Project Caribou

An Educator's Guide to Wild Caribou of North America

Project manager: Remy Rodden, Yukon Renewable Resources

Consultants: Darielle Talarico, Arctic Vision, Whitehorse, Yukon

Principal writer:

Kirsten Madsen, Whitehorse, Yukon

Original illustrations:

Jennifer Staniforth Doug Urquhart

Tanya Handley

Cover: Joyce Majiski

Editing and production: Walker LeBrun Creative Services, Whitehorse, Yukon

For more info: www.projectcaribou.org

Conservation Education Coordinator Yukon Department of Environment Conservation, Protection and Public Education Branch Box 2703, Whitehorse, Yukon Y1A 2C6 (867) 667-3675 or 1-800-661-0408 fax (867) 393-6206 remy.rodden@gov.yk.ca









Territories Resources, Wildlife and Economic Development

Environment Canada (Canadian Wildlife Service—Yukon)

Beverly and Qamanirjuaq Caribou Management Board







Areas occupied by Caribou subspecies

All About Caribou



What's in a name?

The most common names for this animal are "caribou" in North America and "reindeer" in Europe. The word caribou originates from the early French explorers who likely converted the Mi'kmaq word *xaibu*, which means "pawer" or "shoveller," to describe the species. European arctic explorers never adopted the Inuktitut word for caribou, *tuktu*, but preferred in their journals to use the term "the deer" as a short form of reindeer. The word reindeer comes from the Lapland language where the word *reino* means young reindeer. Other terms date back to 1500 A.D. in French as *rangier* and *rangifere*.

Caribou and you

Have you seen any caribou recently? Try looking in your pocket or in your wallet. That's a caribou, right there on the Canadian quarter. The caribou is an animal that is a part of ecosystems all the way around the northern part of the globe. It is an important part of circumpolar biodiversity.

Caribou mean different things to different people. For many northern aboriginal groups, caribou represent a living part of a cultural heritage that goes back for centuries. What do caribou mean to you? This guide is intended to help you answer that question by learning more about this amazing animal.



2

Origins of Caribou

The caribou is an ancient relative of the deer that may have originated in northeastern Asia or northwestern North America. The earliest fossils of caribou date back 1.5 million years and were found at Fort Selkirk, Yukon. During the last ice age, when most of North America was covered by thick sheets of ice, parts of what is now the Yukon and Alaska remained icefree. This refuge, or *refugium*, was called Beringia. The animals and plants that lived here escaped the glacial onslaught. Caribou were present at the time of Beringia and ranged the same areas as the woolly mammoth, steppe bison, camel and giant beaver. Many of these exotic animals did not outlast the cold climate, but some of the Beringian animals that did survive include caribou, moose, muskox and grizzly bears.

Caribou and other members of the deer family belong to a group of animals called ungulates. The word "ungulate" comes from the Latin word for hoof. There are two orders of ungulates: *Perissodactyls*, like elephants and horses, have an odd number of toes; *Artiodactyls*, including caribou, elk and bison, have an even number of toes. Caribou, moose, elk, mule deer and white-tailed deer all belong to the order *Artiodactyla* and to the deer family, *Cervidae*.

All caribou belong to the same genus and species. They share the name *Rangifer tarandus*. There are five subspecies of caribou in North America and four others in Eurasia. In Eurasia the species are called reindeer, and they may be wild, semi-domestic or domestic. In North America the species are called caribou. In North America these subspecies are:

Rangifer tarandus tarandus: tundra reindeer brought to North America from Eurasia. Although some have escaped into the wild these are primarily semi-domestic in nature.

Rangifer tarandus groenlandicus: barren-ground caribou.

Rangifer tarandus caribou: woodland or mountain caribou.

Rangifer tarandus pearyi: Peary caribou, which live on Arctic Islands.

Rangifer tarandus granti: Grant's caribou, which live in Alaska and the northern Yukon. The Porcupine Herd belongs to this subspecies.

The wild caribou of North America are generally identified as being either "woodland" or "barren-ground" caribou. Woodland

caribou are generally heavier and larger than barren-ground caribou. They are found south of the Arctic Circle. Barren-ground caribou migrate the longest distances between their winter and summer ranges.

Woodland (left) and barren-ground caribou

Family Ties

Caribou Taxonomic Chart

A taxonomic chart illustrates the position of caribou in the overall classification of organisms. Each level in the chart contains species that share the same anatomical and morphological characteristics.

Kingdom

Animalia Phylum Chordata

Class Mammalia

Order Artiodactyla (Even-toed ungulates)

Suborder

Ruminantia (Cud-chewers)

> Family Cervidae

Genus

Rangifer

Species tarandus

Adapted for northern living



Woodland caribou, Southern Lakes Caribou Herd, Yukon



Caribou hoof

Caribou were living in North America during the last few ice ages (Wisconsin and Illinoian). Caribou have evolved over a million years of glacial influenced climates. Thus, caribou have developed adaptations allowing them to thrive in landscapes covered in snow and climates of cold temperatures.

Caribou can truly be called "chionophiles," a word that means snow-loving animals.

Caribou have physical and behavioural characteristics that help them survive cold winter environments. Their shape, for example, plays a role in keeping them warm. Caribou have compact bodies, small tails and short ears. These features reduce surface area and thus the amount of heat that can be lost through the skin. In contrast, snakes have long, skinny bodies to increase their surface area so that they can regulate their body temperature through their skin.

To keep the heat in, caribou have two layers of fur covering their bodies and their ears, noses and muzzles. They have fine, crinkly underfur and a thick coat of guard hairs on top. The guard hairs are hollow. The air cells in this hollow hair act as insulation, keeping in the caribou's body heat. The hollow, buoyant hair and large flexible feet of the caribou also make them excellent swimmers. Many caribou herds cross wide stretches of open or fast-moving water during their migrations.

Caribou further regulate their body temperature through their short, thick muzzles (the part of the head that includes the nose and mouth). The muzzle acts as a heat exchanger, warming and cooling air to reduce heat and moisture loss as the caribou breathe in and out.

Summer may be the most difficult season of the year for caribou. At this time, they go to alpine snow patches to cool off and to escape the insects that torment them. Barren-ground caribou search out windy areas on the coastal plain for the same reasons.

