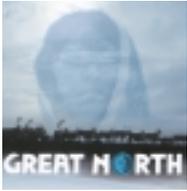


Chapter 2



presented by



Northern Flora and Fauna

GOALS

Learning the characteristics of northern vegetation

Understanding how plants grow in the North

Learning more about land and marine creatures that live in the North

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Chapter 2

FLORA

How does vegetation in the Arctic differ from plants found farther south?

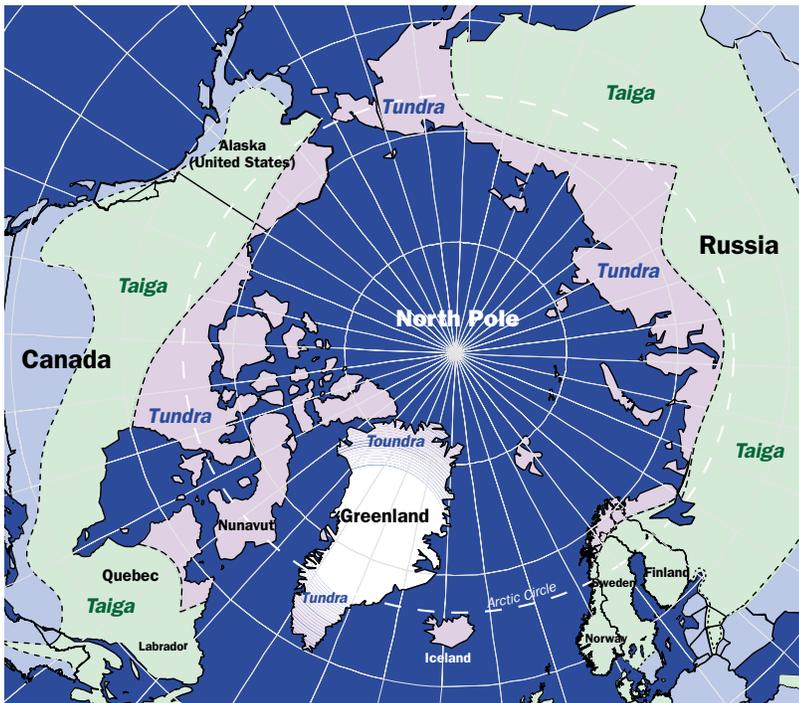
When thinking about the North, many people imagine a deserted, treeless expanse stretching to the horizon — thinking that vegetation couldn't possibly grow and flourish in this environment. But the truth is very different: the North is graced with a wide variety of plants. Starting in the south and travelling northwards, we see deciduous forests giving way to more resistant evergreens. Continuing on towards the North Pole, trees become smaller and more sparse until we reach the tree line. At this point, the climate is so harsh that trees cannot survive.



Other vegetation does not disappear to the same extent. Herbaceous plants, lichens and mosses reign in this landscape. Even at these high latitudes, plants manage to grow and reproduce. There are two broad zones of vegetation in the Arctic. To the south we find a forested land called the taiga, which borders to the north on the tundra.

What is the Tundra?

The word tundra is of Saami origin (see Chapter 5). It refers to a cold plain with arid ground and bare mountains, buffeted by strong winds. In July, the maximum average temperature here is only 10° Celsius (50° Fahrenheit). So the tundra is a zone marked by groups of plants that can survive at very low temperatures — braving the tough Arctic climate year after year.



In this climate, trees grow very slowly. A 300-year-old willow might be only a few centimetres (or inches) high. The growing season is so short that it might only grow 1/4 of a centimetre taller (1/10th of an inch) each year.

Some plants may spend more than an entire year covered in snow. This forces them to adapt in order to stay alive so that they can complete their lifecycle once the snow melts.

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What is the Taiga?

The word taiga is of Russian origin. It refers to a zone of vegetation circling the globe south of the tundra. Here, we find milder average temperatures. The growing season is longer — but the temperature can still plunge to -45° Celsius (-49° Fahrenheit). It is in this region that caribou spend their winters.

Plant life in the taiga varies from one region to another. In North America, it is made up primarily of conifers (especially spruce). In Europe, there is a wider variety of trees, ranging from birch to pines. Swamps, sandy plains and lakes lie scattered throughout the taiga.

