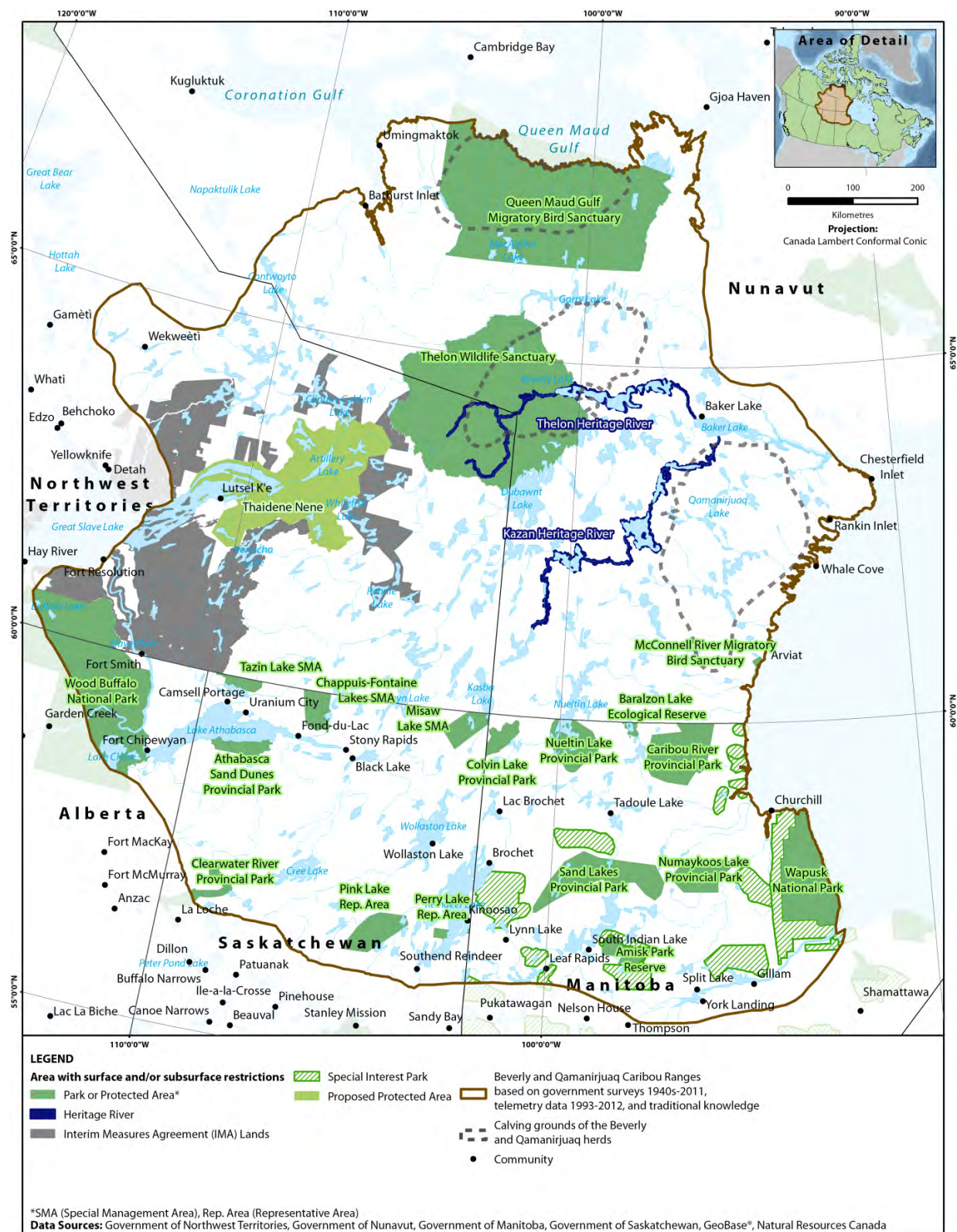


Figure 14. Protected areas and other areas with restrictions on land use within the Beverly and Qamanirjuaq caribou ranges in 2013.



Figure 15. Ecozones and ecoregions within the Beverly and Qamanirjuaq caribou ranges.

Appendix 5. Agencies with Mandates for Management of Beverly and Qamanirjuaq Caribou and Habitats.

Territorial and Provincial Governments

The territorial and provincial governments have ultimate responsibility for the management of caribou under their respective wildlife legislation. The Ministers of each department are empowered to establish harvest seasons, quotas and other conditions that may be required for the conservation of caribou within these jurisdictions.

- **Manitoba** - Department of Conservation and Water Stewardship, Government of Manitoba: www.gov.mb.ca/conservation/
- **Northwest Territories** - Environment and Natural Resources, Government of Northwest Territories: www.enr.gov.nt.ca
- **Nunavut** - Department of Environment, Government of Nunavut: <http://env.gov.nu.ca/>
- **Saskatchewan** - Department of Environment, Government of Saskatchewan: www.environment.gov.sk.ca/

Government of Canada - Aboriginal Affairs and Northern Development Canada:

www.aadnc-aandc.gc.ca

The mandate of Aboriginal Affairs and Northern Development Canada (AANDC) in the North is significant and far-reaching including resource, land and environmental management responsibilities. AANDC's responsibilities for Northern Development include managing the resources, land and environment of the North in places where federal responsibilities have not been transferred to territorial governments (e.g., in Nunavut), and negotiating the transfer of federal responsibilities for land and resource management to the territorial governments (to take effect for the NWT on April 1st 2014).

