ABOUT THE CLIFTON INSTITUTE

Our mission is to inspire the next generation of environmental stewards, to learn about the ecology of the northern Virginia Piedmont, and to conserve native biodiversity. We accomplish this mission by providing environmental education to people of all ages, carrying out ecological research, and restoring habitat for native plants and animals. Our 900-acre property, under permanent protection with a conservation easement in central Fauquier County, provides a beautiful and easily accessible environment for our programs. **2019 was our best year yet: we taught more people, restored more acres, and learned more about Piedmont ecology than ever before.**

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Eleanor Harris, Ph.D., Managing Director  
Alison Zak, M.A., Education Associate  
Feliecia Brooks, Administrator  
Ken Lang, Groundskeeper  
Calob Schminkey, Assistant Groundskeeper

Our grasslands are valuable habitat for declining native species and a resource for our education and research programs.

There are always things to look at, ask questions about, and walk on in the woods.
Eleanor loves being outside with kids and seeing what they get curious about on the trail.

Piedmont Polliwogs camp was Alison’s favorite week of the year!

We could not do what we do without the help of our community.

Bert’s favorite part of the year was seeing summer campers excited to find animals, like this crayfish.

Felicia enjoys teaching people about her passions, including dyeing with native plants.

You can find upcoming events, and subscribe to our monthly e-newsletter on our website and you can follow us on Facebook for news and stories from the field station.
In 2019, we reached almost twice as many people as in 2018 and over four times as many as in 2017.

1,587 children attended 41 field trips or off-site programs, 20 free monthly YHikes! and Piedmont Polliwogs, and 4 weeks of summer camp.

603 adults attended 52 public programs about nature and conservation.

35 volunteers contributed 345 hours to help us lead education programs and maintain and construct trails that we use for our education programs.

9 high school interns and 12 college interns learned what it’s like to work at an environmental field station and contributed to research projects.

We provided programs to people of all ages from across our region throughout the year.

In 2019 we provided field trips for 17 schools from Fauquier, Loudoun, Frederick, Fairfax, and Stafford Counties, six of which had never visited before. We also provided programs for the Boys & Girls Club of Fauquier, the Windy Hill Foundation, the Fauquier Community Childcare Center, and the Child Care & Learning Center, as well as four homeschool groups, all three Fauquier County library branches, and one Scout troop. Our most popular children’s program of the year was our monthly Piedmont Polliwogs for 2-5-year-olds, which we started in February 2019. In 2019 we offered pre-K field trips for the first time and we led more middle school and high school field trips than ever before.

We let grownups in on the fun, too! Last winter we hosted adult public programs about night sky photography, winter tree identification, mathematical patterns in nature, and human-wildlife coexistence. In the spring we held workshops on nature sketching and warbler song identification. In the summer, visitors learned about beetles, moths, butterflies, grassland plants, and “bugscaping.” In the fall we dyed wool with native plants, did yoga, and hosted our first book club. Each type of program we provide (field trip, family hike, summer camp, or public program) looks a little different, but every one of our visitors gets to have fun outside, learn about native plants and animals, and join our community of nature lovers and naturalists.
Getting kids outside is good for them, good for our community, and good for the environment.

We can see the impact our programs have on our visitors: the spark of curiosity, evidence of their increased understanding of the ecology of the northern Virginia Piedmont, and the change in their attitudes towards plants and animals. During our environmental education programs, our students experience wonder and curiosity in nature and develop their scientific and critical thinking skills. Even on short walks, we notice students observing patterns and developing interesting questions about what they’re seeing. Our students also form personal relationships with nature and develop compassion for other living creatures. When people spend time outside, their mental health improves because they are in a peaceful setting, they feel connected to the land and their community, and they experience a sense of wonder in nature. Their physical health also improves from being active. We often ask our students to share their favorite part of the program, and most of them say that it’s just getting outside. After summer camp, multiple parents told us that their children were starting to explore their backyards with a newfound interest in nature and sense of independence. We also hear from teachers about the positive impact field trips have on their students.

