



Furbearing Animals:

A Renewable Natural Resource

Teachers' Guide

(A Complement to the Video Presentation)



CONSEIL CANADIEN DE LA FOURRURE
FUR COUNCIL OF CANADA

Introduction

Created for the 3rd cycle of primary school, ***Furbearing animals: a Renewable Natural Resource*** is a scientific excursion that provides basic concepts and tools to help fifth and six graders understand the characteristics of different animals (fur, teeth, paws, etc.), the habitats that nurture them, and the notions of adaptation, abundance, carrying capacity, and the sustainable use of renewable natural resources. In short, our presentation focuses on the relationship between humans, animals and nature, and aims to help youngsters prepare for their role as citizens, in a society based on scientific knowledge.



** Furbearing Animals: A Renewable Natural Resource is a program produced with support from the Ministère de la Faune du Québec, the International Fur Federation and the Fur Council of Canada.*



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Basic Notions

A scientific language: Throughout our presentation, we use specific terms employed by specialists who work in this area. We believe that this allows young students to better appreciate the real value of nature's subtleties.

1. Renewable and non-renewable resources

What is a natural resource...?

A natural resource is a product of nature. That is to say, any product **that man has not manufactured** himself. Examples: vegetation (trees, flowers, fruits); gemstones (rubies, diamonds); minerals (iron, magnesium, sodium), animals... but also the sun, water, wind, petroleum, etc. People use natural resources to manufacture what they need: a school table, wooden or plastic chairs, a ruler (wooden or plastic), sweaters (in wool, cotton or synthetic fibres), a leather jacket, glass, electricity, etc.

What is a renewable natural resource...?

A renewable resource is a material that nature can produce **quickly and easily**. Example: every year trees produce seeds which fall to the ground, usually in the fall. Flowers also produce seeds. The following spring, nature will produce new trees and new flowers from those seeds. Year after year, all animal species also breed and multiply. Therefore animals and plants are renewable resources.

What is a non-renewable natural resource...?

Non-renewable resources are materials that **take millions of years** for nature to produce. Example: if I take a litre of oil from the ground, the following year nature will not have produced another litre of oil to replace what I took... Nature needs millions of years to produce resources like oil, gas, coal, iron, silver, gold, and diamonds. These are non-renewable resources.

What is a mammal...?

A mammal is an animal that has the 6 following characteristics: **(1)** gives birth to a live and whole being (not an egg); **(2)** has breasts that produce milk to feed their young; **(3)** has skin covered with hair [no scales, no feathers]; **(4)** has a heart with 4-chambers which oxygenates the blood and keeps a warm and constant temperature; **(5)** has four members; **(6)** has a relatively well-developed brain.

What is a vertebrate...?

The main characteristic of vertebrates is that they have an internal skeleton made of bone or cartilage, with a spinal column composed of vertebrae that protect the trunk of the central nervous system. This group contains about 50,000 different species of extremely varied sizes, ranging from the gigantic blue whale (30 m, weighing around 190 tonnes), down to the tiniest of frogs.

What is a furbearing animal...?

A furbearing animal is a **vertebrate and a mammal whose fur has a commercial value**. However, all mammals with fur are not furbearing animals. And, most importantly, the use of furbearing animals is governed by laws and regulations. Humans cannot take furbearing animals any way they please, as many as they want or whenever they want them. We have to obey the laws and regulations that govern the use of these animals.

2. The adaptation of furbearing animals to their habitats

During their evolution, animals have adapted to the type of environment they inhabit by developing specific characteristics that ensure their survival. Let's take two types of furbearing animals to illustrate this concept: semi-aquatic and terrestrial animals.

1. Semi-aquatic animals

Semi-aquatic species, such as beavers, absolutely need both water and earth to live. Lacking gills (the internal or external organs that allow aquatic animals, including fish, to extract oxygen from the water); beavers do not breathe in the water but can keep their oxygen reserve for up to 15 -20 minutes under water or ice. When they dive, their nostrils and ears close instantly; transparent eyelids allow them to see underwater, and lips close behind their teeth, to keep water from entering their lungs. Beavers cannot die by drowning as we would, but if unable to resurface before their oxygen supply runs out, they will be poisoned by their own carbon dioxide which they can't exhale.

When we are cold at night, we roll into a ball under the covers to keep warm. Similarly, the body of many semi-aquatic animals (beavers, muskrats) is round, the shape that best preserves heat. Like all furbearers, beavers have two kinds of hair: **the guard hair**, long and lustrous, to protect them from rocks and branches as they swim, and **underfur** – a very fine and dense fur under the guard hair to help maintain body heat, even under water.



