Friends of Plant Conservation

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President's Message

While we have many challenges to face in the conservation realm, one that needs attention, possibly more than most, is the capture of the inquisitive minds of our youth. Finding ways to pry them away from computer games long enough to introduce them directly with the wondrous world we live in and completely depend on has never been more important that now. To do that requires family participation at some level -- be that just allowing someone else to work with their children, or actually accompanying and participating in the discovery (the best option). To learn about our world requires available, factual information presented in a way appropriate to the given situation. So, here is where all of us with good natural history knowledge or access to good natural history information come into play. When the light goes on in a child's eyes with the delight of discovery and a parent smiles and applauds with approval, the reward for the "teacher" and society is huge. Getting society to recognize the value of such discovery is a never ending task. These challenges are important steps toward gaining the public support to help us conserve and properly manage the populations of listed plant species.

Another challenge worth mentioning is getting enough voters to the polls that want to elect representatives that understand and support the need to fund wise natural resource management in the short and long term. Do what you can to achieve that please!

~ Alvin Braswell
President, FoPC

Deadly Laurel Wilt Disease Found in Sassafras for the First Time in N.C.

***May 23, 2018. From the N.C. Forest Service, NC Department of Agriculture & Consumer Services**:*

In 2002, an uninvited guest made itself at home in the U.S. when the redbay ambrosia beetle was unintentionally introduced near Savannah, GA. By itself, the beetle would probably not be a big deal. However, it carries with it a deadly weapon: a fungus capable of killing redbay trees and other plants in the laurel family. When this fungus infiltrates a redbay, the tree dies in a matter of weeks.

1”-2” long frass tubes are symptoms of ambrosia beetle infestation.

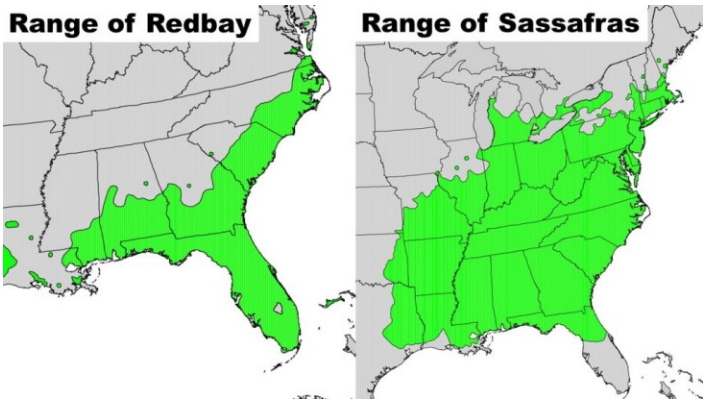
At a faster pace than expected, the disease spread. In 2011, laurel wiltwas first detected in North Carolina. Since then, it has spread to 10 counties in southeastern North Carolina. Driving through that part of the state, it is not hard to find a redbay tree dead from laurel wilt. As of earlier this year, redbay was the only known host-plant to be affected by the disease in N.C… until now.

In April 2018, a team of forest health professionals from the N.C. Forest Service – Forest Health, U.S. Forest Service – Southern Research Station, and N.C. State University – Department of Forestry and Environmental Resources were documenting the spread of laurel wilt when they discovered a pocket of approximately 20 dead sassafras trees. Upon closer inspection, the characteristic streaking of the inner bark associated with laurel wilt was found. Samples were sent off and confirmed in lab using fungal cultures and genetic analysis. The verdict was in: laurel wilt had killed the sassafras.

This is not the first time laurel wilt has been found killing sassafras in the U.S. Several other states in the Southeast where laurel wilt is running rampant report widespread sassafras mortality caused by the disease. However, it is the first time the disease was confirmed in sassafras in North Carolina. Before this confirmation, there were two other sites in N.C. where a single sassafras tree was found dead and exhibited symptoms consistent with laurel wilt, but the fungus was not confirmed. Like redbay, sassafras is in the laurel family. Other plants in the laurel family include spicebush, pondspice, and pondberry. Pondberry is a federally endangered species and pondspice is a species of special concern in North Carolina. Neither of them have been found to be infested in natural settings but lab tests indicate they would be susceptible.

While redbay trees are confined to the Southeastern Coastal Plains, the range of sassafras is much more extensive. It is scattered not only across North Carolina, but northern margin of its range reaches into Michigan in the Midwest and Maine in the Northeast. Because of this, the impact of laurel wilt may cover a much larger geographic area than if it affected redbay alone.

So, keep an eye on the sassafras near you! Laurel wilt disease, once thought to be confined to the coastal plains, will soon be making waves across the state.



Maps: Digital representation of “Atlas of United States Trees” by Elbert L. Little, Jr.

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NEXT DEADLINE: September 10, 2018

Field Trip/Workday Calendar

August 10 – McIntosh Bay Back to McIntosh Bay in Scotland County, this time to assist NCPCP staff with a search for Canby's dropwort, *Oxypolis canbyi*. It hasn't been seen in years but we are hopeful that the restoration efforts that have been underway by TNC and volunteers may result in its return. While we explore the Bay for its rare plant species, we will keep an eye out for plants and animals of interest.

September 21— Picture Creek Seed Collecting Picture Creek, in Granville County, has a few species from which seed need to be collected for augmentation efforts on the site. We can all go and see the site, learn about the plants protected there, the plant community that supports them, and assist NCPCP staff with seed collection. Easy walking, not too much bending.

October 8-11 - One-Two Tie Your Boots, Three-Four Sharpen Your Pencil…. Monitoring *Helianthus schweinitzii* (Schweinitz's sunflowers) populations is conducted annually on several NCPCP Preserves and related areas. Volunteers will be instructed where and how to proceed, and assigned to a team, an area, and a day to work. Some sites can be completed in one-half day, others take a little longer. Any time you can give will be appreciated. Just tell us which day/days you will be available to help. The work is easy and the sites easy to reach.

