Native Plant News

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Native Plant News
Julie Higgie, editor

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North Carolina Lichens:

A National Treasure of Natives

By **James C. Lendemer,** Guest Contributor

Arthonia kermesina

Is that a lichen? How did it get there and what causes it? Those questions have probably gone through your mind while botanizing for natives in North Carolina. As a scientist studying lichens I am often asked these questions by passing hikers when they see me sprawled out looking at a rock with a hand lens, or delicately putting specimens in bags covered with seemingly cryptic notations. My colleagues and students get the same questions, which they dutifully answer.

Lichens are fungi that have adopted a novel lifestyle. While some fungi parasitize crops or decompose wood, lichens are unique collaborations between a species of fungus and one or more algae. Together they form a symbiosis that is more resilient to harsh conditions

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Endangered Perennial Highlighted in Study

By **A. Renee Fortner,** 2014 Shinn Grant Recipient

On June 15, 1957, the botanist Harry E. Ahles was doing field work in a "boggy savanna-like border of a low woodland" in Onslow County, NC. This particular field foray was part of a collaborative effort by botanists at UNC-Chapel Hill to document the plants of North and South Carolina. It was on this day that Ahles encountered an unfamiliar Meadowrue in flower; he later named this new species *Thalictrum cooleyi* Ahles or Cooley's Meadowrue.

Had Ahles visited the site earlier in the season, he might have missed this delicate herbaceous perennial. Vegetatively, the plant can be cryptic with a rosette of compound leaves which are often obscured by surrounding vegetation. When flow-

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President's Letter

Jean Woods

I have a trillium just out of the ground. Now it is in a sunny, protected place, but really!? February can be cold and snowy here in the mountains and who knows when the next polar vortex might make a visit southward?

Winter can be a great time in the native plant world, even without the astonishing blooms we all love to see. Joe, my husband, and I take walks and practice our winter tree ID skills. There's a great little guide called, *Winter Tree Finder* that we use and it has really increased our observational skills and our repertoire of trees we can now ID by their buds alone. A hand lens and a small pocket knife are the only other tools you need, and you don't always need them.

Taking a class is another great winter activity. The Botanical Garden at UNCC has classes as part of their Certificate in Native Plant Studies, which are taught year round. In fact, yours truly will be one of the instructors for "History of Botany in the Carolinas," where I will be sharing some of the research I have done on women botanists in America. The Botanical Garden at Chapel Hill also teaches classes in Native Plant Studies and in Botanical Illustration. Our Southeast Coast Chapter received a grant and are offering a series of classes on native plants. The first will be on Jan. 25, taught by Robert Thornhill. There are opportunities across the state. Check out the links below.

UNCC
https://gardens.uncc.edu/education-events/certificate-in-native-plant-studies/summer-winter-course-schedule/
UNC-Chapel Hill
http://reg.abcsignup.com/view/view_month.aspx?as=5&wp=289&aid=NCBG
http://reg.abcsignup.com/view/view_month.aspx?as=5&wp=288&aid=NCBG
Southeast Coastal Chapter

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Farewell to a Dear Garden Friend

In Memoriam: Emily Hine Allen

1926–2015

Once you met Emily, you never forgot her, for her enthusiasm and love of native plants were infectious. Unlike many enthusiasts, however, Emily went far beyond mere interest in wild plants: she became a fount of knowledge about our native flora, as well as an expert native plant horticulturist.

Initially fascinated by the discovery of a Showy Orchis in her backyard, Emily ended up devoting much of her life to native plant gardening. She was one of the earliest members of the Wildflower Club of Winston-Salem, a group of women (and now men as well) who share their gardens, horticultural knowledge, and delight in wild plants and being outdoors. When I was a teenager I'd sometimes accompany the "Wild Women" (as I called them; my mother was also a member) on their mountain hikes, and I always learned and laughed a lot!

Emily's garden was begun in the early 1960s, and grew from a tangle of vines and weeds to a six-acre showpiece of the Southeast's native flora. Now officially the Emily Allen Wildflower Preserve "Friendship Garden", under the wing of the Piedmont Land Conservancy, the garden has delighted and educated people from around the world. Thousands of people have gloried in walking the trails and seeing an amazing diversity of wild flowers, ferns, trees, shrubs, and vines. Emily's garden is not only an aesthetic pleasure, however, it is also an important biological preserve where hundreds of species of native plants are maintained. As more and more development encroaches on our natural areas, preserves such as Emily's are vital sources of genetic diversity.

The garden is also a marvelous teaching tool. Emily loved to lead groups around the garden, telling them tales about the sex life of plants, the mysteries of identification, the stories behind the Latin and common names. Her teaching also extended to the volunteers in the garden, as they learned what weeds to get rid of and how to tend a particularly fussy species. And she shared her plants with volunteers, friends, visitors, and fellow horticulturists, so that her "babies" now grow in private and public gardens far and wide.

