CERA Interpretive Trail

This CERA Trail winds through a portion of UMBC's 45-acre Conservation and Environmental Research Areas (CERA). UMBC President Freeman Hrabowski dedicated CERA on Earth Day, April 22, 1997, "to further our understanding and appreciation of this natural landscape." During the ceremony, the words of Aldo Leopold were recalled:" When we see land as a community to which we belong, we may begin to use it with love and respect." Since then, CERA has been used for a variety of undergraduate research projects, visited by a number of classes, and has been the focus of class projects.

The CERA Trail is a .6-mile self-guided interpretive path that provides information regarding the ecology and natural history of the area. Numbered wooden posts are placed at intervals along the trail (see map); the text below corresponds to those numbers. The trail is marked by white blazes placed at eye level on trees. A change in direction is indicated by a double blaze.

For more detailed information about CERA visit the CERA website at https://ges.umbc.edu/cera/. To contribute your own observations or ask questions about CERA, send an email to the Chair of the CERA Steering Committee (cera@umbc.edu). Please do not disturb or remove anything from CERA. "Take only photographs; leave only footprints."

#1 Forests of two markedly different ages are visible from here. To the south (facing the post) is an older woodland composed of a considerable diversity of tree species and sizes. The largest tree, a white oak just behind this marker, is 95 feet high and is more than 200 years old. To the north is a much younger woodland, with shorter, thinner trees, many of

which are less than 60 years old. Red maples dominated this young forest when the CERA trail was first established. Now, there is a diverse mix of trees that include Beech, Hickory and Pine. These two forest types reflect past land use.

Before UMBC was founded in 1966, the young forest to the north was likely an abandoned agricultural field, dominated by grasses and wildflowers. Gradually, shrubs and young trees began to grow and shade the site, replacing the herbaceous plants. This sequential change in plant species over time is known as succession. The forest to the south is a much older successionary stage. It has been a wood lot since the early 1900's, although the scattered nature of large trees indicates the forest may have been open to grazing in the first half of the twentieth century.

#2 Can you find the Poison ivy plant? Poison ivy is a woody vine that thrives along much of the CERA Trail. Because contact with poison ivy can cause dermatitis, it's important to know what it looks like and to avoid touching it. You can find poison ivy growing up trees near this post as a hairy vine. These vines do not directly hurt trees when they are attached, unlike other vines like English Ivy vines that can compete with trees for nutrients. Poison ivy can also be found growing upright on woody stems from an underground runner. Look to the right of the post on the ground to spot a ground-growing poison ivy plant.

This plant is easiest to spot when you can see its "leaves of three" that grow during the spring and stay on the plant till the fall. In the fall the plant will also grow berries. More than 60 species of birds eat poison ivy berries, including northern flickers, mockingbirds, and downy woodpeckers. Fall berries are especially important food sources for migrating birds traveling south down the east coast of the United States.

In the summer the ground here is also covered in Japanese Stilt Grass. This is a small, bright green grass that looks like small bamboo. It is a non-native invasive summer plant that outcompetes native understory plants because it can spread quickly and thickly in full sun or deep shade leaving no room for other small plants to grow.

#3 Even though this forest is certainly not considered "old growth," there is a large amount of dead woody debris here. Trees die for a variety of reasons, including disease, and insect and storm damage. In addition, wind frequently prunes dead branches from an otherwise live tree. Bacteria, fungi and insects quickly attack all of this woody debris on the forest floor. These organisms absorb nutrients that had previously been locked up in wood, recycling them back into the forest food chain. Dead branches also provide structural diversity to the forest, providing shelter to animals like salamanders, sowbugs and worms. Trees that die but remain upright are called snags. Snags do begin to decay as bacteria, insects and fungi colonize the upright trunk, but the rate is comparatively slow. Snags are especially valuable as nest sites for owls and flying squirrels, and woodpeckers, creepers and other gleaning birds profit from the rich lode of insects. Although we humans tend to view logs, branches and snags as untidy, they are very important to the ecology of a forest.

Japanese Barberry is a spiny shrub found along the trail that grows bright red berries over that summer that it keeps throughout the winter. Originally imported to the United States in 1875, this was historically planted as living fences for livestock. Now this plant is considered invasive and grows as dense thickets that can crowd out native low-growing plants. It's dense branches also create an ideal humid environment for deer ticks, a parasitic arachnid known for carrying the pathogen that causes Lyme disease.

#4 The area all around you demonstrates the typical structural organization of a forest. At your feet is an herbaceous layer of short, low-growing plants like ferns and grasses. The shrub layer, about 5 to 10 feet high, is particularly obvious here, consisting primarily of a small, pretty tree called spicebush. Overhead, immature trees that are still growing in height form the subcanopy. The largest, most mature trees compose the canopy. These trees get plenty of direct sunlight on their upper leaves, which in turn cast a dense shade on the forest below.

Spicebush is a native shrub or small tree, rarely attaining more than 10 feet in height. It has smooth, glossy oval leaves that taper to a sharp point. Scratch the woody stem and sniff; you'll get a delightful lemony scent. Spicebush produces beautiful red berries in the fall that are eaten by migrating robins and other songbirds.

#5 English ivy coats many of the trees near this marker. A non-native evergreen climbing vine, English ivy is indicative of past nearby human habitation. Note that although the vine climbs up these trees from the ground, there are very few leaves until about six feet up. Possible explanations for this phenomenon include grazing by whitetail deer or shading by the many small trees in this area.

