

# *Dale's Ridge* TRAIL



THE MERRILL W. LINN  
LAND AND WATERWAYS CONSERVANCY

Welcome to the Dale's Ridge Trail! This 2 mile trail on the 137-acre property of the Union County Historical Society was formerly owned by Rosemary and Charles Walker, who placed it under a conservation easement held by the Merrill Linn Conservancy. Beginning along the lane on the south side of Buffalo Creek, the trail, marked with blue blazes, continues west (upstream) until it ascends the ridge on a series of switchbacks which negotiate the 160 ft. rise of the ridge, the trail is relatively level. Along the trail you will experience a variety of habitats including floodplain, mature hardwoods, and fields formerly in agriculture. Within these communities, a preliminary biodiversity inventory has revealed 30 species of trees, 67 kinds of wildflowers, and 6 fern species. Forty-eight species of birds have been sighted; however, this number does not include the many warblers particularly abundant during their annual migrations. To appreciate fully the beauty and diversity of life on the ridge, the trail is worth visiting in each season of the year.

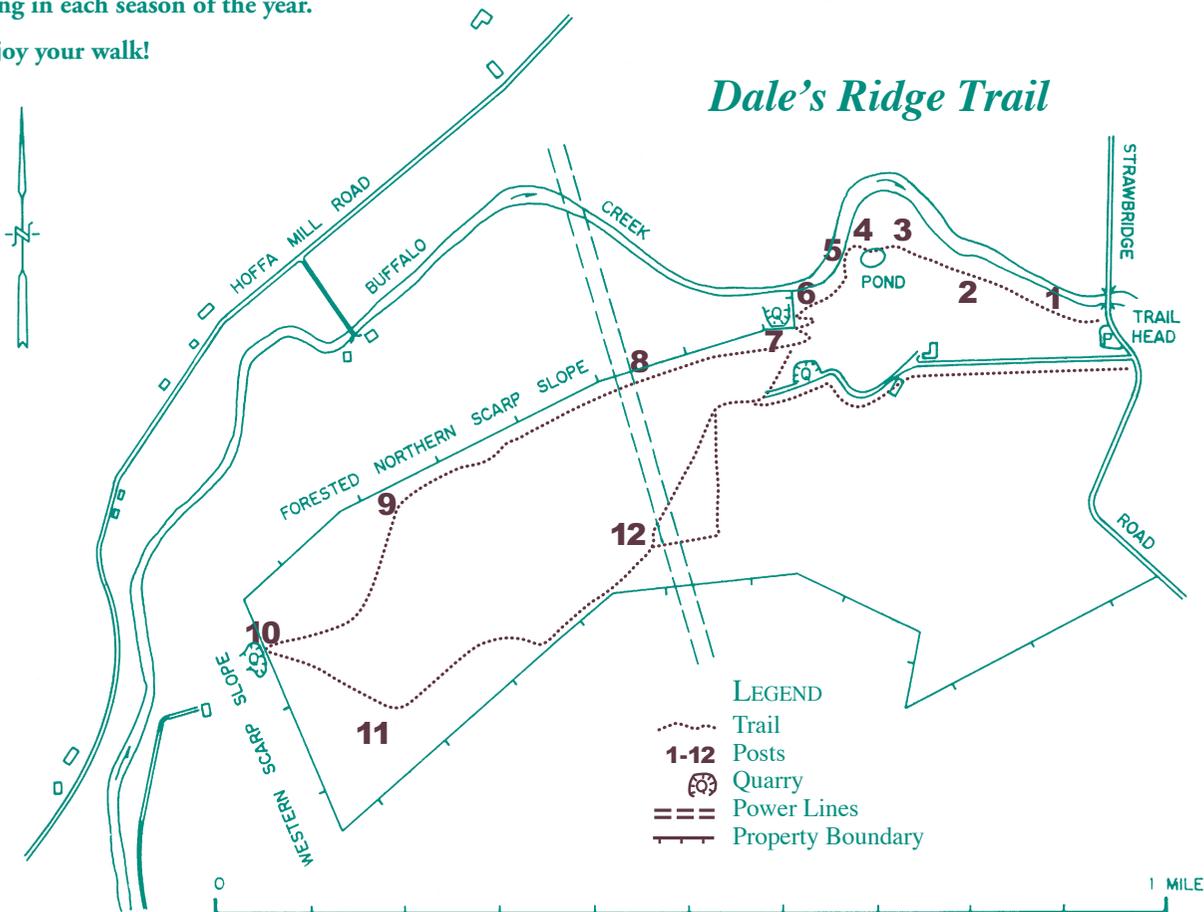
Enjoy your walk!