How did one little lady do all this? By decades of hard work, aided by a loving heart, a willing mind, and a generous spirit. Emily sought knowledge from the best brains in North Carolina and beyond, attended myriad wild plant seminars and conferences, and took courses at Wake Forest University to learn about taxonomy, botany, and ecology. Her knowledge and experience were prodigious; even better were the stories she told about her years gardening, botanizing, collecting plants, and meeting with a broad cast of characters (many of them in the NCNPS!). Emily was president of the NCNPS (when it was known as the NC Wildflower Preservation Society), from 1978–1982, and was a member of the Board for many years.

On any given day, if you visited Emily, you would likely find her on her hands and knees in the garden she created, pulling out the weeds, transplanting strays, and simply loving to be outside among friends, both plant and human.

--**Lisa Lofland Gould**

Article adapted from a letter by the author nominating Emily for the Tom Dodd, Jr. Award of Excellence presented annually at the Cullowhee Conference on Native Plants in the Landscape. Emily received the 2010 Tom Dodd, Jr. Award, as well as many other awards and citations from other organizations and agencies.

CHLOROFIENDS!*

Why I Hate Japanese Stiltgrass— Reasons 1-1,000

By **Catherine Bollinger**

What's the old saying? Insanity is repeating the same act over and over and expecting different results? Or is that stupidity? Either way, on my five acres of North Carolina Piedmont, my greatest exercise in futility is probably attempting to remove/control Japanese Stiltgrass (*Microstegium vimineum*). Oh, how I despise this invasive exotic plant species. Let me count the ways.

Number 1: Dead Japanese Stiltgrass strangles all plant life around my little pond.

It is ugly and covers anything in its path. It grows tall and droops over everything, living and inanimate. Even when this annual grass dies with the frost, its straw-like dead remnants bury my landscape in destructive brown yuck. The floodplain on my property includes a little pond that fluctuates with the level of the perched water table. I've surrounded it with myriad well-adapted wildflowers and native shrubs, but you'd never know it by the photo. It's one of the areas that I didn't find time to weed this year. Now my pond environment pays the price.

Number 2: Hummocks of dead *Microstegium* suffocate other vegetation and allows rodents to thrive.

It creates rodent habitat that thwarts predators. As these evil invaders create grassy hummocks over logs, shrubs, and small trees, they create excellent cover for field rats, deer mice, and voles. It's a tunnel-filled grass metropolis in there. You'd think a rodent population boom would benefit my native predators, especially the Barred Owls and Red-shouldered Hawks. Alas, no. The grass is so thick and covers so much territory that the rodents can largely conduct their business without ever coming into the open and risking capture.

Number 3: Pervasive Japanese Stiltgrass obliterates native floodplain vegetation.

It destroys/alters native plant communities. That's the edge of my property on the floodplain in the photo. The green area is where we stop mowing (we mow to reduce tick and snake issues). The hummocks of straw-like material are mounds of Japanese Stiltgrass, which are growing on an area that we once mowed before we figured out it wasn't technically our land. Behind the *Microstegium*, you can see native floodplain vegetation still trying to fight the onslaught of the invader. It was there undisturbed before the *Microstegium* took hold. If our floods ever return, that vegetation will likely be overwhelmed.

That's how the *Microstegium* got to our property -- via floodwaters. Back in the pre-drought decades, our creek usually flooded spectacularly 5-8 times a year. As more and more developments sprouted up nearby and forest cover vanished, Japanese Stiltgrass appeared in those subdivisions (probably from seeds off bulldozers and other heavy equipment). This annual invader produces a lot of seeds, and one of its favorite modes of transport is water. Rainwater runoff carried seeds from new subdivisions into my creek, and consequent floods deposited them on my floodplain.

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Chlorofiends! (cont.)

Number 4: Winter-dead *Microstegium* chokes native creek-side vegetation.

It has killed almost all the wildflowers and ferns that grew along my creek 15 years ago. As you can see in the accompanying photo, the nasty stuff overwhelms everything. Delicate ferns and wildflowers don't stand a chance.

Number 5: Garden fencing is exploited by the invader

Every object I introduce into my garden is a potential *Microstegium* support, even though that is never my intention. Japanese Stiltgrass climbs the deer fencing that encloses the north side of my yard. I can't mow right up against the fence because of the way it's installed. Weedeaters don't work there either. Hand-pulling is the only option. That's back-breaking, knee-creaking work. And if you don't do it before the grass sets seed in mid-summer, what you pull returns a hundred-fold anyway. Did I mention something about an exercise in futility?

Number 6: Mount Brushmore

It wastes enormous amounts of time that I could be using for other things. I have a mountain of debris that is the result of a clean-up of the deer-fence-enclosed north yard. It's about 8 feet high and 12 feet wide, and is a mix of fallen branches, leaves, and Japanese Stiltgrass. In areas of our yard where the grass hasn't invaded, we rake up the leaves, shred them, and use them for vegetable garden mulch. But the leaves in that pile were too heavily tangled with the Stiltgrass to recover.

There's a good and a bad side to Mount Brushmore.

If there's any good news there, it's that Mount Brushmore is excellent winter habitat for a variety of birds, raccoons, and possums. Air pockets created by piled branches are covered by the thick mass of grass and leaves, creating a thatched roof of sorts that repels rain and insulates against cold.

