

FIELD NOTES



by Kat Norton '20, BFEC Student Manager

LONG NIGHTS, LONG NAPS: HOW OHIO'S SMALL MAMMALS SURVIVE THE WINTER

AS WINTER APPROACHES AND DAYS GET SHORTER AND COLDER, we don our winter coats and spend more time indoors close to the fireplace. While you are keeping warm in your home, have you ever wondered what becomes of the smaller mammals that usually scurry around your backyard? Do they all hibernate? While the term hibernation is commonly used to describe winter dormancy, not all animals that hole up for the winter are hibernators in the true sense of the word. True hibernation is classified as a state of inactivity during which an animal's body temperature, metabolic rate and breathing are significantly lower and slower than during warmer periods of the year. True hibernators are animals that remain inactive for weeks during cold periods. Other animals that experience inactive states during cold periods are said to go into a state of torpor. Torpor describes short periods of dormancy, during which the animal's body temperature does not drop significantly.

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Groundhogs

One of Ohio's true hibernators is the groundhog. Throughout the fall months, groundhogs spend most of their days eating in order to put on a thick layer of fat to prepare for their winter hibernation. Groundhogs hibernate for around five months between November and April. During this period, a groundhog's heart rate, which is usually 160 beats per minute, slows to around four beats per minute. A groundhog's body temperature drops during hibernation to around 38 F. Over the course of the winter, male groundhogs will lose about 47 percent of their body weight, and females will lose about 37 percent. In the spring, groundhogs are slow to awaken, but eventually emerge from their burrows and set about regaining all the weight they lost. For more details about groundhog hibernation and Groundhog Day, check out the article written by Maddie Morgan, "Phil Begins His Long Slumber."

Chipmunks

Eastern chipmunks are tiny members of the squirrel family found in central Ohio. They are adapted to burrowing, but they are not true hibernators. Instead, they cycle between periods of torpor and activity throughout the winter. Chipmunks prepare for winter by storing food in their burrows. They are too small to amass enough body fat to last through the winter, so they rely on their food stores to sustain them during the cold, barren months. In times of abundance, chipmunks are not picky eaters and survive on seeds and nuts, as well as fungi, grain, insects and worms, eggs, and even baby birds or mice. During the fall, however, chipmunks focus on nuts and seeds, collecting them in their cheek pouches and storing them in their burrows. Nuts and seeds are less perishable than other foods and will last through the winter.



Squirrels

In central Ohio, most of the squirrels you see scampering around are eastern gray squirrels. In preparation for winter, squirrels increase their food intake to put on fat stores that they will use in the winter when food gets scarce. Because squirrels do not hibernate, they do not need to completely rely on fat stores for survival. As winter approaches, squirrels begin to collect and store food in shallow holes in the ground. They are able to remember where their caches are hidden and return periodically to unearth their stored food as resources become scarce. Squirrels wait out colder periods by snuggling in their nests with other squirrels. During severe weather events, squirrels will enter into torpor that lasts until mild conditions return.

Skunks

During the winter, skunks hunker down in dens that they usually don't dig for themselves. Although skunks are capable of digging their own dens, they usually take the lazy approach and find burrows that were created by foxes or groundhogs. Skunks pack the drafty areas of their burrows with dry leaves and grasses. Males, usually aggressive toward each other during warmer months, put aside their differences during the winter for survival. Communal burrowing allows skunks to take advantage of social thermoregulation, which keeps them all warm with shared body heat. Skunks also increase their food intake in preparation for winter. While they do not enter a true state of hibernation, they go into short periods of torpor and awaken to eat. In the winter, their diet generally consists of foods that are easy to find — carrion, fruit and seeds. When late winter rolls around, be sure to watch for skunks along the roads! In February, male skunks will leave their winter dens in search of females.