Nunavut Wildlife Management Board: www.nwmb.com

The Nunavut Wildlife Management Board (NWMB) is a co-management board and the main instrument of wildlife management in the Nunavut Settlement Area (NSA), which comprises the major part of the Territory of Nunavut. The NWMB mission is “to conserve wildlife (and wildlife habitat) for the long-term benefit of all Nunavut residents while fully respecting Inuit harvesting rights and priorities.” The NWMB’s duties are assigned primarily through the Nunavut Land Claims Agreement (NLCA) and its decisions are subject to the ultimate authority of the relevant Minister. As the main regulator of access to wildlife in the NSA, the NWMB’s primary responsibilities include: participating in or facilitating wildlife research; conducting wildlife harvest studies; establishing and modifying total allowable harvests and basic needs levels; and establishing, modifying or removing non-quota limitations (e.g., sex or age specific harvests).

Appendix 6. Primary Issues Related to the Lack of Research and Monitoring on Beverly Caribou.

The issues listed below have been identified by the BQCMB as having played a key role in the lack of monitoring on the Beverly herd between 1994 and 2002 and between 2002 and 2006:

- 1) Lack of capacity in all jurisdictions for government-led caribou research and monitoring.
- 2) Government priorities not directed toward Beverly caribou or communities that harvested the herd.
- 3) Frequently transitional state of governments and their wildlife agencies.
- 4) Management plan timeline for population surveys not followed. (A population survey of the Beverly herd was expected in 2000, based on the Beverly and Qamanirjuaq Caribou Management Plan for 1996-2002.)
- 5) Lack of availability of local and traditional knowledge and community-based caribou monitoring information.
- 6) Lack of information about harvest levels.

The following table provides more details about factors that contributed to a lack of research and monitoring on the Beverly caribou herd between 1994 and 2006 and the consequences for Beverly caribou.

Table1. Primary factors responsible for a lack of research and monitoring on the Beverly caribou herd between 1994 and 2006.

Acronyms: Canadian Wildlife Service (CWS), Department of Indian Affairs and Northern Development (DIAND), GNWT (Government of the Northwest Territories), Government of Nunavut (GN), Northwest Territories (NWT), Nunavut (NU), Nunavut Wildlife Management Board (NWMB), Porcupine Caribou Management Board (PCMB), Saskatchewan (SK).

Issue	Contributing Factors	Consequences for Beverly Caribou
1. Lack of capacity in all jurisdictions for government-led caribou research and monitoring.	<p>a) All jurisdictions - Short-term funding cycles prevented commitment to long-term monitoring programs.</p> <p>b) Federal government</p> <ul style="list-style-type: none"> • CWS withdrew from barren-ground caribou research and monitoring for northern SK and southern NWT in the mid-1990s (see also #3a). • In 1990, then- DIAND stopped funding the monitoring program (conducted by the GNWT) for mineral exploration on the Beverly (and Qamanirjuaq) caribou calving grounds. <p>c) NWT - Budget and staffing was not sufficient for research and monitoring of multiple herds simultaneously across NWT. No regional biologist was responsible for the Beverly herd for several years (to 2001). The territorial ungulate biologist was dedicated primarily to Bathurst herd issues (see also #2b).</p> <p>d) NU - Budget and staffing was not sufficient for research and monitoring of all herds across NU (e.g., \$200,000 annually). One biologist was responsible for the Beverly herd plus several other caribou herds in the Kivalliq region (see also #2c).</p> <p>e) SK - Single regional biologist for all of northern SK with no dedicated barren-ground caribou research or monitoring budgets and little capacity for participating in multi-jurisdictional programs (see also #2d).</p>	<ul style="list-style-type: none"> - No budgets for long-term monitoring programs. - A gap in research and monitoring as no jurisdiction(s) assumed the role vacated by the federal government. - No leadership by any jurisdiction for multi-jurisdictional programs. - No monitoring program to provide regular population estimates, sex ratios, survival rates or trends. - No program for monitoring exploration activities or delineating annual calving and post-calving areas.

Issue	Contributing Factors	Consequences for Beverly Caribou
<p>2. Government priorities not directed toward Beverly caribou or communities that harvested the herd.</p>	<p>a) Outside NU, the Beverly range and communities harvesting the herd are in unsettled land claim areas, where no requirements for government programs or actions are legislated through land claim agreements.</p> <p>b) NWT - A boom in exploration and development, including a diamond rush, on the Bathurst caribou range directed much of the NWT caribou program's attention and resources toward addressing issues related to Bathurst caribou and the communities harvesting the herd.</p> <p>The focus on Bathurst caribou was reinforced by:</p> <ul style="list-style-type: none"> • Legislated requirements and policy direction from the NWT government focusing the majority of wildlife research and monitoring effort toward issues of concern to regions with settled land claims and away from regions without. • Availability of funding from outside the GNWT for research and monitoring related to the diamond rush (i.e., from West Kitikmeot Slave Study Society and the federal government). • The GNWT ungulate biologist's history of working with Bathurst caribou and harvesters of this herd. <p>c) NU - The GN's caribou focus in the Kivalliq region was on the Qamanirjuaq herd and communities harvesting the herd. The GN assumed that the GNWT would continue to conduct and finance monitoring and research on Beverly caribou despite the multi-jurisdictional nature of the Beverly caribou range and location of the traditional calving ground in NU.</p> <p>d) SK - The northern part of the province was regarded as low priority by the provincial government. Issues regarding caribou and communities that harvested them were not provided with much attention or resources. Government decision-makers assumed that most monitoring of the Beverly herd would take</p>	<p>- Lack of attention, resources and support for work on Beverly caribou and related issues from all jurisdictions.</p>

