



# Woodland Caribou in Northwestern Ontario *Why they are different...*

Northwestern Ontario Boreal Forest Management  
Technical Note TN-07

by L. Godwin

## Introduction

Woodland caribou (*Rangifer tarandus caribou*) once inhabited much of northern Ontario, but over the past one hundred years, population have dramatically declined and their distribution has steadily receded northward. If we are to retain woodland caribou in northwestern Ontario, heightened awareness and a better understanding of woodland caribou and their ecology are needed.

Resource managers in northwestern Ontario have become familiar with moose (*Alces alces*) ecology because it is widely recognized as a valuable hunted resource. In addition, the “Timber Management Guidelines for the Provision of Moose Habitat” (OMNR 1988) are followed during timber management planning. However, caribou ecology is very different from that of moose, and effective caribou management will require that foresters, wildlife biologists, planners and technical staff have a high level of understanding of caribou ecology.

The purpose of this note is to briefly describe the extent to which woodland caribou ecology is understood in northwestern Ontario, and where relevant, point out differences from moose.

## Description

The woodland caribou is a medium-sized member of the deer family, Cervidae, which also includes moose and white-tailed deer (*Odocoileus virginianus*). All caribou in Ontario are woodland caribou (*R.t. Caribou*), one of five subspecies present in North America. The subspecies which most people are familiar with is the barren-ground caribou (*R.t. groenlandicus*), which migrates in late winter from the spruce-lichen woodlands of the taiga onto the tundra to calve in large aggregations.



## Identification

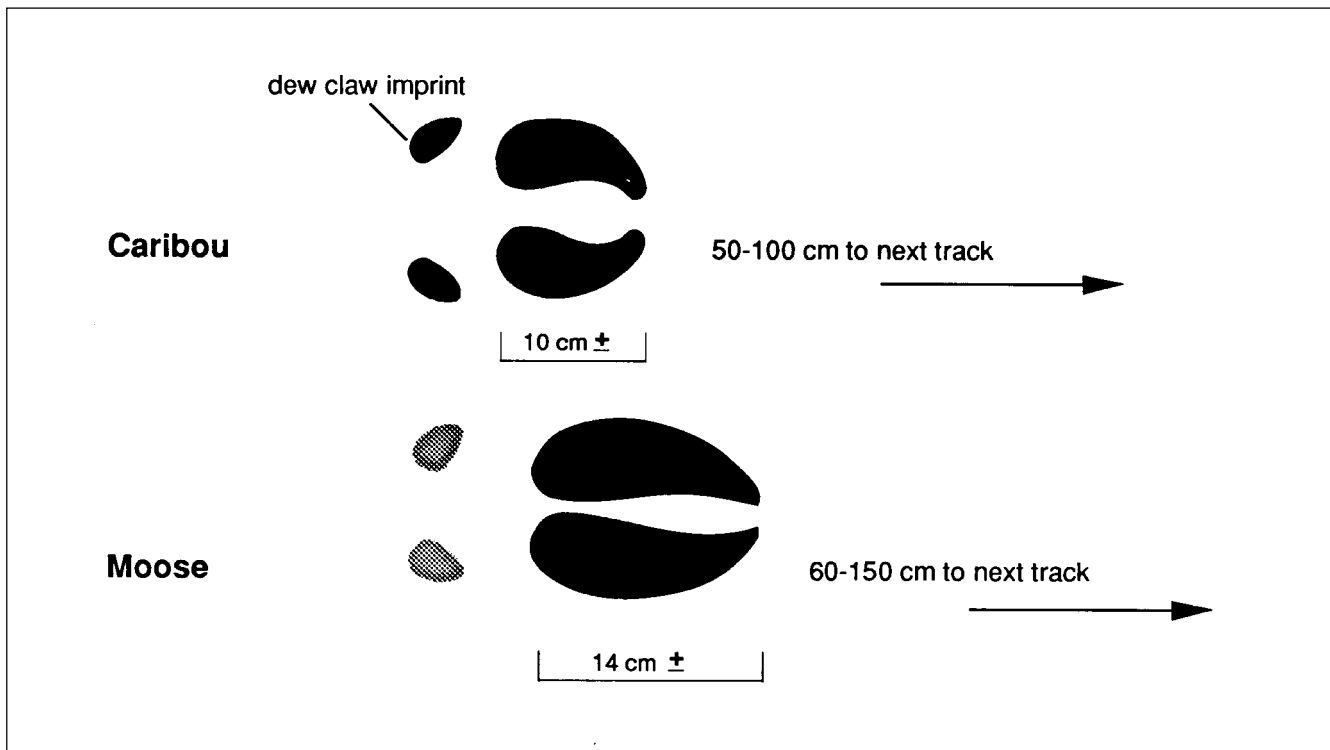
Caribou are easily distinguished from moose and deer by their white neck, ventral mane, limited white areas on the belly and rump, white “socks” above the hooves, thin but spreading antlers and small size compared to moose. Woodland caribou stand about 107-122 cm (3 1/2 - 4 ft) tall at the shoulder, intermediate in size to moose and deer. Males are larger than females, with bulls ranging in weight from 118-205 kg (260-450 lbs) while adult cows weigh 80-110 kg (175-240 lbs) (W. Dalton pers. comm.).

