

The *Leaflet*

Cool Spring Ecological Communities story and photos by Ashley Landes

SUMMER 2021

On the brisk afternoon of February 20, native plant enthusiasts embarked on an adventure on the snowy trails at Shenandoah River Campus at Cool Spring Battlefield. Woody Bousquet (Professor Emeritus, Environmental Studies & Biology, Shenandoah University) and Sydney Vonada (Ecologist, Resource Environmental Solutions) led an informative walk showcasing ecological communities. The walk included a silt bench community along the Shenandoah River and stands of Black Maple (*Acer nigrum*) and Bur Oak (*Quercus macrocarpa*).



In April 2013, Shenandoah University acquired 195 acres of land along the Shenandoah River at the foot of the Blue Ridge Mountains in Clarke County. The Cool Spring Campus supports several university programs including Environmental Studies, Outdoor Leadership, and History. Previously this property held the Virginia National Golf Course and was the site of the 1864 Battle of Cool Spring. With over two miles of trails, the Cool Spring Campus has much to explore including a Civil War Trail, a blue heron rookery, bald eagle nest, spring ephemerals, and rare ecological community types. Cool Spring site manager, Gene Lewis, with the assistance from several organizations including the Chesapeake Forest Alliance Program, are restoring the property to improve riparian buffer zones and increase the number of native species at the site.

Woody and Sydney conducted an ecological study in 2015-2016 in collaboration with Virginia Department of Conservation and Recreation Vegetation Ecologist Gary Fleming. They selected 7 sites on the property to examine their vegetation and physical characteristics. Natural communities belonging to five ecological community types were identified: Mountain Floodplain Forest, Acidic Oak - Hickory Forest, Silt Bench, Low-Elevation Boulderfield Forest, and Mountain Swamp Forest. Woody explained that the presence, absence, and abundance of plants can tell us a lot about ecological communities. A total of 221 vascular species were recorded and 83% are native. They also identified the Boulderfield Forest and Mountain Swamp Forest as state rare ecological community types. Due to time constraints, we explored a few of these ecological community types.

The first community was an Acidic Oak - Hickory Forest, common in our area. Next we visited Low-Elevation Boulderfield Forest and were all stumped by the Black Maple stand. We compared the buds of several maple species including Box Elder (*Acer negundo*), Norway (*A. platanoides*), Red Maple (*A. rubrum*), Sugar Maple (*A. saccharum*) and Black Maple. Black Maples are uncommon in our area, however this basic dry mesic forest is favorable due to the circumneutral soil from the Antietam Formation.

Along the banks of the Shenandoah River, we observed a Silt Bench community. (continued on page 2)



The Virginia Native Plant Society (VNPS), founded as the Virginia Wildflower Society in 1982, is a non-profit organization of people who share an interest in Virginia's wild plants and habitats and a concern for their protection.

The Piedmont Chapter is a sub-group of VNPS in the northern point of Virginia east of the Blue Ridge Mountains. It includes Loudoun, Fauquier, Culpeper, Rappahannock, Warren, Clarke, and Frederick counties.

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The Leaflet can be seen online in color at www.vnps.org/piedmont

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Cool Spring Ecological Communities (continued from page 1)

This type of community is heavily influenced by water flow, and therefore has very nutritional soils. The survey found 58 species within the silt bench community including false mermaid (*Floerkea proserpinacoides*), which is on the Virginia state vulnerable list.

Also along the Shenandoah River, we observed a stand of Bur Oaks (*Quercus macrocarpa*). Bur Oaks are on the Virginia rare plant list and are only known in a few locations, including the Shenandoah River floodplain.



The Cool Spring Campus provides a cross section of the Blue Ridge Mountains and the Shenandoah River floodplain. Woody explained, "It would be hard to imagine a piece of property in the Shenandoah Valley that has such a diverse mixture of habitats and plants, animals, and geology as this property does." "The Cool Spring Campus is a historically and ecologically significant landscape," said Sydney. The trails at the Cool Spring are open to the public daily from dawn to dusk and provide a place to take walks, ride bikes, bird watch, and enjoy these special ecological communities.

Not Your Textbook Roots, Stems and Leaves by Diane Krumme

In her February 27 virtual talk, Dr. Emily Southgate told us plants are not passive. They constantly adapt to gravity, water, nutrients, sunlight, shade, herbivory and other stimuli. They can detect and may even anticipate conditions and respond accordingly. Dr. Southgate explained challenges facing plants: how plants obtain food, sunlight, water and prevent themselves from being eaten.

