

**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**

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SUMMARY

The Beverly and Qamanirjuaq barren-ground caribou herds are an extremely valuable resource for the communities and governments of Nunavut, the Northwest Territories (NWT), Saskatchewan, and Manitoba. The minimum gross economic value of Beverly and Qamanirjuaq caribou harvested in a single year is about \$17 million, and the social and cultural value of the herds is immense. The preservation of these caribou herds and their habitats is essential both for the economic benefits they provide, and for maintaining traditional lifestyles.

The Beverly and Qamanirjuaq Caribou Management Board (BQCMB) believes that these caribou herds should be protected from any human-caused disturbance that has potential to cause significant adverse effects to the caribou or their key habitats across their ranges, and recommends that the following steps be taken to provide adequate protection for Beverly and Qamanirjuaq caribou over the long-term:

- 1) The traditional calving grounds and post-calving areas of these two caribou herds should be provided with long-term legislated protection that prohibits any type of activity that would cause serious or irreversible negative effects to caribou or habitat.
- 2) The herds should be protected during other key life cycle periods (i.e., fall migration/rut, winter, spring migration) and while at water crossings by means of improved Caribou Protection Measures (CPM). An assessment must first be conducted to determine if modifications to the original CPM can provide meaningful protection to these herds. Following an affirmative assessment and development of improved measures, they should be established as a conformity requirement of a revised land use plan for the Kivalliq region, and incorporated into other regional land use plans as they are developed.
- 3) Cumulative effects assessment/modeling through the environmental assessment process should be implemented to minimize destruction of all habitats used by Beverly and Qamanirjuaq caribou outside of traditional calving grounds and post-calving areas.
- 4) Regular delineation of calving grounds and post-calving areas should be undertaken.
- 5) A range-wide system of conservation planning should be established to safeguard the caribou herds over the long-term across all seasonal ranges.

Current policies and measures are not adequate to ensure maintenance of the Beverly and Qamanirjuaq caribou herds in the face of increasing levels of human activity on the caribou ranges. The need for action is urgent in light of (i) the growing and diversifying demand for caribou, (ii) increasing development occurring across the caribou ranges, particularly on or near the traditional calving and post-calving areas, (iii) the lack of action taken to date by the responsible governments to implement long-term caribou protection, and (iv) our lack of knowledge concerning recent seasonal range use by the caribou herds. A system is needed that addresses the cumulative effects of changes occurring across the entire Beverly and Qamanirjuaq caribou ranges.



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List of Acronyms

ANWR	Arctic National Wildlife Refuge
BQCMB	Beverly and Qamanirjuaq Caribou Management Board
CPA	Caribou Protection Area
CPM	Caribou Protection Measures
DIAND	Department of Indian Affairs and Northern Development (federal government; also known as INAC)
DOE	Department of Environment (Government of Nunavut)
INAC	Indian and Northern Affairs Canada (federal government; also known as DIAND)
IOL	Inuit Owned Land
KIA	Kivalliq Inuit Association
MVEIRB	Mackenzie Valley Environmental Impact Review Board
MVLWB	Mackenzie Valley Land and Water Board
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
NTI	Nunavut Tunngavik Incorporated
RWED	Resources, Wildlife and Economic Development (Government of NWT)
NPC	Nunavut Planning Commission
NWT	Northwest Territories



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1.0 INTRODUCTION

1.1 PURPOSE OF THIS PAPER

This paper has been written to outline the position of the Beverly and Qamanirjuaq Caribou Management Board (BQCMB) concerning protection of the Beverly and Qamanirjuaq barren-ground caribou herds and their ranges, and to make recommendations for protecting their calving grounds, post-calving areas, and other important habitats.

1.2 POSITION OF THE BQCMB

The BQCMB recognizes the importance of economic development, including resource development, to the communities on the Beverly and Qamanirjuaq caribou ranges. The BQCMB also recognizes that residents of these communities do not want to compromise healthy caribou herds for the economic benefits of non-renewable resource development. The preservation of caribou and their key habitats is essential both for the economic benefits they provide, and for maintaining traditional lifestyles.

The BQCMB believes that the Beverly and Qamanirjuaq caribou herds should be protected from any human-caused disturbance that has potential to cause significant adverse effects to these herds or key habitats across the caribou ranges. To this end, the BQCMB has consistently called for long-term protection of caribou calving grounds and post-calving areas, and stronger protection of the caribou herds and their habitat throughout all seasonal ranges. Evidence of this consistent position is provided in a variety of forms, including the BQCMB's position concerning the 1987 proposal by the NWT Chamber of Mines to remove the Caribou Protection Areas (BQCMB 1987), and numerous articles published over the years in the BQCMB newsletters *Caribou News* and *Caribou News in Brief* and other publications.

Key Recommendations

The BQCMB recommends that several steps be taken to provide adequate protection for Beverly and Qamanirjuaq caribou over the long-term. Key recommendations for action, which are outlined below, are supported by further explanation in the body of this paper.

- 1) The traditional calving grounds and post-calving areas of these two caribou herds should be provided with long-term legislated protection that prohibits any type of activity that would cause serious or irreversible negative effects to caribou or habitat.
- 2) The herds should be protected during other key life cycle periods (i.e., fall migration/rut, winter, spring migration) and while at water crossings by means of improved Caribou Protection Measures (CPM), if an assessment indicates that modifications to the original CPM can provide meaningful protection to these herds. Following an affirmative assessment and development of improved measures, they should be established as a conformity requirement of a revised land use plan for the Kivalliq region, and incorporated into other regional land use plans as they are developed.
- 3) Cumulative effects assessment/modeling through the environmental assessment process should be implemented to minimize destruction of all habitats used by Beverly and Qamanirjuaq caribou outside of traditional calving grounds and post-calving areas.



- 4) Regular delineation of calving grounds and post-calving areas should be undertaken.
- 5) A range-wide system of conservation planning should be established to safeguard the caribou herds over the long-term across all seasonal ranges.

2.0 BACKGROUND

2.1 THE VALUE OF CARIBOU

About 13,250 aboriginal people live in about 20 communities on or near the range of the Beverly and Qamanirjuaq caribou herds, and depend on them for economic, social and cultural needs. The social and cultural importance of caribou, which cannot be fully evaluated, provides immense and irreplaceable benefits to people across the caribou ranges.

According to statistics compiled in 2001, the total harvest of caribou that year by these communities for domestic and commercial use, including outfitting, was approximately 18,500 animals. This total represents over 850,000 kg. of meat, with a replacement value¹ of about \$17 million. This is the minimum gross economic value of caribou harvested in a single year using a minimum harvest rate. The economic potential is much larger when meat processing and uses such as outfitting for non-resident hunters (up to \$3,400 per animal harvested), skins for clothing and bedding, and bones and antlers for handicrafts are considered (BQCMB 2002a).

2.2 THE CARIBOU RANGES

The Beverly and Qamanirjuaq caribou ranges include large parts of two territories (Northwest Territories (NWT) and Nunavut) and two provinces (Saskatchewan and Manitoba; see Appendix 1 Map 1). These herds migrate annually from winter range primarily south of the treeline to traditional calving grounds² on the tundra. Although cows of each herd return to the same general area (traditional calving grounds) year after year, their use of any particular areas within their calving ground is unpredictable and determined by many factors (e.g., weather, snow melt, plant phenology, insect harassment, predator avoidance, tradition). Therefore, each caribou herd may use a slightly different area for calving each year, known as annual calving areas³.

