

Valued Component – Caribou (Update November 2004)

STATE OF KNOWLEDGE – WHAT IS HAPPENING?

A very brief overview of the state of knowledge with respect to caribou in the NWT is presented below. This overview is preliminary and not intended to be exhaustive.

There are several distinct types of caribou in the NWT.

Barren-ground caribou (*Rangifer tarandus groenlandicus*) include the Bathurst herd, the Beverly herd, the Cape Bathurst herd, the Bluenose-west herd, the Bluenose-east herd, and the Ahlak (Queen Maud Gulf) herd. They migrate from their calving grounds (primarily in Nunavut), to wintering grounds in the boreal forest across the Northwest Territories and Nunavut. The winter range of the Beverly and occasionally, the Bathurst and Ahlak herds extend into northern Saskatchewan. The Cape Bathurst and Bluenose-West herds calve and winter in the Northwest Territories. The Porcupine herd calves along the coast in northeastern Alaska and northwestern Yukon, and winters in Alaska and Yukon, and occasionally in the Northwest Territories.

Woodland caribou (*Rangifer tarandus caribou*) are divided into two ecotypes: Northern Mountain caribou in the Mackenzie Mountains and Boreal caribou in the boreal forest of the Taiga Plains ecozone. COSEWIC has classified Boreal caribou as Threatened in Canada and Northern Mountain caribou as Special Concern.

Although not found in the Mackenzie Valley, the endangered Peary caribou (*Rangifer tarandus pearyi*) and Dolphin and Union herd (Special Concern) are found on the arctic islands of the Inuvialuit Settlement Region. Peary caribou are residents of the Arctic Islands in the Northwest Territories and Nunavut. The Dolphin and Union herd migrates from summer and fall ranges

KEY MONITORING INDICATORS

<i>Calf/cow ratio</i>	<i>Body weight/fat</i>
<i>Parasites/ diseases</i>	<i>Levels of contaminants</i>
<i>Number harvested</i>	<i>Population size and trend</i>
<i>Pregnancy rates</i>	<i>Movements and distribution</i>
<i>Migration routes</i>	<i>Availability of forage</i>
<i>Habitat availability</i>	<i>Wolf predation</i>
<i>Energetics</i>	

on Victoria Island in the Northwest Territories and Nunavut to winter ranges on the mainland in Nunavut.

❖ What are the baseline conditions with respect to caribou?

Barren-ground caribou

It is estimated that about 850 000 barren-ground caribou inhabit the Northwest Territories. The Government of the Northwest Territories has provided information on the distribution, population, management, and economic status of the major herds. The caribou harvest, both subsistence and commercial, is considered sustainable at this time. Population trend serves as a key indicator as declining herds are less resilient to disturbance and need closer monitoring. A brief summary of the herds is provided below. (Further information and distribution maps can be found at: <http://www.nwtwildlife.rwed.gov.nt.ca>).

The Bathurst herd was estimated at 186,000 caribou in 2003, which is a statistically significant decline since a peak in herd size of 460 000 in 1986. The survival of calves is annually monitored and has declined. Since the late 1990s, satellite collars have been placed on between 10-20 cows to track their movements. This baseline monitoring was initiated in response to intensified mining activity in

the Slave Geological Province. A co-management planning committee for the Bathurst herd is developing a co-management plan for the herd.

Current herd size of the Beverly herd is unknown; in 1994 there was an estimate of 286,000 caribou for the Beverly herd, which had increased from the 1980s. The estimated calf proportion of the herd, 20%, was considered healthy but calf survival has not now been estimated since 1994. The Beverly-Qamanirjuaq Caribou Management Board advises government on the management of the herds. Management action will be considered if population size drops below 150,000. The effects of forest fires and potential for industrial activities are a concern for these herds.

Based on recent research, the "Bluenose herd" is now considered to be three distinct herds--the Cape Bathurst, Bluenose-West and Bluenose-East herds. Based on re-analyses of photocensus data, the Bluenose-West herd declined between 1987 and 1992 when the estimate was 56,000 to 74,000. In 2000, this herd was estimated at approximately 64,000 and 85,000 animals. Population estimates for the Cape Bathurst herd are unreliable, but we believe that this herd numbers between 15,000 and 20,000 animals. Post-calving photography of the Bluenose-east herd in 2000 produced an estimated population of 84 400 – 126 000 non-calf caribou. Part of the calving range of the Bluenose-West herd is protected by Tuktut Nogait National Park in the Northwest Territories, however mineral exploration surrounding the park is a management concern.

