Chapter 3

presented by Hydro Québec

Caribou and Reindeer

GOALS

Reviewing the life cycle of the caribou

Understanding the relationship between some of the caribou's physical characteristics and the environment

Exploring caribou migration

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IN GENERAL

What exactly are caribou (besides a symbol of the North)?
In the popular imagination, the North is closely linked with the image of the caribou. They may symbolize the Arctic landscape, but under their coats, caribou hide many fascinating characteristics essential to their survival.

Caribou are land-based mammals belonging to the cervidae family[1]. Their distribution is circumpolar[2], throughout the world's northern (both Arctic and boreal) regions. All caribou are migratory, although the distance they migrate varies widely among the world's various subspecies. Travelling throughout the course of the year — between their winter and summer habitats, between their fawning grounds and the habitat used during their sexual activity (or rut[3]) — caribou never stop moving!

Caribou and reindeer are actually close cousins. They belong to the same species, known to biologists by its scientific name: Rangifer tarandus. Generally, we refer to the animals of this species living in North America as caribou; those living in Eurasia are known as reindeer.

There are a number of unique characteristics that set caribou apart from other animals in the cervidae family and help them survive the northern climate. The wild caribou population is estimated at 5 million throughout the northern hemisphere. They live in herds of greatly varying size. In addition to this enormous population, there are approximately 2 million semi-domesticated reindeer, found mostly in Europe and Asia.

Worldwide Distribution of Caribou (Rangifer Tarandus)*

- Woodland Caribou *(Rangifer tarandus caribou)*
  1. George River Herd
  2. Rivière aux Feuilles Herd
- Barren-Ground and Grant's Caribou *(R.t.groenlandicus and R.t. grantii)*
  3. Qamanirjuaq Herd
  4. Beverly Herd
  5. Bathurst Herd
  6. Bluenose Herd
  7. Porcupine Herd
  8. Western Arctic Herd
  9. Mulchatna Herd
- Barren-Ground Caribou and Peary Caribou
- Peary Caribou *(R. t. pearyi)*
- Wild and Semi-Domesticated Caribou *(R.t. tarandus)*
  10. Taïmyr Peninsula Herd
- Wild Forest Reindeer *(R. t. fennicus)*
- Svalbard Caribou *(R. t. platyrhynchus)*

* Numbered herds count more than 100 000 individuals.
Caribou introduced to the Kerguelen and South Georgia islands in the Antarctic do not appear on this map.

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PHYSICAL CHARACTERISTICS

Antlers

Antlers are structures made of bone-like material, weighing up to 7 kilograms (15.4 pounds) on males and 1 kilogram (2.2 pounds) on females. They fall off when they are no longer needed, and the caribou grow a new set each year.

Power under the Hood!