Rabbits

The most common species of rabbit in Ohio is the eastern cottontail. For the most part, rabbits behave the same during the winter as they do the rest of the year, although their diet changes quite a bit. As the juicy summer foliage begins to dwindle, rabbits turn to less tasty treats and resort to eating bark to survive the winter. Like the lazy skunk, eastern cottontails use burrows that were dug by other animals. If they cannot find a den, they will wait out cold periods under shrubs and brush or in hollow logs. Rabbits generally face increased predation during the winter because their brown coats, which do not change color in the winter, stand out against the snowy landscape, making them more visible.

How can I help?

Leaving human food for animals may be more harmful than helpful. Unnatural food sources may create a gathering place for wildlife, promoting the spread of disease and reinforcing behaviors that may put them in harm's way. Also, consuming food items that are not part of an animal's normal diet can be unhealthy and may lead to complications. The best way to help our furry friends survive the winter is to create a natural backyard habitat that is conducive to our native wildlife. We can plant trees and shrubs that animals might use for shelter, and we can include plants that might be a natural part of their diets. To learn more, attend the January 26 program, "Mapping Your Backyard with Habitat Network."

WHAT ABOUT WINTER?

By Xiaoxuan Hu '20, BFEC Student Manager

Growing up in a central China city that witnesses distinct seasons every year, I thought I knew winter well. For the first 18 years of my life, I had survived frequent periods of below-freezing weather without any heating, and I had seen snow quite a few times. But when I was confronted with my first Gambier winter two and a half years ago, I was deeply humbled. Gambier winter is on a totally different scale. I was surprised to find that here, winter is a valid topic by itself, and people talk about it not out of boredom, but because of its sheer magnitude. It even significantly changes the campus culture; the pace of life becomes slower and the deadlines come seemingly even faster.

Many Kenyon students come prepared for the winter, and some prospective students even visit when the winter is in full swing. But for international students who arrived without ever visiting the campus, Gambier winter was something beyond imagination. How do, or how will, they like the Gambier winter? I asked some friends about their expectations for winter, and here are some responses:

"I'm so excited for the first snow fall — especially to see the reactions of first-years who have never experienced snow! Nature takes on a whole new level of beauty when there's snow all around. The best photos I take are during the winter! There's a sense of consistent and uniform beauty everywhere you look. I personally love winter fashion, too. It really gives us a way to experiment with layering and little accessories like fuzzy socks, scarves, gloves and hats. Plus, there is no better reason (or season) to huddle and cuddle into a warm, cozy embrace with loved ones and some hot tea!"

— Elvin Shrestha '19, from Nepal

"Honestly, I love winter so much. I think there is this weird generalized perspective on it that it's bad and no one wants to do anything and everyone will get depressed and sick and tired ... and, even though, of course, there is a biological basis for that, I think a lot of this negativity comes from the culture around it. There are so many beautiful and amazing things about winter, and I think people tend to underappreciate it. I love going outside in the snow and feeling so many little cold flakes hitting my skin, or running across super soft snow, or experiencing that unique silence after a snowfall, or even just feeling like I'm going on a big adventure every time I leave a building. I truly think we should focus more on all of its fun and pretty parts than on the not-so-good parts."

— Nicolas Pulido Amador '21, from Columbia

"I like winter because I can cover myself with however many clothes I have, but in summer I can't go any less naked when it gets too hot. Just kidding. I like winter. I look forward to the snow because I haven't ever seen proper snow."

— Wasi Sami Siddiqui '22, from Pakistan

"I have never seen snow. The only thing I have in mind is to make a snow angel, and then obviously try to eat it."

— Bisrat Mulugeta '22, from Ethiopia

"I am excited about the winter. I think it would be really fun with the snow and Christmas. I particularly like Christmas, even though it is not traditional in Vietnam; I just love it. It's too expensive to go back home [during winter break], so I may stay here. I want to draw and paint [during winter break]."

— Phương Tang '22, from Vietnam

"Can I write a quote? 'When snow falls and white wind blows, the lone wolf dies but the pack survives.' It's from Game of Thrones."

— Hamza Saleem '22, from Pakistan

"Though I come from the country of Himalayas, we don't get snowfall in the areas where the majority of the population resides. Winter, for me, is a perfect luxury while swaddling in a blanket and taking a sip of my favorite coffee. Going out in proper warm clothes will not be a problem. I would never go out early in the morning, though. Above all, the special winter recipes to keep your body warm would make the whole winter tasty."