How do plants manage to grow in the North?

Arctic plants do most of their growing during the very short Arctic summer, when they get an average of 18 hours of sunlight (and solar heat) a day. Depending on latitude, the growing season can last for months or only a few short weeks.

In many places, the lack of forest cover allows flowering plants, shrubs, grasses, lichens and mosses to flourish in full sun.

But in order to grow, these plants have to battle extreme cold, the abrasive action¹ of particles blown by the wind, and soil that is poor in essential nutrients.

Sprouts appear as soon as the temperature warms up enough. They huddle together to protect themselves from the cold and wind. Some even manage to raise the ambient temperature 10° to 20° Celsius (50° to 68° Fahrenheit) above air temperature. Most plants are perennials that can live from 20 to 100 years. They lie close to the ground, rarely growing taller than 15 cm (5.9 inches). Their closeness to the ground protects plants from strong winds carrying snow and bits of gravel.

Several hundred species of flowering plants grow in the harsh Arctic climate — but they make up only 3% of the world's flowering plant species. The farther north you go, the less diversity of flowering plants you will find. The islands of the High Arctic have only about 50 species. Many northern plants are edible, and have been the staple of northern dwellers' diets for centuries.

Lichens

Lichens are the caribou's most important source of food. Lichens are made up of a combination of algae and fungi that are extremely resistant to arid conditions as well as cold and heat.

Lichens grow on the ground, on trees, on rocks, and throughout the tundra. They can live hundreds of years, but are very fragile and grow slowly. It can take lichens 25 to 50 years to re-cover an area after a herd of caribou has passed through. The length of time will depend on how badly the caribou have trampled the ground.

Because of the poor nutritional quality of lichens, caribou must eat 5 to 6 kilograms (11 to 13.2 pounds) of lichens every day.



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FAUNA An Arctic Seascape

Cetaceans

Large numbers of whales come to feed in the icy Arctic waters during the summer. At this time of year, the water is teeming with an abundance of food — especially small fish and plankton.

Pinnipeds

The walrus and many species of seals inhabit northern waters. They have played a very important role in the survival of northern peoples — providing food and clothing, especially to the Inuit.

Sea birds

Sea birds in the Arctic often build their nests on cliff-sides. One of the more common species is the razorbill.

Polar bears

The Inuit consider the polar bear a "marine animal" because it swims with ease and spends much of its time along the shoreline and on ice floes. Nevertheless, it is the largest land-based mammal in the North.