The hooves of caribou are large and wide. They work in the same way as people's snowshoes to help the caribou travel over the snow with less effort. Caribou have two small toes called "dew claws" and two large, crescent-shaped toes that support most of their weight. In the winter, the fleshy pads on these toes grow longer and form a tough, hornlike rim. Caribou use these large, sharp-edged hooves to dig through the snow and uncover the lichens that sustain them in winter months. Biologists call this activity "cratering" because of the crater-like cavity the caribou's hooves leave in the snow.

An antlered animal

Caribou are the only members of the deer family whose females as well as males grow antlers. There is so much variation in the way the antlers grow that no two antlers are ever the same, even on the same animal. The antlers of female and young male caribou are smaller and simpler than those of mature bull caribou.

Caribou shed their antlers every year. Antlers reach their maximum size when the caribou are four or five years old. Scientists have separated barren-ground caribou from woodland caribou based on the cross-section of their antlers. When cut crosswise, the woodland caribou antler is round while the barren-ground antler is compressed.

Antlers grow from two permanent bony stumps on the caribou's head called "pedicles." A special layer of fuzzy, hairy skin called "velvet" covers antlers when they are growing. This skin contains a network of blood vessels that deposit the minerals necessary to build the antlers. Growing antlers are fragile and sensitive. It takes three to six months to grow antlers.

Antlers have grown to their full size and become hard by the time fall arrives. The blood supply to them is cut off as the bone becomes denser. Bull caribou rub their antlers on trees and shrubs, peeling the velvet off in strips. Bulls use their antlers to challenge and threaten other bulls for mating opportunities with cows during the rut, or breeding season.

Males and females grow antlers at different times. Male barren-ground caribou start growing antlers in March and have a complete set ready for the rut in October. Bull caribou shed their antlers in the fall, after the rut, when hormone levels decrease. Cow caribou keep their antlers until after their calves are born in the spring. They use their antlers to defend their feeding areas (craters in the snow) from the larger but antlerless males. Cows need high-quality food to nourish growing fetuses or young calves.

The hair that covers the body of the caribou is called the "pelage." The pelage varies in colour throughout the year and is darkest in the summer. Peary caribou are the lightest in colour, nearly white, while woodland caribou are dark brown.

Antler or horn?

Caribou, elk and deer have antlers. Goats, sheep and cattle have horns.

Antlers are generally only grown by males, with caribou being the exception to the rule. Antlers are made from bone that grows faster than any other kind of bone. An antler can grow up to one inch a day in the summer! The antlers of older animals are usually more elaborately branched, but the number of points does not signify the age of the animal.

In contrast, horns are permanent and grow slowly larger each year. Horns are not branched like antlers, and they usually grow in yearly 'rings' from which the animal's age can be counted. Horns are made of keratin, which is the same material that your fingernails are made of. Usually both sexes of animals grow horns.





Caribou antler

Caribou behaviour

Making 'sense' of the world

Like other animals, caribou rely on their senses to help them find food, avoid danger and recognize other animals. Caribou rely mostly on their keen sense of smell. They can use their noses to find food plants located deep under the snow. A cow caribou can recognize her own calf by its individual smell, even in a large herd of jostling caribou.

Sight and sound are less important senses for caribou when assessing danger. Sometimes caribou appear not to be disturbed by people who are standing still. However, caribou are very good at detecting movement, even in poor light. Their eyes are large and are located on the sides of their heads so they can see a wide range of what's around them.

Caribou are more curious than other North American deer species. If they haven't been able to verify something as having the scent of danger, they will often move closer to investigate it. People who are downwind of caribou have been able to entice the curious creatures by making odd movements and postures. But if the wind changes, wary caribou will flee to safer ground!

The caribou herd

Caribou need to be able to do two things at once: they need to eat, and they need to keep watch for predators. Like many other animals, caribou fill this need by gathering in herds. When caribou are in a group, several animals will be looking up and around while others are eating. They sniff the air regularly and can recognize predators by scent. They can alert other caribou to danger.



Porcupine Caribou Herd on summer range

Barren-ground caribou form different kinds of herds at different times of the year. Prior to calving, pregnant cows will band together in small groups called "maternity bands." After the young are born, the mothers and calves may form "nursery bands." Larger and larger groups of caribou may move together through the summer as a strategy to reduce harassment by insects. When cool August nights mean fewer insects, these large groups break up and animals wander in smaller groups until fall. By early September larger groups again start to form and continue through fall migration. In winter, bull caribou may avoid groups of cow caribou and their calves, because they know that predators like wolves are drawn to the vulnerable young caribou. Also, they may be challenged for feeding territories by cow caribou, which still have their antlers.

There are other advantages to travelling in herds. By travelling together to calving grounds in large groups, pregnant cow caribou in the barrenground herds reduce the risk of predators killing their calves by sharing the risk with thousands of others. As well, the animals in the centre of the herd are better protected from predators, who may attack unprotected animals or stragglers. In the same way, forming a tightly knit herd may help caribou protect themselves from aggravating clouds of insects.

Woodland caribou are much more solitary. Prior to calving, pregnant cows may separate to give birth and raise their calves in secluded patches of forest. Caribou are most scattered across the range in summer. They do, however, band together in the fall when males are courting females, especially just before winter. Cows, calves and teenage caribou of both sexes travel in small bands throughout the winter, while mature bulls separate until late winter when, for a very brief time, most members of the herd gather together in search of the fresh green plants that appear where the snow has melted.



Woodland caribou, Southern Lakes Caribou Herd, Yukon

Caribou communication

While caribou occasionally snort, grunt, pant and bellow, they are generally silent animals. The most common sound associated with caribou is a curious clicking noise. This clicking sound is produced when caribou walk. It is caused by tendons slipping over bones in the feet. Some aboriginal groups imitated in their ceremonial dances the sound of the caribou clicking. They used decorative rattles made of hollowed, dried hooves strung together.

When an unknown entity appears on the horizon, caribou will try to identify it using their sense of smell. It they can't smell anything, they will circle downwind of the entity to pick up the scent. They move in a trot, keeping their tails up and their heads held high to test the wind for smells. If they become alarmed, caribou will sometimes rear up on their hind legs and bound forward. This is called an "excitation leap." While doing this, they deposit a scent from a gland (the tarsal gland) between their toes. This scent, left on the ground, will warn other caribou passing over that spot.

