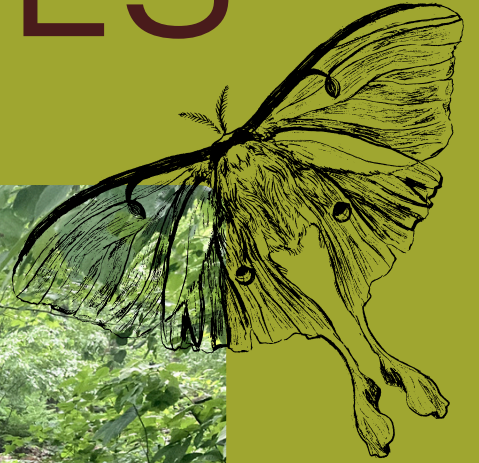




FIELD NOTES



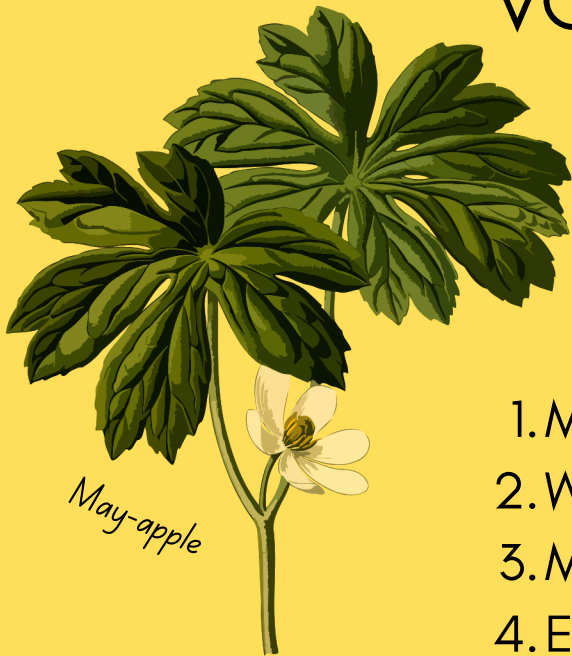
seasonal updates from the
BARABOO HILLS ECOLOGY
RESEARCH COLLECTIVE

Vol. 1 Spring 2026



FIELD NOTES

VOL. 1 SPRING 2026



May-apple

CONTENTS

1. Map of the Baraboo Range
2. What is a Research Collective
3. Mission & Vision
4. Ecological History
5. Species Spotlight: Cerulean Warbler
6. Quartzite Bedrock Glades
8. Long-term Bird Banding
10. Forest Soundscapes
12. Species Search
13. Birds & Woodland Restoration
14. Migration Story
15. Upcoming Events
16. Ways to Contribute
17. Who We Are

