Ohio’s Arc of Appalachia Preserve System
2019 - 2020 News Magazine
“The Little Things That Run the World”
quote by e.o.wilson; painting by rick pas
Inside Cover Art by Artist Steven Kutcher & His Friends

Although trained as an entomologist, Steven Kutcher, has worked in a number of diverse jobs in his career, including artist, insect consultant, comedian, lab technician, naturalist, educator, filmmaker, and the go-to man for employing bugs in Hollywood films. He holds an undergraduate degree from University of California, Davis in entomology; and a graduate degree in biology from California State University, Long Beach, where he specialized in insect behavior and ecology. Steven has provided and coached bugs for over 100 feature films, including Spiderman and Jurassic Park. Earlier in his career, a filmmaker asked Steven to coach a fly to walk through ink and leave footprints on paper—a challenge that Steven met. That experience led to his facilitation of paintings executed by the insects themselves. Steven supplies the canvas, the paint, and some guidance; the bugs do all the rest. The watercolor paint is harmless to the insects and the finished products are absolutely beautiful, as you can see. See Bugsaremybusiness.com. Steven will be teaching one of our 2020 Appalachian Forest School courses called Insects: Diversity, Ecology & Behavior, encouraging relationship building with ‘the little things that run the world.”
This issue is dedicated to insects and the art they inspire

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We can no longer take anything in nature for granted. Even the inextinguishable bright lights of our childhood—trees, fireflies, butterflies, fall color, bees, spring wildflowers, migrating warblers, bats in the belfry, hawks in the sky, box turtles crossing the road, and groundhogs sitting upright on their haunches as we sped by them on the highway—are showing their vulnerability. Our times are requiring us to change the way we think, act, and live, if life on earth is going to survive. This begins with a transformation within.

When Aldo Leopold, author of the Sand County Almanac and father of the conservation ethic, was a young man, he shot an old she-wolf in the West to rid the forest of varmints, just as so many others had done before him. He wrote of the event, “We reached the old wolf in time to watch a fierce green fire dying in her eyes.” Witnessing the she-wolf’s life force vanish as a result of his own deeds changed the trajectory of his life.

Many of us on earth today are replaying the anguish of Aldo Leopold. We are watching the green fire of our earth die, while knowing full well who fired the killing shot. When Aldo stared into the dying eyes of the wolf, he lit up with the connection. In one electrifying second, he recognized that the fierce green fire that animated the unique expression of wolf was the same green fire that created the unique expression of Aldo Leopold. It was the same green fire of the toad, the stag, and the slug.

Love is none other than unity’s recognition, and love wants to pull us into widening circles of connection and compassion. For some folks, the circle is quite small, including extending only their immediate family. That’s a beautiful thing, but even Canada geese and paper wasps do the same. Fortunately, most people are earnestly trying to relate to the larger human community, with all the issues of ethnicity, gender, and faith that the effort confronts.

But we must go even further. In order to find solutions to our pressing world concerns, we must extend ourselves right on across the great species divide. Note, wherever the outer boundary of each person’s circle lies, whether to the
In December of 1987, E. O. Wilson wrote a landmark article in the journal *Science* that would become a cornerstone of modern conservation biology. In "Putting People in the Map," a mapping project that replaced the historic vegetative biomes of the world with 21 categories of modern landscapes, most of which are highly human-altered (you can Google this map for yourself online). The most urban and human-altered landscapes were colored in red. The largest, reddest spots in the world map were on top of England and Germany. These countries are the canaries in the coal mine for demonstrating the cumulative impact of our modern industrial culture upon living landscapes.

Intrigued, I found a research paper called "The Preciousness of the Night Biophony of Insects in Germany." The paper, published in 2013, describes a study of insect numbers in Germany's nature preserves since 1989, providing a rare and priceless 20-year overview. During that span the biomass of insects at the height of summer decreased by 82%. Forty-six of Germany's moth and butterfly species have already disappeared. German entomologists are perplexed and deeply worried.

Interrugently, insects and other arthropods have been the last group of beings on the planet to which humanity has been willing to extend appreciation and respect. The chasm between warm skin and exoskeleton runs deep. Yet nowhere does the green fire burn with such abandon than in the insects. It's a very conservative guess that the world has at least 2.5 million species, compared to less than 45,000 vertebrate species. Every serious field study in the world keeps turning up new species, so we don’t know for sure how many we really have; but maybe as many as 30 million. That's a lot of them to love. Of the more than 1.5 million species of plants, animals, fungi, lichen, and bacteria that we have described, roughly one out of three is an insect.

Intelligence is not the sole possession of humankind. Admittedly we have the capacity for superior problem-solving abilities (which we better put into collective action here real soon), but with a little humility we can see that wisdom permeates all of nature, without exception. Just take a look. Insects were the first creatures to fly, the first to make paper, the first to create photoluminescence, the first to sing, the first to use abstract language, the first to plant and tend gardens, the first to domesticate other animals, the first to engage in chemical warfare, the first to practice deception for self-defense and the conquering of new territories (we had to learn it from somewhere), the first to use their own bodies to produce baby food, and the first to form complex communities with role specialization. Recent experiments have proven that insects even know how to count. Yes, it's true. We now know that bees can count up to four, and that wasps can recognize the faces of their community members.

Bugs, as it turns out, despite their historic numbers, are in deep, deep trouble. Each year in late summer I rejoice in the night biophony of trills, warbles, clicks and rattles made by well over a dozen species of singing insects in my backyard. In my humble opinion, singing insects are one of the finest nature spectacles east of the Mississippi. The East's ample water and lush growth drives that beautiful choir. The preciousness of the performance was put into context for me when I talked to my sister a few weeks ago who had just returned from a two month vacation in Germany. "Nancy," she said, "it was so surreal. I opened my windows at night and it was quiet. Seriously, it was silent. There were no insects singing."

How could this be? Germany lies in the same temperate climate and the same deciduous forest biome as does Ohio. A little research unfolded more of the story. A German entomological society has been methodically inventorying insect numbers in Germany's nature preserves since 1989, providing a rare and priceless 20-year overview. During that span the biomass of insects at the height of summer decreased by 82%. Forty-six of Germany's moth and butterfly species have already disappeared. German entomologists are perplexed and deeply worried.

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article in the newly published journal of Conservation Biology. In it he made one of the first public pleas for insect conservation. Under the title, “The Little Things that Run the World,” he reminded his readers that invertebrates have been on earth 100 million years longer than vertebrates. To illustrate their importance, he wrote that any 2.5 acres of pristine Brazilian rainforest might have a few dozen mammals and birds in it, but the same hectare had over a billion invertebrates, representing 93% of its biomass.

He also went on to say, “The truth is that we need invertebrates but they don’t need us. If human beings were to disappear tomorrow, the world would go on with little change. But if invertebrates were to disappear, I doubt that the human species would last more than a few months. Most of the fishes, amphibians, birds, and mammals would crash to extinction about the same time.” Since we now know that an estimated 87% of all plant species rely on pollination, most of which is provided by insects, plant communities would eventually disappear as well.

Although nearly every food chain rests on a foundation of insects, let’s take birds to demonstrate the fact, since they are so well studied and preferentially beloved. According to Douglas Tallamy, author of Bringing Nature Home, 96% of our birds rear their young on insects, even if they spend the rest of the year eating berries and seeds. No other food source is so packed with fat and protein. He actually counted how many caterpillars it took for a pair of chickadees to sustain a nest of fledglings. Answer: between 6,000 and 9,000. Each baby bird consumed an average of 350-570 caterpillars a day. Chickadees can’t find those insects in a lawn. They need native trees and shrubs.

Tallamy has fast forwarded our entomological understanding for the simple reason that he was patient enough to count bugs and he knew what he was looking at. He took several 12 x 12 sq. foot plots of land in his home state of Maryland, each centered around a particular tree, and then counted the number of caterpillars on just the tree’s lower branches. In one study he counted 410 caterpillars representing 19 species on a young oak. In another, a black cherry produced 239 caterpillars of 14 species (supporting one baby chickadee for less than one day). Conversely, a nonnative invasive burning bush produced 4 caterpillars of just one species, and a nonnative invasive callery pear produced just one lonely little caterpillar.

We come to this sobering conclusion. Nature preserves, as absolutely essential as they are for biodiversity protection, are not enough to save Life on earth. It is absolutely critical that each of us supports nature preservation on the land where we reside, whatever its size, whatever its condition.

If you don’t feel warm and fuzzy toward insects, recognize it is just your familial training and mammalian prejudice kicking in. Begin your inner wrestling. You already put a great deal of effort into trying to get along with that bossy woman, Bertha, who shows up at every committee meeting at church and reminds you of Aunt Jane who belittled you when you were six. And your life doesn’t even depend on Bertha! Surely you can put a little muscle into wrangling with your fears and prejudices toward insects!

When people persecute minorities in our country, enlightened people speak out in their defense. Do the same for the bugs. When your nephew sees a bug in your house and lifts up his foot to squash it, put a gentle hand on his shoulder and study the creature with interest instead. Pull that bug inside the young man’s circle. Take him on night hikes to see the fireflies. Have a picnic among the singers of late summer.

Join me in dedicating the coming years to the conservation of insects, beginning with 2020. If everyone who reads this article makes this commitment, we will do a world of good. First, replace 80% of the nonnative
trees and shrubs in your yard with native varieties, accepting whatever the sacrifice and cost the job requires. Replace at least 60% of your flower garden with native plants. This may be an immense job, but Life is in serious danger. It deserves earnest action.

Secondly, dedicate yourself to insect education. Imagine if every birder turned their attention to what keeps the birds in the air! Buy a good insect guide. Read Tallamy’s books. Go to \texttt{nwf.org/NativePlantFinder} to find out what native trees and plants Tallamy recommends for your zip code. Look for the many fine insect books that have been recently published. They read like adventure novels. Load up \texttt{iNaturalist} on your phone and start identifying and reading up on every insect you find. Watch Doug Tallamy and E.O. Wilson’s inspiring lectures on YouTube. They are the heroes of our time. If you don’t yet know your trees and native wildflowers, make it top priority to learn. If you teach homeschool, work native tree ID into your curriculum.

This summer we have two charismatic teachers coming to Ohio to teach an insect course for one of our Appalachian Forest School offerings: Barrett Klein from Wisconsin, the entomologist son of Karen Klein whose art is gracing these pages; and Steven Kutcher, Hollywood insect wrangler and insect artist and educator (see front inside cover art). Together they will lead a four-day field immersion into the world of insects. We also have a course on fireflies in June, a tree course in midsummer, and a repeat of Nature’s Choir, the late summer singers, in August of 2021. Check out all of next year’s course listings on pages 57-58. Sign up on our website to receive details and registration reminders.

Friends, we live in a time of crisis. The world is rapidly dividing up into those people who are suffering so badly that they live only to survive, those who can’t see beyond their tiny little circles, and those who have the good fortune to care about Life and have the resources to apply solutions. Knowledge and capacity is a grave responsibility. It is time to fan the embers of the green fire within ourselves and let those flames burn high in defense of not just our own lives and those of our children, not just the welfare of humanity, but Life in the largest scale imaginable.

Love shows up as attention, empathy, care giving, and respect. If we are not to go the way of Britain and Germany, insects need all of the above—and they need it now.

\begin{figure}[h]
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\includegraphics[width=0.5\textwidth]{image1}
\caption{Michigan artist Karen Anne Klein holds a master’s degree from Wayne State University of Detroit, where she concentrated on the paper arts - mastering many historic forms of printing processes. She is now retired from running an art gallery in greater Detroit. Many of her own art pieces showcase insects, an inspiration that she attributes to her son, Barrett. Now an entomologist, years ago he turned her on to arthropods when they were both knee deep in an old pond and Barrett brought up a netful of mud from the bottom. To her astonishment, the mud was teeming with life. Karen has spent many hours pouring over museum collections to support her artistic visions. Here her fascination was kindled for the earliest museums in mankind’s history - places known as curiosity cabinets. Karen’s entire house is now a modern curiosity cabinet with roomfuls of art.}
\end{figure}
Upon reflection, it is astonishing to have been part of the Arc of Appalachia for all of its 24 remarkable years. I have been blessed with the opportunity to watch the preserve system grow from zero acres to the 6,600 acres it is today. With each of the 109 tracts of land that we have purchased, I have carried away novel-sized reams of rich memories: some being unforgettable nature sightings; others unforgettable people.

Admittedly, my long history with the Arc of Appalachia gives me some unique perspectives. It allows me to say with confidence that never before have we had a year as engaging and challenging as 2019.