Issue	Contributing Factors	Consequences for Beverly Caribou
	<p>place in, and be funded by, other jurisdictions.</p> <p>e) The majority of harvesters most dependent on the herd were from communities in SK and NWT, rather than NU where the traditional calving ground was located. (Standard population monitoring for the Beverly herd was based on calving ground surveys.)</p>	
<p>3. Frequently transitional state of governments and their wildlife agencies.</p>	<p>a) CWS ended its caribou research and monitoring program in NWT, NU and SK in the mid- 1990s. The federal government assumed that territorial governments would take this role on for the Beverly herd, however, no jurisdiction(s) filled the gap or pursued development of multi-jurisdictional programs.</p> <p>b) Frequent re-organization of NWT and SK environment departments:</p> <ul style="list-style-type: none"> • NWT - In 1996 the renewable resources and economic development departments were merged, and in the early 2000s the departments were again reorganized and these functions were returned to separate departments, with consequences for wildlife staffing, programs, priorities and budgets in both headquarters and regional offices. • SK - In 1995 the barren-ground caribou program was weakened when the branch responsible for the program transferred the biologist undertaking the program to the regional field services branch. In 2004 the biologist was returned to the branch but drastic cuts in staff resulted in less time and resources available for caribou. <p>c) Multi-year planning (through 1990s) for establishment of the territory of Nunavut (in 1999) and subsequently developing the new territorial government resulted in much of the fledgling NU wildlife program's energy being directed toward staffing,</p>	<ul style="list-style-type: none"> - No new multi-jurisdictional research and monitoring program to replace federal program. - Loss of institutional memory, continuity, and information about past research and monitoring. - Periods without research or monitoring while government biologist positions were vacant.

Issue	Contributing Factors	Consequences for Beverly Caribou
	<p>program development, and establishing relationships with local, regional and territorial organizations.</p> <p>d) Retirement and/or departure of biologists and wildlife managers from federal, territorial and provincial governments; frequent turn-over of biologists in some cases.</p>	
<p>4. Management plan timeline for population surveys not followed.</p> <p><i>(A population survey of the Beverly herd was expected in 2000, based on the Beverly and Qamanirjuaq Caribou Management Plan for 1996-2002.)</i></p>	<p>a) The BQCMB's November 2001 resolution for a Beverly population survey in 2002 was not supported by GN.</p> <p>b) The BQCMB's draft funding proposal to the NWMB for a 2002 Beverly survey (with funding committed by GNWT and government of SK) was not supported by the NWMB and was withdrawn.</p> <ul style="list-style-type: none"> • The original plan was to produce a population estimate using a systematic reconnaissance survey and a stratified photo-survey, and to be jointly organized, conducted, and analyzed by the GNWT and GN with assistance from the Baker Lake HTO. • Instead, reconnaissance surveys of the Beverly calving ground were conducted by the GNWT during calving in 2002 to obtain information about the herd and the annual calving area, but not a population estimate. <p>c) After a 2002 reconnaissance survey of the Beverly calving ground the GNWT recommended that collars be placed on Beverly caribou to facilitate tracking the distribution and density of cows on the calving ground before a photo-survey was conducted. GN informed the BQCMB in 2004 of their agreement with this position.</p> <p>d) Conflicting community and government positions about collaring caused an impasse. As a result of the GNWT and GN's positions, no photo-survey of the Beverly calving ground was</p>	<ul style="list-style-type: none"> - Multi-year delays for Beverly population survey. - Eventual opportunity for photo-survey too late due to changes in population size and/or range use occurring in interim period. - No scientific-knowledge based monitoring information available for periods between 1994 and 2002 and between 2002 and 2006. - No current estimates available for population size or sustainable harvest level. - The BQCMB was unable to issue new harvest quotas without current estimates of the herd's status and trend.

Issue	Contributing Factors	Consequences for Beverly Caribou
	<p>conducted while communities formally opposed collaring.</p> <ul style="list-style-type: none"> Elders in northern SK communities who had publicly stated their opposition to collaring caribou restated this opposition to the BQCMB in 2001 and 2003. <p>e) A program for placing satellite collars on Beverly caribou was initiated by the GNWT in 2006.</p> <ul style="list-style-type: none"> In May 2005 SK BQCMB members indicated that SK elders had agreed to limited collaring as a pilot project. The first collaring work targeting the Beverly herd was conducted in late winter 2006 by the GNWT and a calving ground photo-survey was planned for 2007. The June 2007 photo-survey was not feasible due to poor weather and low numbers of cows on the calving ground. 	
<p>5. Lack of availability of documented local and traditional knowledge and community-based caribou monitoring information.</p>	<p>a) Communities are located mostly on the fringes of the historic Beverly caribou range (including south edge of winter range in SK, west of main migration route in NWT, and southeast of calving ground in NU). As a result, hunters were not able to provide regular observations about distribution or condition of the herd.</p> <p>b) Changes in distribution and availability of Beverly caribou to communities could be masked by overlap in the ranges of adjacent herds, as caribou from the Beverly herd and one or more other herds wintered in overlapping areas including harvest areas used by communities in some years.</p> <p>c) In part to address the lack of scientific monitoring, the BQCMB attempted to adapt a community-based monitoring program conducted successfully on the Porcupine caribou range, and ran a pilot project for several years. However, implementation of a long-term monitoring program by the BQCMB was not seen to be feasible or within the mandate of the Board.</p>	<p>- No long-term community-based caribou monitoring program or other system was developed for collecting local and traditional knowledge about the herd or its range.</p>

