

Semprevirens

Spring 2018 The Quarterly of the Virginia Native Plant Society

2018 Annual Meeting Set for Sept. 14–16

‘Sustaining Nature, Sustaining Ourselves’

Article by Cortney Will, John Clayton Chapter

We at the John Clayton Chapter are excited that we will be the host of this year’s annual meeting, to be held Sept. 14–16 in Williamsburg. The conference will be held at the William and Mary School of Education. Built in 2010, the beautiful facility boasts a Gold LEED rating and features prominent rain gardens, which are of course stocked with interesting native species.

This year’s theme is Sustaining Nature, Sustaining Ourselves. Conservation groups such as the Virginia Native Plant Society are excellent at adhering to our primary purpose: sustaining and advocating for the natural world. What some of us are finding we aren’t so great at is claiming the time and resources to

intentionally sustain our organizations and members.

The conservation world faces enormous pressure from climate change, policy decisions, and an expanding population. Added to this landscape are profound technological changes, shifting communications preferences, and a general desire to diversify our organizations to serve a wider swath of the population. How do we adapt?

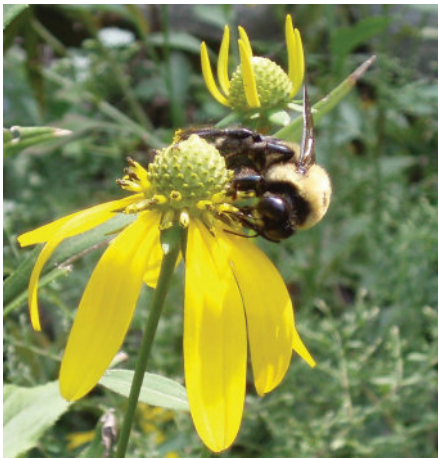
Some longstanding conservation groups want either to progress for the sake of progress or to change to ensure their survival, but many of us don’t know where to start. VNPS has watched two chapters close in the past few years, one of which is happily taking the steps to return. But the trend has concerned some

other chapters, who want to know what they can do to make sure that they remain healthy in the coming decades.

So this year, in addition to showcasing the excellent and varied habitats of the Coastal Plain, we want to know what experts see on the horizon and what they suggest that our conservation groups do to sustain ourselves as well as the habitats we love so much.

And where better to do that than the Historic Triangle and the Peninsula, the sites of so many firsts for our nation? We hope you’ll join us for a series of walks, workshops, talks, and panels. Save the date, and watch for more details over the spring.

We look forward to spending an excellent weekend with you! ❖



Walks, talks, workshops, and panels will keep everyone busy at the Society’s Annual Meeting in Williamsburg September 14–16. Conference attendees might see, from left, Cut-leaf Coneflower (*Rudbeckia laciniata*), Indian Pipe (*Monotropa uniflora*), or Sundew. (Courtesy John Clayton Chapter)



From the President

Visits to Blandy Move and Inspire

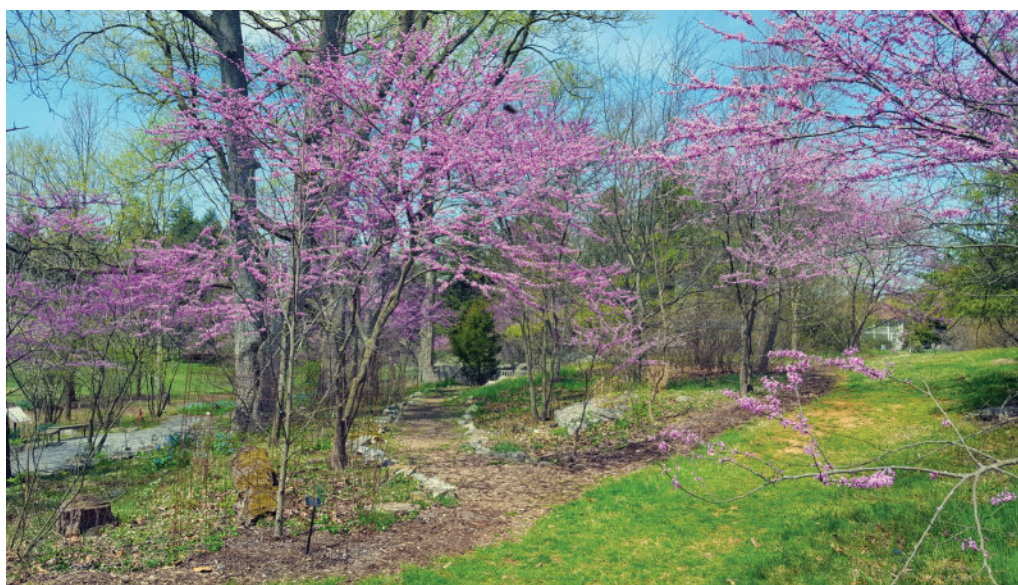
As your president, I regularly drive out to Boyce, where our office manager Karen York works in a small space in the administrative building at Blandy Experimental Farm and State Arboretum of Virginia. Blandy is a field station of the University of Virginia. An hour's drive from my home in Manassas, it's a world away from the fast pace and congestion of Northern Virginia. I know that I am in the country as soon as my car enters Fauquier County as I-66 crosses Broad Run at Thoroughfare Gap in the Bull Run Mountains.

