



# The Clifton Institute



December 2022

## New Native Seed Initiative

Summer is the busiest season, both for the natural world and the Clifton world! In addition to holding another successful season of summer camps, we used the summer to redesign our field trips so that students can directly contribute to ongoing research programs, both of which you can read about in the following pages. We held our twentieth annual butterfly count and second annual dragonfly count, both of which are community science projects that monitor insect populations. And we conducted a pilot study to see if radio tagging Box Turtles would help us learn how to prevent mortality from mowing (it worked!).

One of our most notable accomplishments this summer was receiving a Conservation Innovation Grant from the USDA Natural Resources Conservation Service to fund a new program called The Virginia Native Seed Pilot Project. There is a lot of demand for seeds of native wildflowers and grasses in Virginia, but seeds of several species that are common in native grasslands in the state, and that are valuable to pollinators, are unavailable commercially. This project will launch the native seed industry in Virginia, which will make it possible to plant ecologically appropriate wildflower meadows.

A portion of this grant funded a brand new position at the Clifton Institute. We are excited to welcome Isaac Matlock to the team as our first ever Native Seed Project Coordinator! After receiving a B.Sc. in Biology from George Mason University, Isaac has worked in various positions to restore and conserve Virginia native plant communities. Isaac has dedicated his life to advocating for our native flora and has a wealth of knowledge about propagating native plants. Isaac will work with partners and volunteers to collect seeds of 18 species of wildflowers and grasses across the state, which will then be planted by farmers who will then harvest seeds at scale. Other key partners in the project are Virginia State University, the Virginia Dept. of Conservation and Recreation, Virginia Dept. of Wildlife Resources, the Nature Conservancy, Ernst Conservation Seeds, and the Capital Region Land Conservancy.

Welcome our new Native Seed Project Coordinator  
**Isaac Matlock!**



**COVER:** A Piedmont Polliwog camper with Blossom the Opossum.

**BACK COVER:** A Yellow-rumped Warbler having a snack by the lower pond in October.

## Learn More

website: [cliftoninstitute.org](http://cliftoninstitute.org)

email: [info@cliftoninstitute.org](mailto:info@cliftoninstitute.org)

phone: 540.341.3651

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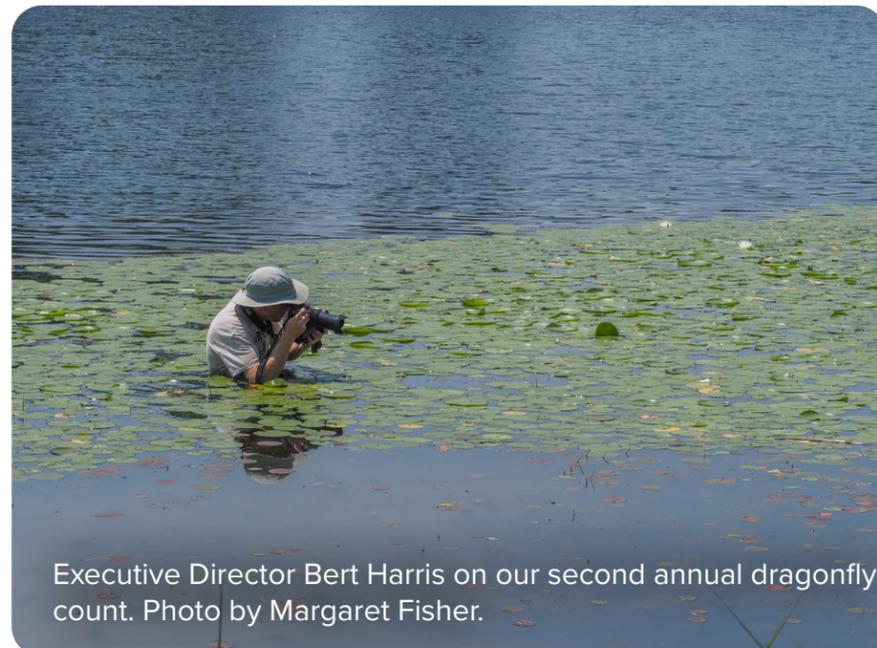
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We can only accomplish our mission with your help. Thank you!



Executive Director Bert Harris on our second annual dragonfly count. Photo by Margaret Fisher.

## Summer Camps For All Ages

Over the course of the summer we held four summer camp sessions: Piedmont Polliwogs for 4 to 6-year-olds, two sessions of Young Explorers for 7 to 12-year-olds, and the Young Scientists Research Experience for 13 to 18-year-olds. In total, 63 campers attended Clifton camps this summer!

Polliwogs camp was all about bugs this year. Education Associate Bridget Bradshaw taught the Polliwogs and their parents different ways that scientists study bugs, from seine nets in streams to sweep nets in fields. The polliwogs tested their knowledge by creating costumes and dressing up as their own imaginary bugs.

At our Young Explorers camps students spent the mornings learning how to identify different groups of organisms (flowers, insects, trees, birds) and then practiced their new skills on hikes around our property. In the afternoon, they did crafts, played games, and nature journaled. Some of the campers' favorite things included seeing beavers on the lower pond, picking wineberries and blackberries, seeing millipedes glow under a UV flashlight, and finding a baby snapping turtle.