"Thank you so much for our trip today! The kids were raving about it on the bus. Luis, who said he thought it was going to be boring because all he likes is video games and his phone, said it was the best field trip ever."

—Text from a teacher after a field trip

Three school buses arrive on the field station for a field trip.

A summer camper shows a flower in her nature journal.

"We loved everything about the day. You all communicate with the students so positively, and we really appreciate your open-ended questioning and thinking. We loved how you were willing to stop and examine even the smallest detail, because it wasn’t so small to one of the children."

—Teacher response to a post-field-trip survey

Attendees at one of our monthly bird walks find a White-crowned Sparrow.

Summer campers explore one of our streams.
RESTORATION
Conserving early successional habitats to benefit declining species

Early successional birds are declining faster than those that live in any other habitat in North America. We manage 300 acres of early successional habitats (grasslands and shrublands) to benefit native species and to control non-natives. Our target bird species are American Kestrel, Prairie Warbler, Grasshopper Sparrow, and Field Sparrow, all of which are declining across the Northeast as a result of habitat loss and degradation. Insects in grasslands are declining too and are much less studied than birds. Our grasslands host eight species of bumblebees, including uncommon species such as Sanderson’s Bumblebee, and significant populations of American and Black-and-gold Bumblebees, both of which are thought to be declining. As we work to restore and maintain these valuable habitats, we conduct regular surveys of the birds, insects, and plants in our grasslands and shrublands to make sure our restoration projects are having the intended effect.

Grasshopper Sparrow
American Bumblebee
Volunteers help conduct a prescribed burn in our shrublands.
Organic native meadow establishment
Volunteers build a fence to enable rotational grazing in our cattle pasture.
Volunteers help clean seeds of native plants.
One of our volunteers sets up a kestrel box.
Managing Director ready for a prescribed burn.
Scouts plant native seedlings.
Photo by Cameron Darnell
In 2019 we started a major grassland restoration experiment. We are working to restore 110 acres of a former cattle pasture that is dominated by fescue to a native grassland to benefit native species. We are comparing the effectiveness of eight different experimental treatments, such as prescribed burning, herbicides, and repeated discing (plowing), to establish a native grassland (see the map below). We have joined forces with Virginia Working Landscapes, the Oak Spring Garden Foundation, and North Wales Farm to implement this project. Together with our interns and collaborators, we are surveying birds, insects, plants, and soils and tracking expenses to find out which treatments help native species without being too expensive.

We cleared 30 acres of Autumn Olive saplings in our shrublands to allow native plants to recolonize.

We burned 8.5 acres of shrublands to control exotic species and promote native ones.

We planted 850 native grass and wildflower seedlings in degraded fields to restore native plant communities and provide habitat for pollinators. Thank you to Earth Sangha and Hill House Farm and Nursery for donating many of the seedlings!

We collected seeds from 38 grassland plant species, which we are rearing in our greenhouse. We will use the seedlings to establish backup populations of rare Piedmont prairie plants and distribute local ecotype plants to landowners.

We monitored 31 nest boxes for American Kestrels and Eastern Bluebirds, from which 10 kestrels and 26 bluebirds fledged.

79 volunteers contributed 1,003 hours to help us remove invasive species, do prescribed burns, clean and sort native plant seeds, plant seedlings, manage our deer population, build fences, and monitor nesting boxes.

30 people attended the grassland restoration tour we held with Virginia Working Landscapes in July and learned about remnant and planted meadows in our region.
**RESEARCH**

We do scientific research to learn about the ecology of the northern Virginia Piedmont, to teach future generations of scientists, and to guide land management.

**Restoration Ecology**

Landowners in our region need to know how native biodiversity responds to different habitat management techniques. We are collecting data to answer these questions. For example, in 2019, we studied the condition of our pasture before we started the restoration experiment. Last summer, one intern and five volunteers helped us collect plant data from 70 points in the pasture, insect samples from 68 points in the pasture, and soil samples from 140 points in the pasture, as well as from four native grassland remnants. We found that pastures that are dominated by exotic grasses have clearly different microbial communities than native grasslands (see the graph to the right). **Having high-quality baseline data will allow us to quantify how conditions improve as our restoration project progresses.** We expect to see increases in the diversity of native insects and plants and healthier soils as the experiment progresses.