2. Terrestrial animals

Foxes, coyotes and the Canadian lynx are terrestrial animals, efficient predators that hunt their prey on land. They have an elongated, aerodynamic shape that allows them to run fast, and cushioned paws to better absorb shock and jump more easily to catch their prey. The **guard hair** in terrestrial animals is very thick to protect them from injuries when they run in the forest while their **down**, which is entirely hidden under the guard hair, helps maintain their body temperature.

3. Classification of animals

The scientific name of animals in Latin is not haphazard. It helps to understand the groupings and classifications that scientists work with. Animals are classified according to their species and subspecies, and grouped according to their behavioral habits. The terms used in science to classify animals often have Latin roots.

Vore	suffix	meaning	to eat/ devour
Herbi	root	meaning	grass / vegetation
Carni	root	meaning	meat
Omni	root	meaning	all

Classification by what they eat...

Foxes, coyotes, lynx and mink are **carnivores**; they hunt, kill and eat a variety of animals. All of their teeth are pointed and sharp, even the premolars and back molars.



Beavers are **herbivores**; they eat roots, branches and bark. All of their teeth are large and curved. Beavers are also rodents: their upper and lower incisors are sharpened against one another as the animal eats. An interesting fact: beavers' teeth grow continuously throughout their lives!



Raccoons, muskrats and bears are **omnivorous**; they eat plants and berries but also frogs, snails and other small animals. They have two kinds of teeth: incisors and canines which are sharp, and molars and premolars which are flat and rounded. Humans are also omnivorous animals.

Classification by their lifestyle (in opposing concepts)...

Diurnal versus nocturnal: The **diurnal animal** forages in the daytime, from sunrise to sunset (e.g. hares); the **nocturnal** animal (e.g. beaver) is active at night. Some animals, known as **crepuscular**, feed twice per day, at dawn and dusk (e.g., red fox, lynx).

Viviparous versus oviparous: **Viviparous** animals (e.g. beaver, mink) give birth to live and whole beings whereas **oviparous** animals (e.g. birds) produce eggs which they incubate for several days until the chick is born.



Monogamous versus polygamous: In some species, male and female mate with a single partner and live in families; they are **monogamous** animals, such as beaver. In others, the females mate with different males; they are **polygamous** animals, like mink.

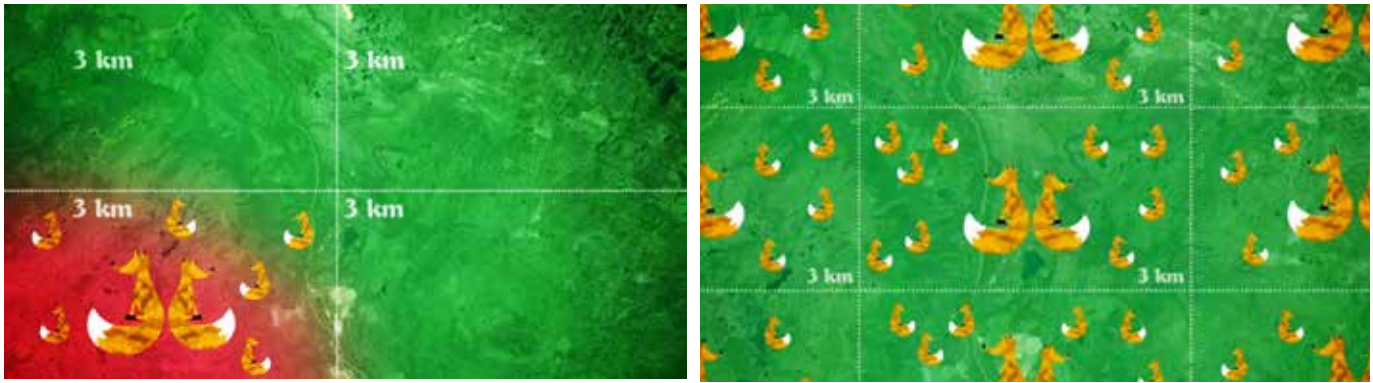
Sedentary versus nomadic: Some animals build a nest, hut, den or burrow, which they constantly transform and maintain. They always travel the same trails to find their food. They are called **sedentary** animals. Other animals roam vast expanses of land abandoning their territories in constant search of new sources of food. They are **nomadic** animals.