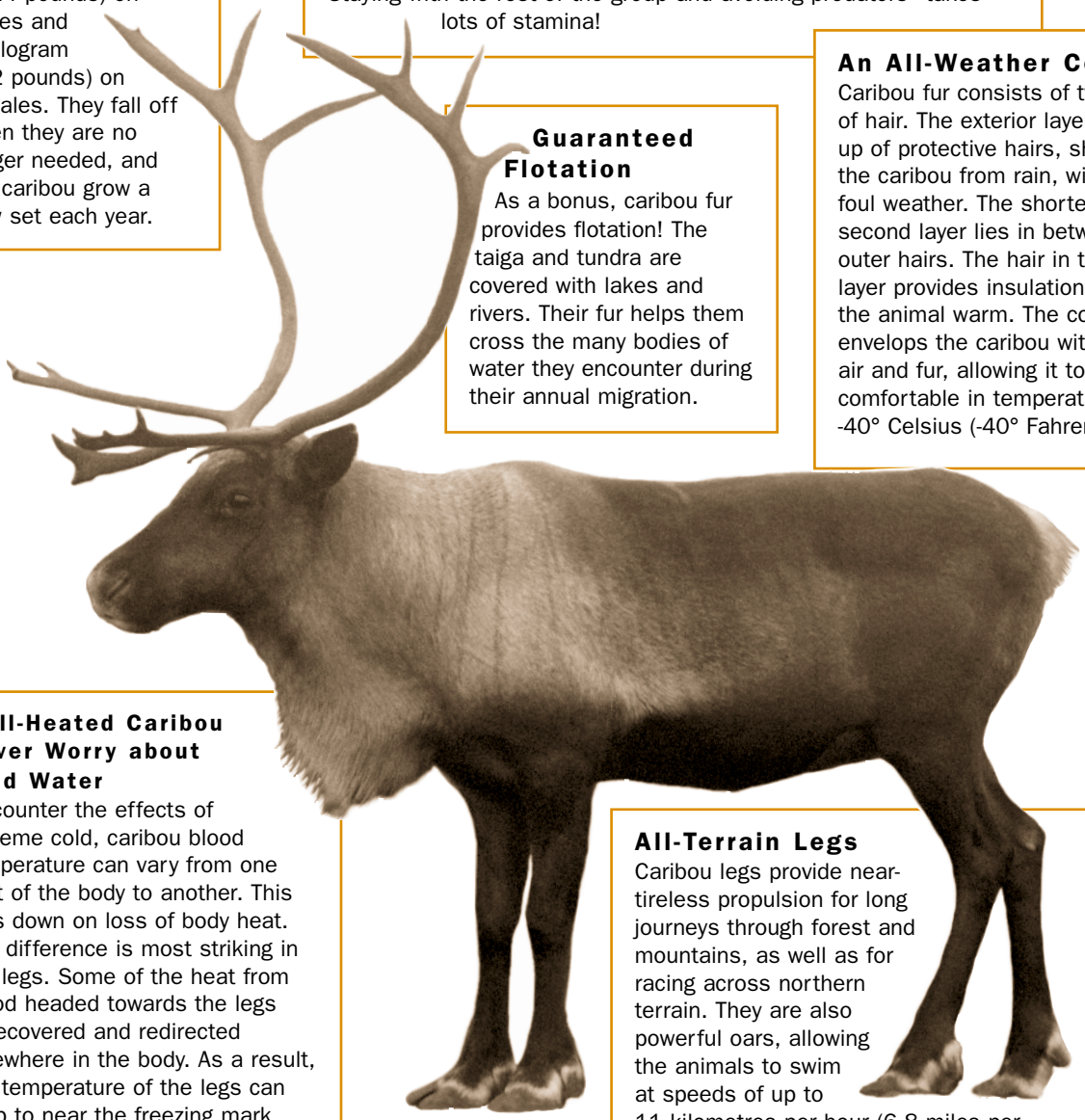
A highly developed circulatory system gives the caribou spectacular performance and an extremely high VO_2max[4]. A caribou can travel at 40 kilometres per hour (24.9 miles per hour) for over an hour, or swim dozens of kilometres (or miles) without really getting tired. Staying with the rest of the group and avoiding predators[5] takes lots of stamina!

Guaranteed Flotation

As a bonus, caribou fur provides flotation! The taiga and tundra are covered with lakes and rivers. Their fur helps them cross the many bodies of water they encounter during their annual migration.

An All-Weather Coat!

Caribou fur consists of two layers of hair. The exterior layer is made up of protective hairs, shielding the caribou from rain, wind and foul weather. The shorter and finer second layer lies in between the outer hairs. The hair in this second layer provides insulation, keeping the animal warm. The coat envelops the caribou with warm air and fur, allowing it to remain comfortable in temperatures below -40° Celsius (-40° Fahrenheit)!



Well-Heated Caribou Never Worry about Cold Water

To counter the effects of extreme cold, caribou blood temperature can vary from one part of the body to another. This cuts down on loss of body heat. The difference is most striking in the legs. Some of the heat from blood headed towards the legs is recovered and redirected elsewhere in the body. As a result, the temperature of the legs can drop to near the freezing mark without causing the caribou any discomfort. By lowering the biological thermostat in their legs and conserving heat where it counts, caribou are well prepared to face the cold.

All-Terrain Legs

Caribou legs provide near-tireless propulsion for long journeys through forest and mountains, as well as for racing across northern terrain. They are also powerful oars, allowing the animals to swim at speeds of up to 11 kilometres per hour (6.8 miles per hour). In winter, the bottom of their feet is covered with hair providing insulation and traction. The hooves, which are in fact the caribou's nails, grow longer in winter in order to put maximum distance between the rest of the leg and frozen ground.

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TUKTU'S LONG JOURNEY

It's early June on the tundra. We are on a plateau near the George River. This inhospitable-looking region of northern Quebec is a traditional calving ground for the world's largest caribou herd. Tuktu[6], the caribou we meet in the film *Great North*, is born here.

