# Animal Life

Some types of adaptations in the animals are migration, heavier coats of fur, and some change color, such as the snow-shoe rabbit. Mice and moles live in tunnels under the snow. Some animals that live in the taiga are bears, badger, beavers, reindeer, foxes, wolverine and squirrels. Many birds migrate to the taiga during the spring because there are so many insects to feed on after the snow melts. Has millions of insects in Summer. 85 species mammals, over 300 species birds, 130 species fish and 32000 species insects present in this biomes.

**Herbivores:** Moose, Snowshoe Hare, Deer, Elk, Porcupine, Caribou, Harlequin Duck, Musk Ox, , Squirrels, Chipmunks, Moles, Arctic Hare , Bighorn Sheep , Dall Sheep, Lemming, Quoll , Reindeer, Snow Goose, Insects, Chickadee, Woodpecker, Warbler, Beaver, Deer Mouse, Muskrat, Northern River Otter, Groundhog, Striped Skunk, Little Brown Bat, Wood Bison.

**Predators / Carnivorous or omnivorous:** Bobcats, Siberian Tigers , Arctic Wolves, Grizzly Bear, Snowy Owl, Greet gray Owl, Bald Eagle, Amur Tigers, Arctic Fox, Polar Bear, Ermines (Short-Tailed Weasel), Wolverine, Black Bear, Coyote, Lynx, Timber, Wolf, Fisher, Pine Martin , Mink , Sable, Gray Wolf, Mountain Lion, Raccoon.

In Water bodies: River Otter, Red-Tailed Hawk, Lake Whitefish, Northern Pike, Lake Trout, Round Whitefish.

Arctic Hare

Least weasel

Red squirrel

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# Herbivores

wood bison

Arctic Hare

Caribou

Moose

Reindeer

Mule Deer

Vole

Elk (Wapiti)
(*Cervus elaphus*)

Porcupine

White / Red squirrel

Bighorn Sheep

Lemming

Least weasel

Musk Ox

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# Predators / Carnivorous or omnivorous

Brown/Black/ White Bear

Husky

Arctic Wolf

Lynx colored fox

Red Fox - *Vulpes vulpes*

Arctic Wolves

Amur Tigers

Fisher

Mink

Ermines

Mountain Lion

Snowshoe Hare
Canadian Lynx

# Others animal or insects

Harlequin Duck

Snowy Owl

Greet gray Owl

Luna Moth

Bald Eagle

Red Tailed Hawk

Chickadee

*Taiga Bluet*

Raccoon Northern Pike

Lake Trout

Round Whitefish

Red throated loon sparrow

# Adaptations of Animals

- Snow, cold, and scarcity of food make life difficult, especially in the winter months.
- Hibernate during the winter or migrate.
- Some animals migrate south, while others hibernate.
- Layers of fur and feathers protect from cold when hibernating.
- In early March, some animals give birth to their young. Although there is still a lot of snow, the spring brings warmer weather and more activity from animals. Some animals have their young a little later to avoid the snow.
- Many animals migrate to the Taiga in the summer. Summer in the taiga produces lots of food so birds and other animals take advantage of this and then leave during the winter months to avoid harsh weather. Other animals like wolves migrate to the tundra for the summer. They then go back to the taiga in the fall and winter months.
- Some animals in the Taiga hibernate during the winter months to conserve energy. Some have large paws that make it easier to move in the snow.
- Animal fur is very helpful to animals in the taiga. Thick fur helps protect from the harsh weather and some animals fur changes color during the seasons to better camouflage them.
- Some animals change colors as the seasons change for camouflage.
- The tough ones simply cope with the environment, and display these types of features:
  - Sharp teeth for hunting (meat – eaters)
  - Insulating feathers or fur
  - Claws.

**Endangered Animals**: Beavers, Wood Bison, Siberian Crane, Amur (Siberian Tiger), Grizzly Bears, Red Fox, Whooping Crane, Amur Leopard, European Mink, Przewalski's Horse, Boral Caribou.