— Prashant Bhandari '22, from Nepal

"We seldom get enough snow for snow boots in my city Wuhan, but winter is still strong and we'd often have hot pots for dinner. My family would crowd in front of the stove with bowls and chopsticks. We would stand there and eat and chat. I definitely miss that. But now in Gambier, winter is no longer associated with food but the beauty of nature. I love hearing the sound of my boots on snow. I love seeing pure white snow in all directions; it gives me inner peace. I love standing on Middle Path during breaks when the campus is empty and just gaze at the snow as it falls around me, on the branches, or in the distance (though the many hour-long campus tours I gave during winter break traumatized me quite a bit)."

— Xiaoxuan Hu '20, from China

Although I've been through two Gambier winters (I'm a junior this year), I am not used to the cold. But as I move through my college years, I become more and more attached to this place, not merely the physicality but the totality of this place: the seasons, the land, the people and — yes — the deadlines. In one way, all of this will last only four years. I come from a different part of the world, I stay for four years here, and I will likely leave for a different part of the world after I graduate. But in another way, everything here will last forever, since the time here and the space together have quietly transformed me. And when I leave, I will carry within me all the touching moments this place imprints in me, including my first impression of Gambier winter.



CARBON, TREES AND THE BFEC

by Kira Lancz '21, BFEC Student Manager

The forests of the BFEC provide habitat for many species, a place for recreation for the Kenyon and Knox County communities, a beautiful and diverse piece of nature in the midst of Ohio farmlands — and they are playing a vital role in the carbon cycle of the area. The trees and soil in a forest constantly take up carbon and release it back into the atmosphere, acting as a living storage for carbon.

Each fall since 2010, students in Professor of Biology Drew Kerkhoff's ecology lab have ventured into the forests of the BFEC to measure changes in the carbon stocks of these forests. This project takes a lot of time and student power and includes data collection in the field, data analysis and lecture time. Kerkhoff designed this project in 2010 and has been gathering and analyzing data ever since. The project has evolved as new equipment purchases have allowed for deeper insights into the process of the local carbon cycle.

Kenyon students gather data at three separate locations: the sycamore forest by the River Trail, the pine plantation and the older forested area along the Fern Trail. Each location has a different natural history and different physical properties. The sycamore forest was agricultural land until the early '90s and has naturally colonized since then. The oldest trees in this area are about 23 years old, and together with the understory vegetation, provide plenty of data for ecology lab students. The pine plantation was established in 1991 on land that was previously a pasture. The older forest along the Fern Trail is a mature forest in an area that has never been clear-cut. The differences between these locations offer great comparisons between younger and older vegetation, and naturally versus artificially colonized forests.

Two data sets are collected at each site. The first includes the diameter at breast height of a random selection of trees. This measurement provides an estimate of the biomass of each area. Fixed carbon from the atmosphere accounts for approximately 50 percent of the biomass in any given area. Documenting the changes in biomass through time allows for continuous comparison of the rate of carbon fixation at each site. From the three sample areas, students can extrapolate the amount of biomass and, therefore, the amount of carbon that may be fixed on the entire Kenyon campus and all 500 acres of the BFEC.

The second data set includes soil respiration, which is a measure of carbon dioxide released from the soil as a result of the decomposition of organic matter. These measurements allow students to calculate the amount of carbon that is sequestered, or stored, in woody plants.

"As climate change continues to transpire, the understanding of our forests is becoming crucial. A key to this understanding is the collection and documentation of data," says Kerkhoff, whose long term plan includes using the data from this project to support an academic paper. The baseline data that his students are currently establishing will contribute to the overarching body of knowledge about climate change and the role of forests.

Serving a more local purpose, Kenyon's Office of Green Initiatives makes use of the data collected from Kerkhoff's project. Carbon sequestration, on Kenyon's campus and on the BFEC property, is reported in Kenyon's annual Greenhouse Gas Inventory. The data from this project is used in part to determine Kenyon's overall carbon footprint.