Virginia's Piedmont extends with farms, estates, and wineries as far as the eye can see. A solitary White Oak tree caught my notice as I passed an exit for Marshall. The last time I drove past, the tree was no more; it succumbed to the fierce early March windstorm and was lying on the ground. This magnificent tree had been ailing, but seeing it on its side saddened me. I vowed to drive home on the local road and stop to pay homage to this old friend.

Further on 66, the exit for U.S. Route 15 north is straight ahead as the interstate veers left. I enter a scenic byway that leads to Paris from

Delaplane along Crooked Run Valley. The speed limit is 45 and blinking signs indicate that it is strictly enforced. I set my speed control and enjoy the opportunity to absorb the scenery that lines the route: magnificent estates, stone walls, cattle, wineries, ponds, and several

Blandy's stately stone signs flanking the entrance road are on my left, and I drive by trees that are protected by deer barriers without which the State Arboretum's trees, occupying more than 170 acres on the property, would be browsed by the deer herd that I often spot on the grounds.



Woodland Redbuds. (Photos by Nancy Vehrs)

Once I have conducted business with Karen by signing letters or checks, reviewing mail, and generally catching up on VNPS business issues, I always take a walk along the Nancy Lar-

entrances to Sky Meadows State Park.

Once in the beautiful Paris of Virginia, I turn west on U.S. Route 50, a divided highway that leads to Winchester and crosses the mountain at Ashby Gap. I traverse the Shenandoah River lined with giant Sycamore trees. I often enjoy visiting a river put-in spot on my way home. The turn for Millwood is a mile before Blandy; it's the location of the historic Burwell-Morgan Mill. More important, it is the location of the Locke Store, a former general store that is now a deli and gourmet shop with many locally grown products. A visit there is always a treat on my way home.

rick Native Plant Trail. It begins just beyond the pollinator beds near the building. I walk through the arbor covered in Trumpet Honeysuckle (*Lonicera sempervirens*), pass the irises, and enter the upper part of the woodland native plant garden. The Dead Tree Hollow sports an old chimney, a stone wall, and fallen logs covered in moss. Huge Witch Hazels (*Hamamelis virginiana*) are on the left. I pass the "Sally Anderson tree," a Tulip-tree (*Liriodendron tulipifera*) planted in her honor a few years ago, and descend the newly redone stone steps to continue on the trail.

I head down the trail where



Wild meadow management.



Flowering Dogwood, almost open.

distant mountains provide the backdrop to the meadows. The native grasses look lovely even in late winter when they sway in the breeze. According to assistant plant curator Kim Strader, “Meadow management is going okay. We continue to have areas of problems with Dahurian Buckthorn (*Rhamnus davurica*), nonnative Bush Honeysuckle (*Lonicera* spp.), and Black Locust (*Robinia pseudoacacia*).” The native Black Locust tries to return to the site where it previously grew. She says that Yellow Bedstraw (*Galium verum*), an invasive from Europe, may never be under control and that it needed more eradication efforts before meadow establishment. In the past I have mistaken it for a very early-blooming goldenrod. Fire

is used for management and Kim says that the meadow is split into three sections that receive treatments on a rotation. One year a section is burned, the following year that section is bushhogged, and the third year it is left fallow. She said that for the first 10 years, rotational fire management was the only technique used. In 2013 bushhogging was added to the rotation and it has reduced, but not eradicated, the aforementioned woody plants.

The trail passes a small pond and wetland where the Buttonbushes (*Cephalanthus occidentalis*) still retain last year’s seed heads

(“buttons”) well into March. There is an observation pavilion overlooking the pond, and I always pause there to look for birds and take in the vista. In late winter I am rewarded with Cedar Waxwings, an Eastern Phoebe, White-throated Sparrows, and, in the sky, a Red-shouldered Hawk.

As I continue along the trail, I pass some rock outcrops and the remains of lobelias that had a magnificent showing of red and blue early last fall. Some of the Joe-Pye Weed seedheads are still evident, and birds hide in the Dogwood shrubs. I pass a rock wall and approach the Baldcypress tree that grows quite well despite dry conditions. As I re-enter the woodland garden, I think about the coming blooms. This time of year the Yuccas provide greenery, and the Possum-haw (*Viburnum nudum*) still holds some red berries from its abundant fall crop.

It’s a privilege to visit our State Arboretum at Blandy regularly so I can view its changes through the seasons, and I encourage you to visit as well. Its special Garden Fair (for which there is a parking fee) is scheduled for Mother’s Day weekend, May 12–13. Our Piedmont Chapter participates with a table at this event. Learn more about Blandy at www.blandy.virginia.edu. ❖



Dead Hollow Trail.

