

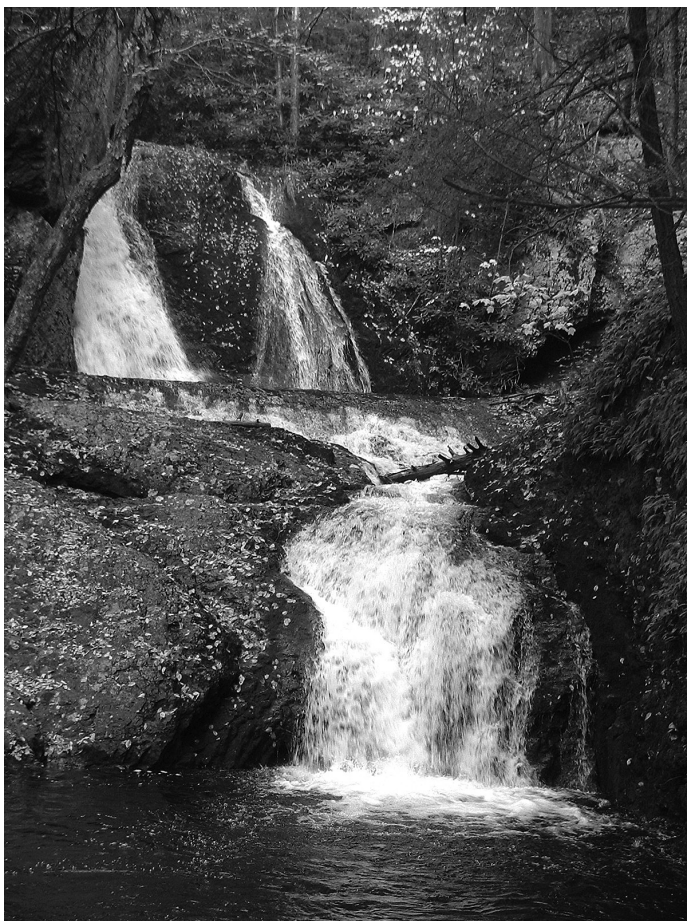


# PEEC

Pocono Environmental  
Education Center

## Tumbling Waters

T R A I L   G U I D E



538 Emery Road, Dingmans Ferry, PA • 570.828.2319 • [peec@peec.org](mailto:peec@peec.org)

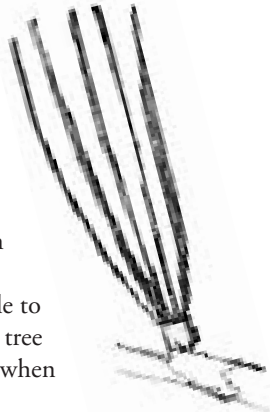
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## 1 WELCOME

Welcome to the Tumbling Waters Trail at the Pocono Environmental Education Center. This trail is 3 miles long and is marked by bright orange blazes. The trail head is located across from Lodge A. You should give yourself about two hours to complete this trail. This trail winds its way through several diverse habitats that are characteristic of the Pocono region, such as hemlock ravines, upland-mixed oak forests, and pine plantations. Other highlights of this trail include a scenic vista overlooking the Delaware River Valley and a waterfall in a shaded hemlock ravine. The numbered markers along the trail correspond to the entries in this guide. These explanations will give you a glimpse into both the natural and human history of this beautiful area. While hiking, please respect the environment, pay attention to your presence in the woods, and as always, practice Leave No Trace hiking ethics.

## 2 EASTERN WHITE PINE

This large tree is an eastern white pine (*Pinus strobus*). Search the ground around this tree and find a cluster of fallen needles. The 2-5 inch long needles are in bundles of five. This is the only species with clusters of five (hint: five letters in the word 'white'). Once abundant throughout the northeast, the eastern white pine has been logged since colonial times, resulting in the absence of virgin trees which stood as tall as 220 feet. In the late seventeenth century, an official of the Royal Navy marked and reserved white pines suitable for the masts of sailing ships. Early settlers were able to see trees marked with the emblem of the navy and know that the tree was property of the King's Navy. This white pine was left behind when this area was logged. Why do you think it was not cut down?



## 3 EXPOSED BEDROCK

Here is a large area of exposed bedrock. Notice the parallel grooves and scratches in the rock. If you were standing here about 13,000 years ago you would be at the bottom of a glacial ice sheet more than a mile thick! Rocks carried in these glaciers made these marks as they scraped across the surface of the rock. These glacial striations are evidence that this area was covered by glaciers during the last ice age. Using a compass you can measure the orientation of the striations to determine the direction the ice flowed.

