Project Caribou

Case Study: Bathurst Herd
Copyright © 2018

This book may be reproduced for educational purposes only. The illustrations may be duplicated solely for instructional use of this material. Reproduction for any other purpose is strictly prohibited without written permission from the publisher. For more information please contact:

   Environmental Education and Youth Programs
   Government of Yukon, Department of Environment
   Conservation Officer Services
   Box 2703, Whitehorse, Yukon Y1A 2C6
   (867) 667-3675 or 1-800-661-0408
   fax (867) 393-6206
   envirowild@gov.yk.ca

This is a supplement to
Project Caribou: An Educator’s Guide to Wild Caribou of North America
from the Government of Yukon’s Department of Environment.
Project Caribou
An Educator’s Guide to Wild Caribou of North America

Case Study:
Bathurst Herd
Case study

Bathurst Caribou Herd: Sound management begins with respect

Prepared by Jan Adamczewski (Government of Northwest Territories, GNWT), Kerri Garner (formerly with Tłı̨chǫ Government, TG), Bruno Croft (GNWT), and Sjoerd Van Der Wielen (TG).

Range and ecosystem

The annual range of the Bathurst Caribou Herd (BCH), defined based on radio-collared caribou movements between 1996 and 2010, covered an area of about 350,000 km² in northern Canada. This is almost exactly three times the size of the island of Newfoundland. Figure 1 (top left) shows the annual range in 1998–2001, based on satellite collared female caribou, along with the shrinking range in more recent years.

This vast landscape included calving grounds west of Bathurst Inlet in Nunavut, a summer range split between Nunavut and the Northwest Territories (NWT), and a winter range mostly in the NWT but extending in some years down into Saskatchewan. The winter range was by far the biggest of the seasonal ranges, resulting in a great triangular annual range with the calving grounds at one northern corner and the other corners south of Great Bear Lake and southeast of Great Slave Lake. In most winters, the herd settled in for the winter south of the tree line that meanders from the northwest to the southeast, but portions of the herd were known to winter on the tundra if snow cover on the ground was shallow and access to forage was relatively easy.

In the 1980s, the BCH was estimated at about 470,000, but by 2009, the once-mighty herd had fallen to barely 32,000. More startling than the decline itself was the downward acceleration: the annual rate of decline increased as the decline progressed. As with other barren-ground caribou herds, this herd’s range has been much smaller at lower numbers. In the past, this was something Indigenous elders monitored over the centuries. At lower numbers, the herd pulled back to core winter ranges and Indigenous winter hunting areas grew and retracted with these changes in caribou numbers and range use. The four maps in Figure 1 show the herd’s annual range based on accumulated collared cow locations from 1998 to 2017 in four time periods; darker areas were used more heavily over time. The contraction northward, particularly in the winter, is readily apparent. The annual range from 2014 to 2017 now occupies less than 100,000 km². In the last three to four years (2014 to 2017), the herd has increasingly wintered north of tree-line, and collared BCH caribou have not been found south of Great Slave Lake for at least 10 years. The Tłı̨chǫ community of Wekweeti was built in part because it was in an area where there were always caribou, even at low numbers. Core areas like this have been documented for other herds as well: these are the places that will have caribou even at their lowest abundance.

Figure 1. Maps of the BCH annual range based on collared female caribou, 1998–2017. Maps are based on kernel densities, courtesy of Angus Smith, GNWT ENR Wildlife Division, Yellowknife.
Unique characteristics

The BCH has had a shifting calving ground, whereas most Canadian and Alaskan herds have had calving grounds that have remained relatively constant in general location since the 1960s and 1970s, when biologists first began to map calving grounds on the Canadian mainland. Surveys of the BCH calving ground east of Bathurst Inlet between 1966 and 1995 showed a westward shift, then a shift to calving on both sides of the Inlet in 1995, and then since 1996 consistent calving on the west side of Bathurst Inlet near the Hood and Burnside rivers. Earlier reports (before 1966) included observations of caribou calving on both sides of Bathurst Inlet, thus shifts from one side of the Inlet to the other may have occurred previously. In the lifetime of a barren-ground caribou herd, 40 or 50 years is a short time, so changes in calving grounds of the BCH and other herds may yet surprise us.