### Rules

- The trail is open to human foot traffic and dogs on a leash.
- Please stay on the blazed trail at all times.
- Please do not take anything from the area or leave anything behind.
- Groups of fifteen or more should contact the Conservancy at 524-8666 before using the trail.

### Safety

- At many places, the trail is bordered by poison ivy. Identified by clusters of three leaves, poison ivy may grow either as groundcover or as small to very large vines on the sides of trees.
- The switchbacks can be very slippery.
- Stay well away from the edge of the slope at view points.



## Dale's Ridge Trail

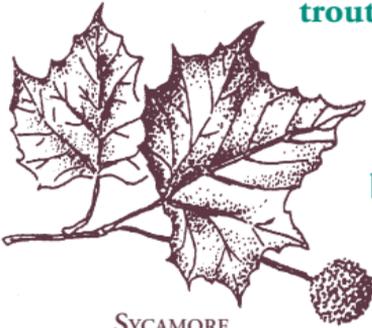
- Please do not throw anything from the viewpoints.
- The trail is open dawn until dusk.
- Closed during regular deer hunting season.
- *All guests use the trail at their own risk.*

POST 1

*The Floodplain*

The floodplain, although often disturbed by the flooding of Buffalo Creek, supports a rich diversity of tree species. Bitternut hickory and black ash dominate but significant numbers of hackberry and boxelder thrive as well. One of the most impressive trees growing in this area is the majestic sycamore with heights up to 100 ft. and diameters of 3 to 10 ft. Also known as American plane tree or buttonwood, the sycamore is distinguished by the creamy white and tan mosaics on its trunk.

A veritable parade of wildflowers begins in early spring with displays of skunk cabbage, yellow trout lilies, spring beauties with

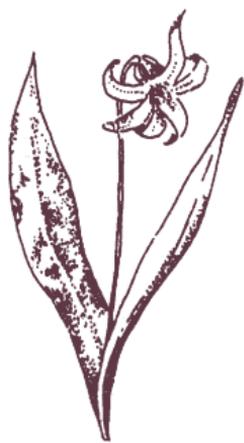


SYCAMORE

peppermint-striped petals, and Virginia bluebells with blue or lavender bell-like blossoms. Into late spring, the succession continues with a profusion of pink, white, and purple dame's rockets

lining the lane. Other flowers to be seen and enjoyed include flowering raspberry and jewelweed.

Showy displays of wildflowers that please us can obscure a disturbing fact. Many species are alien to the U.S., having been introduced intentionally or accidentally. The presence of those exotics is often at the expense of native species of equal or greater beauty, interest or value, that cannot compete with the aggressive invaders. The resulting reduction in native plant biodiversity may be manifested in unanticipated consequences elsewhere as in changes in animal populations.



TROUT LILY



VIRGINIA BLUEBELLS

Some notable aliens you will see on the property include dame's rocket, dandelion, Tartarian honeysuckle, Russian and autumn olive, multiflora rose (a thorny shrub introduced as a cover for game) and a variety of grasses. Garlic mustard, a herbaceous plant 1-5 ft. tall with white flowers and heart-shaped toothed leaves, is particularly abundant at many points along the trail.

