

FIELD NOTES



Twilight

Noelle Jordan, BFEC Manager

Before moving to Ohio to work at the BFEC, I lived in Texas. I enjoyed Texas immensely, but there were a few things about Ohio that I missed, one of which was the extended twilight period during the summer. Twilight figures prominently in one of my defining experiences of summer: sitting outside to watch the sunset, lingering until dark watching the sky change, all the while enjoying an adult beverage.

Twilight is the period when the sun is below the horizon but there is still some light in the atmosphere. Between sunset and full dark, we pass through three different types of twilight - civil, nautical, and astronomical twilight. Depending on what time of year it is, all stages of twilight in Ohio last between 1 hour and 38 minutes and 2 hours and 6 minutes. The closer we are to the summer solstice, the longer the twilight period.

Civil twilight begins when the sun sets, and ends just after the sun reaches 6 degrees below the horizon. During this time, we can see without an artificial light source, and the planets and brightest stars start to appear in the sky.

As the sky darkens into nautical twilight, the sun is between 6 and 12 degrees below the horizon. During this time, we start turning on the lights, but sailors at sea can still navigate by looking at the horizon. They use well-known bright stars and a visible reference point on the horizon to determine their location.

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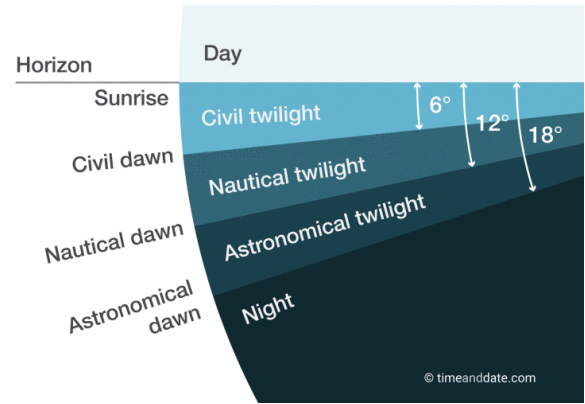
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As the sun passes from 12 to 18 degrees below the horizon, we enter into astronomical twilight. In places with light pollution, we have a hard time distinguishing astronomical twilight from dark, but in areas with little to no light pollution, the faintest stars detectable to the human eye become visible.

Finally, after the sun sinks more than 18 degrees below the horizon, the skies become fully dark.

The length of twilight depends on latitude. When I was in Texas, closer to the equator, the length of twilight was relatively short and didn't change much from summer to winter. The skies would transition from sunset to seeming darkness in about 45 minutes. But in central Ohio, I'm able to enjoy almost 90 minutes of this magical in between time during the height of summer.



Ok, so the science is interesting, but let's find out what this long twilight time really means....

June 22. One day after the summer solstice. The evening is perfect: cool, not humid, a delicious breeze, interesting clouds in the sky. It's Saturday. No work tomorrow.

8:00 – With my favorite bottle of vino, I take a seat on my balcony in the middle of Mount Vernon. The sun still hangs in the sky illuminating the lovely view from below – a lush garden filled with pink lilies, purple petunias, and orange nasturtiums. Clematis climbs up to greet me with deep purple blooms. I hear endless chirping from hidden sparrows and somewhere in the distance a robin sings. The sky is the perfect shade of baby blue. My glass is full.

8:43 – The sky overhead turns a deeper shade of blue – cerulean. The sun's rays, bursting through clouds floating low on the horizon, cast a brilliant golden hue onto the hemlock and maple trees next to my balcony. A bright cardinal, made fiery red by the sun's last rays, sings a sweet salute to a luxuriously long day. Time for another pour.

9:04 – Sun set. Salud. Slainte. A votre santé.

9:05 – The first fireflies.

9:15 – As the sun slips further below the horizon, the western sky transforms into a palette of pastel colors. Pale blue gives way to orange-peach which fades into rosy pink with a gilded nexus where the sun used to be. Clouds with golden outlines silently sail by. Contrails leave glowing evidence of planes arriving to and departing from the Columbus airport. Swallows chatter to each other in acrobatic flight as they catch their last meal of the day. Mmmm... does wine get better with age or simply with the passing of time?

