NORTH TRAIL STATIONS

1. BOY SCOUT CAMP – This foundation marks the location of one of the many structures used by the Piankeshaw Council, Boy Scouts of America, of Danville, Illinois, who owned it from 1938 until its sale on March 28, 1966 to The Nature Conservancy. Funds for its purchase were obtained from private donations to both the Indiana and Illinois chapters of The Nature Conservancy.

The Boy Scouts moved to another campsite after the accidental death of a scout who fell over the high cliff. Visitors using this nature preserve should be extremely careful and remain on the marked trail at all times. **Rock climbing is prohibited**.

2. REPRODUCTION – Several different young tree species are found here. A **bitternut hickory** is 7 feet to your left front. Note the compound (5 to 9 leaflets attached to one stem), alternately arranged leaves. A **sugar maple** is 7 feet to your right front. It has simple (each leaf is attached to the twig), opposite leaves. **American elm**, 9 feet to your right has simple, alternate, rough leaves with toothed margins. **Black oaks**, 12 feet to your right and on the right side of the trail, have simple, alternate leaves with deeply cut lobes. A **shingle oak**, 15 feet behind you, has simple, alternate leaves that are not lobed. Please do not pick leaves or break branches.

Black oak

3. SUGAR MAPLE – This tree is growing on a cool moist exposure. It can grow under dense shade. Note the thick understory of young sugar maples beneath the parent tree.

4. BLACK WALNUT – Notice its rough, chocolate-brown bark and round nuts. It is well known for its valuable wood. A **redbud**, 4 feet to the right has alternate, heart-shaped, simple leaves, and never grows to a large size. The small vine with 5 leaflets found climbing on several tree in this area is **virginia creeper**, a non-poisonous plant.

5. WHITE PINE – This native evergreen is quite rare in Indiana. Thousands of years ago, it occupied a greater range in mixture with eastern hemlock. As the climate became warmer, it could not compete with hardwood trees, and is now found only in a few places, usually around cool cliffs and valleys, and the Indiana Dunes. This soft pine has bundles of five needles attached to the twig. Winged seeds occur in pairs under the scales of the cones.

6. LARGEST TREE – This **white oak** is the largest known tree in Portland Arch. Look for the simple, round-lobed leaves on the ground. Acorns are relished by wildlife. In front of the white oak is a young **green ash** with compound, opposite leaves.

7. RESORT AREA – The Portland Arch area has been a favorite gathering place for Hoosiers and their Illinois neighbors for over a century and a half. At one time, a flat-bottomed boat carried passengers from Lafayette to Portland Arch each Sunday, the Wabash Railroad ran three or four excursions a year, and a park was operated here. This level area once contained log cabins which burned down in 1917, and were replaced by a modern pavilion where meals were served and dances held. A mess hall built by the Boy Scouts also burned at a later date.

8. BLACK OAK – The dark, furrowed bark contrasts with the whitish-gray scaly bark of the **white oak**. Black oak leaves usually have 7 sharply pointed lobes with deeply cut interspaces. It also usually grows on drier, shallow soils. A young **wild black cherry** grows at the right base of this oak. A dense clump of multiflora rose is 12 feet to your right. It is an exotic (not native to this area), and without its natural controls it quickly takes over, pushing out native species by crowding, blocking sunlight, or strangling with its aggressiveness.

9. NON-FLOWERING PLANTS – Plants that do not have true flowers are more primitive species. Diminutive relatives of the giant ferns from the dinosaur days, the plants that grow here on the rocks include **mosses**, **liverworts** and **ferns**. Please do not touch or remove any of these specimens). The mosses are composed of minute, tufted stem-like growths with small fruit capsules. The liverworts cover the rock like a blanket with flat, dark-green, overlapping growths. Ferns grow in clumps from crevices in the rocks. The larger ones with wider fronds are **marginal shield ferns**, while the lighter colored, smaller and narrower fronds are **bulblet ferns**.

10. FALLEN TREE – This **hackberry** fell in 1982. As it decays, its nutrients will be returned to the soil, helping to fertilize surrounding plants. Watch for **poison ivy**, a vine or shrub with 3 leaflets, as you continue along the trail.