Both sexes generally grow antlers, a characteristic unique among members of the deer family. Bulls have the largest antlers with erect spreading main beams, several tines (or points), and palmate brow tines that point forward over the face. Cows have much smaller antlers and a portion of the female population never grow antlers. Bulls shed their antlers from November through March, but pregnant cows retain theirs until after calving, generally in May or June.

Caribou tracks are differentiated from moose and deer by their crescent shape and usually clear imprint of dew claws behind the hooves (Figure 1). Caribou have large feet with long dew claws and crescent-shaped hooves which facilitate travel over snow-covered or boggy ground (Banfield 1974). The hooves become sharp edged in winter, with hair covering the fleshy pads underneath, providing good traction on snow and ice. The sharp hooves also improve the ability of caribou to dig through snow for food (Miller 1982).

Woodland caribou have other adaptations to help them cope with their environment. Their dense winter coat, comprised of hair filled with tiny air bubbles not only makes the coat highly insulative but increases buoyancy for swimming. The short, heavily furred tail and ears help to reduce heat loss during the cold northern winters.

Figure 1. A comparison of caribou and moose tracks ( adapted from Burt and Grossenheider 1976).



## Population Distribution

Woodland caribou once ranged south to Lake Nipissing but their distribution receded northward following European settlement in the late 1800s. During the same period, moose and deer range expanded northward. The decline of caribou was probably due to a combination of factors; hunting, fire, land clearing, logging, increased predation by wolves (*Canis lupus*) due to increased moose and deer densities, and disease caused by brain worm (*Parelaphostrongylus tenuis*) (Bergerud 1974, Darby *et al.*; 1989)

Presently in northwestern Ontario, the southern limit of continuous distribution of woodland caribou roughly corresponds to a line of approximately 50°20' latitude. South of this line, a few remnant populations remain southeast of Geraldton, and on some islands and portions of the north shore of Lake Superior (Figure 2).

