# The Clifton Institute

## Grasslands Issue

December 2023

## Letter from the Executive Director

When Eleanor and I moved to Virginia nine years ago, I wasn't expecting to get involved in grassland restoration, but as I've learned about grasslands in our area I've fallen in love with these imperiled habitats. In Virginia, grasslands were once widespread in the Piedmont region, giving them their alliterative moniker "Piedmont prairies." Together with our partners, we have discovered unplanted Piedmont prairies that are among the most diverse plant communities in the entire state! Spotting a Grass-leaf Blazing Star, Pasture Thistle, or Clasping Milkweed in such a place always gets my heart beating.

In addition to being hyperdiverse, Piedmont prairies host several rare and imperiled plants, such as Torrey's and Basil Mountain-mints and Stiff Goldenrod. Unfortunately, these special habitats have nearly disappeared as they are left to grow up into forests or developed. The best ones that remain are found in power line clearings where they are acutely vulnerable to herbicide spraying, poorly timed mowing, and invasive species.

Here at Clifton, grassland conservation and restoration is the focus of much of our work. While the situation for Piedmont prairies is serious, it's exciting to be working on solutions. We are approaching this problem from three angles. First, our Landowner Outreach Associate meets with landowners, managers of public lands, and utility companies to identify remnant prairies and give advice about how to conserve them. Second, we teamed up with partners to start the Virginia Native Seed Pilot Project, with the goal of creating a source for seeds with Virginia genetics for restoration projects. Third, we educate both adults and children about the incredible native plants and animals that live in grasslands in the hope of galvanizing new and future grassland conservationists.

We are also planning to continue our research on remnant prairies to better understand which species need the most help. The birds that rely on grasslands, like American Kestrels and Eastern Meadowlarks, are probably familiar to you, but little is known about the insects that are found in remnant prairies in the Mid Atlantic. It's likely that specialist bees and declining butterflies rely on remnant prairies, but no one has done surveys to figure this out. We are also developing a project that will study the effectiveness of forest thinning and prescribed fire in forests that are adjacent to remnant prairies in power line clearings. The goal of this work is to allow the native plants to expand to the adjacent sunny woodlands, where they will not be subject to inappropriate management by utility companies.

As I hope you can tell, there's a lot to do, but I am excited to keep working with our partners and our community to save Piedmont prairies while we still can.

Sincerely,

Bert Harris
Eutive Director

**COVER:** Education Associate Bridget Bradshaw identifies grasses with participants in an education program.

# Progress Report From Our Restoration Experiment

When we first set out to restore our non-native fescue cattle pasture to native grassland, we received a flurry of well-meaning, but conflicting, advice. Even the most trusted resources were mainly based on research done on Midwestern prairies. So Clifton, together with Virginia Working Landscapes (VWL), the Oak Spring Garden Foundation, and the Restoration Ecology Lab at Virginia Tech, designed a long-term project with the goal of identifying the most effective restoration method.

In 2019, we split 100 acres of cattle pasture into eight plots to compare the effectiveness of herbicide treatments, organic establishment, prescribed fire, and mowing to restore the field to native plants. One of our goals was to find out if we could bring back a diverse native plant community simply by killing the fescue and allowing seeds already present in the soil to germinate. We also wanted to know if herbicides were necessary, or if repeated tilling followed by planting would be just as effective. Our partners at the Oak Spring Garden Foundation and the Smithsonian Conservation Biology Institute established the same experimental plots on their properties.

In 2019, VWL brought on Jordan Coscia as a summer intern to do plant surveys at all three sites. Jordan went on to join the Restoration Ecology Lab and is including the project as part of her Ph.D. dissertation. The summer of 2023 was Jordan's fifth and final year of surveys. There is still plenty more data analysis to be done, but some patterns are emerging

. The number of native species has increased at all three sites since baseline data were collected in 2019.

. Killing non-native plants and then planting seeds of native plants was more effective than letting the seed bank grow up.

. In fact, spraying once with herbicide to allow seeds in the seed bank to germinate was not any more effective than doing nothing (the control).

