

# THE WABANAKI-ACADIAN FOREST

## Lesson Plan Grade 7

### Learning Outcomes

Components of an Ecosystem  
Food Chains, Food Webs  
Ecological Succession  
Action  
People Place and Environment

### Concepts

Cause and Effect  
Scientific Reasoning  
Similarity and Diversity  
Stewardship and Sustainability

### Themes

Environmental Action  
Climate Change

### CONTENTS

- The Wabanaki-Acadian Forest Ecosystem
- Representative Species At Risk
- Eco-Web, Gamify Learning, Take a Walk, and other Activity Ideas
- Ways to Take Action



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For more on moose and other species at risk/forest topics:  
[www.naturens.ca](http://www.naturens.ca) [info@naturens.ca](mailto:info@naturens.ca)



# THE WABANAKI-ACADIAN FOREST



The forest in Nova Scotia is part of the Wabanaki-Acadian forest ecoregion, a mixed maritime forest characterized by cold winter and wet temperate summers. Historically, the Wabanaki-Acadian forest was rich in biodiversity with more than 60 different species of trees and even more shrubs, herbs, mosses, mammals, birds, reptiles, fish, and other forest-dwelling organisms. The forest has changed dramatically since European settlement and many components of this ecosystem have, unfortunately, become quite rare.



Above: Less than one percent of old growth forest found in the original Wabanaki-Acadian forest, like this Hemlock stand, remains today. Photo: Elmar Langle, cc

This booklet is intended for Grade 7 science teachers and provides background information and activity suggestions for use with Nova Scotia's 2022 renewed science curriculum.

If you are teaching a different grade level, we hope that you will still find this booklet relevant. Most of the activity suggestions can easily be adapted for different ages.

Below: Sun over River Lake in Eskikewa'kik (also known as Eastern Shore Nova Scotia) Photo: Will Crocker, used with permission



## WHAT'S IN A NAME?

The name "Acadian forest" has been applied to the region that encompasses the Gaspé peninsula of Quebec, New Brunswick, Prince Edward Island, Nova Scotia, and parts of New England. This area is known as Wabanakik (the "Dawnlands") by Indigenous peoples. The Wabanaki confederacy was formed in the 1600's and included several Eastern Algonquin nations - the Abenaki, Penobscot, Passamaquoddy, Wolastoqiyik, and Mi'kmaq Peoples. Indigenous languages and the worldviews they inform contain thousands of years of knowledge about the natural history of this area. In the spirit of reconciliation and in acknowledging the importance of preserving that knowledge as we collaboratively work toward conserving the forests of Wabanakik, this booklet refers to this ecoregion as the Wabanaki-Acadian forest.

# THE WABANAKI-ACADIAN FOREST ECOSYSTEM

## Activity Idea: Term Search!

Get your students to look up the definitions of the words **bolded** in this lesson plan



An **ecosystem** is a biological community of interacting organisms and their physical environment. This section highlights some **species at risk** that are part of the **Wabanaki-Acadian** forest ecosystem. To find more connections, search for species at risk in Nova Scotia and read more about the habitat that each species calls home. Dwindling healthy forest habitat is a challenge facing many **organisms** in our province, not just those that have been classified as at risk. The information and activities in this section align with the Grade 7 science outcome: *Learners will analyse the interconnectiveness of living things and the environment, in relation to the concept of Netukulimk.*

## AMERICAN MARTEN

Also known as the pine marten, these small **mammals** live in mature **softwood** and mixed wood forests. Their **population** was decimated by unregulated trapping from 1700-1900. The species was reintroduced to the Liscomb Game Sanctuary in 1956 and in Kejimikujik National Park between 1986-1990. Unamaki/Cape Breton Island is also home to a small remnant population of martens. They are now protected as an **endangered species**, but the population has been slow to recover due to **habitat loss** and **degradation**. Citizens are asked to contact the Department of Natural Resources and Renewables to report marten sightings. This helps with tracking the recovery of this species. The American Marten features prominently in Mi'kmaq legend. To learn more, visit the [Unama'ki Institute of Natural Resources](#).



An American Pine Marten  
Photo: tashad15, iNaturalist (CC-BY-NC)



## Activity Idea: Create an Eco-web!

Help your students understand the interconnections between plants and animals in a hands-on way by having them work together to create a web with string. Each student is assigned a role (a species, for example.) To illustrate what happens when the web is broken, have one student drop their piece (representing the extinction or extirpation of their species). The web on the left is based on the American marten and includes its habitat, prey, and predators. American martens also eat nuts and berries in the summer and are excellent seed dispersers.

Example roles you might assign: red squirrel, red spruce, american marten, eastern coyote, deer mouse, meadow vole, snowshoe hare, human hunter, disease, drought, climate change, etc...

