



Brown Family Environmental Center

FIELD NOTES



Hanging on
Some deciduous trees — including these oaks on Middle Path — hold onto their dead leaves all winter in a phenomenon called marcescence.

Image: Larry Hamill

The Mystery of Marcescence

BY EMMA RENEE COFFMAN '22, BFEC POST-BACCALAUREATE FELLOW

I love a good mystery. The curious naturalist in me is always looking to solve questions I have about the strange things I encounter while out and about in nature. All too often, science seems to have all the answers, and with a simple Internet search I can learn almost everything I could possibly want to know in just minutes.

Every once in a while, though, I have the pleasure of stumbling upon something we don't know how to answer yet — a mystery yet to be solved. Just this year, I was delighted to discover my own mystery, right outside my home at the BFEC farmhouse.

When I first began learning how to identify trees, one of the most basic things I was taught was the difference between deciduous and evergreen trees. Deciduous trees shed their leaves every fall, giving us the gorgeous autumnal colors we know so well, and evergreen trees, like the name suggests, retain their leaves (or needles) and remain green all the way through winter. A simple enough dichotomy, right?

Well, not exactly. I should have known nature would be a little too complicated to work in the ways I expect.

I first suspected something strange was going on when the so-called “deciduous” oak tree near my home in the BFEC farmhouse took a little too long to shed its leaves.

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October turned to November. Frost began covering the ground in the mornings. Soon we had our first snow of the season.

By then, almost all of the trees around the young oak had gone bare, while the oak itself clung to its brown leaves defiantly. They weren’t green like the needles on the eastern white pines nearby — which I know to be true evergreens — so what did that make the oak? Could it even still be called deciduous if its leaves did not fall?

Before your entire tree worldview shatters, the short answer is yes, the oak is indeed a deciduous tree. However, by holding onto its leaves well past the fall, it is exhibiting a phenomenon called marcescence, which only

occurs in a few tree species in Ohio. From the Latin word *marcescere*, meaning “to fade,” marcescence is the term used to describe the process of certain parts of plants (in this case, leaves) remaining attached to the plant, even as they wither.

That is exactly what happened with the young oak I’ve been watching, as the leaves still remaining on the branches are shriveled and brown as if they were ready to fall off, despite remaining firmly attached to the tree. In fact, they will most likely remain there all through the winter, defying everything I thought I knew about fall being the only time trees drop leaves. Since the leaves will eventually drop in the spring when new buds begin to grow, the tree is still considered deciduous. My sweet oak is just a bit of a late bloomer (or, rather, a late dropper).

Oaks are not the only trees that exhibit marcescence. In Ohio, some hornbeams, witch hazels and beeches are also

known to display marcescence. Interestingly, though, some trees only display it when they are young, or only in patches as they age. Odds are, when my small oak grows to be even more massive, it may stop holding onto leaves at all.

It seems like we know quite a bit about the phenomenon, so where does the mystery come in? If you’re at all like me, you might already be asking why trees exhibit marcescence in the first place. Science hasn’t answered this question yet. Indeed, marcescence is a humbling example of a natural mystery that still lies beyond our understanding.

At the very least, we do have some working theories that may satiate our curiosity. It is quite possible that by waiting for the spring to drop the leaves, the trees are creating their own natural mulch for the time of year they grow the most. When the dying leaves finally fall, they will coat the ground to help retain moisture at the base of the tree and eventually decay

into valuable nutrients that can be absorbed by its roots. Another theory is that holding onto the dead leaves may protect the tree in the winter months from browsing deer on the hunt for food. Dead leaves are far less palatable than the twigs and branches themselves, so this may serve well as a natural deterrent against hungry wildlife.

One or both of these theories seem plausible to me, but we may never know for sure. As I stand beneath the oak and watch its dying leaves rustle in the wind, I really appreciate how something I can literally reach out and touch can still be so mysterious. This process we’ve named, described and observed a thousand times over still defies our understanding. How amazing is that?