11. PORTLAND ARCH – The natural bridge above this arch is one of only a few in Indiana. The opening was caused by undercutting of the sandstone bluff on both sides, but the sandstone was strong enough that the rock did not collapse, and this arch was formed. The small tributary stream flows into Bear Creek.

12. OLD DAM – Years ago, a dam was built across Bear Creek Valley here. It contained a water wheel and dynamo that furnished lights for the park for 16 years. This concrete structure is all that remains.

13. MANSFIELD SANDSTONE – This rock belongs to a geologic age known as the **Pennsylvanian Period**, some 230 million years ago. Cross stratification is shown by layers of rock that are made of inclined sublayers. These were formed as sand was carried by a current of water across a shallow bottom and then into deeper water where it was deposited in sloping layers as the current velocity decreased. Recessed areas, such as this, were used as rock shelters by Native Americans and early pioneers.

Spring beauty

14. RED OAK – Notice the dark gray bark with its shiny lighter ridges that become more pronounced in the upper trunk. Leaves are not as deeply cut as those of the black oak, and the acorn saucer does not cover more than ¼ of the acorn. **Marginal shield fern**, with larger spreading fronds, and **Christmas fern**, with narrower fronds, grow on the bank left of this tree.

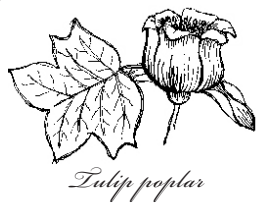
15. MUSCLEWOOD – The small size is typical of this tree which never competes in size with the larger hardwoods. Its name refers to the smooth, gray, vertically-ridged bark. The simple, alternate leaves have fine teeth along their margins.

16. WITCH HAZEL – This is another understory species. It grows in the thin soil on top of the rock. Its many stems produce alternate, simple, oval leaves with prominent veins on the undersides. The twisted, yellow flowers bloom in October and November, instead of spring.

17. BLADDERNUT – This shrub never reaches tree size and often forms dense clumps. Branches have opposite, compound leaves with three leaflets each. The inflated bladder-like seed pod is unique. From this point, you have a good view of the 100-foot high bluff which borders Bear Creek Canyon.

18. THREE TREES – About 4 feet in front of you is a cluster of three tree trunks. Farthest left is **black maple**. Closely related to sugar maple, it has a thicker leaf with shallower lobes, drooping margins and is yellowish-green beneath. Both species are tapped for sugar water. A **bitternut hickory**, back and to the right of the maple, has gray bark with shallow fissures. The nuts are small and bitter-tasting. Farthest right is the fallen trunk of a **butternut tree** which died in 1982. Like the hackberry at station 10, this tree will return its nutrients to the soil.

19. TULIP POPLAR – This poplar, the state tree, is named for its tulip-shaped leaves. It has gray, furrowed bark. The greenish-yellow flower, sometimes tinted with orange-red, blooms in May and June.



Tulip poplar

20. ESCARPMENT AND TALUS ROCK – Several talus rocks that have fallen into the valley are in front of you. As you walk to the next station, the vertical walls of this sandstone escarpment loom above you. Rock climbing, with or without equipment, is prohibited, as a number of fatal accidents have occurred.

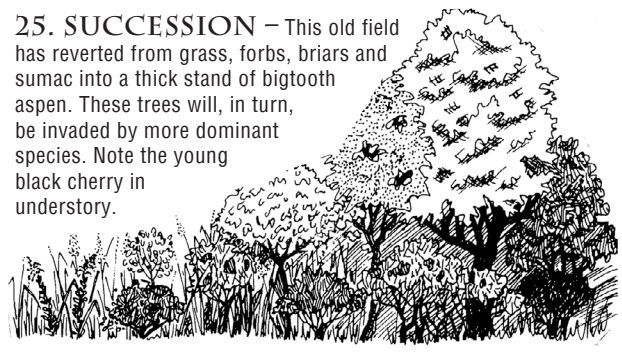
21. AMERICAN BEECH – This specimen is one of the few beech trees found in Portland Arch. In many parts of Indiana, it is a dominant species, found in association with sugar maple on cool moist sites. However, it becomes increasingly scarce in this part of Indiana and more so as you move farther west. Hacking and cutting into the smooth gray bark can cause diseases to start. Please do not harm the trees.