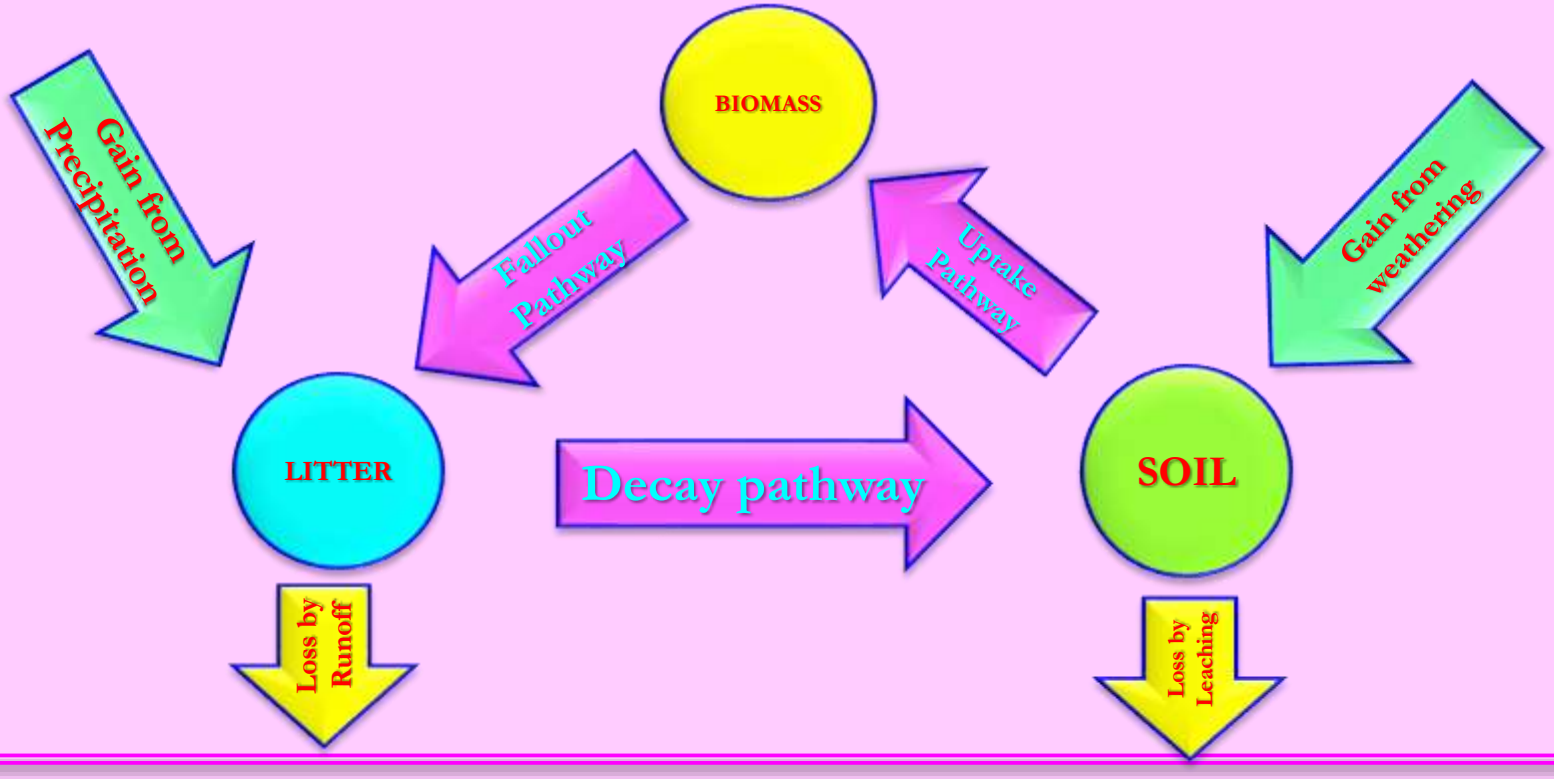
# Decomposers

Decomposers in taiga would be primarily fungi, with some water molds and bacteria too. There are a lot of small arthropods that eat fungi, including springtails and some insects. In turn, these would be eaten by beetles and ground-dwelling spiders; and these in turn would be eaten by things like skunks and opossums. Opossums might be eaten by an apex predator like a coyote or a wolf or a bear. There are many decomposers in the taiga such as fungi, bacteria, snow bug, and common soil.

The one I picked to talk about its role in the taiga is the Honey fungus. It attacks woody and herbaceous plants.

# Nutrient flow

- The largest store of nutrients in taigas is in litter, due to decomposition of leaves from coniferous trees, however slow.
- Biomass in taigas is low because of the small amount of undergrowth and few plant species.
- Soil is lacking in nutrients because of leaching (runoff) and slow breakdown of rocks.