¹ Replacement value was calculated using a cost of \$20/kg, which is the approximate cost of beef in communities in the Kivalliq region of Nunavut.

² **Traditional calving grounds** are the total cumulative area used for calving by a particular herd from the 1950s to present.

³ An **annual calving area** is used by calving caribou from a specific herd in any one year, and often overlaps with annual calving areas used by that herd in other years.



Beverly Caribou

The traditional calving ground (Map 1) and post-calving areas⁴ of the Beverly herd defined by government surveys are located primarily in Nunavut, but extend into the NWT in some years. Beverly calving areas included parts of present-day NWT in 2 of the 23 years in which calving ground surveys were conducted by government agencies between 1957 and 1994 (BQCMB 2000a, 2000b; see map at www.arctic-caribou.com/cdrom/contents/pdf/bcy.pdf). Surveys documented use of areas in the NWT by Beverly cow/calf groups during the post-calving period in several years between 1978 and 1990. Most of the Beverly post-calving area used during this period, however, is located within Nunavut in the northern half of the Thelon Wildlife Sanctuary and to the northeast of the Sanctuary (BQCMB 2000a, 2000b; see map at www.arctic-caribou.com/cdrom/contents/pdf/bpc.pdf).

Qamanirjuaq Caribou

The traditional Qamanirjuaq caribou calving ground defined by surveys conducted between 1963 and 1994 is located entirely in the southern Kivalliq (previously Keewatin) region of Nunavut, within 300 km of the Hudson Bay coast (Map 1). Annual Qamanirjuaq calving areas documented by government surveys during this period were all located in the region between Baker Lake and Arviat (BQCMB 2000a, 2000b; see map at www.arctic-caribou.com/cdrom/contents/pdf/qcy.pdf). Areas used primarily by cow/calf groups during post-calving periods between 1966 and 1990 were in the same general region, but the cumulative post-calving area during this period also extended south and east of the traditional calving ground (BQCMB 2000a, 2000b; see map at www.arctic-caribou.com/cdrom/contents/pdf/qpc.pdf).

Data from 1993 to present from satellite-monitored female Qamanirjuaq caribou indicate that cows have continued to use calving and post-calving areas documented by surveys, plus some additional areas not previously identified. Satellite-monitored caribou used areas during calving periods⁵ between 1993 and 2004 within the traditional calving ground identified through surveys, but also used areas outside the periphery of the known calving ground, with the greatest expansion occurring up to about 100km toward the southwest (Map 2). During post-calving periods between 1993 and 2004, the satellite-monitored caribou cows used much of the area previously documented as post-calving habitat, but also used areas outside the known post-calving areas, including a substantial extension to the south and west of Arviat (Map 2).

2.3 THE BQCMB

The BQCMB was created in 1982 out of concern for the welfare of the Beverly and Qamanirjuaq herds of barren-ground caribou. The Board is a partnership between five governments (Manitoba, Saskatchewan, the Northwest Territories, Nunavut, and Canada) and caribou-using communities from across the range of these two herds (see Appendix 1 Map 1). Board members include community representatives from northern Manitoba (2), northern

⁴ **Post-calving areas** are defined as the areas used by cow/calf groups or by satellite-monitored female caribou during the **post-calving period**, which is the period from late June to the end of July (BQCMB 1999). This is distinguished from overall **post-calving range**, which includes areas used by other sex/age classes of caribou (e.g., bulls, juveniles) during the post-calving period.

⁵ The BQCMB defines the **calving period** as late May to late June (BQCMB 1999).



Saskatchewan (3), the South Slave region of NWT (2), and the southern Kivalliq region of Nunavut (2-3); and a total of 5 government representatives (BQCMB 2002b).

The Board's existence arises from the *Beverly and Qamanirjuaq Barren Ground Caribou Management Agreement* (BQCMB 2002b). Its strength results from the cooperative relationships built over more than 20 years among the individuals representing various government agencies, aboriginal groups, and communities, and their willingness to work together toward a common goal.

The BQCMB advises governments and communities on the ranges of Beverly and Qamanirjuaq caribou regarding conservation of these two caribou herds and their habitats. The 10-year multi-jurisdictional management agreement for Beverly and Qamanirjuaq caribou (BQCMB 2002b) outlines the Board's mandate, responsibilities, membership, operational rules and procedures, and the financial obligations of government parties. BQCMB responsibilities include making recommendations to governments and aboriginal groups for conservation of the caribou herds and their habitat to protect the resource from human-caused declines in health and numbers and to closely monitor and define natural fluctuations.

Recommendations are made according to the Beverly and Qamanirjuaq Caribou Management Plan (BQCMB 2004a), which addresses protection of caribou and habitat specifically through the following goal and principle statements:

Goal 9: "To manage human disturbance in a manner that protects caribou and their habitat."

Principle 10: "The maintenance of suitable caribou habitat, including the preservation of calving grounds, wintering areas and migration routes, is essential."

3.0 THE CONTEXT FOR CARIBOU PROTECTION

3.1 A COOPERATIVE APPROACH

The BQCMB brings together representatives of government and caribou range communities to discuss issues and identify solutions for conservation of the Beverly and Qamanirjuaq caribou herds and their habitats. In the Board's view, conservation refers to the balance between wise use and protection.

The issue of caribou and habitat protection encompasses the entire ranges of both herds, and is relevant to all governments represented by the Board (two provincial, two territorial, and federal). The continued well-being of the caribou herds and their habitats is also of utmost significance and concern to the Aboriginal peoples from communities across the caribou ranges. As a result, management of human activities on caribou ranges, including calving grounds and post-calving areas, is of great interest to the BQCMB and all the communities and jurisdictions it represents.

Recommendations are made by the BQCMB according to the Beverly and Qamanirjuaq Caribou Management Plan (BQCMB 2004a). The first goal and principle of the Plan relate to the Board's mandate for cooperation:



Goal: To manage the herd in a co-operative manner that involves the full participation of communities and governments and brings together local knowledge and scientific knowledge in the management process.

Principle: Effective caribou management must be based on full co-operation, participation and communication among communities and governments.

3.2 RESPONSIBILITY FOR CARIBOU PROTECTION AND LAND MANAGEMENT

The BQCMB expects all parties responsible for resource conservation on the Beverly and Qamanirjuaq caribou ranges to conform to the principle of ***sustainable development***, which it defines as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (BQCMB 2004a). This goal is difficult to achieve because complete information on impacts and cumulative effects of development activities is generally not available to decision-makers. Nevertheless, the federal and territorial governments have adopted the concept of sustainable development whereby the environmental, economic, and social implications of an issue are considered as early as possible in decision-making processes, including processes for development of mineral and metal resources (Government of Canada 1996). The principle of sustainable development is also applied by the Nunavut Planning Commission (NPC) to land use planning in the Kivalliq region (NPC 2000).

The agencies responsible for caribou protection, land management, and regulation of resource development on the most sensitive of Beverly and Qamanirjuaq caribou habitats (i.e., calving grounds and post-calving areas) are described below.

Caribou Conservation

The territorial governments of Nunavut and the NWT are responsible for conserving the Beverly and Qamanirjuaq herds when they are within their territorial borders, which generally includes the calving and post-calving periods each year (i.e., late May to end of July), much of the other non-winter life cycle periods (e.g., spring migration, late summer, and fall migration/rut) in most years, and portions of the winter period in some years. The responsible departments are Nunavut's Department of Environment (DOE) and NWT's Department of Resources, Wildlife and Economic Development (RWED). The provincial departments of Saskatchewan Environment and Resource Management and Manitoba Conservation are responsible for the herds when they range in these jurisdictions, which primarily occurs during the winter period (November to mid-March).