As you walk outside this winter, see if you notice any signs of marcescence in the trees. Who knows — maybe you’ll be the one to solve the mystery.

Roads Good, Roadkill Bad

BY NOELLE JORDAN, BFEC MANAGER

When I was in grad school in a remote town in Oregon, we used to play a game on road trips: name that roadkill. The person to correctly identify the dead animal from farthest away was the winner. I seemed to be immune to the sight of roadkill back then, but today, I feel quite differently. As I drive Route 229 to and from work every day, I find the sight of roadkill painful and disturbing. It seems senseless. These critters are going about their lives trying to survive, moving from nesting sites to food and water sources, and back again, when they are struck mid-stride by a moving vehicle. In a split second, their life is over.

I know many folks might rejoice to see some of these critters lying dead on the road: groundhogs, raccoons, opossums, skunks. These are nuisance animals, right? Good riddance. Others may say that these animals are so numerous that a few dead ones on the side of the road won’t hurt anything. In fact, for some animals like white-tailed deer, it’s a good thing. Culling the herd, and all that.

Surveys conducted by several organizations estimate that 1 million animals die per day on roads in the United States.

If 20 percent of threatened or endangered species populations are killed by vehicle collisions, the risk of local extinction goes up by 10 percent.

Globally, roads are the second largest source of wildlife mortality of vertebrates caused by humans. This number does not include insects and other invertebrates. (That’s right — all those insects smooshed on your windshield are considered roadkill.) While some of us won’t think twice about a dead raccoon or white-tailed deer, what about Florida panthers, or ocelots, or the endangered Blanding’s turtle, or even now our endangered monarch butterflies?

Regardless of how we feel — whether we consider an animal a nuisance or feel some affection for them — vehicle collisions can have a big impact on animal populations. Animals with late maturity age, small litters and large home-ranges are particularly impacted. Many animals that fall into this category are apex predators like brown bears, panthers and bobcats. And species that have small populations (threatened or endangered) are also at risk. In the U.S., this group includes animals like the Florida panther, wolves, and many amphibian and reptile species.

Studies suggest that if 20 percent of these small populations are killed by vehicle collisions, the risk of local extinction goes up by 10 percent. In 2018, 25 Florida panthers were killed by vehicle collisions. At that time, there were only 130 panthers in the wild. At the same time, the ocelot population in Texas was a few dozen. In one year, seven were killed

by vehicles. In Florida, vehicles are responsible for 90 percent of known bear deaths. Even in our national parks, the very places where wildlife are meant to be protected, animals are sacrificed as roadkill. From 1991 to 2011, the number of large animals killed in Grand Teton National Park rose by 205 percent.

And let’s not forget our feathered friends. In 2014, more than 340 million birds, including bald eagles, robins, warblers, bluebirds and many other species, were killed on U.S. roadways. Bird populations have been on the decline for a while. The 2022 U. S. State of the Birds Report, issued by the U.S. Committee of the North American Bird Conservation Initiative, recently reported that “more than half of a selection of 259 bird species from across the United States are declining,” and 70 species are most likely heading toward a federal listing as endangered. While the single biggest threat is habitat loss, roadkill numbers certainly are not helping.

Roadkill is a cause for concern globally, nationally and here in Ohio. Bobcats are of special concern in Ohio. Native to the state, bobcats were extirpated around 1850. According to the Ohio Department of Natural Resources (ODNR), bobcats began to repopulate Ohio in the mid-1900s. While their populations are increasing, ODNR reports that “vehicle strikes are considered the main source of mortality for bobcats in Ohio.”

Skunks may not be as charismatic as bobcats, but their numbers in Ohio

In 2014, more than 340 million birds were killed on U.S. roadways.

steadily declined from 1990 to 2015. Some of the reasons why? Habitat loss, habitat fragmentation (by roads) and vehicle collisions. Skunks are especially vulnerable in February when they leave the safety of their winter dens for mating.