Natural Area Preserves Home to Rare Botanical Discoveries



From Your Natural Heritage Program

By Zach Bradford

Virginia's Natural Area Preserve (NAP) system protects some of the state's rarest plants, animals, natural communities, and geologic features. As such, most of our 63 preserves have received many years of attention from good botanists, so it is easy to assume there is not much left to find. Yet resurveys of Virginia's preserves are still turning up rare and extraordinary plants. Here are some highlights from the past two years:

BLACKWATER ECOLOGICAL PRESERVE (Isle of Wight County).

Though this preserve has been a focus of intensive field botany for many decades, several new rare plants have been recently found here. The summer of 2016 marked the discovery of the rare orchids, Large Spreading Pogonia (*Cleistopiopsis divaricata*) and Eaton's Ladies'-tresses (*Spiranthes eatonii*), the latter of which had not been documented in Virginia in more than 80 years. Later, in 2017, Lytton Muselman of Old Dominion University found several stems of Pineland Scalypink (*Stipulicida setacea*), likely the northernmost known occurrence of this fire-adapted southeastern species.

Next door, at **ANTIOCH PINES NAP**, staff of the Virginia Natural Heritage Program found Sandhills Butterfly-weed (*Asclepias tuberosa* var. *rolfsii*), a southern variety of butterfly-weed that inhabits dry, sandy pinelands subject to frequent fire.

BUFFALO MOUNTAIN NAP (Floyd County). A 2018 review of photographs taken in 2014 revealed Yellow

Nodding Ladies'-tresses (*Spiranthes ochroleuca*), a rare orchid of high-elevation meadows and clearings.

THE CEDARS NAP (Lee County). In 2016, Heritage ecologists found Virginia's first verified record of Catesby's False Bindweed (*Calystegia catesbeiana*) in a dry calcareous woodland atop a cliff overlooking the Powell River.

CUMBERLAND MARSH NAP (New Kent County). The uplands have been an afterthought at this preserve where rare freshwater tidal communities and their federally listed Sensitive Joint-vetch (*Aeschynomene virginica*) have long been the focus. But in 2017, Natural Heritage staff found Virginia's third occurrence of Narrowleaf Golden-aster (*Pityopsis graminifolia* var. *tenuifolia*), Chapman's Purpletop (*Tridens chapmanii*), and Cream-flowered Tick-trefoil (*Desmodium ochroleucum*) in the uplands of the preserve. The latter two species had not been seen in Virginia for many decades, and the newly discovered Cream-flowered Tick-trefoil population is possibly the largest in existence for this globally



Desmodium ochroleucum. (Zach Bradford)

imperiled species that is thought to number only around 1,000 individuals in the world.

ELKCLICK WOODLAND NAP (Fairfax County). Surveys in 2017 resulted in the discovery of Purple Milkweed (*Asclepias purpurascens*) and Rough Hedge-nettle (*Stachys aspera*) in this preserve that protects a globally rare Northern Hardpan Basic Oak-Hickory Forest in a rapidly developing area.

MOUNT JOY POND NAP (Augusta County). A small population of federally listed Swamp Pink (*Helonias bullata*) was found in 2017 on this preserve, a new target of land acquisition and protection by the VNPS.

In addition, prescribed fire and mechanical forest thinning have promoted expansions of rare plant populations at numerous Natural Area Preserves. Notable examples include the drastically increased recruitment of Northern Rattlesnake-master (*Eryngium yuccifolium*) at **THE CEDARS NAP**, a population explosion in globally rare Cuthbert's Turtlehead (*Chelone cuthbertii*) at **CHERRY ORCHARD BOG NAP** (Prince George and Sussex counties), and expansions of federally listed Smooth Coneflower (*Echinacea laevigata*) and Tall Barbara's-buttons (*Marshallia legrandii*) at **DIFFICULT CREEK NAP** (Halifax County), the latter known from two places on Earth.

These finds show that the preserves are truly biodiversity hot spots, and additional significant plant and animal populations will continue to be discovered within them. The Virginia Native Plant Society, through both its advocacy and direct support of the Virginia Natural Heritage Program, deserves immense credit for the health of Virginia's natural heritage and the growth these places. ❖

—Zach Bradford is the Chesapeake Bay Region Steward for the Virginia Natural Heritage Program.

How *Cornus florida* Got Its Name

Article and illustrations by W. John Hayden, Botany Chair

In 1753, Swedish botanist Carolus Linnaeus was the first to apply the scientific name *Cornus florida* to the plant we know as Flowering Dogwood. That simple and straightforward declarative sentence belies the complexity and obscurity of how Linnaeus named this and nearly 6,000 other plants in his seminal work, *Species Plantarum*. To understand what Linnaeus actually did requires a dive into the arcane world of 18th-century botany. And that is what this article endeavors to accomplish, to explain how *Cornus florida*, the 2018 VNPS Wildflower of the Year, got its name.

Before *Species Plantarum* was published, scholarly names for plants were polynomials, essentially descriptive phrases, in Latin, used to distinguish each plant from all others known at the time. Polynomial names are (and were), downright cumbersome. And to make matters worse, they were not standardized. Often, different botanists would describe the same plant by emphasizing different features, coining different polynomials for the same plant. It may be a surprise to learn that Linnaeus, the originator of binomial scientific names of organisms, also used polynomials in his early works. In fact, these cumbersome phrase names are at the heart of each plant recorded in *Species Plantarum*. In essence, the first Linnaean binomial names were derived from polynomials.