Despite declining by more than 90 per cent between 1996 (when the herd numbered about 350,000) and 2009 there was relatively little overall change in how the herd was using the calving grounds, other than the high-density areas progressively shrinking in size. By June 2015, most of the herd’s cows were concentrated in only 1,492 km² (about 38 km by 40 km) for calving. Concentrated calving in a remote area in a short time period, to reduce predation on newborn calves, has long been considered one of the main reasons that migratory tundra caribou herds are able to reach large numbers of many thousands. It appeared that BCH cows were still maintaining that calving practice in 2015, but the area of concentrated calving had shrunk substantially from the 1990s and even from 2009.

Calving ground shifts present a dilemma from a land use planning perspective: protection of calving grounds has often been raised in workshops and community meetings as a key measure in caribou conservation, but protecting a geographically specific area runs the risk of protecting an area that may later no longer be used for calving, and calving occurring in an area that has no protection. Some flexibility will be needed in managing the landscape to benefit caribou calving grounds and other seasonal ranges.

Cultural and social significance

As with other northern caribou herds, Indigenous people have depended on BCH caribou for countless generations. Caribou supplied food, shelter and material for tools. Over time, caribou became a part of the culture of northern Dene, Inuit and Inuvialuit. There is reason to believe that some caribou herds have existed for thousands of years (for example the Porcupine and George River herds), and the intertwined history of northern Indigenous peoples and caribou spans thousands of years as well.

The BCH’s fall and winter ranges were of particular importance to the Tłı̨chǫ and ‘Yellowknives Dene people. In the present day, these two groups’ Traditional Territories encompass most of the BCH winter range, with a border defined by a peace agreement between Edzo and Akaitcho, key leaders who made peace at Mesa Lake after a period of conflict between the two groups. Elders of the two peoples knew the trails used by caribou on their northward and southward migrations, including river crossings, and with time gave many lakes, rivers and other features place names. These place names were more than names of convenience; with the names came stories that make up a part of the oral history passed on by one generation of elders to the next. In older times, Dene and Inuit people had a more nomadic lifestyle and did not live year-round in communities. Knowing the trails and ways of the caribou sometimes meant the difference between survival and starvation, if alternate food sources like fish and moose were also scarce.

Tłı̨chǫ elders have taught that becoming knowledgeable about the land is the way that respect is shown to caribou. They believe that a person becomes knowledgeable by listening, watching, and experiencing, and that there is a relationship between one’s personal knowledge and ability to respect the land. With the effects of residential schools, as well as changing lifestyles and expectations, this knowledge has the potential of becoming lost and, thereby, the respect for caribou diminished. Tłı̨chǫ elders have always believed that when the caribou became scarce they would go away to be left alone – to recover and replenish themselves. They would then come back to offer themselves to the Tłı̨chǫ. Managing the BCH in the present-day must begin with deep respect for not just...
the caribou, but the land and water as well. Furthermore, it must begin with an understanding of the long-established relationship between people and caribou. Indigenous governments are currently working hard with all stakeholders to reestablish the traditional laws surrounding caribou so that all Northerners may understand and benefit from them.

While the Tłı̨chǫ and Yellowknives Dene have perhaps the longest history of knowing and hunting the BCH, several other Indigenous groups also depended on the BCH, including Inuit at the northern end of the herd’s range, and several Dene and Métis peoples at the southern end of the herd’s range. The herd’s huge drop in numbers, harvest restrictions and range contraction northward have meant widespread hardship and a need to change hunting patterns for many communities in the NWT and Nunavut.

**Historic and current status**

Large changes in numbers of barren-ground caribou have been recorded for herds across their North American range from Labrador to Alaska. In the NWT and Nunavut, the 1970s were the last period of general decline in barren-ground caribou; the 1980s were a period of increase to peak numbers in the 1980s and early 1990s. Declines in nearly all herds followed in the early 2000s.

Big changes in caribou numbers are not new for the BCH. Tłı̨chǫ elders identified an earlier period of high numbers in the 1940s (well before biologists began surveys to count barren-ground caribou herds) followed by decline to low numbers in the 1970s and rapid increase in the 1980s. The herd was stable in the early 1990s, started to decline in the late 1990s, then declined at an increasing rate in the 2000s (Figure 2). By 2009, the herd was down to an estimated 32,000 caribou. Thereafter, the herd was approximately stable from 2009 to 2012, a change in trend that was very welcome news in many northern communities.

The abrupt change in trend reflected in part better calf recruitment, but also a huge reduction in the estimated 4,000 to 6,000 caribou per year hunter harvest in 2009 (mostly breeding cows) to a harvest limited to 300 caribou per year in 2010. Unfortunately, the herd declined further after 2012 and was estimated at barely 20,000 in 2015. This represented a decline of 96 per cent from the peak numbers estimated in 1986. The calving photo-survey method used in the eight surveys between 1986 and 2015 has remained consistent, with refinements aimed at improving the precision of population estimates.