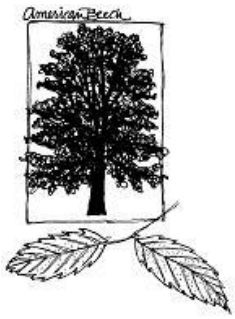
#6 The area south of the post is dominated by tulip poplars, fairly fast-growing trees that rise tall, arrow-straight and branchless for many feet. They can grow quite large, like the specimen to your right on the other side of the trail. In May, tulip poplars have large, cup-shaped flowers that contain a drop of nectar to attract pollinating insects. Leaves turn a beautiful yellow in autumn. The forest floor is open and spacious here, but the flowering plants that are present are mostly species not native to Maryland. They include Japanese stiltgrass and mutliflora rose. Such "exotic" plants often out-compete uncommon native species and may negatively affect ecological processes of the forest.

#7 Note the several erosion gullies here. Water running off Sulphur Spring Road has eroded deep ditches (up to six feet) where the soil is sandy or gravelly. On the other hand, in some places there is very little erosion. Invariably, these places have clay soils and rock just under the surface of the ground. Several remarkably different soil types underlie CERA, reflecting the complex geological history of this area near the junction of the Piedmont and Coastal Plain physiographic provinces. Walk down the trail extension to take a closure look!

#8 The tiny stream in front of you is one of the branches of Herbert Run. It begins in the far corner of CERA from a spring-fed wetland, and quickly gathers enough water so that the streambed

never entirely dries up, even in a severe drought. Water is the basis for life, and the streambed is home to microscopic algae, bacteria, protozoa, and even a few insects. These organisms form the basis of an aquatic food chain different from that of the surrounding forest. Downriver, where the stream is a bit wider and deeper, life will be more diverse, including fish, amphibians and a variety of invertebrates. The UMBC campus contains four arms of the Herbert Run, all of which join near the southern border of campus. Herbert Run flows for about 3 miles through the communities of Arbutus and Halethorpe before joining the much larger Patapsco River near tidewater. The Patapsco forms Baltimore's harbor and then enters Chesapeake Bay. All great things have modest beginnings!

#9 The overlook is perhaps the most scenic section of the CERA Trail. To the north, the land slopes almost twenty feet down to the stream of Herbert Run. Beyond the creek there is a large open area with no trees at all - how this happened is not complete clear. Turning toward the right there is a large White Oak growing at a tilt up the hillside. Oaks play an important role in supporting birds because they host close to 1,000 caterpillar species, which are a nutrient-rich food for baby birds. In contrast to what you see downhill, the soil on this upland where you are standing is well drained and fairly dry. But the fact that virtually nothing grows under the rainshadow of this large tree with smooth, silver-gray bark is not due entirely to the dry soil. This tree, an American beech, has an extensive root system that is particularly competitive for the limited nutrients found in the upper portion of acid soils such as these found in this area.



#10 The trail passes here through a very young forest. This part of the forest is dominated by red maples with a diameter at breast height (d.b.h.) of less than 6 inches. These trees are probably all less than 50 years old, estimated based on site photos from the 1970's that show the site as a mowed field. The lack of tree diversity indicates that when the land was allowed to revert back to nature after human use, red maple seeds happened to arrive here in great numbers, germinated quickly, and got a head start in growth to dominate the site. Red maple is a common, widely distributed tree tolerant of a substantial range of soil conditions, growing in habitats as diverse as sand dunes and swamps.

#11 Note the concrete boundary marker ahead of you. The concrete marker, about 50 feet off the trail in front of the post, is part of the remains of an old fence corner. There used to be strands of barbed wire that ran on either side of the boundary marker along an old fence line. Old photographs indicate that this area was once pastured. At your feet you may notice, depending on the time of year, that the ground is particularly wet here. Previous UMBC student research shows that this section of the trail has a very high water table surface. This means water that is underground is very close to the surface. At this location the water underground is moving toward the Herbert Run tributary to the north.

#12 The trail here passes along the edge of a nontidal wetland. The soil is always wet, and that prevents the growth of many plant species that do well elsewhere along the CERA Trail. Instead, the plants that grow in wetlands are adapted to water-saturated, hydric soils. In fact, the presence of these unique plants is one criterion that defines a wetland under Section 404 of the Clean Water Act,

which protects wetlands from disruption and damage by human activity. Examples of obligate wetland plants that can be seen from here include black willow, the smaller netted chain fern, and the larger cinnamon fern. Another ground cover you can find here is a species of moss known as sphagnum. This type of moss is known for soaking up a lot of water and can be found growing in wet forests.

#13 Examine the soil here; you'll find it's very sandy. The large particle size of sand means that rain drains through it quickly, and therefore this soil is dry (xeric) in nature. There is also very little organic material in this soil, except in the topmost inch or so. These two factors explain why the most common ground covers are lichens, mosses and fungi. These simple, non-vascular plants (and related kinds of organisms) can grow reasonably well in such harsh conditions, but they are frequently out-competed by grasses and herbs in richer soils. Sandy soil is not common on most of the UMBC campus and in Catonsville to the north. However, to the south and east, sandy soil is much more common. UMBC's CERA is atop the junction of two of Maryland's physiographic zones, the Piedmont and the Coastal Plain. Piedmont soils are complex, fairly rich in nutrients, and feature much clay and many stones. Coastal Plain soils are much coarser and sandier, descended from alluvial runoff from the uplands to the west and north.

A few paces uphill will bring you back to the start of the trail loop. Please return this trail brochure to the mailbox for others to borrow. Copies may be downloaded from the CERA website. We hope you've enjoyed your walk through CERA, and that you've learned something about the ecology and natural history of this area. Visit again!