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# Project Caribou

## An Educator's Guide to Wild Caribou of North America

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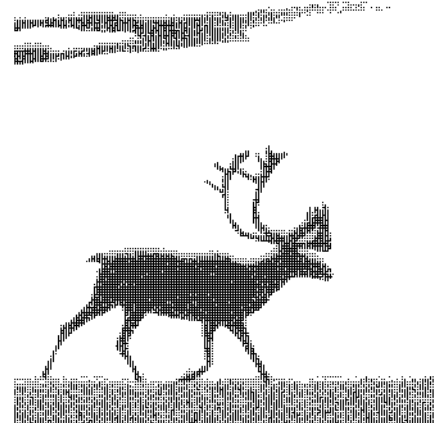
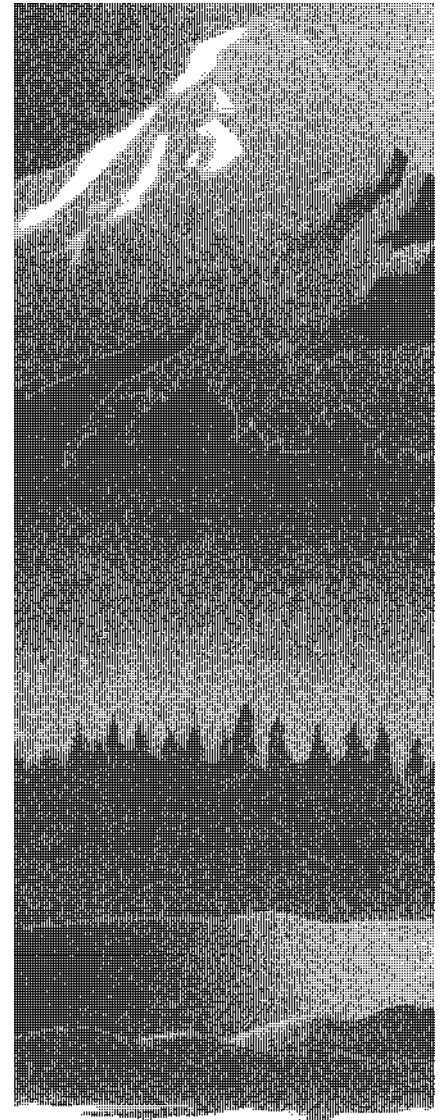
For more info: [www.projectcaribou.org](http://www.projectcaribou.org)

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**Environment Canada (Canadian Wildlife Service—Yukon)**

**Beverly and Qamanirjuaq Caribou Management Board**



**Age**

Grades 5 – 10

**Subjects**

Drama, Biology

**Skills**

Comparison, identification, physical mobility, visualization, research

**Duration**

Two 45-minute periods

**Group size**

25

**Setting**

Indoor/outdoor

**Materials**

- Cartoon caricatures of parasite life cycles on pages 45 to 48
- Costumes and props, elaborate or simple

Warbles: branches

Caribou: blanket, straws

Bot flies: straws, rice, blanket, extended tube, fake dog doo

Tapeworm: suction cups, tape measure

## Bot fly boogie

### Objectives

Students should be able to:

1. Recognize caribou parasites.
2. Illustrate and describe the life cycles of:
  - Bot flies
  - Warble flies
  - Tapeworms
  - Protozoa (e.g., *Sarcocystis*)
3. Discuss the broader ecological significance of caribou parasites on caribou and the predators that prey on them.
4. Understand how to prevent parasites from spreading from caribou to humans.

### Method

Students will develop and present a dramatic presentation to illustrate the life cycles of caribou parasites.

### Background

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 the intermediary host: dogs. 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 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.

## Roundworms

Thread lungworms, also known as roundworms, live in the lungs of caribou, where they lay their eggs. The eggs hatch into tiny, immature worms. These worms migrate up a caribou's windpipe and are eventually swallowed, passing through the digestive system and ending up in the caribou's feces. They continue growing on vegetation and, if eaten by another caribou, travel through that caribou's bloodstream to reach the lungs, beginning the cycle again. Thread lungworms can cause pneumonia in caribou.

## 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. 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.

### **Adaptations for different ages**

**Primary:** Working with the entire class, study one parasite and how it uses its host during its life cycle. Then divide the class into several groups and have them act out the parasite's life cycle.

### **Procedure**

1. Introduce students to the concept of parasites and provide them with background information.
2. Divide students into groups and assign each group a parasite. Provide them with the appropriate life cycle illustration.
3. Have each group research their specific parasite using available materials.
4. Ask each group to prepare a dramatic presentation enacting its parasite's life cycle.
5. Have each group make its presentation to the other students without disclosing which parasite they are depicting.
6. As the other students are viewing the presentations, ask them to try to guess which parasite is being portrayed, writing its name on a secret ballot.

### **Variations**

1. Have the students portray the event first from the parasite's perspective and then from the caribou's perspective.
2. Have the students make their own drawings of parasites and their life cycles.

### **Extensions**

1. Have students research some parasites that live on humans.
2. Look at some actual parasites, using a microscope if available.

### **Evaluation**

1. Discuss what parasites are.
2. Ask students to name three parasites that live on caribou.
3. Discuss whether humans act as hosts for parasites.
4. Discuss whether some parasites may be useful to their host animals.