Reasons 7-1000: Multiply the above reasons by the number of seeds one plant produces in a season. That's right. One plant can produce up to 1000 seeds. Contemplating the math is not advised for gardeners with high blood pressure.

When I roamed North Carolina Piedmont woodlands and stream sides as a child and young adult, Japanese Stiltgrass was nowhere to be seen. This invader has transformed Piedmont wetlands in just a few short decades.

In 2012, experts reported that a leaf blight caused by the fungus *Bipolaris sacchari* had killed large patches of *Microstegium* in West Virginia, Maryland, and Indiana. This fungus also affects some native grasses, but the experts were hoping that *Microstegium* might be more suscepti-

Dead Japanese Stiltgrass strangling all plant life around my little pond.

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President's Letter & Chlorofiends! (cont.)

*(**Letter continued from page 2)***

https://www.facebook.com/events/1588646911353813/?ref_newsfeed_story_type=regular

Winter is also the time that you can put plant those seeds that need "40 days below 40 degrees" in order to germinate, which is most of our native seeds. Lynda Waldrep, NCNPS member and past Program Chair, has been busy setting out seeds. The NCNPS Propagation Guide, which tells which seeds need what treatment, is online in our Members Only Section. It is now out of print, but the pdf is there for our members. Page 30 has a list of seeds that need cold, and the following page has a list of the best season to plant which seeds.

And last but not least, sign up for the Spring Outing which promises to be one of our best! It will be in the heart of one of the most diverse regions on earth, the Southern Appalachians. We have lined up great guides, a great speaker, and a great place to stay. See the details in this newsletter!

(Chlorofiends continued from page 5)

ble – and therefore controllable – through the judicious application of this fungus. However, I've been unable to find any updates on this study.

I have found that experts are now advocating the use of pre-emergent herbicides to suppress germination of the seeds of *Microstegium* in areas where control is desired, such as flowerbeds. Other experts are judiciously spraying the herbicide Glyphosate on recently sprouted stands of *Microstegium* to kill it before it sets seed. I've been told that if you use this product without additional surfactants (added to make the herbicide adhere to plants), it is theoretically safe to use near wetlands, but I am not willing to risk possible negative impacts to the myriad animals living in my adjacent wetland.

I am going to try a corn-derived pre-emergent on a *Microstegium*-infested wildflower area as an experiment this year. If it works well, I may apply it in other areas. Otherwise, I'll continue to spend my winters raking dead Japanese Stiltgrass off of plants and structures in the hopes that next growing season I'll be able to pull the nasty stuff before it sets seed.

Oh, did I mention that seeds remain viable in the soil for many years? Yes, sometimes I do wonder why I try to garden at all.

About the Author:

Before her second birthday, Catherine Bollinger's family moved to North Carolina, where she quickly developed a life-long obsession with the state's native plants and animals and her many gardens. A professional writer and editor for three decades, she now occasionally writes freelance articles and speaks to local gardening groups about our native plants and the challenges they face. Since 2011, she has been blogging at http://piedmontgardener.com. This article is adapted from a blog post she wrote in 2012.

NCNPS Habitat Gardens

Split rail made from local locust tree, Black Mt.

NCNPS has recently certified two gardens through our Native Plant Habitat Certification Program. In November, the private garden of **Larry** and **Audrey Mellichamp** was certified. Larry is the newly retired director of the UNCC Botanical Garden and their garden is located at their Charlotte home. It features a wide range of trees, shrubs, perennials and ferns. Particularly noteworthy is the large planting of spring perennials.

Our organization is always happy to get applications from public gardens, as they offer a great opportunity to educate the public on the beauty of natives and their importance to native wildlife. In December, we certified the **Dr. John Wilson Community Garden** in Black Mountain. This garden features a medicinal plant trail along with other unusual plantings. We encourage people traveling through Black Mountain to stop by the garden at 101 Carver Ave. to view it in person!

—Carolyn Ikenberry

Medicinal Plant Trail, Black Mountain

Treasures from the Mellichamp Home Garden

NC Lichens (cont. from p1)

than either one would be alone. The thallus that we see in the wild, the body of the lichen formed from fungus and algae, is actually a miniature ecosystem that provides food and shelter for an entire unseen world of other fungi, bacteria and tiny invertebrates. Without lichens many of these species would not be able to survive. The importance of lichens extends well beyond providing services for tiny forms of life. In fact lichens are central to many ecosystems and arguably our own lives; they break down rocks and consolidate soil so that plants can grow, they are important players in nutrient cycling, they absorb and release moisture to buffer the environment from extreme temperatures, and they even provide vital nesting materials for hummingbirds and form a major food source for reindeer.

