

The Clifton Institute

Science Education Issue October 2023



Letter from the Managing Director

Over the last year, we've been working to include more community members in the science happneing here. Having the public participate in our research projects is mutually advantageous. We benefit from having extra hands in the field and new perspectives on our research questions. Seeing the challenges that come with each step of the scientific process helps people better understand how scientists come by their knowledge of the world. Participating in a citizen science project can connect people to a community of like-minded naturalists. And while doing science isn't the only way of understanding nature, it is an important one and it can be rigorous and playful, objective and joyful, in equal measure.

As we like to tell our Young Scientists (more about them on page 5), a huge part of the scientific process is coming up with a good question. What better place to practice curiosity than out in nature where a million mysteries await us around every corner?

There are lots of different ways we do science at Clifton. Annual citizen science counts help us keep tabs on the populations of different types of animals. Intensive surveys in the field give us a picture of ecological communities on small scales. Tracking studies show us how animals are moving across large landscapes. Just like artists, scientists have different styles and we hope that by exposing people to these and other ways of doing science they can find a style that clicks for them.

One of the ways I most like to do science is by nature journaling, by which I mean going outside with a notebook and recording my observations, questions, and feelings on paper. After a lifetime of dabbling in sketching and painting, in 2017 I picked up John Muir Laws' *Guide to Nature Drawing and Journaling* on a whim in a bird observatory gift shop. After a couple of false starts, in January 2020 I started a new sketchbook with the goal of seeing if I could establish a nature journaling habit. I was dubious at first, but a glorious afternoon on which I spent two hours in intimate observation of a Jack-in-the-pulpit converted me to the joy of nature journaling. All it takes to transform a sketch into data is adding a note about the date and the weather, which will allow me (or someone else) to come back in a year or ten or a hundred and compare the view then and now. We incorporate journaling into our year-long Nature School series and into field trips whenever we can, and this past year I've started running quarterly nature journaling meetups to help people develop their own nature journaling practices.

In the previous newsletter we wrote about the inquiry-based field trips we started running last school year, which are a big part of our effort to teach young people how to do science. (In case you missed it, the newsletter can be found on our website.) In this newsletter, we wanted to share the other ways we are including our community in scientific research. If you're interested in participating, keep an eye on our website calendar, look out for internships and research positions, or get in touch. Happy sciencing!

Learn more:

Sincerely,

Eleanor Harris

Eleanor Harris Managing Director

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COVER: Mark Ketner tracks an Eastern Box Turtle using radio telemetry.

BACK COVER: Vernal Pool campers gaze into the pool we call Trifecta 1.

Citizen Science Counts

One of the best ways to learn how to do field science is to get out there and do it! Citizen science projects like bird, butterfly, or dragonfly counts are a great way to experience field work while being supported by a group of fellow naturalists (newcomers and experts alike.) We host two counts every summer: a North American Butterfly Association butterfly count, and our very own dragonfly count that we established in 2021. Volunteers do annual counts like these across North America to track changes in animal populations. Here are the highlights from 2023:

NABA Butterfly Count

38 volunteers

39 species, about average

Numbers of Sachems and Pearl Crescents were both way up from previous highs. We also had new high counts for Pipevine Swallowtail, Red Admiral, and Horace's Duskywing and no new lows (meaning no species seem to be in particular trouble)

Dragonfly Count

24 volunteers

58 species of dragonflies and damselflies, **a new high!** We have now seen 67 species across the three years

We documented **three new species**: Aurora Damsel, Vesper Bluet, and Sable Clubtail.

We also found several rare or uncommon species, including Laura's Clubtail, Lilypad Forktail, Appalachian Jewelwing, Sphagnum Sprite, and Elegant and Amberwinged Spreadwings.

Numbers of several of the common pond-dwelling species (Slaty and Widow Skimmers, Eastern Amberwing, Blue Dasher, and Common Whitetail) were down this year, possibly due to lower water level because of drought.







A Chance for the Public to Become Researchers for a Day

A herd of cows looked on as researcher Caylen Wolfer took long, quiet steps up to a telephone pole in the middle of a field. Summer insects buzzed in the heat billowing up from the grass. Caylen reached the base of the telephone pole and raised a long wooden pole with a plastic cup and a small camera attached to it. The cup landed neatly on the entrance to an American Kestrel nest box, temporarily trapping the bird inside. The rest of the kestrel team, who had been waiting at the top of the hill so as not to spook the kestrel out of her box, descended at Caylen's signal. Kristen Whyle, Megan Lemmo and Sydney Jackson made their way around the cows and got to work gently removing the bird.

A group of attendees viewed all of this through binoculars. They were the very first group to participate in a series we're calling Science Saturdays, programs designed to give members of the public an up-close and hands-on experience with our research projects.

The day had begun with an introduction to our kestrel research project. Then the group headed out into our grassland with Prey Abundance Technician Kristen Whyle to learn how to survey dragonflies and grasshoppers, two popular food items for kestrels. They also helped Kristen set up an array of ink traps to survey small mammals and finished up the morning by measuring vegetation density.