9:27 - Birds are finally quiet, cardinal and swallows safely perched for the night. Many flashing fireflies. Clouds are now an inky purple-gray. Trees swish in the gentle breeze. Jupiter is now visible in the southeast sky. The western sky is every shade of pink imaginable.

9:33 – A few bright stars flicker into view. Saturn appears overhead. The western sky is now pale gray with a line of fuchsia at the horizon.

9:51 – The last few fireflies are still on the prowl. Voices of children still playing outside waft up to the balcony. The sky is blue and aqua and deep rose. Last pour.

10:00 – The deep velvety blue that covers most of the sky yields to a narrow line of terra cotta orange on the horizon. I can finally see the Big Dipper. For just a moment, the world seems suspended. Silent. Still.

10:27 - I can no longer detect any color in the sky. Although astronomical twilight doesn't end for another 42 minutes, the sky appears completely dark to me. I savor my last sip of wine. Here's to the long evenings of summer.

Winterberry: Ohio’s Native Holly

Noelle Jordan, BFEC Manager

The other day as I was walking into the Resource Center, I stopped at what sounded faintly like cars zipping around a race track. I looked around for the source of the sound and found not race cars but bees - hundreds of them - happily buzzing all over the Common Winterberry that is planted at the front door of the building. Upon closer examination, there were not only honeybees, but at least two species of bumblebees, 5 or 6 species of flies, 3 wasp species, and who knows what else was buzzing around in there. I estimate that there were several hundred individual insects visiting the tiny flowers on this humble shrub.



The pistillate flowers of Common Winterberry

Common Winterberry (*Ilex verticillata*) is a native holly. Unlike most hollies, it is deciduous and the leaves are not prominently toothed. It is a kinder, gentler holly, if you will. Typical of all hollies, winterberry is dioecious. Isn't that a great word? That was one of the first botanical terms I learned way too many years ago. Dioecious is based on the Greek words for "two houses." It means that the female flowers (and then, of course, the berries) are borne on one tree, while the male flowers with all the pollen are found on separate trees.

Not only is this thicket-forming shrub great for pollinators, it is also great for birds. Up to 48 bird species have been documented eating the berries. The berries are what make this shrub a show-stopper. In the Ohio winter landscape, the bright red berries really pop against the white snow.



The two spotted bumble bee (above) and a species of long-legged fly (below) were found on our Winterberry



Bright red berries of Common Winterberry

Thanks to our volunteers!

All 176 of them! From January through June of this year, we had lots of help leading field trips, staffing our Earth Day Festival, planting new trees, caring for young trees, clearing invasives, leading programs, designing posters, and so much more.