POST 2

### *The Dale House*

Born in 1741 in northern Ireland, Samuel Dale, a wheelwright, emigrated to America in 1766. During the War for Independence, he served in the Northumberland Militia and fought in the Battle of Princeton. In 1789 Dale bought a 303-acre plantation for £ 600 from James Fleming, who had cleared 4 acres and built a log cabin on a place Fleming called "Lilliput." By 1793 Dale had built the front portion of the house on the northeast corner of what is now known as Dale's Ridge. Although no records exist, the back wing was probably added sometime between 1810 and 1840. Of Georgian style, Dale's house was built from local limestone and floors are American Chestnut quarter-sawn. The house was a slave site until 1840.

*The house is open for tours on Sundays during the summer and fall and for several special programs and events.*

POST 3

## *Shingle Oak*

Located about 30 ft. to the right of the trail is a tree that would be difficult for many hikers to identify as an oak unless they saw its fruit, the acorn. Unlike most of the more familiar members of the genus with highly dissected (lobed) leaves, this species has unlobed, oblong, laurel-like leaves; therefore it is also commonly known as northern laurel oak. These trees may grow to heights of 60 ft. and have diameters of 1 to 3 ft. Usually found in moist soils near waterways, this oak's range is largely in the Mississippi and Ohio river valleys; Pennsylvania is near the northern and eastern edge of its range. The origin of the name, shingle oak, can be traced to pioneer days when the wood was widely used to make split shingles.



SHINGLE OAK

POST 4

## *Buffalo Creek*

Originating on a ridge and flowing through a fertile valley, Buffalo Creek is a very typical stream in Pennsylvania's Valley and Ridge province. With its headwaters in the mountains northwest of Laurelton near the Union/Centre county line, Buffalo Creek is the main stream draining the Buffalo Valley. The predominant geological formations at its origin and for the first few miles downstream are sandstones. Physically and chemically, Buffalo Creek, near its source, is a cold-water stream well shaded by deciduous forest. The water contains few nutrients and is also quite acidic and poorly buffered, with pH's in the range of 4.5 - 5.0 (pH of 7.0 is neutral).

In 2009, an acid waters remediation facility was put into service in the upper reaches of the creek to raise the pH. The project was supported by grants obtained by the Buffalo Creek Watershed Alliance of the Merrill Linn Conservancy.

As Buffalo Creek flows eastward through the valley and cuts into limestone, the water chemistry changes dramatically. More nutrients accumulate and the pH becomes much more basic, with values

typically in the 7 - 8 range. Significantly, along its course to the Susquehanna, Buffalo Creek receives a large number of tributaries including Rapid Run and Spruce Run, many of which drain the rich agricultural areas of the valley. Consequently, a high silt load and a heavy concentration of nutrients, (several forms of nitrogen and phosphorus) are introduced into the mainstream. Thus in a matter of a few miles, Buffalo Creek changes from a cold, acidic, nutrient-poor system to one which is warm, basic, and nutrient-rich.

Biologically, Buffalo Creek changes dramatically as well. Brook trout and clean-water insects are characteristic of the headwaters with little in the way of algae or rooted plants evident. Downstream, warm-water fishes, such as eels, suckers, carp, rock bass, and a variety of minnows, are typical. In spring and early summer, the stream also supports brown trout (primarily stocked). Algae and rooted plants become much more common as one progresses downstream.

Prior to the clearing of valley forests for agriculture and other human development, Buffalo Creek probably flowed deeper, colder and clearer. Today, all along its course, its physical, chemical and biological characteristics are significantly affected by human activities.