The Green Corner

OUR FOOTPRINTS

by Dave Heithaus '99, Director of Green Initiatives

As we assess the College's greenhouse gas emissions and seek specific pathways to mitigate them, three major avenues have come into focus: improving the efficiency of existing buildings, moving toward 100 percent renewable energy and identifying opportunities to offset emissions with local, verifiable projects. Thanks to research being conducted by Kenyon students and faculty, we have an improved understanding of how our ecosystems function to absorb and store carbon dioxide. By intentionally managing and restoring historically native habitat, we can offset some of the emissions that we will be unable to eliminate through energy efficiency projects and the deployment of renewable sources. The BFEC will play a pivotal role in this category of emissions reductions.

One might correctly note that all of the above strategies imply we will reach net-zero greenhouse gas emissions as a community through the work of a small fraction of the people who inhabit it. The BFEC can plant trees and maintain woodlands, our facilities staff can continue to refine the way we use energy on campus and our campus planners can install the most efficient buildings possible coupled with renewable energy sources whenever budgets allow. Most of us, and not because we are wholly careless, tend to

Photo: www.tourisme-alpes-haute-provence.com



create emissions while a fair few of us work to clean up the mess. So, what does the rest of the community do to contribute meaningfully?

I think more than anything else, the answer is to develop a culture of energy awareness and responsibility. Yes, please recycle, please eat local when you can and please do all of those earth-friendly things we've always been told to do. But the biggest impact an individual can make relates to four key pieces of modern life: heating, cooling, electricity and motorized transport. When you grab your keys or reach for the thermostat or the remote, don't feel guilty. We all do these things, but just give a moment's thought about needs versus convenience. Until the system changes, and it will, our footprints are measured in the fuels we use.

PHIL BEGINS HIS LONG SLUMBER

by Maddie Morgan, BFEC Post-Baccalaureate Fellow

Groundhogs are one of Ohio's true hibernators. A true hibernator is an animal that goes to sleep for the entire winter season and does not need to consume food or nourishment during its hibernation.

To be a true hibernator, groundhogs will spend late summer and early fall eating a pound of vegetation in one sitting in order to put on a thick layer of fat for winter. Groundhogs will eat all sorts of grasses, lettuce, alfalfa, clover, soybeans and more to stuff themselves for the long sleep ahead of them. In Ohio, groundhogs will start hibernating in October. Once asleep, a groundhog's heart rate will drop from 100 beats per minute to between four and 10 beats per minute, its body temperature will fall from 97F to 40F, and it will take one to two breaths every minute. The groundhog's blood composition will also change as it experiences an increase in blood oxygen, potassium, magnesium and carbon dioxide and a decrease in blood glucose. All of these adaptations help to drastically slow the animal's metabolism. On average, groundhogs can lose 30 percent of their body fat during hibernation, which is why it is critical for them to increase body fat before burrowing to sleep.

Contrary to what Groundhog Day may suggest, groundhogs will remain in hibernation until late March or early April. Our current Groundhog Day is a result of an old Christian tradition called Candlemas that was brought over by German settlers in the 1800s. Candlemas once used candles and badgers to predict the length of winter. When Germans settled in Pennsylvania, the tradition continued with a groundhog that was named Punxsutawney Phil.

UPCOMING PROGRAMS AND EVENTS

A Photographic Journey through Ohio January 12, 2 p.m.

Join award-winning photographer Brad Imhoff as he shares his nature photography from throughout Ohio. From the waterfalls of Cuyahoga Valley and Hocking Hills to the fox family he photographed right here in Knox County, this 90-minute presentation will feature some of the best natural scenes Ohio and Knox County have to offer. **Meet at the BFEC Resource Center.**

Map Your Backyard with Habitat Network January 26, 2 p.m.