Canoparmelia texana

It's hard not to be curious about lichens when the trees and rocks wear a heavy, colorful coat. The lofty spruces and firs of the Smokies and Blacks are covered with them, as are the jagged crests of the Craggies and the grassy tops of the Unicois. Down near the coast they drip from the cypress and black gums in the primeval forests of the Alligator River or Great Dismal Swamp, they paint the *Gordonia* in Angola Bay and Croatan, and sit silently with Live Oaks at Buxton or Sabal Palmettos on Smith Island. In the Piedmont the trees and flat rocks are adorned with mosaics, mixtures of species from the highlands and lowlands. From one end of the state to the other, Tapoco to Swansboro, lichens abound. The motto "first in lichens" could be as apt as "first in flight".

The abundance and diversity of lichens in North Carolina is why I am writing this article. My colleagues and I have worked in the state for nearly a decade, inventorying hundreds of sites and identifying tens of thousands of specimens. We have climbed peaks and slogged through swamps, faced down bears and rattlesnakes and chiggers. We have also traveled back in time, identifying thousands of specimens collected by others over a period spanning more than a century. As a result of all of our efforts we are finally beginning to understand what North Carolina's lichens looked like in the past, what they look like in the present, and what they may look like in the future.

But how many lichens are there? If you've stopped to ponder this question you may have thought there were a few kinds: the gray leafy one, the green leafy one, rock tripe, old man's beard, reindeer moss. But you might not have guessed that there are places where one or two hundred species grow together in the same amount of space it would take to build a ranch home. North Carolina is home to two of these places, hotspots of lichen diversity unlike anywhere else on earth. In the western mountains there are over 1,000 species, more than 800 of them occurring in the Smokies alone. In the eastern low-lying swamps of the Coastal Plain there are over 500 species. More than 400 of them are found on the Albemarle-Pamlico Peninsula and nearby barrier islands.

When my colleagues and I counted up the number of times we have seen each species we found that most of them are rare. In the mountains, more than one third had been

NC Lichens (cont. from p8)

seen only once and nearly 75% were seen fewer than 10 times. The same was true when we looked at the hundreds of sites along the coast. The trend is the same even in the regenerating forests that we have studied in Pennsylvania. Evidently most lichens are rare, regardless of whether you are looking at an old growth forest or one regenerating from recent logging. In North Carolina that means that hundreds and hundreds of species are rare and potentially merit listing as such by the Natural Heritage Program.

Chrysothrix chamaecyparicola

That there are large numbers of rare species may not surprise most people familiar with native plants. However, what surprised us was the number of lichens we found that occur nowhere else. We have now discovered dozens of species that were previously unknown to science; many occur at only a handful of sites in some of the last tracts of mature forests or wilderness areas. There is tiny "Hot Dots" (*Arthonia kermesina*), a lipstick red lichen that grows only on old growth spruces in the very heart of the Smokies. And there is "Carolina Beach Dots" (*Phaeographis oricola*), a crust that covers trees in the few mature maritime forests left on the barrier islands from Hatteras to Smith Island. There are species that have long been known to be special, like the "Rock Gnome" (*Cetradonia linaeris*) that is found on wet, sheltered rocks in the western mountains. There are also species that may have already been lost, such as Catawba Buttons (*Dermiscellum oulocheila*), which was only found twice along the Haw and Catawba Rivers in the 1800's.

Trying to imagine a healthy planet without lichens is difficult. Unfortunately landscapes with fewer and fewer lichens are an increasingly common sight. Although stronger together than the individual fungi and algae would be alone, the lichen symbiosis is not invincible. In fact decline and loss of lichens can be among the first signs of environmental change and degradation. Centuries of habitat loss, pollution, and deforestation have taken their toll on lichens all over the world. If you live in an American city you probably only see a dozen or so species on your way to work, which is an improvement from the days before the Clean Air Act when you would have been hard pressed to see any at all.

In the bigger picture of North America and the world, the importance and uniqueness of the lichens hotspots in North Carolina cannot be understated. These are among a handful of places where you can catch a glimpse, just a glimpse, of what our forests east of the Mississippi once looked like everywhere. My goal is not to wax nostalgic or bemoan progress, but rather to point out the contrast between the lichens you see on a hike in the Smokies and a drive on I-95 to Lumberton or US-64 to Plymouth. If lichens are as important as studies have shown they are, than what are the implications of living in a landscape without them?

Conveying the importance, and beauty, of native species can be difficult when the dozen native orchids with their subtle flowers and scents are replaced by two dozen non-natives that rapidly invade and burst with showiness. Many would ask why it matters that we lose a dozen natives if we gain two dozen non-natives? We know it matters, but conveying that convincingly requires a lot of education. Lichens however, present a unique opportunity. When we lose lichen species they are not

(Continued on page 13)

Chapter Reports

Triad Chapter

Interest in native plants kept NCNPS members busy during the two days of the 2015 Green & Growin' trade show held Jan. 8-9 in Greensboro. Approximately 1,000 handouts on native plants were distributed to participants at the show, and conversations and recommendations helped attendees understand the importance of native plants in the landscape.

Dr. **Larry Mellichamp**, recently retired from UNC-Charlotte, was also busily involved signing his book, *Native Plants of the Southeast,* and chatting with old and new friends at the show. All available Mellichamp books were sold. **John Neal** provided additional books for sale, and NCNPS earned more than $500 from this project as well as $140 from T-shirt sales.

