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Among the most elusive of big animals, woodland caribou are listed as threatened nationally and provincially

the caribou

We are witnessing the disappearance of one of our most iconic inhabitants of the boreal forest, a species some describe as the “grey ghosts”: if industry and logging continue to carve into the forest, Ontario’s woodland caribou may be gone by the end of the century

By Ray Ford

Tugging on his toque and mitts to ward off the biting cold of a February day in Wabakimi Provincial Park, 250 kilometres north of Thunder Bay, Ontario Parks ecologist Steven Kingston surveys the gore on the frozen lake ahead. “Looks like the wolves were having a party,” he says, treading between little pyramids of wolf dung, and avoiding the nose-wrinkling yellow stains the predators have left in the snow to mark their buffet.

“Yeah, they’re not very tidy house guests,” agrees Natasha Carr, a biologist with the Ontario Ministry of Natural Resources (MNR), turning her attention to the victim. “We’ll look at the teeth. Maybe it’s an old caribou.”

Carr frowns as she brushes snow and blood off the jaw. “They look pretty healthy. I think this could be a younger animal.”

Kingston and Carr are like sleuths in a disappearing species case – one that is taking place on a vast scale. Since 1880, Ontario’s woodland caribou have lost half their range – a staggering 35,000 square kilometres per decade. Rough estimates indicate that some 5,000 caribou remain from a population that once extended as far south as Algonquin Provincial Park. If caribou numbers continue to drop at this rate, the species could disappear by the end of this century.

Much more than the fate of the caribou is at stake however. In Ontario, the species, which roams across the top of North America, Europe, and Asia, is so integral to the health of the boreal forest that Justina Ray, executive director of Wildlife Conservation Society Canada, calls their decline

“a first indicator that something could be going wrong” with the northern ecosystem. The boreal region stores vast amounts of carbon and water and helps buffer climate change; if that buffer fails, the caribou’s decline may presage our own.

That is one of the reasons why our group – Carr, Kingston, Gary Kwandibens, formerly the economic development officer with the Whitesand First Nation, and pilot Pat Dickey – are playing detective. We’re in the midst of a two-day helicopter survey of Wabakimi, where caribou are near the southern limit of their range. For decades, if a caribou fell in the forest, few outside the local First Nations community were likely to notice, much less care. But in the spring of 2007 the Ontario government, spurred in part by the efforts of Ontario Nature, and complementing similar moves under the federal Species at Risk Act, put caribou on a fast track for protection (see “The first 10” on page 16).

The attention is due in part to the caribou itself, a magnificent creature with elegant lines and art-deco antlers. But it is also stems from the animal’s role as an indicator species. If the caribou thrives, so does the boreal forest, with its wolverine, marten, migratory waterfowl and warblers. “The caribou is an icon of the wilderness, and its preservation depends on maintaining the vast wild landscapes of northern Ontario,” says Anne Bell, Ontario Nature’s senior director of conservation and education.

Despite the increased interest in caribou, they remain among the most elusive of big animals – difficult to find,



Slow reproductive rates make woodland caribou especially vulnerable to population declines

let alone study. Before calving, the females hole up in bogs or on islands, in densities as sparse as one cow per 20 square kilometres – the equivalent of just 32 caribou in an area the size of Toronto.

At meal times, they stake out the least-popular item in the boreal salad bar: lichen, especially in winter, when other plants are scarce. Bearding the limbs of ancient black spruce, or colonizing exposed bedrock where nothing else will survive, lichen allows caribou to roam beneath the dense cover of the boreal forest.

Swift enough to top 75 kilometres per hour and rugged enough to range over 10,000 square kilometres, caribou are “built for movement,” says Trent University caribou specialist James Schaefer, who has studied the animals from Nunavut to Newfoundland. “They have a lower cost of moving one kilogram one kilometre than any other land animal. The only animal that rivals them is the wildebeest.”

