2022
Annual Report

The Clifton Institute

Letter from the Directors: Five Years In

2022 was our fifth year as Co-Directors of the Clifton Institute. It seems fitting that a milestone year brought big changes with it. One change was the growth in our organization: when we started, there was only one other full-time staff member. By 2022 our team included eight full-time staff, one six-month fellow, one part-time employee, and a slew of seasonal researchers. It has been so exciting for us to watch the farmhouse fill up with desks and workspaces and we're starting to think about how we'll house our team as it continues to grow. Our new staff has helped improve old programs (like our field trips) and launch new ones (like a research project on Box Turtles and an effort to launch the native seed industry in Virginia), all of which you can read about in the following pages.

Another change has been combining our program areas. When we were hired five years ago, our plan was for Bert to work on habitat restoration and conservation, for Eleanor to work on education, and for us to share research duties, keeping the three areas–restoration, education, and research–more or less in separate departments. One of the biggest things we've learned since then is how much better it is to integrate those departments as much as possible. The children and adults who attend our education programs get the unique opportunity to see science in action and to see the effects of different land management practices. Our habitat restoration projects have an impact beyond our boundaries because of the hundreds of people who visit them every year and take what they learn back to their own properties. Our research results inform how we manage our land, and our restoration work generates questions for future research. Clifton is unusual in its focus on all three areas, and it only strengthens our programs.

The progress we've made has only been possible thanks to the amazing community we find ourselves a part of. Whether you made a donation, attended one of our programs, volunteered on the field station, or just cheered us on from the sidelines, you are part of our story. Thank you!

Sincerely,

Eleanor Harris

Bert and Eleanor Harris

Cover: Kestrel research technician Megan McDaniels and volunteer April Harper use a radio antenna to locate a fledgling kestrel.
Back cover: Education Associate Bridget Bradshaw and Managing Director Eleanor Harris look for birds in our greenstone woodlands.

Donate

We can only accomplish our mission with the help of people like you.

You can make a donation at cliftoninstitute.org/donate.

If you have any questions please email Eleanor Harris at eharris@cliftoninstitute.org.

Thank you!

Learn More

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Seasons of the Clifton Institute

One of the joys of spending as much time outside as we do is that we get to experience the less obvious annual cycles in nature. Most people know that birds migrate north in the spring and south in fall, that flowers bloom in summer and animals hibernate in winter. But have you ever noticed that hoverflies come out in late summer? Or that most mushrooms appear in early fall? Or that spiders are especially abundant in September and October? When we start to notice these patterns year after year, we feel connected to the natural landscape around us, inspired to learn more about the plants and animals around us, and empowered to take care of them. Becoming attuned to the seasonal cycles in nature can be a powerful catalyst for deeper understanding, appreciation, and stewardship of nature.

We want to help other people get attuned to these patterns. We offer some education programs, like our Woodcock Watch, Spotted Salamander Migration Walk, and Pawpaw Party, at the same time every year so that people can establish their own annual traditions of coming and experiencing these phenomena. People who come to our bimonthly bird walks get to experience the spring and fall migrations, the summer breeding season, and seasonal changes in our fields throughout the year. In 2022, we even redesigned our field trip programs so that students help us collect data on how plants and animals change over the course of the seasons and year after year. We hope you make time to appreciate the beauty of all the seasons wherever you are.

January	February	March	April	May	June	July	August	September	October	November	December
Trees identifiable by bark and buds	Amphibians breed in vernal pools	Rat Snakes come out of hibernacula	Phoebes nest on the porch	Rose-pink in bloom	Millipedes come out in force	Katydids sing like crazy	Spiders make webs on all the trails	Waterfowl arrive	Good time of year to look at lichens		
Vernal pool monitoring			Bud out phenology	Grasshopper and katydid surveys				Plant surveys in native grassland		Waterfowl behavior	
Winter Tree ID	Salamander Migration	Bird Song	Nature Journaling	Plant Families	Butterfly Walk	Piedmont Prairie field trip		Blacklight Walk		Lichen Identification	
Prescribed Burns		Tree planting	Plant Sale					Plant Sale	Native Seed Collection and Propagation		
American Kestrel habitat research											
Box Turtle tracking project											

Plants and animals · K-12 Field Trips · Adult Education · Restoration · Research


A prescribed burn in our grassland in March.


Marsh Marigolds bloom in April.


Education Associate Bridget Bradshaw helps a student look for bugs in June.


A Red-banded Hairstreak (our mascot) found in July.


A volunteer helps collect native grass seeds in October.


A bobcat caught on camera trap in October.