Cinnamon Fern



Scarlet Tanager

BARABOO RANGE

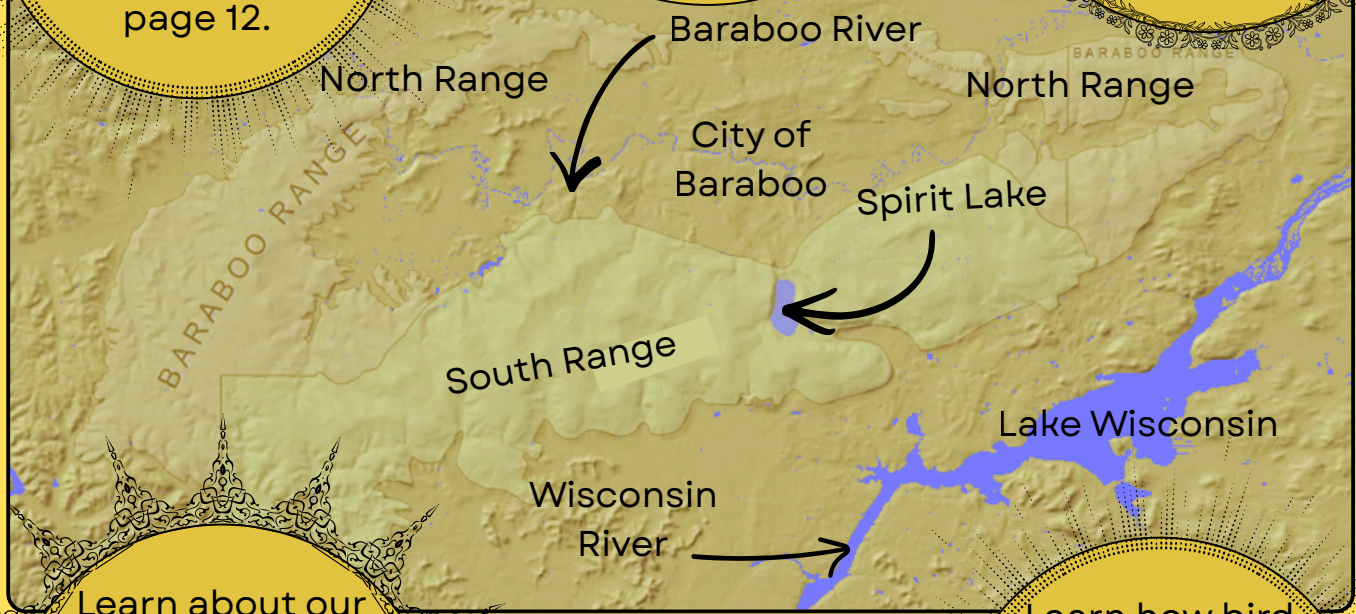
Sauk & Columbia Counties



Tell us what species you observe in the Baraboo Hills this summer!
page 12.

Natural Community Spotlight:
Quartzite Glades
page 6.

Soundscape Baselines Project recording sites are located in seven forest sites
page 10.



Learn about our five long-term bird banding stations in the South Range
page 8.

Join us for a summer event - or learn about volunteer opportunities!
page 15.

Learn how bird species are responding to oak woodland management
page 13.



WHAT IS A RESEARCH COLLECTIVE?

When it comes to understanding a place - and the species who call it home - the more perspectives, the better.

Like many places in the world today, the Baraboo Hills are a landscape in flux. Once-common species are growing rare. Flowers are blooming earlier in the spring. Insect populations are declining. Introduced plant species are spreading.

To pay attention to these changes is the first step towards a future where the biodiversity in our unique landscape thrives. And, paying attention puts us in the way of direct encounters with wild species - moments of curiosity and celebration of the more-than-human world.

By working together to monitor this landscape through careful data collection, we are creating an ecological archive that is greater than the sum of its parts.

Everyone has a unique way of looking at the world, and a particular skillset or expertise. What perspective do you bring?

*What have you noticed about the lives of
other species surrounding you?*



Black-throated Green Warbler



Canada Mayflower

OUR MISSION

The Baraboo Hills Ecology Research Collective is dedicated to sustaining wild species and landscapes through long-term monitoring of population trends, field research, education, and community engagement.

OUR VISION



To deepen our ecological understanding of the Baraboo Hills in the 21st century, we will conduct field research and monitor species responses to global change.



To encourage science-driven habitat management and land conservation, we will work with practitioners to design research questions and communicate findings.



To create a sense of connection and appreciation for ecology and conservation in the Baraboo Hills and globally, we will offer free community programs.

We will strive to provide a safe, engaging and informative space regardless of race, gender, creed, orientation, or disability.



ECOLOGICAL HISTORY

Baraboo Quartzite originated **1.7 billion years ago** as sand at the bottom of shallow seas. This was compacted into sandstone then transformed through heat and pressure into metamorphic rock, which still retains ripple marks from the ancient seafloor. Through tectonic compression **1.6 billion years ago**, these rocks were formed into the Baraboo Syncline: a canoe-shaped mountain range.