# THE WABANAKI-ACADIAN FOREST ECOSYSTEM

## CHIMNEY SWIFT

These small birds have dark brown plumage and a pale throat. They historically nested in large hollow trees but have adapted to European settlement by also nesting in chimneys, as dead trees have since disappeared from the forest. The swift's primary source of food is insects, so they prefer living near **lakes** and **wetlands**.

**Logging, wetland loss, and pesticide** use are threats to the survival of this species because they reduce the number of big, hollow trees available for roosting and reduce insect prey populations. The Robie Tufts Nature Park in Wolfville contains an old chimney from an abandoned building. When it was discovered that chimney swifts were roosting at this site, the chimney was left standing while the rest of the building was torn down. Chimney swifts can be observed at this park when they return from migration each spring.



Photo: Jason Headley, iNaturalist (CC-BY-NC)



Photo by Greg Turner, iNaturalist (CC-BY-NC)

## BLUE FELT LICHEN

Nova Scotia's provincial **lichen** is a species at risk that is considered **vulnerable**. The colour of this blue-gray leaf-like lichen is more pronounced when it is wet. It has ridges, scalloped edges, and red spore sacs. The lichen reproduces by releasing spores into the air. Only spores that land on a suitable host site and encounter the necessary **cyanobacteria** in the atmosphere will be established as new lichens. This type of lichen can be found in cool, wet, foggy mixed wood coastal forests. It typically grows on the trunks of hardwood trees near streams or lakes because it needs humidity to thrive. Threats to the blue felt lichen include **air pollution, habitat loss** due to **forestry** practices, and **development**. Blue felt lichen is also very sensitive to **acid rain**.

### Activity Idea: Gamify Learning!

The information for this section has been drawn, in part, from a series of Species at Risk trading cards created by Nature Canada, Nature NB, and the Young Naturalists Club. Your students could choose a species at risk to research and design their own trading cards. These cards could be printed so that each student has a complete set of trading cards. This activity could incorporate learning about how to protect Species at Risk with the trading cards posted on a bulletin board along with ideas from your class regarding stewardship of Nova Scotia's natural places. Students could also be encouraged to report sightings of Species at Risk with records being kept on a map or bar graph in the classroom.



species at risk trading cards

**Blanding's Turtle (NS, pop.)  
Tortue mouchetée (pop. de la N.-E.)**  
(*Emydoidea blandingii*)

PHOTO: SARAH GILL

**DESCRIPTION**

- medium sized freshwater turtle (18-25 cm) with high domed, helmet-shaped shell
- shell is dark grey (when dry) with yellowish flecks (when wet); long neck with bright yellow chin and throat

**LEGAL STATUS:**  
CAN: Endangered  
NS: Endangered

CAN: SARA status as of 2017  
www.sararegistry.gc.ca

Interesting Fact: their lifespan can be longer than 80 years



species at risk trading cards

**Blue Felt Lichen  
Dégélie plombée**  
(*Degelia plumbea*)

PHOTO: SARAH GILL

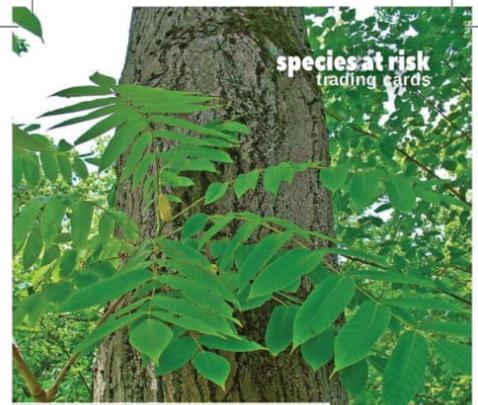
**DESCRIPTION**

- large, blue-grey, leaf-like lichen with ridges and scalloped edges on dark blue-black fungal mat backing, 5-10 cm in diameter
- covered in numerous red spore sacs

**LEGAL STATUS:**  
CAN: Special Concern  
NS: Vulnerable  
NB: Special Concern

CAN: SARA status as of 2017  
www.sararegistry.gc.ca

Interesting Fact: lichen is two organisms coexisting (fungus and alga)



species at risk trading cards

**Butternut  
Noyer cendré**  
(*Juglans cinerea*)

PHOTO: R. ZELL

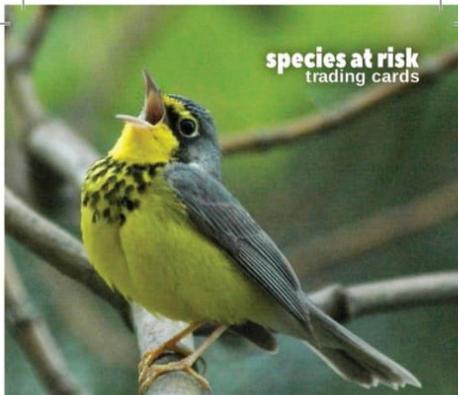
**DESCRIPTION**

- small to medium-sized tree with broad, irregular shape (60 m tall)
- member of walnut family with distinct compound leaves of 11-17 leaflets arranged in feather pattern