The Porcupine herd peaked in size in 1989 and then between 1994 and 1998, the herd declined at a rate of 4% per year. Biologists believe that the recent declining trend in the 1990s is probably related to weather conditions (high snow accumulations on the wintering grounds and short summers in the early 90s). In 2001, the herd was estimated at 123,000 caribou and this indicates the decline has slowed since the 1998 census. YTG, CWS, USF&W, and to a limited extent GNWT monitors the status of the herd and conducts research under direction/advice provided by the herd management plan. The Porcupine Caribou Management Board monitors progress

on the herd management plan and makes recommendations. Development and industrial activities are a major concern throughout the herd's range in Alaska, Yukon and western Northwest Territories. Proposed oil and gas exploration and development within the calving range in Alaska is probably the most significant threat.

Woodland (Boreal and Northern Mountain caribou)

Boreal caribou seasonally remain within the boreal forest. They are found at low densities (1-3 caribou/100km²) and remain in small groups on large home ranges. They choose bogs and fens in black spruce or lichen areas and open jack pine to find forage and avoid predation, to which their populations are vulnerable. Habitat changes including fires and oil and gas development which reduce habitat suitability. Thus the availability of quality habitat is a key indicator and monitoring requirement for Boreal caribou. Information has either not been compiled or is unknown about abundance, trend and habitat availability in the Northwest Territories. There are currently 4 ongoing research initiatives to estimate population size, productivity, and recruitment and to identify and map boreal woodland caribou habitat in the Northwest Territories. Ongoing and proposed oil and gas exploration and development activity along the Mackenzie Valley and east of the Liard River Valley pose a threat to boreal caribou in the Northwest Territories.

There are 3 areas at various stages of candidacy as proposed Protected areas found in the Deh Cho all of which would protect areas of boreal caribou habitat. These areas are the Edézhíe which covers the Horn Plateau and adjacent areas, the Pehdzeh Ki Deh which covers the Blackwater drainage and adjacent areas, and the Sambaa K'e which covers Trout, Cormack, and Trainor Lakes and adjacent areas.

Northern Mountain caribou occur as herds that migrate to above the treeline in late winter for calving, summer, and the rut before returning to forested areas for winter. The NWT shares the Bonnet Plume, Redstone, South Nahanni, Coal River and La Biche herds with the Yukon. Overall trend in herd size is uncertain. The South Nahanni herd was estimated to number 940 in 2001. Limited

calf:cow data indicate that the herd may be declining, but previous population estimates are lacking.

The South Nahanni herd's winter range is largely protected by Nahanni National Park Reserve. The Cantung mine in Tungsten is located within calving, post-calving and summer ranges. However, the mine was shut down in 1986 and reopened for only a brief period between January 2002 and December 2003. Currently, there is no maintenance of the access road. Road access and its use by an increasing number of hunters is a concern.

In 2004, the Tulita Dene Band Council initiated the *Tulita Conservation Initiative* through the NWT Protected Areas Strategy., which proposes protection of approximately 25% (15, 026 km²) of the area of the Mackenzie Mountains within the Sahtu Settlement Area. These areas (Nahanni River Headwaters, Drum Lake, Raven's Throat and Redstone Rivers, and Keele River and Headwaters) are all important mountain caribou habitat. In addition, the Fort Good Hope Chief and Council proposed the establishment of Tsoodehiline-Tuyat'ah (Ramparts River Watershed) as a candidate Protected Area in 2004. Tsoodehiline-Tuyat'ah will protect both boreal and mountain caribou habitat.

Preliminary genetic analysis of boreal caribou in the NWT is using DNA material collected when boreal caribou are caught for fitting radio-collars. The DNA analyses are to quantify the genetic diversity and gene flow between boreal caribou ranges in the NWT, identify variation in genetic diversity of boreal caribou between administrative and ecological regions and examine the genetic relationship of boreal caribou in the NWT to boreal caribou in northern BC and Alberta, mountain caribou in the Mackenzie and Richardson Mountains and adjacent barren ground herds.

