PEEC

Pocono Environmental Education Center

Fossil

TRAIL GUIDE

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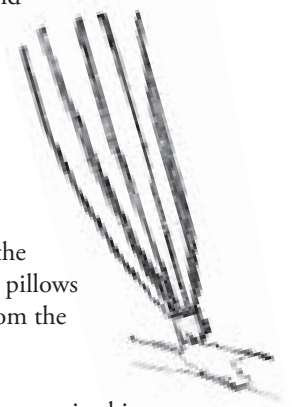
WELCOME

Welcome to the Fossil Trail at the Pocono Environmental Education Center. This 1.25 mile, blue-blazed trail begins across the road from Lodges A and B and ends at the amphitheater on lower campus. The numbered markers along the Fossil Trail correspond to explanations in this guide. These explanations should give you a glimpse into the natural and human changes in our environment. Although the geology of the area is emphasized, you will also learn about several different biological communities.

While on the trail, please observe the National Park motto: "Take only pictures; leave only footprints." **Please leave the fossils where they are so that others may enjoy and learn from them.**

1 THE LAND

Notice the general contour of the land. Was this land previously used by people? In what way? Through time, physical and biological forces change every landscape in a process called biological succession. This land was originally cleared for lumbering and later on for farming. Grasses, shrubs, and trees have repopulated the area.



2 WHITE PINES

When colonists first arrived in New England, one of their major commercial activities was large scale lumbering of white pines (*Pinus strobus*). In virgin stands, white pines grew as high as 200 feet. Their tall and straight trunks were used as masts in the construction of sailing vessels. Pioneers used the soft needles for pillows and bedding. Native Americans made a tea rich in vitamin C from the needles as well.

Notice the size of this white pine in comparison to the rest of the trees in this part of the forest. This tree was left behind when the area was logged. The size of the tree shows that it is older than the rest. Why do you think this tree was not cut down?

3 BEDROCK

Here you can see bedrock, a continuous mass of solid rock that is usually covered by topsoil. Check out the faint parallel scratch marks on the rock. These marks are called glacial striations.

Rocks carried in glaciers made these marks as they scraped across the surface of the bedrock. Striations are just one reminder that this region was covered by continental glaciers during the last ice age. Glaciers are huge ice sheets that move outward due to the stress of their own weight. The Wisconsin Glacier, the fourth and final glacier, retreated about 11,000 years ago.

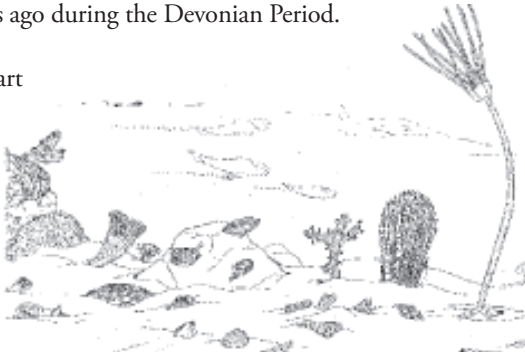
You can measure the orientation of these glacial striations with a compass to determine the direction of the movement of the ice through this area.

4 RED CEDARS

The Fossil Trail turns left at a junction with the Tumbling Waters Trail. If you are interested in finding more fossils, you may take a short detour along the orange-blazed trail to Cedar Knoll. This hilltop is ringed with red cedars (*Juniperus virginiana*). Looking closely, you will find some fossils in the bedrock that pokes through the soil.

5 SILTSTONE

This outcrop is primarily siltstone, a sedimentary rock formed at the bottom of a shallow ocean about 370 million years ago during the Devonian Period.



The formation of sedimentary rock is part of the rock cycle, a process in which rocks are formed, destroyed, changed, and reformed in the earth's crust and on its surface. The three main rock types are: igneous, sedimentary, and metamorphic. Igneous rocks are formed in the molten state, below the surface of the earth, under great heat and pressure. Such rocks may cool and harden upon rising or may surface through volcanoes.

Sedimentary rocks are formed by accumulating sediments, such as silt, sand, or pieces of rocks or shells, under a great amount of pressure from overlying sediments. Metamorphic rocks can be either igneous, sedimentary, or other metamorphic rocks that, due to a great amount of pressure and heat, are decrystalized and altered. An example is marble, which is metamorphosed limestone.

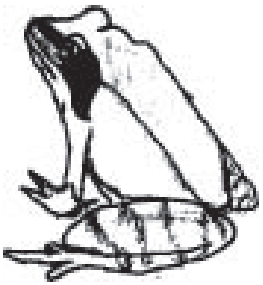
6 FOUNDATION ROCKS

Notice the old foundation on the right. This foundation, along with the stone wall up ahead, is evidence that the land was once cleared and used for farming. Look closely at the rocks in the wall. The smooth flat rocks are shale, and the rocks which contain small pieces of sand compacted together are sandstones. The rocks which contain other small rocks are conglomerates. These conglomerates were not formed in this area. Where do you think these came from? (Refer back to Marker 3)

The first settlers found rocks, dragged by glaciers and dropped as glacial till, covering the land. They cleared the land for homes, fields, and pastures and piled the rocks in out-of-the-way places, often creating stone walls. These walls

also served as boundaries and contained livestock. The collapse of the disturbed sections is due to temperature extremes over the years as well as the activities of plants and animals.

7 WOOD FROGS



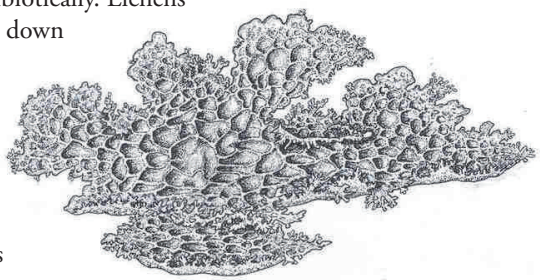
The seasonal pond nearby may appear wet, soggy, or nearly dry depending on the season. Like most wetlands, it provides prime "real estate " for wildlife. Many endangered species are found only in wetland habitat.