Issue	Contributing Factors	Consequences for Beverly Caribou
<p>6. Lack of information about harvest levels.</p>	<p>a) NWT - No harvest data has been collected for the Beverly herd by the GNWT or federal government some communities collect their own harvest data but do not distribute that information.</p> <p>b) NU - The NWMB conducted an extensive harvest study from 1993-2004 that included caribou harvest data for NU communities on Beverly caribou range for 1996-2001. The final report was published in 2004, reporting caribou harvest by community but not by caribou herd.</p> <p>c) SK - In the late 1970s individuals from various caribou range communities were canvassed for estimates of combined harvest from the Beverly and Qamanirjuaq herds. By 1981 this was formalized into regular data acquisition by hiring the same or similar individuals to report harvest on a monthly basis in all of the range communities. In 1996 government funding for the harvest study was discontinued. In 1998 leaders of the Athabasca Denesuline communities voted to support re-instatement of the study but funding was not found to support it. As a result no harvest data for the Beverly herd has been collected for Saskatchewan communities since 1996.</p>	<p>- No ability to estimate the status of the annual harvest in relation to estimates of sustainable harvest (which were also not available; see also #4).</p>

Appendix 7. Management Plan Actions in Support of Goals and Objectives.

BQCMB MANAGEMENT PLAN GOALS, OBJECTIVES, ACTIONS			
GOALS		Objectives	Actions
1	To conserve the Beverly and Qamanirjuaq caribou herds in a cooperative manner	1. Use all forms of knowledge, including Local and Traditional Knowledge (Aboriginal TK (ATK)/Inuit Qaujimajatuqangit (IQ)) and scientific knowledge	<ul style="list-style-type: none"> ○ Capture community and range ecology input, including ATK/IQ/LK, from community BQCMB members at regular Board meetings ○ Include Elder sessions at workshops ○ When funding programs, elder interviews and elder/youth knowledge sharing (i.e. culture camps, workshops) should be priorities ○ Demonstrate how ATK/IQ/LK is being used by the BQCMB (i.e. Recommendations, Annual Report, etc.) ○ Develop and implement a plan for better integrating ATK/IQ/LK into management
		2. Develop additional ways for residents of caribou range communities to be involved in monitoring and management actions	<ul style="list-style-type: none"> ○ Inform community leaders that their BQCMB member will provide info and get feedback at local meeting(s) for use in management ○ Offer input to local wildlife committees from BQCMB Members annually ○ Encourage and support community-based monitoring and training (e.g., workshops)
		3. Facilitate information sharing among harvesters from different parts of the range	<ul style="list-style-type: none"> ○ Facilitate or support travel by Community BQCMB Members and other means for sharing information on caribou conservation issues
		4. Promote processes for community and government Board members to share the responsibility for information exchange with caribou harvesters	<ul style="list-style-type: none"> ○ Support Community BQCMB members with travel and honoraria to undertake and lead information sharing among their communities. ○ Government BQCMB members support community members at meetings
		5. Strengthen relationships and information sharing processes with organizations that have a mandate for caribou or habitat conservation	<ul style="list-style-type: none"> ○ Connect regularly with relevant governments agencies, northern boards and committees , and regional and national organizations ○ Provide support for a spokesperson for the BQCMB to present information and updates to organizations and governments at relevant events in a timely manner ○ Community Members to update wildlife committees, trapping blocks, boards, HTAs and HTOs between regular BQCMB meetings
2	To strengthen support for caribou conservation	1. Increase awareness of caribou issues and the BQCMB by residents of caribou range communities, other northerners, and other Canadians	<ul style="list-style-type: none"> ○ Develop and implement a long-term communications plan that includes traditional media and social media which targets a varied audience including northerners, southern Canadians and circumpolar peoples; include educational institutions, non-government organizations and commercial land users operating on the caribou ranges ○ Continue with BQCMB newsletter and conduct a review ○ Communicate BQCMB positions on sensitive issues with the public (e.g., calving ground protection) ○ Engage conservation groups supportive of sustainable livelihoods