## 4 CEDAR KNOLL

This area is called *Cedar Knoll*. It was named for the many eastern red cedars (*Juniperus virginiana*) growing in this area. Although called cedars, these trees are actually junipers according to their scientific name: *Juniperus virginiana*. True cedars (*Cedrus*) are native to Lebanon, North Africa, and the Himalayas. These cedars are traditionally used for cedar chests and closets, pencils, fuel, and fence posts. The fruits, which



are a tiny cone with a blue fleshy covering, are readily eaten by over 50 species of birds including the aptly named cedar waxwing (*Bombycilla cedrorum*). The fruits are also used as the flavoring for gin.

*From the Knoll, the trail goes downhill to Brisco Mountain Road descending through a relatively open field with red cedars, gray birches, and scotch (Scots) pines. Be careful crossing the road. After crossing the road, continue on the gravel path, following the orange blazes. Look along the right side of the trail for traces of wire fences put up by people who used to own this land. Notice how the tree grew around the wires over the years.*

## 5 LANDOWNERS' HOUSE

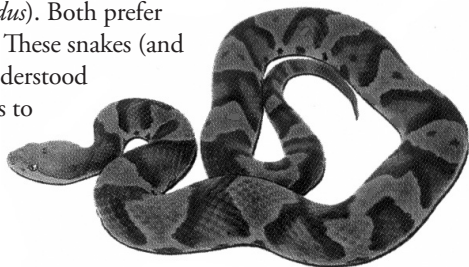
This small clearing is where the landowners' house once stood. Look for evidence such as a telephone pole, an old spring house, and even some persistent garden flowers. Much of this area was farmed as late as the 1930's.

## 6 MIXED OAK FOREST

The woodland you are in now is typical of higher elevations here in the Poconos. It is known as a mixed oak forest. The dominant trees here are chestnut oak (*Quercus prinus*), red oak (*Quercus rubra*), some ashes and hickories, and shrubs like shadbush (*Amelanchier*) and blueberry (*Vaccinium boreale*). Scattered throughout are a few white pines. Just ahead on the trail, look for several tall white pines. The large dead pine on the right side of the trail was struck and killed by lightning in the summer of 2000. Look for the split that spirals down the tree. You may be inclined to assume that this is the path the bolt took as it came down the tree, though that isn't the case at all. When a tree is struck by lightning, it super-heats the sap inside. When the sap boils like this, the gasses need somewhere to go, so escapes by blasting off a chunk of a tree like this one. The structure of a tree varies by species and this white pine grows in a spiraling fashion, so the chunk that was blown off wraps around the tree.

## 7 EAGLES, SNAKES, HAWKS & MORE!

This stone fireplace is all that's left of a small cabin that once stood here. While walking along the ridge, keep an eye out for soaring bald eagles (*Haliaeetus leucocephalus*), turkey vultures (*Cathartes aura*) and hawks—especially during migration time in the spring and fall. There are two species of venomous snakes in this area—the northern copperhead (*Akistrodon contortrix mokasen*) and the timber rattlesnake (*Crotalus horridus*). Both prefer wooded hillsides and sunny, rocky ledges. These snakes (and all snakes for that matter) are often misunderstood and feared by many people. This fear leads to persecution and senseless killing. Snakes are an important part of a healthy, diverse ecosystem and are completely harmless when left alone.



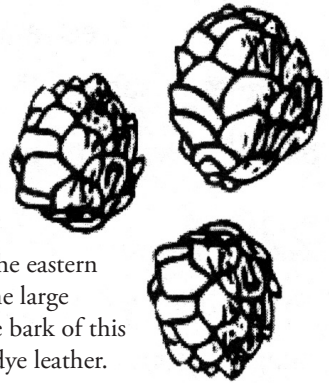
## 8 DELAWARE RIVER VALLEY

Take some time to enjoy the beautiful view of the Delaware River Valley. All the land that you see, including the land you are walking on, is part of the 80,000 acre Delaware Water Gap National Recreation Area. The land was acquired by the federal government in the 1960's with plans of building a dam on the river. The entire valley below you was almost a giant reservoir until plans for the dam were dropped and the government gave the land to the National Park Service. Looking across the river valley, you can see the Kittatinny Ridge in New Jersey. This 400 mile-long ridge is part of the Appalachian Mountains and running along the ridge is the 2,100 mile long Appalachian Trail. The bushes growing out of the rocks here are scrub oaks (*Quercus sp.*) – The smallest member of the oak family in the Poconos.