As soon as Tuktu is born, she is washed by her mother, who licks her all over and then gives her milk to drink. The days are long and the air is warm. Tuktu's fur dries in the Arctic sun. She has everything she needs to feel comfortable after her birth. Already, Tuktu's curiousity is driven by an instinct to become familiar with her environment. Just a few hours after birth, Tuktu is on her feet and ready to follow her mother. She feeds, and listens carefully to recognize her mother's call — she and her mother have to get to know each other! Their mutual bond will help make sure they don't lose each other among the thousands of other caribou in their herd. Tuktu's long journey is about to begin…

In July, at the age of one month, Tuktu discovers creatures that are more powerful than a wolf's fangs, more persistent than the Arctic wind and more numerous than the world's human population: stinging insects. During the next few weeks, Tuktu will be harassed, chased and ambushed in the swamps and peat bogs of the North by mosquitoes, blackflies and warble flies. Some will pierce her skin to drink her blood. Others will lay eggs in her fur. The larvae that hatch from the eggs will pierce her skin or burrow into her nostrils and stay there, sheltered, for the next 10 months!

To avoid insect attacks, caribou gather in groups, with up to 100,000 animals together on a hillside. They act as one gigantic organism, living with a single purpose: to escape from the nightmarish flies. An Inuit expression springs from this behaviour: "There are so many caribou that the mountains are moving." It is a horrible time for Tuktu. She sticks by her mother's side, hoping it will be over soon. Her mother looks for a breeze at the hilltop or a slab of snow from last winter that will allow them to escape from the insects. Sometimes they find refuge by the ocean, in Labrador, or in the Torngat Mountains.

Finally, in August, cooler weather arrives — putting an end to the mass insect attacks. The big groups of caribou break up. Tuktu is now several hundred kilometres (or miles) from the place of her birth. Life is calmer now. Tuktu is well-fed, drinking her mother's milk and eating twigs, nice green leaves and lichen. What a greedy guts! From mid-October into November, it's rutting season. Since the summer, each male has been sporting an enormous set of antlers, now hardened by the sun and wind. Now, the males confront each other to show their dominance and their right to keep a group of females — their harem. Tuktu's mother will be part of one of these harems. She watches the males as they parade in front of the females — and, more importantly, their male rivals — with their oh-so-impressive antlers. This ritual usually means the males can avoid out-and-out combat because the presence of their massive antlers is a disincentive violence. Nevertheless, there will be some violent combat, and every year some of the males will die as a result. Others will be weakened by the effort.

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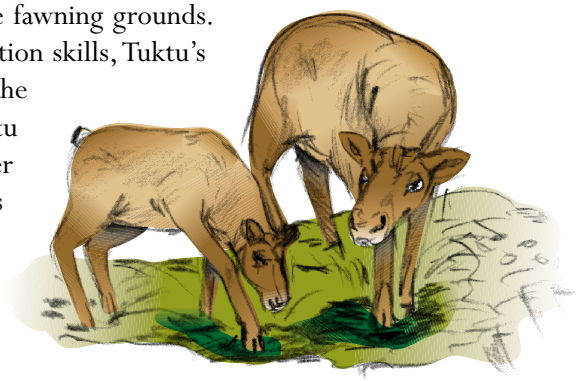
After the mating season, the males lose their antlers. At the end of this period, mother and daughter continue their long march southward — deep into the taiga, and then on farther south into the boreal forest. The caribou will arrive at their wintering grounds — the southernmost reach of their travels — in December. Here, they are sheltered from the winds that ravage the tundra, and they have a far better food supply. Tuktu's mother digs holes in the snow, called feeding craters, so she can gain access to lichen that will feed herself, Tuktu and the fetus she has been carrying for the last few weeks. The long journey never ends, not even in the middle of winter. It does, however, slow down. The dangers Tuktu has to face now include wolves, hunters and ice. The aurora borealis, or northern lights, abound in this region. Winter is long and cold but "fortunately without flies!" Tuktu probably thinks.

Spring arrives. Ice melts on lakes and rivers, making caribou travel harder. The rising temperature is a sign of spring — but an even stronger sign is the signal Tuktu's mother receives from her new fetus, urging her to return as quickly as possible to the fawning grounds. Spring migration has begun. With her incredible navigation skills, Tuktu's mother will cross vast swathes of territory to return to the spot where her herd has given birth for centuries. Tuktu still follows her mother, but does not stay as close to her all the time. She has been weaned for several months now, and will soon have to start thinking more for herself.