Cornus florida is the first of five species of *Cornus* included in *Species Plantarum*, and Linnaeus's polynomial for it is *Cornus arborea, involucri maximo; foliolis obverse cordatis*, reasonably translated as, "Dogwood trees, with the largest involucre; involucral bracts obversely cordate." The only other large-bracted species

of Dogwood known to Linnaeus were *Cornus canadensis* (Bunchberry) and its European counterpart, *Cornus suecica*. Of these three, *Cornus florida* easily stood out as the species with the largest involucre. The other descriptive element in this polynomial pertains to bract shape; "obversely cordate" refers to the notch at each bract's apex, i.e., the portion that developed first and served as a winter bud scale. Most



Cornus florida flower buds surrounded by four involucral bracts derived from overwintering bud scales.

leaves with a cordate (heartlike) shape are widest at the base with a notch where the blade meets the petiole; in Flowering Dogwood's bracts, however, the widest portion is above the middle, and the notch is at the apex, hence these bracts are obversely cordate.

Following this phrase name for Flowering Dogwood, Linnaeus cites, in highly abbreviated form, other published works that used the same name for this plant:

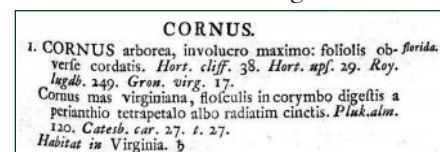
- *Hort. cliff.* 38. *Hortus Cliffortianus*, published by Linnaeus in 1737. Johannes Burman Clifford was a wealthy Dutch merchant who had amassed a large collection of herbarium specimens and living plants in his gardens and hot houses. Clifford hired Lin-

naeus to compile a catalogue of his living plant collections, published as *Hortus Cliffortianus*. *Cornus florida* is treated on page 38.

- *Hort. ups.* 29. *Hortus Upsaliensis*, published by Linnaeus in 1748. For many years, he practiced medicine and taught botany at Uppsala, Sweden. In 1741 he took on the responsibility of overseeing its botanical garden, which he reorganized to represent his ideas about plant relationships. *Hortus Upsaliensis* is his catalog of plants in this garden; Flowering Dogwood appears on page 29.

- *Roy. Lugdb.* 249. *Flora Leydensis Prodromus*, published by Adriaan Royen in 1740. Royen was a professor of botany at Leiden and well acquainted with both Clifford and Linnaeus. Evidently, *Cornus florida* was cultivated in Leiden, known to Royen, and included on page 249 of his Leiden flora. One might wonder how "Lugdb." refers to a flora of Leiden. At one time Leiden was associated with the location of an ancient Roman outpost, a fort called *Lugdunum Batavorum*; it is now understood that the ancient fort lay not within the city limits of Leiden, but some short distance away.

- *Gron. virg.* 17. *Flora Virginica*, published as two volumes by Jan Frederik Gronovius in 1739 and 1743, based on the work of colonial Virginia botanist



The entry for *Cornus florida* in *Species Plantarum*, consisting of two polynomial names, references to earlier publications using those polynomials, and the marginal note, "florida," which, in combination with the genus name, forms the binomial for the 2018 VNPS Wildflower of the Year.

John Clayton. Flowering Dogwood appears on page 17.

The entry in *Species Plantarum* includes a second polynomial for *Cornus florida*: *Cornus mas virginiana, flosculis in corymbo digestis a perianthio tetrapetalo albo radiatim cinctis*. That this phrase name is listed second indicates that Linnaeus considered it synonymous with (and secondary to) the first. This synonym is translated as follows: “Cornelian dogwood from Virginia, small flowers arranged in corymbs surrounded by a perianth of four radiating white petals.” *Cornus mas*, the Cornelian Cherry, is an edible-fruited Dogwood native to Europe and southwest Asia; like *Cornus florida* it has small yellow flower clusters subtended by four bracts, but in the European plant the bracts are much smaller and yellow, and the flowers are not as tightly crowded together. In essence, this second polynomial describes Flowering Dogwood as a Virginian version of Cornelian Cherry. (Of course, we now know that the bracts are not technically floral organs, so reference to them as perianth is, morphologically, incorrect). As with the first polynomial, what follows are references to books that use this phrase name:

- *Pluk. alm.* 120. *Almagestum botanicum*, published by Leonard Plukenet in 1696. Plukenet was royal professor of botany and gardener to Queen Mary of England. Botanically, he is best known for his lavishly illustrated books of exotic plants. His first three volumes were published under the title *Phytographia*. The fourth volume, which included *Cornus florida* in plate 120, was originally titled *Almagestum botanicum*. Similar volumes with other titles followed, but all were republished in 1720 under the original name, *Phytographia*. Plukenet’s *Almagestum botanicum* probably contains the earliest published refer-



Two flower clusters of the European *Cornus mas*, Cornelian Cherry. Notice the four small bracts derived from winter bud scales and the relatively loose aggregation of small individual flowers. Generic similarity between *Cornus mas* and *Cornus florida* was readily apparent to European botanists of the 18th century.

ence to Flowering Dogwood in the botanical literature.

