

1. History

The University Farm of Case Western Reserve University comprises 386 acres of land in the village of Hunting Valley. It is the amalgamation of several gifts of property to the university. Mr. Andrew Squire donated the first property, Squire Valleevue Farm, in 1937. In 1977, heirs of Jephtha Homer Wade II donated a portion of neighboring Valley Ridge Farm, which increased the Farm's size by 104 acres and dramatically reinforced its prominence. Other neighbors, the Hollister's, gave two additional five-acre parcels, in 1984 and 1995. All these gifts were donated to the university to be used for education, research, and recreation by Case faculty, students, staff and alumni.

The Farm contains a variety of wildlife habitats, successional stages of vegetation, and geological formations typical of northeastern Ohio.

The Interpretive Trail is marked by dark brown posts with white numbers or arrows. It is 2.08 miles long and contains 32 marked stations. Numbers in this guide are keyed to the numbers on the posts.

Visitors are asked to stay on the trails and to not pick any plants nor disturb any of the natural features of this beautiful landscape.

2. Hedgerows

In the early farming days, hedgerows were created to act as windbreakers and property boundaries using living plants as barriers.

A common plant used to form such hedgerows was hawthorn (*Crataegus spp.*), an ideal tree due to its luxuriant lower branches, relatively short height, and long thorns. Because of this growth form, hawthorn acted as a barrier for

cattle and other domestic animals. Today such hedgerows continue to provide ideal wildlife cover for birds and fur-bearing animals.

3. Buckthorn

European alder buckthorn (*Rhamnus frangula*) is a native of Eurasia and another common hedgerow species. Successful "pioneer plants" or plants that rapidly invade new areas are often those whose seeds are rapidly dispersed. Look for the bluish-black drupes or cherry-like fruits of the buckthorn. These fruits are readily eaten by birds who then fly to the cover of the next hedgerow and leave buckthorn seeds behind in their droppings. Once buckthorn becomes established in an area, it often becomes an obnoxious and aggressive weed, crowding out native vegetation.

4. Field Succession

Left undisturbed, plant communities undergo a series of predictable changes through time called SUCCESSION. A field like this one will eventually become a mature forest, as each stage in succession modifies the environment to make way for the next.

The composition of the plant communities during succession depends on climate, topography and the seed source of surrounding communities. Those plants that produce large numbers of highly dispersible fruits, such as wind or animal-borne seeds, occur in the earliest stages. Early pioneers must also be able to tolerate full sunshine and poor soil conditions. As these plants live and die, their organic matter becomes incorporated into the soil, preparing the way for plants with more

rigid requirements.

5. Hedgerow Swale

This hedgerow habitat, with abundant water provided by an intruding stream, provides important cover for a variety of wildlife that forages in the open fields and escapes to the dense hedgerow thickets for protection. Thicket-forming shrubs and vines include riverbank grape (*Vitis riparia*), northern arrowwood (*Viburnum recognitum*), black cherry (*Prunus serotina*), wild crabapple (*Pryus coronaria*), and rose (*Rosa multiflora*).

6. Old Field Communities

Abandoned agriculture fields are quickly invaded by various herbaceous plants, many of which are European in origin.

The mowing history of a field can often be deduced from studying the plant composition. Yearly mowing before the growing season reduces woody growth and increases the number of perennial wildflowers. Mowing during the summer also eliminates woody plants and changes the herbaceous growth to predominantly grasses instead of forbs or wildflowers. Common grasses include orchard grass (*Dactylis glomerata*), Kentucky blue grass (*Poa pratensis*), red fescue (*Festuca rubra*), and timothy (*Phleum pratense*). Common herbs are Canada goldenrod (*Solidago canadensis*), Queen Anne's lace (*Daucus carota*), wild strawberry (*Fragaria virginiana*), and New England aster (*Aster novae-angliae*). Early woody invaders include European alder buckthorn, blackberry (*Rubus allegheniensis*), and gray dogwood (*Cornus racemosa*).

7. The Edge Effect

The zone where two different communities meet, such as forest and open field, is known as an ECOTONE. Here there is a commingling of species from both communities, as well as

the presence of a number of species adapted for life in such transitional areas. As a result, the ecotone often contains the greatest density and variety of life. This phenomenon is called the EDGE EFFECT. Studies of breeding birds and game species show that the greatest densities occur where a variety of habitats are in close proximity, providing nesting sites, dense shrubs for cover, and areas for foraging.