Al-Ummah students (out of state - 105 of them)	Gage Anzulavich	Nat Henry
Abby Lee	Gina Golden	Nathan Fanta
Adam Bell	Grant Holt	Nathaniel Jacobson
Adelaide Hurwitz	Hannah Aronson-Paxton	Nick Lust
AJ Allen	Hannah Petrich	Nicole Daniels
Alex Brousek	Hannah Wedig	Nicolette Peters
Alex Fazioli	Harris White	Nikki Anderson
Alex Mitchell	Henry Biedron	Noah Amsterdam
Amanda Bolton	Ian Robertson	Noelle O'Neal
Andrew Helgeson	Jack Shanley (community)	Olivia Dion
Andrew Lybbert (community)	Jacob Holdman	Oscar Phillips
Andy Kellher	Jacqueline Sanchez	Owen Fitzgerald
Angie Perkins	Jaidyn Cook	Paige Bullock
Angus Soderberg	Jake Peer (community)	Pam Leonard
Anna Crobett	James Lane	Parker Weis (high school)
Annie Mogilnicki	James Scotto (community)	Pat Corbin (community)
Ansley Grider	Jason Bennett (Kenyon staff)	Pat McGann
Anthony Gallagher	Jason Kessler	Penny Given
April Murphy	Jeremy Kauffman	Perry Leatherman (community)
Austin Blane Hulse	Jess Dannery	Peter Michalowski
Autumn Gomez-Tagle	Jessica Meza	Phoebe Killea
Becca Foley	Jim Hieronimus (community)	Randy Canterbury (community)
Ben Dorfman	Jimmy Andrews	Ray Heithaus (Kenyon faculty)
Ben Fuhr	Johanna Fickel	Rob Meagher
Benjamin Canniff	John Jacob	Robert Ganther (community)
Bjorn Nillson	John Kunisch	Robert Kassees
Brad Imhoff (community)	John McKee	Ronan Elliott
Brennan Steele	Josh Abrams	Ryan Mott
Brian Miller (community)	Julia Eckberg	Sam Turecki
Cameron Henn	Juvi Rivera	Sarah Ashkar
Caroline Cohen	Kara Morrison	Sarah Dailey
Carson Pfeiffer	Kate LeMon	Sarah Dendy
Catherine Horwitz	Katharine Shuman	Sarah Gaglione
Chase Frederick	Kathryn Mazzolini	Sarah Goslee-Reed (community)
Chase Kivol	Kathy Dean-Ridenour (community)	Sarah McPeck
Chris Bennett	Katie Kress	Sarah Pazen
Chris Sewell	Katie Perrin	Sean Garrett
Claire Barbehenn	Kaylin Allshouse	Sean Lema
Claire Hanke	Kendall Lloyd	Shawn Dailey (Kenyon staff)
Colter Hoar (summer intern)	Kennedy Frazier	Silvia Xu
Connor McEldowney	Lathan Burdulis (high school)	Sophie Silberman
Dan Olivieri	Leah Adekunle-Raji	Stefano De Maria
Darien Byrum	Liana Valin	Stephanie Walsh
Dave Heithaus (Kenyon staff)	Lily McEnerney	Sutton Amthor
Dianne Mack (community)	Lindy Wittenberg	Tara Ford
Doug McLarnen (community)	Liz Cleveland	Taylor Combs (summer intern)
Duncan Hardy (high school)	Luke Hester	Terri Hieronimus (community)
Eddie Pozo	Mabel Jones	Thaise Sudano
Elizabeth Barrowmen	Maggie Bradley	Tim Shutt (Kenyon faculty)
Ellen Beller (community)	Maria Huey	Tom Zaleski
Ellie Blair	Marissa Simmons (high school)	Tyler Page
Ellie Roman	Mason Weis (high school)	Uli Schwendener
Emma Buehrer (high school)	Miah Tapper	Wyatt Medina
Emma Lawrence (high school)	Michael Morgan	Zach Filips
Emma Garshagen	Michael Piconi	Zach Hollander
Emma Linhares (high school)	Miles Hoover	Zavier Hensley Chisholm
Estelle Parker (community)	Miriam Dean-Otting (Kenyon faculty)	Zoe Kleeman
Franny Wiggins	Molly Keen	Zoe Packel
Gabriella Mist	Molly Smith (high school)	

Lyme Disease: A Potential Downside to Spending Time Outside

Mia Fox '19, BFEC's new Post-Baccalaureate Fellow

Katie's face sagged, weak and flat. Specifically, the left side sagged -- sagged as if some invisible angler from below had caught her, threading a hook from forehead to chin, and tugged until the corner of her mouth and eye pointed down. The right side? The right side was fine. A face with mobile musculature. Taken together, grinning became half grin, nearly grimace. To speak, she had to talk out of one corner of her mouth. This was not the same Katie I had tucked into bed the night prior.

Katie was the kind of child I wished I had been -- endlessly curious, whip-smart, round from one too many cheese sticks (ok so I *was* like her in that sense). The soil gave way to her bare feet many times as she raced outside and into the yard. I often dreamt that she had grown roots instead of feet. Nothing could stop her from nature, because she was slowly becoming it. Babysitting her two summers ago was easy enough until one of the downsides of being outside became evident.