**LEGAL STATUS:**  
CAN: Endangered  
NB: Endangered

CAN: SARA status as of 2017  
www.sararegistry.gc.ca

Interesting Fact: it takes 20 years to start producing nuts, which are edible



species at risk trading cards

**Canada Warbler  
Paruline du Canada**  
(*Cardellina canadensis*)

PHOTO: CARL SANDOZ

**DESCRIPTION**

- small songbird (12-15 cm) with thin pointed bill
- blue-grey with yellow throat and breast; necktie of black stripes across the breast with yellow "spectacles" around the eyes

**LEGAL STATUS:**  
CAN: Threatened  
NS: Endangered  
NB: Threatened

CAN: SARA status as of 2017  
www.sararegistry.gc.ca

Interesting Fact: last to arrive in the spring and first to leave in winter



species at risk trading cards

**Gypsy Cuckoo Bumble Bee  
Psithyre bohémien**  
(*Bombus bohemicus*)

PHOTO: MAR LEGRIS

**DESCRIPTION**

- large bee (17-18 mm)
- similar colouring pattern to Bumble Bee but with distinctive white-tipped abdomen

**LEGAL STATUS:**  
CAN: Endangered  
NB: Endangered

CAN: SARA status as of 2017  
www.sararegistry.gc.ca

Interesting Fact: they are a social parasite of the Bumble Bee



species at risk trading cards

**Olive-sided Flycatcher  
Moucherolle à côtés olive**  
(*Contopus cooperi*)

PHOTO: BOB DEVLIN

**DESCRIPTION**

- medium songbird (18-20 cm) with large head; large dark bill and short tail
- brownish olive-grey face, back, and sides; wings are dark; throat, centre of breast, and belly are white

**LEGAL STATUS:**  
CAN: Threatened  
NS: Threatened  
NB: Threatened

CAN: SARA status as of 2017  
www.sararegistry.gc.ca

Interesting Fact: their 3 note song sounds like "quick, free bee!"



species at risk trading cards

**Ram's Head Lady's Slipper  
Cyripède tête-de-bélier**  
(*Cypripedium arietinum*)

PHOTO: ALAN BELLIVEAU

**DESCRIPTION**

- small perennial orchid (10-40 cm tall), which can survive up to 20 years
- fuzzy, small, white flowers with purplish veins on their tops, and a pinkish-purple lip below; three leaf-like petals droop from the flowers

**LEGAL STATUS:**  
CAN: Not Listed  
NS: Endangered

CAN: SARA status as of 2017  
www.sararegistry.gc.ca

Interesting Fact: it resembles a charging ram with its head down



species at risk trading cards

**Canada Lynx  
Lynx du Canada**  
(*Lynx canadensis*)

PHOTO: GETTY IMAGES

**DESCRIPTION**

- shy, medium-sized cat (80-90 cm long) with long legs and large paws
- winter coat is mottled greyish, changing to reddish brown in the summer; black tips on long ear tufts and short tail

**LEGAL STATUS:**  
CAN: Not Listed  
NS: Endangered  
NB: Endangered

CAN: SARA status as of 2017  
www.sararegistry.gc.ca

Interesting Fact: their large hairy paws act like snowshoes in deep snow



species at risk trading cards

**Common Nighthawk  
Engoulevent d'Amérique**  
(*Chordeiles minor*)

PHOTO: CARMELLA MELANCON

**DESCRIPTION**

- medium bird (24 cm) with flat head, large eyes, small bill, and long, notched tail
- mottled dark brown, black, and white plumage; light patch on throat; white patch across underside of long, slender wings

**LEGAL STATUS:**  
CAN: Threatened  
NS: Threatened  
NB: Threatened

CAN: SARA status as of 2017  
www.sararegistry.gc.ca

Interesting Fact: males make a booming noise with their wings when they dive

**species at risk trading cards**

**Butternut / Noyer cendré**  
(*Juglans cinerea*)

Taxonomy: Vascular Plant Found: ON, QC, NB

- Habitat**
- they make up minor components of deciduous stands along the Saint John River, NB
  - like rich, moist, well-drained soils; does not tolerate shade, so is often found in clearings and along streams
  - oval, husk-covered nuts ripen from Sept to Oct; flowers from April to June