One of the methods we use to maintain both grasslands and shrublands is prescribed fire, which tends to promote native species and hurt exotic ones that are not adapted to fire. However, one exotic species, Chinese Lespedeza, has been found to benefit from prescribed fire in some areas. In the fall, interns from the Smithsonian-Mason School of Conservation and Fauquier High School studied whether Chinese Lespedeza abundance has been affected by prescribed fires on our field station in the past. They found no effect of fire on the species, which lends support for the use of prescribed fire to manage early successional habitats in our region.

**Young Scientists Research Experience**

In July 2019, we gave three middle and high school students the opportunity to engage in hands-on scientific research during our first ever Young Scientists Research Experience. On the first day of the week, they each chose their own research question. They spent the next three days collecting data to answer their questions and the fifth day analyzing their data and preparing to present their results to their family and other guests. The scientists on our staff mentored them through the whole process. One student found that bigger pawpaws make more fruit; another found that Grasshopper Sparrows prefer fields where cattle are present to those where they are not (see graph to the right); and the third found that both Field Sparrows and Common Yellowthroats prefer shrublands over grasslands. We can’t wait for next July to do it again!
Effects of Urbanization on Mole Salamanders

Mole salamanders in the genus *Ambystoma* spend most of their adult lives underground in mature forests, but they migrate to vernal pools in the spring to mate and lay their eggs in the water where their larvae will develop before becoming terrestrial. Two species of mole salamanders live at the Clifton Institute: Spotted Salamander (*Ambystoma maculatum*) and Jefferson Salamander (*A. jeffersonianum*). In the spring of 2019, three college students, a high school intern, and a volunteer monitored vernal pools from Arlington to the Shenandoah Valley to study how urbanization affects mole salamander breeding behavior and success. The salamanders seem to be able to reproduce in urban areas as long as large forested parks with vernal pools are available, but analysis is ongoing.

Citizen Science Surveys

In January 2018 we launched a project with the goal of documenting all of the species of animals, plants, fungi, and protists that are found on our 900-acre field station. We are using the iNaturalist app to document and identity what we find. **We closed out 2019 with 1,294 species in our iNaturalist inventory (Maryland Senna was the last for the year) and 191 species on our bird list (Green-winged Teal is the latest addition to our eBird hotspot).** If you’ve never used iNaturalist, we would highly recommend it: it’s a great resource for identifying plants and animals, for learning about the native biodiversity of Virginia, and for engaging young people in the search for new and interesting species. You can find our project at cliftoninstitute.org/iNaturalist. In April we partnered with the Bull Run Mountains Conservancy to conduct “bioblitzes” on our property and on the Bull Run Mountains. Thirty-one people came to our property and added 76 new species to our iNaturalist project. In July we held our 24th annual butterfly count: 26 citizen scientists helped us find 42 species of butterflies, including a Clouded Skipper, which had never been seen on the count before. Finally, in December we conducted our 22nd annual Christmas Bird Count: 28 citizen scientists helped us find 90 species of birds.

One Young Scientist did bird surveys along transects in our grasslands and found significantly more Grasshopper Sparrows in fields where cattle were present than in those where cattle were absent.

The Rainbow Dung Beetle is one of the more colorful species we documented in 2019.
It is only because of the support of generous individuals and foundations that we are able to provide environmental education, carry out restoration projects, and conduct scientific research. We received $297,323 in contributed support in 2019, 72% more than in 2018 and 172% more than in 2017. On top of that (and not included in the support and revenues shown below), in 2019 184 volunteers contributed 2,572 hours, which is valued at $65,406. Our total support and revenues exceeded our expenses by $131,018, putting us in a good financial position to continue to expand our programs in 2020 and beyond. Thank you to everyone who supported us in one way or another! You helped make 2019 our best year yet.