Manning the booth at the event were **Robert** and **Ruth Jones, John Neal, Lynda Waldrep, Tom Harville, Dale Batchelor, John Thomas,** and Dr. Mellichamp.

This is the sixth year that the Triad Chapter has sponsored a booth at the show, a venue for landscape designers, nursery people, and others in the trade. Hundreds of companies exhibited, with representatives from coast to coast as well as several from Canada. The show provides classes and other activities Monday through Wednesday, prior to the trade section.

—Lynda Waldrep

Chapter Reports, continued

South Piedmont Chapter

The Southern Piedmont Chapter's January meeting was in the Mecklenburg County Herbarium at the Dr. James F. Matthews Center for Biodiversity Studies in the Reedy Creek Nature Center. The group was so large that we barely fit in the room! Herbarium curator **Catherine Luckenbaugh** talked to us about the way plants are collected and curated, how specimens are prepared for inclusion in the herbarium, and why herbariums are important. We heard about some of the collectors who have been contributors to the herbarium's 48,000 specimen collection—several are currently NCNPS members! A special thank you to Catherine for such an interesting and informative meeting!

The native plant Medicine Wheel Garden at Reedy Creek Nature Center in Mecklenburg County will be an ongoing project for the Southern Piedmont Chapter, as they work together with staff at the center to create what they hope will be a beautiful and educational public space. The chapter's February meeting was an opportunity to learn more about the medicine wheel concept and to find out ways to help get the garden under way.

In addition we are looking for new leaders in 2015. If you would like to help plan programs, organize volunteers, communicate with the members or help lead our meetings, please get in touch. In fact we are looking for volunteers to help staff a number of Earth Day events throughout the area. We have been asked to have a booth at:

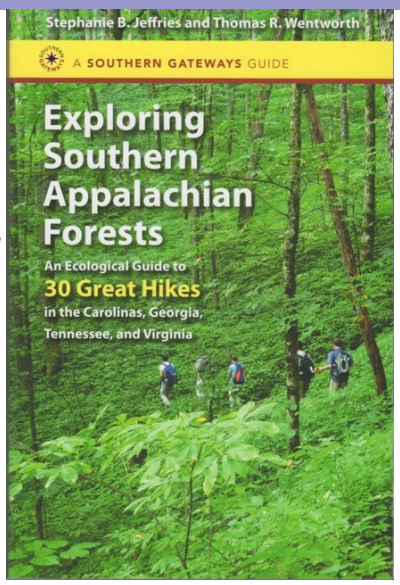
Lake Norman-April 18
Matthews Earth Day-April 18
Reedy Creek-April 18
Wells Fargo Green Team (Harris Blvd campus)-April 21
Davidson Farmers Market April 18

Please contact Christy Larson if you can staff a booth and talk about native plants. It's always fun to get out in the community. NCNPS has all the brochures and signage that would be needed as well as T-Shirts for members.

—Beth Davis

Book Review

Book Review:
Exploring Southern Appalachian Forests: An Ecological Guide to 30 Great Hikes in the Carolinas, Georgia, Tennessee, and Virginia, by Stephanie B. Jeffries and Thomas R. Wentworth. 2014. A Southern Gateways Guide, University of North Carolina Press, Chapel Hill, 309 pp.
$22 paperback.



A few years ago I signed up to take a class in winter tree identification at the NC Botanical Garden. Much to my delight, the instructor—**Stephanie Jeffries**—was both very knowledgeable and very enthusiastic, a great combination! So naturally, when I saw that *Exploring Southern Appalachian Forests* had been released, I snapped it right up and have not been disappointed.

Starting with an overview of the natural communities found in the southern Appalachians, the authors describe the plants characteristic in each community, where the communities are likely to be found (for example, at what elevation and/or exposure), and how human beings have affected the communities (such as through grazing, logging, fire suppression, or invasive species). At the end of each community description they name the hikes in the book where that community can be found.

Thirty hikes—nearly half of them in North Carolina—are described (I can't help but wonder how difficult it must have been to narrow the list down to 30, given the rich diversity of trails in the mountains stretching from Virginia to Georgia!). Each hike includes a map of the trail area, an overview of "Why Are We Here?", and a detailed description of the hiking trail and the plant communities to be seen along the way; every hike also includes a text box with details of community types, elevation, distance and difficulty of the hike, GPS coordinates, directions to the site, and where to go for more information. Numerous sidebar articles explore topics ranging from the Chestnut blight to natural community classification, from the effect of tornadoes to the relationship between latitude and elevation, and much more. Excellent black-and-white photographs are scattered throughout the book; there is also a glossary of terms and a section of illustrations and tips to help the reader differentiate among some of the common trees and shrubs.

The authors are clearly great teachers (both have taught at NC State University and the Highlands Biological Station), and like all good teachers they nudge you to ask questions, look at the landscape carefully, and delight in learning to read its history. We are fortunate that Dr. Jeffries will be our Friday evening speaker at the 2015 Spring Trip; she'll prime us for our mountain hikes along the Blue Ridge Parkway that weekend!