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| <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>a fungus called Butternut canker that has no cure</li> <li>logging and development of land</li> </ul> | <p><b>How to Help</b></p> <ul style="list-style-type: none"> <li>plant Butternut trees in your community</li> <li>protect and don't remove existing trees if possible</li> </ul> |
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For more information: [www.yncns.ca](http://www.yncns.ca) | [www.naturenb.ca](http://www.naturenb.ca)



**species at risk trading cards**

**Blue Felt Lichen / Dégélie plombée**  
(*Degelia plumbea*)

Taxonomy: Lichen Found: NB, NS, NL

- Habitat**
- found in cool, wet, foggy mixed wood coastal forests
  - grows on the trunks of mature hardwood trees and Balsam Firs in depressions that are poorly drained and dominated by mosses and ferns

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| <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>sensitive to air pollution and acid rain (is an indicator of local air quality &amp; air pollution)</li> <li>habitat loss due to forestry practices and development</li> </ul> | <p><b>How to Help</b></p> <ul style="list-style-type: none"> <li>learn how to recognize it but do not collect specimens</li> <li>purchase wood that has been sustainably harvested</li> </ul> |
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For more information: [www.yncns.ca](http://www.yncns.ca) | [www.naturenb.ca](http://www.naturenb.ca)



**species at risk trading cards**

**Blanding's Turtle / Tortue mouchetée**  
(*Emydoidea blandingii*)

Taxonomy: Reptile Found: NS

- Habitat**
- NS population is only found in southwestern part of province
  - found from spring to fall in freshwater wetlands with dense aquatic vegetation, and dark, slow-moving waters with muddy bottoms
  - need exposed gravelly, sandy areas for nesting in June, and permanent pools for hibernating underwater over winter

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| <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>road mortality and collection for pet trade</li> <li>habitat loss and degradation</li> <li>increased population of predators eating their eggs and hatchlings</li> </ul> | <p><b>How to Help</b></p> <ul style="list-style-type: none"> <li>do not disturb them or take them as pets</li> <li>watch and avoid turtles on the road, especially in late May to early July</li> <li>report sightings: <a href="http://www.speciesatrisk.ca">www.speciesatrisk.ca</a></li> </ul> |
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For more information: [www.yncns.ca](http://www.yncns.ca) | [www.naturenb.ca](http://www.naturenb.ca)



**species at risk trading cards**

**Olive-sided Flycatcher / Moucherolle à côtés olive**  
(*Contopus cooperi*)

Taxonomy: Bird Found: YT, NWT, BC, AB, SK, MB, ON, QC, NB, NS, PE, NL

- Habitat**
- prefer coniferous forest edges and openings where there are lots of tall trees and snags for them to perch on so they can launch and catch insects
  - found April to Sept in open areas along forest edges
  - winters in South America

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| <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>forestry practices such as clearcutting and monoculture planting</li> <li>loss of wintering habitat in South America</li> <li>pesticide use killing insects and reducing food source</li> </ul> | <p><b>How to Help</b></p> <ul style="list-style-type: none"> <li>don't use pesticides in your garden</li> <li>support sustainable forestry operations and products</li> <li>more info: Maritime Breeding Bird Atlas <a href="http://www.mba-aom.ca">www.mba-aom.ca</a></li> </ul> |
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For more information: [www.yncns.ca](http://www.yncns.ca) | [www.naturenb.ca](http://www.naturenb.ca)



**species at risk trading cards**

**Gypsy Cuckoo Bumble Bee / Psithyre bohémien**  
(*Bombus bohemicus*)

Taxonomy: Arthropod Found: YT, NWT, BC, AB, SK, MB, ON, QC, NB, NS, PE, NL

- Habitat**
- once found throughout Canada, but now found mainly in ON, QC and NS
  - found in diverse habitats from rural to urban areas where they can feed on plant pollen and nectar
  - in spring, they lay their eggs in nests made by other Bumble Bees (underground and in rotten logs) so host colonies will rear their young

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| <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>decline of host Bumble Bees</li> <li>pesticide use (especially neonicotinoids)</li> </ul> | <p><b>How to Help</b></p> <ul style="list-style-type: none"> <li>don't use pesticides in your garden</li> <li>plant native flowering plants in your garden to provide nectar and pollen</li> </ul> |
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For more information: [www.yncns.ca](http://www.yncns.ca) | [www.naturenb.ca](http://www.naturenb.ca)