Our museums continued to be busy places this year, attracting a visitor count so far of nearly 6,000 at the Sanctuary, and 25,000 at Serpent Mound. Our lodging attendance at the Sanctuary experienced an increase of 36% last year, and another increase of 24% this year. After a long hiatus, we resurrected our Appalachian Forest School in 2019 through the offering of six advanced naturalist courses. Nearly all of them were filled to capacity.

New trail development took place at the following preserves: Rock Run Wilderness, Plum Run, Samson/Obrist Woods, Ohio River Bluffs, and McKimie’s Cave and God’s Country at the Sanctuary. We are reservedly cautious about making any guarantees, but we hope to be able to open the new trails at Rock Run, Plum Run, Samson/Obrist Woods and McKimie’s Cave before the end of 2020.

Major progress was also made this year in the removal of nonnative invasive plants in the Arc preserves. This year Arc staffer Tim, with the help of partner Ethan, finally cracked the puzzle on how to permanently remove Johnson grass from our meadows without harming the more benign grasses growing beneath them. Be sure to check out Crow Point’s parking lot at the Sanctuary. Earlier this year, towering above the meadow’s cool season grasses was a solid stand of Johnson grass, the outcome of years of hay making. After just one treatment, 95% of it was gone.

Tim and Ethan, aided by three dedicated volunteers, also made promising headway removing the Chinese lespedeza that had heavily invaded the old agricultural fields at Kamama Prairie—fields that were well on their way back to becoming a native prairie again. The experts told us that fighting this aggressive invasive was futile. But we couldn’t imagine throwing in the towel, so we worked out a removal strategy, which, so far, seems to be working!

Our invasive plant removal efforts were further assisted by eight service days provided by groups of Xavier University students who visited the Arc through the school’s Alternative Break program. We also were awarded eight weeks of an AmeriCorps NCCC crew this fall, a program you will be reading more about in forthcoming articles.

The realm showing the greatest growth in 2019, however, was that of land preservation. We were able to finish the challenging Fern Gully project. This beautiful fern-shrouded ravine in Hocking Hills is now safely in the embrace of Clear Creek Metro Park—fully protected and fully funded. We also completed the funding of the second single largest tract of land ever purchased at the Highlands Nature Sanctuary: Parker Woods, a 186-acre tract of uninterrupted healthy Appalachian forest.
Lastly, we completed the purchase of a tract of land along Gilkison Hollow Road in preparation for a new trailhead at Ohio River Bluffs. With carpets of blue-eyed Mary’s and dwarf larkspurs lining its borders, we believe Gilkison Hollow to be the most scenic country road in Ohio. Thanks to a major donation of land by Dayton Power and Light, the Arc now owns most of the road on both sides.

The campaign that you will see summarized on the next two pages says much about what else has been keeping us busy this year. We are currently raising the funds to buy NINE properties, six of them new campaign additions, and seven of them located at the Highlands Nature Sanctuary. The campaign will add 524 acres of new natural areas to the Arc of Appalachia Preserve System.

Never have we worked so hard to save so many properties in such a short span of time. Truthfully, looking back at what we accomplished to add these properties to the current campaign—all the negotiations, contract writing, appraisals, title work, grant writing, and successful awarding of Clean Ohio funds, I don’t know how we managed! This last year and a half has been a blur of challenging activity, yet with deeply satisfying results.

Apparent throughout the 2019 calendar year were trends that point to an even greater escalation of growth for the Arc of Appalachia in the years soon to come.

This year we made our first foray into seeking funding for land acquisition and restoration through Ohio EPA’s Water Resource Restoration Sponsor Program (WRRSP), a program in which we delighted to discover we could capably compete. This new funding source serves to expand the number, scale and types of projects we can consider undertaking in the future.

The Arc is also experiencing a notable increase in the number of land donations being offered. Just in the last year and a half, we have accepted the unprecedented donation of four properties, all exceptionally worthy of nature preservation. During this same time period, we had conversations with five separate land owners who are considering land donation among their options for long term conservation. We are seeing a pattern, here, and we believe that the engagement of private landowners in the field of permanent land preservation will continue to grow.

Many people in Ohio who are now past retirement age (that’s me too, by the way!) were deeply influenced by the emerging conservation ethics of the 1960s. As they matured, many of them invested their earnings into the creation of their own private nature retreats and reserves, often in southeastern Ohio. Now that they are getting older, they face a dilemma. If their children are unable or are disinterested in caring for the land, or if no children exist, then the usual conservation easement vehicle does not necessarily fulfill their desire to preserve their lands beyond their lifetimes. They often want a caretaker for their lands who is trustworthy, experienced, enduring, and has the financial capacity to work in their particular region.

These factors contribute to the Arc of Appalachia spreading from its south-central Ohio roots into the Appalachian hill country of southeastern Ohio where so many conservation needs are currently being unmet.

What does all of this mean for the Arc? If we are to meet Ohio’s preservation needs in the Appalachian counties where, dollar for dollar, investment yields the greatest biodiversity, we are going to have to continue to grow. If we accept this growth, the Arc could be managing over 10,000 acres in a handful of years. It is good when an organization’s biggest problem is success, but growth comes with a cost.

I envision in the upcoming years the establishment of two more Arc hubs, in addition to the Sanctuary, from where a regional land manager can work to coordinate preservation efforts across southern Ohio. To support future growth, as well as the sustainable management of the precious properties already in our care, the soundest fiscal plan is to build a strong endowment fund.

Every museum protects its artworks. Our generation built the Arc. Before we pass from the earth, I would like to see us leaving behind an insurance plan that secures our preserves’ care, ensures our good work is never undone, and establishes a replicable model for preservation that can spread to new lands. Please permit this short article to be an introduction to an important topic we will be chatting a lot more about in the near future.
RECENT & ONGOING PURSUITS

COMPLETED Ohio River Bluffs Trailhead

COMPLETED Fern Gully, Hocking Hills

COMPLETED Parker Woods at the Sanctuary

83% DONE Red Rock Bluffs, Hocking Hills

94% DONE Lewis Gorge at the Sanctuary

81% DONE Trillium Hollow, Rock Run
NEW LAND ENDEAVORS
Each gift of $1 leverages $3 of grant funding

75% DONE, GRANT SUPPORTED  Otter Banks, Highlands Nature Sanctuary

75% DONE, GRANT SUPPORTED  God’s Country II, Highlands Nature Sanctuary

58% DONE, GRANT SUPPORTED  FOUR Small Properties on the Rocky Fork Gorge
**Arc of Appalachia Preserve System**

- **sites of recent expansion**
- **sites of current campaign**

**Arc preserves with public hiking trails**

### Current Projects

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<tr>
<th>Project</th>
<th>Acres</th>
<th>Balance</th>
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<td>93</td>
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<td>Red Rock Bluffs</td>
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**At the Sanctuary:**

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<th>Project</th>
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<td>Otter Banks</td>
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<td>Gods Country II</td>
<td>78</td>
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<td>4 small properties</td>
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<td>$105,250</td>
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**Total:**

- **524 Acres**
- **$418,071 Balance**
Campaign Summary

Total acres: 6599           Additional Acres: 524
Total Cost: $2,373,286    Balance to Raise: $418,071

Arc of Appalachia Preserve System
sites of recent expansion
sites of current campaign
Highlands Nature Sanctuary

Current Size 2661 acres; Campaign Completion: 3052 acres

Lodging info & reservations: www.arcofappalachia.org

Trail descriptions on pgs. 53-54; other Arc trails on pgs. 55-56
Ten years ago the Arc of Appalachia acquired God’s Country I from one of the region’s most singular and unforgettable individuals, Emerson Babington. Emerson always loved this corner of Highland County and during his long life he had amassed quite a collection of land holdings in the Rocky Fork Lake region. His bond to the land was tight. Occasionally he would sell off small parcels to young families just starting out - people for whom he had a soft spot in his heart - but for the most part he refused to part with his land.

Emerson developed two major campgrounds in the Rocky Fork watershed. One of them was called Babington’s Campground, located near the Rocky Fork Lake, and one was on the Rocky Fork proper, which he named God’s Country. Both campgrounds offered RV sites to the public on a yearly rental basis.

Emerson, a devoutly religious man, has long been known for his charitable good will, his fiery disposition, and his refreshing forthrightness. His most valued possession is his Bible, although he has admittedly been known to brandish a gun on those occasions that warranted it. Conversations with Emerson, for those lucky enough to know him, are remembered as lively and engaging. Topics usually centered around past escapades, which were legendary; selected readings from the Bible, and animated discussions on numerology. Emerson found deep meaning in numbers wherever they existed, such as the dates of important happenings, the verse numbers of biblical readings, and even the birth date and addresses of new acquaintances.

By 2006 Emerson’s health was failing and his medical bills rising. Driven by necessity, Emerson reluctantly offered to sell his favorite property to the Arc, God’s Country. But only part of it, which is how God’s Country came to be split in half. The Arc gained the upper stretch of the creek, all the way to the Rocky Fork Dam, and Emerson kept the lower half mile of the creek, along with the campground.

A few years after the God’s Country split, Emerson sold us Maude’s Cedar Narrows, land that lay immediately across the Rocky Fork from God’s Country. The tract was named after Maude Lang, a now deceased local school teacher. Many decades ago Maude had generously self-financed the farm for Emerson. He remained grateful and he wanted her name to be carried forward with the land. Emerson’s sales of land to the Arc have been important components in the creation of what we now call Sanctuary West – those properties centering around OH-753.

Following these sales, Emerson’s health continued to decline. Because he was no longer able to personally oversee his campgrounds, these businesses understandably suffered. Last winter we were contacted by Emerson’s daughter...
and guardian with the offer to sell to us one or both of Emerson’s campgrounds. We were eager to re-unite God’s Country; but our inability to finance the project quickly, and our disinterest in buying Babington’s Campground, a highly developed operation, gave the daughter pause for thought. When a real estate investor from Columbus offered to buy both of Emerson’s campgrounds in one packaged deal, it was an offer she couldn’t refuse.

That should have been the end of the story, but if you have been around the Arc long enough, you probably know by now that a challenging chapter is not necessarily the last chapter. We contacted the new owner and asked if he might be possibly interested in selling us just the God’s Country II tract. We also asked if he would be willing to wait until the next Clean Ohio grant cycle so we might seek funding from that source. To our good fortune, his answers to both questions were yes. Thus we signed a purchase contract and applied for Clean Ohio funding.

When we negotiated the boundaries for the God’s Country split with Emerson back in 2007, the only road frontage he was willing to let go was a narrow strip of land off OH-753 at the minimum width permitted by the county. Although this corridor gave us legal access to God’s Country I on paper, in reality it required traversing several steep ravines and two swamps. These features prevented us from accessing God’s Country I’s meadows with our land management equipment, and it stopped us from developing a hiking trail. The public was unable to get in, and for management purposes, neither could we!

Because God’s Country I was so landlocked, it fell out of the consciousness of most of our supporters, but never our staff. We could still get in by foot, and we got to know God’s Country I over the years as the wildlife paradise it is. Perhaps it is because of its remote setting, or because it

Photo Top: Heron at rookery on Paint Creek, located near the Sanctuary and off of Falls Road. Photo by Kathryn Cubert. Wildlife is unusually dense along the less visited upper reaches of the Rocky Fork in God’s Country. Pictured here are (clockwise): bald eagle, river otter, and black ducks from the North Country that winter over in these quiet backwaters
possesses the perfect proportion of creek bank, fields, and woodlands; but whatever the reason, the tract of God’s Country I abounds in wild turkey, bluebirds, kingfishers, great blue herons and some of the densest populations of Henslow’s sparrows in all the Sanctuary. The creek is regularly visited by mink, beaver and even river otter.

In the winter, large flocks of ducks take refuge in the waters kept free of ice by the volume of water coming out of the dam. Rafts of black ducks are signature residents all winter long. Migratory flocks commonly include redheads, buffleheads, teal, wood duck, pie-billed grebes, mallards, hooded and common mergansers.

We are delighted to now share with you two pieces of splendid news.

One, the grant was successfully awarded. And two, if we succeed in raising the required 25% matching funds over this coming winter, we will be able to close on the God’s Country II sometime in 2020, along with its half-mile long frontage on the Rocky Fork, making it one of the most significant acquisitions in our quarter century of piecing the Rocky Fork corridor back together.

The two most exciting things about acquiring God’s Country II will be getting access for our mowing equipment so that we can properly steward the fields, and being able to finally develop public hiking trails. We are so charged by the latter prospect that we have actually started developing the trail on the God’s Country I, even though we must wait for God’s Country II to complete it. This is admittedly putting the cart before the horse, but we wanted to take advantage of the help offered by the AmeriCorps NCCC crew who are currently in residence at the Sanctuary.