Mother caribou communicate with their calves in several ways. A mother will teach her calf to follow her by using a technique called head-bobbing. She lowers her head to the ground and bobs it up and down when danger is near. If she becomes alarmed, she may push and nudge the calf to make it run, and she may encourage it with grunts. Or she may teach the calf to lie down, and then attempt to 'lead' the predator away, like mother ducks that feign a broken wing. By watching their mothers, calves learn the proper responses to danger. The calves' behaviours are reinforced by the rest of the herd.



Caribou and calf (Porcupine Caribou Herd)

Caribou habitat

All animals, including humans, have basic needs. They need food, water, shelter and space. An area in which all these needs are met for caribou is called the caribou's "habitat." It is the place where the caribou lives.

Some areas are more important than others for the survival of caribou herds; these are called "key habitats." Caribou need access to winter ranges with good snow conditions where they can find food. They need safe places to give birth to their calves and areas where they can find relief from insects during the summer.

Because caribou are often on the move, they can be versatile in their feeding habits and eat plants from a variety of habitats.

Caribou share their habitats with an astonishing variety of creatures. They are all part of the ecosystem, and support and sustain themselves to mutual benefit. A naturally functioning ecosystem is more than a food chain. Predators chase caribou, and so do tiny insects, whose larvae grow inside a caribou host. Caribou scour the tundra and forest floors to devour lichen, but their travelling hooves help other plants spread and take root elsewhere. Their fecal pellets return nutrients to feed such things as mosquito larvae in wet areas and plants.



Caribou, Porcupine Caribou Herd



What do Caribou eat?

reticulum

omasum

obomasum

Caribou are "herbivores," or plant-eating animals. The average caribou eats at least three kilograms of vegetation each day—the equivalent of about two garbage bags of food! Caribou eat different types of plants during the year, but their most important food is lichen. "Fruticose" ground lichens are the most significant. Famous among these is "reindeer lichen," called *Cladina rangiferina*. In winter, when green vegetation is not available, caribou depend on the lichens they find beneath the snow. In boreal forests, caribou will eat lichens growing on the ground or on trees. Caribou will also eat winter green plants like lingonberry (low-bush cranberry sedges) and horsetails.

In summer there is a wider variety of food available for caribou. They munch on summer greens like grasses, sedges and dwarf willow or birch leaves. Peary caribou, which live on islands in the Arctic Ocean, enjoy the protein-rich flowers of purple saxifrage and lousewort. Caribou continue to eat these plants for as long as they can during the short northern growing season. When fall arrives, they return to eating lichens, as well as mushrooms if they are available.

Caribou are cud-chewing animals, like cows or moose. These animals chew their food, swallow it, regurgitate it and chew it again. Their stomachs are separated into four chambers to help break down food. Food enters the first chamber of the stomach, called the "rumen," while the caribou is grazing. Bacteria in the rumen break down the plant material until the caribou is at rest in a safe place. Then the caribou "ruminates," or further grinds the food. The food is regurgitated in small portions, called "cud," and chewed by the caribou until it is reduced to pulp. The food then goes into the second and third stomachs, the "reticulum" and "omasum," where most of the water is removed from it. The fourth and final stomach chamber is the "abomasum," which is most similar to the human stomach. Here, food nutrients begin to be absorbed into the blood.

Four chambers of the caribou stomach

Liking lichens

Lichens are the colourful, crusty plants that cling to alpine rocks. They are also the wire-like tangles and many-branched clumps covering tundra boulders, rock outcrops and sandy forest floors. They are also the long dry green strings, or "old man's beard," that hang from trees in boreal forests. There are over two thousand kinds of lichens, and while these dry plants may not appear delicious to you they are a primary food source for caribou.

Lichens are made up of two kinds of plants—algae and fungi—that live together in a mutually beneficial, or symbiotic, relationship. Algae contain chlorophyll, which produces sugars and starches through the process of photosynthesis. Fungi are able to store lots of water to support the algae, in return absorbing the sugars and starches produced by the algae.

Lichens come in many shapes and sizes. They do not have roots, stems, leaves or flowers. There are three main groups of lichens. "Crustose" lichens are flat lichens that often attach themselves to rocks. "Foliose" lichens have a leaflike form. "Fruticose" lichens are tufted, or composed of erect stalks.

Lichens need water to grow. They act like sponges, absorbing moisture from the air, rain and snowmelt. When there is no moisture available, lichens dry out and become dormant. In the north, the season when lichens can grow is very short. Thus, even small-sized lichens can be decades or centuries old.

Lichens have been used by humans to dye cloth, ferment beer and set fragrances in perfume. They have also been used in medicated lotions and toothpaste. Lichens can also be used to monitor air pollution. Because they live for many years and absorb particles from air and water, lichens can contain high concentrations of chemicals and even radioactive fallout, carried in pollution from around the world.



Caribou need to eat 2 garbage bags full each day!



Reindeer moss (Cladina mitis) is an important lichen for woodland caribou.



The places where caribou dig for ground lichens are called "craters."





Grizzly bears and wolves are the major predators of wolves.

Natural threats to Caribou

Caribou predators

Predators are animals that kill and feed on other animals. Though these predators are often considered to be harmful to caribou, they benefit the herd by removing the diseased and old individuals, making the caribou population stronger. Caribou are a source of food for several northern predators as well as for humans.

Wolves

Apart from humans, wolves are the major predators of most caribou herds. During the winter wolves hunt in packs, which are usually made up of seven to nine wolves. An average wolf pack will kill a caribou every few days in the winter. They will spend a day or less feeding on the carcass, since what's left of the carcass freezes into solid ice.

The wolf pack may 'test' a herd of caribou by chasing them and watching for weaker animals that fall behind or are careless. They will then pursue and kill these animals. Wolves will also ambush caribou on trails between lakes, attempting to cut them off from the rest of the herd or to chase them into deep, soft snow.

Wolves usually attack the caribou's head, neck or shoulders. They will try to push the caribou off its feet, or hang with their teeth clenched in the caribou's muzzle or throat. A wolf's jaws can crush the skull of a calf.

Caribou respond to attacks by wolves by trying to outrun them. Where natural cover such as boulder-strewn terrain, ravines and forest occur, caribou will scatter to confuse the wolves. On frozen lakes and in large forest openings they will bunch together to find safety in numbers. If they are cornered, caribou have little means of defence and are usually killed. Bull caribou are especially vulnerable to attacks by wolves and other predators during the rut season, when they are exhausted and distracted.