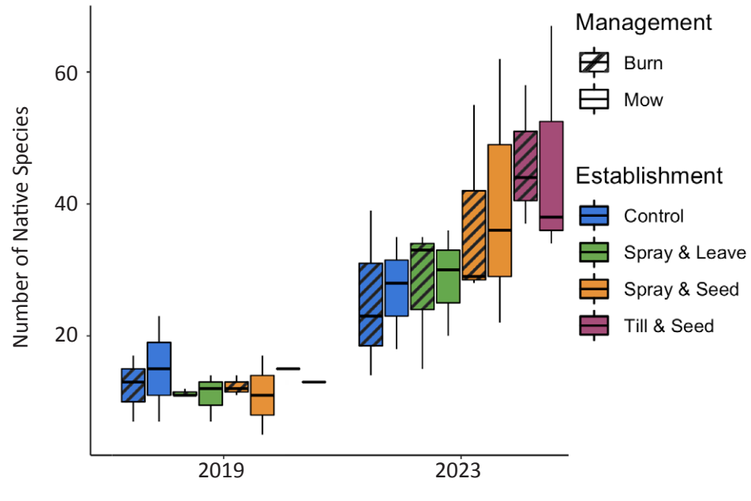
. Managing with fire and mowing led to similar results.

Jordan specifically noted the persistence of invasive species at all sites. "We had to do a lot of management outside of what we had planned," she said. "You have to be ready for what's going to come in."

Once Jordan publishes her final results her main goal is to make sure the information gets into the hands of the people who need it. "The whole reason we're doing this is because landowners had questions." According to Jordan, the biggest takeaway right now is that the effects of the different methods were dramatically different at the three sites. "You have to be willing to adapt your ideas to what's happening on the ground and in the place you're in," she said. "Because it's nature, things will surprise you."

Jordan Coscia checks the GPS coordinates for a plot in the experimental grassland.

**The graph below shows Jordan's preliminary results. The number of native plant species in all eight treatments at all three properties has increased since 2019.**



# Learning From Grasslands

Our experimental grassland is beautiful all year long, but our favorite time to take people out there is in the fall when the grasses turn every shade of ochre and peach and mauve. It's also easiest to identify grasses when they're at their full height and when they have seeds, so October through December is the season for our grassland field trips.

We offer five different field trip programs over the course of the school year. Teachers tend to ask for the programs involving animals–catching bugs, watching waterfowl, monitoring the amphibians in our vernal pools–and they sometimes seem a little disappointed when we tell them they're going to be studying grasses. We love animals too, but we have seen time and time again how much fun kids have learning about plants. Really!

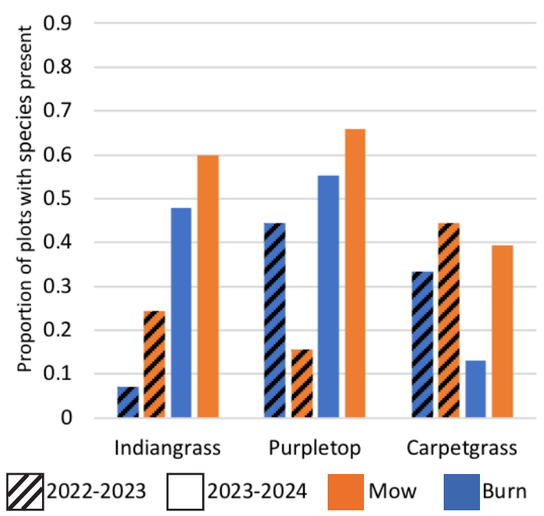
On our grassland field trip, K-12 students do plant surveys in the same experimental plots our grownup researchers are studying. We teach them between 3 and 15 plant species, depending on their grade level. It's no surprise that young brains can soak up new information like sponges, but they seem especially receptive to learning how to identify plants. Students of all ages quickly pick up on the patterns of height, color, and seed arrangement, and within minutes they can confidently point out Indiangrass and Little Bluestem, usually even better than their adult chaperones can.

After practicing plant identification for just a short time, the students work in small groups to survey 10-meter by 1-meter plots for the presence or absence of their species. And they do an excellent job! This year our education staff went and did plant surveys in all of the same plots, just to see how accurate the students were, and our results were very similar to the students'.