Peary and the Dolphin and Union herd

Overall Peary caribou have declined between 1961 and the present time and are nationally classified as Endangered. The High Arctic Peary caribou have declined, and on the western Queen Elizabeth Islands numbered 1100 in 1997. On Banks Island, Peary caribou

decreased from an estimated 12,000 (including calves) in 1982 to an estimated 1500 (including calves) in 1992 and remained stable until 2001 when numbers began to increase. The impact of freezing rain during fall 2003 on the population is currently unknown but the condition of cows was poor and calf production was low. Information on body condition is documented for Peary caribou on Banks Island through collections submitted by hunters. On Northwest Victoria Island the Minto Inlet Peary caribou herd declined to 100 in 1993 (from 4500 in 1980). The status of the Minto Inlet herd is currently unknown despite surveys in 1998 and 2001 as the summer range is adjacent to and may overlap with the Dolphin and Union herd. Surveys are conducted every 4 to 5 years to estimate population size for these herds. Surveys to estimate calf productivity are annual on Banks Island. Mineral exploration activities are proposed in portions of the range of the Minto Inlet herd.

The Dolphin and Union herd on southern Victoria Island increased to 28,000 in 1997 from the 1980s. Satellite tracking studies are ongoing to monitor seasonal movements of this herd. Those collared cows will contribute to interpreting aerial survey results on northwestern Victoria Island. Mineral exploration activities on Victoria Island are ongoing in portions of the range of this herd. In addition, proposed developments in the area of Bathurst Inlet on the mainland may impact winter ranges used by this herd.

Peary caribou are also considered at risk in the Northwest Territories. Key indicators for these herds are population trend (population size and calf production) as well as the physical condition of the caribou. Habitat as an indicator is not as significant as with woodland caribou.

❖ Have the migration patterns of caribou been permanently and substantially altered?

There is currently no information to discriminate between natural and manmade changes in migration at the landscape scale with any degree of certainty. There is information to suggest local responses in caribou distribution at the scale of 10s of kilometers.

❖ **Has the condition of caribou declined?**

This is uncertain, however changes should be anticipated for barren-ground caribou. Traditional knowledge and science both describe longer-term cycles in barren ground caribou numbers. Declines in number can be anticipated for boreal caribou if habitat changes accelerate.

❖ **What are the levels and trends of contaminants in caribou?**

Contaminant levels in caribou are generally low in the NWT, and are not a concern from human food consumption or animal health perspectives. Baseline data on heavy metal, radionuclide and organochlorine levels in all barren-ground caribou herds in the NWT was collected during the 1990s, with on-going work on the trends over time. Almost no data are currently available on contaminants in mountain or boreal caribou in the NWT.

CURRENT MONITORING

Ongoing monitoring programs with respect to caribou in the NWT are outlined below.

Overall monitoring

- ▶ **General Status Ranks of Wild Species in the Northwest Territories (Government of the Northwest Territories since 2000).**
This infobase monitors the general status of species in the Northwest Territories. It is a significant source of information for assessing future monitoring of wildlife species such as caribou. The infobase is a searchable catalogue of information used to rank the status of species, thereby prioritizing them for further assessment and monitoring. The following biological indicators are used to rank species status: population size, number of occurrences, distribution, trend in population, trend in distribution, threats to population

and threats to habitat. The general status ranks will be published every 5 years (see references for 2000 Status Ranks report).

- ▶ **Heavy metals and radionuclide contaminants in caribou (Government of the Northwest Territories since 1991)**
Phase 1 involved the sampling of 10 herds across the Northwest Territories and Nunavut to provide baseline data and spatial patterns of metal, radionuclide and organochlorine levels in caribou tissues. This program also provides an opportunity to monitor parasites, diseases and the general health of those caribou herds. Currently, Phase 2 involves monitoring temporal trends in selected “sentinel” herds. This involves sampling 3 herds (south Baffin, Beverly and Cape Bathurst) every 5 years to look for changes in contaminant levels over time and effects on caribou health. Funding is provided through the Northern Contaminants Program (NCP). See Appendix A for more information on the NCP.
- ▶ **Arctic borderlands ecological knowledge co-op: Community-based monitoring (Arctic Borderlands Ecological Knowledge Society since 1997)**
In the past this program took place primarily in the northern Yukon and northeastern Alaska, but included the communities of Aklavik and Fort McPherson. In recent years the program was expanded to include communities around the Mackenzie Delta (Tsiigehtchic, Inuvik, and Tuktoyaktuk). Information about caribou (primarily the Porcupine caribou herd) is gathered from both community-based observations and various science-related activities. See Appendix A for more information on this program.

