



Wildlife What Am I?

Diversity in the Forest

Curriculum Connection

- *Grade 7 Science: Unit A: Interactions & Ecosystems* (STS & Knowledge Outcomes 1-4)
- *Grade 9 Science: Unit A: Biological Diversity* (STS & Knowledge Outcomes 1, 4)
- *Extension – Biology 20: Unit D: Population & Community Dynamics*
- *Extension – Grade 6 Science: Unit E: Trees & Forests*

Objectives

- *Students will determine the identity of different living things in the forest ecosystem and develop an associated food chain for that ecosystem*
- *Students will analyze the effect of several different changes to the normal functioning of the ecosystem*

Lesson/Activity Duration

- One class period

Materials Needed

- *Wildlife What Am I?* Student worksheet - download and print off one copy per student

Classroom Arrangement

- individual

Background Information

The boreal forest ecosystem is a complex interaction of both abiotic (non-living) and biotic (living) components. Understanding the interdependence of organisms is made easier by organizing biotic components of the ecosystem into food webs and *food chains*. A food web shows mainly the feeding relationships in an ecosystem, while a food chain develops those feeding relationships into a series of *trophic levels* based on the way each individual *producer* and *consumer* gets its food. This interdependence means that changes in ecosystem balance from natural disturbance and human activities can have an immediate effect on individual organisms and long-term effects on the whole food chain.

Important Vocabulary

- **Producer** – makes its own food; usually photosynthesizing plants/lichen that support all other trophic levels in the food chain
- **Primary consumer** – herbivores (eat plants, algae, lichen)
- **Secondary consumer** – carnivores that eat herbivores
- **Tertiary consumer** – carnivores that eat herbivores and other carnivores
- **Trophic level** – division of organisms based on how they get their food (i.e. grasses are in the first trophic level, or producers)
- **Food chain** – how food is moved through the ecosystem from trophic level to trophic level, beginning with producers

Procedure

- Hand out one copy of *Wildlife What Am I?* student worksheet to each student
- Review vocabulary listed above before starting



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- Have students follow instructions on worksheet and work through questions.
- Discuss answers

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Answer Key

Part 1:

- lichen
- caribou
- grey wolf
- snowshoe hare
- grass
- aspen poplar
- deer mouse
- chokecherry
- white spruce
- yellow warbler
- forest tent caterpillar

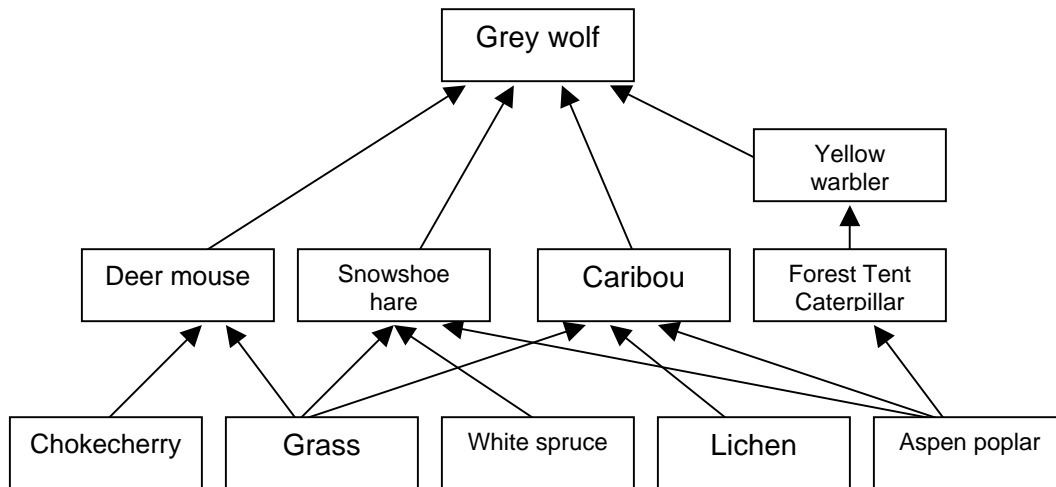
Part 2:

Tertiary
Consumers

Secondary
Consumers

Primary
Consumers

Primary
Producers



Part 3:

- positive – opens up the forest for sun-loving species to grow (grass, aspen) and can mean more food for forest tent caterpillar, yellow warblers and grey wolves in turn; negative – white spruce is a food source in the winter for snowshoe hare populations, so may be tougher for them to find winter food, and lichen that caribou eat grow mainly in spruce forests on or under spruce trees and may be adversely affected
- positive – aspen (a major food source for several animals in the food chain) remains available as a food source; negative – yellow warbler populations could decrease due to a lack of food and company would have to be very careful with the spray to make sure that it can't be transferred to the songbird indirectly by eating caterpillars who have been sprayed



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- c) reduction in the amount of lichen available for caribou, increase in grasses and forbs that snowshoe hare can eat, less protection for caribou (who spend a lot of their time in wetland forests) from grey wolf