Land Management and Regulation of Resource Development

In the Thelon Wildlife Sanctuary - The traditional Beverly calving ground and post-calving areas lie to a large extent within the Thelon Wildlife Sanctuary in the NWT and Nunavut. These areas are not subject to development, as the land included in the Sanctuary has been “withdrawn from disposition” by the Department of Indian and Northern Affairs Canada (INAC). Beverly caribou range within the Sanctuary falls under the jurisdiction of the two territorial governments and INAC, and is also subject to a management agreement developed by the communities of Lutsel K'e (NWT) and Baker Lake (Nunavut) and the territorial and federal governments.

In Nunavut - Most of the Beverly calving ground and post-calving areas in Nunavut outside the Thelon Wildlife Sanctuary are federal Crown lands. A relatively small amount of the Beverly



calving and post-calving areas (along the north-eastern edge) are Inuit Owned Land (IOL). The traditional Qamanirjuaq calving ground is a patchwork of Crown land and IOL, including a large area of surface IOLs and a smaller portion of subsurface IOL. Beverly caribou range outside of the Thelon Wildlife Sanctuary, and all lands and waters of Qamanirjuaq caribou range fall under the jurisdiction of the land and resource management agencies described below (based on INAC 2002).

INAC is responsible for management of federal Crown lands in Nunavut through administration of the *Territorial Lands Act*. This provides for the disposition, use and protection of territorial Crown lands, including such lands used by caribou herds for calving and post-calving in Nunavut. Management of IOLs in the Kivalliq region is the responsibility of Nunavut Tunngavik Incorporated (NTI) for subsurface IOLs and the Kivalliq Inuit Association (KIA) for surface IOLs. The proponent of any major development project in the Kivalliq Region must negotiate an Inuit Impact and Benefit Agreement (IIBA) with the KIA before any work begins on a surface IOL.

Proponents of development projects in Nunavut must obtain approval from the appropriate institutions of public government (IPG) before federal and territorial agencies and the Nunavut Water Board (NWB) can issue the required licenses and permits. The Nunavut Impact Review Board (NIRB), the NPC, the Nunavut Surface Rights Tribunal, the Nunavut Wildlife Management Board and the NWB are IPGs created through the *Nunavut Land Claims Agreement Act*.

Project applications are reviewed by the NPC, which is responsible for developing land use plans that provide guidelines on how the land is to be used for purposes such as industrial development and conservation. (Kivalliq land use planning is discussed further in section 6.2). If the NPC determines that a project proposal is in conformity with the *Keewatin Regional Land Use Plan* (NPC 2000), or a variance is approved, the proposal is forwarded to the NIRB for screening. NIRB screens the proposed project and determines whether a review is required. During a project review NIRB defines the extent of the project, reviews the ecosystemic and socio-economic impacts, determines whether the project should proceed and under what terms and conditions, makes recommendations to the Minister of Indian Affairs and Northern Development, and monitors permitted projects as per the requirements of the Nunavut Land Claims Agreement (NIRB 2004).

In the NWT - The portions of the Beverly calving ground and post-calving area in the NWT outside of the Thelon Wildlife Sanctuary are federal Crown lands. The Mackenzie Valley Land and Water Board (MVLWB) is responsible for land use planning, land use permits, and water licenses for these lands and waters (INAC 2004a). The MVLWB prescribes the Mackenzie Valley Land Use Regulations for all Crown, settlement, and privately owned lands (MVLWB 2001). The MVLWB is empowered under the *Mackenzie Valley Resource Management Act* (MVRMA) to refer land use applications to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) for environmental assessment if their preliminary screening determines that the proposed land use “might have a significant adverse impact on the environment or is a cause of public concern” (MVLWB 2001: 12).

Based on their assessment, the MVEIRB “may make recommendations to mitigate adverse environmental impacts” and recommend terms or conditions for permits issued by MVLWB, or recommend further environmental impact review (INAC 2004a). The MVEIRB “will recommend ways to protect the environment from impacts caused by a development . . . [and] can also recommend to the Minister of Indian Affairs and Northern Development that a development be rejected because the impacts are too great” (MVEIRB 2000).



3.3 THE CHANGING NORTH

Governments and communities in the Canadian North work in a context of profound and rapid political, economic, social and cultural changes driven by forces such as industrial development, the settlement and implementation of land claims, and establishment of self-government. Economic development of the North is a major issue for all governments and communities on the Beverly and Qamanirjuaq caribou ranges.

Increasing and Diversifying Demand for Caribou

Beverly and Qamanirjuaq caribou are hunted by Dene, Inuit, Métis, Cree and non-aboriginal peoples from about 20 communities on or near the caribou ranges (see Appendix 1 Map 1). The number of people resident on both caribou ranges is increasing. For example, the collective population of eight NWT and Nunavut communities that harvest Beverly and Qamanirjuaq caribou has steadily increased from less than 6,000 in 1971 to almost 10,000 in 1999, and it is expected to continue to increase to about 14,000 by the year 2020 (BQCMB 2000c). This increased human population and the greater access to caribou range provided by new and proposed roads in Saskatchewan and Manitoba may result in greater harvest of caribou from both the Beverly and Qamanirjuaq herds (BQCMB 2001a, 2001b). This is of particular concern for the Beverly herd, as harvest levels have been close to the sustainable limit for several years (BQCMB 2001c).

The use of caribou is diversifying from primarily subsistence hunting to a mix of uses that includes subsistence harvest, commercial sport hunts, commercial meat sales, and eco-tourism. The BQCMB recognizes that “these growing and varied demands for caribou require informed and co-operative decision-making”, and has strengthened the process for cooperative management in the draft management plan for 2003-2008 (BQCMB 2004a).

Increasing Development on Caribou Ranges

Mineral exploration and development activities are increasing across the Canadian North, including the Beverly and Qamanirjuaq caribou ranges. Mineral exploration is ongoing in several locations on and near the traditional calving and post-calving areas of the Qamanirjuaq herd (INAC 2004b), and numerous mineral showings are found in the area (GNWT 2004). Major projects in this area include advanced exploration for copper and nickel at Ferguson Lake (GNWT 2004, INAC 2004b), which is an area of documented use by Qamanirjuaq caribou during calving and post-calving periods (BQCMB 2004b). The proposed Meadowbank gold mine (70 km north of Baker Lake) and the Meliadine gold project (20 km north of Rankin Inlet) are near traditional Beverly and Qamanirjuaq calving and post-calving range, respectively (Cumberland Resources 2004).

A major all-season road has been proposed to connect northern Manitoba with Nunavut through winter range and migration routes used by Qamanirjuaq caribou. In Saskatchewan, five uranium mines are situated along the southern portions of caribou winter range. The proposed Goldfields gold mine is within occupied winter range near Uranium City. Mineral exploration has accelerated west of Wollaston Lake along the newly created Athabasca Seasonal Road on range that was occupied by caribou in 2004. Plans are progressing for increased hydro-electric development along the Taltson River on winter range used by the Beverly herd in southern NWT.