—Lisa Lofland Gould

NC Lichens (cont. from p9)

typically replaced by invasive or non-native species. A common species can simply expand to colonize the vacated space, convincing us that uniformity is truly the plague of sameness. Or the space is left abandoned like an empty lot or boarded-up building to remind us of a something vibrant now lost. As we lose native lichens the loss is readily visible to all as naked bark, branches, rocks and soil.

All of the more than 1,000 lichen species in North Carolina are native and many are in trouble. Where these natives presently occur has often been shaped by centuries of past human activities. Many are now further threatened by factors including loss of habitat, pollution, climate change and sea-level rise. The lichens hotspots in North Carolina are unique, not only because of what they can show us but also because they serve as reservoirs for the future. Like seed banks these hotspots hold the genetic material that will allow species to recolonize their ranges if we let them. Recognizing the importance of lichens to us, and the importance of North Carolina to lichens, is crucial to safeguarding our rich natural heritage. If you have taken the time to read this article, I invite you stop for a moment the next time you are out in looking at natives and think of the lichens past, present and future.

James C. Lendemer is a Post-Doctoral Researcher at the Institute of Systematic Botany, The New York Botanical Garden, and author of *The Lichens and Allied Fungi of Great Smoky Mountains National Park: An Annotated Check List*

Photo Credits (other than author):

Jason Hollinger and **Natassaja Noell**
Canoparmelia texana (a foliose lichen)
and
Chrysothrix chamaecyparicola (Moonglow)

Endangered Plant (cont. from p1)

ering (June-August), however, Cooley's Meadowrue rises above surrounding vegetation as a 1-m tall, open panicle with separate male and female flowers occurring on different plants (dioecy). The lax panicles are often supported by shrubs such as Inkberry (*Ilex glabra*) and Wax Myrtle (*Morella cerifera*). Despite a lack of petals, male flowers are showy with a striking contrast between distinctive lavender filaments supporting yellow anthers above. Female flowers also lack petals and are slightly less dramatic, with separate carpels of a greenish-lavender hue topped by white, fuzzy stigmas. A female flower has on average 12 carpels, each with the ability to form a single seed that typically matures from late August-September.

A coastal plain endemic, Cooley's Meadowrue was considered rare when first described and later listed as federally

Renee with the first Cooley's Meadowrue plant she had seen in flower. (Dale Suiter)

Endangered Plant (cont. from p13)

endangered in 1989 (USFWS 2008). Even at this point Cooley's Meadowrue habitat, fire-dependent wet pine savanna, was declining and largely absent from the southeastern landscape. Today, North Carolina has the greatest number of Cooley's Meadowrue plants with 24 subpopulations on private and public lands. Additional populations occur in Georgia (7 subpopulations) and a single population on a private nature preserve in Florida. Continued threats to Cooley's Meadowrue include habitat loss, fire suppression, and possibly limited seed set and low seed viability. My master's thesis research, with support from the Shinn Grant, has aimed to gain critical biological knowledge of Cooley's Meadowrue to aid conservation.

Cooley's Seed Germinates

Male Flower

Although considered dioecious (separate female and male plants), *Thalictrum cooleyi* plants sometimes produce hermaphroditic (perfect) flowers and unisexual (imperfect) flowers on the same individual. Interestingly, flowers which appear to be perfect, in some cases, function only as female or male. In *Thalictrum macrostylum*, another NC native, perfect flowers have stamens that produce non-functional pollen, rendering these flowers functionally female. This is known as cryptic dioecy. I performed a greenhouse pollination experiment to test if perfect flowers in Cooley's Meadowrue produce viable pollen. My results show that perfect flowers produce functional pollen and are self-fertile. While perfect flowers are uncommon in Cooley's Meadowrue, they could help contribute to overall seed set and thus population persistence.

In Ahles' description of *Thalictrum cooleyi*, he noted that seed set appeared to be limited in this rare species. Seed set in dioecious species can be inhibited by factors related to ineffective pollen transfer between male and female plants (i.e., pollen limitation). Studies have found that unbalanced sex ratios can contribute to pollen limitation. Based on my field surveys, there can be twice as many males as females in Cooley's Meadowrue populations. Despite more males, my pollen supplementation experiments indicate that female plants are limited in their seed set, possibly due to low pollen availability or quality. Perhaps pollen limitation in Cooley's Meadowrue is not due to a lack of males, rather how densely plants occur on the landscape. Future conservation strategies may include the addition of plants to existing populations to increase densities and potentially improve seed set.

Restoration efforts for *Thalictrum cooleyi* will also require knowledge of the seed germination requirements. Most seeds of temperate species are physiologically dormant at maturity and require seasonal changes in temperature and moisture to initiate germination. In

Endangered Plant (cont. from p14)

2013 and 2014, I tested for seed dormancy and for the effects of light and length of cold stratification (moist chilling) on germination. My results indicate that Cooley's Meadowrue seeds are dormant at maturity. Cold stratification at 34 °F for 8 weeks can break dormancy and seeds germinate in light or dark. Overall germination rates were low; 35% was the highest germination rate of any treatment. During my experiments, numerous seeds were lost to mold prior to germination, believed to be a sign of poor viability.