**Current and future threats and management actions**

Identifying the causes of increases and declines in barren-ground caribou herds remains a challenging task, as population trend is affected by multiple factors, including weather during all seasons, cumulative effects of industrial development, fire on the winter range, predation and hunter harvest. Neighbouring herds may have opposing population trends (one increasing, the other decreasing) so each herd needs to be considered on its own. Barren-ground caribou herds increased and decreased before there were any mines or roads in northern Canada, and before human-caused greenhouse gas emissions began to increase exponentially in the 20th century. These human effects on the land are part of the story, but they are not the whole story. Explanations for declining caribou herds are rarely likely to be simple or the result of a single factor in isolation.

Much of the BCH’s decline in the late 1990s and early 2000s is likely a reflection of a long-term natural cycle and environmental conditions. In the early 2000s, the herd experienced late calving, reduced pregnancy rates in some years, and poor calf recruitment insufficient to
offset natural mortality rates. Some of the same trends (late calving, low calf to cow ratios on the calving grounds) were also seen in the Bluenose-West and Cape Bathurst herds during the early 2000s, perhaps pointing to large-scale poor environmental conditions. All three herds were increasingly affected at lower numbers by hunter harvest. During earlier periods of low caribou numbers, these herds and others were likely still somewhat remote and difficult for hunters to find. By the 2000s, however, little of the caribou range was still truly remote, and aircraft, winter roads and all-season roads, high-powered snow machines and fast trucks had radically altered the balance between hunters and caribou. This was especially true of the BCH, which was hunted by hunters from more NWT communities than any other herd, including Indigenous hunters, resident hunters and guided outfitters. A declining natural trend was accelerated at lower numbers by a hunter harvest that remained substantial. Hunter harvest of the BCH was not well documented in all years, but was estimated at 3,000 to 5,000 cows and 1,000 to 2,000 bulls in 2008–2009. Hunter harvest on this scale could only lead to further rapid decline from a herd of 32,000, whereas the same harvest from a herd of 350,000 would have had limited effects. In January 2010 a no-hunting zone encompassing most of the herd’s winter range in the NWT, and applicable to all hunters, was put in place by the NWT government as a temporary measure, to protect the herd until a co-management solution could be developed. This measure resulted in widespread anger and questioning of whether the BCH decline was real. However, the abrupt transition from rapid decline (2006 to 2009) to initial stability in numbers of cows (2009 to 2012) on the BCH calving grounds showed that this action had made a real difference. Harvest reduction and management for the Cape Bathurst and Bluenose-West herds similarly was followed by a shift from rapid decline in 2000 to 2006 to an approximately stable trend in 2006 to 2015. Improved calf recruitment contributed to stabilization in all three herds. Hunter harvest from the BCH is manageable, and by late 2010 agreements with key Indigenous governments (Tłı̨chǫ Government and Yellowknives Dene First Nation) and the support of the Wek’eezhii Renewable Resources Board were beginning to build a positive cooperative approach to monitoring and managing the herd.

The further decline of the BCH from 2012 to 2015 led to many further meetings and two formal hearings in 2016. The Wek’eezhii Renewable Resources Board determined in 2016 that all harvest of the BCH should be closed until 2019. The Tłı̨chǫ Government in 2015 showed real leadership in a very difficult area by announcing that Tłı̨chǫ hunters would not hunt BCH caribou until the herd showed signs of recovery, for the sake of conservation and future generations. Other Indigenous groups in the NWT have also generally accepted harvest closure for this herd, citing the need to give the herd a chance to recover to a point where sustainable harvesting is again possible. Harvest in Nunavut of this herd has generally been limited and was recommended in 2016 by the Nunavut Wildlife Management Board to be limited to 30 or fewer caribou per year.