4. The Carrying Capacity of a Territory

The territory

To ensure their survival, animals need a living space that will meet all their needs and where they can multiply to ensure the survival of the species. This space is called a **territory**. The size of an animal's home territory varies depending on the species and available food and other resources.

Consider the fox: A female and her pups need a territory of about 2 to 3 km², depending upon available food. Each year the female has a litter of 3 to 10 kits that reach maturity around the age of 8 to 10 months. These young foxes must then find new territories to raise families of their own.



The Carrying Capacity of a territory

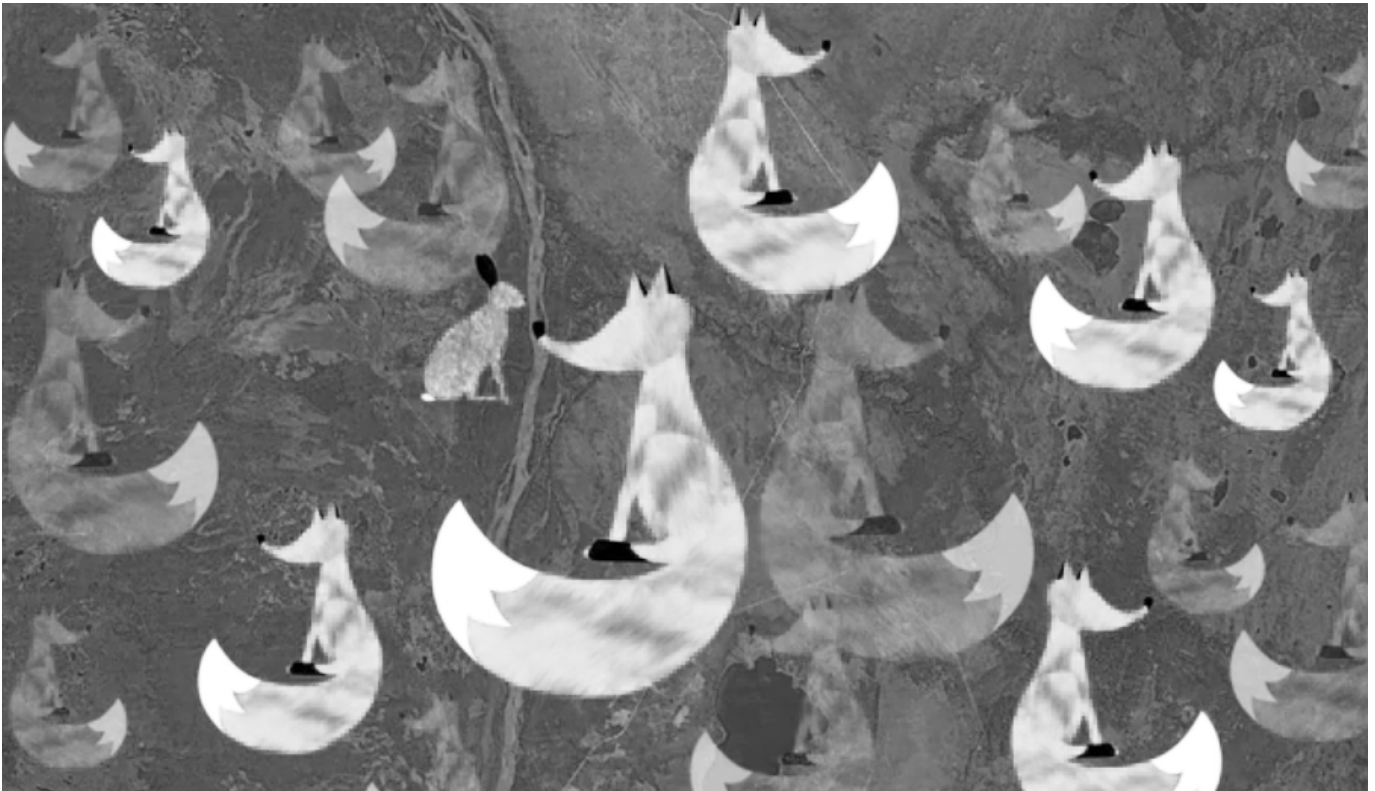
To stay alive and healthy, a family of foxes may need as many as a hundred small rodents each night. If there are too many other predators competing on their territory, there will be overcrowding, and nature will not be able to produce enough food for all. There will then be strife, disease and famine. The number of animals that an area can support is called the **carrying capacity**.