Grizzly bears

Grizzly bears are major predators of newborn caribou calves on some calving grounds, and they may gather in places where calving activity is concentrated. Grizzlies are "omnivores," which means they will eat a variety of foods including plants, berries, insects and meat. When caribou migrate through a grizzly's territory, the opportunistic grizzly may try for some fresh meat, perhaps killing a bull caribou that is exhausted from the rut season. A grizzly may scavenge the carcasses of caribou killed by wolves or other predators.

Golden eagles

The largest of the birds of prey, the golden eagle is an efficient and capable hunter. Where golden eagles are common, they will prey on newborn caribou calves, swooping down with talons outstretched to kill the young animals.

Wolverines

Wolverines are compact animals with strong teeth and jaws and neck muscles that enable them to crush bones and tear at frozen flesh. They will often scavenge caribou that have been killed by bears or wolves but are also capable of killing newborn calves and sick or dying caribou.

Other scavengers

Many other animals in the northern ecosystem take advantage of caribou that have been killed. Lynx and foxes will prey on newborn caribou and also scavenge carcasses, as will birds such as eagles, hawks, ravens, owls, gulls, jaegers, jays, woodpeckers and chickadees. These and other animals are opportunistic predators; they take advantage of circumstances that allow them to overcome prey that would normally escape.

Tiny attackers: insects and parasites

There are other, much smaller members of the caribou's habitat that can have a big effect on the caribou's health. Blood-sucking insects like mosquitoes, blackflies, biting midges and bulldog flies are "micropredators" of caribou. They persistently attack caribou to get the blood they need to hatch their eggs. In summer, these flies often torment caribou, distracting the calves from nursing and the adults from feeding. Caribou will rush wildly about, trying to avoid insect harassment, sometimes injuring themselves in the process.

Tormenting insects keep caribou on the move searching for windy areas like hilltops and mountain ridges, rock reefs, lakeshore and forest openings, or snow patches that offer respite from the buzzing horde. Gathering in large herds is another strategy caribou use to block insects.

Parasites are dependent on the host animals that they live with for all or part of their life cycle. Among the parasites that affect caribou are a variety of worms, insects and microscopic animals called protozoa. Parasites alone are unlikely to kill a caribou, but they may cause the animal to be weak, malnourished, or generally in poor condition. They may also distract them to the point where predators are able to catch them more easily.

Some of the parasites and diseases affecting caribou can be passed along to humans, if they pass through dogs, which act as intermediary hosts. All can be avoided by thoroughly cooking affected caribou organs and meat before eating and/or feeding to dogs.

Tapeworms

Several tapeworms can be found in caribou. The immature forms of the tapeworms hatch from eggs inside the caribou and form themselves into cysts on the caribou's organs or muscles. If an infected caribou is killed and eaten by a wolf or



Caribou often gather on ice and snow patches to escape insects.

Refer to the "Bot fly boogie" activity for illustrations of parasites described here.

dog, the cysts hatch into tapeworms that live in the predator's gut. Some kinds of tapeworms can be up to five metres long! These adult tapeworms lay eggs that pass out in the wolf's droppings. The eggs end up on plants that are eaten by caribou, and the cycle continues.

Warble flies

Several fly species parasitize caribou year-round. Warble flies, which look like small bumblebees, chase caribou around during the late summer and lay their eggs in the caribou's hair on the leg and flank. Larvae hatch from these eggs, burrow through the caribou's skin, and migrate to the animal's back. Here they form cysts and live through the winter, poking a small hole in the caribou's skin through which to breathe. The next spring, the larvae pop out through the breathing hole and develop into an adult fly. These flies only live for about a week, during which time they search for another caribou on which to lay their eggs and continue the cycle. It has been estimated that a female warble fly can fly 1,000 km looking for a caribou. Warble fly larvae are edible and considered a delicacy by some Inuit.

Nose bot flies

Female nose bot flies deposit larvae near the nose opening of the caribou in the summer. The larvae hatch and attach themselves to the inside walls of passages behind the caribou's nose. Over 150 nose bot larvae have been found in a single caribou. This many can make breathing difficult, especially if the caribou is running fast. The larvae grow all winter. In the spring, the annoyed caribou sneeze out the bots, and they grow into bumblebee-like flies.

Protozoa

Protozoa are primitive, one-celled animals. They can't be seen by humans except under a microscope. One kind of protozoa, *Besnoitia*, can cause caribou bones and tendons to become pitted and rough. It is believed to be passed on by biting insects such as black flies. *Sarcocystis* (see diagram in "Bot fly boogie" activity) has a life cycle similar to that of tapeworms. *Giardia* (sometimes call "beaver fever" in humans) is contracted through infected drinking water.

Other threats

Caribou calves are barely larger than snowshoe hares when they are born. They are very vulnerable at this time. If the weather is poor on the calving grounds, strong winds may keep a calf from standing up to feed. Exposure to cold, wet conditions may also cause calves to weaken and die. Though calving grounds are chosen in areas where few predators roam, many caribou calves are killed by wolves, golden eagles, gulls or grizzlies.

Migratory caribou move over a treacherous landscape of melting or falling snow, icy cold rivers and rocky terrain. An accident can occur at any time of the year, but particularly during migrations. River crossings are especially dangerous. During spring migration, rivers are flooding and choked with broken ice. Even very young calves attempt to cross, swimming beside their mothers' sheltering bodies. Strong currents can carry calves away, or they may be hit by floating ice chunks and injured or killed.

Other caribou are killed during the large herd migrations. Insect hordes or predators may cause the herd to stampede wildly, trampling calves and injuring adults. If calves lose or are deserted by their mothers during these stampedes, they will die. Another cow will not accept a calf that is not her own.

Caribou are susceptible to some bacterial diseases. One of these is called "brucellosis." It causes female caribou to abort or give birth to weakened calves. Sometimes the cow will retain the afterbirth, which may cause an infection. Abortion and sterility caused by brucellosis reduce the productivity of a caribou herd.

Humans also kill caribou, through hunting for food or trophies and also through the direct and indirect effects of their activities. Habitat encroachment, resource development and long-term processes such as global warming and pollution may all have great impact on the survival of wild caribou herds.

Barren-ground caribou crossing the Porcupine River

Caribou tragedy

Human actions can have a profound impact on caribou. In 1984 10,000 caribou were drowned as they attempted to cross the Caniapiscau River in northern Quebec. A hydro dam had changed the flow rate and quantity of water in the river. The caribou were swept over Limestone Falls to their death.