22. HEATH FAMILY – There are three examples of these small shrubs. Rare in most parts of Indiana, the low, creeping **wintergreen** has shiny green leaves and small red berries in the fall. Two shrubs that grow to up to 20 inches high are **black huckleberry**, with green undersides to the leaves and black fruit, and **dryland blueberry**, with leaf undersides not green, and blue fruit.

23. UNDERSTORY – The area in front of you contains both shrubs and young trees, including **mapleleaf viburnum**, seedlings of sugar maple, and **flowering dogwood**, which has opposite, simple leaves.

24. SOILS – The soils of this nature preserve have been derived from both the **bedrock** deposited during the Pennsylvanian Period and **glacial deposits** lain down during the Pleistocene Epoch, 12,000 years ago. You are now standing on **High Gap silt loam** developed on Wisconsin glacial drift. As you look downhill you will note that erosion has cut down towards the sandstone bedrock. This topsoil is **Muckingum stony loam** which is less fertile. When you were in Bear Creek Canyon, did you notice the sandy texture? That was **Genesee silt loam**, deposited by flood waters and sand that has weathered from adjoining cliffs.

25. SUCCESSION – This old field has reverted from grass, forbs, briars and sumac into a thick stand of bigtooth aspen. These trees will, in turn, be invaded by more dominant species. Note the young black cherry in understory.



SOUTH TRAIL STATIONS

1. This nature trail traverses three basic community types. A **community** is an interrelationship of plants and animals occupying a common environment and are more or less interdependent upon each other.

This first community is an old field reverting to woodland through a natural process called **succession**. It will take many years for this previously grazed land to become woody. The herbaceous (non-woody) plant species were the first to colonize the area. Gradually, shrubs and trees will come in and shade out many of the herbaceous plants.

Herbaceous plants and grasses are still prevalent here, displaying an abundance of color from spring through fall. Some of the plants you may see include flowering spurge, milfoil, wild asparagus, black-eyed Susan, goldenrod, milkweed, Queen Anne's lace (an exotic), bergamot, and ebony spleenwort (a fern).

2. Shrubs, combined with the colonizer tree species (pioneer species), will eventually shade out most of the herbs. In the mature (climax) forest, there will be very few of the original field herbs left. They will be replaced by shade-tolerant species that are associated with forest communities. Typical shrubs include sumac and many brambles.

The first trees to arrive are the **pioneer** species, such as red cedar, hawthorn, and wild black cherry, surviving only as long as there is little competition for sunlight from other trees. Species of mid-shade tolerance, including tulip poplar, silver maple, and several oak species will eventually shade out the pioneer species. Theoretically, these species will in turn be replaced by the more shade-tolerant species of the **climax forest**. It will be many years before that stage is reached.

Trout lily

This area has been succeeding since 1972, when the state purchased the property. You can see how many years it has taken for the vegetation to develop this far. Succession can be modified at any time by disturbances such as windstorms, fires, and diseases.

3. The **edge** between forest and field is abundant with animals. Such birds as indigo bunting, brown thrasher, gray catbird, rufous-sided towhee, and cardinal are commonly found in the edge habitat. Many of these species require trees for nesting sites or observation posts, yet feed largely on the ground in open areas.

You may see chipmunks scurry ahead of you as you walk this trail. They prefer the forest edge with nearby wooded banks, fallen trees, or broken rocky ridges which they use for their tunnels and nesting chambers.

Deer also prefer the forest edge habitat. You can recognize a deer bed by noting a trampled area of vegetation. Other signs include tracks on the trail, and "rubs" on small trees where the bucks have polished their antlers. Deer are browsers, feeding mainly on the leaves, twigs, fruits of trees and shrubs, and acorns in the fall.

Dutchman's Breeches

4. Bear Creek is a small stream which flows north into the Wabash River. Over the ages, it has cut through the sandstone, forming the cliffs and talus slopes in the nature preserve. At normal stages, the depth is less than four feet in the pools. It is a very clean stream, nearly pollution free.

Note that the trees in this area are more mature. A forest is characterized by tall woody vegetation, but it is more than just trees. It includes the entire site – the plants and animals that occupy the site, the soil type, and the environmental history of the site.