4.0 THE NEED FOR CARIBOU PROTECTION

4.1 KEY ISSUES

The Political Issue

The calving grounds of the Porcupine caribou herd in Alaska have been protected since 1980 in the Arctic National Wildlife Refuge (ANWR), a portion of which ("the 1002 Area") has been subject to a moratorium on oil and gas exploration and development. The Government of Canada has consistently supported the retention of the wilderness designation for the 1002 Area on the basis of evidence that oil and gas development in the area would likely have significant negative effects on caribou and other wildlife. The BQCMB believes that proposed mineral developments on caribou calving grounds in Canada are incompatible with this position.

According to Weihs and Usher (2001:14), INAC "considers that the Government of Canada's position on the 1002 lands may be vulnerable because of proposed mineral developments on calving grounds in Canada which appear to be inconsistent with that position." Hence in 2000, INAC began an initiative to develop "a policy on the management of human activity on caribou calving and post-calving grounds that is consistent with, but not necessarily identical to, the government's position on the Alaska lands." However, more than four years later, no such policy has been completed.

The Ecological Issue

Caribou cows during calving and post-calving are both responsive to disturbance and highly vulnerable. Recent research has shown that the cows need uninterrupted foraging time to produce milk until calves become foragers at about 3 weeks after birth (Russell et al. 2002). This 3-week period is the time when calves are most sensitive to the maternal and environmental conditions that affect their growth, and when they are most vulnerable to predation. Cows and calves are also particularly vulnerable during calving and post-calving periods because they gather together in groups. It is therefore critical to avoid both disturbance of cows and calves during the calving and post-calving periods, and destruction of calving and post-calving habitats.

The Management Issues

- 1) ***Increasing effects of human activities*** - The accumulating and interacting effects of the following stresses, working in combination with other natural factors that exert pressures on the caribou herds (such as predation, insect harassment, disease, extreme weather events), may exceed the capability of Beverly and Qamanirjuaq caribou to cope and may contribute to population declines:
 - ***Increasing land use activities.*** Exploration and development activities are increasing across the caribou ranges (see Sec. 3.3). Land use activities of concern include, but are not restricted to, industrial development. For instance, new roads built to support industrial developments often result in increasing levels of recreational and tourism activities on caribou ranges, because of the access they provide. The combined impacts from all land use activities are potential problems across the caribou ranges, but are of particular concern on calving grounds and post-calving areas, and near important water crossings.



- *Increasing caribou harvest.* Increased harvest will result from growing numbers of people resident on or near the caribou ranges, combined with improved access provided by new roads and access trails to people from outside the ranges (see also Sec. 3.3).
- *Effects of climate change.* Among the predicted effects of climate change is an increasing frequency and severity of forest fires, which will change forage availability on caribou winter range. Negative consequences of these fires will include more frequent interruptions to caribou foraging due to mosquito and warble fly harassment, and greater incidence of other parasites and diseases. It is uncertain if and how those negative effects will be compensated for by increases in forage availability during warmer and longer summers. Changes in the timing of spring plant growth relative to the needs of cows and calves may increase stresses for cows during calving and post calving periods. Some idea of how those changes may cause possible distributional shifts in calving have been modeled for the Bathurst caribou herd (Griffith et al. 2001) and may be applicable to Beverly and Qamanirjuaq herds.

- 2) ***A need for range-wide conservation planning*** - Caribou cows and calves are most vulnerable to human activities and habitat changes on calving grounds and post-calving areas, and therefore protection of these areas is essential. However, the interactions between the effects of changes that occur on all other seasonal ranges with the effects of changes that occur on calving grounds and post-calving areas must be taken into account, because changes that occur anywhere on a herd's range ultimately affect the condition/health of cows and their calves. The cumulative effects from natural and human-caused changes across seasonal ranges set the context for the effects on any one seasonal range. The capability of caribou to buffer changes varies between seasonal ranges and between years, and therefore range-wide conservation planning for each herd is necessary.
- 3) ***Inadequate mechanisms for protection*** - Policies, mechanisms, and the information base for protecting Beverly and Qamanirjuaq caribou and habitat from the impacts of human land use activities are currently inadequate. A variety of options for managing land use activities on caribou ranges across northern Canada, especially activities on calving grounds and post-calving areas, needs to be developed and implemented. The information base, including data on caribou range use patterns, must be improved to allow successful implementation of these policies and protection measures. However, measures should be developed and implemented as soon as possible based on currently available information, and then modified as required based on additional data as it becomes available.

Of particular concern regarding calving grounds, post-calving areas and other important habitats is the federal government policy that once companies are permitted to conduct mineral exploration activities that involve substantial financial investments, they should be permitted to develop mines. The Minerals and Metals Policy of the Government of Canada (Government of Canada 1996) states that "governments should provide reasonable certainty that when industry finds a mineral deposit, it may develop that deposit, provided that all statutory and regulatory obligations are met and the required approvals are obtained" (Government of Canada 1996:15). However, this Policy also states that if potential environmental impacts are "serious or irreversible", cost-effective measures to prevent these



impacts are required, as per the precautionary principle from the 1992 *Rio Declaration on Environment and Development*⁶, to which Canada is a signatory.

The BQCMB believes that the responsible governments (see Sec. 3.2) are not adequately prepared to determine if potential impacts of a proposed development activity will have “serious or irreversible” impacts on Beverly or Qamanirjuaq caribou, their calving or post-calving areas, or other important habitats. Furthermore, Nunavut agencies are not bound by federal policies, so it is not clear what action will be taken if a mine is proposed on IOL that is important to Beverly or Qamanirjuaq caribou, such as calving or post-calving areas.

4.2 POTENTIAL IMPACTS OF HUMAN ACTIVITIES ON CARIBOU

Results of Recent Research

Recent summaries of the potential impacts of human activities on caribou include those by Klein (2000) and Wolfe et al. (2000). Klein (2000) reviewed the effects of human activities such as contaminant, hydroelectric development, and land surface changes on reindeer/caribou. Wolfe et al. (2000) summarized research on the response of reindeer/caribou to the following human activities: aircraft; roads, railways, and transportation infrastructures; recreational activities (snowmobiles, tourist buses, tourist resorts); and forestry (timber harvesting, burning, fertilization). Wolfe et al. (2000) reported that reindeer/caribou individuals and groups exhibited the following behaviours in response to human activities:

- movement away from point sources of disturbance
- increased activity and energy expenditures near disturbance
- delay or failure to cross linear structures
- shift away from areas of extensive and intensive development.

They also reported that cows and calves during the calving season are the most sensitive to disturbance, and that animals are frequently killed by collisions with vehicles and by hunting along roads. Wolfe et al. (2000) were not able to assess the direct and cumulative effects of disturbance at the population level, concluding that more research and modeling are required. They did, however, recommend the following actions:

- avoid disruption of natural patterns of landscape use by reindeer/caribou
- plan and implement effective mitigation procedures in development areas
- monitor the effectiveness of mitigation measures.

Johnson and Boyce (2004) modeled the behavioural responses of barren-ground caribou to disturbance in the central Canadian Arctic and found a strong avoidance of major developments during the post-calving season. They also observed that the likelihood of caribou occurrence increased with increasing distance from major developments up to about 40 km during spring migration/calving, and up to about 130 km during post-calving.

Caribou and Cumulative Effects

Assessment of the cumulative effects of industrial development on barren ground caribou has to date been conducted primarily for petroleum development. The findings of cumulative effects

⁶ Principle 15 of the *Rio Declaration* states: “Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”



assessments should be used to assess the potential effects of disturbance from mining and other types of developments on the Beverly and Qamanirjuaq caribou.