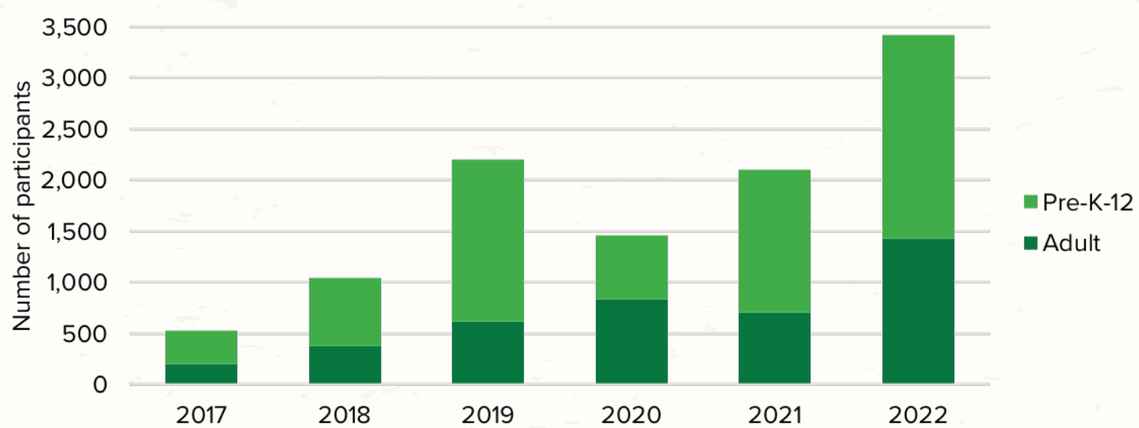
Education

1,988 & 1,434

pre-K-12 students adults

Of our program areas, education was the hardest hit by the pandemic, but in 2022 we not only got back to pre-pandemic levels of attendance but exceeded them by more than half, as you can see in the graph below. **Over 3,400 people attended our education programs last year!** One reason is the growth in our staff. With a full-time Education Associate, our first ever Education Fellow, and our Managing Director working on youth education and all of our staff contributing adult programs in their various areas of expertise, we were able to provide more education programs than ever before. Another reason is that word has continued to get out about the programs we offer here and we still haven't met all the demand for environmental education in our area.

If you come to any of our education programs (over 170 in 2022!), you might learn how to identify lichens, you might practice collecting native seeds, you might help us look for Box Turtles to track, or you might just go for a walk on our beautiful property. Every program is different and there is always so much to learn. Underlying the diverse topics we cover, there are a few unifying themes: we want both children and adults to enjoy spending time outside in nature, to feel curious about the natural world, to have fun learning about nature, and to be inspired to take care of native plants and animals. **We know from personal experience the joy and satisfaction that comes from knowing deeply about and feeling connected to the natural landscape around us and we want to bring that joy to as many people as possible.**



These numbers represent total attendance at our programs, not the number of unique attendees.

Inquiry-based Field Trips

Even here in northern Virginia, not an hour from the nation's capital, there are scientific mysteries waiting to be solved. How are native plants affected by burning or mowing? How do salamanders decide where to breed and how do they know where to find the vernal pools they need to breed in? How will the timing of trees' budding out change in the coming years? As scientists and conservationists, we want to know the answers to these questions. As educators, we have a rich resource at hand: the sponge-like, curious, and enthusiastic minds of the hundreds of students who attend our field trips every year.

In 2022 we redesigned our field trips to give visiting K-12 students the opportunity to collect data on one of five ongoing research projects. They learn about the scientific process, see what it's like to do field science, and contribute to a real science project. Now students can return year after year to see the data from many school groups accumulate into scientific knowledge. In 2022, 1,032 K-12 students from 20 different schools attended our field trips.

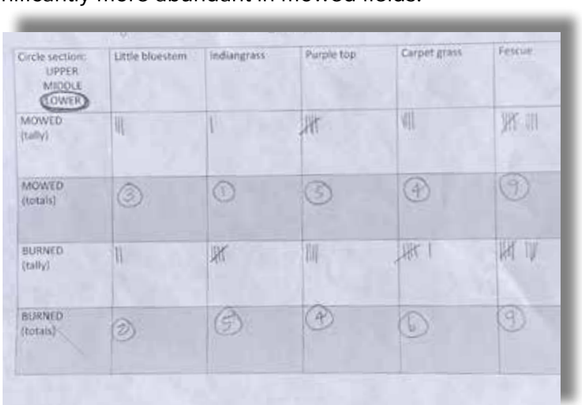
Of the research projects students have been helping with, our favorite is our native grassland restoration experiment. In our 100-acre grassland, we are testing four methods for establishing native plants and two methods for maintaining a grassland: prescribed burns and bushhogging. On a field trip, we don't have time to visit all the different plots, so we focus on comparing unplanted fields that have been either burned or bushhogged. Depending on the age of the students, we teach them how to identify between 5 and 14 plant species, some native, some not, some grasses, some wildflowers, and then we set them loose on 1-meter x 5-meter plots to see which species are present. Sound like a challenge? They're more than up to the task. Grasses have a reputation of being hard to learn, but it just takes a little practice to identify the common species. Below, you can learn for yourself how to distinguish two species of grass and see a data sheet we used with elementary school students. In the data students have collected so far, two species emerged as ones that are significantly different between the two treatments: Indiangrass is more frequent in the burned plots and Purpletop is more frequent in the mowed plots. Next we have to figure out why!

Now that we've been running field trips for a few years, we are starting to see some of the students come back in different grades. In the fall, the freshmen environmental sciences class from Fauquier High School came out for a field trip and over half of them remembered coming here back when they were in fifth grade. We hope their new memories of visiting our grassland and studying our ducks last not just four years but decades into the future. You can learn more about our field trips and sign up for one at cliftoninstitute.org/fieldtrips.