Shallow seas again covered Wisconsin **500-300 million years ago**, and while layers of sandstone and limestone alternately covered the quartzite, they were eventually eroded away. The Wisconsin glaciation between 20,000 and 15,000 years ago covered the eastern Baraboo Range in ice sheets, and formed Spirit Lake. Freeze-thaw cycles created talus slopes.

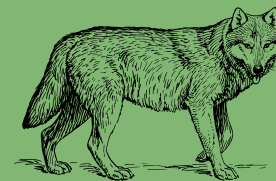


As the glaciers retreated, boreal forests grew, then were gradually replaced by mixed hardwood forests as the climate warmed. Today remnant northern plant communities can be found in cool microclimates in stream gorges and talus slopes.



Indigenous people and lightning-strike fires maintained oak savannas, woodlands, and prairies. Effigy mounds and other earthworks were built more than **1000 years ago**.

European settlement began around **1830**. Wolves, mountain lions and black bears disappeared from southern Wisconsin by **1900**, and the last wild Passenger Pigeon was shot.



Spirit Lake is the name indigenous people give to the beautiful lake south of Baraboo. European settlers named it Devil's Lake, and the associated state park was designated in **1911**.

Conservation expanded across the Baraboo Hills in the **1960s-2000s** when groups including The Nature Conservancy, the Wisconsin DNR, and the Baraboo Range Preservation Association began coordinated land purchases and easements, eventually protecting tens of thousands of acres.



Further reading: *Ancient Rocks and Vanished Glaciers & A County Called Sauk* by Kenneth I. Lange



SPECIES SPOTLIGHT: CERULEAN WARBLER



Cerulean Warblers were once one of the most common warblers in eastern North America. However their specialized habitat requirements - big patches of deciduous forests with large canopy trees - has disappeared in many places, and they have lost more than 50% of their population in the last 50 years.

Nests are often located in wild grapevines near small canopy gaps.



Wisconsin is at the northern edge of the breeding range and birds spend the winter in the Andes mountains of South America.

Female Cerulean Warbler tending her nest

In the winter, they join mixed-species flocks in shade-grown coffee plantations. Look for bird-friendly coffee to help sustain their winter habitat!



Photo by Dustin Welch

To conceal the nest location while leaving after incubation, the female will drop over the side and fall for several meters before beginning to flap.

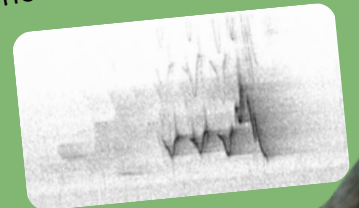


Nests are constructed from bark fibers, grasses, spider webs and caterpillar silk, which Blue-gray Gnatcatchers have been observed stealing for their own nests. White objects (lichens or small mushrooms) are often added to the outer surface.



Diet: insects

Listen (during late May and June) for a buzzy song with three notes on the same pitch, a series of warbles, and a high-pitched trill



Male Cerulean Warbler



Birds maintain strong pair bonds throughout the year.





Shagbark Hickory

QUARTZITE BEDROCK GLADES

One of the rarest natural communities in the Baraboo Hills are the glades that occur on exposed quartzite ridges. Within largely closed-canopy forests, these sites are small natural openings on thin, acidic soil and contain unique combinations of prairie, savanna, and woodland plants.

Glades are hotspots of biodiversity, but you'll have to look closely to observe many of the species found in this habitat type. Here are a few species associated with Baraboo Hills quartzite glades (*species accounts & photos by Angus Mossman*).



Scarlet Paintbrush



The Shivering Pinion (*Lithophane querquera*) is a species of Noctuid moth whose core range is south and east of Wisconsin. A population in the Baraboo Hills represents a northwesterly outlier and the only known occurrence in Wisconsin, with the next closest populations being southern Illinois into southern Ontario. In the Baraboo Hills, the moth seems to be associated with rocky ridges. The adult overwinters, and the caterpillars are out in early summer before pupating in the soil to emerge in the fall.