November 10—Menace or Marvel: Beavers on Preserves. Annual Meeting of Members and friends. Gaston County near Redlair. Featured speakers include Cecil Frost. Additional details coming soon.

REGISTER EARLY AS SPACE IS LIMITED. Directions and other details will be emailed about a week before the event. Please also leave a telephone/cell number so we can reach you.
PLEASE NOTE: Dates may need to be adjusted depending on weather and bloom times. We will advise you as best we can.

TO REGISTER: Send an email to Nancy Stewart … Nancy.Stewart@ncagr.gov or CALL 919 –707-3755

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c/o NCDA&CS, NC Plant Conservation Program
1060 Mail Service Center
Raleigh, North Carolina 27699-1060

2018 Annual Meeting of Members

Menace or Marvel: Beavers on Preserves

Saturday, November 10, 2018

9:30 am—5:00 pm

Speakers include Cecil Frost, Dustin Reece (NCWRC),

Haywood Rankin, Lesley Starke, and Cheryl Gregory.

This will be a special day

to CELEBRATE

the 10th Anniversary of FOPC.

PUT THE DATE ON YOUR CALENDAR

AND WATCH FOR REGISTATION INFORMATION

Voice your Opinion

It has been our tradition, most years, to recognize members who have contributed in extraordinary ways to the development and functioning of the Friends of Plant Conservation. We are asking for your suggestions for the following awards:

PLANT CONSERVATION LEADERSHIP AWARD

The Plant Conservation Leadership Award honors an individual who has made significant contributions to public awareness and/or behavioral changes in public attitudes related to botanical diversity in North Carolina. This award celebrates the tangible achievements of a person who promotes plant conservation and a sustainable environment in North Carolina.
Membership in FOPC is not required.

DISTINGUISHED MEMBER OF THE YEAR AWARD

The Distinguished Member of the Year Award honors members who have made exemplary contributions to the Friends of Plant Conservation.

PLANT CONSERVATION EDUCATOR OF THE YEAR AWARD

Recognizing that the future of plant conservation in North Carolina depends on a well-educated public, the Educator of the Year Award honors elementary, middle and high school teachers, college and university faculty, and other public educators for outstanding contributions to the education of North Carolina citizens.
Membership in FoPC is not required.

HONORARY MEMBER
Description: For on-going exemplary service to the Friends of Plant Conservation and to the mission of plant conservation.
Criteria: A nominee demonstrates selfless commitment to FoPC in areas including but not limited to education, communication, membership, administrative responsibilities, or service to the board and members.
Only five Honorary Members shall be maintained on the membership roll at a given time. If an Honorary Member becomes inactive, the membership chair may contact the member to determine continuing interest. If interest lags, the membership chair may recommend dropping the person from the rolls.

OUTSTANDING SERVICE AWARD
The Outstanding Service Award honors a FoPC member who has made exemplary contributions to the organization. Regularly participates in organization activities, workdays, and promotes plant conservation in his/her community.
Criteria: A nominee will demonstrate dedication to FoPC in areas including, but not limited to education, communication, membership or community service. The nominee demonstrates the ability to mentor, develop and impassion new leaders.

Presentations will be made at the Annual Meeting of Members on November 19, 2018.

Only one nominee will be selected for these awards annually. Not all awards will necessarily be awarded each year.

For more information or to submit a nomination, contact the Awards Chair,

Carrie DeJaco
704-688-2842
carrie.dejaco@gmail.com

Award Nomination Form

Please print legibly or type:

Your Name: _____

Your Contact Information: Phone_____

Email_____

PERSON NOMINATED: _____

NOMINEE'S CONTACT INFO: Address:_____

_____

Phone:_____

Email: _____

AWARD : _____

Description of reasons for nomination (please be specific; use additional page if needed). Remember that your nominee may be in competition with others, so respond as fully as you can:

If your nominee is not a member of FOPC, please give his/her organization/agency:

If desired, you may attach letters of support or other information. Mail your nomination to:

Carrie deJaco

5242 Auburndale Rd., Charlotte, NC 28205-4857

Or send via email to: Carrie.dejaco@gmail.com

Featured Plant:

Helonias bullata,

Swamp pink

For a short period of time in late spring, certain special mountain wetlands come alive with the vibrant magenta flowers of the fabled Swamp pink (*Helonias bullata*). A member of the Liliaceae family, this state and federally threatened perennial wildflower begins as an evergreen rosette of oblong green leaves from which tall stalks, up to three feet in height, arise in April and May. Topped with dense clusters of bright pink, fragrant flowers with contrasting blue anthers, they stand out starkly against the otherwise dark green and brown palette characteristic of their swampy, boggy habitats. And although we are fortunate that this plant calls our state one of its homes, its populations are not without serious threats.

Throughout history the wetlands that contain swamp pinks have been steadily imperiled by encroachment, draining, fill, and other human modifications that result in their demise. Even when wetlands are spared from outright conversion as part of development, small changes within their watersheds can result in drastic hydrologic shifts; in some instances disruption of hydrology can cause a wetland to dry up – conversely, improper water diversion can also lead to sites becoming oversaturated. Furthermore, in the absence of an appropriate-sized or properly-implemented buffer, wetlands can end up buried by excessive amounts of sediment from offsite locations. Any change to hydrology can be devastating to *Helonias*, a species that requires a stable, consistent water table just below the ground surface. Even a disturbance as slight as excessive trampling by foot can alter local wetland hydrology enough to affect populations of swamp pink.