Although numerous studies of the environmental impacts of petroleum development on Alaska's North Slope have been conducted since development began in the 1960s, relatively little assessment of their cumulative effects had been done prior to a review and assessment conducted by the National Academies at the request of the U.S. Congress (National Research Council 2003). The committee assessed the known and probable cumulative impacts of oil and gas activities on caribou as part of a comprehensive, two-year review of information about these activities on the North Slope. They concluded that the interaction of disturbance from industrial activities during calving and the stress of summer insect harassment reduced the reproductive success of female caribou from the Central Arctic Herd, contributed to an overall reduction in herd productivity, and may have contributed to a decrease in herd size in years with relatively high insect activity. They also reported that in some cases, it is impossible to differentiate the causes of observed impacts resulting from climate change on the North Slope from the effects of oil and gas activities.

A recent synthesis of the potential impacts of proposed oil and gas development on ANWR's coastal plain by the U.S. Fish and Wildlife Service (2001) concluded that the cumulative effects of pipelines, roads, and structures associated with development of the 1002 Area "would potentially impact the Porcupine Caribou herd by:

- reducing the amount and quality of preferred forage available during and after calving,
- restricting access to important coastal insect-relief habitats,
- exposing the herd to higher predation, and
- altering an ancient migratory pattern, the effects of which we can not predict."

5.0 PAST AND CURRENT CARIBOU PROTECTION

5.1 CARIBOU PROTECTION MEASURES

CPM were developed specifically to minimize disturbance to caribou on their calving grounds, post-calving areas, designated water crossings, and along migration routes to calving grounds (Mychasiw 1984). INAC introduced CPM in 1978 in response to concerns of Baker Lake residents regarding the potential impacts of mineral exploration activities on caribou range use patterns in the area. The CPM restricted activities i) in designated Caribou Protection Areas (CPAs) between May 15 and July 15, ii) where caribou calve outside CPAs during this same period, iii) during migration, and iv) within 5-10 km of designated water crossings. The CPM was the primary tool for protecting caribou across the Beverly and Qamanirjuaq ranges outside of the Thelon Wildlife Sanctuary.



Caribou Monitoring Program

The caribou monitoring program, which was run by INAC and the Government of the Northwest Territories from 1978 to 1990, primarily provided information on calving ground distribution and post-calving movements of caribou within designated CPAs, and was used to restrict land use activities through prohibition and application of the CPM. From 1978 to 1990, CPA boundaries for Beverly and Qamanirjuaq caribou were delineated based on the caribou herd's use of calving grounds and post-calving areas over the previous 5-year period, and were adjusted following an annual review of boundaries and patterns of range use. The Caribou Monitoring Program was discontinued in 1991 when INAC withdrew funding. The CPM have been applied since then without current information on caribou range use patterns.

The Keewatin Regional Land Use Plan prescribes application of CPM as a conformity requirement as follows:

“Development activities shall be prohibited on all public lands and waters within all caribou calving areas during calving season and within caribou water crossings in the Keewatin, in accordance with the terms of DIAND caribou protection measures contained in Appendix H. Development activities shall be prohibited on IOL within all caribou calving areas during calving season and within caribou water crossings in the Keewatin, in accordance with the KIA caribou protection measures (an example of which is contained in Appendix H).” (NPC 2000:52)

The DIAND/INAC CPM appended to the land use plan are the standard CPM developed in the 1970s. The appended example of KIA CPM provides similar restrictions.

Limitations of CPM

In the Keewatin Regional Land Use Plan, NPC states that “the existing caribou protection measures are adequate” (NPC 2000: 47). However, Weihs and Usher (2001) report that land managers adopted NPC's recommendation to use modified CPM (which they called Mobile Caribou Protection Measures) throughout Nunavut, following their development for the West Kitikmeot Draft Regional Land Use Plan.

The feasibility and efficacy of the original CPM and Mobile CPM need to be assessed for the Kivalliq region and specifically for the protection of Beverly and Qamanirjuaq herds. Use of the original CPM as the primary tool for protecting caribou has several limitations.

- CPM were included in terms and conditions of land use permits using out-dated information on caribou range use patterns. Information on range use during calving and post-calving periods has not been collected, and monitoring has not occurred, since 1990.
- Enforcement of CPM has been inadequate. Inspection of land use operations was generally insufficient to determine whether CPM conditions were being followed. For example, patrols by wildlife officers to inspect mining camps usually occur once a year, which is clearly not adequate, but reflects current levels of funding and staff.
- CPM were developed to address disturbance resulting from exploration, not development projects.
- CPM were developed to minimize disturbance to caribou, but do not provide any habitat protection.



An assessment of Mobile CPM is needed to determine whether modifications put in place by NPC have addressed the first three limitations. The fourth limitation will apply to all versions of CPM unless long-term protection for habitat is incorporated into the measures.

Inadequate Knowledge of Caribou Range Use Patterns

Although CPM are occasionally applied for the Beverly herd, we know little about the herd's recent range use patterns or whether the measures are adequate for minimizing disturbance to Beverly caribou on calving grounds and post-calving areas. We know that Beverly caribou have calved outside the Caribou Protection Area in many years since the CPM were implemented, including at least 4 years in which less than 5% of calving occurred within the CPA (Gunn and Sutherland 1997). Because annual calving and post-calving areas for Beverly caribou have not been delineated since 1994 and 1990, respectively, we do not know what, if any, protection has been provided to calving and post-calving caribou since then through the CPM within the Beverly CPA.

No surveys of calving and post-calving areas used by Qamanirjuaq caribou have been conducted since 1994 and 1990, respectively. However, information about the herd's range use patterns has been collected since 1993 by tracking a small number of caribou fitted with satellite collars. In many years between 1993 and 2004, Qamanirjuaq caribou calved both within and south of known calving areas (as far south as Arviat in 2000 and 2002), including areas outside the CPA (M. Campbell, pers. comm.). Despite availability of these data, we do not have sufficient information to determine whether the CPM are successfully minimizing disturbance to Qamanirjuaq caribou on calving grounds and post-calving areas.

5.2 CURRENT STATUS OF CARIBOU PROTECTION

Beverly and Qamanirjuaq caribou may be provided with some protection during the calving and post-calving periods through application of the CPM within the CPAs; however, as explained above, the success of these measures is not known. Areas used by Qamanirjuaq caribou for calving and post-calving are not currently protected by any legislated protected areas. Part of the Beverly herd's traditional calving ground is protected in the Thelon Wildlife Sanctuary (Map 1). However, much of the calving grounds and post-calving areas used by Beverly caribou from 1957 to 1994 were outside the Sanctuary. The herd calved outside the Sanctuary in 22 of the 23 years government surveys were conducted during this period, and most of the annual calving areas used since 1978 have been primarily or entirely outside the Sanctuary (BQCMB 2000a). In addition, substantial portions of the post-calving areas used by Beverly cow/calf groups between 1978 and 1990 were outside the Sanctuary. Because annual calving and post-calving areas for Beverly caribou have not been delineated since 1994 and 1990, respectively, we do not know what, if any, protection has been provided for these key habitats during the past 10 years or longer.

There is limited protection in place for either of these herds during other times of the year, or for other seasonal ranges or important water crossings. In north-western Saskatchewan, the Athabasca Sand Dunes Wilderness Park protects a small portion of the Beverly herd's winter range and water crossings along the south shore of Lake Athabasca. Three provincial parks and one ecological reserve provide protection for much of Qamanirjuaq caribou fall and winter



range in northern Manitoba⁷. Some traditional water crossings used by Beverly and Qamanirjuaq caribou in the NWT and Nunavut are protected by land use regulations when CPM are attached to permit terms and conditions (BQCMB 2000a). No protection of Beverly caribou habitat has resulted to date from the NWT Protected Areas Strategy (GNWT 1999). The NPC has recommended that a conservation areas strategy for Nunavut be developed and implemented (NPC 2004).