- *Catesb. car.* 27. t. 27. *Natural History of Carolina, Florida, and the Bahama Islands*, published by Mark Catesby; *Cornus florida* appears in plate 27 (with a Mockingbird) of volume 1, published in 1730.

The first portion of the last line of the *Species Plantarum* entry, *Habitat in Virginia*, is self-explanatory. Following, there is a cryptic symbol. That symbol, widely used in medieval alchemy for the element lead, was also associated with the planet Saturn; in *Species Plantarum*, Linnaeus adopted it to indicate a woody plant.

Linnaeus was meticulous in his use of polynomials and, excellent scholar that he was, took great pains to align the various polynomials used by others during the preceding half century. His painstaking adherence to polynomials was fully consistent with that of his contemporaries as well as his own, earlier, works. Polynomials were, quite simply, the standard of the day. But it must have been taxing to keep some 6,000 cumbersome phrase names and their equally complicated synonyms straight. And we must remember that ongoing 18th-century European colonialism (or, if you pre-

fer, imperialism) meant that scientific exploration of global biodiversity was poised to bring to light staggering numbers of plants.

It is tempting to suppose that Linnaeus realized that traditional polynomials were inadequate to the task of providing unique and universally accepted names for the profusion of plants that grace this good Earth. But we can only speculate, because we have no explanation from Linnaeus himself. What we do have is the fact that Linnaeus did initiate binomial names. Perplexingly, what he did looks like an afterthought. Having assembled the catalogue of polynomials for all the plants known to European botany at the time, he added a single word, usually an adjective, in the margin opposite the first (i.e., the preferred) polynomial for each species included in *Species Plantarum*. For Flowering Dogwood, this is the word *florida*, aligned with “*Cornus arborea, involucro maximo; foliolis obverse cordatis*.” Notice that *florida*, like all the species epithets initiated in *Species Plantarum*, appears in slightly smaller type than the bulk of the text.

We will probably never know whether introducing binomial names was truly an afterthought, or whether it was part of Linnaeus’s plan all along. Whatever his motivation, the result was brilliant: binomial names are much easier to remember and yet are descriptive, albeit succinctly so! Botanists never looked back; with the publication of *Species Plantarum* and its marginal, one-word, descriptive insertions, binomial names became firmly established. Zoology followed suit five years later with the 10th edition of Linnaeus’s *Systema Naturae*. Plants, notably, were first, and our Wildflower of the Year, *Cornus florida*, was in the first wave of binomial names to be used in the study and documentation of biodiversity. ❖

Wavyleaf Basketgrass

Where Has It Been? Where Is It Going?

Article and photographs by Carrie Wu



The spread of invasive species is one of today's most serious global environmental problems. Understanding where an invading species is distributed, and whether genetic diversity might affect the likelihood of an invasion's gaining a strong foothold in the new environment is key to predicting the spread of invaders and possibly to developing effective control programs.

Many invasions, however, often aren't detected until the species is firmly established and may no longer respond to eradication efforts. New invasions also provide ideal opportunities for looking at population-level

Wavyleaf Basketgrass (left, top) is as adept at spreading as it is at reproducing. It can piggyback in a dog's coat—and on our own shoes and clothes.

processes relevant not only to invasive-species ecology, but also to how species may migrate into new areas in response to climate change.

First discovered in the United States near Baltimore in 1996 (Peterson et al. 1999), Wavyleaf Basketgrass (*Oplismenus hirtellus* ssp. *undulatifolius*) is recognized as a high-risk invasive species by the U.S. Department of Agriculture. This shade-tolerant stoloniferous grass forms dense carpets in the forest understory that crowd out other ground-layer species (Beauchamp et al. 2013). Flowering spikelets with long awns produce an extremely sticky substance that allows seeds to disperse readily by adhering to nearly anything that brushes past, such as passing hikers or animals.

Wavyleaf Basketgrass has spread into more than 15 counties in Virginia (EDDMapS 2018) following an initial sighting near Swift Run in Shenandoah National Park in 2005. Its range continues to expand. In the summer of 2017 the first populations were detected in Pennsylvania and West Virginia. For scientists studying invasive species, this very recent and well-documented invasion history puts Wavyleaf Basketgrass in the unique position of providing a rare glimpse into the invasion dynamics of a newly establishing invasive species. From a practical perspective, this also means that we are poised at a critical juncture for early-stage invasive species management with Wavyleaf

Basketgrass, able to begin before it can become a widespread invader of the mid-Atlantic forests.

With support from a 2016 Research Grant from the Virginia Native Plant Society, my undergraduate students and I have been working to develop genetic tools with which to analyze the genetic diversity among Wavyleaf populations and examine how the species is spreading across the mid-Atlantic region. These nuclear genetic markers, called microsatellite markers, allow us to look at a specific location in the DNA of an individual. If the DNA sequence is variable, or polymorphic, among individuals, we can use that variation to look for patterns of relatedness among individual plants and across populations. We then can use these patterns to understand the main pathways and mechanisms of expansion in the invaded range. So far, we have developed 16 microsatellite markers for Wavyleaf Basketgrass. The nitty-gritty details have been published in the journal *Applications in Plant Sciences* (Wu et al. 2018).