Contributions Received in 2019

**$10,000 and up**
- Marjorie Sale Arundel Fund for The Earth
- Elizabeth Ann Hylton
- Charles and Mary Mackall
- Ohrstrom Foundation
- PATH Foundation
- Nancy and Dick Raines
- Roller-Bottimore Foundation
- Shearwater Foundation

**$5,000-$9,999**
- Roger Jones
- Randall L. and Catherine D. Mayes

**$1,000-$4,999**
- William M. Backer Foundation
- BWell Today for Tomorrow
- Daniel and Susan Carter
- Leslie and Marilyn Cheek
- Bert and Eleanor Harris
- Elizabeth Haynes and Peter Brush
- Luanne Lemmer and Eric Veach
- Bruce and Susan Jones
- James and Bonnie Kraut
- Doug and Liza Larson
- Cliff Miller III
- Natural Resources Conservation Service

**$500-$999**
- Anonymous (2)
- Robert and Elizabeth Blakney
- Earth Sangha
- Mark Gruin
- Diane Mucci and Liz Holland
- Hope Porter
- Mark Reed
- Don Ritter and Victoria Stack
- Rockley Foundation
- Rosenstiel Foundation
- Fera Simone

**$500-$999**
- James and Bonnie Kraut
- Doug and Liza Larson
- Cliff Miller III
- Natural Resources Conservation Service

One of our shrublands.

Summer campers make and follow a map of the yard.
A summer camper looks at a bug under a magnifying lens.

$100-$499
Mary M. Abel Smith
Airlie
Ken Alm
American Bird Conservancy
Sally Anderson and Richard Cooper
Anonymous (4)
Kelp and Michael Armstrong
John Beardsley and Steph Ridder
Liane Benedict
Ed and Nancy Bernacki
Langhorne M. and Enriqueta Bond
Susan and Charles Brinkman
Edwin and Julie Broadus
John and Winny Buursink
Citizens for Fauquier County
Deirdre Clark
Francisco Dallmeier
Robert Darnell and Christine Greenlees
Ed and Nancy Bernacki
Langhorne M. and Enriqueta Bond
Susan and Charles Brinkman
Edwin and Julie Broadus
John and Winny Buursink
Citizens for Fauquier County
Deirdre Clark
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Robert Darnell and Christine Greenlees
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John Beardsley and Steph Ridder
Liane Benedict
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Susan and Charles Brinkman
Edwin and Julie Broadus
John and Winny Buursink
Citizens for Fauquier County
Deirdre Clark
Francisco Dallmeier
Robert Darnell and Christine Greenlees
Up to $100
Robert Abrams and Joan Boudreau
Afrro-American Historical Association of Fauquier County
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Barbara Tourtelot
Amy Trotto
Ed and Helen Vaughn
Karen Wachtmeister
George and Beth Wallace
Holly Williams
Eileen A. Wilson
Wenyan Zhang

A homeschool group on the trail.

Education Associate Alison Zak shows students an Eastern Tiger Swallowtail.
Piedmont Polliwogs show the turkeys they made during craft time.

Students take turns holding a millipede.
PARTNERS

We are grateful for our partner organizations who help us provide educational programs, carry out our restoration projects, and conduct scientific research.

American Farmland Trust
Bull Run Mountains Conservancy
Chesapeake Bay Foundation
Oak Spring Garden Foundation
Old Rag Master Naturalists
Smithsonian-Mason School of Conservation
Virginia Native Plant Society
Virginia Working Landscapes
Warrenton Garden Club

GOALS FOR 2020

Our goals for 2020 are

• to teach 1,800 pre-K-12 students and 600 adults about nature and the environment,
• to expand our programs for middle school students,
• to prepare 110 acres of grasslands for the establishment of native plants,
• to restore 40 acres of shrublands to benefit declining birds,
• to document and conserve the flora of remnant Piedmont prairies,
• and to study American Kestrel habitat requirements and grassland bird nesting success.

We hope we’ll see you out here before the year is out!