



Caribou on the Brink

Once unimaginably abundant, this “umbrella species” is at tremendous risk. What we do now and for the next few years will either save or doom this extraordinary creature

By Sharon Oosthoek Photos Peter Mather

ON THE MOVE

Barren-ground caribou in the massive Porcupine Herd in the Yukon travel between northern calving grounds and wintering grounds further south

THE STORY OF CARIBOU IS THE STORY OF US. SOME 35,000 years ago, as early modern humans struggled to eke out an existence in Europe, it was reindeer — as caribou are known there — that sustained us. Archeological digs show refuse heaps dating from that time made up almost entirely of reindeer bones. Between 12,000 and 17,000 years ago, caribou was such an important prey animal in Europe that archeologists call it the “Reindeer Epoch.” Closer to home, natural cycles of abundance and scarcity in the George River and Leaf River herds in what is now northern Labrador and Quebec led to periodic starvation among the Innu, the Cree and the Inuit.

Today, caribou (*Rangifer tarandus*) are still essential for many northern Indigenous peoples, and not only as a source of food and clothing. Caribou play a central role in their creation stories, values and relationships with the land, and have done so for at least 12,000 years, dating back to when the glaciers retreated from North America. They are “very deep in the psyche,” says John B. Zoe, a member of the Tłı̨chǫ First Nation. “Our language and our way of life are all based on the caribou.”

But with the precipitous decline of caribou across the country, that way of life is under threat. The Barren-ground caribou that make up the Bathurst herd where Zoe lives in the Northwest Territories declined from a modern-day high of roughly 450,000 in the mid-1980s to a low of about 18,000 today. Over the same period, the Indigenous harvest of that herd went from 14,000 animals in the '80s to 300 in 2010 to essentially none today.

“One of the things the decline of caribou does is it draws people away from the land,” says Zoe, who works as a senior advisor to the Tłı̨chǫ government. “We need to encourage people to follow the old trails — not necessarily for harvesting, but for awareness.”

Anne Gunn, a caribou biologist who has spent more than three decades working with northern people and caribou, echoes his concern: “I can’t imagine what a loss of culture that must mean to kids growing up now. They have the most to lose,” she says.

Gunn, who worked first with the Canadian Wildlife Service and then with the government of Northwest Territories, is now semi-retired. She remembers keenly the feeling of being suddenly surrounded by thousands of caribou: “You hear something, and sometimes you actually smell something, and then they are all around you. The landscape comes alive. You have a 360-view of moving bodies. And that’s gone,” she says. “I think as a biologist, if I were to fly over the empty tundra now, it would break my heart.”

But most of us who live in southern Canada are not as invested as Gunn and Zoe. We are now so far from caribou country that we no longer need them.

Or do we?

“My view is we are more connected to caribou than ever,” says Jim Schaefer, a Trent University biologist who has studied them for more than three decades. “If we still have caribou at the end of this century, I’d be confident we’d solved a whole bunch of issues, not just the caribou conservation issue.”



What Schaefer means is that caribou are an “umbrella species.” They are selected for making conservation-related decisions, typically because protecting them indirectly protects many other species that are part of the same ecosystem.

In the North for example, caribou are the centre of the food web. Among the largest and most abundant land mammal, they are prey for wolves, bears and other species that scavenge their carcasses. Caribou droppings are also essential for nutrient-poor northern soils. Cold temperatures mean decomposing plants take a long time to return nitrogen, carbon and phosphorus to the earth. But as caribou graze, their digestive systems efficiently break down plant matter. One animal can defecate up to 25 times a day, dropping more than 220 kilograms of pellets per year, an important source of key nutrients for the soil.

Caribou are also central to life in northern lakes. They are a significant source of blood for breeding mosquitoes, without which the insects could not produce eggs. This is important because mosquito larvae feed on tiny algae and plankton and the larvae in turn feed fish and birds.

Caribou that live further south, in the boreal forest and in the mountains, are no less an umbrella species than their northern kin. They prefer forests that are at least half a century old, habitat that suits many other plants and animals. While most don’t migrate the way caribou in the North do, they still need large landscapes to spread out and minimize the risk of wolves and bears killing their calves. The typical density of boreal caribou is about one animal per 16 square kilometres.

“Caribou demand a big view,” says Schaefer. “This is not in keeping with our notion of 20 years being a long-term plan. We will not understand conservation of this animal until we scale up,” both in time-scale and geography.