Our preliminary analyses with these markers already show some exciting results. We used these markers



A volunteer collects Wavyleaf Basketgrass to establish a DNA trail.

to compare the amount of genetic variation found in 12 plants collected from the supposed original invasion site, at Maryland's Patapsco Valley State Park, to those found in 12 plants from each of two other Wavyleaf patches, one in Front Royal, Va., the other in Gunpowder State Park, also in Maryland. These patches are located about 200 km apart and in opposite directions from Patapsco Valley State Park.

Across the 16 microsatellite markers, we found greater genetic variation at the Patapsco site than in either of the other two populations. This is what we had hoped to find; if the original Wavyleaf introduction to the United States occurred at Patapsco, then that site should contain all the genetic variability in the introduced range. This pattern of lower genetic variability in the newer sites also suggests that new patches can be established by a very small number of colonists, so even a handful of undetected seeds on a dog's collar could be contributing to Wavyleaf's spread.

We also looked at how the specific genetic variants, or alleles, at each microsatellite marker were distributed across the three sites. At 8 of the 16 microsatellite markers we examined, the population from Front Royal contained alleles not found in the Gunpowder State Park population from Maryland, and vice versa. But, all of the alleles found in these two populations were present in the plants from Patapsco Valley State Park. This suggests that both of these secondary populations could be traced back to the Patapsco site but were founded by different sets of dispersing seeds, likely attached to different hikers. In other words, seeds are continuing to be spread from the original introduction site.

So what's next? We're building our range-wide collection with



The highly invasive Wavyleaf Basketgrass forms dense carpets that crowd out other species.

help from numerous stakeholders and collaborators across the region. This spring and summer, we will be continuing to extract DNA from these samples in preparation for large-scale genetic analysis. With more populations, we can look for patterns of genetic similarity across the landscape and track how populations might be spreading. Is one population serving as a source for all others, or is Wavyleaf Basketgrass spreading along landscape corridors (e.g., watersheds) or anthropogenic corridors (e.g., recreational routes or roads)? Are new patches established by multiple individuals and so able to overcome possible negative consequences of genetic bottlenecks, or are they primarily the result of extensive clonal spread? Our goal is for this information to help stakeholders design control programs that reduce the spread of Wavyleaf from established populations and monitor regions at high risk of invasion to prevent new infestations. Stay tuned. ♦

—Carrie Wu is an associate professor of biology at the University of Rich-

mond. This article is an update of her work that is being completed with the help of a 2016 VNPS Research Grant.

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VIRGINIA NATIVE PLANT SOCIETY

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Next submission deadline: June 1, 2018

Winter Workshop Brings the Forest Home

By Marjorie Prochaska, Piedmont Chapter. Photos by Nancy Vehrs.



A full house greeted the speakers at the Society's Winter Workshop.

The Virginia Native Plant Society's Winter Workshop is always a delight, rescuing us from the last of winter's cold and making us more eager than ever to get out into the woods to see our beloved ephemerals. The workshop this year got us thinking on a grander scale. This time we focused on forests and the trees of which they are composed. We began with Virginia Tech's "Dr. Dendro" himself, John Seiler, who lived up to his formidable teaching skills by peppering his talk with a 10-question quiz. Piece of cake, I thought, but then I tripped up on a question by focusing totally on photosynthesis, forgetting all about respiration.

We were by then deep in to Virginia's forests, all 15.7 million acres of them, distinguishing between hardwoods, at a surprising 79 percent, and softwoods, the acreage of which is curiously decreasing. He reminded us that Virginia's diversity is due to its five distinct physiographic zones, covered by various mixes of forests. He questioned why we persist in referring to Virginia's prevailing forest type as oak-hickory, when there are not that many hickories, in number or in biomass. These forests ought really to be called oak-poplar, because the

most dominant hardwood we are finding in Virginia is the Tulip-tree or Tulip-poplar (*Liriodendron tulipifera*). The total biomass of all *Quercus* (oak) species is greater than that for Tulip-tree, however.

He quizzed us about the world's tallest trees and segued into the cohesion-tension theory, which explains water uptake into trees, by which, when water evaporates out of the top of a tree, another water molecule is pulled up, and this creates tension in the water column, which is held together by hydrogen bonding. When the fog rolls in on the West Coast, however, the California redwood (*Sequoia sempervirens*), which has been known to reach a height of 379 feet, can absorb water through its needles and transport it downward through the xylem. He assured us that transport in the xylem and phloem can occur in either direction.

Virginia's largest trees are growing well, but vines especially are responding to elevated levels of carbon dioxide in the atmosphere. Is there any way to prepare for more Poison Ivy (*Toxicodendron radicans*) and the furiously invasive Japanese Honey-suckle (*Lonicera japonica*)?

