



# The Clifton Institute

2019 Annual Report



# 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.**



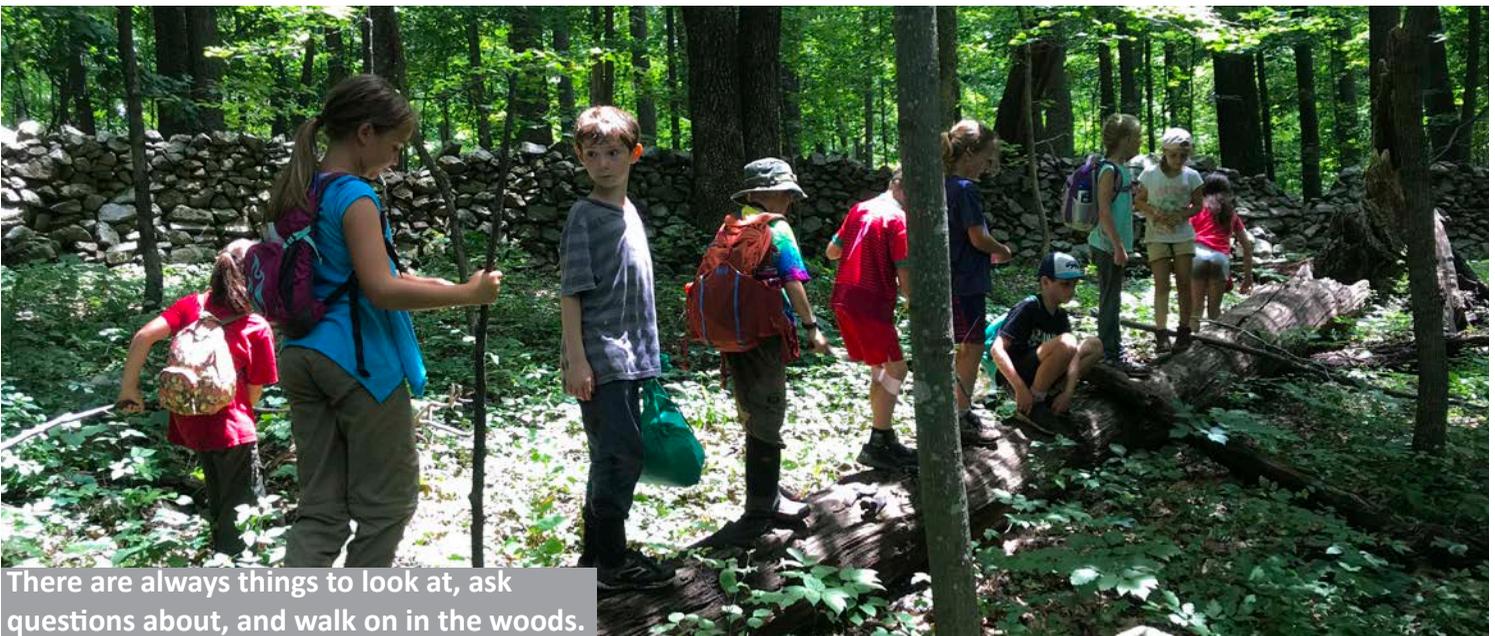
Our grasslands are valuable habitat for declining native species and a resource for our education and research programs.

## Our Board of Directors

Douglas Larson, President  
Robert C. Karch, Ed.D., Vice President  
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## Our Staff

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



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.



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



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



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



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

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.

# EDUCATION

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.

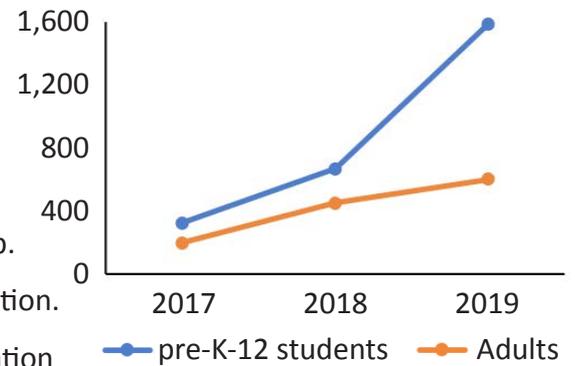
**35 volunteers contributed 345 hours** to help us lead education programs and maintain and construct trails that we use for our education programs.

