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## Mountain Caribou

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survival.*



**BRITISH  
COLUMBIA**

Ministry of Environment, Lands and Parks



## Why are Mountain Caribou at risk?

Mountain Caribou depend upon large tracts of old-growth forest in the Interior Wet Belt. Over the past century, old forests in this high snowfall zone of southeastern British Columbia have become far less abundant. Habitat has been lost to fires, timber harvesting, hydroelectric reservoirs, and human settlement. In many places, the remaining habitat occurs in small patches. The loss and fragmentation of old-growth forests may cause caribou to abandon some areas. It also increases the risk that caribou will be killed by predators or poachers, or disturbed by outdoor recreationists. Resource management guidelines have been developed for all herds of Mountain Caribou in British Columbia, and most herds are being monitored, but habitat alteration continues to pose a threat.

## What is their status?

About 98 percent of the world's 2500 Mountain Caribou live in British Columbia, where they are on the provincial Blue List. This means they are considered to be vulnerable or sensitive, and require special management to ensure their survival. For conservation and management purposes, wildlife biologists have divided these 2500 animals into 13 herds, called sub-populations, ranging in size from about 20 to 450 animals. Seven of the smaller sub-populations are isolated from others, so that caribou seldom move between them. Such herds are particularly at risk because random events like avalanches, hard winters, or a few years of heavy predation could eliminate most or all of a small herd, with little chance for replacement from other sub-populations. In contrast, six of the sub-popula-

tions are larger and occur right next to others, so they have much less risk of disappearing in the immediate future. No one knows how many Mountain Caribou lived in this province historically, but it is clear that some areas where they once lived have been abandoned. One estimate is that about 60 percent of their historic range in British Columbia and the United States no longer supports Mountain Caribou.

Land use plans throughout the Mountain Caribou's range recognize their vulnerability, so there are now guidelines for special resource management where they live. These guidelines mainly affect the rate and type

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of forest harvesting. The goal is to retain enough old-growth forest to meet the caribou's needs, while still allowing some logging. Slightly different approaches to managing Mountain Caribou have been taken in different regions, so a provincial strategy is now being developed. This strategy will coordinate efforts to maintain or recover Mountain Caribou throughout their remaining range. There is no hunting season on Mountain Caribou.

## What do they look like?

Mountain Caribou are closely related to other caribou across North America, and are genetically very similar to those that live in the Arctic and those that live in the boreal forest. They are bigger than Mule Deer, but smaller than Elk. Most bulls weigh about 200 kilograms, with cows about two-thirds that weight. Their colouration varies by season. In autumn, their body hair is mainly medium brown, with white hair around the rump and in a ruff under the throat of

bulls. The head and neck usually have a mix of grey, white, and brown hair. As winter wears on, the dark guard hairs become broken and fall out, causing the brown portion of the body to become much paler.