The long journey back to the calving grounds is fascinating. Tuktu's herd — known as the George River herd — covers 800 000 square kilometres (308,882 square miles) every year. That's an area the size of France and Italy combined. In June, the females pack into the calving ground, which covers a mere 49 000 square kilometres (18,919 square miles) — an area the size of Holland! Tuktu's mother prepares to give birth. She chases Tuktu away, because her new fawn is going to require a lot of her energy in the coming weeks.

This has been a crucial first year for Tuktu. She has grown up at her mother's side, and her mother has passed on to her knowledge she will use for the rest of her life — which she will one day pass on to her own fawns. One day, like other gravid[7] females, Tuktu will have the vital responsibility of leading her group to the calving grounds. Over the course of the year, Tuktu's body has undergone many changes. The soft brown fur she had at birth has become thicker and turned a grey/brown colour that is pale in the winter and darker in the summer. Her antlers have started to grow. A small, thin branch, with no forks, is visible during the first year. She will lose it in June. Then, every year, she will grow a new set of antlers between August and the following June. She will use them to protect a feeding hole during the winter and defend her young from predators.

How many years will Tuktu live? Good question! On average, caribou live six years. During that time, Tuktu will keep up her annual migratory cycle — moving through the northern landscape in search of better feeding grounds, escaping from predators and reproducing. She will probably travel 48 000 kilometres (18,533 miles) during her six-year life span. If she does not fall prey to a predator or a hunter, she may well live 12 or 13 years and travel 96 000 kilometres (37,066 miles). That's like circling the Earth three times!

Glossary

[1] **Cervidae:**
Family of ruminants with branched horns (also called antlers) on their head. The antlers fall off every year at a particular time. Other members of this family include moose, wapiti and white-tailed deer.

[2] **Circumpolar:**
Found around one of the Earth's poles.

[3] **Rut:**
Breeding period among mammals of the cervidae family.

[4] **VO_2max:**
The maximum amount of oxygen used by a mammal's body during physical activity. This number depends on heart rate, volume of blood pumped by the heart with each beat and the amount of oxygen removed from the blood by muscle mass.

[5] **Predator:**
An animal that eats others as prey.

[6] **Tuktu:**
Caribou, in the Inuktitut language.

[7] **Gravid:**
A pregnant female.

Activity

Caribou Travels

Goals:
Understanding the caribou's migratory cycle.

Materials:

1 photocopy of "Tuktu's Long Journey" (pages 4 and 5 of this chapter) for each participant or group.

1 calendar

Directions:

1. Read "Tuktu's Long Journey."

2. Now identify six important annual periods in the caribou's life cycle. Note them on the calendar.

3. Compare your list with the one below. These are the periods biologists use to define the caribou life cycle:

a. Fawning (end of May to mid-June, approximately)

b. Post-fawning aggregation (end of July to mid-August)

c. End of summer scattering (mid-August to end of September)

d. Rut (October to November)

e. Wintering over (December to March)

f. Spring migration (March to end of May)