**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.**



High school students learn about the invertebrates that live in our streams.



Participants in our butterfly program look for butterflies in our native garden.



Our vernal pools are a popular and interesting spot to take a break and look for amphibians.



Elementary school students get a hands-on experience with nature.

"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.

## 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.



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



Summer campers explore one of our streams.



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

# 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.



Managing Director ready for a prescribed burn.



Grasshopper Sparrow

Photo by Cameron Darnell



American Bumblebee



Scouts plant native seedlings.



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.

## 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.



Establishment	Maintenance
Control (no spraying or planting)	+ mow
Control (no spraying or planting)	+ burn
Spray once, plant nothing	+ mow
Spray once, plant nothing	+ burn
Spray three times and plant diverse seed mix	+ mow
Spray three times and plant diverse seed mix	+ burn
Organic establishment (discing)	+ burn
Organic establishment (discing)	+ mow
Riparian buffers	

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.

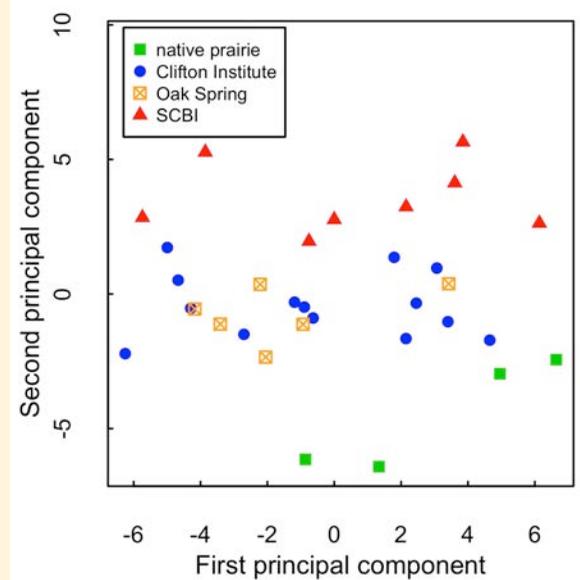
One of the methods we use to maintain both grasslands and shrublands is prescribed fire, which tends to promote native species and hurt exotic ones that are not adapted to fire. However, one exotic species, Chinese Lespedeza, has been found to benefit from prescribed fire in some areas. In the fall, 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

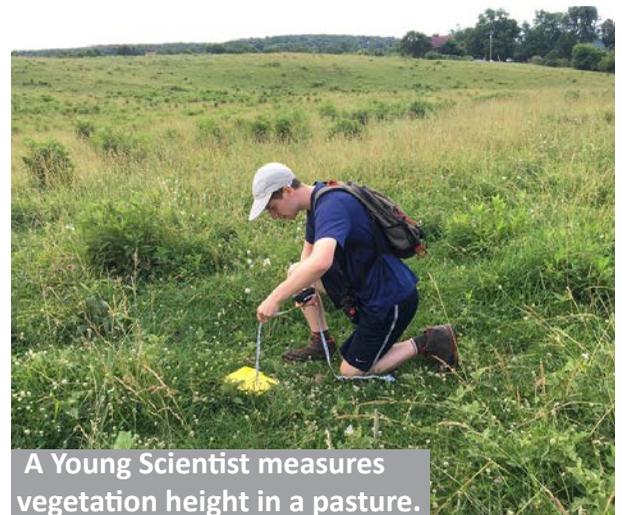
In July 2019 we gave three middle and high school students the opportunity to engage in hands-on scientific research during our first ever Young Scientists Research Experience. On the first day of the week, they each chose their own research question. They spent the next three days collecting data to 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!



Volunteers in our grassland restoration experiment help collect soil that was analyzed to produce the graph below.



Principal components analysis of 27 microbial soil variables at four native grasslands and 28 fescue-dominated pastures (on our property, at the Oak Spring Garden Foundation, and at the Smithsonian Conservation Biology Institute). **Native prairies had more diverse and more complicated microbial soil communities. There were more microbes overall, more fungi, more predators, and fewer bacteria in native prairie compared to fescue pastures.**



A Young Scientist measures vegetation height in a pasture.

