



PEEC

Pocono Environmental
Education Center

Ridgeline

T R A I L G U I D E



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1 WELCOME

Welcome to the Ridgeline Trail (formerly the Sunrise Trail) at the Pocono Environmental Education Center. Give yourself at least 3 hours to hike this looping 4.5 mile trail, which climbs up and over ridges of sedimentary rock (a rope assists your descent at one location), courses around forested wetlands, and dives deep into a mature Hemlock forest following Spackman's Creek. The trail is blazed in yellow. It begins at Cabin 2 and ends on lower campus. It runs along with the Scenic Gorge Trail, blazed in red. Be mindful as to where the trails split and converge. Please return only with fond memories, and leave nature where it belongs. Look for the yellow numbered signs along the trail for the corresponding text.

Caution: As the trail begins its initial ascent through the mixed pine forest, many trees are covered in poison ivy. Note the hairy climbing vine growing up the tree trunks. All parts of this plant in all seasons can cause an irritating rash if it comes in contact with your skin.

2 TAMARACK TREES

Tamarack trees, also called larch, are unique in that they are coniferous (cone-bearing) but not evergreen. Late in autumn, the tree's needle-like leaves turn a bright yellow before dropping. The tamarack trees you see here are European tamaracks (*Larix decidua*) that were planted for various timber usages. The American larch (*Larix laricina*) is a northern species and finds its home in Pennsylvania at high elevations in boggy environments. The tree is easily identified in winter by the abundant small round seed cones that persist on the branches. The seeds are a favorite food for the ruffed grouse (*Bonasa umbellus*) which is the state bird of PA.

The elevated mounds you will pass are part of a series of septic mounds that hold wastewater from PEEC's campus. The mounds are coined 'turkey mounds' as you will often find wild turkeys (*Meleagris gallopavo*) feeding in the lush grass atop these mounds. These open fields in the middle of the forest create edge habitat that benefit both predator and prey. Rodents, eastern cottontail rabbits, wild turkey, and white tailed deer come to feed on seeds and vegetation while hawks, owls, foxes, and coyotes come here to hunt.

3 WITCH HAZEL

In this low moist spot in the terrain, witch hazel (*Hamamelis virginiana*) abounds. It is a small understory tree, growing in multi-stemmed clumps with leaning trunks. A medicinal tree, witch hazel astringent is extracted from the tree and used in making skin lotions and eye-washes. The small yellow flowers have strap-like petals and begin blooming in the winter. The woody seed capsule takes one year to mature and produces



an audible sound as it cracks open to eject 2 shiny black seeds. Look for these opened capsules attached to twig ends.

4 OAK HICKORY FOREST

The forest around you is an example of the major forest type found in the Appalachians called the oak-hickory forest. It is comprised of valuable nut-producing canopy trees like chestnut oak (*Quercus prinus*), white oak (*Quercus alba*), red oak (*Quercus rubra*), black oak (*Quercus velutina*), pignut hickory (*Carya glabra*) and shagbark hickory (*Carya ovata*). It should not be hard to locate various nuts and their coverings beneath your feet. “Bumper crops” of acorns are produced every 2-4 years. A single oak may carry 2000-7000 acorns during such a year. Black bears (*Ursus americanus*), white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*), southern flying squirrels (*Glaucomys volans*), chipmunks and blue jays (*Cyanocitta cristata*), consume these nuts en-masse to bulk up their fat reserves in the fall. At this location the understory is largely shadbush, also called serviceberry (*Amelanchier sp.*). This small tree produces showy white flowers in early spring, and a sweet red edible berry in early summer. The smooth gray bark helps to identify this tree. Blueberry and huckleberry bushes (*Vaccinium sp.*) offer tasty fruits for wildlife throughout the shrub layer.

5 SUCCESSION

Picture the forest around you bare of trees. Most of the Pocono region’s forests were leveled for timber and cleared for agriculture between the 1800’s and early 1900’s. Perhaps there were cattle grazing or vast fields of hay. The soil is very shallow and rocky here, so rocks had to be removed from the field, and were then piled along the field as a stone fence. The fences eventually served well as property boundaries. When farming ceased and these fields were no longer used, nature began the slow process of returning the land to a thriving forested state once again. This process is called succession.

6 SEDIMENTARY ROCK

The ridge that you see is a common feature in the local landscape. Most of the rock apparent in the exposed cliffs and ridgelines are sedimentary formations. This rock was formed during the Devonian era roughly 360 million years ago as silt deposits settled on the bottom of a shallow sea. Under pressure and heat, the silt lithified – cemented together – over time, forming shale. Fossils of marine organisms are often easy to find in this rock. These layers of rock were uplifted during the Alleghenian orogeny – mountain-building event – that occurred 290 million years ago during the Permian Period when Africa collided with North America. Water, wind, and ice have been eroding the land ever since, carving ravines and exposing ridges. These ridges provide den sites for gray fox (*Urocyon cinereoargenteus*), porcupine (*Erethizon dorsatum*), and even black bear (*Ursus americanus*).