BQCMB MANAGEMENT PLAN GOALS, OBJECTIVES, ACTIONS

GOALS		Objectives	Actions
		2. Strengthen support for caribou conservation and the BQCMB from federal and jurisdictional governments	<ul style="list-style-type: none"> ○ Make a BQCMB spokesperson available to meet with government officials annually to maintain or increase support
		3. Enhance awareness of the BQCMB among governments, including senior government officials	<ul style="list-style-type: none"> ○ Recommend that the appropriate Minister from each jurisdiction assign one senior manager for the BQCMB who will liaise with their government Board member and the BQCMB Executive Director
		4. Improve understanding of the concept of cumulative effects and potential impacts on caribou	<ul style="list-style-type: none"> ○ Provide information and promote discussion by caribou range communities, commercial land users operating on the caribou ranges (including mining companies, expeditors, aircraft charter companies) and others
		5. Increase understanding of the value of harvest information in management.	<ul style="list-style-type: none"> ○ Support ongoing harvest data collection programs and promote the value of harvest data to communities as part of conservation education work
3	To increase knowledge of barren-ground caribou and the caribou-human system²⁹	1. Increase knowledge of barren-ground caribou ecology	<ul style="list-style-type: none"> ○ Make ATK/IQ/LK available to managers and scientific findings available to communities ○ Promote BQCMB scholarship to students of ATK/IQ/LK studies ○ Support elder interviews, elder/youth and elder/manager exchanges ○ Give priority to BQCMB scholarship applications with projects that address identified research needs ○ Collaborate with communities to identify key research questions ○ Maintain a list of research questions and needs beyond the questions and needs developed with communities (i.e. herd concept, herd boundaries, migratory mechanisms, variable range use, caribou resilience to environmental stress, population change, etc.) ○ Assess resilience of caribou-human system

²⁹ All of the objectives under Goal 3 are meant to include all forms of knowledge (as listed under Goal 1 Objective 1.

BQCMB MANAGEMENT PLAN GOALS, OBJECTIVES, ACTIONS

GOALS		Objectives	Actions
		2. Improve knowledge of land use on the range and impacts on caribou and their habitats	<ul style="list-style-type: none"> ○ Improve procedure for reporting proposed, planned and ongoing industrial, and infrastructural activity relevant to B & Q herds, to BQCMB ○ Ensure reporting of disturbance to BQCMB, by all land users ○ Support research on impacts of development and related human activity, on caribou and caribou habitat ○ Define thresholds for land use activities in terms of caribou protection and maintenance of opportunities for use of caribou ○ Provide knowledge of the effects of land use activities on caribou to land use planning and environmental assessment agencies for incorporation into those decision-making processes; make this knowledge available to commercial land users and others developing “best environmental practices”
		3. Enhance knowledge of cumulative effects on caribou, habitats and caribou harvesters	<ul style="list-style-type: none"> ○ Identify “individual impact” pieces that contribute to cumulative effects and where more information is needed ○ Identify and create a sharing/input link to cumulative effects modeling efforts
4	To monitor caribou population status over time	1. Support design and use of low impact, respectful caribou monitoring methods	<ul style="list-style-type: none"> ○ Support community-based monitoring initiatives ○ Search out and make existing report available, i.e. on BQ website ○ Report on non-invasive monitoring/DNA analysis, i.e. McFarlane et al. ○ Explore satellite imagery-based monitoring options
		2. Encourage governments to secure long-term funding to adequately monitor both herds	<ul style="list-style-type: none"> ○ Prompt funding commitments based on long-term monitoring plan ○ Augment Jurisdictional funding with industry, conservation funds
		3. Contribute to creation and implementation of a long-term monitoring plan for both herds	<ul style="list-style-type: none"> ○ Develop and Implement long-term monitoring plan that includes population trend, health and condition, predation monitoring, etc.
5	To monitor the harvest of caribou	1. Promote standardizing a method for monitoring caribou harvest	<ul style="list-style-type: none"> ○ Establish a community-supported protocol for sharing harvest data ○ Support the action in a Board-coordinated fashion ○ Develop a measure of the accuracy of data ○ Collaborate across jurisdictions to improve harvest estimates
		2. Encourage governments to undertake harvest monitoring regularly and consistently, whether caribou numbers are high or low	<ul style="list-style-type: none"> ○ Collect harvest data by community or First Nation and distinguish herd and/or harvest areas where possible ○ Make efforts to assess losses including estimated numbers of non-retrieved caribou and spoiled carcasses resulting from inadequate storage
		3. Assist with development and application of a systematic technique for estimating harvest levels where direct harvest monitoring is not in place	<ul style="list-style-type: none"> ○ Collaborate among jurisdictions and academia on a technique for estimating harvest in absence of direct harvest monitoring

BQCMB MANAGEMENT PLAN GOALS, OBJECTIVES, ACTIONS

GOALS		Objectives	Actions
6	To conserve the Beverly and Qamanirjuaq caribou herds within their natural range of abundance	1. Encourage governments to regularly review geographic and demographic boundaries for the herds	Apply best combined sources of historic and current knowledge (including ATK/IQ/LK) to determine herd boundaries
		2. Estimate natural range in size of each herd	<ul style="list-style-type: none"> ○ Apply best combined sources of historic and current knowledge of herd size to define herd size within a natural range of abundance ○
		3. Promote research to assess the impacts of hunting, predation, parasites and disease	<ul style="list-style-type: none"> ○ Apply harvest data, predation, parasites and disease surveys to risk assessment framework ○ Develop scenarios of herd growth in response to a range of mortality levels, and related environmental effects ○ Apply ATK/IQ/LK on above factors combined to estimate impacts periodically
7	To ensure adequate amounts of high quality habitat	1. Encourage governments to identify caribou seasonal ranges	<ul style="list-style-type: none"> ○ Support community-based monitoring initiatives ○ Document beliefs describing seasonal ranges ○ Define and delineate calving grounds and other seasonal ranges. ○ Identify a commonly accepted rationale for distinguishing seasonal ranges based on combined western science – ATK/IQ/LK input and use to standardize the list of accepted seasonal ranges
		2. Promote programs to assess the condition of seasonal ranges	<ul style="list-style-type: none"> ○ Document the amount of “unburned” (e.g., not burned in last 50 years) winter range available to caribou, i.e. quantify burn history ○ Investigate satellite imagery techniques to assess land cover/vegetation ○ Quantify access to seasonal ranges by road and aircraft ○ Identify influencing factors and develop a process for rating condition of seasonal ranges ○ Use modeling (e.g., resource selection function) and observation to describe caribou use of habitat types
		3. Support creation of range-wide habitat conservation plans and assist with inter-jurisdictional coordination and implementation of those plans	<ul style="list-style-type: none"> ○ Work with governments, regional organizations and communities to develop a caribou habitat conservation plan for application across the caribou ranges
		4. Promote protection of key habitats important to caribou	<ul style="list-style-type: none"> ○ Document and apply knowledge of habitats to protection efforts ○ Prioritize efforts for protection of calving grounds and post-calving areas ○ Document and standardize measures for protection of other seasonal habitats
8	To strive for the sustainable	1. Identify and promote use of sustainable hunting practices	<ul style="list-style-type: none"> ○ Elders to identify culturally-acceptable hunting and handling practices ○ Support elder/youth knowledge sharing, i.e. culture camps, workshops ○ Develop and distribute an elder-validated code of ethics ○ Support Marksmanship competitions ○ Support Rifle care and handling workshops

