In Memoriam

Cathy Mayes, who lived with her husband, Randy, outside Hume, contributed time, energy and wisdom to a number of groups in our region, including the Clifton Institute. As a conservationist, Cathy’s main interest was native plants. Prior to joining our Board in December 2019, she was among the teams of volunteers identifying plants on surveys organized at Clifton, as well as by Virginia Working Landscapes. “She was there with a smile, ready to move ahead, even when the briars were tall and the weather too hot,” said fellow Clifton board member Jocelyn Sladen, who partnered with Cathy on many such surveys. “She especially smiled when she pulled me out of a muddy ditch on a survey we did together.” Cathy will be greatly missed by all of us.

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Our Mission

is to inspire future generations 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.

2020 presented many challenges, but we learned to adapt and are proud of how much we accomplished during a difficult year.

Learn More

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While we certainly recognize the four seasons, at the Clifton Institute we divide the year into many more seasons than that. In early February comes Woodcock season; June through August is our main research season; and, normally, October and November are field trip season. That’s one of our seasons that the coronavirus pandemic disrupted.

However, the pandemic also introduced new seasons: virtual event season March through May and Nature School season September through December. The calendar below shows some highlights of what we accomplished in 2020, as well as the events in the natural world that we look forward to learning about and sharing with our community every year. No matter what season it is, we love getting outside to learn about and experience nature with you!
Our goals for 2021 are:

- to teach 1,500 children and adults about nature and the environment;
- to finish establishing plants in our 100-acre grassland restoration experiment;
- to provide advice to 40 landowners on how to manage their land for the benefit of native plants and animals;
- and to study the nesting habitat requirements of American Kestrels.

We also plan to host our first ever annual community science Dragonfly Count, provide our first Nature Camp for Grownups, publish reports on past research projects on our website, and install trail signs to make it easier than ever for Friends of the Clifton Institute* to explore our property.

*With a minimum $40 annual donation, you can become a Friend of the Clifton Institute and get access to our trails every Saturday from mid-January to mid-October and discounts on many of our education programs.
The Box Turtle cohort of one of our Young Explorers summer camps.

**Education**

**631 students**
attended 31 school programs, 23 family hikes, and 4 weeks of summer camp.

**683 adults**
attended 58 walks and talks.*

**13 interns**
learned how to do science and work at an environmental nonprofit.

**20 volunteers**
contributed 400 hours to help us lead education programs and maintain trails we use for our education programs.

We adapted to the coronavirus pandemic by providing lots of small, in-person programs and producing more virtual education content than ever before.

*This number represents attendance at Clifton Institute programs and does not include approximately 100 people who attended Bert’s talk at the Woods and Wildlife Conference, approximately 40 people who watched Bert’s talk at the Virginia Herpetological Society conference, or over 700 people who have viewed recordings of our talks on YouTube.
It took some getting used to, but we enjoyed learning how to give talks on Zoom and make videos, and we plan to keep offering virtual programs even when coronavirus restrictions lift. One advantage of going virtual was that we were able to have participants log into our talks and workshops from all across the eastern United States. In fact, because of our Zoom programs, we reached more adults in 2020 than ever before. You can find recordings of several of our programs, as well as other videos on activities for kids, tours of the field station, and other peeks into what we’re working on, on our new YouTube channel.

With the pandemic bringing in-school operations to a halt, we hosted many fewer field trips than usual. Instead, we started offering our own series of weekday programs for students who were in either virtual or hybrid school. One advantage of these series over field trips is that we were able to see the same students over and over, rather than just once, and they learned so much by coming back on repeat visits.

In 2020 our programs looked a little different (limited attendance, socially distanced, with masks), but our goals remained the same, namely, to teach people about the natural history, ecology and evolution of native plants and animals; to inspire curiosity, wonder, and compassion for nature; to foster scientific and critical thinking skills; and to promote physical and mental health through outdoor activity and quiet time in nature. By what we hear from students, parents, and participants, we know we are accomplishing those goals.

“As a parent, I appreciate not just the outside time Clifton offers my children, but the pace of the programs. It isn’t a ‘learn all you can about nature in a few short hours’ model, but rather, an opportunity to experience and enjoy nature with a focus on walks and observation across all seasons and types of weather (while learning!).”