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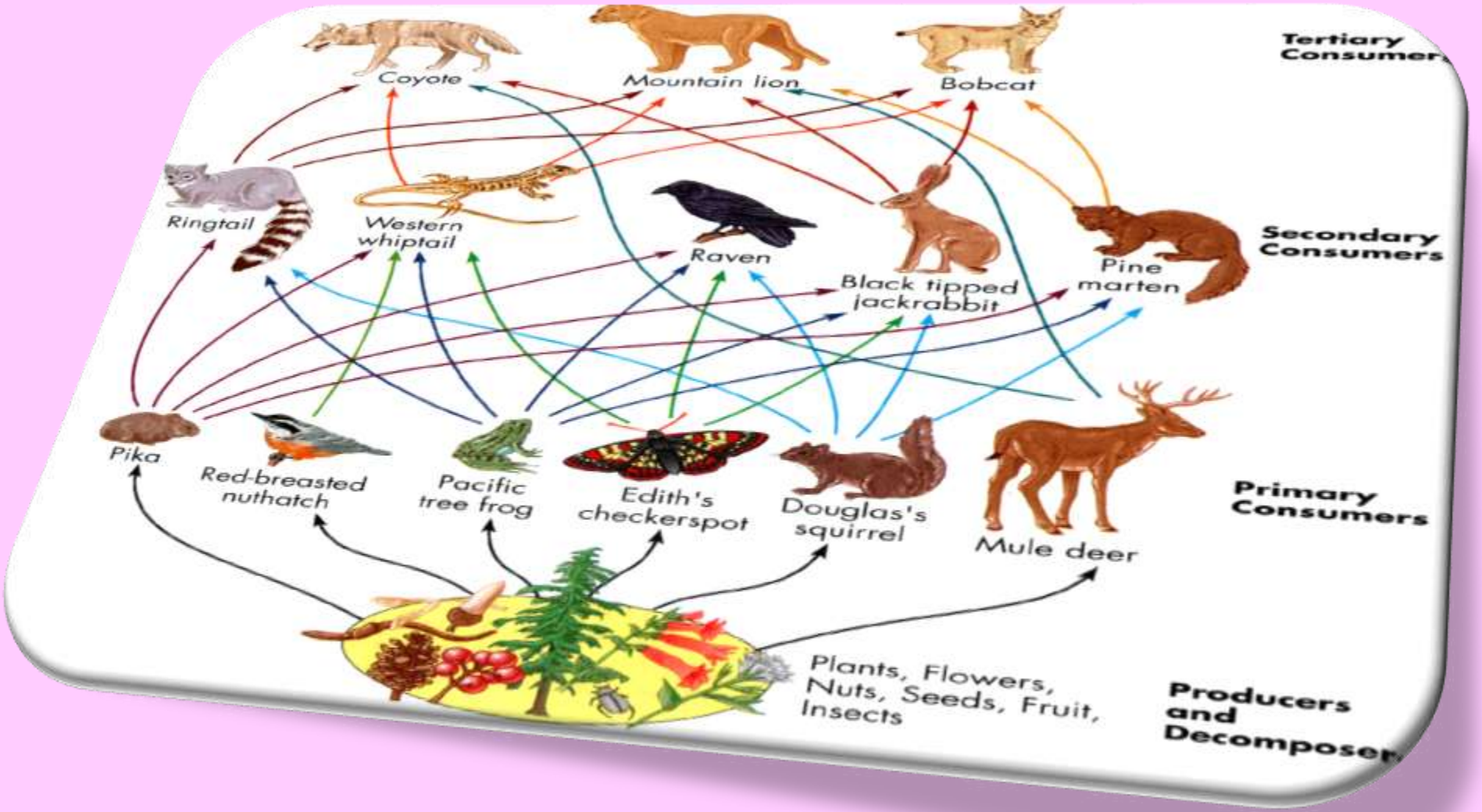
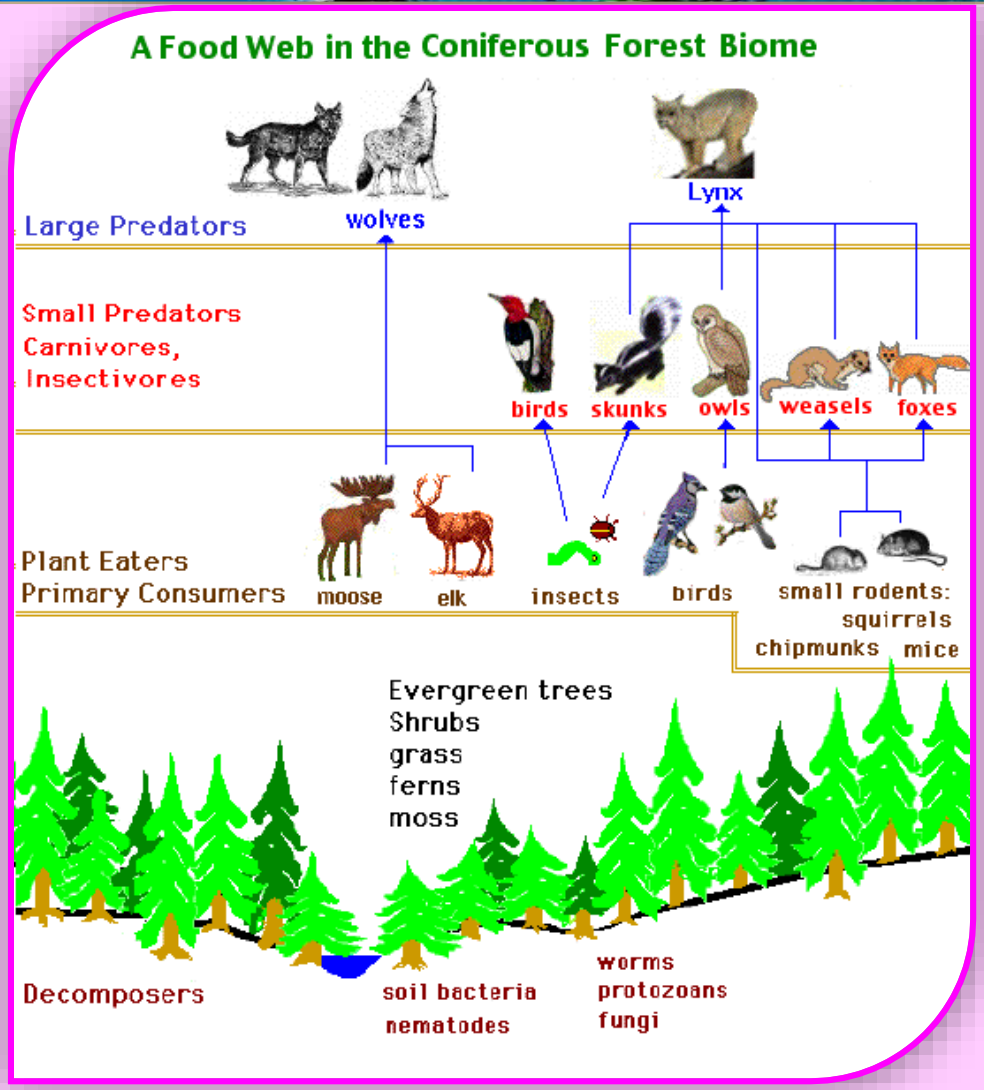
# Energy Flow by Food Chains