For Desirée Narango's presentation, I imagined myself as one of

the Carolina Chickadees (*Poecile carolinensis*) she was studying for her dissertation, attempting to raise my clutch of eggs to maturity. First I had to select a nest site, not insurmountable, given the manicured but well-planted suburban backyards she was studying. The problem was, what to feed these little guys? When they all hatched, I needed 530–570 caterpillars per day, or 6,000–9,000 for the season! I found by far the most caterpillars on native species, but folks still don't seem to understand. Nonnatives can make up as much as 99 percent of the plants in suburbia. Still I persisted, ranging over one square kilometer if necessary. I could still feed my family if no more than 30 percent of the trees and shrubs were nonnative. Loved the oaks, which can shelter more than 557 caterpillar species. My kin settled in nearby yards with mostly invasives produced fewer nestlings, and those that fledged failed to thrive. The protein in caterpillars is crucial to their development. I learned by searching that, attractive as they are, native herbs shelter fewer caterpillars than do native trees and shrubs. We mother birds avoided the nearby forested areas—there might have been a Cooper's Hawk looking for a meal there.

Ryan Klopf, Mountain Region Steward with the Virginia Natural



Harry Glasgow engages in conversation with workshop speaker Desirée Narango.

Heritage Program, brought us back into the forest after lunch. He defined an old-growth forest as one that has never been logged, one that can self-replace, or one that contains very old or very large trees. He went through some of the forest types found in Virginia, beginning with the familiar Chestnut Oak Dry Mesic we see in the George Washington and Jefferson national forests. Ryan manages the Chestnut Ridge Natural Area Preserve in Giles County, which contains eight different natural communities, including old growth forests. These are dominated by Northern Red Oak (*Quercus rubra*) and Chestnut Oak (*Quercus montana*). Ecologists have



Lytton Musselman tells the Longleaf Pine story.

found 300- to 400-year-old individual trees in these communities. Also in the canopy are Cucumber-tree (*Magnolia acuminata*) and American Basswood (*Tilia americana* var. *americana*). As a Natural Area Preserve manager, Ryan identifies and manages the threats,

relying on chemical application for the invasives occurring along the access road. He stressed the importance of controlled burns for removing young Red Maples, which can outcompete young oaks. Because the preserve is privately owned, with little protected land around it and a brutal 50-percent slope, visiting would be a challenge.

Instead, perhaps consider a trip to the Blackwater Ecological Preserve in Isle of Wight County to see a rare stand of Longleaf Pine (*Pinus palustris*). Lytton John Musselman, founder and manager of the preserve west of Norfolk, tackled the subject of controlled burns as well. He stipulated *cool* fires for preserving the Longleaf Pine. This pine once covered 73 million acres, extending from southeastern Virginia to central Florida and, disjunctly, to East Texas. The tree was overharvested in the quest for wood and naval stores, natural fires were suppressed, and domestic hogs were sent to forage in the forests, snapping up the sugar-rich seedlings. The native stock was virtually wiped out; nonnative stock was brought in but did not thrive. Some two hundred mature *Pinus palustris* are now preserved on 50 acres of the preserve. There its seed germinate in winter on bare soil.

The seedling stays small for three to five years, the young needles forming what appears as a grass-like clump; this stage is indeed called the grass stage. The many needles burn quickly in a cool fire, and as the fire moves on, the apical meristem can be preserved.

Rare plants are slowly reappearing. Look for the tiny Pineland Scalypink (*Stipulicida setacea*) on a summer visit. There are a few additional acres of this remarkable tree at the recently established South Quay Sand Hills Natural Area Preserve in Suffolk. ♦

Duo to Manage VNPS Web Presence

Welcome to our new web team of Caitie Cyrus and Mark Murphey. Caitie has been a member of the VNPS John Clayton and Pocahontas chapters for the past several years and has lived in Virginia since 2013. She is an environmental scientist in the private sector based in Williamsburg and specializes in rare, threatened, and endangered plant surveys. She received her M.S. degree in biology from the College of William and Mary, where her thesis focused on conducting a floristic inventory of the College Woods. While a student, Caitie interned at the Virginia Natural Heritage Program for a summer, assisting in field surveys for the Natural Treasure Hunt, an effort funded by the VNPS. Caitie will assist in running the VNPS Facebook page as well as the VNPS website. In her spare time, Caitie loves to hike, botanize, and spend time with her husband.

Mark retired after many years in the IT industry with Internet-related companies. He worked as a manager



Caitie Cyrus and Mark Murphey

and a program and project administrator for companies such as Network Solutions, Web.com, and Neustar. Mark also helped build membership and fundraising systems for nonprofit organizations such as Greenpeace, People for the Ethical Treatment of Animals, and the Association of Retired Federal Employees. He grew up and went to college in Montana but has called Virginia home since 1985. He is a member of the Potowmack Chapter. Mark is a board member of his local homeowners association and volunteers with a regional STEM organization. He is grateful to his wife, Donna, for introducing him to the world of native plants. ♦

—Nancy Vehrs, Society President

Pollinator Way Station Established at Park and Ride

Article and photos by Marie Majarov, Piedmont Chapter

Waterloo is a small, unincorporated village in Clarke County. Located at the crossroads of John Mosby and Lord Fairfax highways, (U.S. Routes 17/50/340), it is a home to a Virginia Department of Transportation's park and ride area that encourages D.C. commuters to carpool and conserve gas. It also supports commuters and conservation of a different variety: native pollinators.