— parent of Nature School students
In September, we started two new series to give students the opportunity to get outside, learn about nature, and spend time with other children while they were in virtual or hybrid school. Nature School for grades K-5 meets every other Wednesday. At every session we teach a lesson about different topics (for example, waterfowl, leaves, and beavers) and then go for a walk to explore and see if we can find the day’s topic in the wild. An average of 18 students attended each session! Middle School Nature Club for grades 6-8 meets every month and a great group of students has started coming to every meeting to experience new ways of playing and learning in nature— for example, building a survival shelter, measuring beaver stumps, and making nature mandalas. We also hosted 13 in-person and virtual field trips for schools and homeschool groups and eight other weekday programs.
Summer Camps

The best weeks of the year! First was half-day Piedmont Polliwogs camp for ages 4-6. The five campers read stories, practiced animal yoga, and walked on a new trail each day. Next up was our Young Scientists Research Experience for ages 13-18. Seven Young Scientists spent a week conducting independent research projects and then presented their findings to family and friends. Last were two sessions of Young Explorers camp for ages 7-12 attended by thirty-eight children. Every morning of camp, we hiked and explored streams, fields, and forests. During Learning Lab, the campers dove into topics like how to identify plant families, how beavers build dams, and what we can learn from an animal’s skull. We also made time to nature journal and make crafts. After a week together, the campers were friends with each other and our staff and we are always sad to see them go.
Family Hikes

In 2020 we continued to offer two free monthly hikes for children and their families: Piedmont Polliwogs for children ages 2-5 and YHikes! for children ages 6 and up. We also started offering a second YHikes! each month to make sure as many families as possible could get outside together. During these programs, our goal is to give children the opportunity to explore freely in nature. They stop and look at whatever plants or animals pique their interest. The whole group learns from each child’s discoveries and our staff are often surprised by what the children find on the trail! Coming back month after month, families watch the seasons change and learn what the landscape looks like at all times of year.
Adult Programs

Throughout the year we offered a diverse set of adult programs that ranged from unstructured exploratory hikes, to scientific talks, to opportunities to practice mindfulness and everything in between. We hosted bimonthly bird walks, monthly Mindful Naturalists programs, and monthly Walks with a Naturalist, as well as many more seasonal programs. We also continued our quarterly nature book club. Our most popular adult program was our Warbler Song Bootcamp, which was virtually attended by 70 people! Other highlights included our annual Woodcock Watch, our first annual Party in the Pawpaw Patch, a Beaver Watch, and talks on Piedmont prairies, grassland restoration, mathematical patterns in nature and what species really are. We’d love to see you at one of our programs soon!
During 2020, we cleared 21 acres of Autumn Olive saplings in our shrublands to allow native plants to recolonize, burned 15 acres to prevent succession, control exotic species and promote native plants, and mulched 11 acres of shrublands to prevent succession to forest.

We propagated over 2,000 seedlings from seeds of 79 species of native plants, which we planted in 2 new gardens of exclusively local-ecotype seedlings and distributed at 2 plant sales.

And we visited 12 local landowners to give advice on managing their properties for the benefit of native biodiversity.

61 volunteers contributed 855 hours to help us remove invasive species, conduct prescribed burns, clean and sow native plant seeds, manage our deer population, build fences, and monitor nesting boxes.
In our restoration work, our goals are to promote native species, especially those that are declining, and to restore, as much as possible, the community of plants and animals that lived here before European settlement. Accordingly, we advocate using regionally appropriate species in wildflower meadows or other plantings. Before undertaking a restoration project, we read existing research and speak to other land managers to understand what species we should be establishing and what the best methods of doing so are. We also conduct scientific research about how to establish and maintain native plant communities. Our 900-acre property gives us a lot of room to provide high-quality habitats for native biodiversity. We also educate the public and give advice to local landowners about best practices. **Through this work, we are having an impact not just on our property but across Virginia and beyond.**

The Clifton Institute, along with most of Fauquier County, falls within the Piedmont biogeographic region. The Piedmont, which is found in between the Blue Ridge Mountains and the Coastal Plain from Pennsylvania to Alabama, is a hilly region dominated by granitic bedrock and clayey soil. Before European settlement, the Piedmont was home to extensive prairies and savannas that were maintained by natural and anthropogenic fires and grazing bison. While we work on habitats at all stages of succession, we are particularly interested in restoring and maintaining these early successional habitats. We are members of the Piedmont Prairie Partnership, through which the results of our research on Piedmont prairie restoration are informing landowners and managers across the Piedmont region.