One of the great things about doing these trips every fall is that we get to compare the plant community year after year. The graph below shows data on three species from the 2022-2023 school year compared to this school year. While that wasn't our original goal, we have become if anything more interested in watching the fields change over time now that we've stopped planting.

Taking students out to do plant surveys teaches them how to do science, exposes them to the beauty of Virginia's grasslands, and gets them thinking about the ways (positive, negative, and ambiguous) that humans manage land, and we are excited to keep learning about plants with Fauquier's youth in years to come.

Students work on identifying plants in the grassland.




**Indiangrass and Purpletop both became more common this school year and Purpletop actually switched to being more common in burned plots. We are pleased to see Carpetgrass becoming less common in both types of plots.**



# Landowner Outreach In Practice: Bonny Brook Farm

In 2021, we started a Landowner Outreach program because we knew people had questions about managing their land to help native plants and animals. One of the landowners who has been with the program from the beginning is our new board member Margrete Stevens at Bonny Brook Farm. Margrete has hosted walks with the Piedmont Environmental Council for many years to showcase the population of Virginia Bluebells along a stream running through the property, but during the landowner visit, we identified a hay field that showed signs of having native grasses. Margrete stopped haying the field.

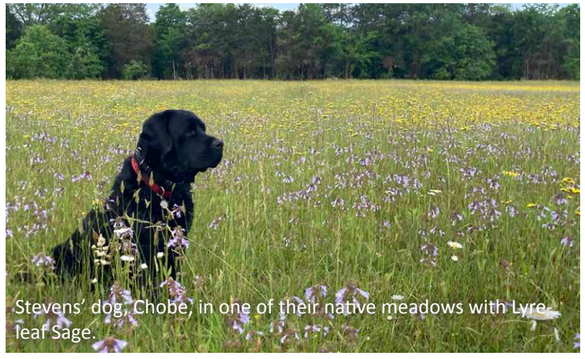
"Throughout the following winter, we enjoyed a beautiful display of Little Bluestem and Indiangrass," she said. "Then, in the spring, the field turned purple, covered in Lyreleaf Sage, and that was followed several weeks later by a yellow display of ragwort. It was unexpected and glorious to have this happen by simply giving the native seed bank a chance to flourish."

Of course, land management doesn't always go smoothly. Like all properties, Bonny Brook has its share of challenges. Margrete said, "the biggest problem has been Multiflora Roses and Japanese Honeysuckle in our tree lines, but we have also had to deal with Callery Pears and Trees of Heaven. For this work we have also had help from Blue Ridge Partnership for Regional Invasive Species Management. The Clifton visits were critical to helping us identify problems, establish priorities, and learn how to tackle invasives."

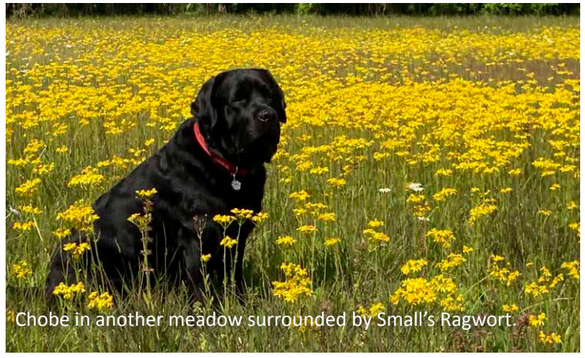
The landowner meetup group at Bonny Brook farm.

Bonny Brook was also the site of a landowner meetup in the summer of 2023. Margrete welcomed any interested landowners who were part of our outreach program to Bonny Brook for a discussion and tour. We organize landowner meetups like these because as important as knowledge is, community is even more essential to long-term success. Meeting other people working on the same issues diversifies the pool of knowledge we can draw from and provides a support system. The more we talk, share advice, and support each other through challenges, the better we become at protecting and restoring land for the benefit of all.

In 2023 we welcomed Kadiera Ingram as our new Landowner Outreach Associate. Kadiera is available to visit properties at the request of landowners, identify ways the land can be managed more effectively, and give advice on how to make those changes. This program is completely free, and all you need to  do to get started is visit the "Landowner Outreach Program" page on our website. We are grateful to the Raines Family Fund for supporting this program.