# 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.



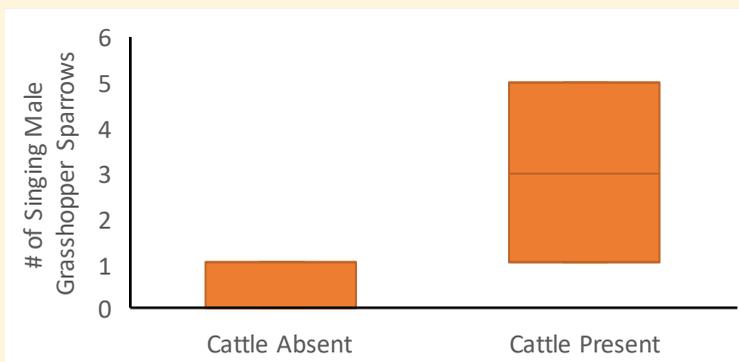
One of our high-school interns in her habitat.

## 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 identify 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](http://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 24<sup>th</sup> 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 22<sup>nd</sup> annual Christmas Bird Count: 28 citizen scientists helped us find 90 species of birds.



Participants in our bioblitz identify mushrooms in the woods.



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.**

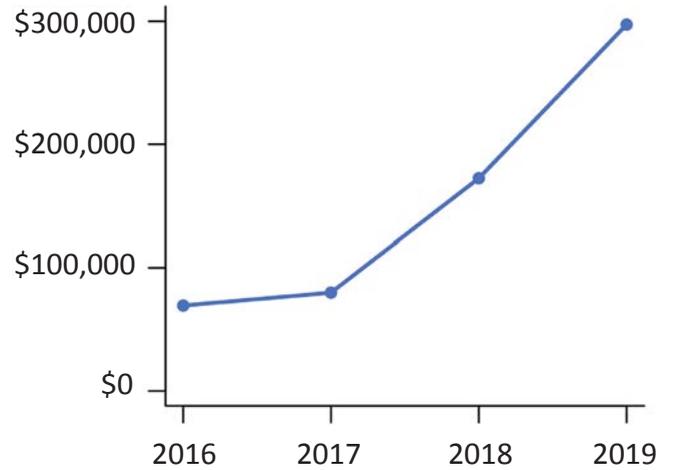


The Rainbow Dung Beetle is one of the more colorful species we documented in 2019.

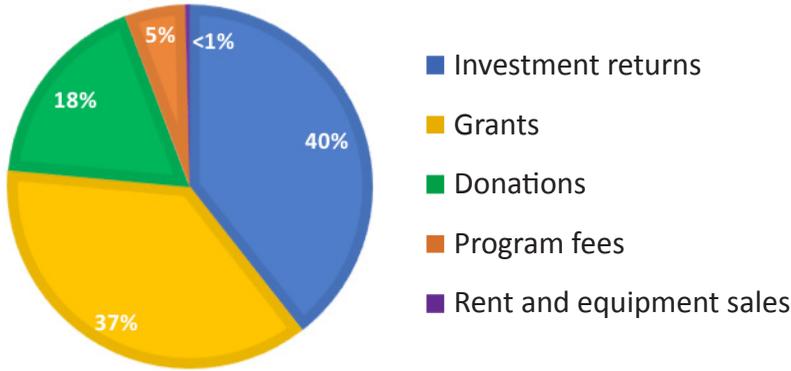
# SUPPORT

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.

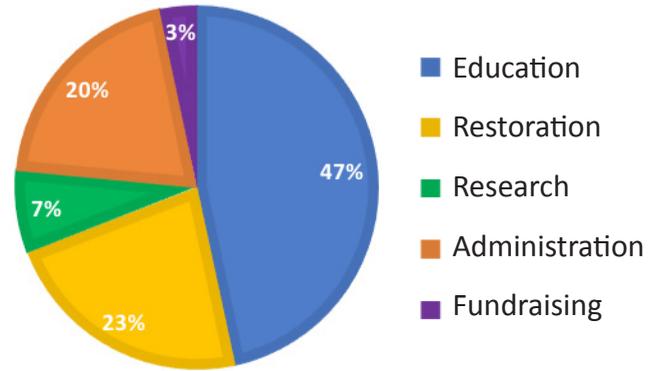
## Contributed Support



## Total Support and Revenues \$542,650



## Total Expenses \$411,632



## 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

### \$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  
 George Ohrstrom  
 Meade M. Palmer Memorial Fund  
 William G. Prime  
 David Snyder  
 Phoebe Tufts  
 Joseph Volpe III  
 Warrenton Garden Club  
 Tom Wood