Direct effects on caribou like hunting can be managed, but the roads and access to once-remote caribou range will remain, and further roads and other development are likely. The BCH’s range is known to have many mineral deposits and a number of past, current and proposed mines exist on the herd’s range, as shown in Figure 3. Which of the proposed mines reach actual production remains to be seen, but in this respect the BCH’s range is unique among NWT caribou herds. No other herd has as many existing or proposed developments on its range. In 2017, all-season roads were proposed for the NWT and Nunavut that would connect Yellowknife to a proposed port west of Bathurst Inlet. In the southern part of the BCH’s summer range, three active diamond mines have been shown to cause partial avoidance by caribou to a distance of about 14 km, and a fourth mine is planned. Biologists’ studies and computer modeling to date suggest that the individual mines have had relatively limited effects on the herd. However, the accumulation of mines, roads, exploration camps and other human effects remains a continuing concern. The effects of mines and roads on caribou have been raised often at community meetings in the BCH range as being at least partially responsible for the decline. A Tłı̨chǫ traditional knowledge study has suggested that traditional migration routes of the herd have been deflected by the disturbed areas around the existing mines and roads. Protecting the herd’s calving grounds in Nunavut, and protecting key unburned caribou winter ranges have also been raised at many
community meetings. As the herd’s numbers have fallen to all-time lows, proposals for further development have been scrutinized with increasing concern; even small-scale effects can be important to a declining herd. To address these concerns, a collaborative working group began in 2014 to develop a comprehensive range plan for the herd to address development issues and protect key caribou habitats.

As the BCH has declined to very low numbers, and particularly as harvest has been restricted and then closed, there have been increasing calls for action to be taken on wolves, the primary predator of caribou year-round. Evidence from wolf den surveys on the herd’s summer range indicates that wolf numbers and productivity have declined substantially as the herd declined in the 2000s, an inevitable change where the primary food source for wolves has decreased by 96 per cent and alternate prey sources are limited. However, the remaining wolves may have a key role in mortality rates of calf and adult caribou and could affect the herd’s ability to recover. In 2016–2017, a collaborative working group that included the Wek’ëzhii Renewable Resources Board, Tłı̨chǫ

Figure 3. A map of existing communities, mines and roads on the BCH range (based on collar locations 1996–2010), with a Zone of Influence around them reflecting current knowledge of caribou responses to disturbed areas. A number of known mineral deposits, proposed mines and proposed roads are shown, some of which may be developed. Map courtesy of Karin Clark, GNWT ENR Wildlife Division, Yellowknife, and Bathurst Range Plan Working Group.
Government, the GNWT, Yellowknives Dene First Nation and the North Slave Métis Alliance was developing a feasibility assessment of options that could be taken to reduce wolf predation on BCH caribou. Whether any of these options will be pursued remains to be determined by management authorities.

Perhaps the greatest unknown for barren-ground caribou is climate change. More extreme weather, longer summers, melting permafrost, altered rain- and snowfalls, different forest fire patterns, changing vegetation communities – all these are predicted and in part already documented. Whether the sum of these effects will be good or bad for the BHC is unknown. People concerned with the welfare of this caribou herd and other herds will need to be prepared for new challenges that have no historic precedent. Studies in 2016 suggested that a number of weather indicators like the summer drought index and warble fly harassment have shown an increasing trend on multiple herds’ ranges, with peak values in 2014, the greatest year for forest fires on record in the NWT. Poor summer feeding conditions could be related to low pregnancy rates seen in the BHC in some years, including 2014–2015.

Overall management, monitoring and study

A multi-partner co-management plan for the BHC was developed in 2004, although it was never fully endorsed by all the participating agencies and partners. Previously the GNWT developed a basic management plan for the BHC in 1988, when the herd was at peak numbers. The Tłı̨chǫ Agreement of 2005 requires a comprehensive management plan for the BHC, and meetings and workshops to develop this plan began in 2013. The process has been complicated by the diversity of groups with an interest in management of the BHC; up to 18 groups have participated at meetings, many of them without settled land claims and with limited resources. Once fully functional, a proposed Advisory Committee for the BHC may take on a significant role in management of the herd and in taking responsibility for an overall management plan for the herd. Of necessity, some management actions have been taken for the herd since 2010, and harvest management, the range plan and environmental assessments, and possible actions on predator management would likely become part of an overall BHC management plan.

Most biological monitoring (e.g., surveys and collars) of the BHC has been carried out by GNWT ENR North Slave regional staff with support from headquarters wildlife staff, with community involvement where practical. There has been a series of graduate student research projects on various aspects of the herd’s ecology and a continuing series of partnerships with academic researchers. The Tłı̨chǫ Government has had a continuing series of traditional knowledge studies of caribou and other wildlife, and other Indigenous groups have carried out their own traditional knowledge studies.

For further information:
Bruno Croft, Acting Superintendent, North Slave Region, GNWT ENR, Yellowknife, NWT.
Jan Adamczewski, Ungulate Biologist, Wildlife Division, GNWT ENR, Yellowknife, NWT.
Sjoerd van der Wielen, Tłı̨chǫ Government, Behchoko, NWT.