OSPREY

*Source Elevation - 2100 ft. (638 m)*  
*Mouth Elevation - 634 ft. (132m)*  
*Drainage Area - 85,760 acres*  
*Length - 28 mi. (45.1 km)*  
*Drainage Pattern - dendritic*

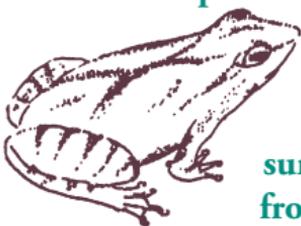


REDBELLY DACE

POST 5

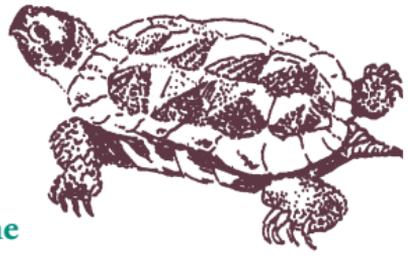
## *The Pond*

This shallow pond in the creek's floodplain is spring fed, but is susceptible to drying in times of drought. Dragonflies and swallows skim its surface. Along its edge, turtles and frogs bask in a sunny spot.



SPRING PEEPER

In springtime, jelly-like masses containing hundreds of frog eggs float just below the surface. A great blue heron may be patiently poised awaiting the moment to spear a meal.



WOOD TURTLE

POST 6

### *Switchback*

Visiting Dale's Ridge in springtime is especially rewarding when wildflowers bloom before the deciduous trees form a dense canopy of leaves. One of the earliest and loveliest of early spring wildflowers is hepatica. Its white or purple flowers appear before the emergence of its three-lobed (liver-like) leaves. Another spring wildflower is rue anemone, a member of a genus known as windflowers because their wiry stems sway in the wind. With dainty, white or pink blossoms, rue anemones thrive in open as well as dense woodlands. Unlike most wildflowers, wild ginger, with an underground stem, has flowers in contact with the ground. The brownish color of its blossoms makes wild ginger even harder to spot against the forest floor. Late April or May is blooming time for foamflower named for the foam-like spires of its floescence. Large and maple-like, the foamflower leaves are covered with numerous hairs on their upper sides. An easily identified wildflower, even after it has lost its flowers, is False Solomon's Seal. Its conspicuously parallel-veined leaves, 3 to 6 in. long, are in a zigzag pattern on its stem. Tiny, white flowers grow in dense bunches at the end of the stalk. Eastern columbine adapts to a variety of soil and light conditions. Easily spotted, columbine bears nodding, bi-colored blossoms 8 in. to 2 ft. off the ground.



COLUMBINE



HEPATICA

The character of the woodland on the northern slope of the ridge changes noticeably with elevation. On the bottom half, Pennsylvania's state tree, the eastern hemlock, predominates. Growing best in cool



RUE ANEMONE

moist conditions, hemlocks are identified by their flat needles with two white bands of stomata below. They reach heights of 60 to 75 ft. and diameters of 1 to 3 ft. The future of these trees is in question due to the introduction of the hemlock woolly adelgid from Japan. This insect is threatening natural populations of eastern hemlocks, which have no resistance to it. On the top half of the slope bladdernut shrubs

with their distinctive pouch-like fruit intermix with eastern hophornbeam trees. Hophornbeam has a shaggy appearance as its reddish brown bark is loose and scaly.

POST 7

### *Ridgetop*

Having ascended the ridge, take a restful pause to ponder the scene of the present and the past. The escarpment you have climbed is composed of limestone formed from deposits made in a shallow, warm, clear marine environment during Devonian time (350-400 million years ago).

It is estimated that 7 to 8 km of additional rock layers once covered this spot which remains today a "high" point on our valley's floor.

The U-shaped outcrop opens to the east and is bounded by steep scarp slopes on the north, west, and south. Historically, the ridgetop has served as cropland and pasture. Quarries on the north and west sides have been abandoned, but operations continue on the south side providing limestone for highway construction.



WHITE ASH



BITTERNUT HICKORY

The north flank of the ridge puts you at the canopy level of the creekside trees.

Consequently, this is an excellent place from which to observe treetop birds.