Confusing Bumblebee



The Confusing Bumblebee (*Bombus perplexus*) is one of about 16 bumble bee species known from Sauk County, and is generally uncommon in southern Wisconsin. The extensive forests of the Baraboo Hills support a surprisingly robust population near the species' southwestern range limit. The plethora of spring-flowering shrubs and forbs in and around the rocky glades are important for bumble bee queens as they are starting a new colony for the year.



Rock Axil-bristle Lichen (*Myelochroa obsessa*) is a small blue foliose (aka leafy) lichen of hard, non-calcareous rocks. This is another species that is mainly southeastern in the US, but with scattered outliers to the north. The Baraboo Hills is a stronghold for this species in Wisconsin, where it can be common on exposed quartzite in the dappled shade of rocky glades.



Visit a high-quality glade by hiking the East Bluff trail at Spirit Lake State Park.



Early spring at a glade in the South Range of the Baraboo Hills.



LONG-TERM BIRD BANDING STATIONS

This spring marks the sixth consecutive year of spending most summer mornings in our Baraboo Hills study sites, carefully examining the population health of the forest bird community.



Although the extensive forests of the Baraboo Hills are a crucial stronghold for forest bird conservation, the Midwestern USA is actually a hotspot of bird population decline - and these declines are becoming worse. Intensive agriculture, widespread loss of insects, or threats encountered during migration may all be contributing, yet without detailed studies, our understanding remains incomplete.



Lisa measures an American Redstart.

While there is much to be learned about the bird community from non-invasive methods (like auditory surveys), monitoring demographic trends through bird banding allows us to move beyond simply documenting population declines to understand the processes behind them.

Our five bird banding stations are MAPS (Monitoring Avian Productivity and Survivorship) stations, which are part of the Institute for Bird Populations' continent-wide monitoring network. The data we collect will help scientists across North America study bird demography, while also providing a detailed look at how birds are responding to habitat changes in the Baraboo Hills.

A key part of our work is to understand how land stewardship - especially oak woodland restoration - can enhance habitat quality and thus sustain bird populations into the future. Learn more about woodlands on page 13.

Examining the plumage of a Blue-winged Warbler.

At our banding stations, we use mist nets (pictured below) to passively capture birds as they move through their nesting habitat. The nearly invisible mesh intercepts birds as they fly through the understory. Each bird is carefully removed from the net and fitted with a lightweight metal band issued by the U.S. Geological Survey and engraved with a unique number. We then take a series of standard measurements, assess the bird's health and condition, and determine its age based on plumage characteristics. The entire process is quick and careful: all birds are released at the capture site, typically within 20 minutes.



Sagara examines a bird at a banding site within a woodland managed by The Nature Conservancy.

Collecting long-term data on individual birds provides critical insight into population trends, bird health, and the stages of the annual cycle where species may be struggling. For example, low numbers of adult Indigo Buntings returning to a study site in the spring suggests threats during migration or on the wintering grounds. In contrast, if many adults are present but few fledglings appear in late summer, the issue may lie closer to home—poor nesting success during the breeding season.

Long-term bird banding also allows us to recognize the same individuals if they are recaptured in future years. Species like Mourning Warbler, American Redstart, and Louisiana Waterthrush have returned to nest in the same Baraboo Hills sites each year since 2021. Through these brief encounters, we begin to see the forest as a community of individuals whose lives unfold across seasons.

Mist net used for capturing birds



Louisiana Waterthrush with a USGS metal band & a yellow band for resighting from a distance.