Nature, a question of balance

If nature is unable to meet the needs of a wildlife population, the number of animals in this population will diminish. If their numbers diminish too drastically over too much of their range, the very survival of this species may be threatened. We then speak of an **endangered species**. Everyone knows this is not a good thing.

The opposite is also true. When there are too many animals of the same species in a given territory, we then say there is **overpopulation of the species**. And this is not good for either the species (famine, disputes and diseases can result), for their habitat (including other animal and plant species which may become threatened in turn), or for humans who share the territory (diseases, such as rabies, can spread more easily to domestic animals and pets when foxes, skunks or other wildlife are over-populated).

There must be a balance between wildlife populations and their habitat to ensure the survival and health of flora and fauna.



How is a balance of populations maintained in nature?

Predators play an essential role in maintaining the balance of nature. Wolves, for example, hunt foxes and beavers. Up to 75% of the diet of the Canadian lynx consists of snowshoe hares, their preferred **prey**.

Humans are also predators that contribute to the balance of the ecosystem. We use the resources nature produces to feed and clothe ourselves. With well-regulated **hunting** and **trapping** humans also help to maintain the populations of some animal species at levels their habitats can support.

When it is necessary to control animal populations, it is more respectful to put these animals to good use rather than waste them. Because hunting, fishing and trapping are today very well regulated in North America, the fish and animals that we hunt are abundant.

5. The Responsible Use of Renewable Resources

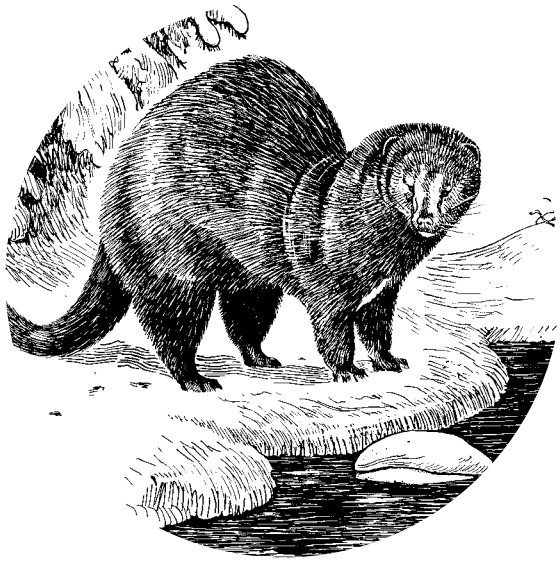
Some animals have dense fur that can be used to make warm clothing. We call these animals furbearers, and they include mink, beaver, muskrat, raccoon, fox, coyote and Canadian lynx. Aboriginal and other hunters eat some of these animals (e.g., beaver and muskrat) and sell their fur to buy other products they need. So long as we protect natural habitats and take only part of the surplus that nature produces, we can continue using animals for generations to come.

This practice is called “the sustainable use of renewable natural resources”.

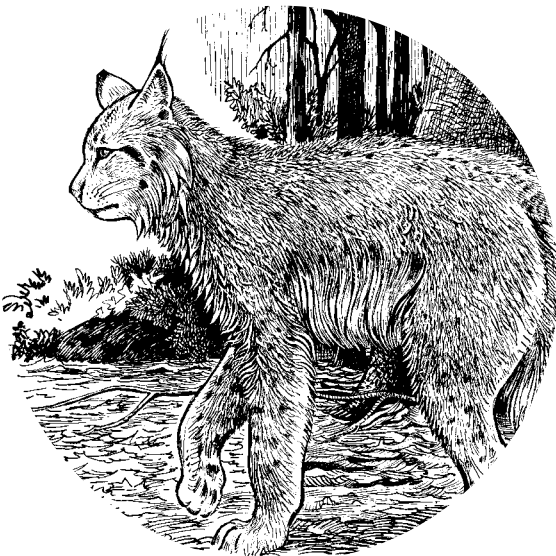
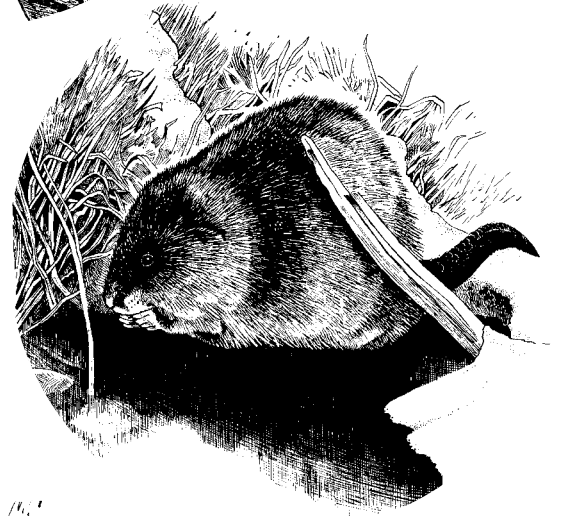
Government authorities have established strict regulations to ensure that only a part of what nature produces is used and that populations of fur-bearing animals remain stable and healthy. **The use of animals for food and clothing is acceptable only if it is done responsibly and sustainably.**