To tell grasses from other plants, remember this rhyme:

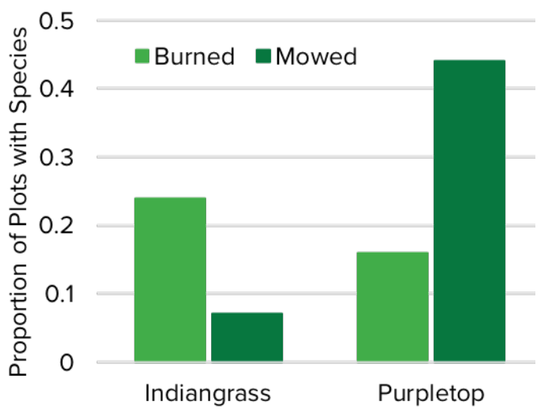
Nodes on the stem bend like your knees,
grasses also have long skinny leaves!

Indiangrass is tall with erect seedheads. Purpletop seedheads flop like sad Christmas trees. The data sheet below shows the number of students in one class who found different species of grass in burned and mowed plots. The graph shows the data from all the classes who have visited so far: Indiangrass is significantly more abundant in burned fields and Purpletop is significantly more abundant in mowed fields.



Circle section: UPPER MIDDLE LOWER	Little bluestem	Indiangrass	Purple top	Carpet grass	Fescue
MOWED (tally)	III	I	卌	IIII	卌 III
MOWED (totals)	3	1	5	4	9
BURNED (tally)	II	卌	IIII	卌 I	卌 IIII
BURNED (totals)	2	5	4	6	9

Indiangrass Purpletop



One of our research projects involves surveying grasshoppers, katydids, and crickets, which are a major food source for American Kestrels, in fields that are managed in different ways. Here students work to identify bugs they've caught.

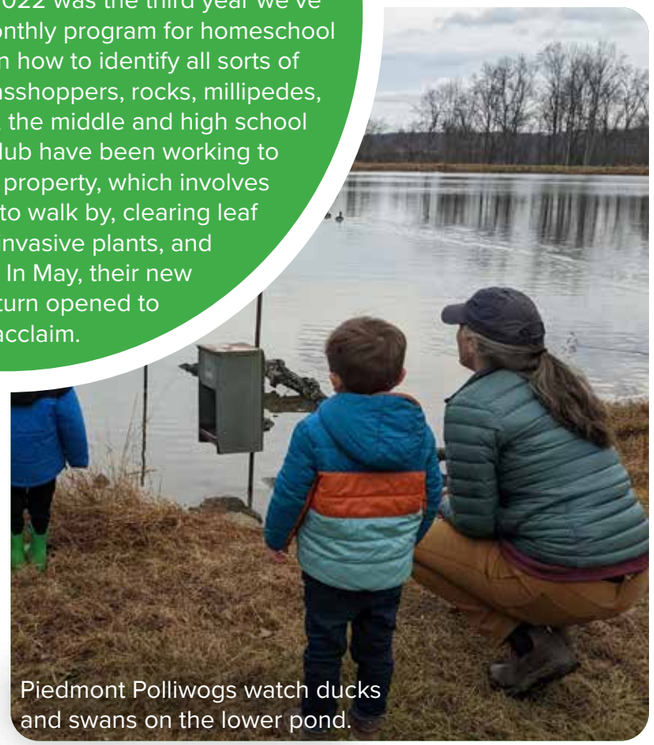
In the winter, students study the behavior of the waterfowl—ducks, geese, and swans—on our ponds.

Summer campers have their morning lesson by the big maple tree.

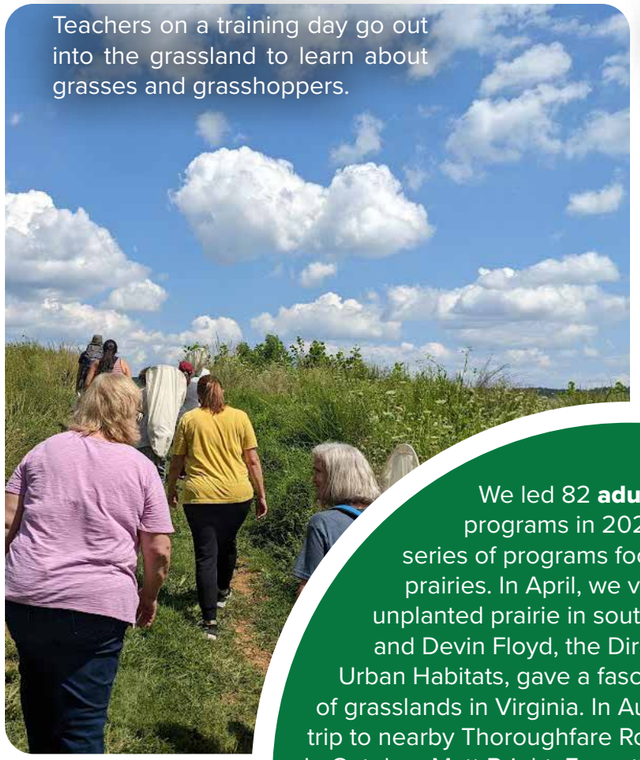
Nature School students read a book on the trail.