SOUNDSCAPE BASELINES PROJECT



Baraboo Hills site illustration by Sarah Heuzeroth

Stepping into a forest on a spring morning, the strongest impression is often sound: wind moving through branches, migratory birds singing as they forage, insects calling. **Together these voices form a soundscape—the distinctive acoustic signature of a place, made up of every sound present in that environment.**

Soundscapes are more than a backdrop; they can also reveal the condition of an ecosystem. Ecologists are increasingly finding that the richness and complexity of biological sound reflects ecological health. As landscapes change, their soundscapes change with them. A prairie becoming urbanized may host fewer vocal species, or the spread of invasive plants may alter which insects or birds are present. As human pressures on habitats intensify, long-term archives of bioacoustic recordings can serve as time capsules—capturing what ecosystems once sounded like in case those soundscapes change or disappear. And crucially, archived soundscapes can also serve as reference points to help guide community restoration efforts.



Bioacoustic Audio Recorder



Zuzana, Sagara, and Maia check a recording site.

In April 2024, the Baraboo Hills became the first North American site in the Soundscape Baselines Project, a global collaboration led by Dr. Zuzana Burivalova of the Sound Forest Lab at the University of Wisconsin-Madison. The project partners with local communities and conservation groups to establish biodiversity baselines in some of the world's most intact forests to support evidence-based conservation.

By integrating soundscape recordings with field surveys, we can link acoustic patterns and ecological communities. Our research in oak woodlands in the Baraboo Hills shows that management practices—especially periodic, low-intensity fires—support greater arthropod biomass and higher bird diversity. Managed woodlands produce richer, more complex soundscapes filled with biological activity, suggesting that acoustic patterns could offer an efficient way to monitor biodiversity.



Maia and Sagara set up a bioacoustic recorder; photo by Caleb Alvaredo for The Nature Conservancy



Visit our website to **READ** our [research paper](#) in *Oecologia*, or an interview in *The Nature Conservancy Magazine*, **WATCH** a [webinar](#) about science & land stewardship hosted by the Oak Woodlands & Forests Fire Consortium, or **LISTEN** to recording clips and learn more about the [Soundscape Baselines Project](#) in a *Great Lakes Now* episode.



American Goldfinch



White-tailed Deer fawn

SPECIES SEARCH

How many of these species or natural events can you find in the Baraboo Hills this summer?



Luna Moth



Shooting Star

1. Ovenbird
2. Shooting Star flower
3. Monarch Butterfly eggs, larva, or chrysalis
4. Raccoon tracks or den tree
5. Gray Treefrog
6. Eastern Phoebe building a nest
7. Common Watersnake
8. Fireflies flashing
9. Virginia Opossum
10. American Basswood tree flowering
11. Little Brown Bat
12. Sharp-shinned Hawk
13. Trout Lily
14. Eastern Calligrapher
15. Wood Thrush singing
16. Spined Micrathena
17. Southern Flying Squirrel
18. Ebony Jewelwing
19. Turkey Tail Mushroom
20. Common Serviceberry

Be a respectful observer! Do not approach active birds nests or otherwise disturb wildlife.



Firefly

*Tell us what you observe!
 We will publish your notes, photos, and sketches in Field Notes Vol. 2.
 Email: bhrcollective@gmail.com;
 Social media @bhrcollective
 (BlueSky, Facebook & Instagram)
 Mail: PO Box 102, North Freedom, WI 53951*

BIRD SPECIES & WOODLAND MANAGEMENT

Woodlands were once a dominant habitat type in Southern Wisconsin, but fire exclusion following European settlement has drastically reshaped these fire-dependent communities. The Nature Conservancy & other landowners are restoring former oak woodlands in the Baraboo Hills and we examined how the forest bird community is responding.



A bird community is only as healthy as the insects they feed on. We found that the vegetation changes brought about by woodland restoration were associated with more caterpillars and higher biomass of aerial insects. More plant diversity means more thriving insects and birds!

We found that restored woodland sites had more bird species than unmanaged sites. However, bird abundance told a more complex story. For example:



Mourning Warblers were more abundant in managed woodlands and often nest in dense patches of understory re-growth following prescribed fires.



