

Sempervirens

Summer/Fall 2017 The Quarterly of the Virginia Native Plant Society

Find Your 'Natural Community' in Virginia



Virginia Natural Heritage Chief Biologist Chris Ludwig, University of Wisconsin ecologist Ellen Damschen, Virginia Natural Heritage Staff Botanist Johnny Townsend, and University of Wisconsin ecologist John Orrock explore a recently discovered shale barren in Douthat State Park. At right is the sweeping expanse of an open shale barren atop South Sister Knob. (Photographs by Jason Bulluck)



From Your Natural Heritage Program

By Jason Bulluck

We all want happy, healthy communities. We hear about the fortunes of finding one's sense of place. Such a phrase renders up mental images of children playing, community gardens, and wholesome neighborhood gatherings. Indeed, we all are better off when we find these avenues to well-being.

What if there were the same recognition for natural communities? What if the values of natural communities were just as colloquial, commonly sought and equally promoted? What if everyone had a favorite that we wanted to know better, that we daydreamed about, visited, talked about, and even waved our flags for on social media?

Well, your friends at the Virginia Natural Heritage Program want that. Our ecologists have just completed Version 3.0 of The Natural Communities of Virginia (<http://www.dcr.virginia.gov/natural-heritage/natural-communities/ncintro>). We are always looking for ways to bring natural communities into the spotlight. After all, they—the species assemblages, the landforms, the ecological processes—are the backdrop for the rare species that we seek to understand and protect. And when intact and protected, they are windows into the past, into the natural history that was the foundation for our Virginia history.

Recently I spent a day visiting a few Central Appalachian shale barrens with staff botanist Johnny Townsend and chief biologist Chris Ludwig. We took with us two researchers from the University of Wisconsin who are especially intrigued by the natural history

and vegetation of these communities, which can sometimes resemble grasslands more than woodlands.

We started in northeastern Bath County, George Washington Jefferson National Forest, hiking up the Shenandoah Mountain Trail toward the twin peaks known as Sister Knobs. There were some treats on the way up the trail: pockets of full-bloom *Aruncus dioicus* (Goat's-beard) with longhorned beetles pollinating them. We heard the singing of Yellow-billed Cuckoos, Pine Warblers, Ovenbirds, Red-eyed Vireos, Scarlet Tanagers, and Worm-eating Warblers. A surprise found blooming along the trail was the globally rare *Phlox buckleyi* (Sword-leaf Phlox). Discovery of this charismatic shale-country phlox, never before documented in the area, pointedly demonstrates the need for continued inventory of even our most well-known sites. (*continued*)



Gray Beardtongue (*Penstemon canescens*) on the Shenandoah Mountain Trail near summit of South Sister Knob in Bath County.

As we ascended, the increasingly barren nature of the forest became apparent. Even below a closed canopy, the acidic, thin shale soils made for a wide-open understory with an evolving suite of plants that tolerate such stressful conditions. On the flank of South Sister Knob, we reached our destination: a fully exposed shale grassland with a mix of prairie and shale-barren endemic species, thriving on the harsh, southwest-facing slope. This odd community type is known as a Central Appalachian Shale Ridge Prairie/Bald, a rare habitat type known only from west-central Virginia.

There we saw Virginia White-haired Leatherflower (*Clematis albicoma*), a shale-barren endemic known only from Virginia and West Virginia; Gray Beardtongue (*Penstemon canescens*); Kates Mountain Clover (*Trifolium virginicum*), another characteristic shale species that ranges north to Pennsylvania; and Shale-barren Pussytoes (*Antennaria virginica*) in bloom. Other

significant plants known from this site include the rare grasses Arctic Brome (*Bromus kalmii*) and Slender Wheatgrass (*Elymus trachycaulus*), as well as the federally endangered Shale Barren Rock Cress (*Boechera serotina*). And how confusing to look down and also find Common Ragweed (*Ambrosia artemisiifolia*) and Daisy Fleabane (*Erigeron strigosus*) in such a spectacular community! But yes, these species are right at home in these droughty barrens and rock outcrops as well as the poor, dry, hot, and abused soils of roadsides all over Virginia.