All of this makes caribou a shadowy presence in the remotest of areas, and a difficult target for predators. Caribou have been so sparse, unpredictable and mobile that wolves

What you can do

Care about the caribou? Here’s how you can help reduce habitat loss and support caribou-friendly policies:

- Reward the environmental efforts of domestic producers by purchasing Canadian-made lumber or paper products certified by the Forest Stewardship Council (FSC).
 - Reduce the stress on the boreal ecosystem (and the global ecosystem, for that matter) by curbing carbon emissions and making everyday decisions such as driving less, growing a garden and heating more efficiently to slow climate change.
 - Participate in Ontario Nature’s Action Alerts e-mail list, and become an Advocate for Nature by communicating directly with government and decision makers. (See www.ontarionature.org/home/advocate.html for more information.) Keep tabs on cross-Canada caribou issues by reading the Bou Blog (www.caribouandyou.ca/blog).
 - Volunteer your time or make a donation to support the boreal conservation initiatives of Ontario Nature (www.ontarionature.org) and other groups.
- Ray Ford**

PHOTO WAYNE SAWCHUK

would rather focus their efforts on more plentiful moose and deer. The result is a predator-prey balance that “seems to work,” says Alberta biologist Liv Vors, a veteran of north-western Ontario caribou surveys. “As long as people don’t get in there and start messing things around.”



Thundering over Wabakimi’s snow-covered landscape aboard a bright yellow helicopter, Carr and Kingston share the predator’s dilemma: there’s a lot of ground to cover and relatively few caribou to find. They scout for caribou on ice-covered lakes, scanning shores and clearings for the animal’s distinctive trails of crescent-shaped hoof prints.

Spying a trampled clearing in a spruce bog south of Wabakimi, Carr asks pilot Dickey to land. She is searching for solid proof of the caribou’s presence: their droppings

“It’s a lot easier to find them in the winter, because you can use the tracks to see where the caribou are feeding,” Carr says, sifting the snow and retrieving a handful of frozen, brown pellets. This is no small accomplishment, because “caribou poop” is as useful, scientifically speaking, as a blood sample.

When these pellets arrive at Trent University, biology professor Paul Wilson will analyse the genetic variations in the samples. Healthy populations with room to roam show a high degree of genetic diversity. Isolated groups, hemmed in by development or living on islands, have more uniform genes – evidence they are at risk of becoming inbred.

Wilson’s research is part of the interest in woodland caribou that spiked shortly after Wabakimi Park was created in 1983. Since then researchers have radio-collared caribou and tracked their movements, scouted calving spots, catalogued key habitat and mapped DNA.

Part of the effort involves understanding how much land caribou need. After its expansion in 1997, Wabakimi became Ontario’s second-largest provincial park, and at 8,900 square kilometres it’s larger than Prince Edward Island. Even so, the park may not be big enough for the wide-ranging caribou. Much of the land to the southwest is already cross-hatched with logging cuts, and as Carr collects droppings, the distant rumble of trains on the CN Rail main line filters through the spruce. When the pellet samples are analyzed, the genetic diversity they reveal will help determine whether these animals near the park’s southern boundary still have enough living space.

Pellets safely stowed, we climb back into the chopper for the day’s main event, surveying tracks and sightings of caribou, moose, wolves and (to gauge the level of human activity) snowmobiles. After experiencing the chill of the spruce bog, we are warmed by the sun pouring through the panoramic windows. The rotors whine rhythmically as the empty lakes and forested hills of south Wabakimi sweep by beneath us. To the north, serpentine creeks meander across the lowlands.

Over crackling radio headsets Carr, Kingston and Kwandibens discuss a local trapper’s sighting of about

30 caribou on a lake just south of the park. “It’s great to hear that,” Carr tells me. “It’s been five or ten years since such large groups were reported in this area.”

Then, not far from the west side of the park, five sorrel dots are thrown into brilliant relief against the dazzling white of the lake’s surface. An antlered bull is in the lead, four other caribou following with a fluid, effortless gait. We swing by just long enough to count them. Carr makes notes as the herd recedes into the white distance.

Within a few minutes, the helicopter clatters over a second group near Wabakimi Lake. The leader looks up and tosses his antlers. Behind him, three caribou dance skittishly in the snow. “Think we’re spooking them?” Dickey asks.

“Not at this distance,” Carr replies.

Then as the helicopter swings north, Kingston spots a pink smear on the ice. Closing in to investigate, we see the stain become a carcass, circled by two smaller figures, one dark, the other a striking tawny red. Wolves at the kill.