7 WETLANDS

Wetlands are classified as “lands where saturation with water is the determining factor in soil development, and the plants and animal communities that exist there” (USFS). Globally, wetlands are the most biologically productive ecosystems. These systems are very fragile and vulnerable to human disturbance. This lush wetland is blanketed with green mosses that function as a sponge for moisture. Various ferns and bountiful wildflowers protrude from hummocks in the spring and summer. The soil is deep and thick with decomposed organic material. It remains shady and cool even in the hottest weather. The canopy is provided by a unique blend of American elm (*Ulmus americana*) and yellow birch trees (*Betula allaghaniensis*) which thrive on organic soils. Look and listen for a variety of birds through spring and summer.



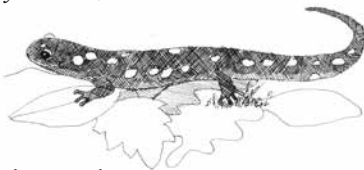
8 WHITE PINE TREE

In front of you is a white pine tree (*Pinus strobus*) that was struck by lightning. Cloud-to-ground lightning occurs when the negatively charged electrons at the cloud base are attracted to the positively charged protons at the ground's surface (opposite charges attract). This creates a conductive path for electricity to travel. A tall tree creates a shorter, easier conductive path for the lightning to travel to the ground. When lightning strikes a tree, the sap instantly “boils” and gases expand causing wood and bark to explode from the tree as the lightning current travels through it. You can see the large plank-like section that exploded from the tree as the electrical current exited the trunk and made its way to the ground.

9 VERNAL POOLS

In shallow depressions throughout the forest, temporary wetlands are created each year following the winter snow melt and early spring rains. These pools are called vernal pools as they coincide with the vernal (spring) equinox. These pools provide essential breeding grounds for thousands of spotted salamanders (*Ambystoma maculatum*), wood frogs (*Rana sylvatica*), spring peepers (*Pseudacris crucifer*), and gray tree frogs (*Hyla versicolor*). Because the pools rarely hold water all year, there is an absence of fish that would normally predate the amphibians' eggs and young in a larger pond. Sphagnum mosses are common here as well as a thick cover of highbush blueberry (*Vaccinium corymbosum*). Black bears seek blueberry thickets for food and shade from the summer sun.

When the pools overflow they contribute water to the local watershed. Water “spills” out and drains its way into Spackman's Creek (the stream you have and will cross again during the hike). The creek enlarges as more tributaries come together and eventually the creeks will enter the Delaware River, which flows into the Delaware Bay and eventually, the Atlantic Ocean.



10 HEMLOCK WOOLLY ADELGID

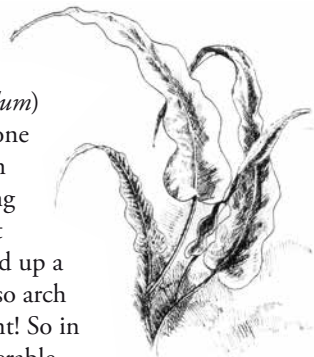
It took just over 3 years (2002-2005) for this large old hemlock tree to turn from an apparently healthy tree into what you see today. The culprit? It's called HWA: the hemlock woolly adelgid (*Adelges tsugae*). Originating in the hemlock forests of southeast Asia, this destructive insect entered North America via the Pacific Northwest in 1927. It was first found in the East in 1995 in North Carolina. It has been destroying the eastern hemlock (*Tsuga canadensis*) from Maine to Georgia ever since. The tiny plant hopper-like insect sucks sap from the trees' needles which cause them to die and drop. Thus a tree's health deteriorates, and may be standing dead in just a few years. An Asian species of ladybug, (*Sasajiscymnus tsugae*) natural predator of HWA, has been released in many areas to help combat the rapid destruction of our state tree.

11 FARMED LAND

Much of this area was farmed during previous centuries. People who lived on this land, the same people whose hands may have helped pile the rock walls, have left their mark in many forms, giving us clues to their way of life. Here we have a stone chimney constructed of rocks that would have been gathered locally. You can also trace the foundation of this small home or camp. A little farther down the trail you'll notice a wet depression where an earthen dam was constructed. This dam backed up the water flowing down slope from a seasonal pool, and formed a pond that may have been 7 - 8 feet deep. These ponds were maintained for fire prevention.

12 WALKING FERN

This interesting evergreen fern is not commonly found in our area. Walking fern (*Camptosorus rhizophyllum*) grows on damp moss-covered rocks, and prefers limestone but will accept many other kinds of rocks. This fern can reproduce vegetatively in a series of short leaps spreading in all directions. The long slender leaf-tips of the parent plant arch to the ground, and the leaf-tips root and send up a new plant! As this new plant gets older its leaves will also arch and their tips will root again, creating another new plant! So in just a few generations walking fern can spread a considerable distance in any direction. See if you can trace this fern's amazing growth. Please do not touch. This is the only area in which this fern is known to grow at PEEC.