Situated on nine acres, seven of them dedicated to green space, this park and ride is truly multipurpose. Bordered by farmland and hedge-rows, it is a great spot for bird-watching or walking a dog. On the property's eastern side is a tree-lined, grassy stormwater "extended-detention basin" that limits flooding and erosion downstream; on the west is a large, mowed grassy area for medical helicopters that also provides habitat for nesting Killdeer.

The park and ride's newest feature is a 15,900-square-foot pollinator plot containing 5,400 pollinator-friendly native plants. An exciting draw for outdoor folks young and old, it is the first of its kind in the Shenandoah Valley and one of Virginia's largest public native-pollinator way stations.

It began as most big things do, with a small group of committed citizens. Loudoun Valley High School environmental science teacher Liam McGranaghan, a longtime Clarke County resident, wanted to improve pollinator habitat. He spurred the formation of a committee composed of representatives from the Virginia Native Plant Society, the University of Virginia's Blandy Experimental Farm, the Shenandoah Chapter of Virginia Master Naturalists, the Piedmont Environmental Council, and the Loudoun Wildlife Conservancy, as well as Clarke County's natural resource planner, to focus on conserving and increasing native-pollinator habitat. Such projects are critical because loss, fragmentation, and degradation of habitat, development, farming that uses genetically modified organisms, climate change, pesticides, diseases, and parasites are all having profound impacts on native pollinators.

It followed naturally to reach out and include VDOT's Staunton District roadside manager, Scott Nye, and VDOT's Edinburg residency office. Nye, interested in furthering VDOT's pollinator-habitat program, proposed a large planting with the

committee organizations on VDOT land at Waterloo. The plan was that land preparations

Society past president Sally Anderson (right) explains to a Master Naturalist volunteer how to distinguish between valuable native plants and invasive weeds.

would be performed by VDOT and that volunteers of participating organizations would plant native plant plugs purchased with Virginia Wildflowers and Protect Pollinators license plate funds. The project had two overall goals, to educate the public and to feed pollinators. The committee organized two September 2016 plantings with a large contingent of volunteers.

Planting day dawned sunny and clear. McGranaghan and some 50 of his environmental science students took part, along with scores of volunteers from the other groups. Adult volunteers were assigned as mentors to small groups of excited students. Within just three hours 2,500 plugs had been efficiently set in the ground.



A Monarch caterpillar munches on a milkweed in the summer, top, and an adult sips nectar from a goldenrod in the fall.



All were native perennial species, one out of every three plants was a milkweed, either Common (*Asclepias syriaca*) or Swamp (*A. incarnata*). Other meadow species selected to create a blooming period spanning summer and fall and offering rich nectar-containing blooms included Goldenrods (*Solidago* spp.), New York Aster (*Symphyotrichum novi-belgii*), New York Ironweed (*Vernonia noveboracensis*), Common Sneezeweed (*Helenium autumnale*),



Beebalm (*Monarda fistulosa* and *M. didyma*), Whorled Coreopsis (*Coreopsis verticillata*), and Smooth Oxeye (*Heliopsis helianthoides* var. *helianthoides*), Blue Wild Indigo (*Baptisia australis* var. *australis*), Mist-flower (*Conoclinium coelestinum*), Dense Blazing Star (*Liatris spicata*), Foxglove Beard-tongue (*Penstemon digitalis*), and Short-toothed Mountain-mint (*Pycnanthemum muticum*).

The community held its collective breath as fall and then winter turned into spring. The plants thrived. Everyone was well versed in the powerful

relationships between native plants and native pollinators, but it was magical to see Monarch caterpillars on almost every milkweed, a plethora of bees and their kin buzzing around the mountain-mint, butterflies of all kinds fluttering among the blooms, and colors waving in the breeze.

Weeding became a Shenandoah Master Naturalist project with VNPS providing expertise in discriminating between plants to pull (not necessarily easy in a new meadow garden) and valuable natives, like Little Bluestem (*Schizachyrium* spp.), arising from the seed bank. Once the overall planting is fully established, more native grasses will be added.

VDOT's interpretive signs further the education goals. It is anticipated that teachers will use the plot as a field trip destination to educate students about pollinators and have them participate in citizen-science projects.

Building on success, an additional 2,900 native plants were added last fall. To accommodate even more of the pollinator community, spring flowering natives were incorporated to provide vital nectar sources for bumblebee queens that must establish new colonies in the early spring.

Saving pollinators is vital to our survival. Waterloo's park and ride provides carefree pollinator-friendly ideas for large or small, home or community plantings that, as native plant expert Doug Tallamy so eloquently describes, together form a significant frame-work, a beautiful patchwork of habitat to offset debilitating losses. ❖

—Marie Majarov is a freelance photojournalist. She and husband Milan, both retired psychologists, live at the edge of a beautiful old woodland in Frederick County. Marie is a Virginia Master Naturalist and served on the organizing committee for this project.



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