According to the Ohio Department of Transportation, “Ohio has one of the highest road densities and traffic volumes in the U.S.” As is true on a global scale, the road systems in Ohio transect and fragment animal habitats to the point that animals must cross roads in order to get from their dens or nesting areas to food and water.

Of course, wildlife collisions are also detrimental to humans. State Farm Insurance reports that “in the U.S., an estimated 1.25 million insurance claims are filed annually due to collisions with deer, elk and moose.” These collisions result in an average of 200 human fatalities each year and cost about \$8 billion in damages each year.

OK. Roads good. Roadkill bad. But what can we do about it? There are many initiatives around the globe to build large overpasses for wildlife corridors. Awesome. But very expensive. In other places, underpasses or culverts have worked to create corridors for wildlife. These (and the overpasses)

tend to work best when fencing is used to direct the wildlife to the corridor. These are a little easier to build, a little cheaper than an overpass, and many areas, particularly around wetlands, have seen great success with underpasses. Fencing alone has been used but needs constant upkeep and maintenance.

A new initiative that is currently being tested in some locations is a roadside animal detection (RAD) system. These are computerized signs with flashing lights that activate when an animal breaks a light beam. These cost a little more than a simple warning sign, but less than an overpass or underpass. These tend to work best for large animals, but not so great for smaller critters.

There are deer whistles — simple, air-activated devices that are affixed to your car and emit a mechanical, high-pitched whistle when the car is moving. The sound is intended to deter deer. Tests conducted by the University of Georgia suggest that these don’t work. The frequency is not in the hearing range of white-tailed deer.

So it seems that reducing or preventing roadkill comes down to you and me. For starters, let’s not aim for those groundhogs and squirrels. When driving at night, slow down. Use your high beams as much as possible, and remain on constant look out. If you see eye shine or movement on the side of the road, slow down a little more. Yes, you will annoy the driver behind you, but you just might prevent a collision

for you and for that driver. When you do see roadkill, you can report it. While there are no official national or state databases, some citizen science projects are trying to gather data. I recently discovered “Roadkill Reports” on a website called SciStarter (scistarter.org). The database is managed by anecdata.org. It takes about 20 seconds to report a roadkill sighting, and the data are used by researchers to track roadkill incidents and identify hot spots. Reporting sightings doesn’t seem proactive, but it seems the very least we can do. I’ve reported 18 roadkill sightings along a five-mile stretch of Route 229 from October 7 through November 14. That’s an average of 3.2 animal deaths per week.

When I first became an environmental educator more than 20 years ago, I thought that being a good environmentalist meant recycling or saving endangered animals in far-away places. After a while, I started looking closer to home and realized that it’s more about taking local action — making choices to live more sustainably and finding ways to make a positive impact in my community. And now, in addition to these things, I wonder if it’s possible for humans, in the midst of our too-busy lives, to live alongside our animal neighbors without senselessly killing them. Is it possible to extend a basic respect for their lives? I don’t know the answers to these questions, but I can tell you that I will be that slow nighttime driver that you’re stuck behind.

Meeting Nature

BY ZELLA LEZAK '25, BFEC STUDENT MANAGER

On one of my recent trips to the BFEC, this time for leisure rather than work, I found myself going down the dirt hill from the gravel parking lot to a little stone ledge that acted as a seat that laid over the Kokosing River. It was a beautiful, sunny day, and I decided to take my time wandering down this path that I now know all too well. It was the first time in a while I was able to fully experience the river's beauty in complete silence, unencumbered by the laughter of friends or the questions of students. Not that those things do not give me pleasure, but I believe that a balance of alone time and time with others is key in a college experience.