**species at risk trading cards**

**Canada Warbler / Paruline du Canada**  
(*Cardellina canadensis*)

Taxonomy: Bird Found: YT, NWT, BC, AB, SK, MB, ON, QC, NB, NS, PE, NL

- Habitat**
- found in moist mixed deciduous/coniferous forests where there is a well-developed shrub layer
  - nest close to the ground in dense vegetation or logs from late May to mid Aug
  - winter in the cloud forests of South America

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| <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>habitat loss and fragmentation in summer and winter habitats</li> <li>window collisions and domestic cat predation</li> </ul> | <p><b>How to Help</b></p> <ul style="list-style-type: none"> <li>buy shade-grown, bird-friendly coffee</li> <li>keep your cat indoors</li> <li>reduce window collisions (see: <a href="http://www.flap.org">www.flap.org</a>)</li> </ul> |
|--|--|

For more information: [www.yncns.ca](http://www.yncns.ca) | [www.naturenb.ca](http://www.naturenb.ca)



**species at risk trading cards**

**Common Nighthawk / Engoulevent d'Amérique**  
(*Chordeiles minor*)

Taxonomy: Bird Found: YT, NWT, BC, AB, SK, MB, ON, QC, NB, NS, PE, NL

- Habitat**
- these aerial insectivores can be seen mid April to Sept feeding on insects at dusk and dawn; winter in South America
  - varied breeding habitats include open areas with little vegetation like sand dunes, forest clearings, rock outcrops and pastures; eggs are laid directly on bare soil

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| <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>reduction of habitat due to fire suppression and agricultural practices</li> <li>reduction of food availability due to light pollution and pesticides killing insects</li> </ul> | <p><b>How to Help</b></p> <ul style="list-style-type: none"> <li>turn off your outdoor lights to minimize light pollution</li> <li>keep your cat indoors to protect ground-nesting species</li> <li>don't use pesticides in your garden</li> </ul> |
|---|--|

For more information: [www.yncns.ca](http://www.yncns.ca) | [www.naturenb.ca](http://www.naturenb.ca)



**species at risk trading cards**

**Canada Lynx / Lynx du Canada**  
(*Lynx canadensis*)

Taxonomy: Mammal Found: YT, NWT, BC, AB, SK, MB, ON, QC, NB, NS, NL

- Habitat**
- found in coniferous forests that have areas of disturbance and regeneration that provide a diversity of habitats for denning and shelter
  - like deep winter snow where Snowshoe Hares live (their favourite prey)
  - located only in elevated areas of Cape Breton NS, and northern NB

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| <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>trapping has reduced the population</li> <li>forestry activities causing habitat fragmentation</li> <li>climate change may cause warmer winters and disrupt Snowshoe Hare populations</li> </ul> | <p><b>How to Help</b></p> <ul style="list-style-type: none"> <li>learn to recognize the species and report sightings</li> <li>support sustainable forestry practices</li> <li>reduce your greenhouse gas emissions to reduce climate change</li> </ul> |
|---|--|

For more information: [www.yncns.ca](http://www.yncns.ca) | [www.naturenb.ca](http://www.naturenb.ca)



**species at risk trading cards**

**Ram's Head Lady's Slipper / Cyripède tête-de-bélier**  
(*Cypripedium arietinum*)

Taxonomy: Vascular Plant Found: SK, MB, ON, QC, NS

- Habitat**
- found in moderately open forests with cool soils and neutral pH that are associated with rough country woodlands, outcrops, cliff tops, and steep slopes in Hants and Cumberland Counties of NS
  - seeds require the presence of fungi in the soil to grow; blooms from late May to early June

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| <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>collection by humans</li> <li>competition with exotic species</li> <li>habitat loss and destruction due to forestry, mining, and off-road vehicles</li> </ul> | <p><b>How to Help</b></p> <ul style="list-style-type: none"> <li>do not pick or remove plants to put in your garden because it's illegal</li> <li>report sighting to <a href="http://www.speciesatrisk.ca">www.speciesatrisk.ca</a></li> </ul> |
|--|--|

For more information: [www.yncns.ca](http://www.yncns.ca) | [www.naturenb.ca](http://www.naturenb.ca)



# THE WABANAKI-ACADIAN FOREST ECOSYSTEM

## RAM'S HEAD LADY'S SLIPPER

This **perennial** orchid has fuzzy, small, white flowers with purplish veins on their tops, and a pinkish-purple lip below. Three leaf-like petals droop from the flowers. The ram's head lady's slipper can be found in **deciduous** forests with cool soils and neutral **pH**, often near **gypsum** mines. The seeds need the presence of certain **fungi** in the soil to grow. Threats to the lady's slipper include human collection, competition with **exotic species**, and habitat loss and destruction due to forestry, mining, and off-road vehicles.