Caylen and company brought the bird back to their mobile banding station (Caylen's car). They took some measurements, put a metal band on her leg for future identification, attached a GPS transmitter, and finally let the group have a close look at North America's smallest falcon before she was returned to her nest box. The data collected by this and other transmitters are helping us understand what kinds of fields are best for kestrels to hunt in.

A few weeks later, the steady beep of a radio antenna cut through the murmur of rain, guiding a group of visitors through the grassy trails of Upper Woodcock field. They were following the signal of a Box Turtle that had been outfitted with a radio tracker as part of Clifton's Eastern Box Turtle research project. Habitat Specialist Andrew Eberly advised a participant on how to move the radio antenna and adjust the signal to home in on the turtle. After a few more minutes of searching, the group spotted the turtle hiding in the tall grass just off the trail.

The turtle was one of forty radio-tagged individuals included in the project. Our goals are to track the turtles' movements and study what habitats they use at different times of year with the aim of providing recommendations to landowners who want to minimize the impacts of mowing on Box Turtles.



After tracking a few more tagged turtles, Andrew brought the group to Box Turtle Junction—an area named for its abundance of turtles—to look for untagged turtles. Sure enough, the group found three! Two were brand new to the project and one was marked, but not radio tagged. Andrew took data for all three turtles, added notches in the shells to the two new individuals (a harmless process done quickly with a file), and then left them to live out their turtle lives. The sky opened up as the group walked back to the house—perfect weather for turtles.

For the Clifton Institute, part of being a good field station is being an accessible field station. We want people who are interested in our research projects to see exactly what we do day-to-day. Educating people about not just the science, but why and how that science is done, will help everyone understand why our research matters. We're excited to keep hosting Science Saturdays and other programs that allow us to share our passion for science with anyone interested!

TOP: Caylen Wolfer walking to check a kestrel box.

CENTER: Bridget Bradshaw, Kristen Whyle, Caylen Wolfer, and Megan Lemmo take measurements on a female kestrel.

LEFT: Participants measure vegetation density during our American Kestrel Science Saturday.

RIGHT: Visitors watch Andrew Eberly weigh a Box Turtle.



Researchers of All Ages at Clifton

In summer, the farmhouse we use as headquarters fills to bursting with researchers. If you had come for a visit on a June afternoon, you might have seen one person on the porch preparing spicebush leaves for a chromatography experiment, four people huddled around the dining table watching videos from a kestrel nest box while charging an array of solar-powered GPS transmitters by the window, someone sitting at the bay window in the kitchen processing box turtle tracking data, and another out back preparing mammal traps. **Of all those people, none are professional scientists, at least not yet.**

The youngest of the researchers here this summer were the seven middle and high school students who spent a week conducting independent research projects during our fifth Young Scientists Research Experience. When we hear about science being done, we often hear about how the data were collected, but the process of coming up with a question to answer in the first place is often overlooked. And yet what really distinguishes the greatest scientists is the originality and insightfulness of their questions, not their fieldwork skills. Even though the Young Scientists were only here for five days, they spent the entire first day figuring out what they wanted to study by going for a long walk, making observations, noticing patterns (and exceptions), and following their curiosity.

Our intern Maggie Grady came back after two years of participating in Young Scientists to do research and to help run this year's program. Maggie exemplifies our hope that students will work their way up through our programs, return to mentor younger students, and find something they might be interested in pursuing as a career.

Logan



Loreli and Liam

Elyssa









Young Scientists exploring the beaver pond



The older researchers that spent the summer with us were college students, recent college graduates, and soon-to-be master's students. They spent anywhere from three to six months here. Five technicians, Caylen Wolfer, Sophie Vazquez, Megan Lemmo, Sydney Jackson, and Kristen Whyle, worked on our American Kestrel tracking project; technician Mark Ketner worked on our Box Turtle tracking project, and interns Maggie Grady and Sofie Marino helped with both projects. Although our technicians and interns didn't get to decide on their own research questions, they did get to help design their data collection protocols, practice specialized field skills, and share their findings with the public.

Most of the technicians conducted fieldwork on private properties (tracking kestrels, radio tagging turtles, surveying dragonflies, and setting up mammal traps), where they had conversations with landowners who will put our results into action through their land management decisions.

As useful as we hope their summer experiences were for our technicians and interns, they were instrumental to carrying out our research projects. We are so grateful for the hard work they put in all summer long and we can't wait to watch their careers unfold.



Megan Lemmo





Sydney Jackson







Sofie Marino



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One of our new research-focused programs this year was a spring break camp all about vernal pools! Nine campers ages 7-12 spent a day investigating the vernal pools on Clifton's property. Monitoring the amphibians breeding in our vernal pools is one of the projects we do with visiting school groups and after ten such visits the campers had the job of collecting the last vernal pool data of the season. We monitor six pools on our property and the campers hiked to all six to measure water depth, temperature, visibility, and pH, and to count the number of egg masses and adult frogs and salamanders. Education Associate Bridget Bradshaw had previously rescued an egg mass from a pool that had overflowed onto the driveway and the campers used their measurements to decide which pool to release the newly hatched larvae into. This was the first season that we used this monitoring protocol and we can't wait to see what happens next year!