A tick bit her, no doubt, as she escaped into the yard. Her parents caught it when it was ripe, full of fluid. Two weeks later, Katie's face began to slide. The diagnosis: probable early disseminated Lyme disease presenting as facial palsy. She called what she had "limes disease" and enjoyed poking at her unresponsive flesh. Her parents, however, were not as amused. Recovery was certain they were told, but after-effects of the disease could last for months.

In Katie's case, facial palsy is an uncommon side effect for a common disease. In fact, only 9% of those infected by the bacteria *Borrelia burgdorferi* (the perpetrator of Lyme disease) can develop the characteristically saggy or numb face of facial palsy. The most common symptom of infection is less dramatic -- a bullseye-like rash. Others could experience intermittent pain, fatigue, and irregular heartbeat.

Since the 1990s, cases of Lyme disease have roughly tripled as ticks carrying *Borrelia burgdorferi* have spread in response to climate change, shifting habitat structure, and urbanization. Today, it is one of the fastest growing vector-borne infections in the United States. This is not to say that Lyme disease, or ticks for that matter, have the ability to kill you. Statewide, 293 cases were reported by the Ohio Department of Public Health in 2018 with a mere 1% sprouting from Knox County. In the same year and nationwide, 30,000 confirmed cases were reported to the Centers for Disease Control and Prevention (CDC). Only 64 of those cases were fatal, making Lyme disease controllable at best.

Ohio Tick ID Card



- A. Long star tick, female
- B. American Dog tick, female
- C. Blacklegged (Deer) tick, female
- D. Blacklegged (Deer) tick, nymph

Despite its manageability and given the myriad side effects, much remains unknown about Lyme disease and other tick vectors. Funding for *Borrelia burgdorferi* research from the National Institutes of Health (NIH) alone surpassed 30 million dollars this year. To put this number into perspective, that's more money given to Hodgkin's Disease and Fibromyalgia research combined -- a pair that claim roughly 2,000 lives annually (directly or through complications). Funding for Lyme disease studies is slated to increase in 2020.

While much has yet to be discovered about Lyme disease, one thing is for sure: being proactive makes a difference! Check your clothing and body for ticks after being outdoors. Remember that not all ticks carry disease, but if you do get bitten, a swift removal (within 24 hours) decreases your chances of getting sick.

Ode to a Barn

Noelle Jordan, BFEC Manager

The barn on the BFEC property has been around for awhile; we're thinking maybe 150 years? In 1999-2000, Ruth T. Bemis and William A. Stroud funded the first upgrade. At that time, the cinderblock base was built and the existing barn was placed on top of that to create a 2-story barn. The original beams and woodwork of the barn were carefully preserved. At that time, here's what was reported in the BFEC newsletter:

“Mrs. Ruth Bemis always has a vision. A few years ago, when the BFEC advisory board was discussing the old barn on the center's property, Mrs. Bemis said, in her usual tone of calm conviction: ‘That barn has lovely bones.’ She was right, of course: the old hand-hewn beams that make up the skeleton of the barn are its most becoming feature. Thanks to her vision, and to generous donations from both her and William Stroud, the barn has been restored and an aviary created on its south side. The BFEC has recognized Mrs. Bemis by naming this superb new facility ‘The Bemis Barn.’ It will be a vital resource for both Kenyon and the Knox County community.”

Fast forward to 2019. The Bemis Barn needed some attention. The original walls on the east and west sides bowed outward, and we could see lots of sunshine through the original siding boards. Kenyon College funded the necessary structural repairs and gave the barn a face lift. Shrock Construction company was careful to preserve the original rural character. To further protect the structure, we've removed the shrubby plants that were growing too close to the walls.



The Bemis Barn as it looked in February 2017.



Shrock Construction covered the old horizontal siding with new vertical siding, then affixed a new door to the hay mow and gave the whole thing several coats of paint.



The Bemis Barn on June 25, 2019.