Photo by mlarocque1962, iNaturalist (CC-BY-NC)

### Activity Idea: Citizen Science in Action!

iNaturalist is an app that can be used to record observations of plants and animals. It is used by naturalists who can help you identify species you have observed. Additionally, the observations that you record can be accessed by scientists who are trying to understand when and where organisms occur. Since most students likely have access to a cell phone, you could run a class bioblitz. A bioblitz is a challenge for your class to record observations of as many different species as possible. If you are not able to take your class on a field trip, encourage your students to make observations during their lunch breaks or write a letter to families informing them of the challenge and encouraging nature walks. Students who enjoy the app could try earning a Biodiversity Challenge Badge from Hike NS and Nature Nova Scotia. See [www.hikenovascotia.ca](http://www.hikenovascotia.ca) for more!

### Activity Idea: Species Stories!

Have your students choose a species at risk to write a story about. They can explore connections to other species (at risk, or not) and tell the story of how the ecosystem would be impacted if their species was no longer present.



**iNaturalist**



# ADAPTATION IN THE LONG LIFE OF A TREE

When we think of **adaptation**, we tend to focus on animals that have relatively short life spans. One benefit of this approach is that it is easier for us to track adaptations within our own lifespan. How can we learn about the adaptations of trees when they live for so much longer than humans do?

The information and activities in this section align with the Grade 7 science outcome: *learners will investigate factors that affect species adaptation and evolution.*

Most of the old Hemlock forest present before European settlement has been lost. In 2021, a team of scientists took **core samples** from several trees in an old growth stand near Hubbards, NS. One of the samples confirmed that they had found an eastern hemlock that was 532 years old. This tree is the oldest on record in the Maritimes!

The eastern hemlock is different from many other **conifers** in that it happily grows in wet shadey environments. This may have saved the few old trees that escaped the rise of industrial forestry, as many are found in inaccessible places like wet ravines.

The eastern hemlock is currently threatened by the **hemlock woolly adelgid**, a sap sucking insect that attacks and kills hemlocks. This **invasive** insect has been observed in established hemlock forests in Kespukwitk/Southwest Nova Scotia. Natural Resources Canada's Hemlock Woolly Adelgid Management Plan includes a recommendation to collect eastern hemlock seeds for preservation of genetic diversity of this tree species. Seeds are stored at the National Tree Seed Centre (NTSC) in Fredericton, New Brunswick. The NTSC houses over 13,000 unique seed collections from more than 200 tree and shrub species.



Old growth hemlock stand in Lunenburg County, NS  
Photo by Colin Gray, iNaturalist (CC-BY-NC)

**Dendrochronology** is the science of tree ring analysis. Studying the rings of trees can tell us many things about environmental conditions during the lifespan of a tree. This [handout](https://cfs.nrcan.gc.ca/pubwarehouse/pdfs/38898.pdf) from Natural Resources Canada highlights five things you can learn from tree rings. (<https://cfs.nrcan.gc.ca/pubwarehouse/pdfs/38898.pdf>)



Healthy hemlock  
Photo: David Erickson, iNaturalist  
(CC-BY-NC)



Hemlock woolly adelgid  
Photo: Scott Morris, iNaturalist  
(CC BY 4.0)

# TREES OF THE WABANAKI-ACADIAN FOREST

Like many skills, learning to identify trees requires lots of first-hand experience. There are so many different groups and species of trees that learning to identify them all can feel like an impossible task. In this booklet, tree identification is broken into two sections: coniferous trees and deciduous trees. Making this distinction is a good first step for youth who are new to tree identification. This section focuses on providing tips for identifying some of Nova Scotia's common trees. Taking photographs of trees during a nature walk is one good way to recall and analyze the different species observed in your area, and it lets you share your sightings with experts who can help you identify them!

## CONIFEROUS TREES: DISTINGUISHING BETWEEN SPRUCE, FIR, AND PINE TREES



Spruce branch

Photo: Joseph Petch, iNaturalist (CC-BY-NC)



Fir branch

Photo: Greg Turner, iNaturalist (CC-BY-NC)



Pine branch

Photo: Becky Parker, used with permission

**Activity Idea: Take a Walk!** Make tree identification into a hands-on experience for your class by going for a nature walk or bringing some samples of spruce, fir, and pine branches or needles into your classroom. Pine trees can be distinguished from spruce and fir because their needles grow from the twig in clusters of 2-5. Spruce and fir are a bit more difficult to distinguish. Fir needles are flat, so will not roll between your fingers. You can use alliteration to remember this - fir=flat. Spruce needles are square and will roll between your fingers. The alliteration trick can help you remember this as well - spruce=square. If you want to challenge your students, try including a larch (tamarack/hackmatack) tree in your identification activity. Bonus points could go to students who know that larch is a unusual coniferous tree that drops its needles in the winter, like deciduous trees!