In addition to field trips, we provide several types of **in-house K-12 education programs**. In the summer we run four weeks of summer camp, with something for every age 5 to 18. It was our Education Associate Bridget Bradshaw's first summer with us and since she is a bug enthusiast our camps took an entomological turn for the better. Monthly Piedmont Polliwogs and Family Nature Walks give children and their families the opportunity to explore nature together. 2022 was the third year we've offered Nature School, a bimonthly program for homeschool students to come and learn how to identify all sorts of different things–vultures, grasshoppers, rocks, millipedes, and more. Starting in 2022, the middle and high school students in our Nature Club have been working to create new trails on the property, which involves picking out landmarks to walk by, clearing leaf litter, cutting back invasive plants, and marking the trail. In May, their new Trail of No Return opened to great acclaim.

Nature School students add entries to their nature journals.



Piedmont Polliwogs watch ducks and swans on the lower pond.



Teachers on a training day go out into the grassland to learn about grasses and grasshoppers.

Adult summer campers make crafts on the porch.

We led 82 **adult education** programs in 2022, including a series of programs focusing on Piedmont prairies. In April, we visited a spectacular unplanted prairie in southern Culpeper County and Devin Floyd, the Director of the Center for Urban Habitats, gave a fascinating talk on the history of grasslands in Virginia. In August, we took another field trip to nearby Thoroughfare Road to see a remnant prairie. In October, Matt Bright, Executive Director of Earth Sangha, helped Executive Director Bert Harris lead a workshop on how to collect and grow the seeds of native grassland plants. We also had four nighttime events: Froggy Friday in May, Creatures of the Night in September, a Spooky Blacklight Walk in October, and a Starry Storytime in November. Children and adults alike enjoy getting to see a whole other set of wildlife, hearing the sounds of nocturnal animals, and feel adventurous navigating by flashlight and the light of the moon.

Participants on a bird walk enjoy fall migration.

Visitors look at constellations through the telescope.

Research

Why Are American Kestrels Declining?

In 2021, we started a research project to try to figure out why American Kestrels are declining, along with collaborators Joe Kolowski at the Smithsonian Conservation Biology Institute and Alan Williams. That year, we attached GPS transmitters to 19 female kestrels and recorded their movements while they were hunting to feed their nestlings. Those data suggested that cattle pastures are suitable for female kestrels year-round and native meadows and row-crop fields are suitable in the spring before they grow tall. But without any data from males, a big piece of the picture was missing and we still had many unanswered questions. We also wanted to see if fledgling mortality might be contributing to the population decline. So, we raised funds for another year of research and we brought on three research technicians for the field season.

Our goal for 2022 was to track 20 adult males and 20 adult females with GPS transmitters. Unfortunately, the same brand of transmitters that had worked perfectly in 2021 were mostly non-functional, and once the breeding season started, we didn't have time to find any alternatives. After weeks of troubleshooting, we were able to outfit four males with transmitters from 2021 and keep tracking nine of the 19 females that were already tagged.

Despite the technical difficulties, we were still able to learn a lot from the males we managed to tag. One especially interesting case was a male named Rabbit, who nested at Clifton but flew seven miles every day to his preferred hunting grounds! It appears that males and females differ in their preference for hunting grounds. In particular, males seem to travel longer distances from the nest box to hunt than females do, but we need more data to know for sure.

We also studied fledgling kestrels for the first time and we attached radio transmitters to 20 of them. We tracked these fledglings to see how they fared during the two first weeks of flight outside of their nest boxes, which is thought to be a particularly vulnerable period for them. Fortunately, all 20 fledglings survived their first two weeks (at least). Our partners at Hawk Mountain Sanctuary in Pennsylvania also found high fledgling survival, so it seems that fledgling mortality may not be a major contributor to declines in our area.

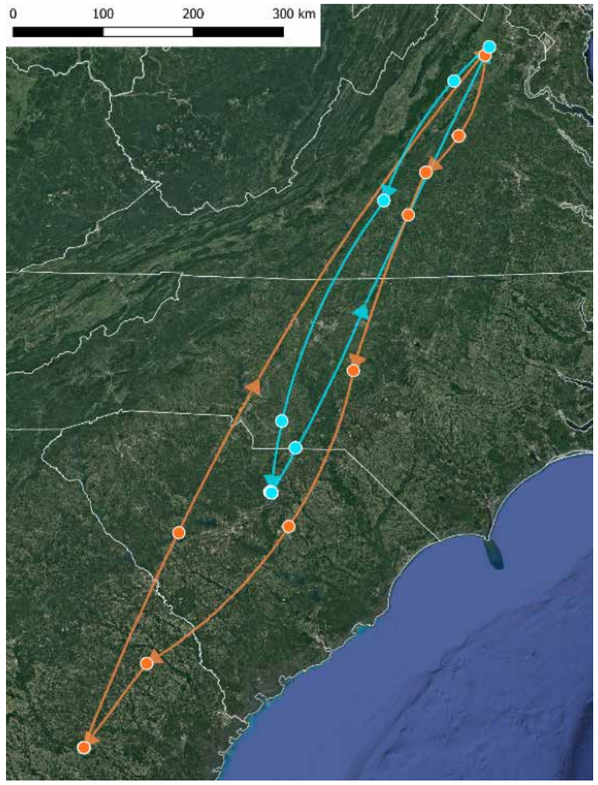
Alan Williams removes a kestrel from a box. Photo by Joe Kolowski.

A fledgling kestrel gets measured before being banded. Photo by Joe Kolowski.