“Wolves don’t like to share,” Dickey says, looking for a safe place to land as the predators lope away.

“They aren’t going very far,” adds Kwandibens. Only when the helicopter makes another low sweep does the pair sprint for cover on the opposite shore.

Out on the frozen lake, Carr gets to work, reconstructing how the caribou died and tearing off a chunk of its flank for DNA testing. Surprised by the predators and separated from the herd, this animal made its last stand on the lake, trampling the snow as it fought off a circle of wolves. At some point a big gray wolf caught the quarry by the throat, crushing its windpipe and taking it down. The wolves we saw might not even be the perpetrators, Carr adds. The actual killers could be sleeping off the feast, while the duo we chased away were merely scavengers. True enough, after takeoff, we see three more wolves lounging in the sun on Finton Lake. The leader – a big, dark gray wolf – snarls, hair bristling on its back. The other wolves stretch and slink toward the bush.



While Carr and Kingston continue the survey the next day, Kwandibens and Wabakimi Park superintendent John Thomson use a lighter to thaw the frozen lock on the door of the Armstrong Lion’s Club. When the lock finally opens, Thomson switches on the lights, plugs in the coffee maker and sets up a projection screen near the Bingo machine. He’s arranged a meeting with about two dozen local trappers – most of them Aboriginal, male and over 40 – to learn more about the state of the caribou.

“Once a year, we’ll take the helicopter up and see where the caribou are,” Thomson says. “But [trappers] are out a lot more than one day in a year, and they see trends on the land.”

Around the hall, men in bush jackets and ball caps settle into chairs and squint beneath the glare of the fluorescent lights. “What we used to hunt and fish before, we don’t get now. Why? The only reason is the cutting, the clearcutting,” says longtime trapper Francis Donio. “Maybe it’s a good thing you are here,” he tells Thomson, “because you’re saving a bunch of forest, and that’s what we need.”

Know your caribou

Caribou, known as reindeer in Europe and Asia, differ in their habits, habitats and appearance, but all caribou are the same species, *Rangifer tarandus*. Ontario's caribou have two distinct "ecotypes":

Migratory forest-tundra ecotype: Residents of the lowlands south of Hudson and James bays, these animals form herds that number into the thousands, migrating long distances to calving grounds and dispersing in the winter. Although the animals are not listed under Ontario's Endangered Species Act (ESA) or the federal Species at Risk Act (SARA), there is concern that they may be declining.

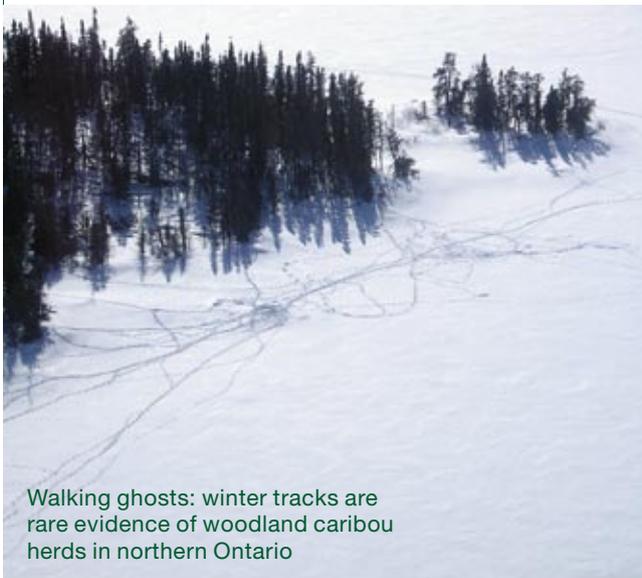
"It's a jewel that we have up there that people don't realize," says Wildlife Conservation Society Canada director Justina Ray. "We have these incredible migrations of thousands of caribou."

Sedentary forest-dwelling ecotype: More commonly known as woodland caribou, both the ESA and SARA protect these boreal forest animals. The woodland caribou's key habitat is lichen-rich mature conifer forests, containing trees that are 50 to 120 years old. The animals forage on thick lichen growing on areas of exposed bedrock or on tree branches, and use large areas of dense forest as a refuge from predators or as travel corridors. Females will select calving areas with good escape routes and are known to out-swim predators.