The bottom line, say caribou biologists, is that in places where healthy caribou populations exist, the land is probably

also healthy, providing ecosystem services such as clean air and water, food and fuel—essential to life, including ours.

But here is the problem: most caribou populations are not healthy. The animal that graces our 25-cent coin was once one of Canada’s most widespread wildlife species, found in over 80 per cent of the country. It ranged from Newfoundland and the Atlantic provinces to Haida Gwaii in British Columbia and from southern Alberta to Ellesmere Island in Nunavut.

Today, their numbers and their range are significantly smaller. At least one population is extinct: the Dawson caribou, a small, pale animal that was last seen in the 1930s on Haida Gwaii, an archipelago off British Columbia. Other populations are fast heading in that direction. Quebec’s Val d’Or herd for example numbers just 18 animals, and Alberta’s Little Smoky herd is no healthier.

Widen the lens, and the view is just as disturbing. In Alberta, caribou no longer roam in about 60 per cent of their historical range. They are also gone from 40 per cent of their British Columbia range. In Ontario, half of their boreal forest home has been lost to industry and development. In Yukon, Northwest Territories and Nunavut, they still lay claim to much of their original habitat. The problem there is not their territory so much as it is their numbers. Many herds have declined by 80 to 90 per cent over the past decade.

CARIBOU ARE ONE OF SEVERAL MEMBERS OF THE

deer family, along with moose and elk. They are generally smaller, though, and are unique in that both males and females sport antlers. Most adults have dark brown fur with lighter patches around the neck and rump, and white above each hoof. And as anyone who has stood close to a caribou can tell you, they produce a distinct clicking sound as they walk, which comes from tendons slipping over foot bones.

Like their moose and deer cousins, they eat grasses, sedges, birch and willow leaves and mosses. But unlike the others, they also eat lichen, which means they can survive at high elevations and on the tundra.

Biologists divide caribou into three rough ecotypes based on their preferred terrain: migratory tundra, boreal forest and mountain caribou. While all three are the same species and can interbreed, they each have different lifestyles, often referred to as “spacing out” and “herding up,” which are responses to predators—losing themselves in the landscape or in the herd.

Tundra caribou, for example, live in herds tens of thousands strong and undertake one of the longest land migrations of any mammal, trekking hundreds, even thousands of kilometres across frozen ice sheets to spring calving grounds. Their numbers fluctuate on a natural cycle of roughly 40 years, linked to changes in weather, food availability and insect harassment.

Boreal and mountain caribou don’t have the same natural population swings. Their lifestyle is also different. They lead largely sedentary lives in smaller groups. Boreal females usually calve alone, often on relatively protected islands or in muskegs, while pregnant mountain caribou head to higher elevations.

Threats are different for each ecotype. The drop in migratory caribou numbers may be the most difficult to untangle because herds typically cycle from high to low numbers. As Gunn says, this can leave the impression that when numbers are low, they will bounce back as they always have.

THE BIG PICTURE

“Caribou demand a big view,” says biologist Jim Schaefer. “We will not understand conservation of this animal until we scale up”

CARIBOU ACTION

It will take a great deal of political will for provincial and territorial governments to do the right thing, and will likely require the federal government to hold them to it. To ensure the right changes are made, Canadians will have to get involved too. Here is what you can do...

LEARN MORE ABOUT THE ISSUES

- Visit the Canadian Wildlife Federation (cwf-fcf.ca) to learn how it is working to develop science-based, land-use models incorporating wildlife conservation, industrial development and economic benefit in the western boreal forest.
- Read the book *Caribou And The North, A Shared Future*, by leading Canadian conservationists Monte Hummel and Justina Ray, published by Dundurn Press.
- Go online and search “COSEWIC status report on caribou.” This will take you to the federal government’s Species at Risk Public Registry, where you can get detailed info on the parlous state of caribou in Canada.
- Download the new caribou report from the Canadian Boreal Forest Agreement website: Understanding Disturbance Thresholds and Opportunities to Achieve Better Outcomes for Boreal Caribou in Canada. (It is not as dry as it sounds.)

CALL YOUR ELECTED OFFICIALS

Be prepared. Be positive. Be patient. Make sure your elected representatives know about this issue and know you care and they should too. Your provincial or territorial members are in a good position to help make a difference. Contact your local MP and the federal minister of the environment and climate change. This is a national issue.

LOBBY INDUSTRY

Write industry groups to let them know that they have a crucial role to play and that you are watching. Online, you can find provincial and national associations, like the Canadian Association of Petroleum Producers and the Forest Products Association of Canada.