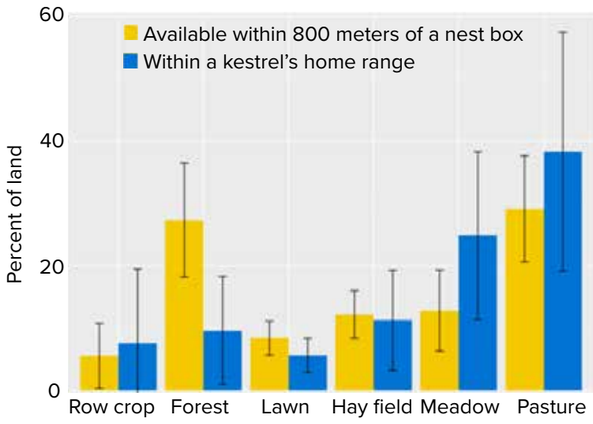
Early in 2022 we picked up some fascinating long-range movement data from birds we tagged in 2021. One female that bred near the Clifton Institute flew to Pennsylvania once her fledglings were gone and then returned to winter just a few miles from her breeding territory. We also now know that some kestrels in our area are migratory, after downloading GPS data from two birds who spent the 2021-22 winter in Georgia and South Carolina respectively and then returned to Virginia to breed in 2022. Remarkably, they both only took two days to fly the few hundred miles home!

Over the last year, we have continued to analyze the data we collected in 2021 and our initial findings will be published in the *Journal of Raptor Research* in 2023. We found that kestrels in our area have small home ranges, averaging 79 acres, and that their territories don't overlap with each other. Most birds made regular trips outside their home range (forays), which is unusual for animals with such small home ranges. Forays averaged 1.7 miles, but some were as far as 89 miles beyond their home range. Our statistical analysis has supported our initial impression: while kestrels use native wildflowers meadows early in the season, they tend to switch to fescue cattle pastures once meadows have grown too tall for them to hunt in. It looks like kestrels like to live side by side with working farms, which is good news for kestrels and farmers alike. One big challenge that we are thinking a lot about is how to manage native grasslands so that they are suitable for kestrels and other short-grass species—stay tuned on that!

Our 2023 research season is already underway and we have successfully deployed new GPS transmitters on both males and females. We're also trying to figure out what it is about cattle pastures that makes them so attractive. We're extremely grateful for the financial support of the Raines Family Fund, BAND Foundation, Nick Lapham, the Virginia Society of Ornithology, the Washington Biologists' Field Club, and Janine Moseley, which will allow us to uncover more secrets about kestrels' habitat needs!



This map shows the paths of two females who spent the 2021-22 winter in North Carolina and Georgia and flew right back to their nest boxes in the spring. Without GPS transmitters, we would never have known about these journeys.



This graph shows the habitat composition within 800 meters of nest boxes and within the home ranges of kestrels while their babies are still in the nest. They use cattle pastures and wildflower meadows more than other types of fields, even though those other types are available. Later in the season, they move away from wildflower meadows as the vegetation gets too tall.

The Effects of Mowing on Box Turtles

Kestrels aren't the only animals we're tracking! In 2022 we launched a multi-year, collaborative research project focused on Box Turtles. These charismatic, long-lived turtles are thought to be declining rapidly, and mortality from mowing may be the most serious threat in rural areas. We want to learn how landowners can mitigate the effects of mowing and hay cutting. For example, can we change when fields are cut, or avoid edges within 100 meters of forest? We also want to understand what habitats are preferred by Box Turtles for foraging, nesting, and overwintering, and how habitat use changes seasonally and based on disturbance (e.g., mowing, burning).

In the 2022 pilot season, Habitat Specialist Andrew Eberly and Jordan Davis, an undergraduate student supervised by Travis Gallo at George Mason University, used a combination of radio tagging and surveying to track turtles on the Clifton Institute property. They attached radio tags to five turtles to test the technology and to start to get an idea for what habitats the turtles use. They also notched the shell of every turtle they found with a unique code (which is harmless for the turtle), so that we can recognize them if we see them again.

Throughout the summer, Jordan, Habitat Specialist Andrew Eberly, and partners from Dr. Tom Akre's Turtle Conservation Ecology group at the Smithsonian Conservation Biology Institute marked a lot of turtles. Based on the data, we were able to generate a rough population estimate for the field station. Preliminary results from the pilot season also showed that the tagged turtles differed dramatically in home range size, some ranging for miles and other staying in a circumscribed area. We were surprised to find that one of the turtles spent most of the summer in our grassland restoration experiment, which suggests that it may be challenging to time haying and bushhogging to avoid turtle mortality.

Thanks to a grant from the BAND Foundation, we will be able to expand this project dramatically in 2023. We will have a full-time research technician to track the movements of 40 turtles and we'll work with partners to do Box Turtle surveys on four properties in Fauquier and Rappahannock Counties. We are excited to continue our research in 2023 and beyond!

GMU undergraduate Jordan Davis finds a turtle in the field.

Education Associate Bridget Bradshaw weighs a turtle before it receives a radio tag.

Young Scientists Research Experience

Nine middle and high school students attended our fourth annual Young Scientists Research Experience in June of 2022. Over the course of the week, the students chose their own research questions, did their fieldwork, analyzed their data, and finally presented their findings. Here's what our 2022 Young Scientists found:

Aurelia found five genera of fireflies in her daytime firefly surveys. Most of the fireflies she found were in the genus *Photinus*. Of the fireflies she found on trees, most of them were on redbuds, followed closely by walnuts and pawpaws.