Limited protection for Beverly and Qamanirjuaq caribou and their habitats may be provided through Nunavut's land use planning process and environmental assessment processes conducted across the caribou ranges (see Sec. 3.2). However, the effectiveness of these processes is limited by a lack of current information concerning seasonal range use by Beverly and Qamanirjuaq caribou, and the Keewatin Regional Land Use Plan (NPC 2000) requires significant updating and revisions to increase its value for caribou protection. There are no provisions for land use planning in much of the herd's range, and there is no range-wide conservation plan to assess cumulative effects of human activities on caribou across their ranges through all seasons.

6.0 ACTION REQUIRED FOR PROTECTING CARIBOU

It is the responsibility of governments to ensure that appropriate action is taken to safeguard barren-ground caribou over the long-term. The principles, tools, and actions recommended for achieving this goal for Beverly and Qamanirjuaq herds and habitats are outlined below.

6.1 PRINCIPLES

The BQCMB recommends that governments apply the following key principles during development of policies and tools for protecting Beverly and Qamanirjuaq caribou and their ranges from the impacts of human land use activities.

- 1) Caribou herds must be protected from serious and irreversible negative effects of disturbance that result from human land use activities.
- 2) In key caribou habitats, requirements for caribou conservation must be paramount.
- 3) The precautionary principle must be the guiding principle when assessing proposals for industrial development.
- 4) Developers should be required to demonstrate that their activities won't cause disturbance to caribou or their habitats that may result in serious and irreversible negative effects.

⁷ Development of mines, logging and hydro electricity are prohibited in Caribou River, Sand Lakes, and Numaykoos Lake provincial parks. The Baralzon Ecological Reserve prohibits mining, logging, hydro development, motor vehicles other than aircraft or motor boats, sport hunting and outfitters.



- 5) Calving grounds and post-calving areas must be provided with long-term protection in legislated protected areas⁸ in which industrial developments that result in habitat modification (such as mining and hydro-electric development) are prohibited.
- 6) Protected areas should be considered for other parts of caribou ranges, including migration and staging areas, water crossings, and key portions of winter range. Improved CPM may also be an option for these areas, if an effective system can be developed and funded adequately.
- 7) The remainder of caribou ranges outside these key habitat areas must be protected through regulation of land use activities that is effective and includes adequate resources for compliance monitoring and enforcement.
- 8) The issue of protection for calving grounds and post-calving areas must be considered in the context of range-wide conservation planning, not in isolation.
- 9) Management of human activities must be flexible to accommodate that:
 - caribou are coping with many environmental influences, including human activities
 - the capability of caribou to buffer changes is unknown. However, this capability is likely limited and varies with conditions, which vary spatially and temporally.

6.2 RECOMMENDED OPTIONS FOR PROTECTING CARIBOU

Policies and procedures, and a plan and tools for implementing them, are needed to ensure maintenance of the Beverly and Qamanirjuaq caribou herds and their habitats, particularly for calving grounds and post-calving areas. Development and implementation of these necessary measures is beyond the mandate of the BQCMB and should be conducted by the federal government in cooperation with all caribou range communities, provincial and territorial governments, land management and environmental assessment agencies, and industry.

Management options currently available for managing human activities on caribou calving grounds and post-calving areas in the NWT and Nunavut were reviewed and described by Weihs and Usher (2001). They recommended that INAC utilize certain options based on consultation with Inuvialuit and Nunavut organizations with responsibility for caribou management. The most valuable approaches for protecting Beverly and Qamanirjuaq caribou from the perspective of the BQCMB are described below. A combination of these approaches should be used to protect the caribou herds and key portions of their ranges.

The BQCMB has produced several products intended to make information about these caribou herds and their seasonal ranges accessible to a wide variety of potential users (see BQCMB 1999, 2000a, and 2000b). These products include a map atlas of seasonal ranges and sensitivity ratings for caribou and habitat to land use activities during caribou life cycle periods, and should be used with other appropriate information to develop a system for protecting caribou and habitat. The Board encourages use of these products for improving decisions that

⁸ The term "protected area" is used in the general sense, and does not infer any particular type of protection, legislation, or prohibition, unless stated otherwise.



affect the caribou herds and their habitats, and provides suggestions for specific uses of these products below.

Land Use Planning

Legally-binding and enforceable land use planning should be a key component of both range-wide conservation planning and a system for managing human land use activities on caribou ranges. To date, however, there are no provisions for land use planning on much of the Beverly and Qamanirjuaq caribou ranges, and the existing land use plans need to strengthen their protection of caribou and caribou habitat. The draft West Kitikmeot Regional Land Use Plan (A. Boyd, pers. comm.), which has been developed based on extensive community consultation, could be an appropriate model for initiating planning across the caribou ranges.

In Nunavut - The Keewatin Regional Land Use Plan (NPC 2000) should be revised to provide clearer direction and more current information for protecting Beverly and Qamanirjuaq caribou as follows.

- An accurate map showing traditional caribou calving grounds should be developed to replace the current map ("Caribou Calving Grounds", p. 51). Additional maps showing areas used by the caribou herds during the post-calving season and all known water crossings should be produced and used as reference materials during land use planning processes. The new maps should be based on historical survey data compiled by the BQCMB (2000a) and recent information collected by the Nunavut's DOE and NWT's RWED.
- Information identifying areas used by the caribou herds during calving and post-calving periods, water crossings, key migration routes, and other important habitats should be made available to the NPC each year for use in updating reference maps.
- These up-to-date maps should be used by the NPC to determine which applications for land use conform to the Land Use Plan, and especially to apply the conformity requirement that development activities will be prohibited on all public lands, IOL, and waters within all caribou calving areas during calving season and within caribou water crossings in the Kivalliq (Term 2.6, p. 52).
- Current maps should also be provided to all agencies issuing permits, licenses and leases for activities on caribou range in Nunavut (e.g., DOE, KIA, NIRB, NWB), and to any parties and processes conducting cumulative effects assessment.
- Improved CPM should be included as a conformity requirement of a revised land use plan if a technical assessment determines that they can be modified to provide effective protection for Beverly and Qamanirjuaq herds, and if they are supported by Kivalliq communities.

In the NWT, Saskatchewan, and Manitoba - Regional land use plans that collectively cover the remainder of the Beverly and Qamanirjuaq caribou ranges should be developed. Regional land use planning is needed for the south-eastern NWT, and a single regional plan might be feasible for the portions of the Bathurst and Beverly caribou ranges in the NWT. Extension of land use planning underway for the Athabasca seasonal road corridor is required to cover the entire caribou range in northern Saskatchewan. In Manitoba, further land use planning will be required if the proposed road corridor is developed connecting Manitoba to Nunavut. All these regional land use planning processes should use and adapt the information and actions outlined above for the Kivalliq region of Nunavut.

A mechanism for range-wide communication about planning must be developed to ensure these regional land use planning processes collectively provide an effective means for managing



human activities on Beverly and Qamanirjuaq caribou ranges. There should also be consistency and coordination between these land use plans and the management plans developed for the Bathurst caribou herd (Bathurst Caribou Management Planning Committee 2004) and the Beverly and Qamanirjuaq caribou herds (BQCMB 2004a).