As we write, the crew is hard at it. They are removing the ubiquitous autumn olive, benching in the new trail, taking down old fences, and building a creek crossing. Puzzling out the design of this bridge and constructing it was, for some of the crew members, the highlight of their entire year of work spent in three previous locations in the Midwest. So clever was their design (see photo above) that the casual hiker might mistake the bridge as a fortuitous but natural arrangement of stones.

For other crew members, a highlight has been the company they keep. Common sights at God’s Country while they have been hard at work have been the ever watchful red tail hawks, the stately great blue herons that course the creek daily, the rarer sight of a pileated woodpecker that slices the sky with its straight arrow flight, and the mature bald eagles that survey their work, circling high above with the sunlight bouncing off their backs.

Such is the magic of God’s Country, soon to be loved by the larger world. Emerson is very frail now and hasn’t been on the land for years, but the seeds of love he sowed on the property certainly fell on fertile ground.
OTTER BANKS
newly found treasure on the rocky fork gorge

photo by kim mccoy; with betty rogers, land steward
Otter Banks Pursuit at the Sanctuary Sows

Profound outcomes sometimes begin with deceptively small events. Like a shift in the wind, or a few flakes of snow. Back in 1995, the young non-profit struggling to afford the 47-acre perimeter of 7 Caves was one such event. Seven years earlier, the purchase of a farm on nearby Lapperell Road by Mr. J. Stauffer, a Mennonite from Pennsylvania, was another such event. The news of these unrelated newcomers didn’t make much of a ripple in the breakfast table conversations at the Rocky Fork Truck Stop. Yet, from these humble beginnings, two movements would grow that would leave this region of land—where Highland, Ross, and Pike counties come together—transformed. The saving of Otter Banks is an important chapter of this greater story and is a topic to which we will return, once we have put all the players into context.

In those early days of the Highlands Nature Sanctuary, our awareness of the Mennonite’s increasing presence in our larger region grew but slowly. We would get wind that another farm had been purchased by the Mennonites, and then another. The mostly young Mennonite parents who settled on these lands belonged to Stauffer Mennonite Church, expanding here from mother communities in Maryland and Pennsylvania. The settlers were soon raising families of their own and founding artisan and agrarian businesses to support themselves. All of this was, for the most part, under our radar. But as more and more Mennonite families moved in, the quick staccato of horses’ hooves on pavement became a familiar part of our sound-scape, as commonplace as the sight of a horse and buggy tied to a tree at one of our trailheads. But to grasp the big picture of what was happening in our region? That was a bit like watching corn grow.

It was only this year that I had the mindfulness to sit back on my heels and recognize the full magnitude of the impact that the 160-plus Mennonite households have had on our landscape. Many of the fields surrounding the Sanctuary, where 20 years ago corn and soy beans grew, now support large greenhouses and row crops of tomatoes, pumpkins, bell peppers, watermelons, cantaloupe, sweet corn and eggplant; as well as dozens of other private businesses.

I can drive just a few miles to any one of three Mennonite-run farm markets. I can obtain locally-grown produce, grass-pastured chicken and eggs, and wildflower honey. Nurseries in the spring provide onion sets, flower baskets, sweet potato
slips, bedding plants and vegetable seeds. In the early fall, I can visit Pickett Run Farm to marvel at their production of thousands of potted mums. At JR’s General Store I can choose from dozens of flours for my baking needs—a dream come true for someone who used to run a bakery. I can pick up staples of cheeses, nuts, and dried beans. Across the road from JR’s, when not counting calories, I can consume a hot and buttery soft pretzel from the Country Crust bakery.

But more important for me than these resources, more so than even the beauty of the Mennonite’s bucolic landscape, is the good fortune of living among people of such integrity. In the Mennonite community the qualities of humility, honesty, non-violence, patience, frugality, simple living, community-mindedness, and hard work are prioritized, practiced and protected, as are the time-honored traditions and skills of the agrarian lifestyle. It’s an exceptionally wholesome environment for our staff to live and work.

The founder of the Mennonite movement was Menno Simons, 1496-1561. Born in what is now the Netherlands, Menno was raised in a countryside torn apart by political power struggles and further destabilized by the Protestant Reformation. His spiritual inclinations led him to become a Catholic priest and it was in that station that he began to entertain doubts about the biblical basis of some of the Roman Catholic Church’s precepts. After undergoing a spiritual crisis, Menno renounced the Catholic faith in 1536 and joined the Anabaptists, one of the many movements that arose out of the Reformation. So great was Menno Simons’s influence that by 1544, the Dutch Anabaptists were referred to as Mennonites, literally “Menno’s people.”

Anabaptists believed (and still do) that if baptism is to have spiritual significance, the person being baptized must be fully mature and independently willing to make a heart, mind and soul commitment to Christ. If widely put into practice back in the 1500’s, “believer’s baptism” would have wrested power away from the church, state, and parents, and given more freedom to the individual. It is an understatement to say the idea was not popular among the established authorities. For the next 100 years Mennonites and other Anabaptists were brutally persecuted by Protestants and Catholics alike. Understandably, the peace-seeking Mennonites were among some of the first immigrants to New England.

Many Mennonite schisms occurred over the following centuries, one being the Amish split in 1693. Another
conservative schism, creating the Stauffer Mennonites, split off in 1845 in Lancaster, Pennsylvania. Over time, the Stauffer Mennonites established 12 communities across Eastern United States, including the one here in Bainbridge, Ohio.

Stauffer Mennonites use horses and bicycles for transportation, and propane for lighting and refrigeration. Their homes are heated with wood and fuel oil. Clothing is plain. They avoid electricity, television, radio, and computers. Hymns are sung a cappella. Phone booths are constructed a good walk from the residences and serve multiple households. All these simplicities are not arbitrary. They serve to diminish the human inclination toward comfort-seeking, materialism, vanity, and idle entertainment.

Once I boldly and uncharacteristically asked one of my closer Mennonite friends if he ever tired of the rules that bound him. He answered me earnestly, “These aren’t rules that are imposed on us from an outside authority. They are the principles of Christian living, scripturally based, that we willingly practice and protect. Community is central to the expression of our faith.” As I contemplated his answer, I realized it was individuality, not community, that I had been trained to protect at any cost. I knew nothing of the benefits of living in a community composed of people who wrestled to overcome its individuality’s perils.

Another time I asked a Mennonite if their prioritized order of service was to community first, family second, then themselves. He threw back his head and laughed. “There’s a whole long list after family before you get to ‘Me.’”
Our Mennonite neighbors are quick to remind us that
their members and communities are far from perfect. Not
all members agree on the interpretation of their guiding
principles. Not all of their children stay within the community
as adults. Farm life and business ventures are inevitably filled
with some disappointment and risk. Challenging relationships
exist in any community, as do unavoidable sickness and the
loss of loved ones. Heartbreak is an unavoidable mosaic of
life. But there is also, undeniably, joy.

Today, when I see the healthy glow on the children’s
faces on the Mennonite farms, playing in the woods and
fields, their eyes dancing with life; when I see teens eagerly
exert their will to perform hard work, carry responsibility, and
care for others before themselves; when I see how loneliness,
the curse of the 21st century, is practically unknown within
the community, then the historic restrictions that protect
the integrity of the Mennonite community make those
regulations’ founders seem uncannily prescient.

For a quarter of a century the Arc of Appalachia has
been buying land along the ten-mile corridor of the Rocky
Fork Gorge. Of the 66 puzzle pieces we have acquired
to date, most of them have either been small tracts (with
or without houses) or medium-sized vacant lands, usually
forested. Only four tracts ever topped 150 acres in size. But
those four were memorably challenging. Because of their
size, they were so hard to afford.
More instructive are the kinds of lands we haven't been buying—the large-acreage farms that still border the creek. Thankfully, farms don't often come up for sale. If they did, our funding capacities would be sorely challenged by the higher price per acre commanded by farm fields, the larger size of the tracts, and the value of the associated farm buildings. For years, we have been secretly hoping that these farms wouldn't come on the market for a long, long time.

When the phone call finally came that Otter Banks was for sale, my heart sank. 'Too soon! Too soon!' We were already fundraising for an unprecedented number of unfinished acquisitions, including the large Fern Gully project in Hocking Hills. The revolving fund we used for emergency acquisitions was drained, and the next Clean Ohio round was months away. Even though we were completely unprepared for an undertaking of this size, I just had to go and take a look.

Otter Banks turned out to be even more daunting on the ground than on the map. Of its 189 acres, 120 were in farm fields and pasture. Two houses had been built on the site, as well as multiple farm buildings. Two of the pole barns were downright cavernous; the largest measuring 100 X 120 feet. An appraisal put the land near the million dollar mark.

It was an early warm April day when I made my way across the large farm fields, heading toward the Rocky Fork Creek. It was immediately clear that the buildings, now sinking below the horizon behind me, had capital needs we could never meet. The entire farm appeared to have fallen on hard times. It would need thousands of hours of TLC and as many more dollars to bring it around.

I entered the line of forest at the rim the gorge, gingerly following an old and very eroded farm lane. The woods had been cut pretty hard in the recent past, judging from the young trees and the half-open canopy. As I rounded the curve that dropped steeply down to the creek, I paused, one foot still in the air, awestruck by the sight before me.

I have followed a lot of farm lanes in my life and I know what to expect of them. Their usually rough-mowed
edges are predictably rutted and their borders lined with invasive shrubs. I saw the usual evidence of abandoned farm equipment, but where was the expected mono-culture of invasive plants? Instead, as I descended into the ravine, on my left I saw drifts of trilliums pouring out of the woods—incongruously tumbling right down to the roadside—along with mounds of sweet William and star fields of rue anemones. To my right was a small sparkling waterfall in a verdant green glen filled with ginger, bishop’s cap, fawn lily, and false rue anemone.

I left the lane and began to trace my way along the steep rocky slopes high above the Rocky Fork. To my astonishment, I was presented with scene after scene of handsome rock formations and flowers so proliferate that they took my breath away. There were four kinds of trilliums, banks of shootings stars, and ancient colonies of Solomon’s seal, large
Otter Banks has the most spectacular floral displays we have ever witnessed in the Rocky Fork Gorge.
flowered bellwort, and blue cohosh. Sometimes, single-species colonies covered an entire cliff side. The forest was a far, far cry from old growth, but the floral displays at my feet certainly appeared to be. Seeing an otter floating down the creek on his back sealed the deal for me!

I emerged from the trek committed to finding a way to protect the astonishing scenery I had just witnessed. We needed two miracles and we needed them fast: money for the quick close the seller was demanding, and some really good partners. This project could not be done alone.

I went right to work. After notifying the board, who quickly voted their enthusiastic support, I called the non-profit The Conservation Fund, from whom I requested the procedures and paperwork for a bridge loan. The last time the Arc borrowed money for a land project was way back in 2003. Neither the board nor I were keen to go into debt again, but the specter of losing Otter Banks was the more painful of the two options life was presenting to us.

It was clear we couldn’t and shouldn’t buy the farm fields. They were not only expensive, but the farm-altered soils would not easily support the transition to a healthy forest. We could plant the fields with native prairie seeds, but we would have to dedicate the rest of eternity to weeding the invasive autumn olives out of them. The houses, both needing work, were two more things we did not need. And thus I made a little flyer announcing to the local community that the Arc wanted to buy the creek corridor of Otter Banks and we were looking for partners to buy the remaining land.

After distributing the handout to the largest farmers in the neighborhood, I drove to the home of Mr. C. Stauffer, a Mennonite family I have had the honor of knowing for 25 years. While Mr. C. and I sat alone at the kitchen table, chatting about various light topics, the kitchen hummed with post-dinner activity. Children ranging in ages from youths to full adults entered and left the room, each focused on their own productive missions. When I finally eased into the topic of potential land partnerships, almost immediately all other conversations ceased and Mr. C’s two oldest sons joined us at the table, fully at attention. In Mennonite communities, there are always young men looking for new opportunities. Farmland for sale is a dependably a very interesting topic.

My little flier was passed on to Mr. T. Zimmerman, a Mennonite family who lived across the road. “Yes,” Mr. T said, “the Mennonites would indeed be interested.” In time Mr. T was chosen as the negotiating representative of what evolved to become three Mennonite buyers, two of them planning to move into the community from out of state.

Despite the initial rush, it ended up being a long and complex negotiation that lasted the entire summer. Twice I thought for sure that the entire deal was over, only to find out that while I was licking my wounds, negotiations had resumed. Because I had a car and internet, I often became the runner, moving information between the seller, the three buyers, and the two attorneys. Splitting the land equitably between the needs of four buyers was an interesting endeavor. I have two poignant memories of looking at survey maps outside Mr. T’s farmhouse in the fading evening light of summer. Once, when the lightning bugs of June were flashing, and another when the katydids of late summer were chorusing overhead. Like I said, it was a long negotiation.