Seasonal movements of Caribou

Some caribou are migratory, moving great distances from winter to summer grazing ranges and calving areas. The barren-ground caribou are well known for their incredible long-distance migrations. The largest herd in North America, the 700,000-strong George River Herd of the Ungava Peninsula, covers over 500,000 square kilometres in its annual migratory cycle.

Some herds of mountain and woodland caribou also make seasonal movements from summer to winter range and have distinct calving areas. Woodland caribou in other parts of the continent are not truly migratory, but sedentary, occupying summer and winter ranges that overlap to a large extent. They may move within a range of only a few hundred square kilometres over the seasons.

Winter

Caribou live with snow, cold weather and short days during the long winter. Caribou do not travel great distances in the winter. Their winter ranges are usually in areas where snow can be dug easily. Caribou make "craters" in the snow with their hooves, searching for ground lichens.

Spring

When the snow begins to melt and the days grow longer, caribou begin to feel the migration urge. Pregnant cow caribou are the first to move towards calving grounds. Bulls, young caribou and cows that have not bred begin to migrate to summer ranges a few weeks later.

Caribou calves are born in the spring, from mid-May to mid-June, depending on the herd. Introduced reindeer (see sidebar on next page) can even calve at the end of April. The timing of caribou births appears to match the times when new, nutrient-rich vegetation is at maximum growth.

In the large barren-ground herds calves are born in special areas called "calving grounds," which can vary from year to year but are often in traditional locations. Caribou calving grounds are areas where new spring vegetation appears first. They may also be areas that offer better protection from predators and insects. In smaller woodland herds, individual cows choose specific calving sites that they return to year after year rather than congregating in calving grounds. Among the forest-dwelling woodland caribou, cows separate to search out secluded locations for calving on treed islands in lakes and muskegs.

Caribou calves grow up fast. They are able to stand shakily and walk a few steps within an hour of being born. After a day, they may be running and trotting. Only a couple of days after being born, calves are able to keep up a running pace and even swim across streams!

Because they are born at about the same time, calves grow up together and develop at similar rates, learning to keep up with the herd by the time

Calving time

Most caribou calves are born within a few days of each other. Their mothers have migrated to calving grounds or scattered to secluded patches of forest, places where they feel safe and protected from harm. It may take a cow from 15 minutes to several hours to give birth. When the calf is born, the mother caribou licks it clean. The calf suckles to get milk. Calves push against their mothers' udders (an act known as "bunting") to stimulate milk production.

All this physical contact helps to forge a strong maternal bond between the cow and her calf. They learn how to recognize each other's scent so they can find each other if they are separated. This is important because caribou travel long distances in herds that can include thousands of other caribou.



Young calf calling for its mother

Domesticated reindeer: caribou cousins

Reindeer are thought to have first been domesticated more than 2,000 years ago by people who lived in the mountains along the Russian/Mongolian border. Reindeer may have been used by these people to help with hunting wild animals. Since that time, reindeer have served a wide variety of purposes for people in northern Europe and Asia, from supplying milk, food and clothing to pulling sleds. Today, reindeer herding remains a way of life for many Arctic peoples, including the Sami in Scandinavia and the Nenets and Chukchi in Russia.

Reindeer herding was introduced to North America in the late 19th century, when an American missionary came up with the idea of 'importing' reindeer from Siberia in an effort to ease the starvation facing aboriginal peoples on Alaska's northwest coast. Whalers, and later, miners, were depleting caribou herds and marine mammals that these people depended on. It was felt that the introduction of domesticated reindeer would provide the natives with a reliable source of food. Herders from Siberia, and later, Sami herders from Norway, were brought over to teach the local people how to herd the reindeer. Reindeer were used at this time for food and also as pack and sled animals, particularly during the Gold Rush.

it begins to move. Calves that are born early in spring, during migration on the barren lands, or after the calving season are not very strong. They are more likely to be killed by predators or abandoned by their mothers when they cannot keep up with the rest of the herd.

Calves remain close by their mothers throughout the summer. They learn behavioural responses from their mothers and from the rest of the herd, such as how to recognize and react to danger. By the fall, they are weaned and no longer dependent on their mothers for milk.

Summer

Caribou herds continue to move about in their summer ranges. For barren-ground caribou these are north of tree line. Mountain caribou move to moist alpine tundra and open mountain meadows, while woodland caribou move to open spruce and pine forests close to wetlands and lakeshore. By being continually on the move, caribou can avoid overgrazing and also take advantage of a wide variety of habitats. With the new growth of grasses, herbs and shrubs, caribou can diversify their diet. During the long summer days they eat steadily, building up fat reserves for the fall rut and the winter. This good life in summer is often disturbed by hordes of parasitic flies and mosquitoes. These insects drive the caribou to seek relief areas in mountains, on snow banks and even in lakes and oceans.

Fall

As cold weather approaches, the summer movements of the caribou within the herd blend together and become a fall migration. Barren-ground caribou move south from the northern tundra towards the boreal forest or other more sheltered areas where snow and weather conditions are better. Similarly, mountain caribou move from exposed locations into valley bottoms, and woodland caribou move to sandy forest openings and muskeg wetlands to feed on lichens growing on trees and on the forest floor.



Porcupine Caribou Herd travelling through summer range

Caribou mating season: in a 'rut'

The mating season of certain ungulates like caribou, elk and moose is called the "rut." During this time, bull caribou grow thick white manes, and their necks swell to twice their normal size. Bulls thrash against trees, rubbing the velvet off their antlers. They become restless and aggressive. They eat very little and begin to emit strong odours. (At this time, hunters avoid killing them, because their meat is tough and strong-tasting.)

During the rut, caribou challenge other bulls to ritualized sparring matches in an attempt to prove dominance. They face each other in a "threat position," with heads low to the ground and antlers thrust forward. If a challenge is accepted, the bulls clash together and push and twist their heads from side to side. The bull that manages to push the other backwards has established dominance. These battles can sometimes become violent, resulting in injuries and even deaths. Occasionally, the antlers of two sparring bulls become locked together, and both may be killed by predators or die of starvation.

Some woodland caribou bulls herd groups of females into "harems" and attempt to prevent other bulls from mating with them. Barren-ground caribou are constantly mingling and breaking into new groups.