BQCMB MANAGEMENT PLAN GOALS, OBJECTIVES, ACTIONS

GOALS		Objectives	Actions
	[wise] use of caribou	2. Make harvest management recommendations following the Board's priority use categories	<ul style="list-style-type: none"> ○ Maintain or update as necessary existing BQCMB priorities for caribou use
		3. Encourage governments to develop a harvest management plan that considers herd status and sustainability	<ul style="list-style-type: none"> ○ Develop a harvest management plan supported by ATK/IQ/LK as well as scientific knowledge
9	To influence commercial land use in a way that protects Beverly and Qamanirjuaq caribou and their habitats	1. Encourage all parties to monitor and assess the impacts of commercial land use and cumulative effects on caribou and habitats	<ul style="list-style-type: none"> ○ BQCMB to establish a process for compiling observations and knowledge provided by community board members and their communities about impacts of human land use and cumulative effects of disturbance on caribou and habitats ○ Encourage governments to develop processes for assessing and monitoring cumulative effects of human land use activities on caribou and habitats ○ Encourage jurisdictions to collaborate on assessment of cumulative effects of human land use activities on caribou and habitats ○ Describe and evaluate the impact of new and existing roads and other linear corridors accessing caribou habitat
		2. Promote and support establishment of disturbance thresholds for land use	<ul style="list-style-type: none"> ○ Develop a process to determine disturbance thresholds based on tolerance of caribou and caribou habitat to the effects of human land use activities
		3. Encourage land use planning and contribute to land use plans across the caribou ranges	<ul style="list-style-type: none"> ○ Encourage jurisdictions to develop and/or implement land use plans that incorporate effective measures for caribou and habitat conservation ○ Provide information to organizations responsible for land use plans to ensure adequate protection for B&Q caribou habitat
		4. Develop and recommend mitigation measures for commercial land use activities	<ul style="list-style-type: none"> ○ Identify types of land use activity by habitat or seasonal range for which there are caribou or habitat disturbance or other issues ○ Use all available information, including input from BQCMB members and communities, to develop mitigation measures ○ Provide input for development of best environmental practices and recommendations on use of these practices to mitigate effects of land use activities on caribou and habitat
		5. Review key land use proposals for potential effects on caribou and habitats and make recommendations for avoiding or minimizing those effects	<ul style="list-style-type: none"> ○ Review key land use proposals identified to have potential significant adverse effects on B&Q caribou and habitat ○ Inform BQCMB members, communities and relevant organizations about project proposals of potential concern regarding potential significant adverse effects on B&Q caribou and habitat ○ Provide recommendations to relevant agencies on exploration and development proposals where there are potential adverse impacts on caribou or habitat

Appendix 8. Key Monitoring Indicators and Actions.

- 1) **Seasonal Distribution and Range Use:** Radio-collared adult cows are tracked by satellite to identify areas used during specific seasons (calving, post-calving, summer, fall, winter and spring), movement patterns and changes in seasonal distribution between years. Aerial surveys are conducted to delineate annual calving areas as well in some years. In addition local and traditional knowledge about seasonal range use patterns is collected.
- 2) **Population Trend and Abundance:** The most efficient and cost effective way to determine the trend of herds over time is currently through aerial surveys conducted over the calving areas using the same method from year to year. Population estimates are based on aerial surveys, with counts conducted visually by observers or by using photographs taken by specialized aircraft when weather, caribou densities and other conditions permit. Collection of local and traditional knowledge about relative numbers of caribou observed from year to year is also conducted.
- 3) **Herd Productivity:** Spring composition studies are used to monitor trends in over-winter calf survival. In addition traditional harvesters provide observations of calves and yearlings within their annual hunting areas.
- 4) **Herd Health:** Biologists and hunters participate in body condition monitoring using standardized techniques and harvesters provide their observations about disease and parasites in harvested and observed caribou.
- 5) **Range Quality, Quantity and Availability:** An ecological land classification project completed by the Nunavut government for the Kivalliq region has produced maps of vegetation cover across the caribou ranges, which provides baseline information for future comparison and assessment of changes over time.
- 6) **Predation:** Predator-caribou relationships are being examined using aerial surveys of predators, genetic analysis of tissue and hair samples, analysis of predator diets using hunter samples and scat samples and other methods.
- 7) **Human-caused Disturbance:** Information from hunters is being collected and used to assess levels of disturbance to caribou from mineral exploration and development activities. The BQCMB is also tracking potential sources of disturbance to caribou, particularly on key seasonal habitats such as calving and post-calving areas and migration range, which include: locations of exploration projects and mines; applications for permits for advanced exploration and new mining projects; and issuance of new mineral tenures, which indicate interest in the mineral potential of areas.
- 8) **Harvest:** All available harvest information is being used to produce harvest estimates. Governments and communities have been encouraged to develop minimum standards for collection of harvest data and standardized harvest reporting processes; to obtain annual harvest estimates; and to assess levels of mortality that result from wounding and ineffective retrieval, as well as additional losses due to inappropriate storage of harvested animals.
- 9) **Weather and Climate:** Analysis of weather data from monitoring stations and local and traditional knowledge about changes in weather and climate could be used to determine short term weather and long-term climate effects on caribou health and productivity related to forage quantity, quality and availability.