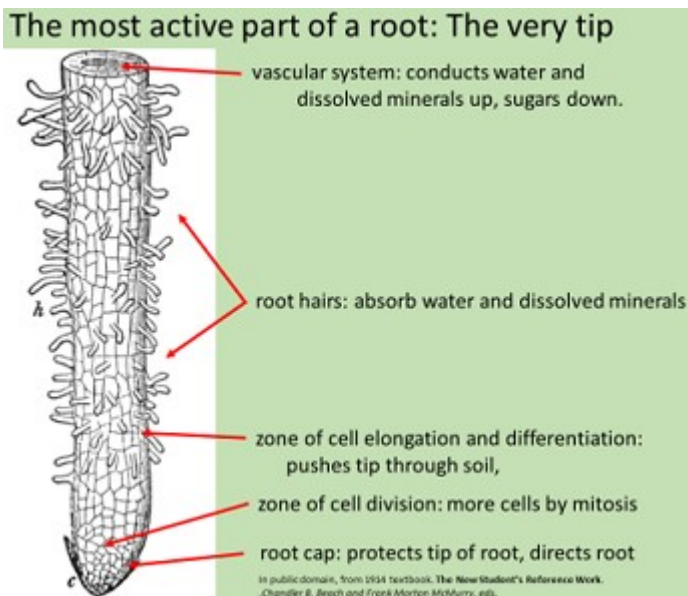
Roots are the most critical part of the plant. When you sow a seed, the root grows first. Plant roots have a few major functions. They anchor the plant, and they absorb water and minerals and move these up to the stem. Roots also store the products of photosynthesis. Roots have several types of tissues. The tip of the root is the root cap. It protects the root's sensitive tissue. It perceives gravity so the root grows down. If a root comes upon a rock or other obstruction in the soil, it can sense it and change its direction of growth. Above the root cap is the region of cell division, where cells divide into either new root cap cells or cells causing the root to elongate. Above this region, the root is mature and grows hairs. These hairs increase the surface area available to the root and are vital in absorbing water and minerals.

Dr. Southgate explained how mycorrhizal fungus connects to the plant through the root. In this mutualistic association, the fungus has (continued on page 3)



Not Your Textbook Roots, Stems and Leaves (continued from page 2)

direct access to the products of photosynthesis (sugars) even though it lives underground. In return the plant benefits from the mycorrhiza's absorption of water and minerals. Mycorrhiza can also tie two different plants together. A study of Trout Lilies (*Erythronium americanum*) and Sugar Maple (*Acer saccharum*) saplings proved that in early spring the still dormant Sugar Maple saplings received sugars through the mycorrhiza connecting them to the Trout Lilies. Sugar Maples with this mycorrhizal association got a jump start to the growing season and performed better than saplings without this association. If the Trout Lily gets anything from the Sugar Maple is unknown. Trout Lilies die back, including roots, leaving only its corm. Trout Lilies have the unusual ability to grow new roots in the fall. Trout Lily may get some nutrients from the Sugar Maple in the fall to aid in the lily's new root growth. More study is needed to prove this conclusively.



Dr. Southgate touched on stem form but most time was spent on the defenses used by stems such as prickles, thorns, spines and hairs.

She also discussed leaf form and function. A leaf's main function is photosynthesis, converting sunlight into food for the plant. Plants can maximize the absorption of light through leaf arrangement. Leaves can have thorns, hairs and waxes to prevent them from being eaten. One example was a caterpillar, crawling on a tomato leaf, breaking a glandular hair releasing an acid that attracts parasitic wasps. The wasps then lay eggs on the caterpillar. Plants can produce nasty-tasting chemicals. Some of these chemicals are always there in the leaf, others are produced when the leaf is damaged.

Plants have within-plant communication. It can be electrical, hormonal or chemistry based. Plants also communicate with each other through these same systems. Plant communication is a very new field of study, it is exciting to think of all the things we have yet to learn. You can watch Dr. Southgate's presentation at <https://vimeo.com/518378820> and see far more information.

Weston Wildlife Management Area (WMA) by Karen Hendershot

On March 13 we went to see Shumard Oaks (*Quercus shumardii*) in the Weston WMA in Casanova, Virginia. Our guide Ron Hughes, wildlife biologist of the Virginia Department of Wildlife Resources (DWR), treated us to an exploration of plant communities in this diverse forest. The roughly 270-acre property had been donated to DWR by the Nourse Family in a desire to protect the forest for the long term. The area had been farmed but Ron pointed out that we could see that it had not been timbered. Trees cut for wood tend to root-sprout and regrow in clusters but that was not evident here.