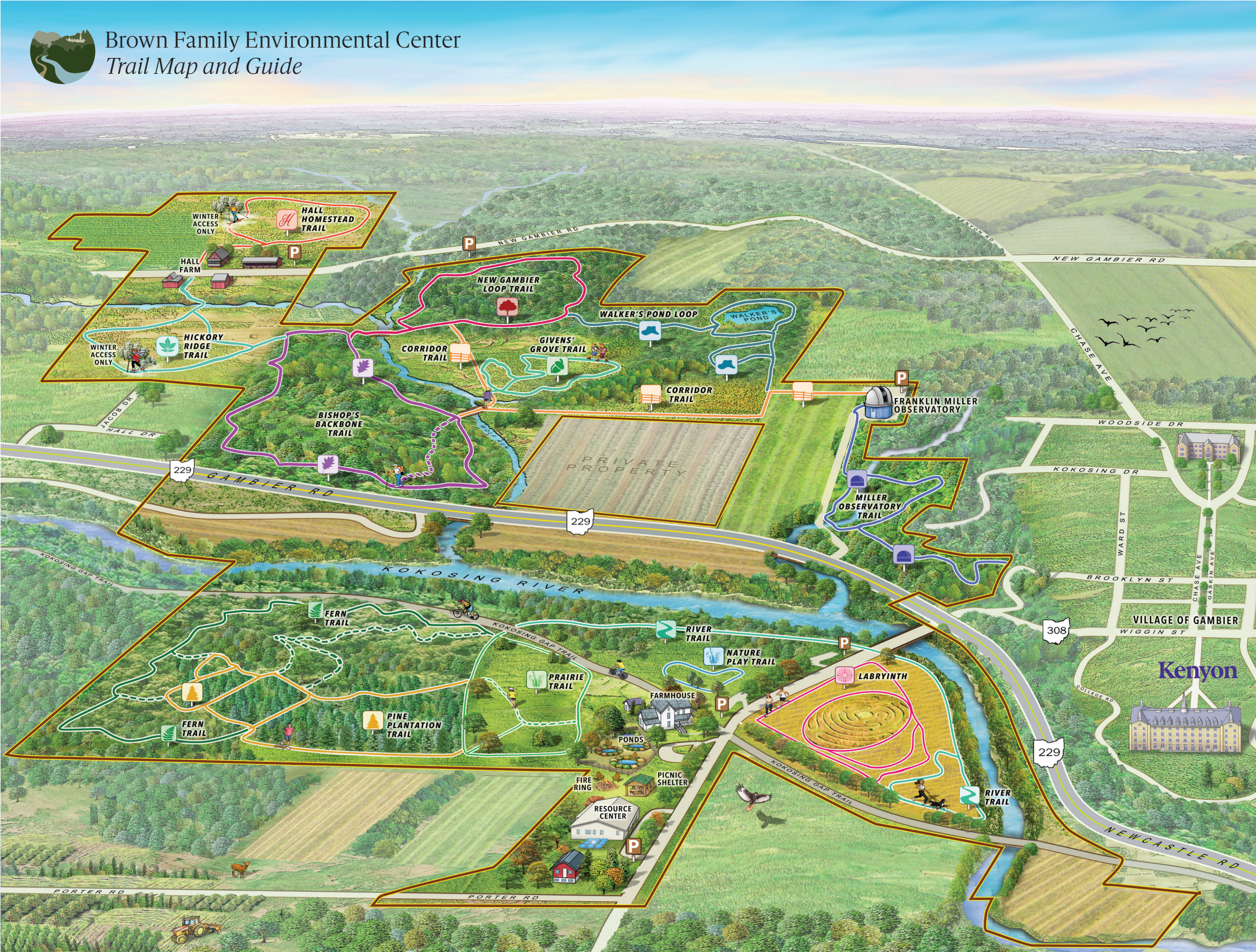
Back to the story at hand, because it was so quiet, I was opened up to a completely new experience. Never before had I seen the Kokosing in this way. Not only was I quiet, but the river was quiet, too. I was able to see into the clear water, the glass-like surface unbroken by ripples. I saw fish swimming around, in a private aquarium that I was privileged to witness. Along the river's edge, deer approached. Mere feet from me, they silently bent to drink from the crystal clear water.