In an area completely devoid of trees, the slope of South Sister Knob provides quite the vista to West Virginia, where every parallel ridge seemed to repeat the same vegetation patterns. Looking southwest you see more shale barrens on the dry slopes of adjacent mountains. Looking northeast, you see more of the same. This expanse of shale woodlands may be of little use for agriculture, but it provides Virginia with a wealth

of unique communities and plant species.

We also visited a couple of recently discovered shale barrens within the boundaries of Douthat State Park. There was full-bloom *Erysimum capitatum* var. *capitatum* (Western Wallflower), found in only a few locations in Bath and Alleghany counties, and new populations of the to-be-described shale barren violet (*Viola* sp.); the latter species' global range includes only Bath and Alleghany counties. Again, from the base of the slope, these sites were nearly indistinguishable from surrounding forest. But once

on the barren, looking along the slope and across valleys, one sees that these odd communities, though restricted to Virginia's Ridge and Valley, are very much a part of that otherwise forest-dominated landscape.

We stood there speculating about the floristic likenesses and disparities of each barren, pondering how the flora colonized and assembled there—seed by lucky seed—over evolutionary time. As we looked at the centuries-old, tortured red cedars clinging to the ledges, I couldn't help but think of Charlie Brown's Christmas tree, scant, scraggly, bedraggled, apparently of little use, yet, like these shale barrens, utterly charming and like no other. How's that for a sense of place? ❖

Jason Bulluck is director of the Virginia Natural Heritage Program, a division of the Department of Conservation and Recreation. Learn more about Virginia's Natural Area Preserves at www.dcr.virginia.gov/natural-heritage

Opportunities Will Abound at Tri-State Conference

Excitement continues to build for the Tri-State Native Plant Conference this fall (Sept. 29–Oct. 1), sponsored by the native plant societies of Virginia, Maryland, and West Virginia. By the last day of July it was sold out, much to the relief of the Potomack Chapter members, the VNPS hosts for the meeting. The chapter provided a strong commitment to the conference in order to secure the site, which is the National Conservation Training Center in Shepherdstown, W.Va., a beautiful 550-acre campus nestled on the Potomac River. Attendees will enjoy exclusive use of the campus throughout the conference.

Wesley Knapp, keynote speaker on Friday night, recently commented that “a multistate conference like this is of exceptional importance. Rarely do we look across our state lines to see, learn, and explore, but that is arguably the most effective way to broaden your knowledge base regarding species identification and habitat types.”

Knapp, mountains botanist and



Some participants can expect to see *Eurybia divaricata*, the White Wood Aster. (E.M. Truax photo)



Fall colors, such as this sumac against a backdrop of golden trees are what conference-goers can look forward to at the Tri-State Conference. (E.M. Truax photo)

ecologist for the North Carolina Natural Heritage Program, spent many years with Maryland’s Natural Heritage Program and has both a broad and intimate knowledge of Mid-Atlantic plant communities. He made the observation that networking is not something most scientists or nature lovers do naturally. Typically these types “prefer isolation and quiet,” said Knapp, “but meeting and discussing conservation goals with like-minded people from other states allows us to have more impact as a conservation community by focusing our thoughts and honing our message.”

The role of individuals and conservation partners such as native plant societies and conservation groups is enormously important, Knapp said. “The mid-Atlantic is a well-researched and -inventoried region, but boots on the ground are thin. We need more people with eyes for detail combing natural areas and ruderal habitats alike to document the flora. Additions to state floras are being made in great numbers. You, too, can make discoveries by exploring lands.” In his talk on Friday, he will discuss methods for the discovery and inventory of important, rare, and new species.

Participants at this year’s meeting

will be able put their new skills to use as they explore an abundance of diverse habitats. Field trips will range from the heights of Ferry Hill and Ice Mountain to the wetlands of Cranesville Swamp. Walks along the C&O Canal, at the Blue Ridge Center, Cool Springs Preserve, and more will provide opportunities to observe and learn more about the fall wildflowers, shrubs, trees and ferns.