Our fourth annual Young Scientists program was our biggest yet, with nine middle and high school students attending. Each student conducted their own independent research project, which ranged from studying how many bugs live on different types of mushrooms to the depths of crayfish holes to the singing behavior of different types of birds. They concluded their session by presenting their findings to an audience of their families and peers. Some of these students have been coming to our programs for years and we always get a little emotional to see them growing into such passionate and thoughtful scientists.

We don't limit the joys of summer camp to just kids! At the end of August, we held our second annual Nature Camp for Grownups. Co-Director Eleanor Harris and Education Associate Bridget Bradshaw had a blast learning, crafting, and getting to know the campers over the course of the weekend while they learned about bugs, went on hikes to listen to bird songs, stargazed, and made crafts featuring native plants and animals. We can't wait to do it all again next year! If you'd like to join in on the fun, registration for all 2023 camps will open in February.



Young Explorers campers designed parachutes to explore how seeds are dispersed by the wind.

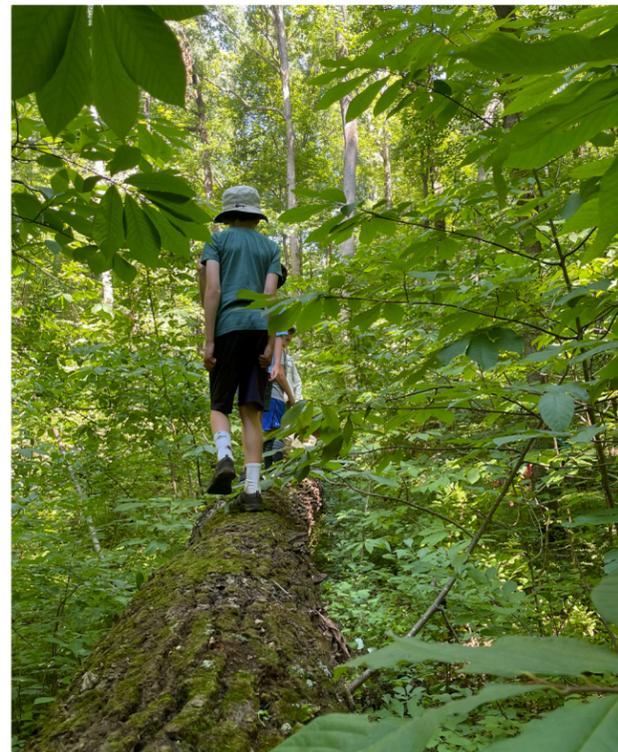
# Summer Camp Photo Gallery



Piedmont Polliwogs find bugs in the wild while dressed up as bugs. Photo by Karissa Epley.



A Young Explorer investigates a bug caught during a hike.



Young Explorers got to explore downed trees that fell during the big storm in June.



Camp days included time for quiet reflection and nature journaling.



A morning lesson with counselor Bridgette Gorg.



Young Explorers pose as kestrels for a group photo at Fox Overlook.



Young Explorers exploring the lower pond.



Participants in our second annual Nature Camp for Grownups look for aquatic invertebrates in a water sample.



One of our Young Scientists gives his final presentation to family and friends.

# New Type of Field Trips: Teaching the Scientific Method With Real-World Results

In September of 2022, Education Associate Bridget Bradshaw was standing in our 100-acre grassland experiment having a conversation with one fifth-grade student about bison husbandry while pulling Swamp Agrimony seeds out of another student's hair. Students were valiantly thrashing away at the tall vegetation on either side of the trail, diving headfirst into sweep nets to push the contents into a Ziploc bag. They hoped to find one of the types of Orthoptera (grasshoppers, katydids, and crickets) that they'd spent the last hour learning to identify. Bridget looked at one student's data sheet on the ground. There was a drawing of an ant and something that was maybe a spider. Next to that, a few big zeros, despite the many grasshoppers hopping just out of reach of the students' nets. Bridget gently ended the bison conversation and called "last sweep and then we head back!" The students let out mixed cries of relief and disappointment. On the hike back to the farmhouse, the group wondered: why didn't we catch any grasshoppers? Bridget was dreading analyzing the data, worried that the kids would feel like they had failed. This was the first time Bridget had run this field trip and she wasn't quite sure what to expect.

Dr. Bruce Alberts, a prominent biochemist and recipient of the 2014 National Medal of Science, published a letter in January, 2022, titled "Why Science Education is More Important than Most Scientists Think." He writes, "providing a quality education for a nation's youth is perhaps the most important task that confronts a society, but to do it well is an enormously complex task." One of the goals outlined in his letter is to make the logic of science—observation, question, hypothesis, evidence collection, analysis, critical discussion, and sharing of results—so familiar to people that it is used in all parts of life in order to make smart decisions. Studies have found that actively participating in science and interacting with scientists lead to feelings of increased competency and positive feelings towards science in people of all ages (Bonney et al. 2009).