Quick Tip: If you don't know many experts in tree identification, the iNaturalist app can be a good resource. Information generated within this app is created by users, so it is important to question accuracy and obtain verification from alternate sources.

# TREES OF THE WABANAKI-ACADIAN FOREST

## DECIDUOUS TREES: DISTINGUISHING BETWEEN ASH, BEECH AND BIRCH BY EXAMINING LEAVES

Ash, birch and beech trees all have elliptical leaves, so how can you tell them apart?



Ash leaves

Photo: bdebc, iNaturalist (CC-BY-NC)



Beech leaves

Photo: inat\_nat, iNaturalist (CC-BY-NC 4.0)



Birch leaves

Photo: thebailliekid, iNaturalist (CC-BY-NC)

Ash leaves are **compound**, which makes them relatively easy to distinguish. Compound leaves refer to many leaflets growing out of a single stem. By contrast, **simple** leaves refer to a single leaf. Beech and birch leaves are examples of simple leaves. Beech and birch leaves can sometimes be distinguished by their shape. Beech leaves tend to be narrow at the stem and point, forming an oval. Birch leaves are sometimes wider at the stem end than at the point, forming an almost heart shape. Another, perhaps more reliable, way to tell these two types of trees apart is to look at their bark. Birch trees have a distinctive papery bark.



Beech bark

Photo: David McCorquodale, iNaturalist (CC-BY-NC)



Birch bark

Photo: Sebastian Pardo, iNaturalist (CC-BY-NC)

### Quick Tip:

Take a field guide when you go walking in the woods. *East Coast Trees & Shrubs* by Jeffrey C. Domm is a visual guide to Atlantic Canadian species that fits easily into a backpack.

# TREES OF THE WABANAKI-ACADIAN FOREST

## Activity Idea: Leaf Observation

Many students in Grade 7 will already be familiar with the distinctive shapes of oak and maple leaves, and may be interested in learning more about how these trees change through the seasons. If there is an oak or maple tree on your school grounds, you could lead a long-term observation of the tree throughout the school year. What do the leaves look like in late summer? What colour do they change to in the autumn? When do they fall from the tree? When does the tree drop its seeds? Are there any birds, animals, or insects observed on or around the tree? Can students observe seeds being dispersed? When do you begin to see buds forming in the spring? How long does it take for the leaves to emerge? To get an idea of the impact that trees have on their ecosystems, you could set up a thermometer in the shade of a large tree and compare the temperature in this location to the temperature in an unshaded area. Students could be encouraged to collect leaves from the tree in the autumn for a collage. These leaves could be used to demonstrate the different parts of the leaves and to support a discussion on photosynthesis.



Oak leaves

Photo by Sybil Nunn, iNaturalist (CC-BY-NC)



Maple leaf

Photo by Sybil Nunn, iNaturalist (CC-BY-NC)

This section describes a small selection of trees that can be found in the Wabanaki-Acadian forest. Students could be encouraged to learn about trees that are not included in this booklet. How can these trees be identified? Where are they most likely to grow? How long do they live? What have people (Mi'kmaq or settlers) used the trees for historically? Perhaps science and creative writing could both be incorporated into an assignment where students write a story from the perspective of an old tree. They could include facts about the tree as well as some of the historical events that the tree has witnessed during its lifespan.

## Activity Idea: Ecological Investigation

Oaks and maples tend to not get along. Why might that be? Have your students research the habitat needs of these two different tree groups (including soil conditions, light availability, etc) and list reasons that might explain why you don't often find the two growing side by side.

# FASCINATING FACTS ABOUT TREES

Trees communicate by releasing pheromones into the air. When elms and pines are infested with leaf-eating caterpillars, they release pheromones to attract wasps that are natural predators of the caterpillars.

Big, old trees, also referred to as mother trees, support younger trees in the forest by sharing sugar, water, carbon, nitrogen and phosphorus through their root networks. Research has shown that when mother trees are cut down in a forest the survival rates of younger trees are reduced.

People feel better after being around trees. Research has shown that exposure to chemicals released by trees has been related to reduced blood pressure, reduced anxiety and increased pain threshold.

Old hemlock trees can grow to 200ft tall and 7ft in diameter.

Climate change is expected to change the distribution of some tree species. Some scientists expect white pine, for example, to struggle with higher winds in more extreme weather events, while wet-adapted red maple is expected to do just fine under more frequent flooding events.

Research has shown that walking in a forest (as compared to an urban area) actually decreases people's cortisol levels. So, having more forested areas could reduce stress levels. If your school yard does not have trees, you could plant some. First, research which type of native trees would be best suited for your habitat and then get planting! You could even take this project one step farther by propagating some trees from seed. Any extra seedlings that you don't have space to plant could be gifted to community members or sold as a school fundraiser.