13 WHITE TAILED DEER

In Pennsylvania, white-tailed deer (*Odocoileus virginianus*) have over-populated many regions due to the absence of natural predators and the increase of open areas and the forest-field edges where deer find abundant grass to graze. As a result, many forests have been over-browsed by deer. As herbivores, they eat the succulent herbs on the forest floor and the leaves and new shoots of

trees and shrubs during the growing season. In winter they feed on twigs and buds. Although this is completely natural, the forest may have little chance to regenerate itself if there is over-browsing. Many creatures may suffer from over-browsing, like ground-nesting and shrub-nesting songbirds, due to lack of cover. If you're in a deciduous forest and there isn't any new tree growth, chances are there are too many deer in the area.

14 HEMLOCK FOREST

Stand and feel the magic of this forest! Here trees stretch tall for the sunlight and shade the forest floor beneath. Fallen hemlock needles make the soil acidic and so very few plants are found growing here. Their shallow roots spread wide holding the soil in place on steep slopes. Hemlock forests create a cool microclimate as they provide shade and trap moisture keeping these mountain streams running cool even in the summer. Snow does not accumulate as deeply under hemlock trees and provides easy travel for mammals throughout the winter months. Almost all old-growth hemlock stands were logged in this region between 1850 and 1920. Because the tree bark is high in tannic acid, the bark was stripped and shipped to local factories to be used in the leather tanning process.



Remember the name of the bug attacking these trees? This forest is already in a state of decline. Try to imagine all these trees like the one at point #9. What would happen to the animals in this forest? The water? The soil?

15 POLYPORES

This fallen American beech (*Fagus grandifolia*) provides a good example of decomposition in the forest. Many factors, such as climate, woodpeckers, bacteria, fungi, and termites, are important in the process of decomposition of this wood. Wood is a very complex material. By feeding on the wood and changing its structure, decomposers help to break the wood down into simpler, smaller materials so that important elements like nitrogen can be released into the soil and atmosphere. Other living things will rely on the nutrients released into the soil for their own growth. One day this tree will become part of the soil and microorganisms in the soil will continue to feed on the organic matter. The tough woody fungi that you see are called polypores. They protrude like small shelves from dead wood, and are often coined shelf or bracket fungi. Look for the tiny pores on their undersides, where the spores exit the fungi.

16 STREAM SPECIES

This stream has excellent water quality. Here in the hemlock forest, we are not far from the stream's origins, so it hasn't had a chance to be exposed to contaminants. Because many species of macroinvertebrates and amphibians are sensitive to pollutants, their abundance indicates a healthy water system. You may wish to turn over rocks and see what lies beneath. Please return rocks to their original positions, and return creatures to the water. Look for small

cylindrical cases of pebbles ‘glued’ together. These are the homes of caddisfly larvae. Look for two large red salamander species, the northern red salamander (*Pseudotriton ruber*) and spring salamander (*Gyrinophilus porphyriticus*) hiding beneath flat rocks in the shallow water. The stream here is calm but soon it will turn into a series of waterfalls as it descends the plateau’s edge en route for the Delaware River. Pennsylvania’s state fish, the brook trout (*Salvelinus fontinalis*) lives in the deeper pools below the falls.



17 AMERICAN BEECH

The American beech (*Fagus grandifolia*) is easy to identify because of its smooth gray bark. The buds are long and orange and may remind you of a miniature cigar. Beech trees hold on to their dead leaves all winter long. They hang dry and have a light golden brown color. You can hear them rattle in the wind on cold winter days. On large trees, look for distinctive claw marks of where black bears (*Ursus americanus*) have climbed them to feed on the delicious small beech nuts in early fall. Many beech in our area have become infected with the beech scale insect (*Cryptococcus fagisuga*) which carries a fungal disease (*Nectria coccinea*). Signs of the infection include cracking bark with black edges caused by cankers growing beneath.

18 LICHENS

If it’s lichen, you’ll like it too! If you see it growing, breathe deep. It indicates clean air-quality! Look around you. It looks like somebody took green and grey paint and splattered it over all the tree trunks. Lichen is a dual-organism, composed of both a fungus and green algae, or cyanobacteria (blue-green algae). The two exist together in a mutually beneficial relationship called symbiosis. The fungus can’t photosynthesize and produce its own food as plants do, so they must absorb food from a host. The fungus secretes a mild acid to break down organic matter, even rocks, and then absorbs the nutrients and minerals. As the algae photosynthesize, they create carbohydrates which the fungi also obtain as food. The fungus provides a moist site for the algae to grow and protects it from drying out during times of drought. Lichen comes in many forms. See how many types you can find where you live.

This concludes the Ridgeline Trail. We hope you’ve enjoyed the landscape you’ve just explored and understand a little more about the components that comprise a forest. From the amphibians breeding in vernal pools, to the plight of the hemlock forests, all things are interconnected and sustained by a very delicate balance. This sensitive system is easily harmed by outside influences like acid rain, and by internal influences like the spread of non-native/invasive plant species. We should all be aware of our individual role as stewards or care-takers of this beautiful land and do our part to protect it and ensure its survival.

You can follow the campus road back to the Main Building and parking lot. Please keep and reuse or recycle this trail guide.



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Trail Map

If you no longer have a need for this trail guide, please return it to the front desk so that it may be used again.