A research field station like the Clifton Institute is an ideal venue to provide authentic science experiences to students. 78% of people in the U.S. live within 60 miles of a research field station (Struminger et al. 2018), so if we can figure out how to engage children in research going on at field stations it could make a difference across the country. This is why, in the spring of 2022, Bridget, Co-Director Eleanor Harris and Education Fellow Jacob Ewert sat down to re-write Clifton's field trip curriculum so that each of the 1,000-plus K-12 students who attend our field trips each year get to participate in real scientific research. While receiving her degree in environmental education, Bridget got used to scouring the literature to find the best ways to design different types of field trips, but there aren't many people who have tried to design research methods that students who range in age from kindergarten to 12th grade and who have little to no field experience can carry out in large groups (sometimes 75 at a time!). That gives us the challenge and privilege of figuring a lot out on our own. We'll work with the students to use their data to make real land management recommendations and we'll share our trials and errors with other field stations looking to improve their science outreach.

Which brings us back to Bridget, in the grassland, covered in seeds, zeros in hand, kids in tow. Students on this field trip were trying to answer the question: "does fire affect the abundance of orthopterans in our experimental grassland?" American Kestrels, tiny charismatic falcons whose numbers are declining across the northeast, eat a lot of grasshoppers and nobody has studied the possible effects of different land management strategies on prey populations. The students had split into three groups to do their surveys. Individually they only found a child-sized handful of grasshoppers. But after graphing their data, all three graphs showed the same pattern: higher numbers of orthopterans in the mowed section. The students acknowledged that, given they were only surveying for 40 minutes, this might not be an immutable truth, but still, how amazingly consistent given that the field crew had been trained just an hour prior! Our intrepid students started to wonder about what could explain their findings. Do grasshoppers really only eat grass and if so is there more grass on the mowed side? Did the burned side have more blackberry bushes that caught the nets and let the grasshoppers escape capture? We did the same surveys with two



Second grade students use sweep nets to survey grasshoppers and katydids in our experimental grassland.



Bridget and Eleanor explain surveying techniques to high school students.

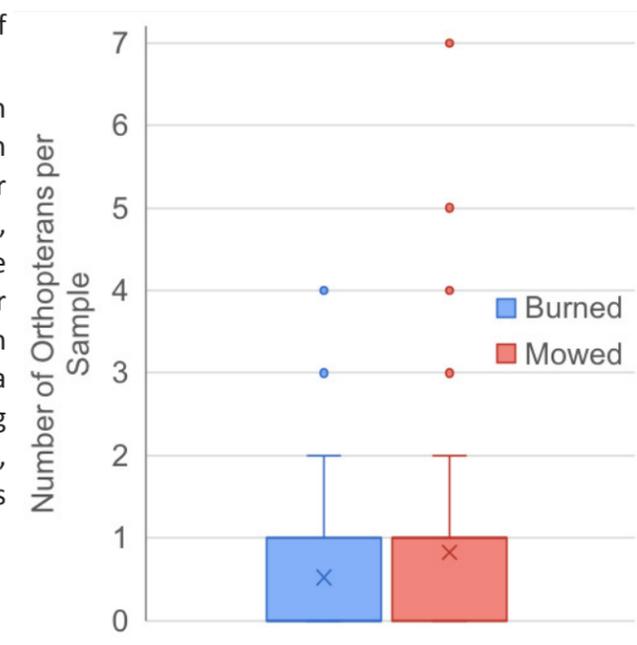
other schools before the weather got too cold and putting all of their data together shows the same pattern.

There's untapped power in bringing students to a research station and enlisting them as researchers for a day. They learn that each tidbit of information gained about the world is paid for in sweat and sometimes blood (the grassland is a thorny place), and they learn that understanding how those "facts" came to be is important in deciding how much weight to place on them. Our hope is that each year going forward, classes will return to watch the landscape change and see the power of aggregating data to find patterns in plant communities, vernal pools, wintering waterfowl, the onset of spring, and, of course, grasshoppers, because most meaningful discoveries—and certainly the kinds that take decades or centuries to see—are the work of many.

Alberts B. 2022. Why Science Education is More Important than Most Scientists Think. *FEBS Letters* 596: 149–159.

Bonney R, Ballard H, Jordan R, McCallie E, Phillips T, Shirk J, Wilderman CC. 2009. Public Participation in Scientific Research: Defining the Field and Assessing Its Potential for Informal Science Education. A CAISE Inquiry Group Report. Online Submission.

Struminger R, Zarestky J, Short R, Lawing AM. 2018. A Framework for Informal STEM Education Outreach at Field Stations. *BioScience* 68: 969-978.



Data collected by three different schools on orthopterans in burned and mowed plots. The X shows the average number of orthopterans found per sweep net sample. The dots show outliers. The difference is not statistically significant, but there is a weak trend showing more orthopterans in mowed plots.



**Open-access days for Friends of the Clifton Institute resume on January 8.**

**Learn more at**

**[clftoninstitute.org/events](https://clftoninstitute.org/events). We hope we'll see you soon!**