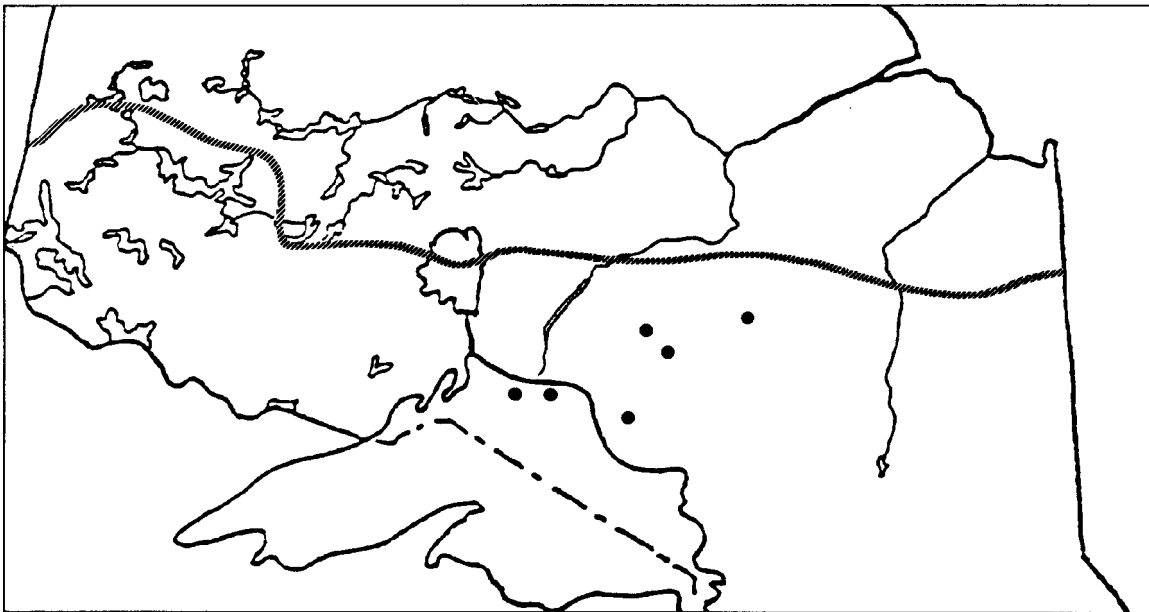


Figure 2 Southern limit of continuous woodland caribou distribution and remnant populations in Ontario, adapted from Darby *et al.* (1989). The dots indicate the approximate locations of remnant populations

At present, a reliable estimate of Ontario's caribou population is not available. Aerial surveys of known caribou range combined with the various local estimates yield a current provincial estimate of 15,000 (Darby *et al.*; 1989), which is close to a 1965 estimated of 13,000 (Simkin 1965). Both estimates are thought to be far below the carrying capacity of their current range.

There are at least six remnant native herds with a combined population of approximately 500 caribou found south of the line of continuous distribution (Darby *et al.* 1989). These are located at the Slate Islands, Pic Island, Pukaskwa National Park, Caramat, Flanders Township and Hagarty road (Figure 2). Generally these populations exist at very low densities (<0.1 caribou/km<sup>2</sup>). The exception however, is the Slate Islands which in the absence of predators, support the highest density of caribou in the world (typically 6.9-11.0/km<sup>2</sup>) (Bergerud 1980). In recent years, the population peaked near 650 animals prior to a die-off in 1990 due to a food shortage. This reduced numbers to less than 100 animals (W. Dalton pers comm.).

## Biology

### Reproduction

Caribou have a lower reproductive capacity than moose and deer. Female caribou usually take 2.5-3.5 years to mature while moose can conceive at 1.5-2.5, and white-tailed deer can conceive at .5-1.5 years of age. Caribou always give birth to single calves whereas moose and deer often give birth to twins. Delayed maturity and single births are compensated for by a relatively high pregnancy rate (80-90 percent) of mature female. The adult sex ratio of caribou favours females, and as with moose or deer, caribou bulls will breed with several cows.

Woodland caribou give birth in late May or early June after a gestation period of 227-229 days (Bergerud 1978). The calves are able to follow their mothers within one hour of birth and grow rapidly in the first few months. In the absence of predation, calf recruitment can bring about rapid population growth in caribou herds as evidenced in the Slate Islands population.

### Mortality

Predation is the most important mortality factor affecting Ontario's woodland caribou (Darby *et al.* 1989), with the most significant predator being the timber wolf. The abundance of timber wolves determines the density of caribou. Timber wolves in turn are limited by the prey base. In rather simple northern ecosystems, where caribou are the only winter prey of wolves, the numbers of wolves and caribou limit each other. In the more complicated ecosystems with moose as alternate winter prey, wolf density is not dependent on caribou alone. Where moose are common, wolf density is nearly independent of caribou density, and wolves are an order of magnitude more common than in caribou-only ecosystems. Prime adult moose can successfully fend off wolf packs, but by preying on young and old moose, wolves can become common enough to hunt caribou to the last animal.