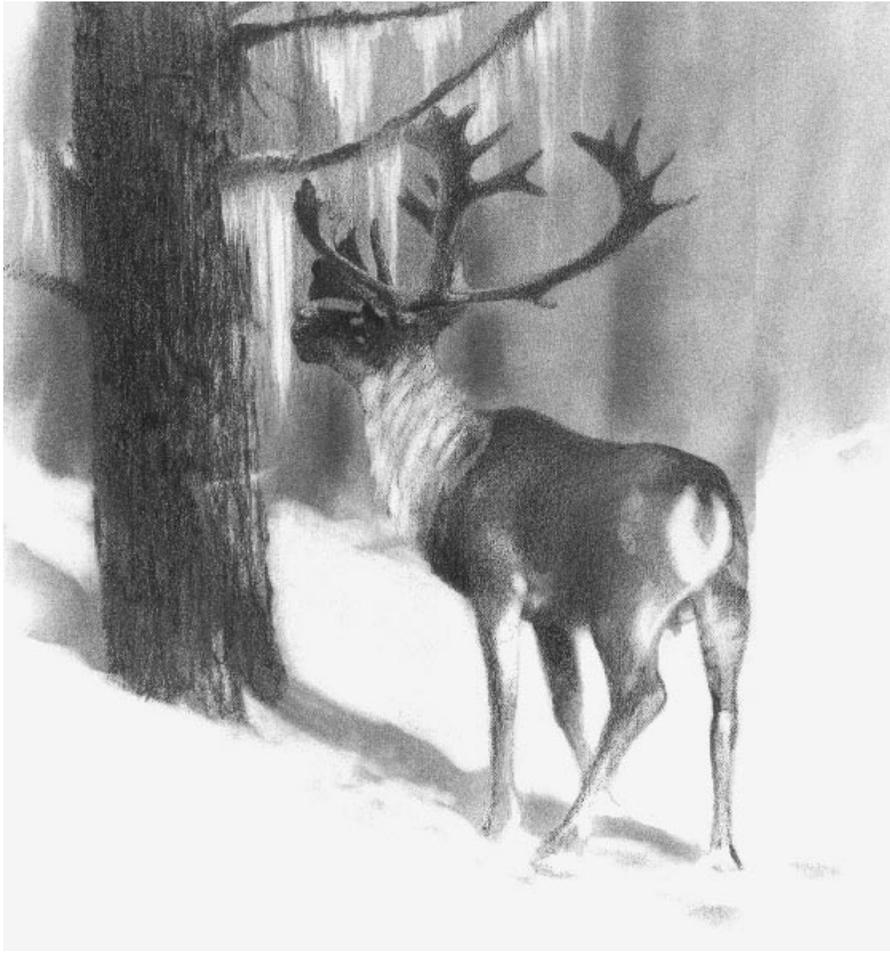
Nearly all caribou cows grow antlers, a characteristic not shared by any other species within the deer family. The antlers of mature males are extremely large relative to their body size. Females' antlers are smaller.

Caribou's bodies show a number of adaptations for life in cold, snowy environments. One such adaptation is their hoof design. When walking in snow or on soft ground, the caribou's weight is spread between large, crescent-shaped hooves and large dew-claws set well back on the foot. The hoof print of a caribou is about the same size as that of a moose, yet the caribou weighs only half as much! This helps the caribou move on top of the snow instead of floundering through it. Another adaptation is the caribou's extremely warm coat, with its hollow, kinked hairs that efficiently trap a layer of warmer air against the body. The caribou's short ears, tail, and snout minimize the loss of body heat.

## What makes them unique?

Mountain Caribou differ from other types of caribou mainly in the way they use their habitat. Five sub-species of caribou are recognized in North America. The subspecies living in forests from British Columbia and southern Yukon to Newfoundland is known as the Woodland Caribou (*Rangifer tarandus caribou*). Within British Columbia, Woodland Caribou can be further divided into the following three ecotypes:

- ◆ **Boreal Caribou** live in the relatively flat terrain of the boreal forest in northeastern B.C. During the winter, these caribou spend much of their time in open forests and muskeg using their hooves to dig craters in search of terrestrial



(ground-growing) lichen. Boreal caribou have been proposed for inclusion on the Blue List.

◆ **Northern Caribou** live in the mountainous part of northern and west-central B.C. These caribou normally winter either on windswept mountain ridges or in pine forests at low elevations. Like Boreal Caribou, they get most of their winter food by cratering for terrestrial lichen. Northern Caribou are Yellow-listed, meaning they are not at risk.

◆ **Mountain Caribou** live in parts of southeastern B.C. and in a sliver of northern Idaho and northeastern Washington. This area receives much more precipitation than surrounding regions and is known as the Interior Wet Belt. In comparison to the places where other ecotypes live, the deeper snow accumulations

in the Mountain Caribou's range are a greater impediment to digging through the snow to find food. To avoid this problem, Mountain Caribou often migrate to lower elevations or move to other locations with less snow. Then, when the snowpack becomes firm enough to support their weight, they move upslope and stand on top of the snow to reach lichens growing on trees. These arboreal lichens sustain them for most of the winter.