Turkey Run borders the property, so it harbors a good example of the Piedmont / Mountain Flood Plain Forest and Swamps community. A celebrity of this forest is the Shumard Oak (*Quercus shumardii*) – somewhat rare in Virginia. It flourishes with the calcareous deposits and nutrient density of the area and likes a wet but well-drained environment. These oaks became more prominent as we approached Turkey Run, which overflows occasionally and then recedes. Older Shumard trunks tend to flare out at the base, leaves are deeply lobed with long bristles at their tips, and their acorns are large. (continued on page 4)



Weston WMA (continued from page 3)



The Shumards had numerous companions similarly happy in the wet Turkey Run bottomland. Among them were Pin Oaks (*Quercus palustris*), which can tolerate more water than the Shumards. They could easily be identified by epicormic branching which drooped like arms of a discontented forest creature. Green Ash trees (*Fraxinus pennsylvanica*) were also here. The opposite branching of Ashes yields a trident-like form at the tips, and the D-shaped leaf scar helps characterize the Green Ash. The American Elm (*Ulmus americana*) with its stately, umbrella-like shape, also enjoys damp environments.

Also in the Turkey Run floodplain we were greeted by our first floral signs of spring – emerging Bluebells (*Mertensia virginica*), just in bud, and Spring Beauties (*Claytonia virginica*), with their grass-like leaves.

Ron pointed out that a mere foot in elevation gain enabled vegetation less associated with the wet bottomland. We soon came upon the knobby trunks of Common Hackberry (*Celtis occidentalis*), green twigs of Eastern Boxelder (*Acer negundo*) and Black Walnut (*Juglans nigra*), with its fuzzy gray buds. We even found the leaf of a Swamp White Oak (*Quercus bicolor*), common here in the Culpeper Triassic Basin according to *The Flora of Virginia*.

The higher levels of the Weston are a diverse upland forest. Eastern Redcedar (*Juniperus virginiana*) was abundant. It showed male blossoms and a cedar-apple rust gall. We also came upon a Slippery Elm (*Ulmus rubra*) just in bud. It prefers drier conditions than those loved by American Elm.



The higher elevations held a more typical Oak-Hickory forest. Scarlet Oak (*Q. coccinea*), Northern Red Oak (*Q. rubra*), and White Oak (*Q. alba*) were all here, along with at least three Hickory species -- Bitternut (*Carya cordiformis*), Pignut (*C. glabra*), and Mockernut (*C. tomentosa*).

This rich forest was not without foreign interlopers, however. Ron pointed out that wherever a sunny opening occurred there was an infestation of Wineberries (*Rubus phoenicolasius*). And, as we were leaving, our chapter president Emily Southgate spotted an exotic bush – Winter Honeysuckle or Sweet-breath-of-spring (*Lonicera fragrantissima*) – so fragrant that she could smell it through her mask. It was a beauty, for sure, but not welcome among native plant enthusiasts!

Balls Bluff by Mary Ann Good

Four wildflower enthusiasts joined Phil Daley for a walk on April 15 up and down the wooded paths, across the high bluff, and along the riverside path at Balls Bluff Battlefield Regional Park north of Leesburg, bordering the Potomac River. As the sun broke out from early cover, the Spring Beauties (*Claytonia virginica*) opened to blanket the ground in an almost unbroken carpet of sprinkles. One of the first flowers we encountered as we set off from the parking lot was one of the most highly sought here, a single Bird's-foot Violet (*Viola pedata*) of two-toned purple. It is nearly extirpated (continued on page 5)



Balls Bluff (continued from page 4)

at this site where they once were regular, if scarce. Common Blue (*V. sororia*), Striped Cream (*V. striata*), Yellow (*V. pubescens*), and Marsh Violets (*V. cucullata*) were more widespread. Small patches of Bluets (*Houstonia caerulea*), delighted us with their simple, modest beauty, and we saw the last of the Cutleaf Toothwort (*Cardamine concatenata*), Early Saxifrage (*Micranthes virginensis*), and Field Pussetoes (*Anemone neglecta*)—even a small patch of purplish kidney-shaped leaves, all that remained of the early-blooming Liverleaf (*Hepatica acutiloba*). Others whose flowers were gone: Bloodroot (*Sanguinaria canadensis*), Harbinger of Spring (*Erigenia bulbosa*) and Twinleaf (*Jeffersonia diphylla*). Other plants not yet blooming gave away their identity by their distinctive foliage, such as Violet Wood-Sorrel (*Oxalis violacea*), Yellow Stargrass (*Hypoxis hirsuta*), Rattlesnake Plantain (*Goodyera pubescens*), Mayapple (*Podophyllum peltatum*), Crane-fly Orchid (*Tipularia discolor*), Perfoliate Bellwort (*Uvularia perfoliata*), Solomon's Seal (*Polygonatum biflorum*) and False Solomon's Seal (*Maianthemum racemosum*), all showing promise for future walks.