Bathurst herd

- ▶ **West Kitikmeot Slave Study (West Kitikmeot Slave Study Society (1996-2001)**
WKSS is a trans-boundary program with Nunavut funding scientific and traditional knowledge studies in the Slave

Geological Province area to gather baseline information for species such as caribou, as well as other ecological information. Four studies described below were funded under the WKSS. See Appendix A for more information on the WKSS.

- ▶ Seasonal movements of the Bathurst caribou herd (Government of the Northwest Territories since 1996)
Information on caribou movement has been collected by collaring caribou and tracking movement through satellite transmitters. Accompanying uncollared caribou are also observed, along with other parameters such as snow depth, snow melt rate, temperatures, and wind (affecting insect activity), to determine yearly changes in seasonal movements. Information will be exchanged with the Dogrib traditional knowledge study on caribou also under the WKSS.
- ▶ Bathurst caribou calving ground studies: Influence of nutrition and human activity on calving ground location (University of Alaska, Government of the Northwest Territories and Canadian Wildlife Service since 1998) (scheduled to end in 2001)
This WKSS project focused on factors that might affect where caribou choose to calve, such as food and nutrition. Researchers looked at the types of areas being used by the caribou most often and least often.
- ▶ Traditional knowledge on the relationship between caribou migration patterns and the state of caribou habitat (Dogrib Treaty 11 Council, 1996-2000)
This project recorded traditional knowledge from Dogrib elders about caribou movements, caribou habitat and the relationship between the Dogrib and the caribou. Information was exchanged with another WKSS study on the seasonal movements of the Bathurst caribou herd.
- ▶ Tuktu and Nogak project - Inuit knowledge about wildlife in Bathurst Inlet: Focused on caribou and calving areas (Simon

Fraser University and the Tuktu and Nogak Board, 1997-2000). have added to the references – Thunder on the Tundraawaiting final report)

- ▶ Bathurst caribou herd calving ground surveys (Government of the Northwest Territories since 1965)
The last calving ground survey took place in 2003. The timing and frequency of future surveys will be determined by the recently formed Bathurst herd co-management planning committee.
- ▶ Wildlife effects monitoring program (BHP Diamonds Inc. since 1994)
The program monitors caribou, and other wildlife, that pass through or live in the BHP claim block and may be affected by the EKATI diamond mine. The program also supported the WKSS.
- ▶ Wildlife/habitat monitoring (Diavik Diamond Mines Inc. since 2000)

Cape Bathurst, Bluenose-east, and Bluenose-west herds

- ▶ Cape Bathurst and Bluenose-West caribou spring composition counts (Government of the Northwest Territories since 1986)
- ▶ Cape Bathurst and Bluenose-West caribou body condition (Government of the Northwest Territories since 1998)
- ▶ Cape Bathurst, Bluenose-West, and Bluenose-East caribou census (Government of the Northwest Territories since 1998)
- ▶ Cape Bathurst, Bluenose-West, and Bluenose-East ongoing satellite tracking (Government of the Northwest Territories since 1996)

Porcupine herd

- ▶ Porcupine caribou composition counts (Yukon Territorial Government since 1992) (can include western Northwest Territories)
- ▶ Porcupine caribou body condition (Yukon Territorial Government since 1988) (can include western Northwest Territories)
- ▶ Porcupine caribou herd census (Yukon Territorial Government since 1972) (can include western Northwest Territories)
- ▶ Porcupine caribou herd total estimated harvest (Yukon Territorial Government since 1985) (can include western Northwest Territories)
- ▶ Porcupine caribou herd movements and distribution (Yukon Territorial Government since 1970) (can include western Northwest Territories)

Woodland (Boreal and Northern Mountain caribou)

- ▶ Boreal caribou research program (Boreal Caribou Committee since 1996)

This program is focused on the boreal caribou of northern Alberta, however the research and monitoring is highly relevant to the NWT boreal caribou. Government, industry and academics are involved in the program. (See <http://www.deer.rr.ualberta.ca/caribou/>). A traditional knowledge study was done in the Deh Cho, Gwich'in Settlement Area, Inuvialuit Settlement Region, and Sahtu Settlement Area to document the historical and current distribution of boreal woodland caribou in those areas.