Protected Areas

Three forms of protection must be provided to adequately protect calving and post-calving caribou: i) year-round protection of the traditional calving grounds and post-calving areas from habitat destruction, ii) protection of calving caribou from disturbance, and iii) protection of post-calving caribou from disturbance.

Protected areas with fixed, legislated boundaries provide the strongest long-term protection for caribou, and the greatest certainty to developers. Legislated protected areas are currently the only option that can afford long-term protection for key caribou habitats. The application of legislated protected areas should be used for protecting calving grounds at a minimum; legislated protection of post-calving areas should be an essential next step. Portions of several caribou ranges are currently protected in this manner for Porcupine caribou (Ivvavik and Vuntut national parks), Bluenose caribou (Tuktut Nogait National Park), and Beverly caribou (Thelon Wildlife Sanctuary).

The protection of calving grounds and post-calving areas must result in minimizing disturbance to caribou and preventing range destruction. Because each annual calving and post-calving area is as critical as any other in the year that it is used, it is not sufficient to protect only the part of each traditional calving ground or post-calving area that is used most recently or most frequently – the cumulative area known to be used by a herd for calving and post-calving over many years (i.e., the traditional calving ground and post-calving area) must be protected.

The protected areas approach, where development activities are prohibited from a defined geographic area, is not generally popular with government agencies, and is seen by some as too simplistic (Weihs and Usher 2001). However, no other option provides long-term protection for caribou habitat and certainty to developers. Furthermore, once established, protected areas provide a low-cost approach to caribou conservation relative to other options.

The main deterrent to establishing protected areas is known or hypothetical loss of economic opportunities because an area is no longer available for certain development activities, such as mining, oil and gas development, or hydro-electric development. However, it is essential to the future of the caribou herds to protect caribou from disturbance when they are most vulnerable and to protect critical calving and post-calving areas from habitat destruction. Until an adequate alternative method is developed to provide long-term protection of habitat, legislated protected areas will be necessary.

Improved Caribou Protection Measures

According to Weihs and Usher (2001:12) “In the West Kitikmeot Draft Regional Land Use Plan, NPC revised the Caribou Protection Measures used in the Kivalliq Region for the Beverly and Qamanirjuaq herds to include a mobile component (“Mobile” Caribou Protection Measures). These measures are mobile in that they should “travel with the caribou” to protect them at critical times in their life cycle and at places where they are most vulnerable.” This tool is apparently preferred over other options by the NPC for various reasons, including their flexibility and because the location of calving each year does not need to be predicted in advance.



According to Weihs and Usher (2001), NIRB, KIA, and INAC apply Mobile CPM as terms of licences and leases where applicable.

Mobile CPM are not an adequate tool for protecting Beverly and Qamanirjuaq calving grounds or post-calving areas for the following reasons.

- They will not protect habitat from destruction or alteration.
- Developers will expect to be granted development rights if their exploration activities are successful, and habitat loss will occur.
- For Mobile CPM to be effective, a monitoring program needs to be developed and supported by a long-term commitment of financial resources, trained personnel, and accountability by all parties across both caribou ranges. This is not likely to persist given current and future economic constraints on responsible governments.

Mobile CPM could be useful for protecting caribou while they are using other seasonal ranges and important habitats (e.g., migration routes and water-crossings), since they allow protection to move with caribou herds as they migrate across the range.

The advantages and disadvantages of Mobile CPM should be assessed specifically for Beverly and Qamanirjuaq caribou before it is considered as a tool for protecting these herds. This assessment should determine if application of Mobile CPM can offer meaningful protection for Beverly and Qamanirjuaq caribou, or if further revisions to the measures are needed to provide an effective system. Once a useful set of improved protection measures has been identified, and it is determined that relevant communities support their application, then improved CPM should become a formal conformity requirement of a new land use plan for the Kivalliq region, and for other regional land use plans as appropriate. The use of CPM should not be left up to the discretion of land managers.

Recommendations for improving the original CPM:

- 1) CPM must be assessed in the context of recent information about caribou, the response of caribou to disturbance, and cumulative effects. Without evaluation, their effectiveness cannot be adequately assessed. The review is a necessary step for determining the type of specific improvements required to make the CPM effective, and should be conducted before Mobile CPM or any other modification of CPM are applied across Beverly and Qamanirjuaq caribou ranges.
- 2) CPM applied to protect Beverly and Qamanirjuaq caribou must take into account both the recent expansion of Qamanirjuaq caribou range and shifts in the areas used for calving and post-calving by both herds. Much more work needs to be done on the Beverly herd before we can determine if the original protection measures would be adequate, if Mobile CPM would provide significant protection, or if additional modifications are required.
- 3) Annual monitoring information must form the basis for CPM to ensure that CPAs are based on current data, that the effectiveness of CPM can be assessed, and that necessary changes to CPM and CPA can be identified. This will require that governments fund caribou monitoring programs, that developers provide sufficient funding for an adequate level of monitoring, or that both governments and



developers provide funding and conduct monitoring cooperatively.

- 4) Governments must ensure adequate capacity for monitoring compliance with CPM and other permit terms and conditions.
- 5) The feasibility of developing measures similar to the CPM should be investigated for protecting caribou on seasonal ranges other than calving grounds and post-calving areas. Simple regulations like CPM, as opposed to permanent exclusion of activities, may provide adequate protection for caribou herds throughout most of the year. However, annual monitoring would be required to ensure that such measures provided effective protection for Beverly and Qamanirjuaq caribou.

Environmental Assessment – Project Screening and Review

Land managers and regulators (i.e., INAC, KIA, MVEIRB, MVLWB, NIRB, NPC, NWB,) should routinely use the following information and tools, in combination with findings from Nunavut DOE's Qamanirjuaq caribou monitoring program and recent information from any other monitoring and survey programs, for evaluating potential effects of proposed development activities on Beverly and Qamanirjuaq caribou and caribou ranges.

- 1) ***Caribou calving and post-calving areas*** – Maps produced by the BQCMB showing caribou calving and post-calving areas based on government survey data from 1940-1995 (BQCMB 2000a) should be updated with new information from DOE's and RWED's monitoring programs each year, and used as reference materials (see also Land Use Planning above).
- 2) ***Caribou range use patterns during other life cycle periods*** (late summer, fall migration/rut, winter, spring migration) - Historical use of other seasonal ranges compiled by the BQCMB based on government survey data and locations of satellite-collared caribou (BQCMB 2000a; www.arctic-caribou.com/cdrom/contents/mapatlas.htm) should be used with local knowledge and recent information collected by DOE on range use by Qamanirjuaq caribou to produce current range use maps.
- 3) ***Water and ice crossings***
 - Table listing 120 documented water and ice crossings (BQCMB 2000a; www.arctic-caribou.com/cdrom/contents/wcsites.htm).
 - Rating system for assessing the importance of water crossings to caribou (BQCMB 2000a; www.arctic-caribou.com/cdrom/contents/water.htm).
 - Map showing the relative importance of water and ice crossings (BQCMB 2000a; www.arctic-caribou.com/cdrom/contents/pdf/wci.pdf).
- 4) ***Caribou-range sensitivity rating*** - A generalized rating for sensitivity of caribou and caribou range to land use activities by life cycle period (BQCMB 1999; www.arctic-caribou.com/cdrom/contents/report.htm).

6.3 GENERAL RECOMMENDATIONS

The BQCMB's recommendations for developing a system for protecting Beverly and Qamanirjuaq caribou herds and their habitats are provided below. These recommendations build on the general principles outlined previously.