The responsible and sustainable use of wildlife and other renewable resources is a principle supported by the World Conservation Union (IUCN) and other environmental authorities.





Profile of Leading Furbearing Animal





Credit: Charles Douglas,
© Canadian Museum of Nature

Physical Characteristics

Length (total): 42 - 62 cm

Length of tail: 13 - 21 cm

Weight: 500 g - 2,000 g

Habitat:

As a semi-aquatic animal, mink live near ponds, rivers and water springs. Solitary (except during mating season) mink are often on the move. A mink will steal the huts or dens of muskrats and other animals, often eating the original owner first.

Food:

The diet of the mink varies according to the seasons. In summer, mink eat crustaceans, frogs and small mammals including mice, hares, moles and muskrats. Fish and ducks complete the summer diet. In winter, mink mainly hunt mammals.

Physical Appearance:

A lush brownish-red or black fur. The feet are slightly webbed for swimming and diving more easily.

Predators:

Since mink are very aggressive animals, only coyotes, wolves, lynx and the great horned owl will attack them. A mink will defend itself even against larger animals. Young mink are sometimes eaten by reptiles.

Behavior and Lifestyle:

- Nocturnal
- Active all year round
- Polygamous
- Solitary once the young have left their parents
- Nomadic

Territory:

Up to eight square kilometers

Beaver

Castor Canadensis



Physical Characteristics

Length (total): 90 - 120 cm

Length of tail: 23 - 40 cm

Weight: 15 - 39 kg...

Habitat:

A semi-aquatic animal, beavers settle in a deciduous forest near water. They build dams on a river or lake to flood their territory and to increase the depth of the water so that a space at a certain depth will not freeze. Beavers also build a protective hut equipped with tunnels that allows them to enter the water without going outside, which protects them from terrestrial predators. Every day, the beaver maintains and solidifies its constructions with mud, branches and leaves.

Food:

Strictly herbivorous, the beaver eats buds, bark, and new shoots of Birch, Aspen and Poplar. It also eats the roots of aquatic plants. Beavers accumulate piles of branches under the water, near the entrance to their hut, so in winter they don't have to venture into deep snow to search for food. Under the ice, they feed at leisure, without fear of predators.

Physical Appearance:

Beaver fur is brown on the back, fading to grey on the underbelly. The tail is covered with hard scales and some rough hairs. The hind legs are webbed, while the forelegs are equipped with nimble fingers to manipulate branches.

Credit: Charles Douglas,
© Canadian Museum of Nature

Predators:

The young have many predators, including owls, falcons and otters, which are capable of penetrating the hut by the vent and tunnels. Bears, wolves, coyotes, lynx and bobcats can attack adult beavers. Humans also hunt beavers for their nutritious meat and warm fur.

Behavior and Lifestyle:

- Nocturnal
- Active all year round
- Monogamous, lives with a family
- Sedentary

Territory:

A beaver's territory can extend from its pond for more than one kilometer into the woods.

Muskrat

Ondatra zibethicus



Credit: Charles Douglas,
© Canadian Museum of Nature

Physical Characteristics:

Length (total): about 50 cm

Length of tail: 25 cm

Weight: 1– 1.5 kg

Habitat:

As a semi-aquatic animal, muskrats live near rivers, swamps, ponds and lakes where aquatic vegetation is abundant. Muskrats dig burrows and build huts near the water. It is said they can even 'squat' in a beaver lodge.

Food:

Muskrats eat all kinds of aquatic plants and hibernating frogs, mussels and other easy to catch prey.

Physical Appearance:

Dark brown on the back with a silver grey belly. The paws are not really palmate, but coarse hairs between the toes help muskrats to swim quickly and effortlessly.

Predators:

Another semi-aquatic animal, mink, is the main enemy of the muskrat. On land, muskrats must be wary of foxes, coyotes, lynx and bobcats.