The pattern of habitat use followed by Mountain Caribou is uniquely suited to the forests and climate of the Interior Wet Belt. In the past there were few fires in this area, so it was dominated by a nearly continuous cover of old forest. It takes a long

time for trees to develop heavy loads of arboreal lichen, because the lichens grow slowly and are continually lost to wind and breaking branches. As a result, only very old forests provide abundant lichen. The prevalence of such forests allowed the Mountain Caribou to adapt to using arboreal lichen as their staple food for most of the winter.

Large patches of old forest allow caribou to avoid predators, such as Wolves, Cougars, bears, and Wolverines. This is because most other ungulates (such as Elk, Mule Deer, and Moose) live in areas with younger forests or clearings, so predators tend to be there too. By using different habitats than other ungulates, caribou are less likely to encounter predators. The larger the caribou's habitat patches are, the farther they can be removed from the areas where other prey species live.

In late winter, snow in the mountains of southeastern B.C. is very deep. While two or three metres of snow would be a hardship for those ecotypes of caribou that depend on ter-

*Just before calving, cows travel alone to rugged, remote areas, probably to minimize the risk of predation.*

restrial lichens, it can be advantageous to Mountain Caribou. By standing on top of the deep snow pack, caribou can reach the portion of the trees bearing heavier lichen loads. At the same time, the deep snow drives Elk, deer, and Moose down to valley bottoms where there is less snow, and most

predators follow them, leaving the caribou safely isolated.

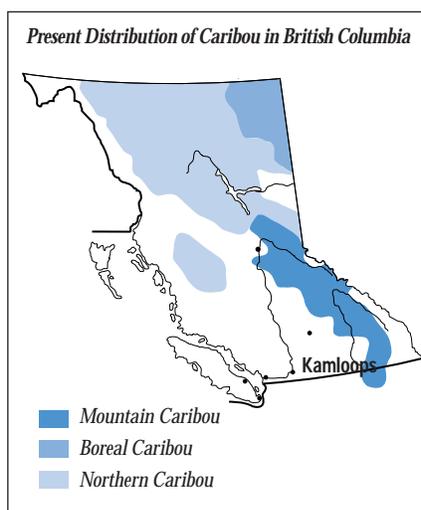
Because Mountain Caribou are so well suited to ecological conditions in the Interior Wet Belt and had a

historic range that matched its boundaries almost exactly, they can be considered a “flagship species” of this area. No other large animal has a distribution so closely tied to this region. Mountain Caribou are also considered to be an indicator of the health of the Interior Wet Belt ecosystem because of their correspondent distribution, their use of a range of habitat types within this ecosystem, and their sensitivity to ecological disturbance. Forest management in areas where Mountain Caribou live is often based on the premise that if caribou populations are maintained, the rest of that ecosystem’s flora and fauna will also survive.

How do they reproduce?

Like most other ungulates, caribou mate only during a period known as the rut, which usually occurs in October. During the rut, bulls, cows, and calves all congregate together. The bulls establish a hierarchy according to their size, condition, and strength, and the dominant bulls do most of the breeding. Cows do not normally mate in their first or second years. Immediately after the rut, the groups break up.

Most Mountain Caribou calves are born in early June after a gestation period of a little over 7½ months. Just before calving, the cows travel alone to rugged, remote areas, probably to minimize the risk of predation. Unlike Barren-ground Caribou, which gather on calving grounds, Mountain Caribou cows are scattered widely across the landscape when the time comes to deliver their young. Almost all births are of single calves. Like all caribou calves, those of the Mountain Caribou struggle to their feet and begin following their mothers shortly after they are born. Despite this early mobility,



many are killed by predators or die from other causes when very young.

What do they eat?