Today, as I write, three Mennonite families now own the farmland portion of Otter Banks, two of them already in residence. On my last visit, they had made good progress cleaning up the residences and barns, and were already leveling a site for their first greenhouse. Their dream is to dedicate the farm primarily to vegetable production. A planned system of ponds will supply the irrigation. Work horses, mules, and buggy horses already graze the pastures.

I am also delighted to announce that the Arc applied for and was successfully awarded Clean Ohio funding for Otter Banks. A trusted non-profit partner, Wilderness East, currently holds the deed to the creek corridor and will continue to do so until the Arc has 100% of its funding in place. We are at the last leg of our marathon to secure Otter Banks! The finish line is now in sight for what proved to be the most challenging acquisition in all the Arc’s history.

But so much has been gained. We will be able to protect the land we know as Otter Banks. We saved ourselves hundreds of thousands of dollars by working with partners. We served our agrarian-based community by not taking farmland out of production. We have made new friends. Most importantly, we now have a strategy in place when the next big farm on the Rocky Fork comes up for sale.

We couldn’t have found better partners. Perhaps in decades hence we shall look back at this event and perceive it as “one of those deceptively small beginnings…”

When the deeds were ready to sign, Mr. T shook my hand and said, “That was fun. Let’s do it again someday.” I suspect we will.
Maude’s Cedar Narrows Expansion
4.63 acres  Balance: $13,550
Maude’s Cedar Narrows protects a stunning section of the Rocky Fork in Sanctuary West, just downstream from the Rocky Fork Lake dam. This parcel lies immediately west of Maude’s trailhead, spanning both sides of Skeen Road. The tract serves to secure half the watershed of a beautiful tributary, shown right, that cascades into the Rocky Fork and is accessed by the hiking trail.

The Old Mill House
Across from Ravenwood Lodge
2.55 acres  Balance: $6,900
Ravenwood in Sanctuary West is one of our most beloved lodges. It once served as the residence for the caretakers of Beaver Mill. Although the mill is long gone, the dam still holds, providing a pleasant sound-scape for lodging guests. An even older Beaver Mill residence still stands directly across the road, though greatly deteriorated. To secure the future of Ravenwood’s ambiance, our plan is to acquire this site on the creek, and thus remove the possibility of future development directly across from the lodge.
Nightsong
Expanding Cedar Run’s Protection
0.5 acre DONATION

Nightsong is a small house site located at the historic entrance to the Cedar Run Trail (recently moved to Hwy 50). Behind the house is beautiful Cedar Run, known for its carpets of snow trilliums. The tract was purchased and then generously donated to the Sanctuary by Arc supporter, Karen Arnett. Over the years, Karen has been instrumental in bringing several tracts of land into the embrace of Sanctuary, for which we are eternally grateful.

Rockbow
Education & Volunteer Lodging
6 acres Balance: $84,800

Rockbow is an extremely important puzzle piece, sitting directly on the Rocky Fork Gorge and surrounded on three sides by already protected Sanctuary lands. The property lies on Browning Road and includes a beautiful rock shelter as well as a well-maintained manufactured home of recent vintage. The residence will be developed to meet the greater lodging needs associated with our plan to increase Appalachian Forest School offerings and serve the growing lodging needs of Arc volunteers.
Expanding Rock Run Wilderness to

In 1838, John Locke, employed by the newly formed Ohio Geological Survey, worked his way down the slopes to Rockville, a little village just east of the big sand flats on the Ohio River. He was a man with a mission. Much of the territory he was exploring was a deeply forested landscape of steep and narrow ravines. From ridgetop to valley, the region boasted the greatest and most rapid change in elevation in all of Ohio. At the time of his visit, much of the territory was pure wilderness.

John recorded in the Second Annual Report of the Geological Survey: "...we found some little lagoons in the lowest places of the channel of the creek [of Rock Run], at which we procured water, almost alive with small fishes, for our horse. At about six in the evening we arrived at Rockville, and took lodgings with the hospitable proprietor, Mr. Loughery. I am aware that in my account of this little journey, I have gone into the details of an exploring tourist, but as I was in a kind of terra incognita, a peculiar region, I thought my notes, pretty much as I have put them down at the time, might not be uninteresting or uninstructive."

The arrival of John Locke boded big changes for the land. The region boasted a wealth of high quality sandstone ledges, each separated by layers of shale and clay. John's records, combined with the industry and business ambitions of his host, Mr. Loughery, resulted in booming sandstone quarrying operations centered out of Rockville. Nearly every exposed rock ledge in the region was cut up into sandstone blocks and carried by oxen to the waiting barges on the Ohio River. From there the sandstone was transported to Cincinnati and beyond, where it served as the building blocks of the rapidly rising metropolitan centers of Eastern United States. The stone was called City Ledge, one of the finest sandstones in all the world.

Following the opening of the quarries came the well-connected Mr. William Flagg, who amassed 9,000 acres of holdings in the Rock Run region. He founded viticulture on the gentler slopes and built a handsome cabin that he named Buckthorn. Terra incognita was rapidly becoming terra domestica.
But fortunes come and fortunes go. Before the end of the 19th century, most of the quarry operations had ceased; Flagg’s Catawba grapevines were destroyed by powdery mildew, and his handsome cabin, Buckthorn, had long ago burned down. In 1922, Shawnee State Forest was created, beginning with the purchase of 5,000 acres of cut-over, fire-ravaged land. Over time the State Forest grew to its present size of 60,000 acres, including half of Rock Run’s watershed. From that time forward, other than the occasional logging event, Rock Run was on its return to wilderness.

Beginning in 2004, the Arc began buying privately held properties remaining in the Rock Run watershed that, fortuitously, kept coming up for sale. In conjunction with the existing State Forest holdings, we have achieved the protection of what is essentially the entire watershed of the Rock Run.

As the Arc’s Land Stewardship Manager, I didn’t become heavily involved at Rock Run until two important events came to pass. One was when the Arc was finally able to purchase stretch of land on Hwy 52 that provided us, for the first time, room for roadside parking and access to the main valley of Rock Run.

The second event was the opportunity to include Trillium Hollow among the Arc’s Rock Run holdings. As the Rock Run jigsaw-puzzle of a watershed slowly came together, the Arc’s western lands, which include the botanically rich sand flats at Sandy Springs, and its eastern lands, which include Rock Run proper, remained separated by a major topographical feature. That feature was Trillium Hollow, an impenetrable and impassable chasm formed by Trillium Branch as it descended rapidly to its confluence with Rock Run. Without owning the upper reaches of Trillium Hollow, the Arc’s plan for trail building was blocked. We couldn’t possibly navigate hikers through Trillium Hollow, and we didn’t own enough land to go around it.

Imagine, then, our surprise and delight when the owners of the head of Trillium Hollow, completely on their own initiative, notified us of their interest in selling their land. Naturally our answer to their offer was a resounding, “Yes.” With all the pieces now falling into place, I was tasked with creating and installing a hiking trail at Rock Run. I couldn’t wait to discover terra incognita for myself, with its hemlock-laden ravines, cliff-hanging wetlands, and crystal clear shale-bottomed streams. I was eager to carve into Rock Run’s wilderness a path that others could follow.

I made many visits to Rock Run this past year, exploring all its special nooks and crannies. I wanted to witness the hillsides aflame with autumn colors, see the lay of the land in winter, and find where the flowers grew in the spring. I sought council from people who knew this land’s history best, as I hoped to include many historical features along the route. After all these preparations, I got out the flagging tape and began connecting the dots.

One of the limitations I encountered while flagging the trail route at Rock Run is that I had to spend a quarter of the day in the car just to get there and back from the Sanctuary. But as luck would have it, I discovered a wonderful campground immediately across Hwy 52 from Rock Run called Sandy Springs Campground. Here it was just a short walk from my camp site to the trailhead. The owners, Darcie and Julie, were skilled hosts and had created a very clean, secure, and comfortable campground, complete with restrooms, showers, and a playground.

Once the trail was flagged, the real work began. In order to change elevation gradually—for the sake of hikers as well as to minimize erosion—nearly half of the trail would require benching. By benching, I am referring to cutting
Rock Run
trillium hollow balance $40,134

Photo by Tom Croce Photography
against the contour of the slope to create a flat walking surface on the side of the hill. There is only one way to do it—by manually swinging a mattock. Doing this kind of work in a rural location, for hours on end, and for miles of trail, would be a daunting task for anyone. I wondered, “How am I ever going to find enough help to do this?”

The influx of youthful energy that came to us this fall through the AmeriCorps NCCC program provided the answer. Once a week the crew, along with myself, co-worker Ethan King, and a few other willing volunteers, drove to Rock Run to put in a hard day of work. Swing by swing, foot by foot, we worked for a total of 9 days to notch a bench along a one-and-a-half-mile portion of the route, creating a level path up the otherwise unnavigable, steep and rocky hillside.

As I write, the trail is not yet done, but it I can visualize the experience hikers will enjoy upon its completion. Allow me to take you on a virtual tour.

The trailhead lies at the base of the hill along Hwy 52. A short spur leads to McCall Township Cemetery, with gravestones dating back to the early 1800’s. As the trail zig zags up the hill, it passes a five-foot-tall sandstone pillar marking a 150-year old boundary corner. Chiseled on the rock is the inscription “Two White Oaks and Two Dogwoods,” describing the trees, long gone, that once marked the spot.

Farther up, the trail crosses an old mining bench. Today, these wide flat terraces provide interesting rock-scapes and spectacular views of the Ohio River and the Kentucky hills beyond. Vernal pools have formed on the poorly drained mining benches, providing high quality wetlands for amphibians. In the spring, the pools are filled with egg masses and the air resounds with peepers and chorus frogs.

Leaving the benches behind, we continue to clamber uphill until the trail crests over the ridge, 650 feet above where we first started. On this flat ridgetop lies a beautiful stone-lined cistern from a 19th century homestead. Here, families of old would have cast their bucket into the recess to draw out their precious stores of water. We can pause here a moment to imagine all the many untold stories rooted in these high ridges and Appalachian ‘hollers.’

After passing by this relic, we dip down into the upper reaches of Trillium Hollow, an exceptionally lush and verdant valley filled with ferns, wildflowers, and moss covered logs. Whenever I drop off the ridge and into this hollow, I am always struck by how the sounds of the modern world abruptly cease. In early summer, hikers’ ears will be filled with the sweet harmonies of wood thrush, the sharp and clear call of the ovenbird, the triumphant ring of the pileated woodpecker, and the ascending zip of the parula warbler. Colonies of red trilliums, also known
as wake robins, are found here in the spring with their distinctive slightly nodding crimson flowers.

As the trail slowly ascends back out of Trillium Hollow, we enjoy one last poignant view of the Ohio River as from the ridgetop, before descending back to the trailhead and completing our 3.5-mile journey.

I am very excited to debut the trail to Arc supporters during our upcoming Wildflower Pilgrimage. Those who have already walked the completed portions of the trail have loved it, claiming it to be possibly the most beautiful trail in the entire preserve system. My dream is that this 3.5 mile trail will prove to be only the first phase of a much larger system of trails at Rock Run. We certainly have room to grow. If we can find enough volunteers to assist with trail upkeep, perhaps someday we could extend the hiking trails all the way to our western most holdings at Sandy Springs—sheltering the most unique ecosystem in all of the Arc.

What makes Sandy Springs so unique? The answer is that its soils are nearly pure sand, where only species adapted to both soil saturation and drought can thrive. Among the specialized plants of Sandy Springs is *Opuntia humifusa*, the eastern prickly pear cactus. Its sharp barbs, flat pads, and beautiful orange blooms make a field of them a memorable sight. Imagine—a cactus native to Ohio!

Sandy Springs is also home to the amazing fungus-growing ant, *Trachymyrmex septentrionalis*. Fungus-growing ants are mostly tropical in distribution, the exception being *Trachymyrmex septentrionalis*, whose geographic range is centered in the sandy habitats of temperate southeastern United States. The population in Sandy Springs, along with one in the Pine Barrens of New Jersey, represent the species’ northernmost reaches.

These ants are true gardeners, growing and eating colonies of fungus in their underground chambers. Unlike their near cousins, the tropical leaf cutter ants, who gather live plant material to feed...
their fungi, these ants gather dead matter to make compost heaps for their fungus gardens, gathering food such as fallen oak catkins, caterpillar frass, and dead insects. Even more amazing, there is a species of bacteria that lives on the ants as a “biofilm,” exuding a fungicide that prevents the growth of other fungi and thus helps to “weed the garden.” Ants are some of the most sophisticated social creatures on the planet.