- 1) Information on recent range use patterns of the Beverly and Qamanirjuaq caribou herds must be collected. We also need to define key areas for long-term protection of caribou habitat. An improved information base is necessary to support sound decision-making concerning management of human activities on caribou ranges. Information provided by monitoring Beverly caribou with satellite collars, continued satellite tracking of Qamanirjuaq caribou, and regular delineation of the calving grounds and post-calving areas would be extremely valuable.
- 2) New tools to protect habitat must be developed, particularly for caribou calving grounds and post-calving areas. This would ideally result from (i) development of a protected areas strategy and implementation program for Nunavut, and (ii) greater priority placed on protecting barren-ground caribou by parties implementing the NWT Protected Areas Strategy, Manitoba's Protected Areas Initiative, and Saskatchewan's Representative Areas Network.
- 3) On calving grounds and post-calving areas both of the following types of protection must be provided:
 - protection that minimizes disturbance to caribou cows and calves
 - protection that prevents habitat loss.
- 4) The starting point for calving grounds and post-calving areas should be prohibition of any type of activity that would cause significant disturbance or habitat modification, including industrial development. Long-term legislated protection for these areas is essential. Cumulative effects assessment through the environmental assessment process must be implemented to minimize permanent alteration of habitat on Beverly and Qamanirjuaq caribou range outside of calving grounds and post-calving areas (e.g., at or near water crossings and on migration routes and winter ranges). Additional measures that address impacts of development on caribou and caribou habitat must be developed. This will require research and modeling on the cumulative effects of human activities on caribou and caribou habitat.
- 5) Improved CPM may be an appropriate tool for permitting temporary activities outside of calving grounds and post-calving areas during times of year when caribou are not using these areas. However, Mobile CPM as currently described in the West Kitikmeot Regional Land Use Plan (NPC 2004) is not an adequate tool for protecting calving grounds and post-calving areas.
- 6) Ongoing evaluation of population trends through regular censuses and monitoring of indicators (e.g., recruitment, body condition, pregnancy rates, habitat conditions) is required to evaluate the effectiveness of management procedures (e.g., protected areas, land use planning, CPM and environmental assessment process).
- 7) Consultation with stake-holders, especially communities and land claims bodies, must be the basis for development of an approach to manage human activities on caribou ranges. The activities that are planned and conducted by scientists must be effectively communicated so that the public understands the consequences (both immediate and long-term) and the costs and benefits of trade-offs inherent in decisions made in favour of either caribou conservation or development activities.



7.0 CONCLUSIONS

The BQCMB has argued since its inception that suitable habitat for calving and post-calving must be maintained for the Beverly and Qamanirjuaq caribou herds. Maintenance of suitable caribou habitat throughout the Beverly and Qamanirjuaq caribou ranges, including calving grounds, post-calving areas, wintering areas, migration routes and water crossings, is a priority of the BQCMB and caribou range communities. However, little action has been taken to date by the responsible governments to implement long-term caribou protection, and current policies and measures are not adequate to ensure maintenance of the Beverly and Qamanirjuaq caribou herds in the face of increasing levels of human activity on the caribou ranges.

Conservation of these caribou herds and their key habitats must become a priority for the five governments that are party to the multi-jurisdictional management agreement for the Beverly and Qamanirjuaq caribou herds (BQCMB 2002b). A system that addresses the cumulative effects of changes occurring across all seasonal ranges must be developed for these herds by governments in cooperation with caribou range communities and other land users to ensure that human activities result in no serious or irreversible negative effects to these culturally and economically valuable caribou herds or their habitats.



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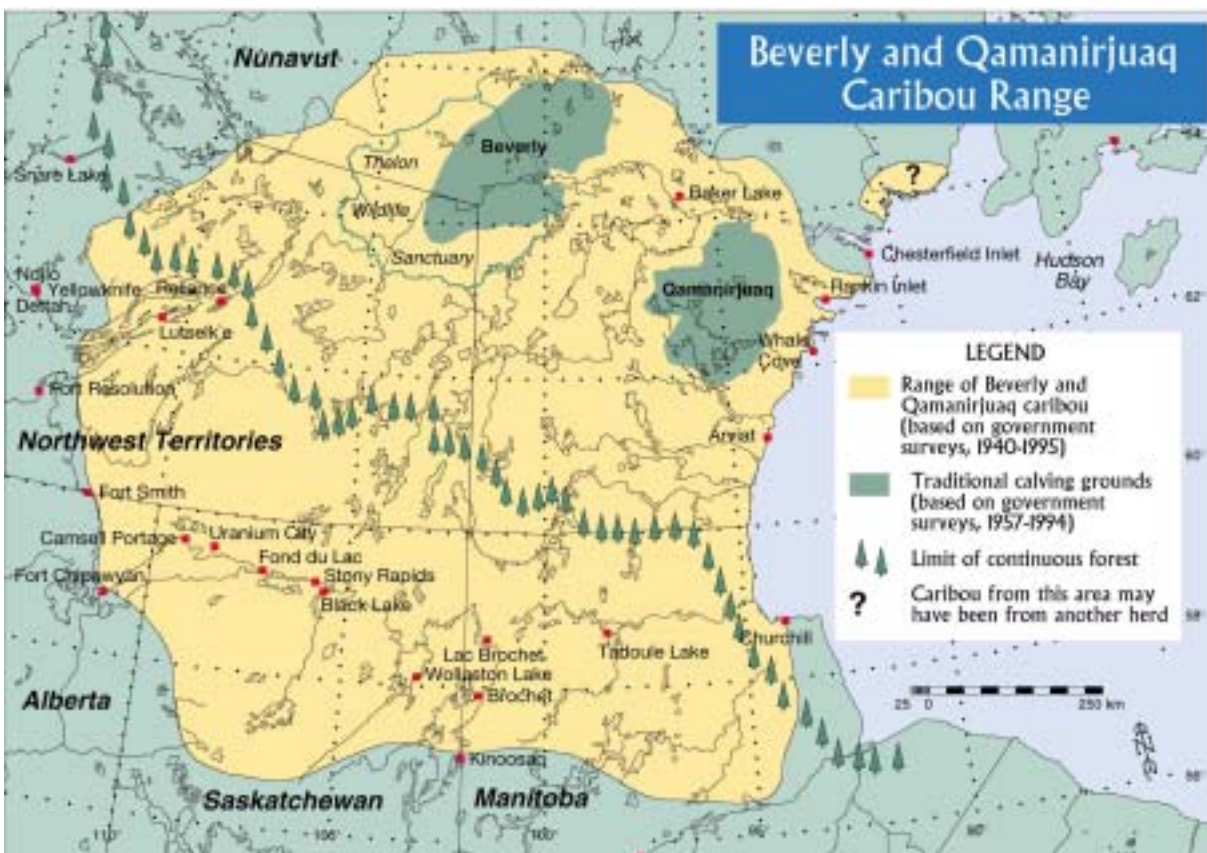
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APPENDIX 1. Maps showing documented Beverly and Qamanirjuaq caribou ranges.

Map 1. Combined year-round ranges (including all seasonal ranges) and traditional calving grounds of Beverly and Qamanirjuaq caribou, based on information obtained during government surveys between 1940 and 1995.





Map 2. Qamanirjuaq caribou calving and post-calving areas, based on locations of satellite-monitored caribou during calving and post-calving periods from 1993 to 2004.