The Green Corner: News from the Farm

**Ryan Hottle,
Manager, Kenyon Farm**

If you haven't visited the Farm lately, check out these photos of what's going on. In spite of the deer and groundhogs, we should double our production this summer from last summer. Feel free to stop by any time!



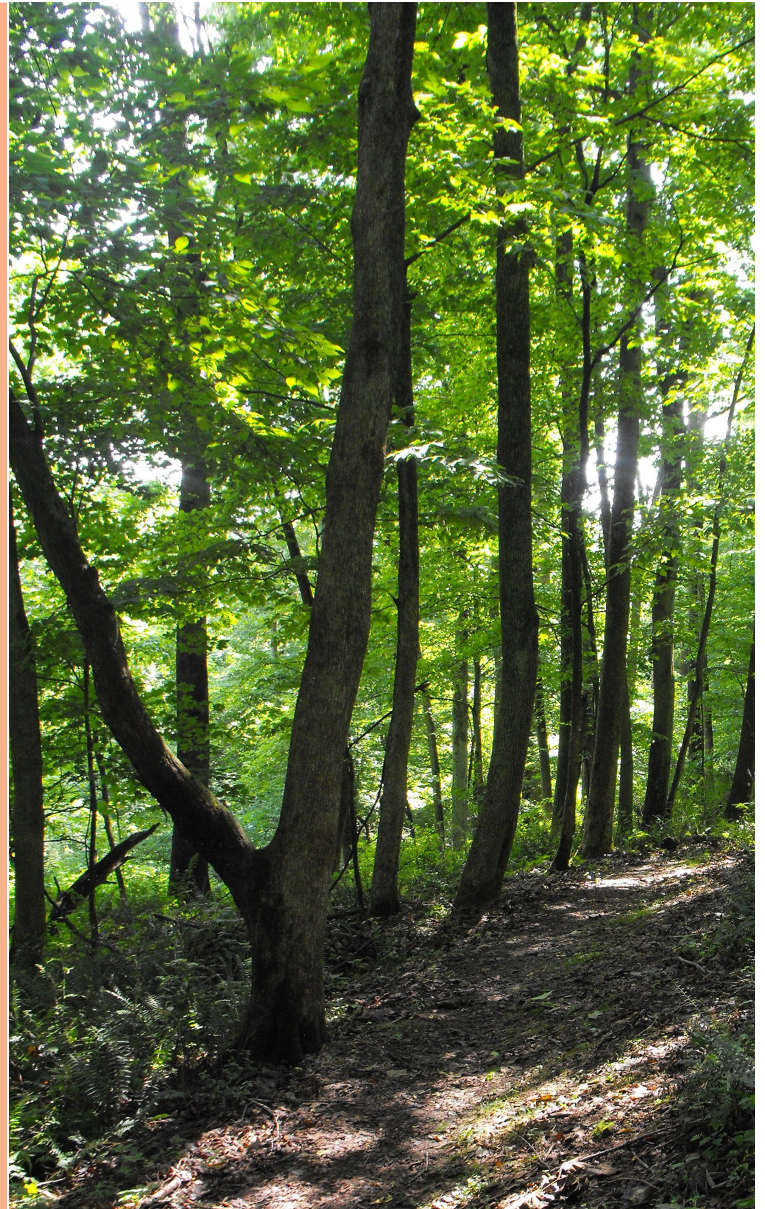
Yummm... Organic strawberries! \$2.50/pint pick your own.



Lookin' good!



Even garter snakes love strawberries.



This is the perfect time of year to stroll our shaded forest trails. Fern Trail, Bishop's Backbone and the River Trail will keep you cool and inspired. Come out and enjoy!

Mark your calendars...

Knox County Nature Photography Contest

PHOTO SUBMISSION AUGUST 26 - OCTOBER 14

Kokosing River Trail Run (5K/10K)

OCTOBER 19, 9:30 A.M. (RACE START TIME)

Fall Harvest Festival

OCTOBER 19, 12:00 – 4:00 P.M.

Thanks to our donors!

Our generous supporters provide us with the resources we need to fulfill our mission. The donors listed below provided gifts to the BFEC in March, April, and May of this year.