Each spring, just after the ice melts, wood frogs (*Rana sylvatica*) gather by the hundreds. After a week of breeding activity, they return to the surrounding woods and are seldom seen. Fed by spring rains, the wetland serves as a nursery for thousands of quick-growing tadpoles. By midsummer, as the water level drops, tiny wood frogs "jump ship" to find new homes on dry land.

8 LICHENS

Notice the rock ledge. Plant and animal communities and the land are constantly changing. Although it is happening too gradually for you to see, the rock is becoming soil through a process called erosion.

This rock face is slowly being weathered by the forces of nature. Physical factors which contribute to the breakdown process are wind, temperature, and freezing and melting of water. Chemical factors include the sun, water, and the effects of organisms growing on the rock's surface. The grayish-green patches on this rock are called lichens, a type of organism that erodes stone. Lichens are made up of fungus and algae that live together symbiotically. Lichens secrete a mild acid which slowly breaks down the rock, making minerals available to them. They may also break down organic matter, such as dead trees. This breakdown, combined with the weathering of the rock, builds a thin soil layer. You may have noticed that mosses have colonized this soil layer. Small plants may eventually move into the soil built up by the mosses.



9 OLD LOGGING ROAD

Here the fossil trail comes out on an old logging road and may be hard to follow. Look for the blue blazes and be ready for a left turn a short distance ahead. For a shortcut back to PEEC, turn left and follow the logging road back a few hundred yards.

10 DEAD TREES

Notice the standing dead tree off to the right of the trail. Dead trees are a critical part of the forest habitat for many insects, birds and mammals. Some birds, such as the pileated woodpecker (*Dryocopus pileatus*) and black-capped chickadee (*Poecile atricapillus*) will chisel out their own nest cavities in rotting trunks. Other forest dwellers, including screech owls (*Megascops*), mice (*Mus*), and flying squirrels (*Pteromyini*) will use pre-existing cavities. Dead trees are also homes to organisms, such as lichens, mosses, centipedes, bark beetles, and fungi which break the wood down into soil.

11 STAY ON TRAIL

The path becomes steep along the next part of the trail. Please walk carefully, and stay on the trail. Traversing the landscape will avoid causing erosion and ruining the forest floor.

12 EASTERN HEMLOCK

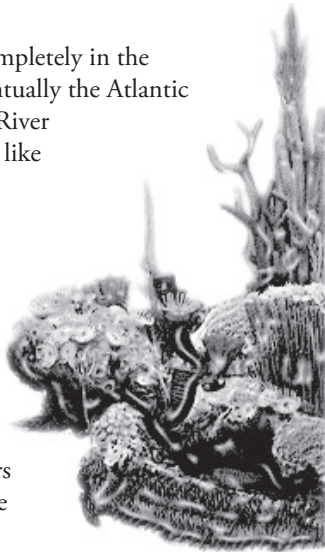
The tree that overhangs the trail at this point is the Eastern hemlock (*Tsuga canadensis*), Pennsylvania's state tree. Its brittle and knotty wood is used only for low-grade construction, however hemlocks were once highly prized by leather tanners for the reddish-brown dye known as tannic acid found in its bark.

As you walk down the hill, notice the change in the vegetation. When the area was being harvested by the tanning industry, hard-to-reach hemlocks in ravines and gorges were often spared. This area has a good selection of deciduous trees, including birch, oak, hickory, ash, and maple, in addition to the coniferous hemlock and white pine.

13 POND-FED STREAM

This small pond-fed stream is seasonal and may dry up completely in the summer. The stream leads to the Delaware River and eventually the Atlantic Ocean. To ensure water quality throughout the Delaware River Watershed, we must take care not to pollute small streams like this one.

14 DEVONIAN SILTSTONE



About 350-400 million years ago during the Devonian Period, this part of the continent was covered by a vast, shallow ocean. Nearby, extensive mountain building was taking place. Through millions of years, the forces of weathering and erosion reduced the size of the mountains. Water was the major eroding force, breaking off small pieces of rock called sediments. Streams and rivers carried the sediments and eventually deposited them in the

nearby seas. The siltstone you see here is evidence of the formation of sedimentary rock.

The hard remains of ancient marine life forms were embedded in the sediment layers and fossilized when the surrounding rock hardened. The outcrop of Devonian siltstone above contains fossils of crinoids, brachiopods, and trilobites. **Be careful climbing the hill if you go to look for fossils. Please do not remove any of the fossils from this area. Remember you are in a National Park.**

15 SPRING HOUSE

To the left of the trail is the foundation of a spring house which supplied water to an old homestead near the bottom of the ravine. Water piped through the spring house kept this structure cool and made it an ideal site for storing food.

Marker 15 is the last marker on the trail. Cross through the campfire site and follow the road up back to the main building and front parking lot. We hope you enjoyed the trail. If you have any questions, feel free to ask our program staff.

NOTES

GEOLOGICAL CALENDAR

Eon	Era	Period		Millions of Years Ago
PHANEROZOIC	CENOZOIC	Quaternary		2
		Tertiary		66
	MESOZOIC	Cretaceous		144
		Jurassic		208
		Triassic		245
	PALEOZOIC	Permian		286
		Carboniferous	Pennsylvanian	
			Mississippian	360
		Devonian		408
		Silurian		438
		Ordovician		505
		Cambrian		570
PRECAMBRIAN				

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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.