As I sat observing, I was reminded of a high school experience. When I was in high school in San Francisco, I worked as a volunteer at Glide Memorial Church, an organization that provides three free hot meals each day. It is a women's shelter, a daycare, and a harm reduction facility, and I spent many hours volunteering there. The harm reduction facility was a place where we helped people struggling with addiction by providing them access to clean supplies to prevent the spread of disease, medical care, Narcan training and many more free resources. My supervisor's mantra was, "We're meeting people where they are, not where we want them to be."

Since then, I have thought about that philosophy quite frequently, and as I sat by the river, it came to me again. Sitting quietly, I was meeting nature where it was, and I was so delighted at the new world that was opened up to me. I feel like nature met *me* where *I* was. And it filled me in unexpected ways.

After this experience, I urge each of you, especially those who are trying to get out of your heads, to spend some quiet time in nature — to meet nature where it is, and, in the end, to meet yourself where *you* are and not where you want yourself to be.

Hit the Trail This Winter
Meet nature at the BFEC by taking a winter hike. All trails — including the new trails at the Hall Farm — are open for your exploration and enjoyment. Use this convenient facility map to plan your adventure.



EGGciting News From the Kenyon Farm

BY BETHANY MCCARTY, KENYON FARM MANAGER

This November, the Kenyon Farm added 300 laying hens and a brand new mobile chicken coop to the farm for egg production. This new enterprise will give Kenyon students a production-focused experiential learning opportunity. Kenyon Farm student employees and volunteers spent time this fall preparing for the arrival of the hens by constructing a concrete pad, installing a 2.5-ton feed bin and auger, building a fence, and learning about the coop and its automation systems. Students will provide daily care to the chickens including feeding, watering, and gathering and washing eggs.

Not only is this a great hands-on learning experience for the students, but the Kenyon Farm is supporting the local food system at Kenyon. The farm is partnering with AVI, the College's food service provider, to provide about half of the eggs served in Peirce Hall.

The laying hens live in a high-tech mobile chicken coop. The coop has automatic doors that let the chickens out to pasture during the day and keep them safe

from predators at night, nest boxes that open and close to keep the eggs cleaner and keep the hens from becoming broody, automatic lights that provide supplemental lighting during the winter months to encourage egg production, and a large feed bin and water tank that keep the hens fed for several days. The automated systems are all powered by a solar panel located on the roof.

The Kenyon Farm chose to go with a mobile chicken coop so that the laying hens could be raised on pasture. Pasture-raised laying hens are healthier and happier because they have access to the outdoors with more area to roam, sunshine, and the ability to eat bugs and grass. Happy chickens also produce healthy eggs. According to a 2003 study from Pennsylvania State University, eggs from pasture raised hens contain twice as much omega-3 fat, three times more vitamin D, four times more Vitamin E and seven times more beta carotene than eggs from conventionally raised laying hens. Raising laying hens on pasture is also a regenerative farming approach. When the hens graze on pasture, they distribute their manure that then adds nutrients to the soil. Currently, the hens are grazing on a garden plot at the farm that is growing a cover crop for the winter. In the spring, this garden will be planted with vegetables for summer harvest.

The Kenyon Farm is very EGGcited about our new venture. We hope you stop by the farm to see our new pasture-raised laying hens.



UPCOMING PROGRAMS AND EVENTS

Winter Tree ID

JANUARY 14, 2–3 P.M.

Yes, you can identify trees in winter. Learn about leaf scars, bundle traces, bud scales and more. We will start inside the Resource Center with the basics, and then we'll test our new-found knowledge outside as we identify some common trees. Dress for the weather. *Meet at the Resource Center.*

Himalayan Bowls and Chanting

JANUARY 21, 10:30 A.M.