A comparison of woodland caribou distribution with moose and wolf densities in northwestern Ontario shows that the present southern limit of continuous caribou distribution corresponds closely to the northern extent of medium to high densities of both moose and wolves (Darby *et al.* 1989). Moose, as well as deer, expanded their range northward as timber harvest patterns created habitat conditions suitable for browsers. Increased densities of moose and deer supported higher wolf numbers, thereby increasing predation on caribou and reducing numbers in the southern portion of their range. Bergerud (1989) believes the regulation of caribou numbers in Ontario is driven by wolf predation to the extent that sustainable populations of caribou are to be found only in those areas not capable of supporting significant moose and/or deer populations.

Other known predators are lynx (*Lynx canadensis*), black bear (*Ursus canadensis*), and humans. Caribou calves, in the first few weeks of life, are particularly susceptible to be attacked by black bears.

In Ontario, only Treaty Indians may legally hunt caribou within their treaty areas. Native harvest may threaten local populations due to certain aspects of caribou behaviour which make them particularly vulnerable to firearms. Caribou's grouping behaviour and curiosity allow for multiple kills at close range, and their association with open areas increases their vulnerability.

Train collisions with caribou occur occasionally and can have a significant effect on small local populations. Another potentially serious mortality factor is the parasitic brain worm (*P. Tenuis*) which is carried by white-tailed deer, and is fatal to caribou and moose.

### Seasonal Ecology

Woodland caribou are the most gregarious of the deer family in Ontario, especially in autumn, winter and early spring. However, they remain essentially solitary in late spring and summer. In the boreal coniferous forest, they are found most often in mature and over-mature jack pine and spruce stands. Caribou use a variety of habitat types, exhibiting strong seasonal preferences governed by forage availability, predators, and snow conditions (Darby *et al.* 1989). A detailed review of the seasonal ecology of woodland caribou in northwestern Ontario is provided by Hamilton (1978).

The Penn Island population of woodland caribou that inhabits the Hudson Bay lowlands exhibits migratory and grouping behaviour identical to barren-ground caribou, but this behaviour is not characteristic of Ontario's forest-dwelling woodland caribou.

## Summer

Prior to calving in the spring, cows disperse individually to sites where concealment and safety are provided by the forest, topography, and waterbodies (Bergerud and Page 1987). Bulls also remain solitary during late spring and summer but utilize a greater diversity of habitats than cows. Cows usually calve on islands or near lake shorelines. The proximity to water provides an avenue of escape for cows and calves if pursued by wolves or other predators. Caribou are strong swimmers and even at a young age are well adapted to swimming long distances. Caribou may also use shorelines, open bogs and exposed ridges for relief from insects during the summer months.

During the summer, caribou feed on a wide variety of plants, especially the leaves of deciduous trees such as willow and birch, and shrubs such as Labrador tea and blueberry. Herbaceous plants, lichens, mushrooms, grasses, and some sedges are also eaten wherever abundant. Caribou are actually more versatile in their feeding habits than other cervids in North America (Bergerud 1974). The availability of summer habitat, other than calving areas, is not a critical factor for woodland caribou.

## Winter

With the approach of winter, woodland caribou form small groups in preparation for the rut. Breeding takes place around the end of September or early October. Groups of caribou remain together through winter in areas of mature, open-canopy, coniferous forest.

During autumn and early winter, evergreen broadleaf shrubs associated with treed muskeg are an important food source. With increasing snow depth, caribou feed extensively on lichens, primarily *Cladina* spp., generally known as reindeer moss. The lichens are common in open, upland stands of jack pine and black spruce. The animals locate snow-covered ground lichens by smell and then paw down through the snow forming feeding craters'. (The name caribou originates from a Micmac Indian word for 'one who digs'). Lichens, although low in protein are rich in carbohydrates. Some other nutrients are obtained from evergreen shrubs and herbs found under the snow. Woody browse may also be consumed but it is not a dietary staple as it is for moose and deer. Deepening snow and increasing hardness of snow cover force caribou to move onto higher wind-swept ridges where lichens and other vegetation are more available at minimum energy cost.

