



The Environmental Importance of Trees and Old Growth Forests:

I. Resources:

- [Wachusett's Green Giants](#) Wachusett Mtn tree identifier from the DCR
- [Images of Old Growth trees on Wachusett Mountain and map of 4 forest locations](#)
- [2001 Discovery report of Old Growth at Wach Mtn](#) (Historical primary source)
- [The Lost Forests of New England](#) Excellent video on Old Growth forests covering many of the life science frameworks!

II. Background information:

Some of the basics of the environmental importance of trees :

- Carry out photosynthesis releasing oxygen
- Provide diversity of habitats and shelter to wildlife
- Store carbon in their tissue whether living or dead
- Benefit humans by providing beauty, lumber, shade, roots prevent erosion and water runoff

- III. **Interactive Activity:** View this [slideshow](#) explaining a very cool webtool, MyTree, for assessing individual tree benefits. Students choose a tree in their yard or on their street or one at school. They answer some brief questions about it and promptly are given a full report on the economic and environmental value of the tree over a 20 year period. This is a quick, easy, user-friendly web tool that allows students to collect data that can be used to explore complex real world problems.

- IV. **Life Science Frameworks:** As we aim to teach students how environmental factors (& genes) influence the growth of organisms, we can use evidence found from studying old growth forests for support.

**Three features of old growth forests:**

- 1) multilayered tree canopy (meaning there is a variety of tree species)
- 2) wide range of tree diameters (growth rates varied)
- 3) large accumulation of standing dead and fallen down dead trees

These three features create a variety of plant and animal habitats which promotes biodiversity of wildlife, enriches soil microbial communities, increases carbon storage, and allows for natural competition among tree species.

Definition of an old growth forest:

In the northeastern United States experts agree that Old Growth Forests

- Are at least ten acres in size, which is large enough for them to be self-sustaining.
- Contain trees that are greater than 50% of the maximum known age for a particular species.
- Have not been cleared for agriculture or timber harvest.

The old growth forest on Wachusett Mountain covers more than 160 acres and is broken up into four different forest types. (See map link above) The species specifics of old growth trees on Wachusett Mountain are: yellow birch, red oak, eastern hemlock, black birch, pignut hickory, sugar maple, red maple, red spruce. (see Green Giants of Wachusett link above)

- V. **Why these trees have survived so long** is largely due to their environment. The old growth trees on Wachusett Mountain are located on steep, mountain sides surrounded by boulder fields and ledges, making them difficult to clear for agriculture or timber harvesting. Other environmental factors that contribute to their long lives are the cool temperatures, moist soil and shaded areas up on the mountain. It is also likely that harsh winds and ice allowed for opportunities for rejuvenation of the tree after limbs were shorn off. One example of an old growth tree species on Wachusett Mountain is the Yellow Birch. Some of these trees have lived close to 400 years, which is about how long it has been since the Pilgrims came to Massachusetts! On average, a Yellow Birch in a different environment may live for only about 150 years in the wild.

In the old growth forest video resource [The Lost Forests of New England](#), there are sections (about 19:30 to 23:00) which explain and show how the bark of the same tree will look different as it ages.

- VI. **Interactive idea-** Measure the height of a tree



VII. Curious facts about Yellow Birch

<https://extension.unh.edu/blog/2022/07/fun-facts-about-yellow-birch-new-hampshire>

1. Yellow birch twigs have a **wintergreen taste** from a chemical compound called methyl salicylate. Chemists have since created this compound synthetically to flavor certain candies and add to mouthwash and muscle liniments.
2. Yellow birch seeds germinating in sugar maple stands cannot penetrate sugar maple leaf litter. Sugar maple roots also produce **allelopathic** chemicals that hinder yellow birch seedlings from competing. **That is why yellow birch often germinates best on stumps, nurse logs, and boulders!**
3. **Yellow Birch seeds are an important food source-** Moose, deer, and snowshoe hare prefer to browse on yellow birch seedlings and saplings. The seeds of yellow birch are sought after by a variety of birds such as pine siskins, redpolls, goldfinches, chickadees, and ruffed grouse.