*The trail continues with a descent into the ravine below. Watch your step – the trail is steep with loose rocks. On warm, sunny days look for the elusive fence lizard (*Sceloporus undulatus*) running over the rocks and hiding behind trees. The fence lizard is one of only three true lizards native to Pennsylvania.*

## 9 SWITCHBACK TRAIL

The switchback trail here will lead you down to the waterfalls! Please stay on the trail following the switchbacks – no shortcuts. The trail is designed to minimize erosion which can be a problem in steep areas. As you walk down the trail, try to feel the drop in temperature. The type of forest will change from the mixed-oak forest to what's known as a hemlock ravine. The eastern hemlock (*Tsuga canadensis*), Pennsylvania's state tree, is the large evergreen tree with short, flat needles and tiny cones. The bark of this tree was harvested for its tannic acid, which was used to dye leather.



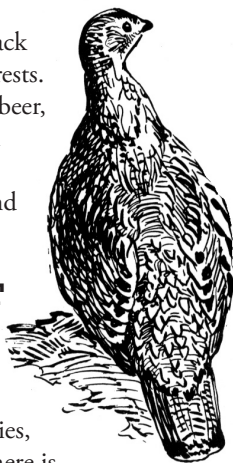
## 10 ENJOY THE WATERFALL

By now you will be able to see the waterfalls. Stay a while and enjoy the beauty. This is the halfway point of the trail. The forest here is dominated by hemlocks. Due to the lack of sunlight, not many plants are able to grow on the ground here. Plants such as the rhododendrons, mosses, and ferns are shade-tolerant and are able to thrive under these conditions. Water levels fluctuate throughout the seasons and depending on the time of year, you can see salamanders, crayfish, frogs, and fish. The water tumbling over the rocks adds vital dissolved oxygen. The source of this stream is a combination of lake water, ground water, and runoff from rainfall. About a mile downstream, the stream empties into the Delaware River.

*To continue on the trail, go back up the switchbacks, when you get to the top the trail goes to the left.*

## 11 BETULA LENTA

This marker is attached to a black birch (*Betula lenta*) tree. Black birches are occasionally found in association with hemlock forests. The sap from these trees was traditionally used to make birch beer, an alcoholic drink in early settler times. The wood is hard and heavy and is used to make furniture. Buds and seeds are eaten by a variety of birds including goldfinches (*Carduelis tristis*) and ruffed grouse (*Bonasa umbellus*).



## 12 MIXED-DECIDUOUS FOREST

You are about to go through another transition in forest type. Since leaving the waterfalls, the forest has been mostly hemlock dominated. The next forest community is typical mixed-deciduous. This area is characterized by birches, hickories, white and red oaks, and many small red maples. The canopy here is not as dense as the hemlock forest, so sunlight is able to reach the lower levels. This allows other plants like shrubs, flowers, and grasses to grow here. Notice the many small hemlocks growing along the transition. These transition areas are called ecotones, and ecotones such as this one are excellent places to observe wildlife. The varied plant life allows animals the opportunity to take advantage of both plant communities for food and shelter.

## 13 PINE PLANTATION

You are now entering a pine plantation. These pines were planted about 50-60 years ago after the preceding forest was logged. Notice how they are in straight lines. The two most common species of pine planted here are red pine (*Pinus resinosa*) and Scots (scotch) pine (*Pinus sylvestris*). Look on the ground for needles from both. The Red Pine has 3-8 inch needles that come in clusters of 2. The Scots pine also has needles in clusters of two, but they are much shorter—about 1-3 inches. The Scots pine also has bright orange (or butterscotch) colored bark on the upper half of its trunk.

## 14 PICKEREL POND

This is Pickerel Pond. This is not a natural pond; it was originally built by the Pharo Family by damming a small stream. Ponds such as this provide habitat for a variety of plants and animals. Amphibians such as newts, salamanders, and frogs can be found here. Choruses of singing frogs can be heard here during the breeding season. Look for evidence of the resident beavers such as chewed sticks and pointed stumps.





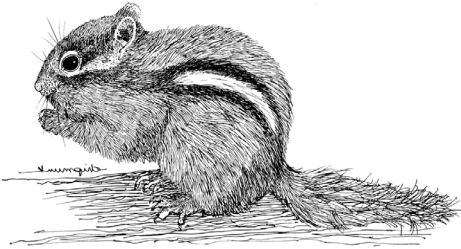
## 15 LOOK UP!