Unlike other members of the deer family, both male and female woodland caribou grow antlers, although bulls have more ornate racks. Coat colour ranges from rich brown to greyish brown, with white on the lower side of the tail and white "socks" above the hooves. Hollow hairs up to 10 centimetres long provide good insulation and help keep the 110- to 210-kilogram mature caribou afloat in the water. Large bulls can stand more than 1.2 metres high at the shoulder.

Cows usually mate when they are two-and-a-half years old. After a gestation period of seven and a half months, they calve in mid May or early June, typically producing only a single calf. Within a few days, a caribou calf can outrun a person and swim more than 100 metres. Despite this, calf mortality is 50 to 80 percent during the animal's first year of life.

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Walking ghosts: winter tracks are rare evidence of woodland caribou herds in northern Ontario

A few decades ago, seeing a dozen or more caribou during the winter was not so remarkable. On Ratte Lake, "there were so many caribou they left big piles of caribou pellets on the lake," recalls Richard Wanakamik, who wears a cap emblazoned "Native Pride." "From the shore they looked like muskrat lodges. That's how many caribou there were before," he continues. "After they started cutting, then nothing. Not overnight, but over time."

Afterwards, Whitesand First Nation members bring in cauldrons of soup and platters piled high with sandwiches. Donio expands on the ancient ties to the caribou: "To me, caribou is a sacred animal. If they were gone, I'd find there'd be something missing. My traditions and culture would have something less."

But there is no quick way to stem the caribou's decline, and no simple explanation for it. "Ten years after cutting you still see caribou and think 'Oh, we're doing great, they're still here,'" says Vors. "Thirty years after cutting you're asking, 'Where have they gone?'"

It's easy to rule out food shortages or hunting as the major trigger for the decline of the caribou. Although poaching may be a problem, hunting for caribou by non-First Nations peoples has been banned in Ontario since 1929, and healthy crops of lichen can be found in areas the caribou are abandoning. Vors suspects that instead the process begins with industry: logging, mining, road building and, especially in the west, oil and gas extraction. After an area has been logged, caribou must share the landscape with increasing numbers of moose or deer, newcomers who move in to browse new growth.

More prey brings more predators, and wolves make use of logging roads, hydro or gas lines and snowmobile trails to penetrate more deeply into caribou country. "You've not only upped the wolf population, you've given them ways to travel, and you've improved their hunting efficiency," Vors says.

Because a caribou cow has limited reproductive capacity (only one calf a year, and in some years none), according to Schaefer "it doesn't take much to tip a population into a decline." A few extra wolf kills a year on a sustained basis, and the herd begins to lose its drawn-out battle of attrition.

The result is a time-delayed disappearance – a process that began 20 years ago with the first stroke of a feller-buncher in a new clearcut and continues today, 20 kilometres from that levelled area, with a wolf shaking a dying caribou by the throat. Once the predator-prey balance tilts against the caribou, its decline is almost impossible to reverse.

And wolves aren't the only challenge the caribou face. "The real wild card is climate change," says Vors. Warmer weather encourages the northward spread of moose and deer, consumes forests with larger and more intense fires and increasingly violent storms, and triggers the freezing rains that seal off lichen beneath an icy crust. A related menace is the meningeal worm (or brainworm), a parasite carried by white-tailed deer. Caribou can be wiped out in an area where infected deer become established.

Given those pressures, Vors expects the southern boundary of this species' Ontario range to shrink northward by 50 to 200 kilometres over the next two decades. If caribou

losses continue, “they’re toast,” she states bluntly. “They might not even last until the end of the century.” No wonder Vors calls woodland caribou “the walking dead” and Schaefer refers to them as “grey ghosts.”



But maybe there is reason for hope. Six months after Carr’s helicopter survey of Wabakimi, Ontario Premier Dalton McGuinty announced the province’s intention to protect 225,000 square kilometres, or roughly half of the boreal region, an area that includes part of the boreal forest. Properly managed, it’s a move that could ensure a northern refuge for caribou, although it won’t likely help the animals now roaming far to the south, in Wabakimi.