8. Climax Forest

Eventually in every dry land plant community, succession slows and plant communities achieve a self-maintaining state. This final self-reproducing permanent condition is known as the CLIMAX FOREST. The composition of such a forest varies from region to region depending on climate and topography. Here in northeastern Ohio, the most common climax forest type is American beech (*Fagus grandifolia*), and sugar maple (*Acer saccharum*). Note that the seedlings and saplings in this area are the same species as the tall canopy, an indicator of a mature wood. Climax species are adapted to being able to grow in their own shade. Climax communities maintain themselves because the successional process is repeated on a micro-scale whenever a disturbance occurs, such as the creation of a sudden opening in the canopy when an old tree topples.

9. The Forest Floor

In the well-developed soil of a mature forest, a great variety of wildflowers appears, especially during early spring before the leaves of the canopy close out the sunlight. These plants usually leaf out and die back between mid-April and mid-May, taking advantage of the sun's energy to store food products of photosynthesis in underground parts for next year. Spring woodland wildflowers include ill-scented trillium (*Trillium erectum*), cut-leaved toothwort (*Dentaria laciniata*), yellow mandarin (*Disporum lanuginosum*), wild geranium (*Geranium*

maculatum), and bloodroot (*Sanguinaria canadensis*).

The forest floor also is inhabited by a multitude of insects, salamanders, reptiles, ground nesting birds, and mammals, including several species of mice and shrews.

10. Grape Vines

The vines of the wild grape (*Vitis vulpina*) form impenetrable tangles in their search for light. Using sturdier trees for mechanical support, these plants often shade out and kill the trees below, creating many forest openings.

On the beneficial side, grapes provide food for grouse, deer, rabbits, skunks, fox, mourning doves, and cedar waxwings during their September to November fruiting period.

11. Creek and Pedestrian Bridge

Overflow water from the fishing pond upstream fills this creek. It is an intermittent creek that flows only during periods of abundant moisture such as early spring.

The pedestrian bridge was designed and built by Professor Dario Gasparini and his students from Case Department of Civil Engineering during spring 2002. The bridge is a "pre-stressed" Howe-Stone truss. It is pre-stressed by tension in the vertical bars. The pre-tensioning forces were controlled so that the horizontal "chord" elements will always remain in tension.

12. Glacial Relic Community

Twelve thousand years ago the glaciers receded from northern Ohio, leaving a barren landscape on which plant succession began. Cold-climate plants living south of the ice margin provided the seed source for re-vegetation of the newly exposed land. As soil built up, new communities appeared in a process that continues today. On north facing slopes and in ravines, a cooler microclimate exists which still supports plants from glacial times, such as Canada hemlock (*Tsuga canadensis*), yellow birch (*Betula lutea*) and Canadian fly honeysuckle (*Lonicera*

canadensis). Red squirrels often use the hemlock for nesting sites.

13. Lookout

During the time that farming was active in this area, it was necessary to build bridges across the ravines in order to transport lumber and other materials through the woods. This is the remains of an old service road. Note the Berea sandstone formation on the far bank. This rock was often used as a building material around the farms. Hemlocks also are found on these cooler hillsides.

14. Oaks

This area is characterized by the presence of large red oaks (*Quercus rubra*). These trees are estimated to be around 200 years old.

15. Cucumber Trees

The cucumber tree or cucumber magnolia (*Magnolia acuminata*) gets its name from its curious cucumber shaped fruits, which were once eaten by pioneers after extracting the bitter taste. A member of the magnolia family, the tree bears small, greenish-white flowers in the spring.

16. Intermediate Succession Stage

The intermediate succession stage includes several light-tolerant tree species such as blue beech and dogwood in the upper forest story and young sugar maples and American beeches indicating the progression of the succession stage.

17. A Pioneer Tree: Tulip Tree

The tulip tree or yellow poplar (*Liliodendron tulipifera*) is the tallest hardwood tree in North America, reaching heights up to 200 feet. Note the straightness of the trunk and the lack of lower branches, making it a very valuable tree to foresters. Their distinctively lobed leaf easily identifies the tulip tree. Large yellow and orange

tulip-like flowers adorn its upper most branches in late May. It is a common tree of our second-growth forests because of its ability to grow rapidly to the top of the canopy, reaching for sunlight.

18. Creating a Ravine

The deep ravines and minor valleys on the Farm are the result of water eroding away the soil and bedrock. Even streams that flow only in the wet season can profoundly affect the surfaces over which they move.

Mainly the slope of the land determines the erosive capability of water. This deeply cut ravine would be termed "young" geologically because there has been insufficient time for secondary erosion to cut back the slopes on the sides of the ravine.

The abundance of water draining eastward from the heights of the upper Farm into the Chagrin Valley was an important feature of this area to early settlers.