Changes in water quality can also be a stressor in swamp pink habitat – if farmland is adjacent, management practices such as fertilization and pesticide application can lead to nutrient imbalances that can migrate through

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groundwater and contaminate subsurface hydrology. Likewise, adjacent livestock operations pose threats to wetland plants and hydrology – if animals escape into areas containing *Helonias* they can trample vegetation outright, alter water regimes, and also create nutrient problems through excessive defecation.

Protection of mountain wetlands through sustained conservation efforts is a simple first step to alleviating these development pressures, but even a perfectly-written easement can't stop a poacher from striking. Akin to the men who illegally harvested thousands of Venus flytraps from coastal NC Gamelands in 2015 some thieves also have their eyes on swamp pinks, which are sought by hobby gardeners looking to add rare flair to their bog habitats - sadly, research has shown that *Helonias* rarely survive translocation efforts. Furthermore, swamp pink sports low seed production and viability rates as well as extremely short dispersal distances, and as a result, puts most of its reproductive efforts into clonal growth, which inevitably leads to low genetic diversity within extant populations - all of these are traits common in species with cryptic and tenuous life cycles.

Management of North Carolina's swamp pinks and their habitat has been spearheaded by two main organizations, the NC Plant Conservation Program (with support from the Friends of Plant Conservation) and the US Fish & Wildlife Service. Together these groups have sourced and pooled resources and provided funding and technical tools to perpetuate native plants and their ecosystems through acquisition and management of important plant sites. While the USFWS mainly assists with funding, the PCP works on the ground to carry out field projects in biology, monitoring, and management that benefit *Helonias* and other protected plants within their preserves. The FOPC works behind the scene and, through advocacy, education, partnerships, and fundraising and development, insures that all NC imperiled plants are protected in their natural habitats through a statewide network of conserved or preserved sites and NC citizens' commitment to environmental stewardship.

~Owen Carson

Photos:
Owen Carson,
FoPC Board and
Environmental
Equinox, Inc.

Winter Prescribed Burns – 2018

Prescribed burning is challenging, but here's a bit of why we do it. For many rare plant species across North Carolina, fire suppression is a serious threat, making prescribed burning an important tool for land management. Choosing the timing of a prescribed burn is dependent on the goals. In some ways, any prescribed burn is better than no burn—but when we have particular objectives, then being selective about when and under what conditions we burn can make a big difference. PCP is often aiming to reduce leaf litter as well as to knock back the mid-story, namely shrubs and saplings. Burning at nearly any time of the year will accomplish the former, but growing season burns are important for accomplishing the latter.

However, there are additional challenges to burning in the growing season. For one, many sites might be well-suited to growing season burns, but best-suited to the early or late ends of the season, narrowing the window of opportunity. This window is further narrowed when there are hardwood trees involved. For instance, if we're aiming for the early growing season, then we need to have the right weather turn up during the short span of time when sap flow has begun, but before leaf -out is so far advanced that a stand has become resistant to fire (i.e. shaded, humid, and newly green). And then, we may have several burn units with the same or similar needs. Having these factors align multiple times in the same short window—well, it is challenging.

Smooth coneflower seeds.

Smooth coneflower seedlings.

Despite what I just said, PCP staff have had a good year for prescribed burns at the Plant Conservation Preserves, occurring across the state. Although we have had previous seasons with greater total acreage and greater number of burns completed, this year's calendar was full of units that are difficult to burn. Despite being tricky, these burns are well worth it! For our small staff, accomplishing prescribed burns like these requires a heavy reliance on productive partnerships. PCP could not have done it were it not for help from NC Forest Service, NC Botanical Garden, NC Natural Heritage Program, The Nature Conservancy, as well as individuals from local fire departments and the National Park Service. With their help, PCP has accomplished eleven burns at eight preserves so far, this year. Most of these burns occurred between mid-March and mid-April, and if you recall how wet February was, this is a real accomplishment, indeed.

With the tremendous effort required to coordinate staff, partners, volunteers, etc. to successfully conduct a prescribed burn—it sometimes feels like completing the burn itself is the accomplishment. But of course, it's the positive benefits following the burn that we're really after. No fewer than 21 imperiled plant species benefitted from these burns which reduce woody competition, promote flower production,

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and expose mineral soil required for successful seed germination. This last part is particularly important for restoration and management of sites with rare plants, especially those with small populations. Even when good soil exposure can be created by a prescribed burn, the benefit is not realized unless viable seeds land on these sites and germinate. In some cases, we may encourage this process along a bit to maximize the benefit of a prescribed burn.

One example comes from Durham County. Last fall, in anticipation of burning in coming months, PCP collected smooth coneflower seeds from our neighbor, Freudenberg Performance Materials, LP, which has a small population of this species immediately adjacent to one of PCP's Durham preserves. PCP has been partnering with Freudenberg for several years to manage this population on their behalf.

This March, in partnership with NC Forest Service, we conducted our second burn at this tract. One week following the burn, PCP staff sowed a few hundred seeds into seed plots adjacent to the existing coneflowers, imitating natural spread of the population into available, but unoccupied, habitat. In May, we resurveyed these plots and were pleased to see 130 seedlings had germinated! To put it in perspective, the parent population has several hundred plants, approximately 200 of which have bloomed per year since PCP has begun managing and monitoring this site.

This increase of 130 additional plants is a significant increase for this small population. PCP will continue to monitor the success of these seed plots as well as the parent plants on behalf of Freudenberg. PCP is also working in partnership with Freudenberg to provide additional management assistance, including tree thinning and future prescribed burns, to support the smooth coneflowers on the PCP Preserve.

Lesley Starke
Plant Ecologist, NC Plant Conservation Program
NC Dept. of Agriculture and Consumer Services

Seed plots at planting

Seed plots re-sprouting.