Those caribou on the edge of logging and mining development must instead rely on the new Endangered Species Act (ESA), and the habitat protection it offers threatened and endangered species. But the protection afforded under the ESA is itself uncertain as the Province permitted an exemption to the act for the forestry industry earlier this year.

Ontario has been adapting and modifying caribou-friendly logging practices since the late 1980s, using a “mosaic” of cuts designed to allow the progressive regeneration of new caribou habitat as older forests are cut.

“We still have caribou in places where we had them a decade ago, at the southern edge of their range. We’ve retained caribou habitat that wouldn’t be there if we had gone with the traditional forest harvesting approach,” says Ted Armstrong, MNR regional wildlife biologist for northwest Ontario. Still, given that it takes up to 60 years for caribou habitat to regenerate, Armstrong adds “we won’t know for several decades how successful we are.”

Ontario Nature’s Bell argues that’s a good reason to hedge our bets by preserving large, intact, protected areas alongside those cutting mosaics. Otherwise, the north is being subjected to “a grand experiment” in forest management. “And there’s no clear indication it’s going to work.”



Disappearing caribou have become the wildlife counterpart of shrinking glaciers and splintering ice caps, an early warning sign that something is wrong in an ecosystem that holds more than 80 percent of the world’s fresh water and acts as the planet’s largest terrestrial carbon warehouse. Canada’s boreal forest and wetlands alone store more than 186 billion tonnes of carbon, the equivalent of more than 900 years of Canada’s greenhouse gas emissions. If caribou-friendly forestry management keeps that carbon out of the atmosphere, then caribou become partners in buffering global warming. Ultimately, they “have a value in maintaining the climate that allows us to continue our way of life,” says Vors.

This is not the first time our fate has been bound up with that of the caribou. Schaefer remarks on a distant echo of the recent First Nations’ experience: “We know hunters in Europe 15,000 to 20,000 years ago relied heavily on caribou for food,” he says. “Maybe because our species depended

On the front lines

Ontario Nature is not only trying to protect caribou and the boreal forest; the organization is actively working on the front lines to maintain both the forest and the creatures that depend on it. Supported by funding from Ministry of Natural Resources’ Species at Risk Stewardship Fund, Julee Boan, Ontario Nature’s Thunder Bay-based boreal conservation coordinator, is working with foresters on ways to better understand and regenerate caribou habitat.

“If we’re losing species, that’s a sign we’re headed down a slippery slope,” says Boan. “It’s important that we understand what’s happening with caribou, because that helps us understand what’s happening in the boreal forest in general.”

Over thousands of years, caribou have adapted to the kind of coniferous forest that grows after wildfires sweep through. However, after logging an area, there is increased likelihood that the greater mix of hardwoods may provide more for moose.

“The research is looking at the types and amount of vegetation that grows back after logging as a result of different harvesting techniques,” Boan says. “In many ways, cutting does not cause the same results as fire, and can include complex impacts on the relationships between soils, nutrients, and growth. We need to better understand which logging techniques do not put caribou at such a disadvantage in terms of the forests that grow back.”

Federal support is helping Ontario Nature, the Wildlife Conservation Society Canada and the Webequie First Nation conduct caribou surveys in Webequie’s traditional area, about 550 kilometres north of Thunder Bay. The Webequie effort combines aerial surveys with interviews of community members.

“Caribou are part of our traditional knowledge package. We need people to recognize their roots and understand their heritage,” says Gary Kwandibens, former economic development officer with Whitesands First Nation. “We’re trying to develop the traditional attachment to the land and to maintain these skills.”

But Kwandibens also sees the economic potential for First Nations to act as stewards for boreal conservation. This past winter, for example, trappers were offered a small snowmobile fuel subsidy in exchange for recording wildlife sightings. Such cooperative ventures could diversify the community’s reliance on forestry, tourism, hunting and trapping.

Outside caribou country, the challenge now lies in getting city dwellers to care about an animal they only see on the back of a quarter.

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on them for so many years, that’s why we find them so attractive.” Now, in the age of helicopter surveys and DNA sampling, our reliance is, if anything, greater. “We often think of ourselves as more distinct from nature than ever before,” Schaefer adds. “But I tend to think our future and the future of caribou are linked more tightly than ever.”

Ray Ford is a freelance writer who lives in what used to be caribou range, near North Bay, Ontario.