One characteristic that Mountain Caribou share with all other ecotypes is their reliance on lichen during the winter. However, they select a different type of lichen than other ecotypes, and also have more variability in their diet through the year. In late

*A caribou's hoof print is about the same size as that of a moose, yet the caribou weighs only half as much!*

winter, Mountain Caribou rely almost entirely on “horse hair” (*Bryoria* spp.) and “old-man’s beard” (*Alectoria sarmentosa*), two hair-like lichens that grow in clumps on coniferous trees. While this diet is low in protein, it contains enough calories to sustain caribou until spring. From then until fall, they switch to a wide variety of fresh green plants, often ones growing in damp sites. They select mainly forbs (broad-leaved herbs), since caribou have difficulty digesting the woody stems of most shrubs.

By early winter, the tender portions of most forbs have withered,

but the snowpack is not yet deep enough to allow caribou to reach much of the arboreal lichen on standing trees, so they shift their feeding style again. One way that Mountain Caribou adapt to early winter is by moving great distances in search of trees that have been blown over by the wind. The lichen on fallen trees is easily accessible, so one downed tree provides many times more food than a standing tree. In this same season, and especially if there has been a recent heavy snowfall, Mountain Caribou often go to lower elevations with less snow, and dig for shrubs and forbs that have retained their green leaves. The most common food plant sought this way is falsebox (*Pachistima myrsinites*), a small shrub. By late winter, when the snowpack is firm enough to support caribou and deep enough to allow them to reach higher up the trees, they switch back to feeding mainly on arboreal lichen growing on standing trees at higher elevations.

Where do they live?

The current range of the Mountain Caribou includes the Rocky Mountains for a short distance north and south of the Yellowhead Highway, and parts of the Cariboo, Monashee, Purcell, and Selkirk mountains, including extreme northeastern Washington and the northern tip of Idaho. Their former range – almost perfectly corresponding to the limits of the Interior Wet Belt – extended south to central Idaho and covered larger sections of northeastern Washington, northwestern Montana, and the Selkirk, Purcell, and Monashee mountains in British Columbia.

Although caribou occur on both sides of the Rockies along parts of the British Columbia-Alberta border, they belong to different ecotypes on either side of the continental divide.

The Mountain Caribou's range includes both rugged peaks and more gentle highland terrain. Ecological conditions and habitat use vary with elevation and from north to south. The highest elevations fall within the Alpine Tundra (AT) biogeoclimatic zone, which occurs above the treeline. Just below this is the Engelmann Spruce-Subalpine Fir (ESSF) zone. At the lowest elevations throughout most of the Interior Wet Belt is the Interior Cedar-Hemlock (ICH) zone, although this is replaced by the Sub-Boreal Spruce (SBS) zone at the northern limit of the Wet

Belt. Mountain Caribou can be thought of as following a "double elevational migration" over the course of the year. In late winter, they are normally found near the upper end of the ESSF, walking on top of the deep snowpack and feeding mainly on arboreal lichens from standing trees. As spring arrives, they often move downslope to the lower ESSF or ICH to find areas that become snow-free earlier. In summer, they move back up to the ESSF and even into the AT. By moving gradually upslope they can follow the "green-up" line and have access to a continuous supply of young plants. Being at higher elevations in the summer also allows them to enjoy cooler temperatures and fewer biting insects, especially on snow patches. In early winter, most Mountain Caribou move downslope again to find shallower snow, either in the lower ESSF or in the ICH. Finally, the cycle is completed as they move back up to the upper ESSF in late winter.

These elevational movements are very pronounced in some sub-populations. In contrast, those at the

extreme north and south ends of the Mountain Caribou's range and those living in highland, rather than



BULL CARIBOU IN SUBALPINE FIR FOREST IN LATE AUTUMN. Doug Jury photo

mountainous, terrain make smaller or less regular elevational migrations. The annual movement pattern also differs for pregnant cows, who move to rugged, high-elevation sites in late May or early June for calving.

