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.

Hanging on

Some deciduous trees — including these oaks on Middle Path — hold onto their dead leaves all winter in a phenomenon called marcescence.
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 evergreen—even 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. It 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. It is exactly what these leaves are doing. 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. The only time they drop leaves. Since this process is so common, this is why we refer to “new growth” 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 stummels me how the tree manages to do this. 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 winter. Perhaps it provides some degree of protection. However, the drop 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 new shoots, and 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 as literally reach out and touch can still be so mysterious. This process has been 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**

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

Regardless of how we feel — whether we consider an animal a nuisance or feel some affection for them — vehicle collisions 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 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. With up to 100 panthers in the wild, at the same time, the population of the panther 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 vehicle is the most likely agent that will cause an animal to be killed. (This is considered roadkill.) While we may never know for sure, we can consider roadkill a cause for concern and a way to protect the environment and the animals themselves.

In 2014, more than 340 million birds were killed on U.S. roadways. Suddenly declined from 1990 to 2015. Some of the reasons why? Habitat loss, habitat fragmentation (by road) 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 transact 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. Amazingly, but not unexpected, 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, but a little cheaper and overpasses in many areas, particularly around wetlands, have seen great success with underpasses. Federal aid has even been provided to states of $3 million per year to help maintain and construct these.

A new initiative that is currently being tested in some areas 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 they work. 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 those229 from October 7 through November 34. That’s an average of 3.2 animal deaths per week.

When I was 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 us, the millions of humans in our midst, to take care of our own neighbors in the midst of our too-busy lives, to live alongside our animal neighbors in our own communities. And now, in addition to these things, I wonder if it’s possible for us, the millions of humans in our midst, to take care of our own neighbors in our own communities.

If 20 percent of threatened or endangered species populations are killed by vehicle collisions, the risk of local extinctions goes up by 10 percent.
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 half of the eggs served in Peirce Hall. The laying hens live in a high-tech mobile 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 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 betacarotene 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.

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**Upcoming Programs and Events**

**Family Nature Quest: Skulls and Smiles**

**February 11, 2–3 P.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.

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**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.
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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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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