Allan Bazzoli M.D. will offer the sounds of 18 Himalayan singing bowls combined with harmonic chants from different cultures to immerse you in a very relaxing, transcendent experience of vibration and sound. Bazzoli will chant a blend of Native American sounds, the OM chant (the universal chant), the dragon chant and the Snow Mountain chant. Cost: \$20 (proceeds will help fund a new television screen in the BFEC lecture room). The program lasts one hour and is limited to 12 participants. To reserve a spot, email jordan2@kenyon.edu or call 740-427-5052.

Backyard Birding During COVID

FEBRUARY 4, 2 P.M.

Join Carson and Barbara Miller, local birders, for a colorful presentation of birds that were found without traveling far from home. The backyard and short drives became a rewarding option during the pandemic. Some birds will be familiar, like the blue jay and cardinal. But the snowy owl and white pelican were among the more elusive and rarely seen birds encountered in our area. The presentation will include many photos and recorded calls. *Meet at the Resource Center.*

Family Nature Quest: Icy Experiments

FEBRUARY 4, 10:30 A.M.

Blizzards, icicles and frost are just a few of the unique ways water shapes itself in the winter. Join us inside where it's warm for a day of cool experiments that will teach us how water, ice and snow behave in winter. *Meet at the Resource Center.*

DONORS AND VOLUNTEERS

FALL 2022

Kenyon provides financial support to the BFEC, but the center has been able to grow largely through the generosity of volunteers and donors. We are indebted to the following individuals, groups and businesses for recent donations of time, materials and funding. If you would like to make a gift or volunteer for a project, please call the BFEC at 740-427-5050.

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Madeleine Chapman
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Family Nature Quest: Skulls and Smiles

FEBRUARY 11, 10:30 A.M.

Humans can eat meat or vegetables quite easily, but what about other mammals? What do they eat? How do they get their food? Turns out, the answer is all in the teeth. Join us as we take a closer look at some Ohio mammal skulls to learn more about their lifestyles. *Meet at the Resource Center.*

Family Nature Quest: Naturalist Notebooks

FEBRUARY 18, 10:30 A.M.

If you love being outside, are curious and ask a lot of questions, you might just be a naturalist in the making. In this program, we will spend our day as naturalists and learn how to keep our own field notebooks. *Meet at the Resource Center.*

Family Nature Quest: Winter Nature Play

FEBRUARY 25, 10:30 A.M.

Just because it's cold doesn't mean we can't enjoy some nature play. Bundle up for this program as we explore the Nature Play Trail in the cold, learn how to stay safe outside when the temperature drops and then spend some time inside warming up again with a cup of hot chocolate. Be sure to dress for the weather. *Meet at the picnic shelter.*

Guided Hike: Hall Farm

MARCH 18, 2 P.M.

Enjoy this guided hike of the Hall Farm area and take a peek at the barns and house. The hike is strenuous for most folks, and it may be a little soggy. *Meet at the Hall Farm parking area.*

Maple Syruping at the BFEC

MARCH 25, 2 P.M.

We've been busy tapping maple trees and making syrup. Join us to learn about the process. After the program, everyone will do a blind taste test (real maple syrup versus store-bought stuff), and then we'll enjoy a waffle with some BFEC syrup. Yum! *Meet at the Resource Center.*



**Brown Family
Environmental Center**
Kenyon

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OUR MISSION

The Brown Family Environmental Center exists to support the academic goals of Kenyon College, to provide opportunities for education and research, to engage Central Ohioans of all ages with nature, and to conserve the natural diversity of the Kokosing River valley.

OUR STAFF

Emma Coffman '22, *Post-Baccalaureate Fellow*
Jill Kerkhoff, *Facilities Coordinator and Office Administrator*
Shane McGuire, *Land Manager Naturalist*
Noelle Jordan, *Manager*

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TO MAKE A GIFT, PLEASE FILL OUT THE INFORMATION BELOW, DETACH THE SHEET AND SEE MAILING INSTRUCTIONS.

There are many reasons to give, including the satisfaction of knowing you're a part of critical environmental education and conservation programs. Receive preferred access to workshops, a hard copy of our newsletters, and a discount on bird seed. **Use the form below to send your contribution today.**

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