Ecology of boreal woodland caribou in the Gwich'in Settlement Area. Collaring study was initiated in 2002 to determine seasonal patterns of habitat use, productivity, and recruitment. Satellite tracking has been ongoing since 2002 (Government of Northwest Territories).

A survey of boreal caribou area of occupation was conducted in the North Slave administrative region in November 2004. This survey completed the baseline mapping of boreal caribou occupancy for the NWT.

Ecology of mountain woodland caribou in the north Mackenzie Mountains (Sahtu Renewable Resources Board and Government of the NWT since March 2002). This program includes satellite radio-tracking, composition surveys, genetic analysis (University of Alberta), and parasite studies (Western College of Veterinary Medicine).

Since March 2003, RWED has been using conventional VHF radio-collars deployed on adult females to monitor population trends in the Cameron Hills area of the Deh Cho by measuring adult female survival and 10 month calf, as well as gathering baseline information on boreal caribou health. Boreal caribou locations will be used to predict boreal caribou occurrence throughout the study area.

A monitoring program was established in the Trout Lake-Celebita Lake area of the range in March 2004. Ten female caribou were equipped with satellite radio collars to monitor seasonal range use, calf production and survival, and adult survival.

Northern Mountain caribou along NT/YT border are being equipped with satellite collars to monitor seasonal movements, demography, and to determine if there is another separate herd in the Yukon. Research being conducted by Parks Canada/YTG and the Wildlife Conservation Society; 18 collars successfully deployed in October 2004

There has been monitoring of the annual harvest of northern mountain caribou in the Mackenzie Mountains by non-resident hunters since 1965. Annual reports published compare harvest over time and tabulate calf:cow and bull:cow ratios based upon hunter observation reports; hunter observation report tabulation has been ongoing yearly since 1995. These reports indicate fairly healthy calf:cow ratios at least from August-Sept observations.

Peary Caribou and Dolphin and Union Herd

- ▶ Peary caribou population surveys (Government of the Northwest Territories) have been conducted at irregular intervals since the 1960s except for Banks and to a lesser extent on NW Victoria Islands where surveys have been more frequent and regular.

Surveys to assess calf production and over winter survival of caribou are a priority. There have been annual sex/age classification surveys conducted in summers on Banks Island for almost a decade. Similar surveys have been conducted on Melville and NW Victoria Islands but with a shorter time series. In the future population surveys will be undertaken based on need.

Dolphin and Union herd - Ongoing satellite tracking to monitor seasonal movements and distribution. (Government of Northwest Territories since 1987)

GAPS AND RECOMMENDATIONS FOR MONITORING

A list of monitoring gaps and recommendations for future monitoring under the NWT Cumulative Impact Monitoring Program is found below.

Gaps

- ❖ Baseline information on the threatened Boreal caribou and their habitat
- ❖ Implications of global warming especially for the relationship between moose, wolf predation and boreal caribou
- ❖ Cumulative effects for the Bathurst caribou herd relative to mining activity; and the three Bluenose herds and Porcupine herds relative to oil and gas exploration and development.
- ❖ Monitoring programs for the Ahiak and Beverly herds which currently winter in the Northwest Territories.

- ❖ Absence of information to discriminate between effects of environmental variation and human activities.
- ❖ Contaminants, parasites and diseases in boreal and mountain caribou.

Recommendations

- ❖ Expand monitoring of trend in Boreal caribou populations (adult female and calf survival) (research and monitoring through the Boreal caribou research program in Alberta can serve as guide)
- ❖ Conduct cumulative effects modeling to determine the state of habitat for Boreal caribou (including human-caused changes and natural changes such as wild fires and climate change)
- ❖ Document current and past industrial development within the extent of occurrence of boreal woodland caribou
- ❖ Consider applying management, monitoring and modeling techniques for the Porcupine caribou herd to the Bathurst, Bluenose East and West, Ahiak and Beverly herds in the Northwest Territories
- ❖ Population and energetics simulation modeling is currently underway for the Bathurst herd and should be considered for other herds where development is occurring
- ❖ From proposed co-management planning for the Bathurst herd, further monitoring recommendations will be forthcoming

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Relevant monitoring reports, past monitoring programs, research documents, and scientific publications are found below.

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