A Grasshopper Sparrow in our native grassland. This is a rapidly declining species for which we are trying to provide habitat. Photo by Alex Shipherd.
Native Seed Propagation

Seeds of many of the characteristic and beautiful plants of Piedmont prairies are not available from commercial sellers. Sometimes seeds are available but only of genetic variants from other parts of North America. To address this issue, in 2019 we started collecting seeds from native plants and propagating them. (We always collect with permission and leave the vast majority of seeds at any site.) In the fall of 2020, Bert collected seeds of 79 species and volunteers are helping us clean the seeds, sow them, and re-pot the seedlings. We distribute seedlings and seeds to the public at plant sales and we use the rest to establish example pollinator meadows with all-local plants. We sold over 750 seedlings at our two plant sales in 2020, as well as enough of a custom seed mix of locally appropriate species to cover 24,500 square feet. We will be holding our next sale on May 15, 2021. Thank you to the Warrenton Garden Club who generously supported this work!
Shrubland Management

Shrublands are an important habitat for many declining species of birds, including American Woodcock, Yellow-breasted Chat, Prairie Warbler, and Field Sparrow. This habitat is disappearing due to development, the invasion of non-native plants, fire suppression, and because, if left unmanaged, shrublands turn into forests. Unlike grasslands, which can be mowed or burned once a year, shrublands should only be cut back every two to five years to allow the shrubs to grow up. For the last three years we have been working to get all of our shrublands into a regular management rotation. Thanks to support from the Robert F. Schumann Foundation, we were able to purchase the equipment we needed to conduct prescribed burns and in 2020 we burned 15 acres of shrublands, more than ever before. Despite our work over the last few years, there were a few areas that had grown up so much as to be impossible to either burn or bushhog. In December 2020 volunteer Mark DeBord spent three days using his own forestry mulcher to cut back 11 acres of these intractable spots. Going forward, we will be able to mow or burn these areas ourselves. The hard work is worth it, as we found more Prairie Warblers in our shrublands in 2020 than in past years, and our interns documented over 60 species of plants in these fields, including characteristic plants of high-quality prairies such as Elliott’s Bluestem, Green Milkweed, and Rose-pink.
We do scientific research in order to determine the best methods for conserving declining plants and animals, to understand the effects of our and others' restoration work on native biodiversity, to learn about the ecology of the northern Virginia Piedmont, and to teach students and our community how to do science. Every year we focus our efforts on one major project and in 2020 that was studying remnants of the Piedmont prairies that were once widespread in our area. You can find the results from past studies on our website at cliftoninstitute.org/research/reports and we will be publishing reports on our 2020 research projects there soon.

Northern Piedmont Prairie Surveys

Piedmont grasslands are diverse and understudied habitats that are home to several declining bird and insect species. During the summer of 2020, Clifton Institute staff and interns, together with Virginia Tech, Virginia Working Landscapes, and the Center for Urban Habitats surveyed the plants in 37 unplanted grasslands in five counties. Our goals were to determine which species of plants are found in grasslands in the northern Virginia Piedmont; to identify threats and conservation solutions for these important habitats; and to design seed mixes for use in wildflower meadow plantings and grassland restoration projects in the region.

Over the course of the study, we found 433 species of plants, 84% of which were native, including four state-rare plants and one globally-rare plant (Torrey’s Mountain-mint). The most diverse meadows were found on relatively basic, clay hardpan soils, but high-quality meadows were also found on soils derived from more acidic sandstone and greenstone bedrock. Surprisingly, the highest quality grasslands were found in powerline clearings, where annual mowing maintains diverse plant communities. Unfortunately, three populations of rare plants in powerline clearings were accidentally sprayed with herbicide by power companies during our study. Several sites also are threatened by invasion of plants from Asia, Europe, and the Midwestern United States. The Clifton Institute is continuing to work with power companies, government agencies, and private landowners to improve management of these special grasslands. We also have designed a seed mix to use for meadow plantings in our area so that wildflower meadow plantings can provide excellent habitat while also being beautiful and easy to establish. If you need advice about how to establish your own wildflower meadow, please get in touch with our new Land Management Outreach Associate Marie Norwood.
Young Scientists Research Experience

During our Young Scientists Research Experience, middle and high school students spend a week conducting independent research projects under the guidance of our staff, who get to share the experience of their graduate degrees with the next generation. In 2020 seven students participated, and they found:

• that bees tend to prefer scented flowers like sumac, butterfly milkweed, and common milkweed;
• that there are more species of birds singing in Clifton’s forests than in its fields;
• that dragonflies are more abundant in shallow water than deeper water;
• that mushrooms are more common in forests than in other habitats;
• and that wineberries are more abundant than other brambleberries in forests.

In addition to their specific research results, the students learned the valuable skills of formulating research questions, collecting data, and performing statistical analyses. The students’ projects also gave our staff ideas about research we should conduct ourselves in the future!
American Kestrel Habitat Requirements Pilot Study

American Kestrels are declining and, despite much interest in this charismatic falcon, scientists still do not fully understand why. Kestrels need open fields in which to hunt rodents and insects, but it is not known what types of fields — cattle pastures, hay fields, crop fields, wildflower meadows, or shrubby fields — are best for kestrels, and there is little information for landowners who want to provide habitat for kestrels. In 2021 we will be attaching GPS transmitters to 19 kestrels to track what types of fields they forage in and how that relates to their reproductive success. In 2020 we conducted a pilot study, during which intern Alex Shipherd observed kestrel foraging behavior to give us a preliminary idea of the types of fields they favor and what procedures we should use in 2021 to capture adults and attach the transmitters. We are really excited to get the full project underway this year.