### \$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

### \$5,000-\$9,999

Roger Jones  
 Randall L. and Catherine D. Mayes



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 Broaddus
- John and Winny Buursink
- Citizens for Fauquier County
- Deirdre Clark
- Francisco Dallmeier
- Robert Darnell and Christine Greenlees
- Susan Day
- David and Karissa Epley
- Victoria Fortuna
- Judy Gallagher
- Rick and Hilary Gerhardt
- Goose Creek Association
- Karen Greene
- Peter Stephens and Kristine Haataja
- Elizabeth and Barry Hamilton
- Joyce Harman
- Hartman Jewelers
- John T. Hazel
- Caroline E. Heald
- Karen Hendershot
- Thomas Higginson
- Hill House Farm and Nursery
- Timothy Hinchman
- Greg Huddleston
- Joshua Jakum
- Melissa A. Johnson
- Stephen A. Jones
- Robert Karch
- Jeanette King
- Diane Krumme

- David and Linda Larsen
- Michael Larson
- Robert and Blair Lawrence
- G. Robert Lee and Sue Kellon
- Mary Frances LeMat
- Thomas Lovejoy
- Jody Marshall
- Emily and Steven Mickelwait
- David Norman
- Northern Piedmont Community Foundation
- Leah Oliver
- John R. Parks
- Jean Perin
- Marion K. Poynter
- Peter E. Quint
- Paula Rabkin
- Cynthia Rivera
- Susan W. Russell
- Sue Scheer
- Gerry Sikorski
- Jane Smith
- Mark and Candice St. Onge
- Richard Starke
- Michael and Margrete Stevens
- Page D. Styles
- Byron Swift
- Patrick Tallarico
- Eudora E. Thorpe and John Rice
- Sheryl P. Twining
- Eric and Amy Venclik
- Virginia Herpetological Society
- Virginia Native Plant Society Piedmont Chapter
- Adie and Beatrice Busch von Gontard
- Arthur and Elizabeth von Keller
- Jim and Meghan Whatton
- Richard and Molly Poole Wolfe
- Don and Marianne Wood

**Up to \$100**

- Robert Abrams and Joan Boudreau
- Afro-American Historical Association of Fauquier County
- Amazon Smile
- Rick and Betsy Anderson
- Joyce Andrew
- Anonymous (17)
- Anne Douglas and Henry Atherton
- Michael Barreda
- Romney Bathurst
- Marion Beers
- Matt Bright and Katherine Isaacson
- Callie Broaddus
- Kathy Christie
- Robert and Brenda Crawford
- Laurel D. Crooks
- Robert Dornin

- Charles and Arlene Folkers
- John G. Fox, II
- Larry Giesting
- Gail Gilbert
- Tom and Leigh Gill
- Sarah Gustafson
- Pamela Alley Hagan
- Steven Hall
- Richard Heppard
- Brandon Jasionowski
- Andy Johnston
- Marionette Jones
- Angela Kemp
- Peggy Kenney
- Diane King
- Claire Kluskens
- Donna R. Kuroda
- Patricia Lane
- Daniel and Nancy Langberg
- Sara Ann Lawrey
- Edmund LeGrand
- Barbara Liechti
- Robert and Anna Lim
- Marion Lobstein
- Kathy Louthan
- Jonathan and Beth Lynn
- Brian Mayell
- Mary Pat McCartney
- Carole Miller Herholtz
- Dusty Morlier
- Janie Mosby
- Tim Nosal
- Mary O'Meara
- John and Joyce Palm
- Elizabeth K. Perreten
- Esther C. Peters
- Charles Phillips
- John and Carol Pitts
- Eric and Kristina Purkey
- Leighton Reid
- Sue Russell
- Sarah S. Hodgkin Trust
- Martha H. Spencer
- Anita Sutherland
- 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



Some summer campers signed up for an all-day hike and got to see far-flung corners of the woods.

# 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.



Jordan Coscia from Virginia Working Landscapes conducts a plant survey in our grassland restoration experiment.



Families attending YHikes! have a quiet moment.



Volunteers at Let's Volunteer Day help remove invasive species from our shrublands.



Thanks for reading!

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