A single large oak tree can drop as many as 10,000 acorns in a single year - known as a mast year. This adaptation is in response to birds and mammals eating most of the acorns that an oak tree drops.

There is a solar wood kiln (a room for drying freshly cut wood) on the Eastern Shore, at the Deanery Project

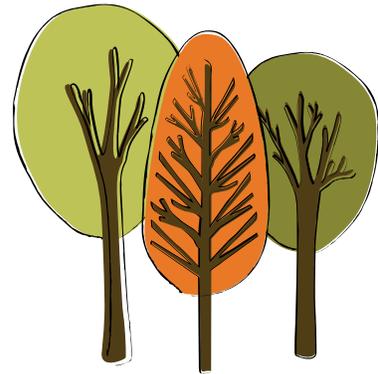
## Activity Idea: Tree Facts

What fascinating tree facts can your class find through an internet search or chat with a scientist? Compile a list of your favourite facts.

# FORESTRY AND SUSTAINABILITY

**Netukulimk** is a Mi'kmaq principle of **resource management** that creates a responsibility to use the earth's resources sustainably. Achieving an acceptable standard of living for humans must be balanced against the integrity and diversity of the environment.

*Take only what you need and waste nothing.*



**Clearcutting** is a forestry practice where most of the trees in an area are cut down and little woody material is left on the land. It is a kind of **even-aged forestry** approach that prioritizes short-term gains over long-term sustainability, and has dominated working forests in Nova Scotia for over 100 years, resulting in significant old forest loss. More information about the legal definition of a clearcut in Nova Scotia can be found at [Nova Scotia Forest Notes](#). In addition to removing the trees themselves, this practice also causes damage to the soil and impacts habitat for other wildlife. It also results in release of much of the carbon that the forest had sequestered.

**Sustainable forestry or ecological forestry** is developing in response to resource exploitation that has decreased the health of Nova Scotia's forests. This approach includes practices intended to mimic the natural processes of the Wabanaki-Acadian forest, like **wind-throw**.

**Monoculture planting** refers to replacing trees that have been cut down with a single species planting. Typically, fast-growing species are selected to maximize the productivity for industrial forestry operations. This practice does not support recovery of biodiversity in areas impacted by clearcutting.

## Activity Idea: Mapping the Forestry Footprint

Do you know whether the forests near you are private or public lands? Do you know if they've been clearcut, selectively cut, or ecologically managed in the past? Make a map of the area surrounding your school/community, big enough to include lots of forest area. Visit the provincial landscape viewer to find out which lands are public (public working lands, public parks and protected areas, etc) and which are privately owned. Can you tell what kind of forest surrounds your school/community? Then, visit the provincial harvest plans viewer to see what government has planned for public lands near you. Which of these harvest types could meet the definition of a clearcut?

[www.novascotia.ca/natr/landscape](http://www.novascotia.ca/natr/landscape)  
[www.nsgi.novascotia.ca/hpmv](http://www.nsgi.novascotia.ca/hpmv)

# WAYS TO TAKE ACTION

The information and activities in this section align with the Grade 7 science outcome:  
*Learners will implement an environmental stewardship plan.*

**Stewardship** is similar to Netukulimk. It means taking care of something, so environmental stewardship means taking care of the environment. People who are committed to taking care of the Wabanaki-Acadian forest are forest stewards.



*Unless someone like you cares a  
whole awful lot, Nothing is going  
to get better. It's not.*

~Dr. Seuss, *The Lorax*



## **Activity Idea: Talk to other people:**

- Write to your MLA to ask what they are doing to protect forests.
- Tell people about the role of the Wabanaki-Acadian forest in preserving biodiversity and fighting climate change.
- Start a school-wide petition asking the provincial government to transition from clearcutting public lands to ecological forestry on public lands.

## **Activity Idea: How "Green" is your class?**

Look around your class and school to see where paper products are being used. For example, tissue, toilet paper, paper towel, paper handouts. Here are some questions to ask:

- Are these paper products from sustainable sources?
- Are they being used responsibly, and not wasted?
- Is paper waste being sorted and disposed of appropriately?

## **Activity Idea: Take the Wabanaki-Acadian forest steward pledge!**

- I will help preserve the Wabanaki-Acadian forest by reducing the amount of paper products that I use and choosing products that are recycled and or sustainably sourced.
- I will protect the Wabanaki-Acadian forest by speaking out against clearcutting and other unsustainable forestry practices, especially when I see them happening on public land.
- I will promote the Wabanaki-Acadian forest by telling my friends and family about what I have learned.