The forest you are currently in is a **lowland forest**. Species (both plants and animals) more adapted to wet conditions occur here.

5. There are two forest types present along this portion of the trail, the lowland forest and the upland forest. The forests differ primarily in elevation and, consequently, soil moisture. This results in a difference in the plants, animals and soil composition. The lowland forests along this trail differ from those in Bear Creek Canyon because they do not periodically flood. Forests that are covered with water at certain times of the year can be termed **floodplain forest**.

As you are walking through this lowland forest, look for old snags which were once living trees. They now provide shelter for birds, animals, and a substrate for other plants to live upon, such as the poison ivy vine.

6. Note that this portion of the trail is built up from the surrounding lowlands. It may have been an old roadbed that once went through this area. At one time there was a mill on Bear Creek.

Look for the pawpaw patch in the understory here; the pawpaw is a small tree with large 16- to 20-inch simple toothless leaves and a long, deep brown, hairy end-bud. The fleshy, green, and somewhat banana-like fruits appear in the early fall. Fully ripened fruits are sometimes difficult to find, as squirrels, raccoons, opossums, and other animals enjoy them.

It is a fairly long walk to the next station; enjoy the sights along the way.

7. You are now walking in an **upland forest**. In this community you will see species more adapted to drier areas, such as shagbark hickory, white oak, black oak, and white ash.

In the spring you will see an abundance of wildflowers in this area. Before the deciduous trees leaf out, these plants flower quickly to take advantage of the available sunlight. Other wildflowers that bloom throughout the summer do so in the shade of the forest canopy.

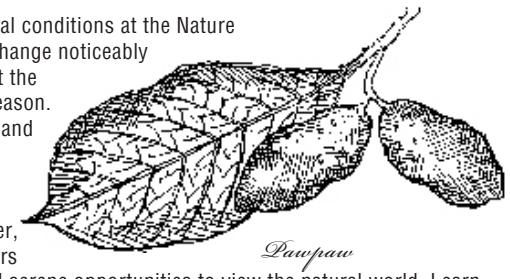
In the summer, the leaves of the forest canopy block out the sun and absorb the heat. This accounts for the noticeable temperature difference between the shaded forest and the exposed successional field. As you walk through the field again at the end of the trail, try to sense this difference.

8. You have probably seen several downed and partially decayed trees along the trail. The decomposition of these, as well as leaf litter and animal remains, helps to replenish soil nutrients to the forest.