19. Indian Mound

This formation has long been known as the "Indian Mound" and was believed to be related to past occupation by Native Americans. However, an archaeological investigation in 1981 by Prof. David Bush revealed no artifactual material or cultural strata in the mound. A few surface artifacts have been found at the Farm, the oldest being a single projectile point with a probable age of 6,000 to 3,000 B.C. These findings suggest that during prehistoric periods, the area was probably inhabited seasonally by small bands of hunters and gatherers.

20. The Forest Floor

A great diversity of wildflowers, ferns, and shrubs occur as groundcover in the rich soil of mature woods. Some of the plants in this spot include wintergreen (*Gaultheria procumbens*), Christmas fern (*Polystichum acrostichoides*), and Solomon's seal (*Polygonatum biflorum*). Common birds in this habitat include ovenbirds,

hooded warblers, and rose-breasted grosbeaks.

21. Second Growth Forest

The woodlot you are standing in is indicative of a second-growth stage in forest development. The trees are of uniform diameter and height and are probably all the same age, which is called an even-aged stand. A disturbance, such as clearing the trees for timber or farmland, made way for the germination of these rapidly growing pioneer species.

22. Farm Reservoir

The Wade family built an elaborate water supply system by developing ponds and constructing this 115,000-gallon reservoir fed by numerous wells and pumping stations.

23. Witch-hazel

The witch-hazel is a relatively tall shrub that is common throughout the eastern U.S. Oil obtained from the leaves, twigs, and bark is used in the production of witch-hazel rubbing lotion. Buds are brown, somewhat flattened, and essentially naked with dense yellowish-brown hairs ("winged foot"). Conspicuous yellow flowers are borne in the fall and fruit matures the following year. The fruit is a short, 2-celled woody capsule from which shiny black wingless seeds are forcibly ejected. Empty fruit may persist for several years.

24. The Forest Understory

The vegetation of a forest may be divided into layers by height. The community is usually named from the trees present in the canopy. Below the canopy, in the sub-canopy or understory, there may be a variety of smaller trees adapted for life in the shade such as sugar maples and American beech.

25. Cottonwood: A Wetland Tree

A common tree of wet woodlands, the eastern cottonwood (*Populus deltoides*), has a rapid rate of growth, making it a successful competitor for

sunlight. The cottonwood is short-lived. At 75 years it is old with the heartwood probably already eaten away by decay. A tree 125 years old is rare. In compensation though, it may grow at the rate of four to five feet in height each year and a 50 year-old tree might have a trunk two yards in diameter. The cottonwood is an early bloomer, bearing separate male and female flowers in catkins. In mid-spring, the seedpods burst, freeing the vast numbers of cottony, wind-borne seeds for which the tree is named.

26. Pond Habitat

This pond was formed by damming a small creek sometime prior to 1940. As on dry land, aquatic communities undergo successional stages. As the floating plants, such as pondweed, die and sink to the bottom, organic material and silt accumulate and the pond becomes shallower. By 1984, the accumulation of debris had become sufficiently severe that the pond was dredged that summer. The depth of the water influences the types of aquatic and semi-aquatic plants that can exist, so the pond community is constantly changing as organic material accumulates on the bottom.

27. Fishing Pond

This is one of two fishing ponds at the Farm. Such aquatic habitats support a variety of animal life. Green frogs, spring peepers, wood frogs, and bullfrogs will use the pond for breeding in the spring. Also present are bluegills, trout, and largemouth black bass as well as painted and snapping turtles, northern water snakes and garter snakes.

28. Soil Depressions

These depressions are found throughout the forest floor. They are thought to be caused when trees fall and the roots are pulled out of the soil. They have an almost perfect circular shape and can be up to one to two feet deep.

29. Swampland

A swamp area is wet all year around. Small trees that grow here are very tolerant of excess water. Among the plants growing in this area are ferns, yellow flag, and marsh marigold. The overflow water from four research ponds and one fishing pond upstream forms this swamp.

30. Glacial Rocks

These boulders are glacial erratics. They are igneous and metamorphic rocks from the Canadian Shield that were carried into Ohio by glaciers of the Ice Age. When the ice melted back about 12,000 years ago, the boulders were deposited on the landscape. Cracks in these rocks show how freeze-thaw weathering works to break them into small pieces.

31. Farm Boundaries

The original boundary between the Squire Valleevue Farm and the Valley Ridge Farm passed through this area. Remnants of concrete posts and rusted metal fencing provide hints of bygone days.

32. Open Fields

This open field behind the "Sheep Barn" is mowed once a year at the end of the summer. The Farm's open fields are mowed weekly, monthly or annually depending on each area's use. These practices accommodate the varied uses of the Farm, such as preservation of wildlife and bird nesting grounds and provision of opportunities for education, research, athletic, and recreational activities.