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Name: _____

Part 1: Wildlife Riddles

The following organisms are all commonly found in Alberta's boreal forest and aspen parkland ecosystems. Using the riddle clues below, identify the organisms:

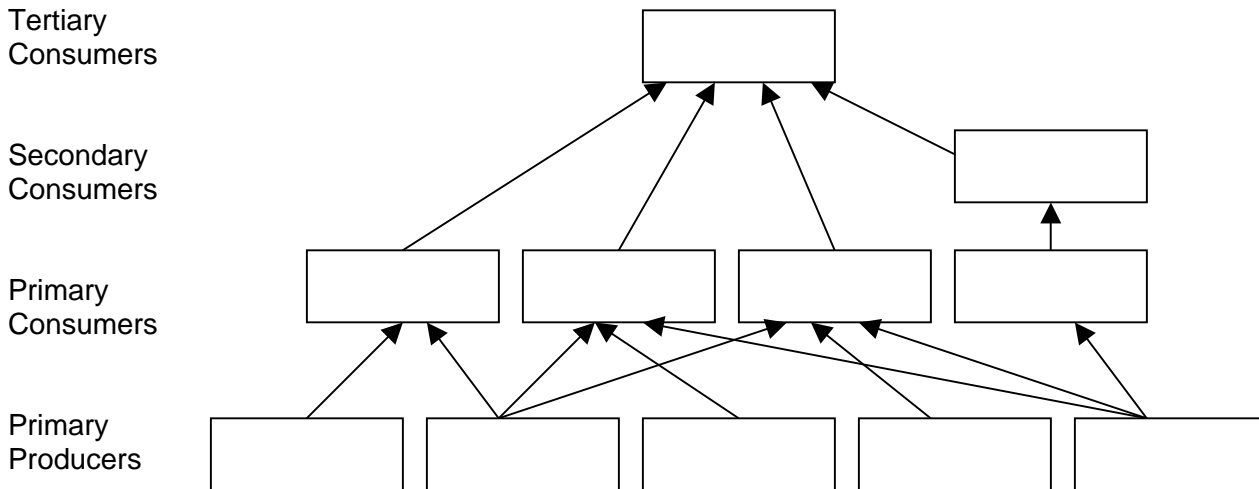
- a) I am a combination of an algae and a fungus. There are more than 500 different types of me in Alberta's boreal forest and aspen parkland. I am the favorite food of the woodland caribou. (cenlih)

- b) I am the rarest member of the deer family in Alberta. Both the males and females of my species have antlers and I spend most of my time in older, wetland forests. (ubiarco)

- c) I am an effective hunter both alone and when I'm in a pack. I belong to a very strong social group. (eyrglofw) _____
- d) Found across North America from Alaska to New Mexico, I am adapted to northern winters with my wide hindfeet and camouflaged fur (brown in the summer, white in the winter). I am also the primary prey species of the lynx. (ssonewhorhea) _____
- e) I am a sun-loving plant species that is well-adapted to many different growing conditions. There are over 100 different types of me in the boreal forest, although some species were introduced by Europeans. (srasg) _____
- f) As the most widely distributed deciduous tree across North America, my smooth white bark is a common sight in the boreal forest. I am a good winter food source for many animals in the forest – as my inner bark and twigs are tasty and stay above the snow. (speanpploar) _____
- g) With my distinctive coloring that looks like the much larger white-tailed deer, I am one of the most common rodents in the boreal forest. I am one of the few animals active in the winter above the snow, but that makes me prime prey for owls and other predators. (eerduoesm) _____
- h) My bright red or dark purple berries and hard wood make me a very distinctive shrub in the boreal forest. (kcheoreryc) _____
- i) As one of the most widespread coniferous trees in the boreal forest, my distinctive Christmas tree shape makes me easy to identify. You can often find deer and other animals bedding down underneath the wide blanket of my branches in the winter. (thiweruspec) _____
- j) I am one of the most common songbirds found in the boreal forest of Alberta. My bright color reminds many people of a canary and my 'warbling' call is very common in many aspen poplar forests. (wolyelbraerwl) _____
- k) My reputation as a 'pest' often precedes me, but I am an important part of the forest ecosystem, providing food to many bird species. The 'keyhole' pattern on my back gives me a distinctive look. (estorfnttelatacelrip) _____

Part 2: A Boreal Food Chain

Using the organisms from above, fill out the food chain below.



Part 3: A Balancing Act in the Forest

Pick two of the following situations and answer the question listed:

- There is an outbreak of spruce budworm (an insect that can cause the eventual death of white spruce trees if the outbreak continues for more than five years) in an area of the boreal forest. What is one positive effect and one negative effect that this may have on the food chain you have just completed above?
- A forest company decides to try out a new insecticide spray to kill the forest tent caterpillar that is eating the leaves of the aspen trees they use for making wood products. What is one positive effect and one negative effect that this may have on the food chain you have just completed above?
- Several wetland forests in the area have been cleared and drained to harvest peat moss for urban gardens and to make room for agricultural development. Give two examples of how this will affect the food chain above.