The Growth of Caribou Antlers

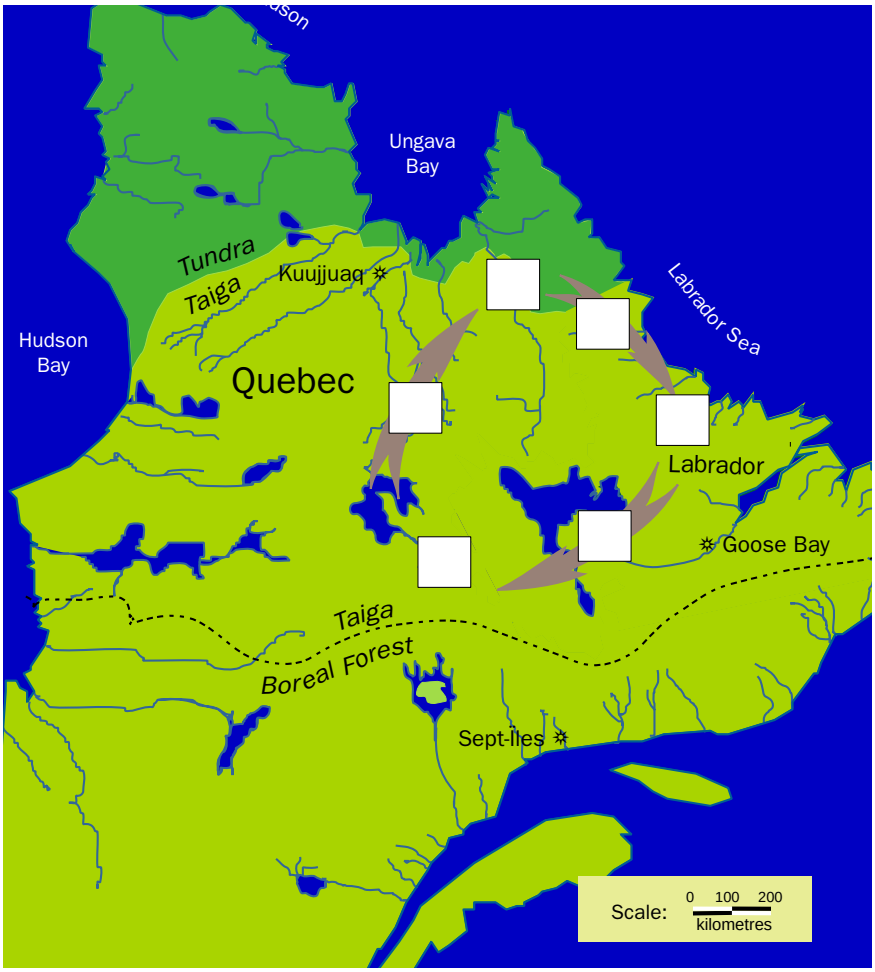
During periods of growth, the antlers are a collection of fragile, spongy tissues loaded with blood vessels. At this time, the antlers are covered with soft brown hair known as velvet. Once the antlers reach their full development, blood stops circulating in the antlers as blood vessels retreat to their base. Then the velvet dries up and falls off. The result is that for a few days, the caribou exhibit bloody-looking horns. The blood will slowly dry, giving the antlers their characteristic brown colour. The antlers will whiten over time, due to the effects of sun and weather.

Let's Explore Some More:

4. Write the letter beside each of the annual periods in the appropriate boxes on the map below.

5. Using the scale below, calculate approximately how far Tuktu travels in a year.

Solution on page 8



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I Dig, You Dig, We Dig...

The first French explorers in North America discovered a strange animal. The Native Mi'kmaq (Micmac) people called it xalibu; Europeans pronounced it caribou. The name means "shoveller" or "slogger" — and it comes from the caribou behaviour of digging holes in the snow. During the winter months, a caribou will dig up to 50 of these feeding craters per day, in order to find the five or six kilograms (11 to 13.2 pounds) of lichen that it requires.

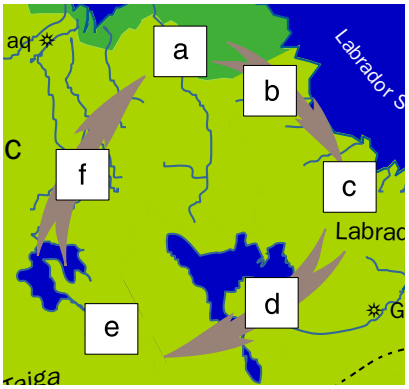
Questions:

What do caribou do to combat the cold? What do you have to do to stay warm and conserve energy in your own home?

How do the caribou manage to find their bearings and know which way to go? How do you find your way where you live — in your city or town, or in the countryside?

Why do caribou migrate? Have you ever migrated? What impact do mosquitoes and other stinging insects have on the caribou? What impact can they have on you?

SOLUTIONS: ***4. Map***



5. Approximately 2 400 kilometres (1,491 miles). Caribou don't migrate in a straight line, and they have to make many detours around obstacles in the tundra. So the actual distance Tuktu travels may in fact be quite a bit higher — as much as 4 000 or 5 000 kilometres (2,485 or 3,107 miles)!

Resources

BOOKS

Calef, G. 1981. **Caribou and the Barren-lands**. Firefly Books / Canadian Arctic Resources Committee. ISBN: 1895565685. 176 p.

Russell, H. John. 1998. **The Nature of Caribou: Elegant Nomads of the North.** Douglas & McIntyre. ISBN: 1550546228. 114 p.

WEB SITES

Human Role in Caribou/Reindeer Systems: www.dartmouth.edu/~arctic/rangifer/index.html

A good fact-sheet on caribou from the Canadian Wildlife Service www.cws-scf.ec.gc.ca/hww-fap/caribou/caribou.html

Caribou Québec: www.caribouquebec.qc.ca