Declan found crayfish holes at a wide variety of distances from standing water, some over 20 meters from water. There was no relationship between how deep a hole was and how far away from water it was.

Elyssa found that there were more insects on gilled mushrooms than on any other growth form.

Lane found that there were slightly more species of lichens on trees closer to water than farther from water. Of the nine species of trees he found lichens on, Tulip Poplars had the most species of lichen.

Liam found four types of fish in our creeks and ponds: Eastern Blacknose Dace, Fantail Darter, Largemouth Bass, and Bluegill. The vast majority of the fish he found were daces. Liam caught more fish per sweep of the dip net in the creeks than in the ponds.

Logan found that, of Carolina Wrens, Common Yellowthroats, and Eastern Towhees, wrens had the longest songs. All three species had longer songs in the morning than in the afternoon.

Loreli found that there were more frogs in the ponds than in the creeks.

Maggie found that both damselflies and dragonflies prefer to perch on skinny logs rather than wide logs. She also found that damselflies are pickier about the locations where they are willing to perch.

Sarah found that Eastern Phoebes were more attentive parents than were Eastern Bluebirds.

10,000+ Observations on iNaturalist

One of our favorite things to do is just go on a walk and see what species we can find. There's always something new to discover, even in a place where we walk almost every day! Thankfully, iNaturalist has enhanced nature walks by helping people identify what they see, and incorporating unsystematic observations into a database of verified observations. If you're unfamiliar with iNaturalist, it's a website and an app to which you can upload pictures of plants, animals, and fungi and where artificial intelligence and a community of experts work together to identify whatever it is you've spotted. Nameless blooms, moths, and mushrooms suddenly have identities, allowing you to learn about their life histories and distributions in the world.

We use an iNaturalist project to collate all observations made on the Clifton Institute property into one database. 2022 marked the fifth year of the project. By the end of the year, 188 people had submitted nearly 10,000 observations of over 2,300 species! Having this biodiversity database helps us understand what's living on the field station and how we can manage the property to benefit rare or declining species. We also recently looked through the last five years of data to see what we could learn. Based on how frequently new species are observed, we can make rough predictions about the total number of species in different groups (plants, insects, birds, etc.) we can expect to find in total. One thing we've learned is that we have a ways to go with mushrooms! We'll be working to rectify that this year.

Here are some of the most exciting discoveries from the last five years:


A rare Winter Bumblefly.


A beautiful Rose-pink growing wild in our unplanted prairie remnant.


An uncommon Yellow-bellied Flycatcher


An incredible Rainbow Scarab Beetle.

20+ Years of Community Science

Science is for everyone, whether you're a researcher working toward a Ph.D., a retiree watching birds at your backyard feeder, or even a kid in elementary school. One of the best ways to engage scientists of all kinds is with community science projects like the Audubon Society's Christmas Bird Count and the North American Butterfly Association's butterfly count, both of which Clifton has participated in for over 20 years. In addition to those, we've created our own project: an annual Dragonfly Count, which we debuted in 2021. This is one of the only community science surveys of dragonflies to be done in North America. Community science counts like these are one of the best ways to monitor plant and animal populations and they create invaluable long-term data sets. We can only keep running these counts because of the volunteers who lend their time and enthusiasm to the cause. Thank you to everyone who has contributed to these projects! Here's a summary of who participated and what we found in 2022:

Clifton Dragonfly Count: 23 volunteers found 55 species, including the first Laura's Clubtail documented in Fauquier County

NABA Butterfly Count: 32 volunteers found 40 species, including an incredibly high number of Sleepy Oranges

Christmas Bird Count: 53 volunteers found 91 species, including more American Coots than ever before

Restoration

Launching the Native Seed Industry

One of the most exciting developments of 2022 was the launch of our Native Seed Pilot Project. Like many other people working on restoring native grasslands, we have a hard time buying the native seeds we want to plant. Seeds of many species that are characteristic of remnant native grasslands in our area are not sold by seed companies. And the vast majority of those that are sold have out-of-state genetics. They may bloom at the wrong time or be too tall or short, which reduces their value to pollinators. Furthermore, to restore declining grassland plant communities in Virginia we must work with seeds and plants that have local genetics. Another emerging demand for native seeds comes from the solar energy industry. Through their Pollinator-Smart program, the Virginia Department of Conservation and Recreation (DCR) and the Department of Environmental Quality have been encouraging the solar energy industry to establish pollinator meadows in solar farms. But at the moment there aren't seeds with Virginia genetics for them to buy.

Last year we received a $200,000 Conservation Innovation Grant from the USDA Natural Resources Conservation Service to fund a project to launch the native seed industry in Virginia. The goal is to collect seeds of eighteen species of full-sun plants across the state, to grow the seeds into seedlings, and then to distribute the seedlings to farmers who will grow crops of wildflowers and grasses for seed production. This is a win-win for the people who want to buy native plants and for farmers who can make money off of a new valuable crop on just a few acres of land.