During the rut, bulls approach cows from behind with outstretched necks. These usually silent creatures make a hoarse, coughing sound. If a cow is not ready to mate she will run away. But if she has come into "heat" she will allow the bull to move closer, mount and mate with her. The bull then moves on to other cows. By the end of the rut season, bull caribou are exhausted and depleted of the energy fat reserves they have built up over the summer. They are in rough shape and susceptible to predation as they face another long, cold winter.



Two bulls sparring during the rut

Attempts to introduce reindeer herds to the Canadian north have met with varying degrees of success. Reindeer were brought over from Alaska in the 1930s, in one case taking five years to move across the Arctic to the Mackenzie Delta. The plan was to establish a herd of reindeer owned by the government, from which interested Inuit could borrow to start their own small herds. Several family-owned herds were established, but the experiment was not a success. Only one commercial reindeer venture is still operating, at Reindeer Station, near Tuktoyaktuk. This herd, today numbering about 8,000 animals, has operated as a private business since the mid 1970s.

Reindeer were introduced to another Arctic community, Sanikiluaq, on the Northwest Territories Belcher Islands, in 1978. Native caribou had disappeared from these Hudson Bay islands because of severe weather conditions. The government introduced the reindeer to the islands, hoping to supplement the Inuits' traditional diet of marine foods. The reindeer are now free-roaming on the islands, managed and hunted by the local Inuit.

Herding of reindeer did not catch on in a significant way with native peoples in Arctic North America, who continue to prefer to hunt wild caribou. Today about 50,000 reindeer remain, most of which are in Alaska. Reindeer provide profit to today's herders through the sale of meat and antler velvet, which is valued in Asia as a health aid.

Clothing from caribou

You may have heard of Hollofil® and other types of modern outdoor clothing made from synthetic fabrics. This clothing can be a good insulator, but the original 'hollow-fill' came courtesy of the caribou. Northern native peoples have been using caribou skins to make clothing for centuries, knowing that such clothing provides excellent insulation and durability in a harsh winter environment.

Each caribou hair consists of a network of large cells arranged like a honeycomb to trap air. Air is also trapped between each of the densely matted hairs. This air acts as an excellent insulator. Ice and snow collecting between the hairs can easily be beaten off with a wooden or bone beater, a drying technique that doesn't work as well with modern fabrics. Traditional clothing made from caribou skins can be a lifesaver for an Inuit hunter caught in a fierce storm.



Humans and Caribou

Caribou have always formed a basic part of the cultures of people living in the Arctic and subarctic. Caribou have provided people and their dogs with meat for eating; fat for light and cooking; hides for clothing and shelter; and bones for needles, fish hooks and ornaments.

People also formed mythologies and legends and structured their cultures around the caribou. They travelled to known migration routes to intercept herds for hunting. They told stories about caribou. They taught their children to respect these animals. Traditional hunters believed that if they had the right thoughts about animals and treated the carcasses properly, they would always have enough to eat.

They also created taboos that showed their respect. For example, in both Inuit and Dene cultures it was taboo to mix foods from the water with foods from the land. Therefore, caribou and fish could not be eaten on the same day. Inuit did not even cook caribou over driftwood fires because the wood came from the sea.

Using every part of the caribou

Resourceful northern peoples know not to let anything go to waste. Their respect for the caribou they hunt and their many survival needs lead them to find innovative uses for all parts of the animal.

(The discussion below uses the past tense. Please be aware, however, that caribou is still an integral part of many northern cultures, and much of what is described is still in practice today).

The caribou's meat was eaten fresh or dried. It could also be pounded and added to berries and grease to make "pemmican," which lasted a long time. Sections of the caribou's head such as the tongue, nose and chin were considered delicacies. The brains were eaten or used to cure hides. The velvet on the antlers was singed and eaten. The rest of the antler bone was used to make a variety of carved items including buttons, fishing jigs, knife handles and the ribs of kayaks.

Many organs were also used. The heart, liver and kidneys were roasted and eaten. The stomach was cleaned and washed and then used to store fat, blood, or water. The intestines were washed and cut up and added to stews. The blood was collected and used to add flavour to soups. Lungs were not eaten by people, but were fed to dogs.

Bones were scraped clean of meat and used to make tools like scrapers, knives, needles and fish hooks. They could also be ground into bonemeal for cooking. Boiled bones provided grease. Bone marrow was eaten raw or cooked. Hooves were boiled until tender, eaten raw or dried. Hollowed hooves were made into decorative rattles.

Caribou hides were also used in various ways. Dried or untanned hide, also called rawhide, was used to make drums, rattles and buckets, or was stretched over boats. When rawhide is stretched in strips and dried, it forms "babiche," a tough thong used in the webbing of snowshoes, dog harnesses, snares and bowstrings.

Tanned hides were used to make clothing: moccasins, mitts, mukluks, pants, shirts and dresses. Tanned hides were also cut and sewn to make many other things, from pouches and packsacks to bow strings and baby belts. They were also sewn together and draped over frames to make skin houses.

Hides tanned with the hair on were used to make warm winter clothing: parkas, mittens and pants. They could be used as robes or sleeping mats. Sewn together and draped over willow poles, they made winter dwellings.

Traditional hunting methods

Caribou was the staple around which many northern communities were organized, and the hunting of the caribou was often a community activity in which everyone participated.

One common hunting method was to build an enclosure to entrap migrating caribou. These corrals or impoundments were constructed in clearings or on frozen lakes. They were built of brush and consisted of an exterior fence that could be over a kilometre long, surrounding a maze of shorter brush fences with babiche snares in the openings. The caribou were driven into the corral. Women and children surrounded it, shouting to keep the caribou from breaking out. The hunters then attacked the snared caribou with spears and the loose caribou with bows and arrows.

Out on the tundra, where there was no brush from which to construct corrals, hunters placed sticks topped by fluttering strips of hide. These sticks were arranged in rows to lead caribou towards blinds constructed of stones. Women and children again took part, chasing the caribou towards hunters hiding behind the blinds. In similar fashion, Inuit built long rows of stone cairns they called "inukshuks," meaning "resembling a person." Migrating caribou were thought to perceive these stone men as hunters and avoided passing through them. In this way, the hunters were able to lead caribou to areas where they could ambush them.

During migration periods, many hunting groups waited at traditional river and lake crossings, and speared caribou as they swam. From a kayak or canoe the hunters could lean over with a short lance and pierce the animals' backs. The floating carcasses of caribou could be retrieved later.