# Food Wave


Tertiary Consumers
Coyote
Mountain lion
Bobcat
Ringtail
Western whiptail
Raven
Black tipped jackrabbit
Pine marten
Secondary Consumers
Pika
Red-breasted nuthatch
Pacific tree frog
Edith's checkerspot
Douglas's squirrel
Mule deer
Primary Consumers
Plants, Flowers, Nuts, Seeds, Fruit, Insects
Producers and Decomposers


A Food Web in the Coniferous Forest Biome
Large Predators
wolves
Lynx
Small Predators
Carnivores,
Insectivores
birds
skunks
owls
weasels
foxes
Plant Eaters
Primary Consumers
moose
elk
insects
birds
small rodents:
squirrels
chipmunks
mice
Evergreen trees
Shrubs
grass
ferns
moss
Decomposers
soil bacteria
nematodes
worms
protozoans
fungi

# Human Activity in the Taiga

- Small communities live in the taiga and use its resources in the forestry and mining industries. They rely on one area for all of their resources and they are eventually overused. Native people also consider the boreal forests their home.
- Other industries that put the taiga in danger are logging, and hydroelectric development. 90% of all logging that is done is by using clear cutting and using heavy machinery. This harms the environment and any wildlife living nearby.
- Waste from power plants also has a damaging effect.
- Hydroelectric development has lead to the flooding of large areas. This has caused the landscape to change and has also produced methyl-mercury and acid rain.

# Threats

Human activates / Intervening: There are many industries that claim to be dependent on the boreal forest that have caused great damage. Some of these industries include logging, fur trapping, and oil exploration.

A. Logging and deforestation: Logging is always a threat; unless carefully managed these forests are very slow to regrow and corporate pressures may reduce the amount of management and/or accelerate cutting beyond what can be sustained. Large areas of boreal forest have also been flooded as part of hydroelectric projects (right). Deforestation is occurring in Mongolia, where there is a high demand for firewood and construction timber, yet only 8% of Mongolia is covered by forests.