Close-up, Smooth coneflower seedling

Purple Fringeless Orchid

Platanthera peramoena~

A Search

The Purple Fringeless Orchid is blooming now in the Piedmont of NC. While you are out in the Piedmont, be on the lookout for the species at this time of year. If you spot it, send a note to the NC Plant Conservation Program and Natural Heritage Program to create a new record. It is as a Threatened species In NC that older texts say only occurred in the Mountains. More Piedmont localities would be nice to find.

~ Alvin

Other listed Platanthera spp.

P. grandiflora, Large Purple-fringed Orchid. Threatened

P. integra, Yellow Fringeless Orchid, Special Concern

P. integrilabia, White Fringeless Orchid, Special Concern,

Editor's Notes:

Alvin is correct that information be sent to the Natural Heritage Program and NCPCP. NCNHP has an online form you can use: https://www.ncnhp.org/share-data/contribute/plant-survey-form.

Please send us a photo too, but be sure to remove any GPS info that is collected by your camera. Send to **info@ncplantfriends.org**

Weakley's Flora reports it Rare in the Piedmont.

USDA Plants Database reports the species in Forsyth County

Purple Fringeless Orchid is found in bogs, seepages, moist forests, and moist meadows in the mountains. It blooms beginning about the 3rd week of June and will bloom sporadically through October. In the Piedmont bloom time may be a little different but rich, moist areas are still likely places to watch for it.

Remember, no plant or seed collecting if you spot it. If a specimen is needed, NCNHP will advise you or visit and collect themselves if the population will not be harmed. This is a Threatened species, so take care and keep the information to yourself except for notifying NCNHP and NCPCP.

Thank you for taking time to watch for this species!

Conserving Native Bees and Other Pollinators

***Nancy Lee Adamson, PhD**, ecologist, Xerces Society for Invertebrate Conservation & USDA Natural Resources Conservation Service, East National Technology Support Center, Greensboro, NC nancy@xerces.org*

Pollinator Diversity in North Carolina

There are about 500 species of bees, 175 species of butterflies, and an unknown number of other insect pollinators (wasps, beetles, flies, etc.) in North Carolina, plus one bird, the ruby-throated hummingbird (Asher and Pickering 2014, http://ncwildlife.org/plan . Dr. Matina Kalcounis-Ruppell of UNC Greensboro says that our native bats are occasionally pollinators, but none seek nectar like the fruit bats in western North America. Many pollinators have specialized relationships with plants that have evolved to defend themselves against herbivores while also coaxing help for pollination and seed set. Most of us know plants that invite hummingbirds, such as wild columbine, coral honeysuckle, trumpet creeper, and cardinal flower. You may notice the perfect fit for butterflies visiting lilies like Turks' cap, whose flower parts slather pollen on butterfly wings. Bees that have specialist relationships with flowers usually collect pollen from one genus or one family, sometimes reflected in the bee's scientific name (see http://jarrodfowler.com/specialist_bees.html), but collect nectar from diverse plants. There are a number of aster family specialist bees, though asters such as sunflowers may have a huge diversity of pollinators. For some plants, like yucca, their primary pollinator (the yucca moth), is also their primary herbivore (the yucca moth caterpillar).

Syrphid fly on *Salix*.

Though we know less about fly, beetle, wasp, ant, and other insect pollinators, some may be especially important for native plant pollination—particularly spring ephemeral wildflowers and unusual carnivorous plant communities. Syrphid flies (aka flower or hover flies) are active in cooler, wetter conditions than many bees. In the US, syrphid flies and a number of other predatory and parasitoid insects are generally monitored more for their roles reducing crop pest populations (conservation biological control). In this essay, we take a closer look at native bees.

Bombus impatiens (russet banded morph). The common eastern bumble bee is likely the species of bumble bee you'll see on flowers 90% of the time, but we saw this russet morph (its abdomen is usually all yellow and black) on the endangered Heller's blazing star, *Liatris helleri*, in western NC.

Native Bee Diversity in North Carolina

Most people recognize bumble bees, carpenter bees, green metallic sweat bees, mason bees and leafcutter bees. The vast majority of these native bees are solitary. This means that when they emerge from nests as adults, they mate, then each single mom makes and provisions nests alone, though sometimes in aggregations. She collects nectar and pollen, lays an egg, then seals off a nest cell before repeating the cycle. She never sees her young hatch, eat the provisions she collected, go through four or five instars, pupate (transform from a grub-like larva into an adult with wings), and emerge from the nests she made for them. She only lives three to six weeks, and her young may spend most of the year underground or in the cavity where she created each nest cell. Since she does not have a queen, sisters, brothers, live larvae, or provisions for over winter to protect (like honey bees), she is never defensive near her nest. This is why you can place bamboo for cavity-nesting bees or an adobe block for ground-nesters by your front door and enjoy watching them close-up through the growing season without fear of being stung. In the bamboo or a woodblock, you will likely see mason bees in spring, then leafcutter bees in early summer, along with some of our solitary wasps, such as mud daubers (who collect spiders to feed to their young). Only bumble bees and a few other species are social, e.g. live in colonies with a queen, female workers, live larvae that they are actively feeding, and males (who leave the colony to

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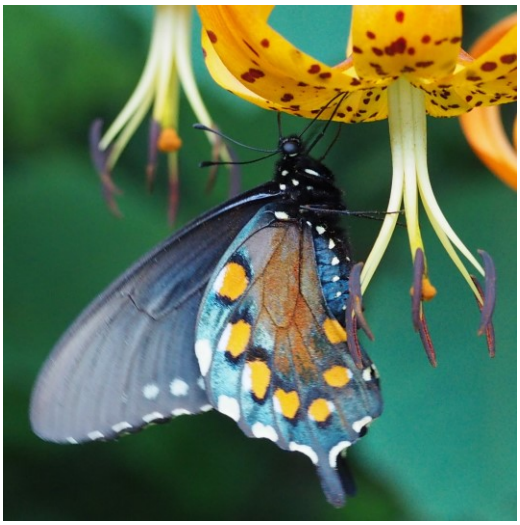
*Habropoda laboriosa***.** Though the blueberry bee collects pollen only from flowers in the heath family, it may collect nectar from other flowers, like redbud, *Cercis canadensis.*

to mate). Carpenter bees are semi-social, sometimes living with more than one generation, but the male with the white patch you may see defending his territory is harmless—he, like all male bees, has no stinger. European (aka western) honey bees were introduced to the Americas with early settlers (more for the wax needed for candles and water-proofing than honey).