Behavior and Lifestyle:

- Nocturnal
- Active all year round
- Polygamous
- Solitary (the female takes care of the young by herself)
- Sedentary

Red Fox

Vulpes vulpes



Credit: Charles Douglas,
© Canadian Museum of Nature

Physical Characteristics:

Length (total): 95 cm - 1.20 m

Length of the tail: 33 - 45 cm

Weight 3.5 - 7 kg ...

Habitat:

A terrestrial animal, the red fox prefers open fields (where rodents live). It can dig a burrow or steal and modify the burrow of other animals.

Food:

Mice, rats and other small rodents are the fox's favorite prey; but also squirrels, hares and insects. In the summer they will eat invertebrates and fruit.

Physical Appearance:

On the back, the fur ranges from reddish brown to flamboyant orange depending on the individual. The tip of the tail and the belly are white.

Predators:

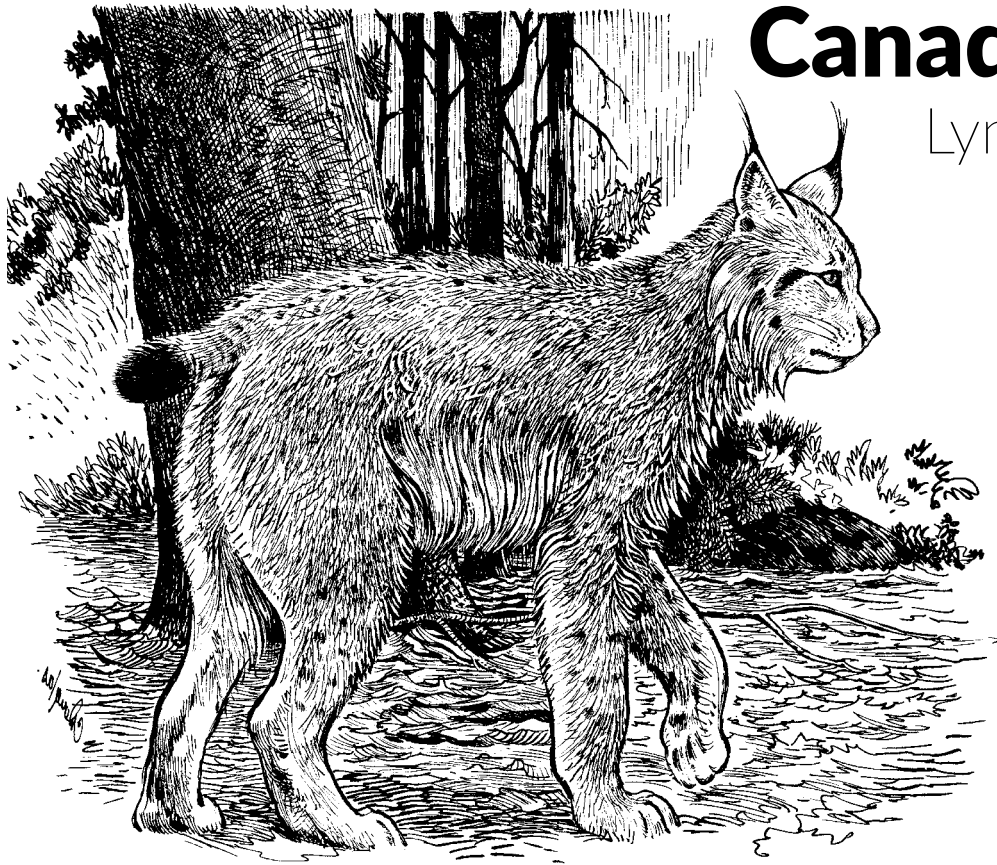
Coyotes, gray wolves, bears, eagles and mustelids, such as stoats, weasels, martens and mink, can attack adult foxes to eat the pups.

Behavior and Lifestyle:

- Nocturnal
- Active all year round
- Monogamous
- Solitary in winter, male foxes will live with the female (vixen) through the spring and summer until the pups leave, when they are around 10 months old.
- Nomadic

Territory:

From 2 to 3 km² - a family of foxes may need up to one hundred small rodents per night to stay healthy.



Canadian Lynx

Lynx Canadensis

Credit: Charles Douglas,
© Canadian Museum of Nature

Physical Characteristics

Length (total): 78 cm - 100 cm

Length of tail: 9 - 12 cm

Weight: 5 - 18 kg...