Hydroelectric Project, Quebec

**B. Trapping:** Fur trapping in Russia's Siberian boreal forests has put many species at risk of extinction, the most notable being the Siberian tiger. Yet, in areas near taigas, fur trapping is an important part of both the economy and culture.

C. Climate change: However, one of the most significant forms of human impact on the taiga is climate change. The boreal forest in itself already plays a significant role in global climate through the carbon cycle and despite human interference, it is one of the most intact forest ecosystems in the world. This change rising temperatures leading it to move northward slowly.

D. Insects: In Canada, oil extraction is a major threat to its boreal forest, and more than 30% of the Canadian Boreal Forest is reserved for current and future development. In alaska, there is also a large amount of oil and gas exploration in the Yukon Flats.

E. Pollution: Acid rain (Scrubbers should be used to reduce pollution from factories releasing pollution into the atmosphere.), The main chemicals in air pollution that create acid rain are sulphur dioxide and nitrogen oxides, and soil stains (**Taiga soil** tends to be young and poor in nutrients. It lacks the deep, organically enriched profile present in temperate deciduous forests. The thinness of the **soil** is due largely to the cold, which hinders the development of **soil** and the ease with which **plants** can use its nutrients.)

F. Mining: Perhaps the biggest threat to the boreal forest today is exploration and development of oil and natural gas reserves. Vast amounts of petroleum products lie under these forests. The high demand for fossil fuels are pushing exploration and development into areas once thought impossible to exploit. It is not clear whether the slow-growing coniferous forests can recover.

**G. Global warming:** Perhaps the most serious is Global Warming; as the planet warms the southern reaches of the boreal forest will become warm enough for deciduous trees to outcompete the conifers and replace them. There is some evidence to suggest that additional carbon dioxide and methane - both greenhouse gasses - will be liberated from warmer tundra and taiga soils as the built up detritus of thousands of years is finally free to decompose. This additional release of greenhouse gasses could accelerate global warming even further.

H. Forest fires: Shift in location, forest fires will become more frequent.

I. Insect infestation: Forest-destroying plagues caused by insects such as the spruce bark beetle, the mountain pine beetle, the aspen-leaf miner, the larch sawfly, the spruce budworm, and the spruce cone worm.

# Threats to the Taiga

Deforestation

Burst Fire

Urbanization

Logging

Rode construction

Drilling For Oil, And Mining

# Protection

We /you can help protect the Taiga by reusing and recycling your resources.

A. Boreal forest conservation framework
B. Wildfire suppression
C. Taiga rescue network
D. Replanting
E. Prohibition

# Impact on Global Climate

The Boreal forests hold large amounts of carbon, and their biomass is so huge and so vital that during the growing seasons, the worldwide levels of carbon dioxide fall and the worldwide levels of oxygen rise. But the world's knowledge of the taiga's importance in the carbon cycle and the control of greenhouse gases is relatively small when compared to other biomes such as the rainforest. More and more scientists are beginning to research the taiga, such as the BOREAS Project in Canada.

The Boreal Ecosystem-Atmosphere Study (BOREAS) is an experiment in the northern boreal forests of Canada. Its goal is to improve our understanding of the boreal forests -- how they interact with the atmosphere, how much $CO^2$ they can store, and how climate change will affect them. They want to learn to use satellite data to monitor the forests, improve computer simulation and weather models so scientists can anticipate the effects of global change. So far the group has learned about the composition of the soil, the water and energy balance, evaporation, and climate in the taiga.

# Ecological Standpoint

Because of the climate, soil, and other conditions, the Taiga is home to fewer plant and animal species than other biomes. Plants have less energy available to them because of the low position of the sun and the soil which contains few nutrients. Since the plants don't have as much energy, the consumers that eat the plants have less energy available to them as well. Also many areas in the Taiga are wet and resemble a bog. Plants have a hard time finding nutrients here and trees do not have sturdy soil to hold their roots.

# Conclusion

Humans have had a huge impact on the Taiga biome. The Taiga is affected by clear cutting, hydroelectric development, and mining. When people remove the forest, the animals are affected greatly by habitat loss. Mining has the soils polluted and streams filled with waste. With hydroelectric development, people also have rerouted streams and rivers, giving a change in fish migration.

# Review

1. What is a Taiga Forest Biome?
2. What types of trees grow in the Taiga Forest Biome?
3. What kind of weather is in the Taiga Forest Biome?
4. Does the Taiga Forest Biome get a lot of rain?
5. Are animals found in the Taiga Forest Biome?

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- https://php.radford.edu/~swoodwar/biomes/?page_id=92
- http://borealbiome.weebly.com/impactsprotect.html

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