After the AmeriCorps depart next week, Ethan and I, along with our small band of volunteers, will continue to return to Rock Run to finish the benching work, install the trail signs, and hang the interpretive signs. We would love for you to work alongside us.

A few days ago, when the AmeriCorps crew and I were ascending the steep hillside to our remote work station, I was startled to come across a group of men, high up on a rock ledge. Other than my work partners, these were the first human beings I had ever seen at Rock Run! As I recovered from my surprise, I discovered they were members of a hiking club. Several of the hikers were over 80 years old and each one of them donned a well-worn hiking staff. They told me they had been following my Arc of Appalachia Facebook reports on Rock Run’s trail progress, and that they just couldn’t wait any longer to see it for themselves. They also shared with us that they thought this trail was going to be a wonderful asset for the region. As we all stood there together, perched high on the rock ledge of Rock Run, I contemplated the winding path that had brought us all here together in this moment in time—myself, the AmeriCorps workers, and the hikers.

Building a trail at Rock Run is more than moving aside rocks and stones; it is the creation of something nearly permanent, a legacy that will be enjoyed for generations long after I am gone from this earth. Whether future visitors come seeking solitude, exercise, beauty, or soul restoration, I hope they find what they are looking for.

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Interested in helping out at Rock Run?
Write me at:
tpohlar@arcofappalachia.org

Interested in following us on Facebook?
Click LIKE at:
facebook.com/ArcofAppalachia

Interested in Sandy Springs Campground?
10% discount to all Arc members
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As I make my way down Queer Creek in the Red Rock Bluffs Preserve, I forget about the struggles of everyday life and smile as I observe all the beauty around me. Stunning hollows cut up through the hillsides above me, extending as far as my eye can see. Multiple tributaries feed from them, their crystal clear waters filtered by the shallow root systems of hillsides of hemlocks. I look into a small pool of water that acts as a mirror, reflecting on my memories. I continue hiking, making my way to a set of three breathtakingly beautiful waterfalls that drop into a central pool. The scene takes me back to my childhood and the many memorable family outings we took.

I will always remember the excitement I felt when my parents said, “Ethan, we’re going to Hocking Hills.” At that age, it’s amazing how my imagination would run wild when I entered a grove of eastern hemlock trees. Here is where I felt free. I recall losing my sense of reality and disappearing into this mystical place where I could be anything I wanted to be. I'd clamber up boulders and envision myself on top of the world. I may have been only a few feet off the ground, but when I jumped, it felt like I was skydiving. I would fall into my dad’s arms where he would kiss me on my forehead and send me off on my next adventure.

Along with its natural beauty, Red Rock Bluffs Preserve has a lot of cultural history packed into its 40 acres. Both inspire reflection. Carl E. Venard, who worked as an entomologist at The Ohio State University, was drawn to the Hocking Hills region. On April 27, 1946 he purchased Red Rock Bluffs, which included a remote cabin. Like most wilderness cabins, there was no running water nor electricity, so Carl had to retrieve water from his neighbors’ wells. He loved spending time at the cabin, identifying plants and tending to his Chinese chestnut trees. This was his place of peace, where he could become one with the natural world. Sigurd Olsen described the way Carl may have envisioned his escape from the everyday world when he wrote, “I named this place Listening Point because only when one comes to listen, only when one is aware and still, can things be seen and heard.”

There is something beautiful about how a cabin in the woods and the peacefulness it provides comes together to allow the mind to regain clarity. So many naturalists had places like this where they formed and wrote the ideas that are still the backbone of today’s nature preservation movement. I think of Aldo Leopold’s shack in Wisconsin, Annie Dillard at Tinker Creek, Sigurd Olson at Listening Point, John Burroughs’ Slabside Cabin, Henry Thoreau at Walden Pond, and the wilderness cabin Dick Proenneke built on Twin Lakes in Alaska.

Like these famous writers, I too romanticized living in a cabin in the woods. I was given my first opportunity to do so when I was a student at Hocking College. Back in
John Burroughs, 1837 - 1921, was a beloved and prolific nature writer in America, publishing 23 nature books and many more essays in his long and productive life. "Slabsides is the name of the log cabin built by John and his son on a nine-acre wooded and hilly tract in 1895 in New York."

Sigurd F. Olson, 1899 - 1982, was an American author, environmentalist, advocate for the protection of wilderness, and a lifelong resident of Ely, Minnesota.

Aldo Leopold’s Shack in Barraboo, WI

Aldo Leopold is considered the founder of the conservation ethic. His most famous and influential book was the Sand County Almanac.

PHOTO CREDITS: 1) Slabsides, the cabin, was downloaded through Wikipedia and sourced through Wikipedia user [http://en.wikipedia.org/wiki/User:Bikeable Bikeable], 23-Oct-2005. 2) John Burrough's Photo was downloaded through Wikipedia and sourced through The Critic: http://babel.hathitrust.org/cgi/pt?id=chi.74712517;view=1up;seq=146;size=175 3) Listening Point Cabin was downloaded from Wikipedia and is attributed to McGhiever [CC BY-SA 4.0 (https://creativecommons.org/licenses/by-sa/4.0)]. 4) Aldo Leopold’s Shack was sourced from the National Park Service, Rebecca Kumar.
1982, my uncle and his friends built a small cabin on two acres near Hocking Hills and he allowed me to live there from 2014 to 2016, along with my two cousins while we all attended school. I recall splitting firewood on cold January days, log by log, until the skin on my hands could no longer bear the discomfort. There, I learned to see the wood pile as a means of survival, and I gained a new respect for all the rustic cabin dwellers who have come before me.

While living in my uncle’s cabin in Athens County, I was aware that most of my friends looked out their windows and saw a city, while when I looked out my window I saw a living landscape that could be enhanced to increase species diversity. My cousins and I removed invasive species and reintroduced native flora which brought in even larger numbers of white-tailed deer, squirrel, turkey and migratory birds. Sitting around the smoky wood stove at night, reflecting on current projects, and discussing visions for the future of our little preserve, gave me a new sense of direction and purpose.

I left that two-acre plot and woodland cabin when I finished school and took a job doing ecological field studies in Colorado. When that position ended, I read about an opening at the Arc of Appalachia. I was thrilled when I got the job, but I was ecstatic when I found out that I could live at Fort Hill—an especially extraordinary cabin in the woods. I may not have to haul water like Carl Venard, but my cabin is still quite rustic. It is paneled with American chestnut and I live in the middle of 1400 acres of the largest mature forest in all of Ohio. The slabs that have been stacked to create the stone walls that border the driveway are covered with lichens, providing homes for eastern fence lizards. I love to listen and catch glimpses of the yellow-billed cuckoos that inhabit the surrounding woods.

As I write, I am sitting here at Fort Hill on the old stone patio, contemplating what it is about places like this that give me such serenity. Some men may feel a greater sense of masculinity when they live self-sufficiently in a wilderness area; but I see the gifts of my lifestyle as being purity and freedom, especially when compared to the more urban lifestyles of my friends. The ability to escape the drama that surrounds the daily lives of so many, allows me to find myself and to continue to grow in this natural life I have chosen for myself.

Like a generation of naturalists before me—Venard, Dillard, Olson, Burroughs, Leopold, and Proenneke—I am fortunate to live in a very special place. John Burroughs said it perfectly: ‘Life has a different flavor here.’ The smells, the sounds, and the sights of the changing seasons have become part of me. I’ve created a friendship with a squirrel who greets me every morning. We startle each other when I open the front door and he bounds back into the forest. I enjoy early morning cups of coffee on the front porch, listening for the woods to come alive as the sun comes up over the hill. There’s really nothing like the time-honored tradition of a cabin in the woods.
More dependably than the progressive “on again, off again” weather of spring, the summer spectacle of the fireflies confirms that summer’s warmth is here to stay. Many of us trace our affinity for lightning bugs back to our youth, those summer evenings with family and friends, chasing, catching, and admiring nature’s flashlights. Understanding firefly natural history is a continually evolving science. And, of course, the more we know, the more we realize we don’t know. This makes our journey with these little summer sparks all the more adventuresome.

Becoming reacquainted with fireflies over the past few years has been an eye-opening experience for me. My interest in them was sparked by serving as a volunteer host for two of the Arc’s Firefly Workshops held in June. I was astonished to learn that Ohio is home to 16 to 18 different species of fireflies, with more species being verified every year. To initially distinguish one species from another, one must note the time of day, as well as the flash sequence, duration, frequency, intensity and color.

Around the world there are nearly 2,000 species of fireflies. They are not flies, nor bugs, but actually beetles. Their distribution is closely associated with moist environments. Some species in Japan even spend their larval stage in the water as an aquatic predator. Reflecting on Ohio’s spring and early summer of 2019, we definitely have a leg up on the moisture requirement. Anyone residing in an arid climate has likely never seen a firefly spectacle in their native home. We are lucky to live where we do.
And then there was light... blue ghosts, railroad worms & synchronous fireflies

"Perform random acts of light and leave behind glowing flash-trains of senseless beauty." - quote from the 2019 Firefly Course

Like many insects, fireflies go through a four-stage life cycle: egg, larva, pupa, and adult. Once they hatch, firefly larvae have voracious appetites, racing to store enough energy to complete their life cycle. They consume soft bodied, moisture-dependent prey often many times larger than themselves, such as earthworms, snails, and slugs. Generally, fireflies do not eat as adults.

Not all lightning bugs glow as adults, and not all fly as adults, but, most firefly eggs and all larvae glow. Why? Evolutionary scientists have concluded that glowing eggs and larvae preceded the evolution of flashing tail segments in adults. Many insects exhibit visual or olfactory displays that signal to potential predators, “Don’t eat me. I am poisonous & noxious. Yech.” The orange and black monarch butterfly is a classic example of visual cues that say, “Go away.” The glowing eggs and larvae carry the same message. Repeated tests have shown that birds have a particular disdain for luminescent food after just one meal encounter with fireflies, remembering their mishap for weeks.

Among the European fireflies, females are generally flightless, earning them the name glow worms. The shimmering light emanating from within their translucent bodies serves a two-fold purpose: to warn potential predators and to attract mates. In the United States glow worm females are relatively rare. The most charismatic of our female-flightless fireflies are the Blue Ghosts. Males fly ankle high and keep their light on for a minute or more. In prime habitat the eerie glow of Blue Ghosts, in search of their flightless female friends, creates a floating carpet of tiny lights. They were once thought to be restricted to the Southeast, but just last summer a population of these mesmerizing fireflies was found in northern Kentucky, not
far from Cincinnati. Might they yet be found in Ohio? Join the growing firefly watcher frenzy and you may be the first to verify their presence in the Buckeye State.

And, speaking of flightless females, we find ourselves face-to-face with railroad worms. The genus, Phengodes, is Latin for “like railroad tracks.” Ok, just kidding. The name is derived from the Greek word meaning “shining.” Females are large, up to three inches long, the size of your pinky finger. They have variable patterns of glowing lines and dots resembling railroad tracks or the illuminated windows of a passing train at night. Taxonomically they are not quite considered fireflies, but are close kin just the same.

Like the Blue Ghosts, these females are many times the size of their flying, male counterparts. The males, sporting large fern-like antennae, are rarely seen. Male Phengodes lack a lantern on their abdomen and spend most of their short adult life looking for love in the dark. Oh, to be as flashy as their lit-up cousins, but alas, it’s just not meant to be. Devoted summer spark enthusiasts long to glimpse a female railroad worm at least once in their lives. At the Appalachian Forest School’s Firefly Workshop in early June, 2020, you will have the opportunity to look for one at Fort Hill. We actually spotted one there last spring (see top photo left).

Now, about this “light” that has fired human imagination for countless generations—what is that all about? Fireflies predate human beings by millions of years. Over time, it is believed, the glowing that initially protected the larvae evolved into a complex adult anatomical structure enabling male and female fireflies to find each other in the dark. Do you suppose this is a safer time to mate, away from the prying eyes of predators? Inside the abdominal lantern is a complex chemical factory. In a highly choreographed chemical dance, luciferin, luciferase, ATP, and oxygen are combined in a specific sequence, the end result being a flash of light. Amazingly, this process appears to generate no heat whatsoever, shining with four times the efficiency of an incandescent bulb.