Want to transform your backyard into a lush wildlife habitat? The Habitat Network is an online citizen science tool from the Cornell Lab of Ornithology that allows anyone to map their backyard, farm, park or school in order to collect data about local environments. The website also provides easy strategies to sustainably design and manage your new backyard. **Meet at the BFEC Resource Center.**

Family Nature Quest: Groundhog Day February 2, 10:30-11:30 a.m.

Did you know that the groundhog is one of Ohio's true hibernators? On this Groundhog Day, learn all about what that means and how the groundhog survives our harsh winters. Then step into a groundhog's shoes and explore a burrow. If the weather cooperates, we'll head outside to see some real groundhog holes. **Meet at the BFEC Resource Center.**

Stories from the Stars February 8, 7 p.m.

Admire the season's constellations as you listen to Professor of Humanities Tim Shutt tell mythological stories about the stars. Weather permitting; the program will be cancelled if it's too cloudy. Call the BFEC for program status. **Meet at the BFEC Resource Center.**

Winter Bird Watch February 9, 9 a.m.

Drink hot chocolate while observing birds eating from the BFEC feeders. Ray Heithaus will teach us a bit about field markings and bird identification, migration and why some birds don't migrate, and he'll tell us about Project Feederwatch, a great citizen science initiative from the Cornell Lab of Ornithology. We'll provide binoculars for those who may not have their own. **Meet at the BFEC Resource Center.**

Family Nature Quest: Winter Tracks February 9, 10:30-11:30 a.m.

Learn all about the critters that "tolerate" winter, and the tracks they leave behind as they search for food and water. Make some of your very own tracks to take home. If the weather is decent, we'll head outside to spot some of these tracks with our very own eyes. **Meet at the BFEC Resource Center.**

Family Nature Day February 16, 10:30 a.m.-1:30 p.m.

Celebrate Valentine's Day with the Gund Gallery and BFEC! We'll have "heart-hikes" to take pictures of nature; Valentine's Day-themed nature crafts that include printing your photos, decorating frames, and making a nature collage; a cookie decorating station; story times; and hot chocolate and cider. The "heart-hikes" will occur at 10:45 a.m. and 12:15 p.m.; cameras will be provided. Story times will be at 11:30 a.m. and 1 p.m. **Meet at the BFEC Resource Center.**

"Owl" at the Moon: Full Moon Walk and Owl Talk February 19, 6 p.m.

Join us for an invigorating hike in the light of the full moon. We'll call for owls, and, hopefully, they will call back. Dress for the weather, and be prepared for an uphill climb. Program may be cancelled in the event of inclement weather. Call 740-427-5052 for program status. **Meet at the BFEC Resource Center.**

Family Nature Quest: Bird Survival Kits February 23, 10:30-11:30 a.m.

Explore Ohio's winter birds and how they survive. Build your own bird feeder to take home. If the weather is tolerable, we'll head outside with binoculars to see some of our feathered friends. **Meet at the BFEC Resource Center.**

Family Nature Quest: Maple Madness March 2, 10:30-11:30 a.m.

Learn about how to make this delicious treat, and help us complete the syrup-making process. Pour some finished maple syrup over waffles and enjoy! **Meet at the BFEC Resource Center.**

Climate Reality March 30, 2 p.m.

Director of Green Initiatives, Dave Heithaus '99, will share facts, figures and images illustrating the impacts of global climate change and discuss actions that might prevent the worst of our potential futures. **Meet at the BFEC Resource Center.**

The Buckeye Trail: Hike Ohio April 4, 7 p.m.

Pam Leonard celebrated her 50th birthday by taking a little hike — 1,442 miles — that circled Ohio. The Buckeye Trail, founded by Grandma Gatewood, is a nationally recognized loop trail highlighting much of Ohio's rural beauty. Pam is one of the few women to have completed the entire trail. Join Pam and representatives of the Buckeye Trail to learn more about the trail and to hear some of Pam's tales from the trail. **Meet at the BFEC Resource Center.**

Keep It Wild: Earth Day at the BFEC April 20, Noon-4 p.m.

Celebrate Earth Day with this FREE event. We'll have owls, hawks, skunks, river otters, snakes and more for you to meet up-close. Make-and-take bluebird boxes, bat boxes and more. Live music and a food truck will round out the afternoon.