Habitat:

Lynx lives in coniferous forests, rich in dense undergrowth.

Food:

As much as 75% of the diet of the Canadian lynx consists of snowshoe hares. In fact, the populations of lynx increase and decrease, following the 10-year population cycle of snowshoe hares. Bobcats, which generally live in more southern regions, hunt a larger variety of prey.

Physical appearance:

The fur is silver grey in winter and turns brownish in the summer. The lynx has a small tail with a black tip. (By contrast, Bobcats have

black rings on a longer tail). Very long black-tipped hairs stick out of the ears. (Bobcats have very short hair on their ears). Rough hairs between the toes form a sort of snowshoe when they are spread that helps lynx walk on snow in winter.

Predators:

Wolves and cougars

Behavior and Lifestyle:

- Nocturnal
- Active all year round
- Polygamous
- Solitary (the female takes care of the young by herself)
- Sedentary

Territory:

From 11 km² to more than 300 km² according to the abundance of available food.

Additional Resources

Skull of a North American Beaver



Credit: "Beaver Skull" by William N. Beckon, CC BY-SA 3.0.

Additional Resources

Skull of a Red Fox



Credit: "Red Fox Teeth" by Dark Morelia, CC BY-NC-ND 2.0.



Credit: "Red Fox Teeth" by Dark Morelia, CC BY-NC-ND 2.0.

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Quiz

to Test Acquired Concepts

Furbearing Animals,

a Renewable Natural Resource

1. Ecology and social organization

Circle the correct answer

- 1- **A natural resource is:**
a) any product that humans transform into something else
b) any product that humans have not produced
c) natural products that humans can use
- 2- **Three examples of natural resources are:**
a) electricity, wool, polyester
b) water, oil, fur
c) both a) and b)
- 3- **A renewable resource is a resource...**
a) that lasts a long time
b) which runs out and renews itself
c) that nature can produce quickly and easily
- 4- **An example of a renewable resource is:**
a) coal
b) rocks
c) animals
- 5- **A non-renewable resource is a resource that nature...**
a) replaces every 2 or 3 years
b) takes millions of years to produce
c) renews every 100 years
- 6- **A furbearing animal is any animal...**
a) that has hair on its body
b) whose fur is used in a controlled way
c) that is a four-legged pet
- 7- **A mammal is an animal that:**
a) produces milk to feed its young
b) was born in an egg
c) none of the above
- 8- **A vertebrate is an animal that:**
a) has a skeleton
b) has a heart with four cavities
c) both a) and b)