We had a parade of colors. Wild Blue Phlox (*Phlox divaricata*) lifted their heads above the low foliage. In contrast, Wild Ginger (*Asarum canadense*) carefully hid its dark maroon flowers under ground-hugging leaves. The similar-colored flowers of Toadshade (*Trillium sessile*) appeared like unopened buds sitting atop its three, mottled leaves. We pondered whether two *Dicentra* species—Dutchman's Breeches (*D. cucullaria*) and Squirrel

Corn (*D. canadensis*)—could be distinguished by their lacy foliage alone, and soon decided that sometimes the leaves of one were more silvery and sometimes the other. (continued on page 6)





Balls Bluff (continued from page 5)

Stars of the show were the masses of Virginia Bluebells (*Mertensia virginica*) carpeting the bottomland along the river. Pink buds opened to sky blue flowers, with some even pure white. The adjacent steep bluff harbored a few stands of Red Columbine (*Aquilegia canadensis*) not able to be viewed up close but beautiful nevertheless. Farther along as we began to climb to the top of the bluff we encountered the long unbroken stretch of Trout Lily leaves, many not mature enough to bloom but containing plenty of the showy yellow flowers (*Erythronium americanum*) and a good number of the rarer white species (*Erythronium albidum*), but they were past their peak. Just entering their prime, along the top of the bluff



was our last treat—a large stand of Shooting Star (*Primula meadia*), their pink-purple down-curved flowers looking like so many badminton shuttlecocks standing tall above the rosettes of basal leaves.

Above our heads, we admired Black Haw (*Virburnum prunifolium*) in bloom and the unusual maroon blossoms of Pawpaw (*Asimina triloba*). Equally intriguing were the long, pointed buds of Beech (*Fagus grandifolia*) trees, some starting to unfurl.

Enjoying the sunshine were several Eastern Rat Snakes (*Pantherophis alleghaniensis*),



unfailingly encountered along the bluff at this time of year, mostly curled up along branches jutting over the riverside floor far below. While birds were not greatly in evidence, we enjoyed hearing the songs of two of our returning warblers, the Louisiana Waterthrush (*Parkesia motacilla*) who loves rapid rocky streams and the Worm-eating Warbler (*Helmitheros vermivorum*), inhabitant of dry wooded slopes. Such are the many joys of a springtime walk at Balls Bluff Park.

Front Royal/Warren County's Royal Shenandoah Greenway—Richard Stromberg

Led by Master Naturalist and Chapter Board Member Richard Stromberg on April 17, 16 people walked from Skyline High School to the Shenandoah River. It was a tour of clumps, not just individual plants and flowers but clumps of them.

Near the amphitheater under the fence surrounding a sinkhole that probably connects to nearby Skyline Caverns, we found clumps of Toadshade (*Trillium sessile*)

A single Green Violet (*Hybanthus concolor*) was followed by several clumps further down the path. It is the only member of the Violet family (*Violaceae*) in Virginia that is not in the *Viola* genus. It is not often seen and often overlooked because it is all green, even the flowers, which hang from the leaf axils and are less than a quarter inch.

Clumps of larger- more colorful-flowered violets appeared periodically: Common Blue Violet (*Viola sororia*), Wood Violet (*V. palmata*), Downy Yellow Violet (*V. pubescens*), and Striped Cream Violet (*V. striata*). (continued on page 7)



**Front Royal/Warren County's Royal Shenandoah Greenway** (continued from page 6)

Wild Blue Phlox (*Phlox divaricata*) formed a mound. We saw clumps of Needle-tip Blue-eyed-grass (*Sisyrinchium mucronatum*) too. A clump of Wild Ginger (*Asarum canadense*) required peeking underneath the leaves to see each plant's flower lying on the ground, growing from the crotch of the plant's pair of leaves. Even several Jack-in-the-pulpits (*Arisaema triphyllum*) grew together. Hairy-fruit Chervil (*Chaerophyllum tainturieri*), with its tiny white flowers almost hidden by the feathery leaves, always seems like a clump.