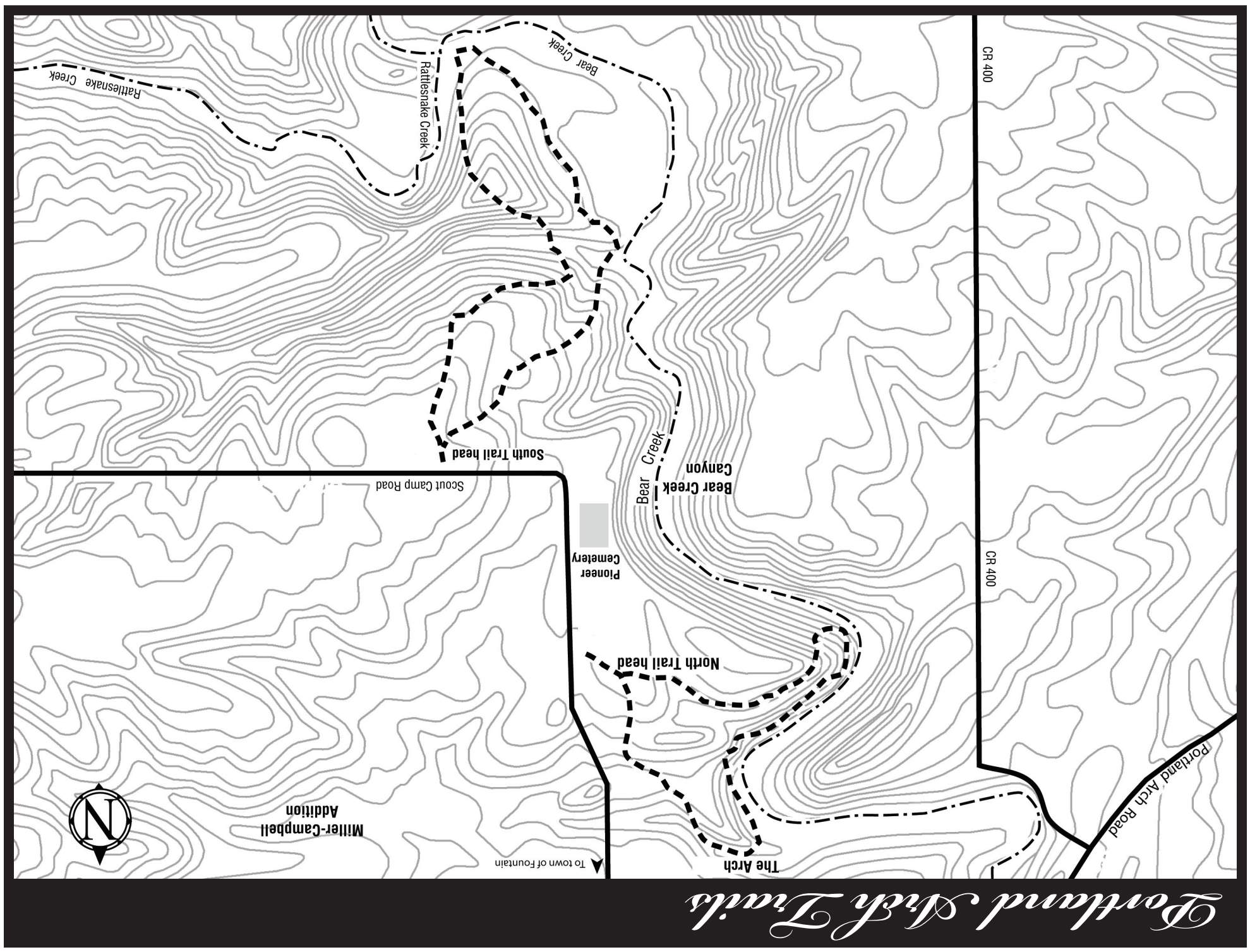
The phenomenon of deciduous trees and shrubs losing their leaves is called **abscission**. It is a response to the increased length of dark periods. Short days promote the production of a chemical in the leaf which forms a separation layer between the leaf and the stem. This weakens the leaf's hold enough so that its own weight or the wind will cause the leaf to fall.

9. Especially noteworthy in this area is the relict population of white pine. The white pine has long, soft needles in bundles of five. Ages ago, when the climate was much cooler, extensive populations of these trees grew in Indiana. They persist here due to the cooler **microclimate** or pockets present in a restricted local area (such as a ravine). These ravines are generally cooler, have different light intensity, wind, moisture, and temperature than the surrounding area. It is a long jaunt to the next marked station.

10. Natural conditions at the Nature Preserve change noticeably throughout the growing season. Visit often and notice that when the weather turns colder, winter offers unique and serene opportunities to view the natural world. Learn woody species of plants by their bark and twig characteristics for a new challenge. Winter birdwatching and nature watching are also enjoyable.



Pawpaw



Welcome

Portland Arch Nature Preserve contains two trails: the “north trail” and the “south trail”. A parking lot is present at each trailhead. Both trails begin at the registration box. Walk to station one and continue counterclockwise. Both trails are moderately rugged due to some areas of difficult (uneven, wet) footing. This nature preserve is established for the purpose of preserving the area in its natural state. Help us protect the natural values by:

- Remaining on the marked trail
- Protecting all plants and animals
- Keeping the area free of litter
- Keeping pets on a leash
- Observing the ban on hunting fires, cutting, rock climbing, picnicking, camping, horses and vehicular use

We hope you enjoy your nature walk and you will visit this area again. Please be sure you signed the registration sheet at the beginning of the trail. If you do not want to keep this brochure please return it to the box.

White pine with cone and needles

Directions

From Attica go south on U.S. 41 for about five miles and then west on County Road 650 North. Once in the town of Fountain, follow signs to the preserve. There are two parking lots, each with an adjoining self-guiding trail. The south trail can be reached from the second lot.

rm/pa 08-07

Portland Arch

Nature Preserve

AND

National Natural Landmark

Indiana Department of Natural Resources
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