

COUNTING CARIBOU

How Did Canada's Most Populous Ungulate End Up On Ontario's Endangered Species List?

The caribou is the most abundant wild hoofed animal in Canada. With 3.89 million caribou spread across the country, there are more caribou than deer, moose, and elk combined. It is globally abundant, too, since the caribou of Canada is the same species as the reindeer of Eurasia. So how did the most widespread and populous ungulate end up on Ontario's Endangered Species List? It's all about how they were counted.

There are five subspecies of caribou in Canada, with "woodland caribou" being the most widespread. It lives in mountainous areas, mature forests, and very sparse forests, where its preferred food – lichens – are abundant. Woodland caribou number about 1.28 million in Canada, according to the Committee on the Status of Species at Risk in Canada. Accordingly, it is far too numerous for the subspecies to be considered at risk as a whole.

However, the woodland caribou subspecies has been subdivided into two ecotypes: the "forest-tundra ecotype," which moves between habitats; and the "forest-dwelling ecotype," which prefers to live in the woods. One of these ecotypes is less populous, and therefore considered threatened. Needless to say, if any animal population is subdivided enough times, the result is bound to be a very small population that can be considered at risk, threatened, or endangered. That could be what has happened with woodland caribou in Ontario.

For example, a 1999 status report estimated that Ontario contained 20,757 woodland caribou – a healthy population. Of these animals, 15,832 were designated as the forest-tundra ecotype and 4,925 were considered to be forest-dwelling. It was decided that the smaller population – the forest-dwelling ecotype – should be considered threatened. The fact that 76% of the animals were considered safe and 24% were considered threatened raises an important question about the interpretation of the data: is there actually a difference between the forest-tundra ecotype and the forest-dwelling ecotype?

The Ministry of Natural Resources and Forestry (MNR) has been trying to answer this question for over a decade. They have used "caribou-cams," attached to the animals' hairy chins, which record every bite they eat and every step they take. They have used GPS collars that record their movement across the landscape. They have even tracked the movement of wolves and examined their faeces, to understand the predator-prey interactions of woodland caribou across the province. Researchers have roared through the skies in helicopters to observe the presence of both woodland caribou ecotypes. It has been a massive and productive research effort, with more than 50 projects being conducted by MNR scientists and biologists, supported by academics and the forest industry.

In the end, all of this research suggests that there are minimal differences between the subspecies of caribou in Ontario. Radio-collar studies and genetic analyses have confirmed that the forest-tundra ecotype and the forest-dwelling ecotype naturally make enormous movements. They naturally come into contact with each other. The zones in which they live tend to overlap. Consequently, the evidence supporting the notion of two distinct caribou ecotypes is very weak. If there aren't actually two types of woodland caribou in Ontario, it is incorrect to designate the non-existent subset as "threatened."

MNRF's work and preliminary results have been described in the *State of the Woodland Caribou Resource Report*, a three-part publication released to the public in December 2014. It describes what has been done across the province. MNRF has also published eight detailed *Integrated Range Assessments for Woodland Caribou and Their Habitat*. These assessments provide an initial assessment of how caribou herds are faring within the 13 population ranges identified in the official *Ontario Caribou Conservation Plan*.

That explains how a provincially, nationally, and globally abundant species has been listed as threatened: its population was subdivided and evaluated as two small parts, rather than one cohesive whole. But that isn't the only factor contributing to woodland caribou's place on Ontario's Endangered Species List. There is another counting issue, this time related to how researchers measure the availability of habitat for these ungulates across the province.

MNRF has conducted numerous surveys to address this issue. Not surprisingly, these surveys suggest that the range of woodland caribou herds has barely changed since the 1950s. Specifically, the vast majority of the core range that was occupied the 1950s is still occupied today. In northwestern Ontario, the range has significantly extended southward by hundreds of kilometers. On the whole, this is good news for woodland caribou in Ontario – the extent of their habitat has been maintained in most places, and grown bigger in a few spots.

This success story is partially due to a productive partnership between MNRF and the provincial forestry sector that has been evolving since the mid-1990s when the "caribou mosaic" was first applied in forest management plans in northwestern Ontario. This approach has involved managing the entire landscape in huge patches (i.e. blocks of 10,000 – 30,000 hectares) to provide a continuous supply of connected, suitable habitat over the long term. Another trend that has contributed to the abundance of woodland caribou habitat is the history of fire suppression in northern Ontario, as the subspecies prefer mature/older forests that tend to produce more lichens.

Interestingly, numerous population surveys by MNRF suggest that areas subject to forest management have healthier woodland caribou populations than areas that have been entirely left to nature. This is due to higher fecundity and survivorship of animals in these areas. For example, more woodland caribou are being born and surviving from year to year in areas like Nipigon and Kesagami, which are managed by forestry companies, compared to Missisa and James Bay, which are not.

This suggests that woodland caribou are not threatened due to a lack of habitat. Their habitat is being protected across Ontario, and in any case woodland caribou populations appear to be stronger in areas where forestry companies operate. If the subspecies is declining, it is due to variables within their habitat that MNRF either is unable to control or incapable of measuring.

Indeed, there are many good reasons to be skeptical of the data being used to calculate the size and range of woodland caribou populations in Ontario. For example, current trend estimates are based on only two or three years of data. Yet ungulate populations are known to vary in response to decades-long trends like the vagaries of winter weather, which can restrict access to food, or the assembly of predators like wolves. Furthermore, the models used by MNRF to predict habitat suitability are incapable of accounting for how the habitat changes over time in mature/older forests due to the senescence and decay of trees and other forest components over time. They assume that woodland caribou habitat remains viable forever, as long as nobody harvests it or burns it down. Such shortcuts

are simplistic but necessary due to the complexity of woodland caribou population dynamics and habitat preferences.

Accordingly, MNRF's own reports are prefaced with statements like, "Caution is warranted in the interpretation of the *Integrated Range Assessment[s]* results due to the limitations of available data and conditions or circumstances not readily integrated in the analysis framework." More data are needed to better understand the factors responsible for stability and growth of woodland caribou populations in Ontario.

In summary, woodland caribou remain abundant in Ontario and their habitat is well protected. MNRF has made a valiant effort to understand Ontario's woodland caribou populations, but the \$11 million dollars spent so far has only allowed researchers to scratch the surface. More reliable data are needed to provide precise, definitive answers about the nature of woodland caribou as a species and their habitat requirements. But then again, research almost always results in more questions than answers.

At this point, we may need to reconsider the questions that we are asking and review our methods for answering those questions. Perhaps going forward, the key question should not be, "Are caribou endangered on the landscape and how can we help them?", but rather, "How can we ensure that caribou continue to live in northern Ontario for another 60 years?"

Considering that MNRF data confirms that woodland caribou continue to persist in northern Ontario and the recession of its habitat has been minimal over the last 60 years, there is a case that government leaders should hit the pause button on all woodland caribou policy in Ontario and review existing caribou policy.

Without an adequate understanding how woodland caribou herds use the landscape – let alone a firm grasp of the differences between ecotypes of the subspecies – it is not possible to develop science-based policy. Further policy should be discussed after scientific studies have validated or modified current hypotheses about the relationship between disturbances and the population dynamics of woodland caribou, and compelling empirical evidence can confirm the legitimacy of the theory of two woodland caribou ecotypes.