Native bees are especially important crop pollinators since their only food is pollen and nectar (other native pollinators eat insects or other parts of plants at some life stage). Bees and wasps are "central place foragers" traveling as short a distance from

Andrena accepta. Most of our andrenid (mining bees) are active in early spring, but this sunflower specialist is active in fall when our native sunflowers, *Helianthus* spp., are in bloom.

their nest as possible to forage. Native pollinators, especially native bees, are vital for successful production of blueberry, apple, strawberry, blackberry, raspberry, squash, cucumber, cantaloupe, melon, persimmon, muscadine grape, and tomato, and all our native plants that depend on pollinators (Cane 1996; McGregor 1978).



Papilio troilus. Notice the pollen on this spicebush swallowtail's wings visiting Turk's cap lily, *Lilium superbum*

Of the 500 or so bees in North Carolina, mostly native, about 17 are bumble bees (*Bombus* spp.), nearly 100 are mining bees (*Andrena* spp.), and 21 are mason (aka orchard) bees (*Osmia* spp.), groups tremendously important for spring flowering fruit crops such as apple and blueberry. Among mason bees, there is one managed native species, the blue orchard bee, *Osmia lignaria*, and two naturalized species, *Osmia cornifrons* and *Osmia taurus*, that were introduced to the US from Japan in 1977 by the USDA Agricultural Research Service (Batra 1978). Also vital for North Carolina crops are some pollen specialist bees, the southeastern blueberry bee, *Habropoda laboriosa*, and three squash bees (cucurbit specialists), *Peponapis pruinosa, Xenoglossa strenua,* and *Xenoglossa kansensis* that are especially important for squash, cucumber, and pumpkin production. Another specialist, the rose mallow, hibiscus, or okra bee, *Ptilothrix bombiformis*, may be important for okra and possibly cotton. Some leafcutter bees, *Megachile* spp., are specialists on wild peas and may also be effective in cultivated peas. In NC, there are about 37 *Megachil*e species.

Promoting Pollinators

Environmental educators promoting pollinator gardening and conservation can help reduce fears associated with pollinators that have stingers and plants that have pollen by reminding people that 1) bees, wasps, and other insects on flowers will fly away if you get too close, 2) most bees and wasps are solitary, so not defensive near their nests, 3) placing a wasp deterrent lantern outside in February helps encourage social wasps to nest elsewhere, and 4) plants needing a pollinator have heavy, sticky pollen so most pollinator garden plants do not cause allergies (see Insect Pollination of Goldenrod video at http://www.discoverlife.org/goldenrod/).

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Megachile xylocopoides on *Helianthus schweinitzii*

Like us, all pollinators need food, shelter, and protection from toxins. Understanding the diversity of pollinators in our natural landscapes will give land owners and land managers the opportunity to better support unmanaged and managed species.

~Nancy L. Adamson

Andrena on *Claytonia virginica.*

Osmia in bamboo.

World Atlas Of Desertification

On June 21, 2018 the Joint Research Centre published an updated edition of the World Atlas of Desertification. Included in the publication are the following findings:

- Over 75% of the Earth's land area is already degraded, and over 90% could become degraded by 2050.
- The economic cost of soil degradation for the EU is estimated to be in the order of tens of billions of euros annually.
- Land degradation and climate change are estimated to lead to a reduction of global crop yields by about 10% by 2050. Most of this will occur in India, China and sub-Saharan Africa, where land degradation could halve crop production.
- As a consequence of accelerated deforestation it will become more difficult to mitigate the effects of climate change
- By 2050, up to 700 million people are estimated to have been displaced due to issues linked to scarce land resources. The figure could reach up to 10 billion by the end of this century.

While land degradation is a global problem, it takes place locally and requires local solutions. Greater commitment and more effective cooperation at the local level are necessary to stop land degradation and loss of biodiversity.

Download a copy of the Report:

https://wad.jrc.ec.europa.eu/

Redlair Observatory Project

The Redlair Observatory is a project of Universities (UNC Charlotte, UNC Chapel Hill, Queens), the State of North Carolina (NC Plant Conservation Program (PCP); NCDEQ, and non-profits (The Catawba Lands Conservancy; Friends of Plant Conservation; and the Redlair Foundation), who have partnered with the generous support of the Duke Energy Water Resources Fund and local businesses (Geologic Exploration, Inc.; Hart and Hickman, PC; Crawford Environmental Services, LLC dba CES of NC, PLLC) to establish the Redlair Observatory at Redlair Preserve – a Piedmont site of long-term environmental, ecological, and hydrological monitoring adjacent to the South Fork of the Catawba River.

This data collection partnership has largely been in place since 2004, but since the purchase of the core Redlair parcel by NCPCP and the receipt of a large grant, we are now motivated to more formally and clearly establish the Redlair Observatory, with its own mission and partners, as being distinct from Redlair Preserve, the land - comprised of several adjacent property parcels that are protected to different degrees under NC law.

Missy Eppes and Haywood Rankin scout Redlair for likely well sites.