Seed Bank Study

Since 2019 we have been working to establish native plants in a 100-acre field that was dominated by non-native plants. Along with Virginia Working Landscapes and the Oak Spring Garden Foundation, we are testing the effectiveness of four establishment methods. One is to spray non-native plants with herbicide with the goal of allowing seeds of native species in the soil (the “seed bank”) to germinate. This will only work if viable seeds of desirable species are present in the soil. Our best guess at what species are in the seed bank is to survey the plants that are currently growing in the field, but it’s not known how accurate that is. In the spring, intern Rachael Harrington collected 140 soil samples from around the field, removed roots and vegetation, and sowed the soil into flats. In the summer, Young Scientist Declan Sullivan compared the plants growing in these pots to the vegetation growing in the field and found that they were completely different! We are continuing this research to better understand why the standing vegetation in grasslands may be a poor representation of the viable seeds in the soil.
Effects of Climate Change on Mountaintop Bird Species

Smithsonian-Mason School of Conservation (SMSC) students spend a semester at the Smithsonian Conservation Biology Institute, taking classes and getting hands-on conservation experience with George Mason University professors and Smithsonian scientists. They spend a month each semester doing research projects with local conservation organizations. In 2020, two SMSC interns helped us analyze data we have been collecting on the bird community of Mount Mitchell, North Carolina since 2016. Our goal is to determine if the birds on the mountain are being driven to higher elevations by climate change. Aliya Hochstadt analyzed the data and found that both Dark-eyed Juncos and Golden-crowned Kinglets had moved uphill. Sophia Chapin found that elevation was a better predictor of where most bird species are found than was vegetation. We will continue to collect and analyze these data in the years to come.

Community Science

Every year we work with community scientists in order to monitor different groups of plants and animals and teach the public about the scientific process. In 2020 we conducted our 24th annual North American Butterfly Association count and 21st annual Christmas Bird Count, in which six and 51 volunteers participated respectively. Four volunteers monitored our bluebird boxes and shared their data with the Virginia Bluebird Society. And 35 volunteers documented 1,322 species on our iNaturalist project! In December, Eleanor gave a talk about statistics to help community scientists and other members of the public feel empowered to analyze the data they are collecting. All of these projects are helping us better understand the plants and animals that live on our property and how their populations are changing over time.
Support

In 2020 we received $334,452 in contributed support — 13% more than in 2019 and 94% more than in 2018. This increase in contributed support helped us hire a new Communications Assistant, purchase equipment we have needed for years, carry out ambitious research and restoration projects, and continue to provide education programs during the pandemic. It is only with the help of our supporters that we are able to accomplish our mission. A list of the donors and foundations who supported us in 2020 is on pages 20-21.

Total Support and Revenues: $571,969
Total Expenses: $458,680

One of our amazing crews of volunteers who spent a morning removing Autumn Olive.
In 2020, **143 volunteers contributed 2,186 hours**. This can be valued at $59,459, which is not included in the support and revenues to the left. Volunteers led bird walks, helped with Piedmont Polliwogs, built fences, assisted with prescribed burns, conducted plant and bird surveys, removed invasive species, built kestrel boxes, counted butterflies, sowed seeds, maintained trails, and more. One highlight was the Eagle Scout project carried out by Patrick Donovan: Patrick and his Scout troop constructed a boardwalk to go over a wet spot in one of our fields so that we can use the trails there at all times of year. We are humbled by the amount of work our volunteers are willing to do to help us accomplish our mission and we couldn’t do it without them!

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

- American Farmland Trust
- Bull Run Mountains Conservancy
- Chesapeake Bay Foundation
- Oak Spring Garden Foundation
- Old Rag Master Naturalists
- Piedmont Environmental Council
- Smithsonian-Mason School of Conservation
- Virginia Native Plant Society
- Virginia Working Landscapes
- Warrenton Garden Club
- White House Farm Foundation
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Gary Roles
Joan Semple
Jocelyn Sladen
Lina, Sylvie, and Anna Wachtmeister

Photo of the upper pond by Christopher Frost.
We hope to see you in 2021!

In the mean time, you can keep up to date by signing up for our e-newsletter on our website (cliftoninstitute.org) or by following us on Facebook or Instagram (@clifton.institute). You can help us accomplish our goals for 2021 by donating at cliftoninstitute.org/donate.

Thank you for your continued support!

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