There are at least two broad habitat features normally found in areas where Mountain Caribou live. First, the landscape is almost always dominated by large tracts of old forest. Compared to younger stands, older forests offer a number of benefits

*Large patches of old forest allow caribou to avoid predators.*

including: heavier lichen loads; a potentially better selection of other food plants; more effective interception of snow; and less frequent use by other ungulates and their predators. The second habitat feature that is important to Mountain Caribou is terrain. Where there is a choice between mountains that are very rugged and those that are gentle and rounded, they normally select the latter. This may be related to ease of movement, the lack of dangerous

avalanche paths, and the presence of more continuous forest cover.

What can we do?

Mountain Caribou are challenging animals to protect, but there are clear steps that can be taken to ensure they remain a part of our natural heritage. Probably the most important management action is maintaining large tracts of habitat in a condition suitable for their needs. This means having parks or other no-logging zones, surrounded by areas in which some timber harvesting occurs but a high percentage of old-growth forest

is retained. The pattern of timber harvesting may be as important as the amount cut. There are some indications that creating a "checkerboard" of cutblocks and reserves may cause serious problems. This pattern fragments the landscape and increases the amount of travel that caribou must undertake to make use of the remaining habitat. It may also attract ungulates that feed in cutblocks and along forest edges, and in doing so, draw the predators of these species into cut areas and significantly increase the rate of predation on Mountain Caribou. For these reasons it may be preferable to mimic the natural disturbance patterns found in old-growth forests by doing partial cutting with small openings, such as the ones that would be produced by small clumps of trees blowing down or dying from disease. This type of cutting pattern may be less disruptive to caribou movement and less attractive to other prey species.

Regulation of human access and recreational activities in key habitats will reduce the level of disturbance to caribou, and prevent them from being displaced into poor quality habitat. For example, land use planning that creates separate zones for



LOW ELEVATION CEDAR-HEMLOCK FOREST IS USED AS EARLY WINTER RANGE BY MOUNTAIN CARIBOU.  
*Susan Stevenson photo*



HIGH ELEVATION ENGLEMANN SPRUCE-SUBALPINE FIR STANDS AND PARKLANDS ARE USED BY CARIBOU DURING LATE WINTER, SUMMER AND FALL.  
*Trevor Kinley photo*



THIS UNDEVELOPED VALLEY USED BY MOUNTAIN CARIBOU HAS OLD-GROWTH HABITAT EXTENDING FROM SUBALPINE TO VALLEY BOTTOM.  
*Art Twomey photo*

caribou winter range and for snowmobile riding can allow these two uses to co-exist. A continued moratorium on hunting of Mountain Caribou will prevent some direct losses.

In some sub-populations, recovery actions may be necessary. Particularly for the seven smaller herds, the risk of complete extirpation may be great enough to warrant transplanting animals from larger sub-populations. Although this is not a permanent solution, it can allow smaller groups to ride out short-term peaks in predation, or buy time while recovery plans are put in place. A transplant program has been undertaken in the southern Selkirk Mountains. Another action that may be needed occasionally is the careful management of other wildlife populations. In some locations there have been recent increases or changes in the distribution of other ungulates and their predators. Where this results in predation rates that exceed the natural ability of caribou to maintain their populations, adjustments to alter prey and predator levels may be necessary to restore caribou population viability.

Research and monitoring also allow us to take timely and appropriate management actions. In addition to population surveys, biologists are conducting ongoing research in relation to most sub-populations, on habitat selection, alternative forest harvesting systems, and predation.

Members of the public can offer direct help in a variety of ways. Reporting sightings of caribou to local BC Environment offices (particularly when the caribou are seen in valley bottoms), obeying access and recreation regulations, reporting violations of these regulations, and supporting plans to maintain caribou habitat will all contribute to healthy Mountain Caribou populations. 



IN LATE WINTER, MOUNTAIN CARIBOU FEED ALMOST ENTIRELY ON ARBOREAL LICHENS.  
*Darwyn Coxson photo*

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