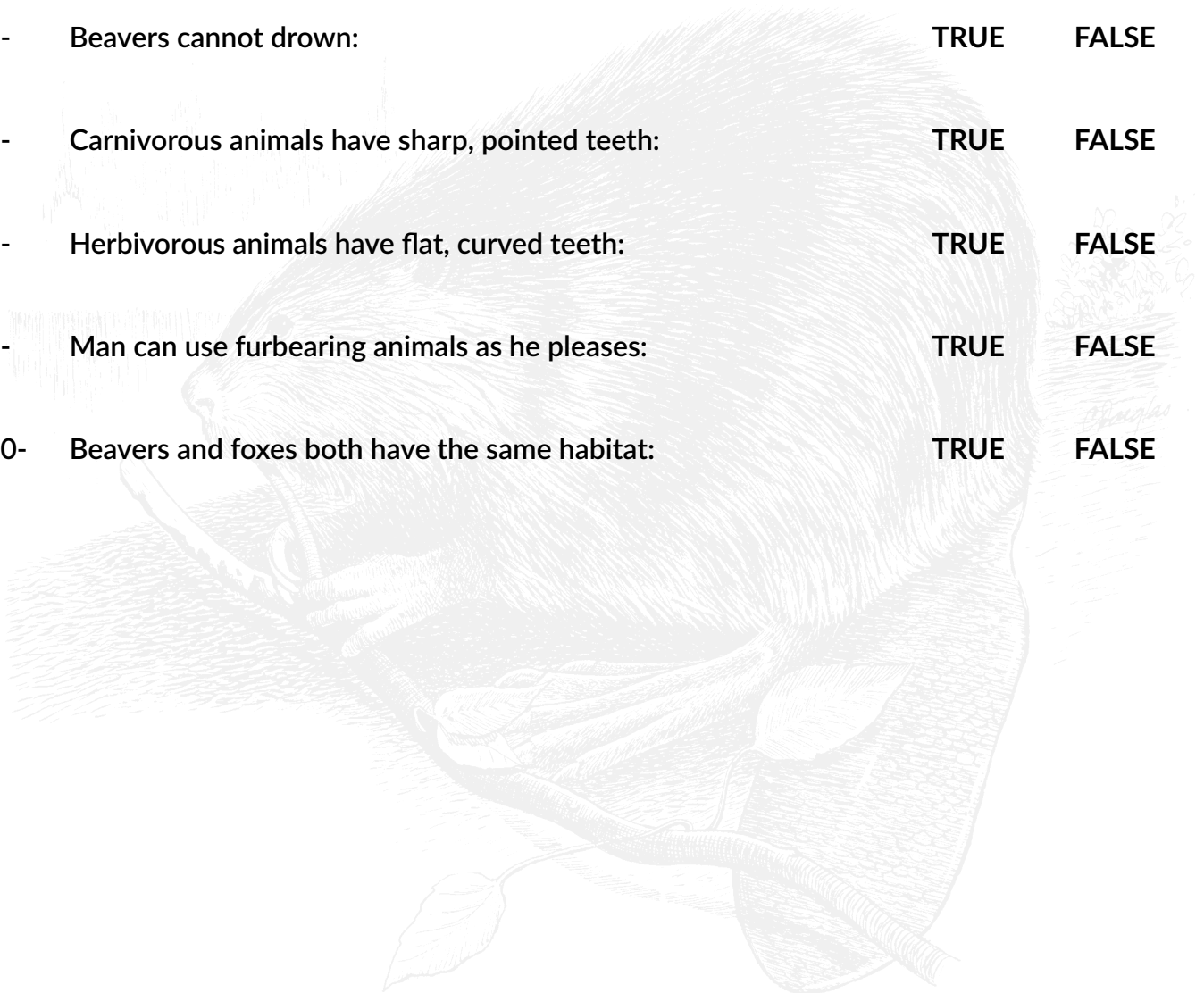
2. Habitats of fur bearing animals and their adaptation to their environment

Complete the following phrases

- 1- To survive, semi-aquatic species absolutely need _____ and _____.
- 2- The body of a beaver or muskrat has a _____ shape.
- 3- Furbearing animals have two kinds of hair: guard hair and _____.
- 4- Three terrestrial furbearing animals are: _____ , _____ and _____.
- 5- Terrestrial predators have an _____ form, allowing them to run fast; they have padded paws that allow them to jump and _____.
- 6- The guard hair of terrestrial animals protects them from _____.
- 7- Carnivorous animals eat _____.
- 8- Herbivorous animals eat _____.
- 9- Man eats everything, so he is an _____.
- 10- The suffix "vore" means : _____.

True or False (circle the correct answer)

- | | | | |
|-----|--|------|-------|
| 1- | Beavers can breathe under water: | TRUE | FALSE |
| 2- | Their nostrils and ears close instantly under water: | TRUE | FALSE |
| 3- | The eyelids of beavers are transparent: | TRUE | FALSE |
| 4- | Beavers have lips in front of their teeth: | TRUE | FALSE |
| 5- | Beaver's teeth grow throughout their lives: | TRUE | FALSE |
| 6- | Beavers cannot drown: | TRUE | FALSE |
| 7- | Carnivorous animals have sharp, pointed teeth: | TRUE | FALSE |
| 8- | Herbivorous animals have flat, curved teeth: | TRUE | FALSE |
| 9- | Man can use furbearing animals as he pleases: | TRUE | FALSE |
| 10- | Beavers and foxes both have the same habitat: | TRUE | FALSE |



3. Carrying capacity, rich and poor habitats and sustainable use

Briefly answer the following questions

1- What is the territory of an animal? _____

2- What happens when there are too many animals in one territory? _____

3- What is the carrying capacity of a territory? _____

4- What are the characteristics of a rich beaver habitat? _____

5- What kind of habitat does a family of foxes need to survive? _____

6- What do we mean by "the balance of nature"? _____

7- What is the role of a predator? _____

8- What is the role of a professional trapper? _____

9- Why do governments have strict regulations regarding the use of furbearing animals?

10- Explain the sustainable and responsible use of a renewable resource.

* * *

Dear Teacher,

We hope you will enjoy using this new educational resource and will find it helpful in your work.

We will continue to revise the content and would appreciate receiving any comments or suggestions you may have.

You can contact us at info@furcouncil.com

The Editor



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FUR COUNCIL OF CANADA