Several flowering bushes of Gooseberries required some research. The white calyx tube led me to call them Missouri Gooseberry (*Ribes missouriense*) rather than the more usual Appalachian Gooseberry (*R. rotundifolium*) found in Virginia.

Some of the more vigorous people climbed the hill next to the railroad overpass. There we found many clumps of Twinleaf (*Jeffersonia diphylla*), past flowering but showing fruit.





Saturday	Jun 12	1pm	Wildcat Mountain Woods and Fields Walk
Fauquier County. Walk near Warrenton to be led by Chapter Board members Emily Southgate and Jocelyn Sladen. For more information and to register, contact piedmontvnps@gmail.com			
Saturday	Jul 10	1pm	Massanutten Walk
Shenandoah County. Join Master Naturalist Richard Stromberg for a from the Bear Wallow parking lot. Register at piedmontvnps@gmail.com to get meeting instructions.			
Saturday	Aug 14	1pm	Butterfly Walk
Place to be determined. Register at piedmontvnps@gmail.com to get meeting instructions.			

Japanese Blackberry by Richard Stromberg

In the spring issue of *The Leaflet* the reference to Wineberry on page one and in the picture caption on page two were incorrect. Walk leader Jack Monsted, Assistant Curator at the State Arboretum has told us about it.

Yes, it was indeed a Japanese blackberry, *Rubus parvifolius*, and you are correct in that it is not listed in the flora of Virginia. I sent in a voucher specimen to the botanists at DCR a little over a year ago, but I think they're waiting until they have a few more observations to add it to the flora officially.

This plant came to Blandy when it was planted here intentionally by the arboretum director back in 1939. Based on what records I could find, 10 seedlings were acquired from the soil conservation service and planted at Blandy. It is likely that all the *Rubus parvifolius* here now comes from those 10 original plants.

As for how common it is nationally, the Biota of North America Program lists it as occurring only in the Midwest - Ohio, Illinois, Iowa, Missouri, and Nebraska - view the map here:

<http://bonap.net/MapGallery/County/Rubus%20parvifolius.png>.

Several of the unusual invasives we have at Blandy share similar distributions. One explanation is that it may be an artifact of seed distribution during the 1930s - many of our early specimens came from the soil conservation service who primarily distributed seeds and plants to midwestern farmers in an attempt to control soil erosion. Unfortunately, many of those experimental plants (*Rubus parvifolius* included) ended up becoming rather invasive.

The US Department of Agriculture Plants database calls *Rubus parvifolius* Thimbleweed and says it is native west of the Rockies, in the upper Midwest and in Massachusetts. When I saw it in California, the leaves, flowers, and fruits reminded me of Purple-flowering Raspberry (*R. odoratus*) back home, except the flowers were white instead of purple.





Thompson WMA by Sally Anderson

The spring walk at the Thompson - how many years now? Yet every year it seems fresh and wonderful. A two-day postponement on account of a severe windstorm resulted in a perfect evening for the walk. Evening, by the way, is such a wonderful time to be there. The migrating birds are starting to come, and as the forest dims, they begin to sing and fly lower in the trees. The Large-flowered Trillium (*Trillium grandiflorum*) in shades of white and pink are the main attraction, and were in full flower, no harm done by the storm. This year the trail was lined with masses of blue and yellow violets. Other stars of the show are the Showy Orchis (*Galearis spectabilis*) and the Yellow Lady's Slipper (*Cypripedium parviflorum*), just coming into bloom. In the seep, the bright green leaves of Skunk Cabbage (*Symplocarpus foetidus*) and False Hellebore (*Veratrum viride*) were mingled with the large, furry fiddleheads of the Cinnamon Fern (*Osmundastrum cinnamomeum*). The patch of Golden Ragwort (*Packera aurea*) on the fire road has expanded up the slope, for a real show.



We have become proud of showing off the lack of Garlic Mustard (*Alliaria petiolata*) on the single file Marjorie Arundel Trail (aka Trico Trail). Working with Potomac Appalachian Trail Club this past March we were able to start a new area of invasive work. There are still management issues though. Recently, someone came through and cut all the large grapevines, leaving slimy fungus-coated, dripping vines. It seemed unnecessary, as the trees holding them are full sized and healthy, and they provide so much wildlife benefit. Thanks to all who love to come out and share the beauty of spring, and to chapter president Emily Southgate for co-leading and sharing her depth of botanical knowledge.



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