The mission of the Observatory partnership is to provide a much-needed, long-term, high-resolution database of groundwater, surface water, soils, ecology and weather that spans the South Fork floodplain up to small (<km-scale) headwater catchments that comprise >95% of the watersheds of local streams and rivers. These small watersheds are major contributors to water quality in large rivers of the Piedmont. Observatory data will be available for researchers, planners, land managers and K-16 educators - providing long-term insight into undeveloped watersheds adjacent to the rapidly growing urban areas of Charlotte and Gastonia. The Observatory is broadly similar in its long-term mission in both research and education to federally funded Critical Zone Observatories and Long-Term Ecological Research Sites. Combined with its proximity to the rapidly growing Charlotte metropolitan area, the Observatory has strong potential to achieve distinction as a key location for natural data in the Piedmont of the southeastern United States.

Identified need: An integral portion of the Redlair Observatory is a newly awarded ~$75,000 Duke Energy Water Resources Grant that allows us to establish long-term groundwater, surface water and weather stations in the Deep Creek, Big Lake Creek, South and North Rhyne watersheds. These automated collection stations will collect data every 15 minutes, requiring periodic downloads, either through site visits or dedicated cellular connections. We are reached out to our partners to inquire about the feasibility of providing financial support (~$1800 annually) for the recurring expense of a data plan that would allow cellular down/ uploading of the station data. Here are the details surrounding this request:

The Duke Grant was a partnership between UNC Charlotte (Missy Eppes & David Vinson), CLC and PCP. UNC Charlotte is setting up the monitoring stations, and PCP committed, as a partner in the Grant, to providing volunteers to download the data from the stations and upload to a central database. There was no salary allowed in the grant by Duke, and the initial commitment from everyone in the Grant is 5 years. The Grant indicated that a volunteer would need to be in the field for a total of 4 hours once every week over the course of this five years in order to adequately download and upload the data set. Thus the Grant did not include a budget for automated cellular download and upload of the data. Technology for such systems

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A simple way of downloading data, monitoring proper functioning of equipment, and eliminating the need for volunteers who can commit 4 hours per week for five years... A No Brainer!

has advanced greatly in recent years. Automation of down/uploading would be preferable over volunteers because it would enable automatic detection of any sensor malfunction, reducing the potential that data might be lost between visits by a volunteer. Thus, the PCP volunteers might only need to go out occasionally over the course of the entire five year deployment.

Further, such automation increases the quality of data sets such as these overall because it reduces the potential for human error.

As of now, the Grant covers the cost of the instrumentation with our existing funds. However, each cell link requires a monthly fee - like a cell phone bill - of about $15 per month. We estimate needing about 10 individual modems for the Observatory given the spacing between monitoring stations. Thus, to have an automated system over the life of the grant would cost about hundred $150 per month for five years for a total of $1800 per year (comparable in cost to paying the volunteer $10/hr - $1920).

Martha Cary (Missy) Eppes, Ph.D.
Professor of Earth Sciences
Department of Geography & Earth Sciences
UNC Charlotte

The Decision

Seeing the scientific value of the project, and the ease and reliability of remote equipment over finding willing volunteers to devote 4 hours per week, every week for 5 years, the FOPC board of directors voted to contribute $3,000 toward the total cost. The Catawba Lands Conservancy committed $6000 to the project to reach the needed total of $9000 for the equipment.

Being of the opinion that this is a project that Alice Zawadzki would have approved, the Board decided to use funds from her bequest.

Photos for this story courtesy Lynn Robertson, UNC Charlotte.



A Botanical Adventure

On Sunday May 29, I had the opportunity to go on a botanical adventure with Bruce Sorrie, botanist, retired from the NC Natural Heritage Program. The North Carolina Natural Heritage Program is a program of the Division of Land and Water Stewardship within the North Carolina Department of Natural and Cultural Resources.

Bruce has over 30 years of experience and is an expert in his field, and can name just about any plant you can point out. He has written "A Field Guide to Wildflowers of the Sandhills Region," which also has many plants you'd expect to see in the Uwharries. His guidebook is arranged by habitat, and features over 600 wildflowers, flowering shrubs and vines.

Bruce allowed The LandTrust for Central NC to auction off a morning with him looking for unique plants as part of our fundraising event, RiverDance, last year. The winner of the botanical tour brought along a friend and we met at the Eldorado Outpost Sunday morning on our adventure.

We drove mainly in the Badin Recreational Area of the Uwharrie National Forest. Our first stop was a site of a recent prescribed burn. Here we spotted skullcap in bloom. Also flowering were some milkweed plants, which look like popcorn balls with stars in the middle of each popcorn piece, and they were a little scorched from the fire, but otherwise doing fine. We saw some nonnative plants as well, including microstegium and queen anne's lace, the latter of which most people think of as native but it is actually from Europe. There were native passionflower vines just about to bloom, as well.

The next place we stopped had fire pink and light pink bee balm in bloom, along with delicate yellow sundrops. Typically you see fire pink more along rocky slopes, but this was right in the roadside. A little further along we spotted coreopsis and goat's rue. We walked into the woods a bit among towering chestnut oaks, and saw striped wintergreen in flower. Another stop by a small creek resulted in us spotting some jack-in-the-pulpits in bloom.

At yet another location, we found some of the state endangered Carolina thistle. We were unsure at first what thistle it was, especially because there was so much of it, we questioned whether it could be the rare one. However, we found out later that this is probably the best population of Carolina thistle found in the state. There were bumblebees and a Zabulon skipper gathering pollen from these plants. A grey petaltail dragonfly made a stop on Bruce's hat, also an uncommon find.

At our last stop, we got to see maidenhair fern, native clematis with its pretty bell shape, and wild hydrangeas in bloom. This was along a roadside with a rocky outcrop and steep elevation. A lace-winged roadside skipper was perched atop the wild hydrangea in one of my pictures. They are also uncommon and are a specialist on rivercane.