Hooded Warblers, Acadian Flycatchers and Ovenbirds were less abundant in managed woodlands, indicating that we need to conserve many different types of forests to support the full range of bird species in the Baraboo Hills.



Red-eyed Vireos, Scarlet Tanagers, Rose-breasted Grosbeaks and several other forest species were equally abundant between managed and unmanaged sites.



Prescribed fire at Green Forest Preserve, a managed woodland study site.



Check out more results and read the full research paper on our [website](#).

MIGRATION STORY

7 July 2022

Banded as a hatchling at a managed oak woodland banding station within Hemlock Draw Preserve (The Nature Conservancy)

It is very rare for a banded bird to be encountered again at a different location - either at another banding station, a birding hotspot, or even a chance encounter. However, one hatchling Indigo Bunting we banded in the Baraboo Hills was later documented 1,728 miles away in the Cayman Islands, illuminating the magnitude of the journeys our 'everyday' birds undertake in their lifetimes.

9 April 2023

Resighted and photographed 2.4 miles NNW of Gun Bay, Cayman Islands

Indigo Buntings migrate at night and navigate using a combination of star positions, landforms, and earth's magnetic field. Adult birds weigh around 15 grams - as much as 3 nickels or 1 tablespoon of butter.

Even as technology improves and we are able to track the movements of individual birds, resighting banded birds still plays an important role in helping us piece together the migration ecology of birds.



USGS metal band with unique number on left leg (not shown in photo)

Pink color band on right leg

Photo by Jennifer Butler Artuch

Female or immature Indigo Bunting



Second year male Indigo Bunting with brown feathers (immature plumage) still visible on his back



Birding tip: If you see a banded bird - especially one wearing a color band - try to get a picture, document which leg the band is on, and report the encounter to The Bird Banding Lab! reportband.gov



Join us in the field this summer!

World Migratory Bird Day with Powered Up Baraboo

May 5th, 6 - 7:30pm

Did you know that Baraboo is a Bird City? Learn more about what this means and how you can help support migratory birds. Join us for a presentation at the Carnegie-Schadde Memorial Public Library. poweredupbaraboo.org

Natural Resources Foundation Bird Banding Field Trip (#56)

May 17th, 8am - noon

Visit a study site, observe a bird banding demonstration, and learn about our long-term research in a woodland owned and managed by The Nature Conservancy. wisconservation.org/field-trips

Wisconsin Society for Ornithology Birdathon / Bandathon

Saturday May 30th, morning

Join us for a bird banding demonstration at the Honey Creek Preserve to support WSO's annual fundraiser for the property. Stop by the banding table, or take a guided hike through the preserve. wsobirds.org



Science Open Houses

June 14th, 4-8pm & July 18th, 7-11am

Drop by one of our study sites to learn about the species we encounter and the data we collect. We will be banding birds, recording soundscapes, and searching for interesting plants & insects. Families welcome! For more information: bhrcollective.org/events



We are looking for volunteers!

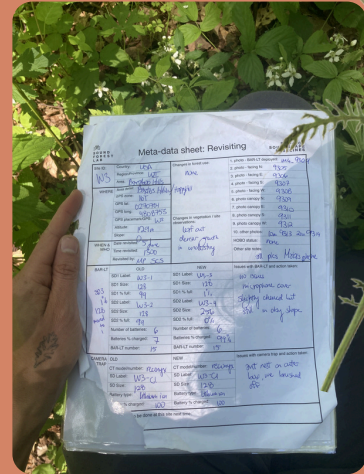
Learn how you can help with fieldwork or with compiling historic ecology data. Send us an email for more information: bhrcollective@gmail.com



WAYS TO CONTRIBUTE

Historical Ecology Project

Drawing from a long tradition of conservation and research in the Baraboo Hills we are compiling a historical ecology dataset to place today's observations within a longer ecological context. If you have field notes, species records, or other materials you'd be willing to contribute, we would love to hear from you. We are also seeking volunteers to help digitize historical information into a searchable, open-access database.