Appendix 9. Communication Audiences and Tactics.

Potential Audiences for BQCMB Communications Products

Following are some of the audiences that could have an interest in the BQCMB and caribou management issues:

- Students and other youth from communities across the caribou ranges
- Hunters from communities across the caribou ranges
- Hunters who live outside the caribou ranges but are harvesting Beverly and Qamanirjuaq caribou
- Aboriginal leaders and Elders
- Community wildlife organizations
- Regional wildlife and land use planning organizations
- Regulatory agencies
- Industry operating on the caribou ranges (e.g., mining, air charter, expediting)
- Government officials and decision-makers
- Northern politicians
- BQCMB (board members and staff)
- Teachers (grades K to 12)
- Media - reporters and journalists
- University and college professors/instructors and students
- Members of the general public interested in caribou conservation and management

Communication Tactics

The following list of communication tools will be used by the BQCMB to identify appropriate ways to communicate effectively with various target audiences on caribou-related issues.

Tools	Components	Frequency	Budget
Conduct Survey/Audit	<ul style="list-style-type: none"> - informally canvass all stakeholders on communication activities - develop a feedback or survey form to gather information on desired communication activities 	- annually	new funding may be required
New releases	<ul style="list-style-type: none"> - provides responses to emerging issues - make announcements on issues 	<ul style="list-style-type: none"> - as needed - add "News" link on website 	from core BQCMB funds
Position papers	<ul style="list-style-type: none"> - highlights emerging or critical issues 	- as needed	from core BQCMB funds
News stories	<ul style="list-style-type: none"> - highlight regional issues - find opportunities for regional stories - provide information on harvesting caribou and/or predators - encourage information sharing among all stakeholders - create story ideas for an online newsroom - build relationships with newspaper reporters or journalists 	- two to three times a year	new funding may be required to pay writer to prepare some canned stories
Newsletter – Caribou News (required by <i>Caribou Management Agreement</i>)	<ul style="list-style-type: none"> - provide information on the Board and its activities - examine frequency and distribution 	- twice a year	from core BQCMB funds
Newsletter – others (cross-promotion)	<ul style="list-style-type: none"> - provide information on the Board and its activities - highlight regional issues - encourage information exchanges 	- to be determined	from core BQCMB funds
Electronic newsletters	<ul style="list-style-type: none"> - short email news on what's happening - updates or regular contact with audiences 	- up to six times a year	from core BQCMB funds

Tools	Components	Frequency	Budget
Advertising	<ul style="list-style-type: none"> - purchase advertising space in newspapers if harvesting information is required - purchase advertising space in newspapers if comments on certain issues are required - promote the updated website 	- to be determined	new funding may be required
Annual Reports (required by <i>Caribou Management Agreement</i>)	<ul style="list-style-type: none"> - share information on activities - capture highlights and success stories - redesign with promotion in mind 	- annually	from core BQCMB funds; additional funds may be needed for a redesign
Posters	<ul style="list-style-type: none"> - encourage information sharing among all stakeholders - seek comments on certain issues if required - promote the updated website 	- once (print version); and available for downloading	for design only (self printing) or funds required for limited print run
Brochures	<ul style="list-style-type: none"> - promote the Board and its activities - include overviews, programs, services - encourage information sharing among all stakeholders - promote the updated website - post on website - promote the conservation of caribou 	- once (print version); and available for downloading	for design only (self printing) or funds required for limited print run

Tools	Components	Frequency	Budget
Handouts/Fact sheet	<ul style="list-style-type: none"> - promote the conservation of caribou - provide highlights on activities - post on website for downloading - provide information on harvesting caribou and/or predators 	<ul style="list-style-type: none"> - develop a few or a series for posting on website - as needed 	for design only (self printing) or funds required for limited print run
Local Hunting Guides	<ul style="list-style-type: none"> - provide information on harvesting caribou and/or predators - encourage information sharing among all stakeholders 	<ul style="list-style-type: none"> - once a year 	new funding may be required
Website (required by <i>Caribou Management Agreement</i>)	<ul style="list-style-type: none"> - update website to provide easier navigation - align information with audiences - develop a web data input sheet for recording information on monitoring the herds - provide a positive environment for information sharing and building support 	<ul style="list-style-type: none"> - ongoing 	content from core BQCMB funds; redesign and updating via in-kind support
Email	<ul style="list-style-type: none"> - provide a positive environment for information sharing and building support - use to build awareness and connections 	<ul style="list-style-type: none"> - ongoing 	from core BQCMB funds
Facebook	<ul style="list-style-type: none"> - test interest for ongoing communications - use to build awareness and connections - provide a positive environment for information sharing and building support 	<ul style="list-style-type: none"> - ongoing 	from core BQCMB funds and in-kind support