For all fireflies, the females court from the ground or vegetation; males seek females from the air. Knowing that multiple species of lightning bugs occupy the same habitat, how do they visually tell each other apart? Flying male’s species-specific flash sequence is recognized by a waiting female. If she is a species with her own lanterns, she signals her desire by responding with her own species-specific flash pattern, aimed at a particular male and at exactly the prescribed flash interval. But, it’s not just that easy. Imagine all the males sharing one enormous “party line” (if you are old enough to remember). Meaning, if I see another male get the green light from a waiting female, I will try to beat him to the discriminating girl. If he does get to her before I do, I might just stand right on top of him, along with 10 or

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*Photo Top:* Railroad Worm female at Fort Hill.
*Photo Middle:* carnivorous firefly larva attacking a snail.
*Photo Bottom:* firefly light show at Ridgeview Farm at the Sanctuary, courtesy of Tom Croce Photography.
Photographer Christopher Sherman is blazing new trails as a ‘nomadic photographer.’ For 25 years Christopher worked as an entrepreneur, most of those years in Austin, Texas. There he started a number of businesses including an aerial photography business specializing in drones - earning him a reputation for producing stunning metropolitan cityscapes, such as the photo of bats flying over Austin, below. Then, in 2018, at an age when most businessmen are rooted in ambition, Christopher decided to seriously pursue his art. And we mean seriously. He shut down every one of his businesses and stripped himself bare of the identity he had spent the last quarter century establishing. He pared himself down to just two main possessions - his car and his camera. Then he hit the road.

Although he still sells photos from his website, cvsherman.com, Christopher admits that he shoots primarily for himself. Pulling off the side of the road whenever the impulse rises, taking advantage of unplanned lighting conditions, stumbling across completely unanticipated subjects, chasing subjects as evasive as lightning bugs and lightning flashes, and crashing at 2 am in the morning in whatever hotel presents itself is what Christopher calls “the Zen of it all.” Christopher has visited 22 states, Canada, Iceland, Australia, New Zealand, Singapore and Shanghai. More travel is planned.

Insect populations worldwide are declining, and this is especially true for fireflies. To conserve fireflies in your yard, be mindful that fireflies rely on darkness to distinguish the tiny lights of their mates during their brief mating season. Keep outdoor lighting to a minimum. Make sure lights are aimed downward, or on a motion sensor. Be sure to avoid broad spectrum insecticides that toxify the soil and decimate firefly populations. Firefly eggs and larvae depend on high soil moisture. Cut your grass higher than four inches to conserve moisture. Your grass will appreciate this too. Provide leaf litter mulch around your trees to create wild and moist areas in your yard, or even larger expanses if possible. If you can, set aside part of your yard as a wild meadow, mowing only once annually in November or later. Some of our showiest fireflies require unmown grass. This timing goes for bush hogging fields or meadows, as well. Allow all insect families their appointed seasons to lay their eggs undisturbed - fireflies in early summer; grasshoppers, crickets and katydids in late summer and fall. They can all be accommodated with an early winter mowing.

It has been exceptionally enriching for me to explore the lives of the wonderfully illuminating residents of Ohio’s fields and forests. I have precious memories of standing near the banks of the Ohio Brush Creek in June and witnessing the gentle cascade of ember-like, glimmering Chinese Lanterns. I remember the night I saw the softly glowing Little Grays hovering just above the grass and goldenrod while the bright but mysterious Photurus covered the trees like Christmas lights. I volunteer to host the Appalachian Forest School Firefly Workshop because I think more people should have the opportunity to experience the magic of these silent summer sparks. Please join me!
Front End Loader/Tractor

Total Cost of Used Equipment: $35,000  Balance: $20,000

by Tim Pohlar

During my eight years on an organic dairy farm in La Crosse, Wisconsin, I learned a thing or two about tractors. A good loader tractor is the backbone of any land management operation and here at the Arc, we are in serious need of this essential piece of equipment. Not only do we need to mow several hundred acres of grasslands and prairies each year, but we also have gravel to spread, kiosks to lift, and invasive species to remove. I knew just what I wanted: a used 80-horsepower tractor with low engine hours, four-wheel drive, and a front end loader. I felt this would strike the right balance between functionality, reliability, and cost.

Such a tractor would help the Arc fulfill its core mission of creating a Sanctuary for Life and supporting the vast array of plants and animals that depend upon our open meadow habitats, such as Henslow’s sparrows and bluebirds, prairie dock and butterfly milkweed, as well as our breathtaking spectacles of singing insects and flashing fireflies. In addition, the power of this machine would allow us to do much more in less time, helping us to significantly boost biodiversity.

For many years, the Arc has relied on the extreme generosity of John, an Ohio grain farmer, to be able to manage our grasslands. Each fall, John would load up one of his valuable tractors and haul it over 100 miles to the Sanctuary. With this tractor, along with a bat wing mower John had donated to us, we were able to winter mow our fields every year, often with John behind the wheel.

Knowing that he would not be able to keep up this effort forever and knowing how badly the Arc needed such a piece of equipment, John offered to sell us his beautiful Kubota M8540 at $15,000 under market value! You won’t believe this part: it boasts an 85 horsepower engine, low hours, four-wheel drive and a front end loader. My response came faster than a hen can snap up a grub, “John!! YES!! Thank you, SIR!” Just give me a moment to come up with the rest of the funds. Folks, I think this would be a beautiful gift to find “under the tree” for the Arc this year, don’t you???
DREAM: to build the Appalachian Forest School into a regional education center offering advanced naturalist courses

A Licensed Kitchen is required if we are to expand above the temporary food license limitation of ten events a year

Total Cost: $150,000  Balance: $120,000

The Highlands Nature Sanctuary was birthed in 1995 by its founders in their bakery at the North Market in downtown Columbus. Sanctuary fliers sat on top of the glass counter, bearing the printed words, “Wilderness in Ohio, if you could, would you save it?” Below were three shelves stocked with flaky cinnamon rolls, potato cheddar bread, buckeyes, chocolate cashew bars, and Grains of the Goddess bread. Across the alley was their second business, Benevolence Cafe. Here another stack of fliers could be found next to a row of steaming stockpots filled with a variety homemade soups. Inevitably the fliers were permeated with the fragrance of cumin, sautéed garlic and onions, rosemary and thyme. The story of the Highlands Nature Sanctuary that grew to become the Arc of Appalachia cannot be separated from delicious healthy food, the pursuit of living simply, and the farm to table movement.

Legacies of Benevolence Cafe include two staff members who once worked in its kitchens and behind its counters: Tim Pohlar and Andrea Jaeger. If you have attended our Donor Gatherings, the Wildflower Pilgrimage, or any of our Appalachian Forest School courses, you know that Benevolence’s legacies continue on in the food we serve to our visitors.

Our dream is to be able to host Forest School courses and other educational events at the Sanctuary every week from early spring through fall. The Sanctuary already has 3,000 acres of outdoor classrooms, 16 miles of trails, and lodges. The collective value of these assets totals over 11 million dollars. With an additional $150,000 investment, we can complete our 24 years of preparations to become a regional education center - simply by building a licensed kitchen. Whispering Springs, donated to us a few years ago, is the place to do it. There is ample land there to install the required new septic system and parking lot. Earthstar Lodge already provides a renovated, stunningly beautiful, and climate-controlled classroom space. The first floor of Chanterelle Lodge, now empty and adjacent to Earthstar, can be turned into the kitchen. If nature education is a mission that makes your heart sing, and you are interested in supporting this vision, please reach out. We wish to thank Marcia Miller and Kevin Eigel for seeding this project with a generous pledge of $20,000. Thank you, thank you, dear friends!!!
DREAM: to meet a regional education

REMEDY: To renovate the historic 1876 home at Barrett’s

The Highlands Nature Sanctuary, the Arc’s largest preserve, is a very busy place these days. On any one weekend we may find ourselves providing overnight facilities for a Women’s Retreat, the Appalachian Forest School, college students helping out with land stewardship tasks, Volunteer Museum Hosts, and private lodging guests.

One might think that’s enough going on, but we have higher dreams yet. For a quarter of a century we have been methodically building up the Sanctuary to meet what we believe is its highest destiny - to serve as a regional education center for advanced naturalist courses. Our goal? To teach the teachers.

Never in the history of our country has providing nature education become more critical. Most parents today grew up in the city without the benefit of playing in natural outdoor settings. Nature education is not part of our primary or secondary education. Even our colleges prioritize biochemistry and cellular biology over ecological field studies. If our society is going to preserve nature literacy, providing training in the field - mentor to student - must continue to be offered.

The Sanctuary has the perfect combination of assets to present this kind of holistic education. However, to achieve our dream, we will need to develop additional lodging in the Sanctuary to house course participants, leaders, and support volunteers. Fortunately, we have just the place to do it! Barrett farmhouse has been waiting for our attention ever since Sue Kellogg donated the historic residence to us back in 2005.

The Susan J. Kellogg Education Center

Susan Jane Kellogg was born June 2, 1928 in Atlanta, Georgia. She moved to Cincinnati, OH with her family at age 2 when her father was transferred there by Procter & Gamble. Sue graduated from Withrow High School and went on to Denison University, graduating in 1950 with a Bachelor of Arts Degree.

In her second career move, Sue joined P&G to become one of the first women computer programmers in the company. It was a job she treasured, staying until her retirement in 1988.

Sue loved the out of doors and was always ready to go hiking, canoeing, sailing, or skiing. She shared leading a senior girl scout troop with the help of a good friend. Together they led some outstanding sailing trips.

Sue became aware of the Highlands Nature Sanctuary through a friend; initiating a wonderful and enduring relationship with the Arc of Appalachia. Her generosity has been ongoing over the years, culminating in her donation of the Barrett Farmhouse, now known as The Susan J. Kellogg Education Center.
center's greater need for overnight lodging

We wish to restore this handsome, sturdy, utilitarian six-bedroom farmhouse to the ambience of an 1876-1910 residence. The farmhouse has "good bones" with modern insulation, electric and plumbing and a good furnace. The most recent renovation of the house - probably back in the 1980-1990's - erased much of the history when the owners replaced the original entrance doors, flooring, cabinets, and windows. Fortunately, two dedicated volunteers, Randy and Linda Ankrom of Marietta, have already tackled the house with their paintbrushes, covering the previously brightly colored walls with a historically benign and tasteful covering of cream colored paint.

Phase 1 of our agenda is to renovate the bathrooms on both floors in order to serve a crowd of people, and to completely redecorate the kitchen in alignment with the date of the house's construction. The farmhouse's kitchen current decor - with its faux stone vinyl floors, modern mass-produced cabinets, and stained Formica counters - is painfully out of touch with the spirit of the house. We believe that by redecorating the kitchen, we can start the heart beating again for the entire house.

What we successfully did at Beechcliff when we renovated it back to its original 1912 decor early in our history, we can do again for this old farmhouse. When guests walk through the door, we want them to feel they just time traveled back to 1880. If you love history, old houses, and creating beautiful and historically accurate interior spaces, this is about as fun as it gets! Please consider giving this project your support.
DREAM: Restoration and Trail Building at Ohio Hanging Rock
Cost $40,000 Balance $5,000

The new 750-acre forest preserve at Ohio Hanging Rock in northeastern Scioto County has captured the imagination and hearts of many wilderness advocates. It shelters over 8 miles of waterways and protects many rare plants, such as Feather-bells, Strenantheium gramineum, and Northern Rose Azalea, Rhododendron prinophyllum. Large clay deposits on the lower elevations once supported an active fire brick industry, the relics of which can still be found among the trees. Clay also contributes to the area’s saturated soils and low elevation wetlands, supporting robust amphibian populations.

Restoring this Ohio Hanging Rock landscape is one of the Arc’s priority endeavors. We are already working on the procedures which would formally vacate the abandoned county roads currently running through the park. Once the roads are closed, we will install guard rails along the accessible roadways to limit all but pedestrian access. Water bars will be installed on the old roadways to prevent erosion and encourage the re-colonization of plant cover. Then for the fun part - the trails! Trailheads and a hiking trail system will be established in the park, opening up a stunning region of the state to hikers who has never before had public access.

The cost of this project is $40,000, $30,000 of which has already been granted through Clean Ohio. Donor and board member, Jim Silver, along with his wife Emily, have generously made a challenge grant of $5,000 toward the project, encouraging Arc donors to get us across the finish line with the remaining match. Thank you Jim and Emily!!!
The Little Singers of Late Summer

Unless otherwise noted, photos of the singing insects were generously provided by Lisa Rainsong, see https://www.listeninginnature.com

The year was 1936. Vincent G. Dethier packed up his Model A Ford with a student’s typically spartan load of possessions, and set out from Boston to Dr. Pierce’s field lab in the mountains of Franklin, New Hampshire. He was sure the job awaiting him would be a pleasurable summer pastime before he entered Harvard as a grad student in the fall. Dr. George Pierce, a retired Harvard physics professor and acoustic engineer, was working on breaking the sound barrier of human hearing and had honored Vincent by asking for his help.