Science & Land Stewardship

The Anthropocene is a time of rapid change for landscapes, natural communities, and species. While many of these shifts are driven by habitat loss, climate disruption, and declining biodiversity, there are also hopeful stories—of people working together to restore and care for the places they love. Our goal is to ensure that our research helps inform land management decisions in the Baraboo Hills and beyond, supporting the long-term health of wild species and ecosystems. We believe science is most meaningful when it is guided by questions that matter to conservationists, landowners, and land managers.

This spring, we will begin a series of conversations with land stewards across the Baraboo Hills to help shape our research priorities for the coming years. Together, we aim to align our work with the region's most pressing conservation needs. Send us an email to join the conservation: bhrcollective@gmail.com



Donations Accepted

We are a 501(c)(3) nonprofit organization, and all donations are tax-deductible. Contributions go directly toward supporting our research, with over 90% of our budget dedicated to field equipment, field technician salaries, and volunteer mileage reimbursement. As a growing organization, your support makes a meaningful difference in helping us carry out this work.



MEET OUR FOUNDING BOARD



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Laura Berman



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Lisa Hartman

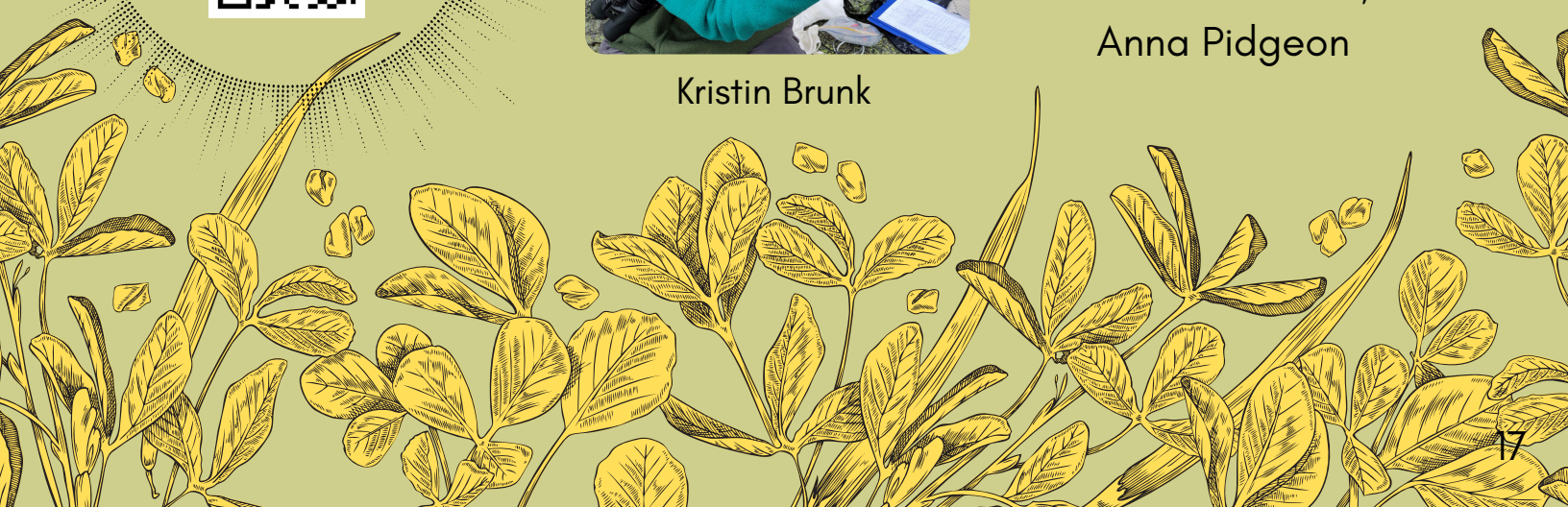
Read our [bios!](#)



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