Tools	Components	Frequency	Budget
YouTube	<ul style="list-style-type: none"> - test interest for ongoing communications - use to build awareness and connections 	- ongoing	from core BQCMB funds and in-kind support
Twitter	<ul style="list-style-type: none"> - test interest for ongoing communications - use to build awareness and connections - information sharing and building support 	- ongoing	from core BQCMB funds and in-kind support
Blogs	<ul style="list-style-type: none"> - test interest for ongoing communications - use to build awareness and connections - information sharing and building support 	- ongoing	new funding may be required to pay for writing stories
AGMs /Hunting Org. and Public Meetings	<ul style="list-style-type: none"> - inform them of resources available - make presentations - information sharing and building support 	- as needed	from core BQCMB funds
Conferences/Workshops	<ul style="list-style-type: none"> - inform them of resources available - presentations at related conferences or workshops - explore an exhibit or display option and marketing materials 	- as needed	from core BQCMB funds for development of presentations, marketing materials, travel costs, registration fees
Caribou Awareness Day	<ul style="list-style-type: none"> - create an event that brings awareness to the issues facing caribou and its cultural importance in the communities 	- annually	new funding may be required to pay for an event planner

Appendix 10. Conservation Education Resources.

Previous BQCMB Education Programs

Following are key educational programs and products developed previously by the Board that it will continue to use or adapt as part of new conservation education programs.

- **The Barren-Ground Caribou Schools Program** produced by the Board between 1983 and 1985 was intended to provide school-age children with information about caribou from both a scientific perspective and traditional knowledge of caribou harvesters. The extensive information “kit” that was distributed was seen as an excellent resource, but it was not officially recognized by departments of education outside Saskatchewan, and usage rates were low. However, some of its content was adapted for use in other related programs (see below) that are still in use by teachers today.
- In 1995 the BQCMB produced a 20-page colour **caribou information booklet** in English, Dene and Inuktitut for use in schools that highlighted the importance of caribou and issues such as acceptable hunting practices, wastage, sustainable development, habitat protection and co-management.
- In 1988 the Board established a scholarship fund to help students pursue education in management and conservation of barren-ground caribou and their habitat. The **Caribou Research and Management Award** is still awarded semi-annually and was expanded in 2012 to traditional knowledge studies related to caribou. The Board is considering new ways to attract applicants from Beverly and Qamanirjuaq caribou range communities and encourage studies specifically of these caribou herds or their ranges.
- In 2009/10 the BQCMB started an **“On the Land program”** to provide modest funding support to organized projects that will expose school youth in Beverly and Qamanirjuaq caribou range communities to hunting, trapping and land skills passed on from experienced hunters and trappers, and/or elders.
- In 2010 the BQCMB created a set of three educational posters with the theme **“Respect Caribou and the Land - You Can Make a Difference!”** to promote the following messages:
 - o “Make best use of the caribou”;
 - o “Take only what you need, Use all that you take”; and
 - o “Shoot bulls - and fewer cows. When caribou numbers are low, take fewer cows to help the herd recover”.

Other Educational Resources

Following are some existing educational resources available for use by the BQCMB and others for addressing educational priorities. This list will be reviewed and revised periodically by the Board with the assistance of northern public education specialists.

1) For Elementary School Students:

Government of the NWT's *Let's Go Hunting Activity Book* (1988; 81 pp.)

http://www.enr.gov.nt.ca/_live/documents/content/letsgo_hunting.pdf

2) For High School Students (some content is applicable to younger students as well):

- a) Government of the NWT's *Caribou and People: A Shared Future* (2009; interactive DVD)

http://www.enr.gov.nt.ca/_live/documents/content/Caribou_and_People_A_Shared_Future_Table_of_Contents.pdf

(table of contents is available on-line; DVD is available from GNWT-ENR)

- b) Yukon government's *Project Caribou: An Educator's Guide to Wild Caribou of North America* (2001; English and French)

<http://www.taiga.net/projectcaribou/>

- c) Porcupine Caribou Management Board (PCMB)'s *Porcupine Caribou School Program* video series and teacher's manuals

<http://www.pcmb.ca/resources>

3) For Hunters:

- a) Fort Smith Metis Council in conjunction with GNWT-ENR

- *The Caribou Hunters* video - shows one way of hunting, skinning and butchering caribou in an efficient and ethical way (available on VHS and DVD from regional ENR offices)

- b) CircumArctic *Rangifer* Monitoring and Assessment (CARMA) Network

- *Caribou Health Monitoring Training* video (available on DVD)

http://carma.caff.is/index.php?option=com_content&view=article&id=661&Itemid=1310

Rangifer Body Condition Monitoring I Level 1 Field Protocols

<http://carma.caff.is/index.php/resources/field-protocols>

4) For Communities (including schools):

CARMA - *Voices of Caribou People*: <http://voicesproject.caff.is/>