If you look up you will notice an unnatural object in this tree. What is it? It is a house designed to attract a nursery colony of bats. Despite what many people believe, bats are not blind, do not fly into people's hair, and are responsible for fewer cases of rabies than dogs. Bats are important for maintaining balanced ecosystems because they are the only major predator of night flying insects. Our most common bat, the little brown bat (*Myotis lucifugus*), can eat up to 600 mosquitoes an hour! Unfortunately many bats are in trouble due to loss of habitat, senseless killing, and white nose syndrome. Six out of Pennsylvania's eleven species are considered of "special concern" (rare, threatened, endangered, or an undetermined status) according to the EPA biological survey. If occupied, this bat box could house over 500 female bats and their young.



## 16 STONE ROWS

You may have noticed many of these stone rows along this trail or even elsewhere in the Poconos. These stone rows are evidence of earlier human activity. Much of this area was at one time cleared for lumber, farming, and pastureland. As settlers cleared the ground of stones, they made these walls. As flatter and more fertile farmland was opened to settlement in the West, these fields and pastures were abandoned. Over time, the forest grows back, but these walls are a reminder that this land was once much different. These old walls are now a favorite home for snakes and chipmunks.



## 17 NON-NATIVE PLANTS

Notice the old foundation here. Again, it is evidence that this land was once occupied. Around this area are many species of non-native plants, such as multiflora rose (*Rosa multiflora*), honeysuckle (*Lonicera*), and garlic mustard (*Alliaria petiolata*). Many non-native plants were brought here intentionally by early settlers and some were introduced accidentally. Some plants simply "escaped" from gardens and were well-suited for the conditions here. Almost one fourth of the plants in the east are introduced species. From here, the trail crosses the road and continues through a large hedgerow of forsythia (*Forsythia*) (another non-native plant).

## 18 EMERGENT WETLAND

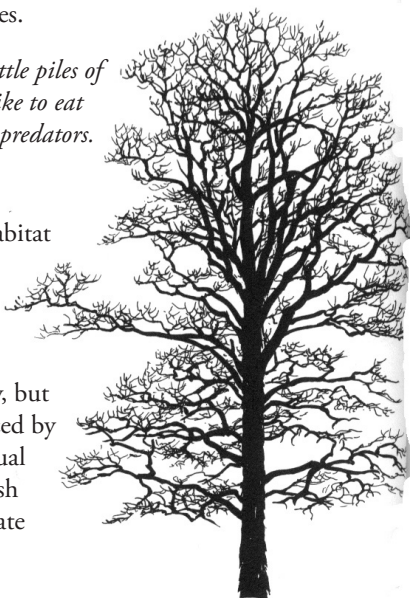
This area is known as an emergent wetland. This wetland is dominated by green plants such as skunk cabbage (*Symplocarpus foetidus*), sensitive fern (*Onoclea sensibilis*), and gray dogwood (*Cornus racemosa*). Wetlands are a vital part of a healthy environment. They filter water and control flooding. They provide

essential habitat for many species of reptiles, amphibians, insects, and birds. This marker is attached to a shagbark hickory (*Carya ovata*). Notice the bark which gives the tree its name. Bats are often found hiding behind these 'shags'. The wood is traditionally used for tool and ax handles.

*The trail continues along another wall. Look for little piles of chewed nutshells on top of the rocks. Chipmunks like to eat where they can survey the area for dangers such as predators.*

## 19 THE SUCCESSION

The open field you see here is a very different habitat from the wetland and forest areas. The soil is drier and sunlight reaches even the small plants on the ground. This field is a great place to see many different species of wildflowers (no picking, please). The field is mowed periodically, but if left undisturbed, small plants would be replaced by taller plants, shrubs, and finally trees. This gradual change in a habitat is called succession. The 'trash graveyard' was established in 1998 to demonstrate the amount of time it takes for trash to decay, decompose, or break down. Please do not litter.



*Follow the tree line through the field, taking a right turn at the post. Look around here for a tree with three different shaped leaves. This is a Sassafras tree. The roots were traditionally used to make root beer.*

## 20 SHRUB WETLAND

You are now walking over a shrub wetland. The boardwalk helps to protect this fragile area. This wetland represents the transition from a drier upland habitat (the field) to the pond. Plant and animal life is diverse here. Local wildlife is a great place to view some of the local wildlife. Some of the shrubs growing here include the gray dogwood, choke cherry (*Prunus virginiana*), arrowwood (*Viburnum dentatum*), and multiflora Rose: (*Rosa multiflora*)

*Continue along the boardwalk leading you back to PEEC.*

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*The natural world is always changing. It changes from season to season, year to year, century to century. The face of this landscape is constantly being reshaped by both natural and human forces. Time itself brings change. We hope that this trail has given you a glimpse into the natural world and the beauty of the Poconos. If you have any questions, feel free to ask at the front desk. 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.*

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## Trail Map

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