During WW I, Pierce produced high frequency detection equipment for the defense of the US Navy. After the war he invented ways to step down ultrasonic sound so that it could be heard by the human ear and recorded. Now he was being driven by a burning question, ‘Is nature a much noisier place than we once thought?’ He turned first to the recording of bird songs, but found no major ultrasonic surprises in the avian realm. That summer he planned to turn his attention toward crickets, katydids and grasshoppers. As it would turn out, this field of study would prove to be so evocative that Pierce would continue studying insect singers for the next 12 years.

Pierce hired two students—one to be the photographer and the other to catch and catalog the insects. The latter would be Vincent’s job. Vincent couldn’t believe his good luck. Someone was going to actually pay him to catch bugs. It was too rich.

One of the outcomes of Vincent’s bucolic summer in the mountains was a book he wrote years later about his field experiences. It is one of the loveliest nature books ever written, called Crickets and Katydids, Concerts & Solos.

Vincent was perfect for the job. He was descended from a family of musicians, and was naturally attuned to sound and music making. He had been enamored with insects ever since he was a child, and he was a rare combination of a scientist by head and an artist by heart.

As Vincent knew viscerally by the end of the season, it is not only humans who have the desire to sing, but also Life, itself. A trained opera singer can turn her body into an instrument, but then, so can birds, spring peepers, and crickets. Like a virtuoso, a tree cricket isn’t born able to sing. Silent nymphs spend a summer eating and molting. Only when the males make their final molt do they emerge as sophisticated living instruments. And, once they are capable of singing, they don’t stop singing—not until the first heavy frost drops them out of the trees.
Snowy Crickets are beautiful singers fond of the bushes and low trees found in suburbia and farmsteads. They are masters at turning leaves into song. Here is a trim little fellow at rest.

It is a pity that over-familiarity mutes our ears to the miracle of singing insects. If we could allow ourselves to fully grasp the wonder of the late summer symphonies, especially here in Eastern North America, we would fling open our windows at night, write poetry, schedule insect song vacations in rural dells, and, at season's end, gently bring our fading songsters into the warmth of our homes where their music might enchant us a few weeks longer.

The Chinese and Japanese have demonstrated all these proclivities. According to Wil Hershberger, author of The Songs of Insects: "The finest singers were given endearing names that described their songs or habitats, such as jin zhong (golden bell), jiao ge-ge (singing brother), kusa-hiban (grass lark), yabu-suzu (little bell of the bamboo grove), and aki-kaze (autumn wind)."

If you are lucky enough to live to 85, you have just 85 chances to let the beauty of late summer's music thrum the chords of your soul. But, if you want to hear the songsters in their full range of glory, it's best you don't wait too long in life to earnestly start listening or you might be too late.

What Dr. Pierce discovered during that summer back in 1936 is that insect song does indeed exceed normal human hearing. The common true katydid, for instance, sings between the ranges of 3000 Hz to over 20,000 Hz. The highest our human ears can pick up is 18,000 Hz, but only when we are very young. Thus most adults can only hear the lower frequencies of the true katydid's call. Our common true katydid is far from being the highest soprano of the insect world. Katydid's have been discovered in Columbian rainforests singing at the incomprehensibly high frequency of 130,000 Hz, higher than even bats. Nature is indeed a noisier place than we've ever suspected.

Vincent writes, "Sad to say, full appreciation of summer's music is reserved for the young, because the pitch of so many of the songs is too high to be perceived by

Snowy Crickets are beautiful singers fond of the bushes and low trees found in suburbia and farmsteads. They are masters at turning leaves into song. Here is a trim little fellow at rest.
When tree crickets sing, they transform into exquisitely designed instruments. The so-called mirrors of their wings and carefully modified leaves greatly amplify the sound.

Insect Range of Singing

Each section represents one octave of frequency; four octaves are illustrated

Graphics by Kayla Rankin

middle-aged and elderly ears. This failing is just one facet of the dulling of the senses with age, perhaps a divinely calculated diminution so that we may withdraw from the world gradually."

Technically, the Orthopterans aren’t singers, but fiddlers. Except for some of the singing grasshoppers (most grasshoppers are mute), they produce sound by rapidly stroking the hardened edge of one wing (the scraper) over the file teeth of the other wing (the file).

Vincent writes, “How such refined creatures can produce the volume of sound they do is cause for further wonderment. A person has only to run his thumbnail across the teeth of a comb to notice the low volume of sound. The secret lies in the structure and constitution of their wings. It is only when the vibration is transferred to a sounding board that the sound is enhanced and transformed.”

Tree crickets, like the snowy tree cricket shown below, lift their wings nearly perpendicular above their back when they sing. The shiny drum-like “mirrors” of their wings serve to vibrate and amplify their song. To further increase volume, tree crickets often cut holes in leaves just slightly larger than their breadth when their wings are open. Here they position themselves to sing, transforming the leaf into the tree cricket’s self-made megaphone. Katydids and their relatives also have these special “stridulatory fields” on the base of their wings that serve as both sound makers and sound boxes.

During last summer’s Nature’s Choir course, offered through the Arc’s Appalachian Forest School, students learned the identities of the various songsters. Most everyone already knew the common true katydid, but most were surprised by the large diversity of its relatives, such as the bush katydids, the angle-winged katydids, and the round-winged katydids.

When tree crickets sing, they transform into exquisitely designed instruments. The so-called mirrors of their wings and carefully modified leaves greatly amplify the sound.

The enlarged singing structure of a true katydid’s wings, clearly showing the magnificently engineered file and the scraper. Photo provided by Wil Hershberger. See http://songsatinsects.com
Nearly everyone knew the fall field cricket, but few knew we would find a half dozen other common species of crickets that were only 3/8 inch long or even smaller when fully adult, each with its own distinctive sweet song. It was a revelation.

Because low-frequency human speech is one of the last sounds to fade out for aging ears, it came as a shock to some of the older students to realize that their childhood summer meadows, once filled with the peaceful rustlings and tickings of meadow katydids, had gone silent on them. Or that the night call of the coneheads—once piercingly loud as it poured through the open windows of their car when they sped down country roads—was now getting a little hard to hear. Thankfully, even for
the oldest folks in the crowd, the cicadas, the ground and tree

crickets, and both the true and so-called false katydids remained

within range. Summer nights were still a delightfully noisy place.

Perhaps the most astonishing discovery during the course

was the sheer diversity of singing insects in Eastern US habitats.

Although we never left the Highlands Nature Sanctuary during

the four days of field trips, we recorded 41 singing species of

orthopterans and cicadas.

Let us give Vincent the last word.

‘By the end of Indian Summer, the silence that was to be
winter had muted the land. Few sounds were heard from the
animate world. Gradually I adjusted to the passing of summer
and to my return from the disordered beauty of rural habitats
to the manicured landscape of suburbia. I was not prepared for
a reprise.

Three days before Thanksgiving, as I was hurrying through
Harvard Yard, I heard a single cricket chirping. The chirp sounded
exactly like that which in early June had ushered in a summer of
song. This time, however, the caller was a Fall Field Cricket that
had found temporary shelter near the grating of a heating vent
outside Thayer Hall. Whereas the chirping of the Spring Field
Cricket had resonated with promise, had evoked memories of
summers past and anticipation of summers to come, this song,
with identical scoring and execution, evoked different emotions.
Even as I let my imagination range, I realized anew how much
the listener brings to the music, how music evokes moods
complementary to its setting, and how moods close the circle by
shading the music. I felt a sense of melancholy listening to the

cricket. He was calling, and there was no mate to listen. He was
calling into the void of imminent winter. Yet in that melancholy I
experienced—if not anticipation and assurance—at least hope for
another spring.

Two days later it snowed.’
1. **Forest Museum Trailhead — 3 trails**  
_Directions_: The Forest Museum is one mile south of Hwy 50 on Cave Road. The parking entrance is on your left, across from the Museum. These relatively short Museum trails are some of the most stunning trails in all the Sanctuary. See special hours below.

_Etawah Woods Trail_: 1.2 mile trail begins at Museum  
_Valley of the Ancients_: 0.5 mile trail begins at Museum  
_BARRIER RIDGE Trail_: 3.0 mile loop. A long gradual climb up to the top of Barrier Ridge with a faster descent. We recommend carrying this map and your cell phone since sometimes the route is difficult to find in autumn when the leaves have just fallen. The trail begins in the lower elevation parking lot west of the Museum. Look for a set of stone stairs on the right hand side in the middle of the lower parking lot. Do not begin this trail after 1 pm to ensure return before the parking lot closes.

2. **Barrett’s Rim Trailhead — 2 trails**  
_Directions_: Follow Cave Road south until you pass Browning Road on the right. Turn into the very next parking lot on the right. It is a gravel parking lot with a wooden fence at its entrance.

_BARRETT’S RIM Trail_: 2.5 mile loop. A mostly level trail with one short descent and ascent. The trail follows the Rocky Fork Creek along the base of a vertical rock wall. The area is often referred to as the “Jewel of the Rocky Fork Gorge.”  
_ROUNDTOP Loop_: 1.75 mile loop. Roundtop winds through a rich sugar maple forest and through a chestnut oak shale barrens. The trail makes a gradual climb to the ridgetop and back down.

3. **Cedar Run Trailhead — 1 Trail**  
_Directions_: Turn left onto Hwy 50 from Cave Road and follow Route 50 for 3 miles. After you pass Browning Road on your left, look for a gravel parking lot on the left in front of an old silo. The trail begins at the parking lot.

_Cedar Run Trail_: 2.5 mile loop. Trail begins by following an old farm lane into an open meadow and then enters the woods as it continues to the Cedar Run Gorge. Trail provides beautiful views of rock walls and fern-covered boulders along spring-fed Cedar Run. A spur leads to a small waterfall nearly hidden by a fallen rock.

4. **Miller State Nature Preserve — 3 trails**  
_Directions_: Follow Cave Road south until it dead ends, then turn right on Barrett’s Mill Road. Cross over the Rocky Fork Creek. Miller’s parking lot, which is signed, will be on the right, midway up the first hill. Drive or walk down the long lane to the trailhead. Miller boasts classic Rocky Fork scenery with rock-scapes, sparkling streams, and spring flowers. Three trails are available for hiking: the Falls Trail, a 1 mile loop, the Tuliptree Trail, a 0.75 mile loop, and the Arch Trail, a 0.5 mile loop.

5. **Kamelands Trailhead — 1 trail**  
_Directions_: Follow Cave Road north to Hwy 50 and turn left (west). The parking lot is exactly 0.5 miles down the road on your right. Park near the old barn and walk towards Hwy 50. To the right of the driveway a trail sign leads you underneath Hwy 50 through an old cattle tunnel and onto the Kamelands Trail.

_KAMELANDS Trail_: 2 mile loop. Mostly level trail. This trail leads through rolling meadows to the wooded corridor bordering the high bluffs of Rocky Fork Creek, directly across the gorge from the Forest Museum. This trail boasts immense ancient oaks, interesting rock formations, and an optional spur trail down to the canyon floor.
6 Crow Point Trailhead — 1 trail
Directions: Follow Cave Road north. Just before you reach Hwy 50, turn right at the mowed entrance. The parking lot is signed.
Ashy Sunflower Trail: 1 mile loop, mostly level. This trail runs through a planted prairie that is stunningly beautiful in early- to mid-August when the rare but showy ashy sunflower bloom. Dog Friendly - but must be on a 6-foot leash.

7 Ridgeview Farm Trailhead — 1 trail
Farm Restoration Model and American Chestnut Demonstration Orchard
Directions: Follow Cave Road north to Hwy 50. Turn left. One mile west of Rainsboro on Hwy 50, turn south onto State Rt. 753 at the blinking yellow light. After 1.8 miles, turn left at the sign for Beaver Cemetery on a gravel lane. Keep left at the fork and follow the lane back to the cemetery, where you can park. Trail entrance is signed.

Ridgeview Farm’s Restoration Trail. 1.5 loop trail features educational signs interpreting the biodiversity-boosting practices that are taking place on this old farmland. The trail winds through gently rolling open fields and into a swamp forest that shelters skunk cabbage and marsh marigolds. Along the trail is an Educational Chestnut Orchard featuring three species of chestnuts and blight resistant F-3 hybrids. Listen for orchard orioles and the rare Henslow’s sparrow, Ridgeview’s signature birds. This preserve exists to demonstrate that restoring biodiversity is possible on an abandoned farm.