Fish

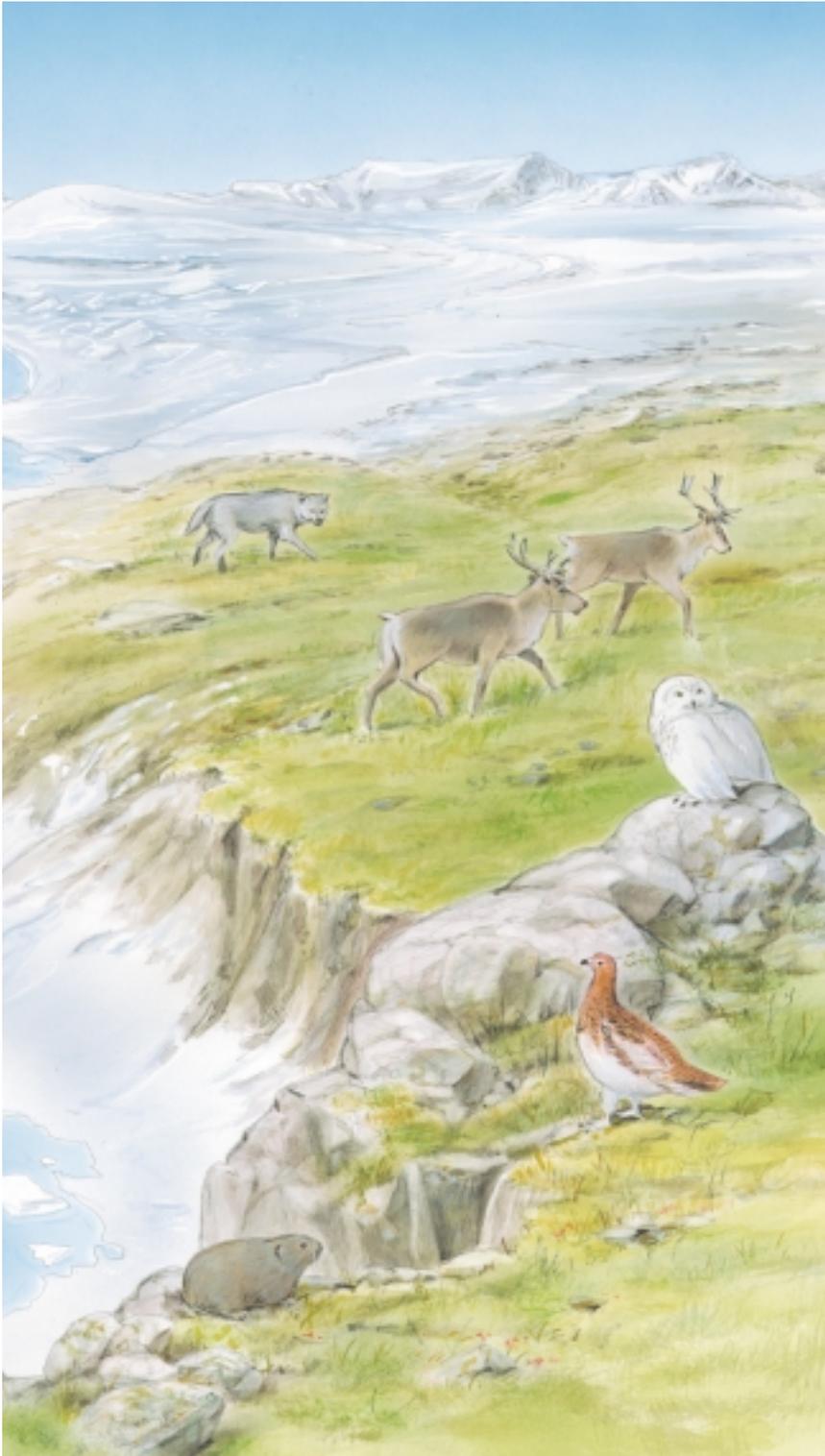
Fish like Arctic char, halibut and capelin are prey for many marine animals. They make up an essential part of the relatively simple food web² found in these cold seas.



Note: this illustration goes with the picture on page 5 (below).
Animals are not necessarily drawn to scale.

Chapter 2

FAUNA An Arctic Landscape



Carnivores

Wolves are among the North's largest land-based predators. To survive, wolves are opportunistic feeders³. Like their cousins, the Arctic fox, they don't pass up carrion.

Ungulates

Caribou and their cousins, reindeer, are certainly the creatures most closely associated with the Far North. But moose and muskoxen (though these number far fewer than caribou) may also be found in various regions of the Arctic. The caribou live in large herds. Muskoxen form smaller herds and moose live alone.

Birds

The North's wide-open spaces allow birds of prey, such as the snowy owl and the golden eagle, to capture many small rodents. Birds of prey share their airspace with primarily granivorous (grain-eating) birds, such as the common redpoll and the snow bunting.

Rodents

Rodents form the basis of most northern carnivores' diets. Lemmings, voles and beavers play an important role in the ecosystem. Cyclical fluctuations in their numbers lead to similar cycles among their predators.

Note: this illustration goes with the picture on page 4 (above).
Animals are not necessarily drawn to scale.

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Glossary

1 Abrasive action:

The action of particles of sand, gravel and snow carried by the wind as they strike, wear down and damage plants.

2 Food web:

The complex set of relationships that exists between predators and prey in a particular area. In simple terms, who eats whom? We used to call this the food chain, but food web is a more accurate reflection of reality.

3 Opportunistic feeder:

An animal that does not stick closely to a particular diet. Opportunistic feeders take advantage of every opportunity to eat.

Activity

Discovering the True Nature of the North

Goal:

Learning more about northern flora and fauna.

Materials:

Reference book on plants, dictionary or encyclopedia.