TALK, TWEET AND POST

Talk to your friends, pass this article along. Get them to write letters too. Use your social media to amplify your effect. Help create the awareness that will help conserve this species and the precious boreal landscape they occupy. And remember, personal consumption translates into natural resource development pressures in caribou habitat. Consume responsibly.



CARIBOU ESSENTIALS

Adapted from Hinterland Who's Who online

The caribou, or *Rangifer tarandus*, is a medium-sized member of the deer family, Cervidae, which includes four other species of deer native to Canada: moose, elk, white-tailed deer and mule deer; it is the same species as the reindeer of Eurasia. Only with caribou do both males and females carry antlers.

There are about 2.4 million caribou in Canada. Despite the apparently large number, some populations have been determined to be at risk by the Committee on the Status of Endangered Wildlife in Canada (online, search COSEWIC).

Historically Canadian caribou have been divided into four subspecies based on location, genetic makeup and evolution. Six years ago, Environment Canada commissioned a report rethinking species types and diversity. The study considered "phylogenetics, genetic diversity and structure, morphology, movements, behaviour and life history strategies, and geographical distribution" and concluded that there are 12 discrete types of caribou in Canada.

They identified: **Boreal caribou** in the boreal forest from B.C. and the Northwest Territories to Labrador; **Northern Mountain caribou** of B.C., Yukon and Northwest Territories; **Central Mountain caribou** of central B.C. and Alberta; **Southern Mountain caribou** of southern B.C.; **Barren-ground caribou** of northern and northwest Canada; **Peary caribou** in the Arctic Archipelago; **Dolphin-Union caribou** of Victoria Island; **Eastern Migratory caribou** of northern Labrador, Quebec, Ontario, and Manitoba; **Newfoundland caribou**; **Tornat Mountain caribou** of northern Quebec and Labrador; **Atlantic-Gaspésie caribou**, the remnant of a population in the Gaspé Peninsula, the Maritimes, and northern New England; and **Dawson's caribou**, which went extinct from Haida Gwaii in the 1930s.

Caribou are well-adapted to winter. Their short, stocky bodies conserve heat, their long legs help them move through snow, and their long dense winter coats provide effective insulation, even in extreme cold and high wind. Large, concave hooves splay widely to support the animal in snow or muskeg, and function as efficient scoops when the caribou paws through snow to uncover lichens, a primary food. (The name "caribou" may be derived from the Mi'kmaq name for the animal, "xalibu," which means "the one who paws.") —Staff

Visit hww.ca for a lot more information.



ROOM TO THRIVE

The biggest cause of caribou decline is human alteration of habitat: for logging, oil and gas, hydroelectric projects, mining and settlements

listed as "threatened."

The new plan focuses on protecting critical caribou habitat, a task that falls heavily on individual provinces and territories. At press time, governments were expected to publish individual programs designed to protect or restore to an undisturbed condition at least 65 per cent of the range of each caribou herd within their jurisdiction. (If they do not, the Federal government can intervene.) Scientists estimate that would give the herds a 60 per cent chance of being able to sustain their numbers, a slim margin for error.

As Gunn points out, it's a plan that calls for a 40 per cent chance of declining caribou numbers — an unacceptable risk, she says. So can we still save the caribou? Gunn pauses, choosing her words carefully. "If I were to say no, I would be damning the ability of the human community to respond to our own living world," she says. "I have no doubt we have enough knowledge to halt the decline. It may sound Pollyannaish, but it will take collaborative work." 🐾

Most short-term solutions are focused on some form of reduced predation. In Alberta and British Columbia, where conservation plans include shooting wolves from helicopters, research shows increased caribou numbers. But the small number of follow-up studies suggests once the wolf cull ends, caribou populations resume their downward slide.

In southern British Columbia, authorities have also experimented with moose culling in the hope that it might decrease wolf numbers, allowing caribou to bounce back. In 2003, the province increased moose hunting permits tenfold in a 6,500-square-kilometre area in the Columbia mountain range. A University of Alberta-led study showed that by 2011, moose had decreased by about 70 per cent, many wolves had high-tailed it out of the area and the survival rate of the largest caribou herd had increased enough to stabilize.

The impact is similar to a direct wolf cull, "but is insufficient to achieve recovery, suggesting that multiple limiting factors and corresponding management tools must be addressed simultaneously to achieve population growth," the study's authors say.