8 Sanctuary West Trailhead — 1 trail
Directions: Follow Cave Road north to Hwy 50. Turn left. One mile west of Rainsboro, turn south onto State Rt. 753 at the blinking yellow light. Follow OH 753 for 2.8 miles. The mowed lot will be on your left, on a lower elevation than the road. Use caution when leaving the parking lot - this is a blind exit.

Listening Trail: 0.5 mile trail following the bluffs of the Rocky Fork with a spur down to the creek. Gorgeous views of the Rocky Fork Creek and handsome rock formations.

9 Maude’s Cedar Narrows Trailhead — 2 trails
Directions: Follow Cave Road north to Hwy 50. Turn left. One mile west of Rainsboro, turn south onto State Rt. 753 at the blinking yellow light. 2.3 miles down 753 turn right onto McCoppin Mill. Follow McCoppin Mill over the Rocky Fork Bridge. At the top of the next rise, turn left on Skee Road. Follow Skee around the bend. When the road straightens, (at the 0.3 mile mark), turn onto the first lane on your left. Look for tall hickory trees shading the lot.

Prothonotary Trail: 0.5 mile loop with a descent into the canyon floor and back up along the rim. Gorgeous views of the Rocky Fork Creek, rich spring wildflowers, and interesting rock formations.

Maude’s Cedar Narrows Trail: 1.5 mile loop with a 50-foot rise and fall in elevation. Maude’s comes off the right loop of Prothonotary Trail and returns to the trailhead parking lot. The trail follows the foot of the bluffs overlooking the Rocky Fork Creek, then up Franklin Branch tributary. Marvelous spring wildflower displays and rock formations. Great grassland birding on the return route.

Museum Hours & Museum Trails
Trailhead #1 on Map
9:30 am - 4:30 pm
Open daily May - Sept; Weekends Apr & Oct

All other Trails
Open daily sunrise to sunset
Weather permitting

See a maintenance issue on a trail?
Text Ethan at 513-508-8549

Emergency Numbers to call or text:
9am - 5pm at 937-365-1935
After hours: Tim at 937-509-2796
Ethan at 937-588-1268 (land line)
**Junction Earthworks Preserve**  
1143 Township Hwy 377, Chillicothe, OH 45601  
The Junction Earthworks Archaeological Park and Nature Preserve is open to the public 9 am to sunset. The park features 2000 year old Native American earthworks, four nature trails providing over four miles of hiking, and a 70 acre native prairie providing spectacular summer wildflowers and rare grassland birds.  

**Directions:** Turn south on Plyley’s Lane off Western Avenue (HWY-50) on the west side of Chillicothe. In one mile Plyley’s will turn sharply to the right. Turn left on Bellevue. Preserve is immediately on right.  

**Earthworks Trail:** 0.5 mile loop - A short meadow trail passing by Junction’s nine ancient earthworks.  

**Tippecanoe Darter Trail:** 1.7 mile loop - Traverses a 70-acre restored grassland prairie with outstanding floral displays in early July. The trail then enters the woods and descends into the floodplain forest of Paint Creek. Two spurs lead to the banks of Paint Creek.  

**Star Brook Trail:** 1.2 mile loop - Leads into the bluff forests lying above Junction’s earthworks and prairie. Beautiful wildflowers in mid April.  

**Steel Earthworks Trail:** 3 mile loop - Park at Junction Parking lot, then turn left on Bellevue and walk along the edge of the road. Watch out for traffic. When Bellevue turns into Plyley’s Lane, continue straight across the intersection and walk along the edge of Plyley’s Lane to the entrance of the 1-mile long abandoned railroad corridor that leads to Steel Earthworks. Trail entrance is on your right and is marked. Trail winds through a planted prairie and provides views of a still-visible circle mound. A spur leads to the North Fork of Paint Creek.  

**Gladys Riley Golden Star Lily Preserve**  
Tick Ridge-Koenig Hill Rd, Otway, OH 45657  
The preserve is named after an early spring wildflower, the Golden Star Lily. The flower has a spotty distribution in only a few eastern-central states and is uncommon throughout its range, yet grows in significant numbers at this preserve. The preserve features 3.5 miles of hiking trails.  

**Directions:** Take OH-348 south out of Otway. Turn left onto Rocky Fork Road and then left again onto Tick Ridge-Koenig Hill Road. The preserve will be on your left after crossing over the bridge.  

**Yellow Buckeye Trail:** 1 mile loop - Winds slowly up a steep hillside through ancient oaks and hickories. Lower elevations dense with ferns. Winter vistas. Trail is rocky and requires good balance.  

**White Walnut Trail:** 1.5 mile loop - A rocky low elevation trail that requires good balance. Follows the Rocky Fork floodplain. Outstanding spring wildflowers.  

**Chaparral State Nature Preserve**  
209 Hawk Hill Rd, West Union, OH 45693  
In 2015, the Arc of Appalachia partnered with the Ohio Division of Natural Areas and Preserves to successfully purchase an adjacent 60-acre property that nearly doubled the preserve, bringing it up to 130 acres. The entire preserve is well accessed by trails which are managed by the State of Ohio. Chaparral Prairie offers three loop hiking trails and one spur trail totaling 2.0 miles.  

**Directions:** Follow OH-247 north out of West Union for 0.7 miles. Turn left on Chaparral Road for 2.8 miles. When the road makes a 90 degree turn left, continue straight onto Hawk Hill Road. The Nature Preserve will be 0.2 miles down the road on your left.  

**Trails include:** Hawk Hill Trail, a 0.7 mile loop; Bald Hill Trail, a 0.7 mile loop; Cedar Barren Trail, a 0.5 mile loop; and Prairie View Spur, a 0.1 mile long trail.
Plum Run Prairie Preserve - SCHEDULED TO OPEN IN 2020 - WATCH FOR ANNOUNCEMENTS
Mendenhall Road, just east of Peebles, OH 45660
140-acre Plum Run Prairie is one of the best examples in south-central Ohio of a native tall-grass prairie. Plum Run boasts a truly exceptional ecosystem with many rare plants and beautiful prairie panoramas. At least 40 acres of the site is covered in pristine prairie, with roughly another 60 acres of meadows naturally undergoing natural prairie restoration from the soil’s native seed bank.

Directions: From OH-32/OH-41 drive east on OH-32. Turn south on Mendenhall Road, the second exit east of Peebles. The parking lot will be on your left 0.25 miles down the road.

Appalachian Mound Trail: 1 mile loop - Winds through an intact tall grass prairie and cedar glades. Passes large mounds created by the Appalachian Mound Builder Ants.

Plum Run Trail: 1 mile loop - Passes through a high quality prairie and then enters a lush woodlands bordering Plum Run. Outstanding spring floral displays.

Chalet Nivale Preserve
1272 Bacon Flat Rd., Peebles, OH 45660
Chalet Nivale features two loop trails that meander through the low floodplain created by two short tributaries of Scioto Brush Creek that have sculpted the bedrock into mossy slump blocks and intriguing outcrops, bounded by vertical cliffs. A third trail dissects a meadow that lies like a low bowl that is surrounded by a rim of Appalachian hills. The trail provides pleasant panoramas of the surrounding hill country. Beautiful spring flowers.

Directions: From OH-32/OH-41 drive east on OH-32 for five miles. Turn left on OH-73 North, cross the bridge over Scioto Brush and take the first left on Bacon Flat Road. The preserve will be 0.20 miles down the road on your right.

Crawdad Creek Trail: 1.2 mile loop - Follows a verdant dolomite stream valley bordered by a 40 foot vertical rock wall.

Early Buttercup Trail: 1 mile loop - Follows a deeply forested and rich stream valley in a beautiful woodlands with handsome rock formations. Gorgeous wildflower displays in the spring.

Golden Meadows Trail: 1 mile loop - Leads through a sunny meadow.

Fort Hill Earthworks
13614 Fort Hill Rd, Hillsboro, OH 45133
Fort Hill protects a 2000 year-old large earthen-walled ceremonial enclosure on its flat ridgetop. The 1400-acre preserve also shelters one of the finest and oldest forests in Ohio. Four miles of trails immerse hikers in the beauty of Ohio’s Appalachian hill country and lead through one of the tallest oldest forests in all of Ohio.

Directions: Turn south on OH-41 in Bainbridge and follow for 12 miles. Turn right on Fort Hill Road and drive 1 mile. The park is on your left and well signed.

Fort Trail: 2.2 mile loop - Trail ascends from the base of Fort Hill to the top of the ridge, providing a steep climb but also the best views of Fort Hill’s earthwork remnants - tall mounds that encircle the bluffs of the ridge.

Deer Trail: 1.2 mile trail that can be combined with part of the Fort Trail to make a 2.3 mile loop. Leads through Appalachian hill-country with truly astounding trees in what is essentially an old-growth forest.

Note: The Gorge Trail & Canby’s Mountain Lover Trail will remain closed due to unsafe hiking conditions until extensive trail repairs funded by the Ohio History Connection are completed.

TRAILS OPEN SUNRISE TO SUNSET
weather permitting
For trail maps and more information visit arcofappalachia.org/hiking-visiting/
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www.arcofappalachia.org
Learning Birds by Song - Bird Identification & Ecology -- June 3-7, 2020
This is an in-depth course that teaches you to learn and remember the songs, calls and field identification skills of the breeding birds in America's Eastern Forest Heartland, as well as their natural history and ecology. Gaining such skills requires lots of time in the field, patient repetition, good learning aides, and positive reinforcement – attributes that are not often found in casual bird walks with birders, but will be bountifully present in this course. This is our most popular forest school course and it usually books up quickly. Don’t delay in registering.

Fireflies - Early Season Spectacles - June 5 - 6, 2020
Christmas Lights, Mr. Macs, and the Enchanting Synchronous Fireflies
For two consecutive nights you will be immersed in a world of winking lights – with your days free to rest and explore the Sanctuary on your own. You will experience the spectacle of Christmas Lights, be introduced to “Mr. Mac,” and savor one of Ohio’s newfound natural treasures – the synchronous fireflies. Witness whole areas of the forest going dark simultaneously, then coming back to light during their illuminating courtship flight. Put a little spark in your early summer! Photo art by Karen Klein.

Trees of the Eastern Forest - Field Recognition Level II - June 24-28, 2020
This in-depth course will teach you to recognize some of the more challenging and more habitat-specialized trees and shrubs of the Eastern United States by leaf and bark. Topics of forest ecology, natural history and conservation are embedded in this thoroughly field-oriented curriculum. This is a companion course to Level I, which teaches 43 of the most common and distinctive Eastern trees. This course teaches an additional 45 trees and shrub species. If you are a beginner, we recommend taking the Level I course which will be offered in 2021. Certification available.

Insects - Diversity, Ecology & Behavior - August 13-16, 2020
Field trips to the diverse habitats of forests, prairies, caves, and aquatic communities
Building familiarity with the thousands of insect species that share our biome is the foundation of a strong nature education. You will learn the astonishing ecological relationships, life cycles, and survival skills of insects in the context of habitat. Through storytelling, mentoring, journaling, and keen observation, you will learn to identify most insects by order or family, and - for the most common - by species. The name, however, is just the beginning. This is a holistic inter-disciplinary immersion.

Darter Fest - Ecology, Field ID and Conservation of Eastern Darters
August 27-30, 2020  photo of Rainbow Darter by Uland Thomas
The gorgeously colored darters - four genera in the perch family endemic to North America - are to fish what the warblers are to birds and butterflies are to insects. We will be seining the riffles of rivers, creeks and headwater streams in pursuit of darters native to southern Ohio. We have a chance of seeing 16 of the 22 species that have historically been recorded in the state. Participants will learn darter ID, fish anatomy, family recognition, and identification of the most common fish of our region's waters.

Growing Wild - Propagating Native Plants from Seed - Sept 15 - 18, 2020
Whether you want to grow native plants from seed for a pollinator garden or for ecological restoration efforts, this course, led by native plant nurseryman, professional landscape ecologist and restoration expert, Gary Conley, will jump start your mastery. Gary will teach you the art and science of native plant culture - everything from seed collection, storage, and stratification, to planting out in a properly prepared environment. Participants will gather wild seed in the Arc preserves of both common and rare species, which you can then take home with you for your own native sowing.
Spend your spring in the company of flowers

2020 Wildflower Pilgrimage
April 17 - 19

Photo by Tom Croce Photography
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Thank you for having the capacity to open your heart to not only people, which would be praiseworthy enough, but to the little things that run the world - creatures who gift us so generously with mystery, diversity and companionship.

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Someday, after mastering the winds, the waves, the tides and gravity, we shall harness for God the energies of love, and then, for a second time in the history of the world, man will have discovered fire.

~ Pierre Teilhard de Chardin