Directions:

1. On the illustration below, identify the tundra and the taiga.
2. Write the name of each plant or tree (from the list on the left) under the appropriate image.
3. Write the number of each plant in the appropriate box in the illustration below. Which plants grow in the tundra? Which grow in the taiga?

Answers on page 8

Ecosystem Ecosystem

	1	2	3	4	5	6	7	8
Birch								
Dogwood	HEIGHT 49 FEET 15 metres	HEIGHT 3.1 INS 8 centimetres	HEIGHT 9.8 INS 25 centimetres	HEIGHT 3.1 INS 8 centimetres	HEIGHT 49 FEET 15 metres	HEIGHT 5.9 INS 15 centimetres	HEIGHT 1.6 INS 4 centimetres	HEIGHT 98 FEET 30 metres
Lichen								
Black Spruce								
Pine								
Arctic Poppy								
Dwarf Willow								
Saxifrage								

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Let's Explore Some More:

4. In the word box, find the words below, all of which have to do with birds and their environment.

S	E	A	H	S	U	R	H	T	A	H	C
F	M	M	U	R	R	E	I	B	S	A	S
A	A	P	G	R	T	D	A	E	N	F	R
L	L	U	G	I	I	I	R	A	O	L	E
C	M	F	K	V	T	E	D	K	W	I	H
O	A	F	E	S	V	A	H	O	Y	G	T
N	G	I	I	O	G	O	N	A	O	H	A
K	P	N	L	O	W	I	N	G	W	T	E
C	I	P	O	O	E	R	I	V	L	K	F
U	E	S	R	A	Z	O	R	B	I	L	L
D	E	C	P	T	A	R	M	I	G	A	N
S	A	N	D	P	I	P	E	R	R	I	A

Air
Beak
Canada Goose
Chat
Crow
Dive
Duck
Eider
Falcon
Feathers
Flight
Gull
Hawk
Kite
Magpie
Murre
Owl
Plover
Ptarmigan
Puffin
Razorbill
Sandpiper
Sea
Skua
Snowy owl
Thrush
Vireo
Wing

5. The 9 letters that remain form a mystery word that describes behaviour typical of Arctic birds.



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Questions:

Each habitat has its own unique set of plants and animals. What are the differences between plant life in the taiga and the tundra? What other habitats can you name? Can you name some other plants that live in these habitats?

Edible plants play an important part in the diet of northern peoples. Which of the plants shown on page 6 are edible? In what form are they eaten? Can you name other edible plants that grow in the wild?

All of the birds in the mystery word box live in the Arctic during at least part of the year — all except two. Which are they? (Answer: Chat and Kite.) Can you name other species of birds that do not live in the Arctic? Do you know of any other birds that live in the Arctic, but whose names don't appear in the box?

The mystery word in the box reminds us of the importance of migration to birds' survival. What do you think pushes birds to head off on their migratory journey? Are there birds that stay in your area year-round? Can you name some of them? Can you name some migratory birds that live in your area?

SOLUTIONS:

1. The ecosystem on the left is the taiga, the one on the right is the tundra.
2. 1) Black spruce 2) Saxifrage 3) Dogwood 4) Lichen
5) Birch 6) Dwarf willow 7) Arctic poppy 8) Pine
3. Plants 1,3,5 and 8 are found in the taiga. The others are found in the tundra.

5. HIDDEN WORD: MIGRATION

Resources

BOOKS

- Peterson, L. A. 1982. **Field Guide to Edible Wild Plants: Eastern and Central North America.** Houghton Mifflin Co. ISBN: 039531870X. 330 p.
- Pielou, E.C. 1994. **A Naturalist's Guide to the Arctic.** University of Chicago Press. ISBN: 0226668134. 327 p.
- Taylor, B. 1995. **Arctic and Antarctic.** Eyewitness Books. ISBN: 0773728430. 64 p.

WEB SITES

- Arctic Wildlife:** www.mnh.si.edu/arctic/html/wildlife.html
- Flora of Iceland:** www1.bos.nl/~dvuijk/plants/index.html
- Land and Wildlife of the Nunavut:** www.arctic-travel.com/chapters/florapage.html