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All in all, this was an excellent way to spend a morning, searching for these unique wildflowers along the roadsides in the Uwharries. Many spring wildflowers have already bloomed and set seed, but there were still plenty in flower for us to spot and enjoy. You don't need an expert like Bruce to enjoy these beautiful wildflowers, though, as they are just as lovely whether you know the name of them or not. You can even purchase your own field guide of your choice and learn how to identify them yourself if you so desire. Botanizing is just another great excuse to spend time outside enjoying the beautiful sights and scenery that nature has to provide.

~ Crystal Cockman
FOPC Board
Land Trust of Central North Carolina

Volunteer Recognition

The Raleigh Parks and Recreation Department and the Greenway Advisory Board recognized what we have known for a long time: Herb and Pat Amyx are outstanding volunteers! Last Spring they were presented with an award for OUTSTANDING VOLUNTEER PROJECT at the 23rd Annual Fred Fletcher Outstanding Volunteer Awards Ceremony.

Our congratulations to them both, and our gratitude for their continued work on PCP preserves. In 2015 FoPC recognized each of them as Distinguished Members of the Year.

We look forward to seeing them in the field many times in the future, and we invite YOU to join our volunteer ranks!

Tater Hill Team

Matt Estep, steward at Tater Hill, took advantage of a glorious day and a monster auger to install a PCP Preserve sign. The sign instructs those who want access to the site to contact PCP.

It won't keep out those who have little regard for private property, but is fair warning that they are trespassing and subject to the laws of North Carolina.

Matt has been a huge help with preserve management, leading guided walk and conducting volunteer workdays. He has his eyes on the property, along with other neighbors, and eventually we may get trespassing under some measure of control.

Thanks Matt!

PS—The sign, along with others, were donated by Friends of Plant Conservation thanks to our many generous donors.

Updating Imperiled Species List

The NC Plant Conservation Program updates its list of Endangered, Threatened, and Special Concern species every 5 years, with a full review every 10 ten. The last update was completed in 2010, listing 419 species. In the ensuing years major staff at PCP and budget cuts, staff changes, and a move from the NC Department of Environmental Quality to the NC Department of Natural and Cultural Resources by the NC Natural Heritage Program has delayed the ability to accomplish this major task.

The revision of the state protected list has been on the radar of PCP, NHP, and the PCP Scientific Committee for several years and is currently being assessed. Lesley Starke (PCP) has taken the lead with Laura Robinson (NHP). All tracked plant species are reviewed—including those possibly under threat from commerce, habitat change, pests, poaching, the number is over 800. All species will be reviewed with the listing criteria previously established by the PCP Scientific Committee.

Lesley analyzed the NHP data to determine which species had significant changes in the data since the previous assessment in 2008. Of those that had significant changes, PCP is reviewing if there are changes in threats and trends. We are also reviewing several hundred species that were previously determined to be data deficient. Alan Weakly (Scientific Committee chair) Lesley and Laura have been meeting to review the data deficient species, determine if they are still data deficient, and determine the trends. Lesley reports that they have made good headway this spring.

In the previous review process of 2008-2009, nearly 400 species (397) were determined data deficient, meaning they could not be adequately reviewed. Since then, there were substantial updates in the NHP records for ~100 (98) of these data deficient species, bringing them into our current round of review. They have been able to bring 48 of the 98 species out of data deficient status and into the review pool. The remaining 50 species were determined still data deficient.

With that section completed (review of the previously data deficient species) the next subset for review are 75 species which were not tracked in the database during the previous review process and are thus being examined with the Scientific Committee review criteria for the first time.

The NC Natural Heritage Program maintains a separate list which is not the same as the NCPCP list. It can be accessed at their website: www.ncnhp.org

The current NCPCP list can be found at www.ncagr.gov/plantindustry/plant/plantconserve/

Sisyrinchium dichotomum, White irisette. State and Federal Endangered.

An Update from Cheryl Gregory

The ~1,200 acre Tater Hill Plant Conservation Preserve protects much of the Potato Hill Bog and Seeps/Rich Mountain Bald/Harmon Knob natural heritage natural area (NHNA) which is rated "outstanding" for biodiversity by the Natural Heritage Program. This natural area is further recognized as being a top-ranked rare ecosystem having one of the best clusters of Southern Appalachian Bog communities including many northern disjunct and rare plant populations. This natural area contains 12 natural communities of importance including two of global significance: Northern Hardwood Forest (Beech Gap Subtype) and Southern Appalachian Bog (Long Hope Valley Subtype). One of the most important features of this natural area is the unusually mineral-rich and high pH (basic) soil, weathered from amphibolite rock which supports unusual natural community types and rare plant species, relative to the rest of North Carolina.