Benefactor

Buffy & Bob Hallinan
 Joe & Kimberlee Klesner
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 Nicolas & Linda Penniman
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 Ian & Charlotte Watson
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Student

John Ciecka
 Maria Rogers
 Jenny Sutcliffe

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 Cari Ficken & Richard Marinos
 Paige Roberts
 Emily Zeller

In-Kind Donations

Buffy Hallinan - Uprooter
 Susan Walker - Birdfeeder Items
 And to whomever left the spotting scope – thank you!

BFEC

by the numbers

176

volunteers
made our
spring programs
& events successful!

135

Current
members

738

Elementary
students enjoyed
field trips this
spring

755

Guests at
Keep It Wild: Earth
Day at the BFEC

492

Kenyon students
and faculty at
BFEC this spring

1688

Hours served by
volunteers
January - June

3017

Estimated number of
patrons who used the BFEC
facilities January - June

4

Part-time
summer staff

UPCOMING EVENTS & PROGRAMS

Plein Air Painters

EVERY TUESDAY, 6:00 - 8:00 P.M.

Paint, draw, or sketch at the BFEC! Bring your supplies, including a chair and/or easel, and spend the evening hours painting in a peaceful setting. The Resource Center will be open for restrooms. *Meet at the BFEC Picnic Pavilion.*

Family Nature Quest: Yuck!

JULY 13, 10:30 – 11:30 A.M.

From spittlebugs to pond scum it's all things slimy, ugly, and foul! We'll dissect owl pellets to learn about digestion from the opposite end (barf!) and explore the funkier side of nature around our prairie and ponds. Come discover how "gross" parts of nature can be good. *Meet in the Picnic Pavilion. In the event of inclement weather, program will be held in the Resource Center.*

Outdoor Om: Yoga at the BFEC

JULY 15 - AUGUST 28, EVERY MONDAY & WEDNESDAY, 12:10 - 12:55 P.M.

Use your lunch break to de-stress with an outdoor yoga class. Bring your kids, grandkids, friends, etc. - open to all ages. Bring your own mat or use ours. Free! *Meet in the BFEC garden (behind the farmhouse).*

Family Nature Quest: Enchanted Forest

JULY 20, 10:30 – 11:30 A.M.

Let's tour the BFEC's magical places! Using our imaginations and the sense of wonder that nature provides, we'll venture into the garden in search of mythical creatures such as fairies, pixies, and elves. Along the way we'll learn about the real animals and natural phenomena that are the basis for many of these fabled beings. You'll build a fairy home of your own! *Meet in the Picnic Pavilion. In the event of inclement weather, program will be held in the Resource Center.*

Family Nature Quest: H₂Whoa

JULY 27, 10:30 – 11:30 A.M.

Dive into the warm waters around the BFEC (not literally). Below the surface, tadpoles, frogs, and insects are all around. In the air, red-winged blackbirds and dragonflies are taking advantage of the surrounding plant life. Come learn about what's happening in our ponds and grab a net to reveal watery worlds! *Meet in the Picnic Pavilion. In the event of inclement weather, program will be held in the Resource Center.*

Family Nature Quest: Child vs Wild

AUGUST 3, 10:30 – 11:30 A.M.

Do you have what it takes to survive outdoors? Hike up to our pine plantation to learn about natural items that meet our nutritional needs and build a lean-to. We'll wrap up with s'mores and fire building tips. *Meet in the Picnic Pavilion. In the event of inclement weather, program will be held in the Resource Center.*

Tastes of Nature: Jams & Jellies

AUGUST 3, 2:00 P.M.

Back by popular demand! Kathy Dean-Ridenour will teach us how to make jams and jellies using local berries. Everyone will make a batch to take home with them, and we will have several varieties for tasting. Kathy has been a backyard forager and garden grazer for many years. Space is limited - call now to reserve your seat! 740-427-5052. Materials fee \$10. *Meet in the Resource Center.*

Big Problems for a Little Fish: Redside dace in Canada & U.S.