This grant allowed us to hire Native Seed Project Coordinator Isaac Matlock to lead all aspects of the project, including seed collection, plant propagation, recruitment of farmers, and coordination with partners. The grant also partly funded the construction of a new greenhouse that we are using to grow plugs for the project. Staff at our partner Virginia State University are working with additional farmers. We are also working closely with DCR and the Department of Wildlife Resources through the Pollinator-Smart program, as well as with partners at Ernst Conservation Seeds, who are helping grow seedlings; the Nature Conservancy; and the Capital Region Land Conservancy. In the fall, Isaac worked with volunteers and partners to collect seeds from over 100 sites. Isaac and partners collected seeds from sixteen of our eighteen target species and collected enough seeds to grow 30,000 plugs for our farmers this year.

Isaac Matlock watering native plants in the new greenhouse.

Pollinator-friendly Plantings

Even as our new Native Seed Pilot Project took off, we continued working on pre-existing projects to sell, plant, and educate people about native plants.

2022 marked the third year of our native plant sales and we held two successful events in May and September, at which we distributed hundreds of native plant seedlings. All of our seedlings are grown from seeds collected in Virginia, meaning they are not just native species but local ecotype as well.

Thanks to funding from the Piedmont Chapter of the Virginia Native Plant Society, in 2022 we were able to start work on a new meadow on the Clifton Institute property, called the Cathy Mayes Memorial Meadow in memory of our late board member. After planting seeds and seedlings last year, we are eagerly waiting to see what blooms this summer.

In 2022, the Fauquier Board of Supervisors unanimously voted to become a Bee City USA, joining a nationwide initiative led by the Xerces Society for Invertebrate Conservation. Executive Director Bert Harris became Co-Chair of the We Need Bees Committee, which coordinates the county's new pollinator-friendly programs. One such program was a Native Garden Tour in June 2022, co-organized with the Piedmont Environmental Council, Warrenton Garden Club, and Fauquier County Deparment of Parks and Recreation.

Top: Visitors pick out seedlings at our native plant sale in May 2022.

Middle: Our land management staff prepare ground in our Cathy Mayes Wildflower Meadow prior to planting.

Bottom: Attendees at our Native Garden Tour learn about the plants in our native garden.

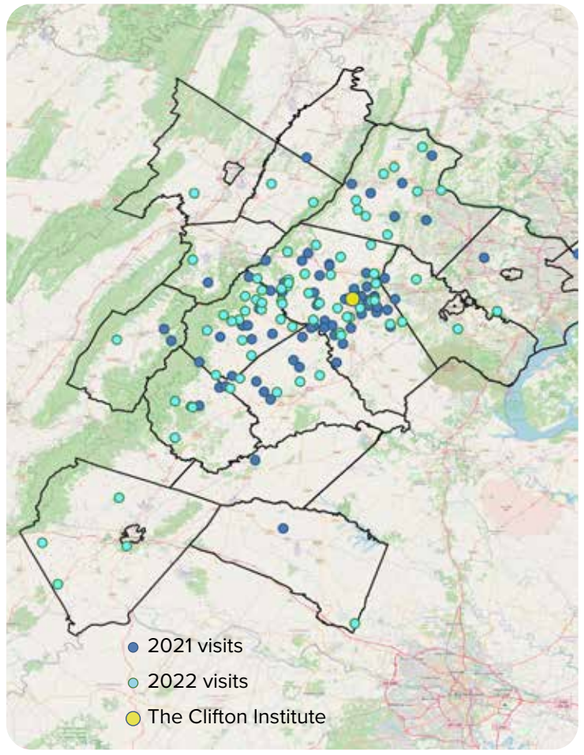
Landowner Outreach

Our vision for the future of the Piedmont is to increase the number and diversity of native grasslands and shrublands and to have a landscape where people can enjoy and make a living from the land while also providing a home to native plants and animals. That requires removing invasive plant species, establishing native plants, and preventing open areas from growing up into forests. We do our best to fulfill that vision on our 900 acres, but that's just a small piece of the puzzle. Since 2021, we have been helping landowners across the region manage their properties by providing free advice about the various steps in the process of restoring and managing grasslands and shrublands.

In 2022, Land Management Outreach Associate Marie Norwood visited 79 landowners who collectively manage about 7,000 acres. She also continued to advise people she had visited in 2021. From what we can tell, they are taking her advice. For example, because of Marie's visits, several landowners have altered the timing of mowing to avoid grassland bird nesting season. Several landowners are now working to establish native wildflower meadows. And a handful are even gearing up to do their own prescribed burns.

In the fight to restore native habitat, every tool matters. Last year a powerful new tool was forged: a Google group administered by Marie where landowners can give each other their own recommendations. There are over 100 people in the group and it has turned into a vibrant community of like-minded people cheering on each other's restoration work. Members of the group have started meeting in real life to walk properties together and see the fruits of each other's labor. In October we held our first landowner meetup here at Clifton and twenty landowners came to share their stories and learn from our staff. As always, we feel grateful for the community of people in northern Virginia working to conserve native biodiversity and, because of their hard work, we look forward to seeing what the landscape looks like in five, ten, or even twenty years.

Marie Norwood consults with a landowner during a property visit.



Native Grassland Experiment

Restoring a native grassland is not a quick and easy process. If the field is too far gone, it can be necessary to remove the existing vegetation, which can take months or even years, depending on the method you choose. Then seeds or seedlings can be planted. Those might take a year or two to establish themselves. Even after all of that is completed, the work isn't done. It might be necessary to spot-treat remaining patches of invasives. And the field needs to be disturbed (mowed, grazed, or burned) every year or two forevermore to ensure that it doesn't grow up into a forest.