Several solitary hunting methods were also used. Caribou inhabiting forest areas in winter could be chased through deep snow by a hunter until they were tired enough to allow the hunter within bow and arrow range. Hunters also tried to trick caribou, draping themselves with caribou skins and holding antlers over their heads and moving towards unwary caribou until they came within arrow range.

Caribou snares were made with babiche. The snares were set at antler level and tied to sturdy trees or poles that would get entangled in brush when dragged about by the harried animal.

During the rut period, bull caribou were sometimes lured towards the sounds of other bulls fighting over a female. The unfortunate animals actually encountered hunters rattling pieces of antler together!

It is still possible today to see the remains of caribou fences and hunting camps on the tundra. The small, squat, stone men—inukshuks—built by hunting communities of the past are still present on the windswept northern coastal plains.



Barren-ground caribou crossing the Porcupine River

Changing relationships

The arrival of Europeans changed the northern people's relationship with the caribou. The nature of the caribou harvest was dramatically altered by the needs of whalers who travelled the arctic seas in the 1800s. They needed caribou for provisions. So did later waves of fur traders and trappers, prospectors and miners, who all added their needs to the caribou harvest. Between 1890 and 1910, professional meat hunters worked to feed all the people on the land. In the 1930s, a great deal of caribou meat was needed to feed the animals of the many people who used dogs and sleds for travel. The introduction of the rifle made it easier to kill the caribou and lessened the amount of skill needed in the hunt.

In less than a generation, mechanized transportation and high-powered rifles have again revolutionized hunting. The fleet-footed caribou must outrace high-speed human predators.

Present day use of caribou

The dietary and cultural aspects of the caribou remain important to northern aboriginal groups. Caribou is a nutritional food source, high in protein and low in fat. Hides and antlers are still used to make clothing and artwork; crafts and art are now an important aspect of the northern tourism industry.

The hunt has a cultural importance to the community as well. Being able to procure one's own food and enjoy sharing it with others is a source of satisfaction, self-worth and dignity. Hunting is an integral part of northern society and culture, and it offers a lifestyle alternative to buying imported foods from retail stores.

Caribou are hunted every month of the year and consumed every day by the aboriginal people of Alaska, Yukon, NWT, Nunavut, Manitoba and the Ungava Peninsula. Non-aboriginal northerners also hunt caribou on a seasonal basis as dictated by wildlife regulations. Other people can come from southern parts of Canada or foreign countries to hunt caribou. Caribou thus have both recreational and subsistence value.

Tourists also enjoy caribou for sightseeing and photography. People camping, hiking or canoeing are thrilled at the sight of wild caribou. The sight of these wild herds gives people a strong feeling of wilderness.

Want to find caribou?

Start by learning more about caribou. Think about their needs. Where would caribou find food, water and shelter in this season? Study caribou migration routes and the kinds of habitat they might choose at various times of the year. In the summer, caribou are more likely to be spotted on breezy ridges or seen as brown specks on remnant snow patches, where they seek relief from insects. Remember to think about whether your presence might be a disturbance to caribou.



Please keep your distance.

Human-related threats to Caribou

Whereas before northern people were dependent on caribou populations for survival, now the caribou's fate is often held in the hands of people.

Oil and gas development on calving grounds

Concentrated human activity in caribou calving grounds—such as oil and gas exploration or development—could interfere with instinctive maternal behaviours or cause cows to abandon traditional calving areas for less favourable ones where food may be scarce or calves more at risk of predation. At birthing times, cows are wary and will flee if disturbed. Calves that are not yet steady on their feet may have a difficult time keeping up with their mothers.

There are several theories about why barren-ground caribou return to traditional calving grounds year after year. One is that caribou are avoiding insects and predators present in greater numbers at this time of the year on the southern parts of their range. Another is that cow caribou need the new, nitrogen-rich vegetation that occurs on the calving grounds. For whatever reason, traditional northern calving grounds are critical habitat for many barren-ground caribou herds.

Logging on caribou ranges

Woodland caribou depend on lichens from the forest floor for winter food. Cows seek out the mature forested islands in muskegs for raising calves. Caribou need the shelter of forest for cover. Caribou ranges are typically large, harbouring small herds of animals. Caribou must travel constantly to avoid overgrazing in habitat where the food source is thinly scattered, grows slowly and is sensitive to disturbance. Intensive logging activity on



Porcupine caribou on the Dempster Highway

woodland caribou ranges could destroy important feeding grounds, calving areas and forest cover. This destruction might occur at too rapid a rate for caribou to adapt. It could mean that in the long run, fewer and fewer caribou will be able to survive in forests subjected to logging.

Roads

Ancient northern hunters knew that caribou were wary of unusual linear structures. They were able to guide the caribou for hunting using flimsy antler fences or rows of stone piles. In a similar way, reindeer herders in Scandinavia sometimes guided their animals by laying dark strips of cloth on the ground. In a modern society where roads, power lines and oil pipelines cut across the landscape, the caribou's wariness may have many implications for their survival.

There are several major effects roads have on caribou. One major problem with roads is the increased access they offer hunters. Herds that once were available only to small groups of subsistence hunters travelling over the land are made accessible to many people. Roads also provide a hunting corridor for wolves, which use the plowed surface to travel and survey their prey from the road.

Another consideration is whether the vehicles and people travelling along roads will disrupt the movements of caribou herds. If caribou avoid crossing roads, their range on the other side of the road is lost to them. Roads also attract tourists, and the more traffic the more chances that caribou will be hit and killed by vehicles. Tourists may also start forest fires.

Roads, once in place, tend to encourage further industrial expansion and development. The compounding effects of development on fragile northern ecosystems are not fully understood. Logging, increased air travel and hydroelectric dams could all pose threats to caribou herds.

Disturbance

Activities associated with hunting and northern travel can pose problems for caribou. Snow machines, automobiles and aircraft that chase caribou or frighten them into running long distances can cause a problem called "stress syndrome." Violent exertion causes chemicals to build up in muscles faster than blood can remove them. The changes this causes in the muscle can bring death to the caribou, hours, days or even weeks after the harassment occurred. Panicked caribou can also injure themselves in other ways. Hunters must be aware that the survivors of a hunted caribou group may suffer as much as their quarry.

Lichen pollution

Pollution caused by people living far from the territory of the caribou may still have an effect on the caribou and those that depend on them. One example of this effect is that of the radioactive element cesium.