Vegetative propagation can be a useful restoration tool for plant growers when seed germination rates are low, as for this Meadowrue. In June 2013, I received permission to dig Cooley's Meadowrue plants for a vegetative propagation experiment. I tested the effectiveness of using various plant parts (propagules) and the root growth hormone, Indole-3-Butyric acid (IBA), to propagate Cooley's Meadowrue. Over half of the propagules survived; caudex and rhizome divisions were most successful. The survival of propagules did not depend on the addition of IBA. Vegetative propagation is a viable option that could be part of an effective restoration program for Cooley's Meadowrue.

Since being discovered by Ahles in 1957, little research has been done on *Thalictrum cooleyi*. Funding from the Shinn Grant allowed me to study important aspects of Cooley's Meadowrue that will hopefully aid conservation and inspire further research of this endangered species.

(Renee Fortner is an MS candidate in biology at East Carolina University.)

Renee at Shaken Creek Nature Preserve

Acknowledgements
I would like to thank the North Carolina Native Plant Society, Catherine H. Beattie Fellowship of the Garden Club of America and Center for Plant Conservation, Southern Appalachian Botanical Society, and the US Fish & Wildlife Service for helping fund this research. Numerous people have given me guidance on this project, but I owe a special debt of gratitude to my research advisor, Dr. Claudia Jolls

Photos:
Renee Fortner, Erika Dietrick and Tyler Lawson

Spring on the Blue Ridge Parkway!

Our Spring 2015 trip will be hikes along the Blue Ridge Parkway near Asheville, NC, May 8-10. This part of the Parkway is a very diverse area rich in species. On Saturday there will be two separate hikes with groups switching between the two. Near lunchtime we will stop at the Pisgah Inn for a bathroom break and a chance to visit the gift shop, and our lunch will be a picnic along the Parkway. On Sunday we will go north on the Parkway and visit Craggy Gardens.

Here are some links to information about the Blue Ridge Parkway.
http://www.romanticasheville.com/wildflowers.htm; Craggy Gardens:
http://www.blueridgeheritage.com/attractions-destinations/craggy-gardens and the Folk Art Center on the Parkway:
http://www.southernhighlandguild.org/pages/folk-art-center/general-info.php

The southern Appalachians are considered by The Nature Conservancy to be a world-wide hot spot of diversity, and they are a true delight in the spring, when many of the spring ephemerals bloom. Our hike leaders will be Dr. **Larry Mellichamp**, botanist and retired director of the UNCC Botanical Garden; Ed **Schwartzman,** NC Natural Heritage Field Botanist; **Mark Rose**, retired nurseryman and plant expert; and **Tom Ferguson**, botanist working with the NC Natural Heritage Program.

Our speaker on Friday night will be Dr. **Stephanie Jeffries**, who will speak on stories from the forested landscape: How to see the forest with the trees. Why is spruce-fir forest missing from some mountaintops? What created grassy balds? Is the northern hardwood forest even a real natural community? Dr. Jeffries co-authored (with Thomas Wentworth) *Exploring Southern Appalachian Forests: An Ecological Guide to 30 Great Hikes in the Carolinas, Georgia, Tennessee, and Virginia* (see a review in this newsletter). Copies of the book will be available for sale during the weekend.

On Saturday night we will hold our annual Plant Auction, so start potting up those plants soon!

The Friday and Saturday night programs will be held at Lutheridge in Arden, NC [http://www.lutheridge.com/]; this is a beautiful conference center with hiking trails, many trees, and a tranquil setting. ***Lodging at Lutheridge is now sold out,*** but you can still register for the ***Commuter package***, which includes dinner Friday & Saturday nights, breakfast Saturday & Sunday mornings, a bag lunch for the hike on Saturday, and day use of the facilities at Lutheridge. OR you can register with NCNPS and just come to the talk, hikes, and plant auction.

Another lodging option is the nearby Fairfield Inn Fletcher, 31 Airport Park Road, Fletcher NC 28732; (828) 684-1144. Lutheridge has arranged a rate of $79/night; you'll need to call the Fairfield Inn and tell them that you are with the NCNPS and that there is no more room available at Lutheridge. Other lodging options may be found at http://www.tripadvisor.com/SmartDeals-g29871-Arden_North_Carolina-Hotel-Deals.html

If you prefer to camp, there is a campground located near where we will get on the Parkway.
http://www.recreation.gov/camping/lake-powhatan-nc/r/campgroundDetails.do?contractCode=NRSO&parkId=70206

Links to nearby restaurants can be found at:
http://www.tripadvisor.com/Restaurants-g29871-Arden_North_Carolina.html

Spring Trip Registration Form

Name(s)
_____

Address
_____

Email
_____

Cell Phone _____
Choose one of the following two options [everyone must pay a registration fee]:

____ NCNPS member registration fee: $30/person ($20 limited income) $ _____

____ NCNPS non- member registration fee: $50/person $ _____

Select your lodging:

Lodging & meals at Lutheridge ADULT:
____ Lodging (2 nights) and 5 meals fee: $165/person $ _____
I/We prefer lodging in a cabin or the large house (circle one)

Lodging & meals at Lutheridge CHILD ages 10–17:
____ Lodging (2 nights) and 5 meals fee: $70/person $ _____
I/We prefer lodging in a cabin or the large house (circle one)

Lodging & meals at Lutheridge CHILD ages 4–9:
____ Lodging (2 nights) and 5 meals fee: $45/person $ _____
I/We prefer lodging in a cabin or the large house (circle one)

Roommate Name: _____

____ **Commuter fee:** $90/person (this option includes 5 meals & daytime use of Lutheridge) $ _____

____I plan to attend the talk, hikes, etc., but will make my own food and lodging arrangements.
Meals: PLEASE circle choice: ***carnivore, vegetarian, and/or gluten free***

____ Join the NCNPS: $25 for individual membership, $35 for family $ _____

TOTAL ENCLOSED $_____

Cancellation Policy: a refund minus $25 will be made for cancellations received by April 6, 2015. There will be no refund for cancellations made after April 6, 2015.

Registration deadline: RECEIVED by April 6, 2015

____ I/we will bring a food item for the Friday evening social (enough for ~4 people—large amounts not necessary).

Please make check payable to: *NC Native Plant Society* and mail to:
Terry Ball, Treasurer, 716 Kemp Road W, Greensboro NC 27410

A Thank You to Members!

My husband used the old adage, "Do as I say, not as I do" when talking to my daughter at the dinner table recently. It made me think about what I am "do"-ing and saying that is teaching my children who to be and what to do. It is important to thank people for their time, efforts and enthusiasm. So… to all of our membership, I say thank you! Thank you for formally and informally spreading the native news. I like to to call it "planting the seeds of native knowledge".

Here's the good news: **In 2014, NCNPS members performed over 1,100 education hours and reached thousands of people.** NCNPS gratitude is also extended to those of you who planted natives, learned more about natives, shared a native from your garden or talked to friends about the importance of natives. Could we ever truly measure how far the seeds of knowledge travel?
And I hope if you asked my children, ages 6 and 10, what I "do", that they could tell you. This past fall, a pollinator meeting + a young teacher + myself, currently the NCNPS Education Chair = a Native Pollinator Garden 8th Grade Practicum. You will find me every Friday at the Community School of Davidson trying to connect young minds with native plants. I not only have the opportunity to lead this practicum, but was also given a 20'x30' garden space at the school.

Circling back to saying thank you… At the end of my youngest daughter's school day, she sits in a circle with her classmates. One student sits in the middle of the circle and is the "Standing Ovation" for the day. Each student pays the Standing O a compliment, and is, in return, thanked. Wouldn't it be wonderful if we all ended our day in accolades? That is the purpose of this article. Thank you for helping us reach farther this year !

-Christy Larson

Member Spotlight!

Edward Davis

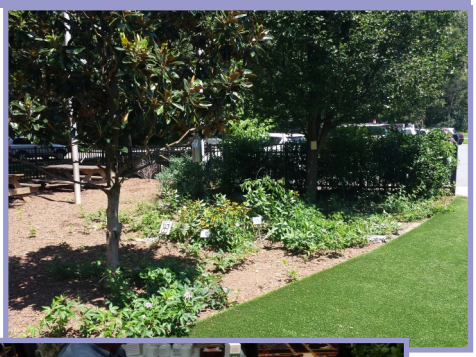
Ed comes from a gardening family. A native of Walhalla, S.C., Ed is Horticultural Supervisor at the UNC Charlotte Botanical Gardens. He is a licensed Landscape Architect with over 30 years of landscape design experience. His goal with native plants? "As designer for the new Mellichamp Native Terrace at the UNC Charlotte Botanical Gardens, I want to educate as many people as I possibly can about what native plants will thrive in their own gardens." His favorite native plant? "I am a plant lover and have had a strong interest in native plants since my childhood. If I had to choose one, it would have to be Southern Magnolia. I can't imagine having a garden without one."

Know a member who's doing something natively? Send their info to:

jchiggie@yahoo.com

NCNPS Education & Outreach

If a picture is worth a thousand words to you, then those on this page speak volumes. The pictures represent: 1) **Lisa Tompkins** and other Piedmont Chapter members removing invasives 2) Dr. **Larry Mellichamp**, teaching about natives, and trying to take flight, 3) *Hexalectris spicata*, Crested Coralroot, photo and orchid outreach by **David McAdoo,** 4) **Trena McNabb** educating members about her native meadow, 5) **John Neal Bookseller's** array of educational books at the Master Gardeners Conference in Winston-Salem, and 6) Community School of Davidson's soon-to-be Native Pollinator Garden, outreach by **Christy Larson**.



North Carolina Native Plant Society
C/O Julie Higgie
176 Huntington LN
Mooresville, NC 28117

We're Wild About Natives!

Longtime NCNPS member Emily H. Allen in her famous pose on Mt. LeConte. A memoriam to Emily is on page 3.