Caribou are well adapted to surviving winters on a diet of lichens although lichens may not be essential for winter survival. This adaptation allows them to occupy habitats that largely exclude moose, and may be their primary predator avoidance strategy during winter.

Winter range generally does not overlap with summer range, necessitating movement between the two seasonal habitats. In moving between summer and winter range, woodland caribou in the boreal coniferous forest of northwestern Ontario apparently do not exhibit strong ties to traditional migration routes. Seasonal movements are commonly in the range of 10-40 km but in some areas caribou use the same range year round. Seasonal range for populations in northwestern Ontario varies widely in size up to several hundred square kilometres (Darby *et al.* 1989).

Most aspects of caribou behaviour, habitat selection, and movements help reduce the occurrence of wolf encounter. Caribou do not necessarily need a major portion of their range in lichen-rich mature forest except as a means to avoid high moose densities and thus wolves. In order to survive in northwestern Ontario, woodland caribou rely on *Cladina* spp. lichens in late winter and shorelines in summer (Bergerud 1989). The result is that caribou in northwestern Ontario are found only in areas with major limitations for supporting moose (and wolves) in high densities, unless they can find islands or other forms of refugia where they can exist in a predator-free environment (Cumming and Beange in prep.).

## Management issues for Woodland Caribou

The unique ecological requirements of woodland caribou provide a number of challenging issues for resource managers in northwestern Ontario. Several of the issues are presented here for consideration.

## Caribou vs. Moose and Deer Management

Populations of caribou and moose and/or white-tailed deer are not compatible on the same land base because of associated wolf predation and parasitic disease. In areas where caribou are present, a decision must be made to manage for either caribou or moose and/or deer. When a decision has been made to manage for caribou, management techniques should be pursued to support caribou but discourage moose and deer populations through habitat management.

## **Forest Fire**

Mature and over-mature conifer/lichen stands provide critical areas of winter habitat for caribou. Both the age and the dry soils on which these stands tend to occur increase their susceptibility to fire. Fire protection priorities may play a role in the management of caribou winter range.

## **Timber Harvest**

Timber management practices must be conducted in a manner which supports forest stands capable of producing lichens on suitable sites and discourages fragmentation of forest cover in winter habitats. Timber harvest most often leads to proliferation of woody browse, providing conditions for increased moose and deer numbers. Consequently, wolf densities increase, resulting in increased predation on caribou. Harvest and regeneration techniques need to be developed to mitigate the effects of timber management on caribou, particularly as timber harvesting expands into previously remote areas of northwestern Ontario (Darby and Duquette 1986, OMNR 1990).

## **Forest Access Roads**

The construction of forest access roads into areas of caribou habitat will increase disturbance of local populations and may result in displacing caribou into less preferred areas. Road access facilitates native subsistence hunting, illegal hunting and increased mobility of wolves.

## **Predator Control**

Predator control is achieved indirectly through habitat management. Limited predator control at the local level may be justified if predation on caribou threatens management objectives.

## **Relocation of Caribou**

Relocation of caribou may be used to supplement small existing populations or establish new ones in areas of former range. Candidate sites should have suitable habitat conditions, low predation, low deer and moose numbers, and compatible land use objectives.

## **Harvest**

Native harvest of woodland caribou is unregulated and may exceed sustainable levels in some areas. More information is required to assess the impact of native hunting and potential sport hunting on caribou populations.

The challenge for retaining woodland caribou in northwestern Ontario's boreal forests will be to: 1) prevent caribou from being driven out of the few remaining refuges; and 2) prevent areas supporting caribou from being changed into places that favour moose and consequently, wolves.

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