Caribou depend on lichens as a primary source of food in the winter months. Lichens take nutrition from moisture. Lichens grow very slowly and live a very long time; because of this nutrients are more concentrated



Road sign posted in the range of the Southern Lakes Caribou Herd, Yukon



Logging on west side of Marsh Lake, Yukon



Caribou tracks in soft mud

in lichens than in other plants. Unfortunately, heavy metals such as cadmium and cesium accumulate and become concentrated in the same way. Cesium is passed along to caribou that eat the lichens. Radioactive elements like cesium may be cancer causing.

In northern Canada, tests have shown the levels of contamination to be low enough that Health and Welfare Canada has not recommended against the human consumption of caribou meat. However, contamination levels were so high in northern Europe after the Chernobyl nuclear disaster that reindeer meat had to be destroyed. Even in Canada, levels of contamination increased by up to 25% in some caribou herds after the disaster.

Cesium does not persist in the body tissues of caribou. This means that the level of it found in the meat will be higher in winter, when the animals are on a lichen diet, than in summer, when caribou eat a wider variety of plants. However, other forms of pollution, like heavy metal fallout, do accumulate in body tissues such as the liver and kidneys. The caribou of the far north are a powerful symbol of the potentially devastating effects of human activity, even on the other side of the world. Perhaps this example will encourage people to understand that every action has a consequence.



Studying Caribou in the wild

Traditional knowledge of caribou was gathered through centuries of observing the behaviour of the animals. Traditional knowledge led to values and hunting practices that promoted respect and complete use of the animal, rather than wasteful or unwise killing. Traditional knowledge of the caribou is centred in northern aboriginal communities and cultures, passed on through an enduring oral tradition. Aboriginal people use the knowledge that has been passed down to them in their interactions with caribou in the present.

Governments and biologists gather scientific knowledge about caribou. It is based on repeatable observations, experiments and data gathering. Scientific knowledge is based on a written record.

Both scientific and traditional knowledge about caribou can be used together in wildlife management to ensure the survival of healthy caribou populations despite hunting and resource development.

Biologists study animals to learn the best ways of managing them for the survival of ecosystems. Caribou and other large mammals can be considered "indicator species": that is, if they survive in healthy populations then so do many other members of the ecosystem.

Biologists gather information about caribou in several ways. They may do aerial or ground surveys to count caribou herds and study their composition (the numbers of various sex and age classes). Biologists can also get information about caribou from native and non-native hunters by doing harvest studies. They can tag caribou and find out where the caribou are killed by collecting tags from hunters. Another kind of study involves putting radio collars on caribou. These collars transmit a signal that can be picked up from an airplane or by satellite. Radio-collaring allows scientists to track the movements of individual caribou through the seasons.



Woodland caribou equipped with a radio collar

Caribou viewing tips

Always observe caribou from a distance. If a caribou becomes alert or nervous and begins to move away, you are too close.

Use binoculars or spotting scopes to get a better view.

Try to minimize the noise you make: talk in whispers and limit the clicking of cameras.

Never come between a cow caribou and her calf.

Avoid bull caribou during the rut season when they may be aggressive.

Behave like a guest in their wild habitat: do not bother them.

If you can't find any caribou, keep in mind that people have been baffled by the movements of caribou for centuries. Some, like the men of Sir John Franklin's expedition in 1821, have starved to death because they miscalculated the behaviour of caribou. Hopefully, your caribou mission doesn't have such high stakes!





Predator control

A highly controversial method of increasing caribou populations involves reducing predator numbers. Wolves are the usual target. A common, lethal method of predator control is aerial shooting from helicopters. A non-lethal method is the sterilization of breeding wolves so that they are unable to reproduce. Because they are complex and controversial, most modern predator control programs are highly scrutinized and thoroughly studied to assess their effectiveness.



Working to protect Caribou

The more we learn about the effects humans have on animals, the more we realize that we need to foresee the consequences of our actions and plan accordingly. This can be called wildlife management.

In the past, humans did not have the means to seriously alter the natural environment and the abundance of wildlife that depends on it. New developments in technology and the explosive growth of human populations have given us the power to wipe out entire species. We have learned that wildlife needs protection, or stewardship, to survive in the world of today.

Wildlife management can take many forms. It can include licensing hunters and setting hunting seasons and quotas. It can also mean allocating resources to certain users, like aboriginal groups or resident hunters. Another important way wildlife management works is by protecting habitat or setting guidelines for its use.

Another management tool is to make efforts to reduce caribou mortality. Predator control programs are one way governments have tried to protect caribou populations. Hunting of caribou can also be restricted. The government restricts non-native hunters by imposing seasons, quotas and licensing requirements. Aboriginal hunters are generally assured access to caribou and other game animals for food.

The management of caribou is made more complicated by the fact that these animals migrate great distances. Caribou pay little attention to political boundaries, crossing through adjacent provinces, territories and even countries. Wildlife managers are learning to balance traditional and scientific knowledge about caribou when making decisions.

Successful management of the caribou is challenging because different people may have different ideas about how many animals should be harvested every year and how many caribou each person should get. Other people may have different ideas about how the land should be used and what the best ways are to protect caribou and their habitat.

Many jurisdictions are focusing on "integrated management" of wildlife. In Manitoba, for example, department wildlife biologists review logging plans with respect to wildlife habitat and have the ability to change operations to accommodate wildlife requirements. The new discipline of conservation biology guides this process.

Another way that management of caribou has improved in recent years is through a process called "co-management." Co-management is a partnership where all people who rely on the caribou in an area are involved in making decisions about how they are managed. This often involves biologists, government representatives, aboriginal people and other stakeholders.

How can you help protect Caribou?

One way you can help protect caribou is by learning more about caribou, their habitat and the threats to their survival. Without public support, wildlife management programs have limited success. Students can become involved in caribou and other wildlife issues by participating in public consultations regarding issues that affect caribou. Issues may be local or national, such as when land use regulations are being established or changed.

Students can also contact local government, nonprofit and private wildlife agencies for ideas on how to help caribou and their habitat. People face important choices now and in the future about how we use and affect the natural world. These choices can affect caribou and other living things.

Students can explore questions about caribou in the following activities and in discussions with their friends, families and communities. By turning education into action, students can make a difference to caribou. Their concern and activism can ensure that caribou continue to be an important part of northern ecosystems and communities, and a connection to the wild.