The large white pines behind you once stood in a pastureland. The absence of young pines in the dense understory indicates that these old trees will eventually be replaced by different species.

Dominant species in the shrub level are common privet, blackberry, and saplings of bitternut hickory and white ash. Emerald ash borers, a non-native insect, threaten our native ash species. A significant population of young black walnuts is invading this community. As these species mature and the old pines fall, the character of this area will be dramatically altered in an ongoing succession of change. In springtime, look for Dutchman's breeches and bloodroot along the ridge edge.

POST 8

### *North View*

The undulating landscape before you attests to the appropriateness of our areas's geologic designation as a Valley and Ridge Physiographic province. Formation of this topography began more than 600 million years ago with deposition of sediments in aquatic or marine environments and their subsequent compaction and cementation into rock. About 250 million years ago, deformation caused by continental collision heaved these strata to heights far greater than those seen today in the Rocky Mountains. Since the end of the period of uplift 200 million years ago, weathering and erosion have reduced those mountains to the gentler landforms we see today.

Immediately to the north are White Deer Ridge and Nittany Mountain; Buffalo Mountain is the next ridge west. Composed of resistant sandstones, these southwest to northeast trending ridges are part of the Appalachian Mountain chain. The farmland in the foreground is developed on rich soils that were formed by weathering of limestones and shales of Silurian Age (395-430 million years old) that underlie the valley. Much of our county's acreage is classified as prime farmland by the U.S. Department of Agriculture, which accounts for the prominence of agriculture in our local economy.

POST 9

### *Woodland*

This once open forest floor has become dominated by a thick understory of sugar maple. It contrasts dramatically with the dense, shrubby vegetation of the former pastureland you have just traversed. A few spring ephemerals can be found in the forest's herbal layer (e.g. May-apple, black cohosh, squawroot, hepatica, and eastern columbine).



SUGAR MAPLE

Although not a virgin forest, this woodlot is an old growth stand of oak, hickories, and ash but is strongly dominated by an extremely healthy sugar maple population. The abundance of sugar maple in this stand is unusual for our area. Why is it here?



NORTHERN RED OAK



WHITE OAK

Does the nature of the ridgetop soils favor this species? Did landowners selectively cut this forest?

As you enter the woodland, notice a three-sided mound of lime – the location of a former lime burn. There, limestone was stacked above the ground or in a kiln and then burned to produce calcium oxide, which after hydration became calcium hydroxide for application to the surrounding fields. During the process, certain areas may have burned at too high a temperature causing the materials to fuse and form clinkers which had no value as a liming agent. Clinkers can still be found today scattered about the area. By 1940 modern grinding equipment, which pulverized stone, and mechanical field spreading equipment made burning limestone on the farm an obsolete process.

POST 10

### *West View*

This vantage point on the west-facing scarp slope is provided by another abandoned limestone quarry. *Please stay well away from the edge.* Beyond the channel of Buffalo Creek, the valley, bound by forested ridges, tapers to a close at the western end of the county. Sloping eastward, the ridges are plunging anticlinal folds of Tuscarora quartzite, a form of sandstone. Separated by valleys made by plunging synclines, the whole structure is much like a piece of corrugated metal which has been tilted toward you.

## *Farmland*

The soils of Union County lie atop sedimentary rock of Ordovician, Silurian and Devonian periods of the Paleozoic Era. Some were formed in place (in residuum) directly over the parent bedrock; however, glacial, colluvial, alluvial or windblown deposits also might have contributed to their structure.

Varying in depth, color, texture, water-holding capacity, and chemistry, more than 100 soil types have been identified countywide. Three of those, Hagerstown silt loam, Kreamer cherty silt loam, and Opequon silty clay loam, are found on Dale's Ridge. Opequon is predominant. Like the others, it was formed from weathering of limestone. Opequon is a shallow, well-drained soil with a brownish topsoil to a depth of about 5 inches. Underlying the topsoil is a clay subsoil—yellowish-red to 11 inches and red from 11-16 inches. Limestone bedrock may be at a depth of only 16 inches.