The answer, research suggests, is a two-pronged approach that limits predators — both animal and human — while also protecting and restoring habitat so caribou have enough space to recover. In other words, it's no use protecting the animals if we don't also limit our industrial footprint.

The key word is *limit*, say biologists, not *eliminate*. "I'm not saying we should put the Gaspésie under glass," says St-Laurent. "I'm from the region and I know people have to work. But we probably went too far with logging, and we need to step back." Gunn agrees: "The North needs development. I'm not convinced it's incompatible with caribou." Recent decisions by territorial impact review boards, made up of government and Indigenous members, give her confidence. Development isn't rubber-stamped, she says. In fact, boards have turned down some mine proposals, forcing them to come back with proven mitigation strategies, including the placement of roads.

The next big push to conserve caribou habitat is expected soon. In July, Ottawa released a plan for the recovery of the boreal population of caribou, which is

Schaefer's research shows boreal caribou are more likely than not to disappear within four kilometres of a road, including a remote logging road. The issue is that while wolves feed mainly on moose and deer, they will readily make a meal of any caribou that crosses their path. Moose and deer reproduce faster than caribou, and their populations can handle the predation. The caribou, not so much.

That's what is happening with the Gaspésie herd, an isolated population of about 90 mountain caribou south of the St. Lawrence River. "If we continue with business as usual, in 20 to 35 years, the Gaspésie herd will be gone," says Martin-Hugues St-Laurent, a caribou biologist with Université du Québec à Rimouski.

Those who study caribou say whether they recover depends on how willing we are to act, in both the short and long terms. This year, two short-term proposals stirred up controversy — one in Quebec and the other in Alberta.

In April, the Quebec government proposed capturing the roughly 18 remaining members of the Val d'Or herd and transporting them to a zoo. Scientists publicly accused the government of not adequately studying whether the herd would disappear without this intervention, and environmental groups accused it of catering to the interests of forestry and mining. The proposal was shelved just two months later when the zoo withdrew its offer, citing public opposition. At press time the Quebec government was still mulling alternative approaches to saving the herd.

Meanwhile, Alberta's proposal to restore the dwindling Little Smoky herd by penning off a large tract of forest for pregnant cows was still on the table at press time. The herd, numbering roughly 80 animals, lives in oil and gas country "in the most disturbed range in Canada," says provincial biologist Dave Hervieux. The government's plan calls for protecting cows and calves from predators in a 30-square-kilometre enclosure, with the possibility of expanding to 100 square kilometres. Once they are old and strong enough, at about a year, the calves would be released. The maternity pen is part of a suite of interventions in Alberta that includes landscape rehabilitation and wolf culling (which is not without its controversy and detractors).

But when numbers are low, the caribou are less resilient to changes in the environment. In the North, where the migratory herds live, the environment is changing fast. Predation, parasites and hunting all contribute to caribou deaths, but hunting is the one we have the most control over, albeit in a complex and controversial way.

Gunn puts part of the blame for caribou declines in the North on delayed action. She says wildlife managers did not lower quotas quickly enough in the face of new technology. "Hunting has changed with easier access through the use of roads, snow machines, even cellphones and GPS," she says. "Managers were slow to adjust changes in harvesting to the number of caribou until it was too late."

Industrial development — especially mining — also has an impact on the caribou's northern environment. Research on the Bathurst herd shows a shift in caribou distribution even 25 kilometres away from a mine. "That bullet is bigger than the one that comes out of a gun," says Zoe.

Climate change, meanwhile, is a wild card for caribou. Warmer temperatures in the North could mean more vegetation for eating. On the other hand, it could also mean more shrubs, which may be both good and bad. Shrubs cast shade on sun-loving lichens, but their root system is also linked to an increase in mushrooms, which caribou love.

However, climate change will almost certainly mean more insect harassment, which interrupts feeding and drains a caribou's energy. The more frequent freeze-thaw cycles that come with climate change can also coat lichen with a thin layer of ice that makes it harder for caribou to get to their dinner.

Further south among the boreal and mountain caribou, the biggest cause of decline is habitat alteration. Logging, oil and gas infrastructure, hydroelectric development and mining, along with human settlement, are the main culprits. Logging for example destroys old-growth trees that harbour lichens. It also opens up new habitat for moose and deer that are attracted by tasty shrubs and saplings that thrive in clear cuts. Moose and deer in turn attract predators such as wolves, and logging roads and seismic lines make it easy for them to hunt caribou.