AUGUST 31, 2:00 P.M.

Redside dace (*Clinostomus elongatus*) are endangered in Canada but populations in Ohio are healthy. Two grad students from Windsor University spent the summer in Gambier researching how water temperature affects spawning. Learn about their findings and the plight of this little fish in Canada. *Meet in the Resource Center.*

Birding the Americas: Inspiration, Intrigue, & Birds

SEPTEMBER 3, 6:30 P.M.

Carson Miller retired from the world of academia and got hooked on birding. His photography skills allowed him to document his birding adventures particularly in North, Central, and South America and many other beautiful places. Join us for an evening of intriguing stories and inspirational photos! *Meet in the Resource Center.*

Family Nature Quest: Vulture Awareness Day

SEPTEMBER 7, 10:30 A.M. – 11:30 A.M.

You heard that right. It's International Vulture Awareness Day. Vultures are one of the world's most underappreciated and overlooked creatures. Learn about what they eat and their vital role as nature's cleanup crew. *Meet in the Picnic Pavilion. In the event of inclement weather, program will be held in the Resource Center.*

Family Nature Quest: Prairie Party

SEPTEMBER 15, 10:30 A.M. – 11:30 A.M.

Covering about 5% of Ohio's land, prairies are important habitats for native birds, insects, and other wildlife. Learn about the history of prairies in Ohio, then catch, observe, and release insects to explore our prairie and discover its current role in Ohio. *Meet in the Picnic Pavilion. In the event of inclement weather, program will be held in the Resource Center.*

2019 River Rally

SEPTEMBER 21, 9:30 A.M. – 1:00 P.M.

Meet at 501 S. Main Street at the C.A. & C. Depot. The Kokosing River is one of only fourteen Scenic Rivers in Ohio. Celebrate this community treasure with a river cleanup and free lunch. Registration begins at 9:30 at the **C. A. & C. Depot, 501 S. Main St., Mount Vernon, 43050**. For more information contact Randy Canterbury, 740-393-6704.

Family Nature Quest: Falling Leaves and Tree ID

SEPTEMBER 28, 10:30 A.M. – 11:30 A.M.

It's officially autumn! We'll identify trees by their leaves before they change color and paint the Ohio landscape with shades of red, orange, and yellow. We will collect leaves to make a variety leaf rubbings and leaf paintings. It's your own autumn masterpiece! *Meet in the Picnic Pavilion. In the event of inclement weather, program will be held in the Resource Center.*

*All programs and events are free and open to the public unless stated otherwise.
9781 Laymon Road, Gambier Ohio | 740-427-5052 | <http://bfec.kenyon.edu>*





Brown Family Environmental Center

at Kenyon College

bfec.kenyon.edu | 740-427-5050

BROWN FAMILY ENVIRONMENTAL CENTER | 9781 LAYMON ROAD | GAMBIER, OH 43022

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

Mia Fox, *Post-Baccalaureate Fellow*

Jill Kerkhoff, *Facilities Coordinator & Office Administrator*

Shane McGuire, *Land Manager Naturalist*

Noelle Jordan, *Manager & Program Coordinator*

Be part of it!

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 part of critical environmental education and conservation programs. Receive preferred access to workshops, a hard copy of our newsletter, and a discount on quality bird seed. *Use the form below to send your contribution today.*

NAME (FIRST, MIDDLE, LAST)

ADDRESS

CITY

STATE

ZIP/POSTAL

COUNTRY

()

MOBILE PHONE

EMAIL ADDRESS

Membership level:

- Student \$20 Individual \$35 Family \$50
- Friend \$100 Patron \$250 Benefactor \$1000 +

Amount enclosed: _____

My check, payable to Kenyon College, is enclosed

Please bill my _____ Visa or _____ MasterCard

Card number _____ Exp. date _____

Mail to: BFEC, P.O. Box 508, Gambier, OH 43022

Your donation is tax deductible as allowed by law. The Brown Family Environmental Center at Kenyon College is a 501c(3) nonprofit organization.