Many of the open fields and cultivated soils around you have been farmed since the late 1700's. Intensive farming can lead to problems, and shallow soil such as these require special consideration in planning their use. While soil loss of 3 tons per acre each year is locally considered tolerable (as nature seems capable of replacing soil at this rate), acreage in some parts of Union County is losing soil at ten times that rate.

Given the importance of agriculture to the local economy, such losses are obviously detrimental to our area, but the impact is more far-reaching than this. Soil erosion is a major cause of deterioration of water quality. Sediments leaving Dale's Ridge enter Buffalo Creek, the first step on their journey from Union County to the Chesapeake Bay. Sediment-choked and nutrient-laden waters going into the Bay have been blamed for the decline in its productivity.

Contour plowing, strip cropping, minimum tillage, and cover crops of grasses and legumes may be part of a land management plan designed to protect and preserve this priceless natural resource.

Native summer wildflowers on field edges and other open areas include goldenrod, asters, milkweed and sunflowers.

*Red-Cedars*

Individuals of eastern red-cedar are common in the former pasturelands and old hedgerows near the trail. Although this native, evergreen, aromatic tree grows on a wide variety of soils ranging from swamps to dry limestone outcrops, it can be an aggressive early colonizer of abandoned pastures and can form dense stands on upland, limestone-derived soils of abandoned farmlands. In contrast to most conifers whose foliage makes soils more acidic, red-cedar's decomposing foliage makes surface soils more alkaline because its foliage concentrates calcium from the soil. This addition of calcium to surface soils can increase earthworm activity, which in turn can elevate soil organic matter and increase water-infiltration rates. However, competition with hardwood species including maple, oak, and ash on sites with rich soils can limit red-cedar's success. As a consequence, the red-cedar stands in abandoned pastures are expanding while woodland stands with maple, oak, and ash are contracting. In our area, red-cedars typically persist only 60 to 80 years because of competition from hardwoods. There is ample evidence of such successional turnover on Dale's Ridge.

Red-cedar trees are either male or female. Female trees are most evident during the fall when their berry-like cones undergo a color shift from green to pale blue. The fleshy cones, containing one to four seeds, do not open but rather remain on the tree well into the winter unless they are consumed by birds including cedar waxwings (hence their name), robins, mockingbirds, and bluebirds or by small mammals such as chipmunks, opossums, voles, and mice. Cedars are also a food plant for Olive Hairstreak butterflies, a Pennsylvania species of concern found on this property. Red-cedar is important to wildlife not only for its fruits but also because its dense foliage provides valuable nest and roost sites for birds including robins, blue jays, mockingbirds, juncos, and several species of sparrows.



DAME'S ROCKET



POISON IVY

## *Our Mission*

The Merrill W. Linn Land and Waterways Conservancy works with individuals and other organizations to protect important aspects of the natural environment in Union, Snyder and upper Northumberland counties. We strive to ensure that our natural resources of scenic, environmental and ecological importance are preserved, managed, and monitored for the enjoyment of present and future generations. Through conservation partnerships with landowners, land gifts, and outright purchases, special areas can have permanent protection.

This property and trail are maintained by the volunteer efforts of members and friends of the Conservancy. Only through continued stewardship by those volunteers and you, the users of the trail, will it remain the treasure of natural diversity that it is today. Help protect it for generations to come as the Walkers have wished.

*We hope you have enjoyed your walk. Your comments, suggestions for improving the trail, and reports of any hazardous conditions or violations of use that you encounter are important to us. Please contact the Conservancy by calling 524-8666 or writing to:*



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*Illustrations: Courtesy of Jeanette Campbell*

*Map: Courtesy of Mid-Penn Engineering Corp.*

*Coverphoto: Courtesy of Dave Hafer*