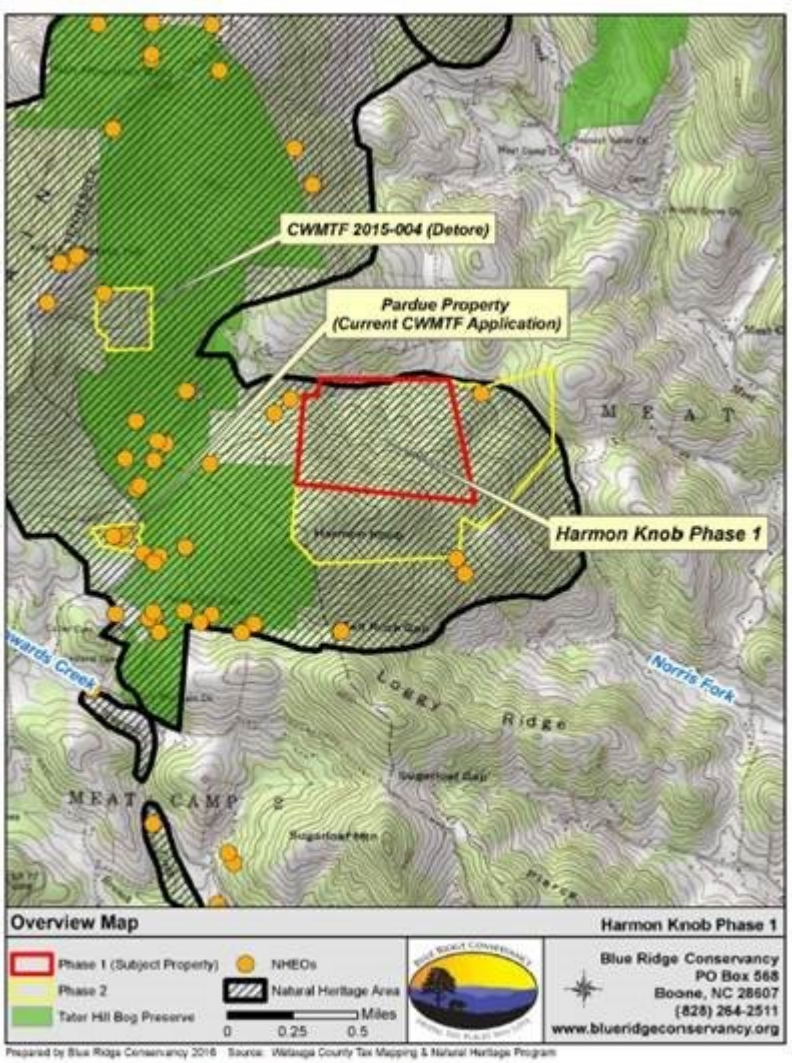

Figure 1. Harmon Knob and Tater Hill PCP Preserve. The Harmon Knob protection project is proposed in two phases. Phase I includes 170 acres of the Proffitt tract. The Gray's Lily subpopulation in the Phase I tract was not known at the time this map was created and is not shown here.

Blue Ridge Conservancy had successfully purchased this property through fundraising efforts and private donations which helped provide matching funds to the endeavor. At closing, BRC gifted Harmon Knob Phase I & II to the Department of Agriculture and Consumer Services with PCP serving as custodian and manager. The latest Phase II property closed and the deed was recorded on May 18, 2018. The transaction added ~200 ac to the eastern side of Tater Hill. The combined Phase I (2016 acquisition, another gift from BRC) and Phase II areas encompass 360+ acres of exceptional habitat and they improve the boundary of the preserve to better include the Harmon Knob amphibolite mountain feature. Currently, we know that there are two imperiled plant species on the new parcels. One species was previously identified by PCP staff as critical for protecting in North Carolina and this species is not currently protected in the PCP preserve system. There are only two populations of this species in the region making this a high priority conservation target. Additionally, new populations of three state rare species, one of which is new to the Tater Hill Preserve, were also observed during a recent site visit to the Phase I area. A great addition and successful partnership in rare plant conservation with Blue Ridge Conservancy!

~ Cheryl Gregory
Administrator, NCPCP

EDITORIAL

Getting Plastic Under Control

We saw many jaw-dropping, beautiful sights on our visit to the Southwest this summer. In spite of the heat, wind, Exceptional Drought level, and dodging fires as we selected our routes, it was a trip full of surprises.

One thing I did not expect was to learn is the impact of plastic bags on cows...and other animals I presume. We noticed a lot of roadside litter, even on the backroads we favor when travelling. The worst was in New Mexico. With the nearly constant wind out there, it is natural that the litter blows around, and plastic bags often get caught in barbed wire fences.

With horror I noticed a cow consuming a plastic bag. That night, I looked it up and the news is not good. Apparently plastic bags are appealing to cows as they have either a salty or sweet taste. Once eaten, there is little that can be done for the cow. Their digestive system can't handle the plastic, there is nothing to give them to dissolve the plastic, so if there is enough, it blocks their intestines. Soon the cows lose their appetites, become lethargic, and eventually die.

There are biodegradable plastics available, but they are more expensive and only reduce the length of time for the plastic to degrade. Those items do not completely disappear any more that regular plastic.

I continue to struggle to reduce plastic consumption, looking for as many products as I can that do not arrive packaged in plastic. Many things are beyond my control, car and appliance parts for example, but when I do purchase something in plastic I do my best to RE-USE until it falls apart, and then to RECYCLE.

It is truly disheartening to see trash everywhere, even on and around ancient ruins in our Southwest. We can do better.

~ Editor

This article is the opinion of the Editor and does not necessarily represent the position of the Friends of Plant Conservation. KS

PS: Those are not cows in the background of the photo above; it's Cholla cactus, *Cylindropuntia imbricata*. The Cholla in the photo below is growing in a 1,000 year old lava field near Carrizozo, New Mexico.

Friends of Plant Conservation, Inc.

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IF YOU DID NOT RECEIVE A RENEWAL NOTICE, PLEASE USE THIS FORM

☐ **New Membership** ☐ **Membership Renewal**

☐ Enclosed are my dues:

Student	$5.00	$_____
Individual	$15.00	$_____
Family	$25.00	$_____
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☐ I would like to make an addition donation to:

Caraway Preserve	$_____
Cedar Mountain Bog	$_____
Jesse's Fund	$_____
Land & Stewardship Fund	$_____
Unrestricted Funds	$_____
TOTAL ENCLOSED	$_____

Suggestions:

Volunteer Opportunities—circle choices

Preserve Steward: to monitor a preserve as directed by NCPCP staff

Work Crew: to assist with Preserve workdays (invasives removal, plant monitoring, boundary checks, and more).

Newsletter: write articles, layout, research, or other activities to improve communication with members.

Board service: the place to get to know imperiled plants and habitats; conservation issues; staff, members; and really make a difference in N.C.

Photography: photograph imperiled plants and habitats for newsletter and website.

Committees: less time commitment, still aiding the organization and rare plants: membership, volunteers, education, advocacy, programs.

My

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