Stevens' dog, Chobe, in one of their native meadows with Lyre-leaf Sage.



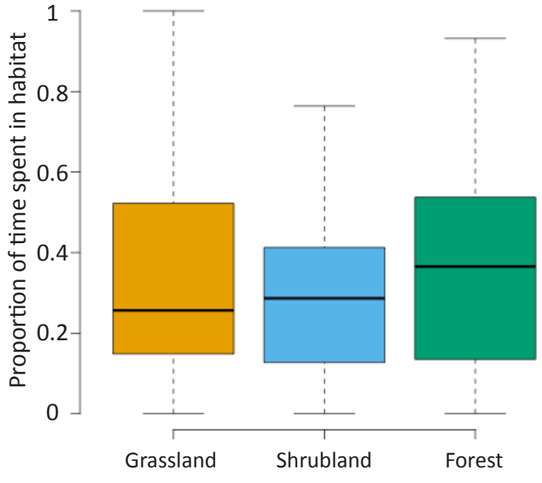
Chobe in another meadow surrounded by Small's Ragwort.

# Where The Box Turtles Roam

Imagine being a Box Turtle. What kind of place do you want to live in? A forest with lots of leaf litter and slugs to eat? A protected shrubby area with water nearby? How about a hot sunny grassland? It doesn't sound that hospitable for turtles to us, but we know that box turtles are out there because they get killed during mowing and haying. Unfortunately, there is no research on exactly when and why Box Turtles utilize grasslands, fields, and pastures in Virginia.

In 2022 we teamed up with the Turtle Conservation Ecology lab at SCBI and Travis Gallo at the University of Maryland to study how Box Turtles are doing in our area and to develop mowing guidelines for landowners. This year Clifton staff, research technician Mark Ketner, and research intern Sofie Marino tagged 40 Box Turtles with radio transmitters in Fauquier and Rappahannock counties and recorded 1,600 turtle locations.

We were surprised to find that the turtles spent almost two thirds of their time in fields, confirming how vulnerable they are to mowing in our region. Turtles were also much more likely to be found in spots with a lot of downed woody debris (logs and sticks) and shrub cover (e.g. blackberry thickets). This indicates that it's a good idea to leave some blackberry thickets in fields to serve as habitat for Box Turtles, quail, and other wildlife.




The graph above shows how much time the turtles in our study spent in three habitats. We were surprised that they only spent a third of their time in forests.

Here are a few of the stories of the turtles Mark and Sofie found in our grasslands this summer:

Turtle A was found in early May at the edge of the grassland. In June she moved near to the Clifton farmhouse. She returned to and stayed in the grassland for most of July, before moving into the forest in August, having walked almost half a mile over the course of the summer. Mark and Sofie nicknamed her "Amelia" because she was the first turtle they found to move such a distance.

Turtle B was found in early May in the grassland. At the end of August she started a trek of over half a mile to a forest patch where we expect she'll overwinter.

Turtle C was found in early May in the grassland, where she remained until the end of August. Over the course of the summer, she was found mating with males on three different encounters. She moved into the forest in August.

Our results so far are preliminary. The historic drought this summer if anything suppressed Box Turtle movements, and it will be really interesting to see how our results change in the coming years. We are grateful for support from the BAND foundation which made this research possible.



Left: An eastern box turtle navigating through tall grass.

Top: An eastern box turtle in the forest with a radio tracker attached to its shell. The trackers do not damage the shells and eventually fall off.

Bottom: Turtle technician Mark Ketner tracking a tagged turtle in one of our fields.

## First American Kestrel Paper Published

For the last three years we have been collaborating with Dr. Joe Kolowski at the Smithsonian Conservation Biology Institute and Alan Williams to study American Kestrels to better understand why they are declining in the eastern United States. We are delighted to announce that the first peer-reviewed paper on our research has been published in the Journal of Raptor Research! The full article is available on our website under “Research Publications.” In this paper we report on the home range size and ranging behavior of female kestrels. Executive Director Bert Harris will give a presentation on Zoom in February on the latest results. Check our website and socials for more information! Here, Dr. Kolowski and research technician Sophie Vazquez release a kestrel after attaching a GPS transmitter to his back.