Why go to all that work? Grasslands and shrublands are home to more declining bird species than any other habitats in North America. Grasslands also host more threatened plants than any other habitat in Virginia. That's likely the case for insects as well, but we can't say for sure since insects are not as well studied. And while forests in Virginia aren't in danger of disappearing, native grasslands are. That knowledge was enough to convince us to undertake the challenge of turning a 100-acre fescue field into a native grassland. Beyond the challenge of the hard work and patience was knowing how to do all of those steps!

So we teamed up with partner organizations Virginia Working Landscapes (VWL) and the Oak Spring Garden Foundation (OSGF) to conduct a big experiment to test four different methods for establishing native plants and two disturbance methods (mowing and burning). We spent the three years from 2019 to 2021 doing all of the establishment work in our 100-acre grassland while VWL and OSGF did the same on their respective properties.

2022 was the first year we could relax a little and just mow or burn in late winter and watch the fields grow up. It seems that the herbicide + seeding treatment was most successful and that fire did a better job than bushhogging at promoting native grasses. But we won't know for sure until we finish data collection. Clifton staff and partners did baseline plant surveys in the experimental plots in 2019 and Virginia Tech Ph.D. student Jordan Coscia will return in summer 2023 to re-survey the plots. Stay tuned!

This image was taken in April 2022 as part of the Virginia Base Mapping Program. Our grassland is outlined in yellow. The surrounding fields are green because they are dominated by fescue, which grows throughout the winter. In contrast, most of the grassland is tan and brown because native grasses only grow in warm weather.

The area outlined in orange was burned in March 2022. The contrast between the burned area and the mowed area around it shows what a large effect different land management strategies can have. The left half of the burned area is a control where we did nothing to establish native plants. The right half was sprayed once with herbicide in 2019, after which we allowed the seedbank to grow up. Again, the contrast between green and brown shows the preponderance of native plants where we sprayed herbicide.

Community

211 volunteers

2,601 hours

We could not provide so many education programs, do as much land management, or conduct our scientific research without the help of volunteers and partner organizations. In 2022, volunteers led bird walks and helped run our Nature School programs, maintained trails, monitored bluebird boxes, removed invasive species, helped conduct prescribed burns, planted trees, and more. Thank you so much to all of our volunteers!

Partner Organizations

American Farmland Trust
American University
Bull Run Mountains Natural Area Preserve
The Capital Region Land Conservancy
Center for Urban Habitats
Chesapeake Bay Foundation
Ernst Conservation Seeds
Fauquier County Parks and Recreation
Friends of the Rappahannock
Land Trust of Virginia
The Nature Conservancy
Oak Spring Garden Foundation
Old Rag Master Naturalists
Piedmont Environmental Council
Smithsonian Conservation Biology Institute
Smithsonian-Mason School of Conservation
University of Maryland
Virginia Department of Conservation and Recreation
Virginia Department of Wildlife Resources
Virginia Native Plant Society
Virginia Outdoors Foundation
VIrginia State University
VIrginia Tech
Virginia Working Landscapes
Warrenton Garden Club
White House Farm Foundation

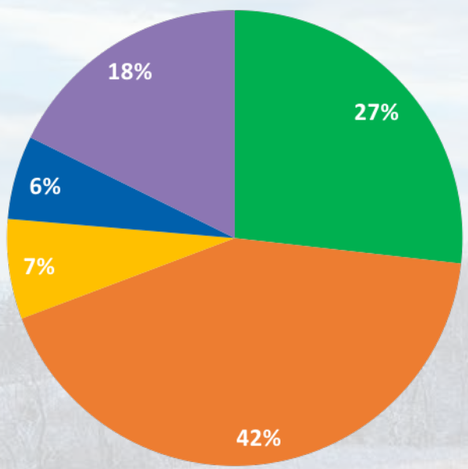
Volunteers and staff suit up for a prescribed burn in March 2022.

Thank you for your support!

The charts below show the sources of support and revenue we received and the allocation of our expenses in 2022. The 406 individuals, businesses, and foundations who contributed to the Clifton Institute in 2022 can be found on the next three pages. We could not accomplish our mission without the help of people like you. Thank you for your support!

Total Support and Revenue

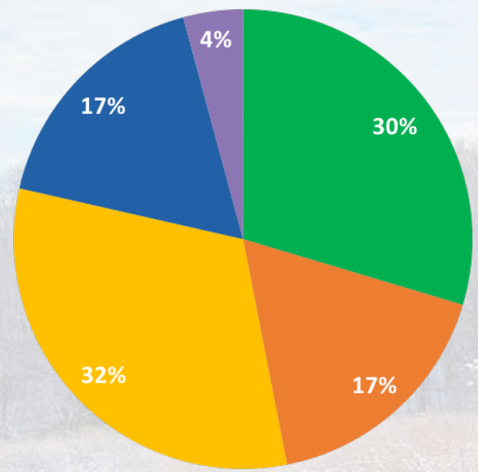
$760,632



- Donations
- Foundation / trust grants
- Government grants
- Program fees
- Investment returns

Total Expenses

$807,404



- Education
- Restoration
- Research
- Administration
- Fundraising

Equipment sales and rent represent less than 1% of support and revenue.

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Amazon Smile
Betsy and Rick Anderson
Sally Anderson and Richard Cooper
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Norah Argodale
Kelp and Michael Armstrong
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