Thank you to our **volunteers.**

Thanks to our dedicated volunteers! These are the generous folks who gave their time in September, October, November and December.

- | | | |
|-------------------|--------------------------|-------------------|
| Alex Levy | Eli Baumann | Kayla Alcaide |
| Andie Kelleher | Ellie Randolph | Keely Lovato |
| Angus Soderberg | Ellie Roman | Kendall Lloyd |
| Anna Deryck | Emma Coffman | Lara Hoffer |
| Ashley Jeon | Emma Garschagen | Lindy Wittenberg |
| Ava Earl | Estelle Parker | Maggie Bradley |
| Bella Stevens | Franny Wiggins | Maggie Murphree |
| Ben Fuhr | Georgia Stole-McAllister | Mary Gerhardinger |
| Ben Nutter | Grace McManus | Matthew Rhee |
| Bill Ernst | Grant Holt | Michaela Brydon |
| Bjorn Nilsson | Hadley Seymour | Nicolas Pulido |
| Brennan Steele | Hannah Bachman | Owen Fitzgerald |
| Brian Miller | Hannah Wedig | Paola Cortes |
| Brooklyn Ellis | Harris White | Robbin Gan |
| Camille Baxter | Henry Biedron | Ronan Elliott |
| Caroline McNeer | Henry Terhune | Sarah Dendy |
| Cecily King | Hulda Geng | Sarah McPeck |
| Chai Simba | Isak Davis | Sasha Stroud |
| Chloe Shane | Jake Peer, Knox County | Sophia De La Cruz |
| Claire Hanke | Soil and Water | Sophie Silberman |
| Conner McEldowney | Jen McMahan | Terri Hieronimus |
| Daniel Kim | Jeremy Baier | Tristan Neviska |
| Dave Heithaus | Jess Dannery | Zoe Kleeman |
| Dylan Hartman | Kara Morrison | |



BFEC *by the numbers*

5918

Total people served by BFEC,
July 1-December 30, 2018

205

Kenyon students and faculty
visiting during fall 2018

1802

Guests at the Fall Harvest Festival

193

Volunteers, July 1-
December 30, 2018

1116+

Volunteer hours from July 1
through December 30, 2018

173

Current members

697

Elementary school children
visiting during fall 2018

BFEC MEMBERS

September-November 2018

BENEFACTOR

Joe and Kimberlee Klesner

INDIVIDUAL

John Hammond
Kenneth Smail

PATRON

Gene Bailey
Geoff and Lori Brown
Philip and Sheila Jordan
Jennifer McMahon

STUDENT

Allie Dumas
Jesse Okie
Zack Weber

FRIEND

After Kenyon Society
Barry Bowden
Vincent Baker and Barbara Evans
Noelle Jordan
Bill and Pat McCulloh
Dean Sheldon

DONOR

Grant Carney
Anna Kate Cascio
Taylor Eth
Diana Huffman
Laurel Johnson
Carmen King
Annette Laing
Margot McLeod
Bryan Ogihara
Maggie Taylor

FAMILY

Chris Bickford and Karen Bagne
James Garman
Bruce and Debra Kinzer
Kristin Knopf
Sally Rogan
Tim Shutt
Stephen Schneider
Barbara and Jerry Walker-Simpson



Brown Family Environmental Center

at Kenyon College

bfec.kenyon.edu | 740-427-5050

BROWN FAMILY ENVIRONMENTAL CENTER | 9781 LAYMON ROAD | GAMBIER, OH 43022-9623

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

Madeleine Morgan, *Post Baccalaureate Fellow*

Jill Kerkhoff, *Facilities Coordinator and Office Administrator*

Shane McGuire, *Land Manager Naturalist*

Noelle Jordan, *Manager*

SUPPORT LOCAL CONSERVATION

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.*

NAME (FIRST, MIDDLE, LAST)

ADDRESS

CITY STATE ZIP/POSTAL CODE 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 _____

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

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