Saturday’s keynote speaker, Rodney Bartgis, and Kevin Dodge, who will be leading trips to both Ice Mountain and Cranesville Swamp, are old partners. They collaborated to create a self-guided audio tour of Cranesville Swamp, one of the first sites to be designated as a National Natural Landmark. This special spot, home to many rare species, is protected by The Nature Conservancy. On Saturday night, Dodge will be entertaining around a real campfire with his standout show, “Sounds of Nature,” some of which were certainly inspired by his time at Cranesville. Can’t make the conference? Enjoy the audio tour at home. You can link to the map and audio tour at <http://tinyurl.com/map-audiotour>.

—*Suzanne Dingwell, Website Manager*



From the President

Huntley Meadows: My ‘Sense of Place’

As my Facebook friends know all too well, Harry and I visit Huntley Meadows Park in Fairfax County every Monday morning. Harry has been leading the park’s official Monday Morning Bird Walk for many years now, and I have been assisting. While it’s difficult for this night owl to get up so early in the morning to drive nearly an hour for this 7 a.m. walk, the ritual is rewarding.

We arrive about a half hour before the official start, and I begin a solo sweep at a brisk pace. In the summer, the forest is just awakening. Robins and Cardinals are the early risers and the most vocal. As the summer progresses, the sounds of insect life begin to crescendo. A Barred Owl might startle at my passing and reward me with a glimpse of his silent and magnificent wing span. He will follow me with his large eyes once he settles on a branch. Early morning light shimmers through the forest canopy.

I alight from the woods and enter the boardwalk in the central wetland. While Huntley Meadows does, indeed, have some meadows, it is best known for its magnificent wetlands smack in the middle of some of the densest development in Fairfax County, just blocks from busy Route 1. Herons perch on logs and stealthily and patiently seek fish and frogs for breakfast. The inundated trees have died but now provide habitat for Bluebird and woodpecker nests. Canada Geese honk and settle in along the edges. An Osprey may appear, circle the wetland, then skill-

fully dive and make off with a reward, maybe a nonnative snakehead this time. Red-winged Blackbirds screech “o-ka-lee” from the cattails, and a beautiful Common Yellowthroat sings “wicity-wicity-wich” from a willow. Swallows and swifts buzz the wetland, inhaling insects. Frogs croak, and a muskrat swims by with some vegetation in its mouth. An Indigo Bunting sings in couplets from the top of a Red Maple (*Acer rubrum*) at the edge of the wetland. The small Gnatcatcher nest is camouflaged with lichens visible in that same tree; a large snapping turtle covered in mud is barely visible in the shallow water. I return to the woods and meet up with the birding group as its members listen for flycatchers and vireos. I share my preliminary report and we re-enter the wetland, stroll at leisure, and share our discoveries.

This place is alive! Each season brings its rewards. In the winter, snow or ice makes the tree outlines a wonderland and numerous ducks call the wetland home. In spring the forest floor is carpeted with Spring Beauties (*Claytonia virginica*) and edged with Sweet Cicely (*Osmorhiza claytonii*). The bird migration brings many fleeting visitors. As spring turns to summer, breeding season brings a flurry of animal activity. Purple Milkweed (*Asclepias purpurascens*), Larger Blue Flag (*Iris versicolor*), Swamp Roses (*Rosa palustris*), Lizard’s-tail (*Saururus cernuus*), Buttonbush (*Cephalanthus occidentalis*), Swamp Milkweed (*Asclepias incarnata*), and Swamp Rose-mallow (*Hibiscus moscheutos*)

provide sweeps of color and nurture many butterflies and pollinators. A specimen Turk’s-cap Lily (*Lilium superbum*), Square-stemmed Monkeyflower (*Mimulus ringens*), and White Turtlehead (*Chelone glabra*) engage the discerning eye. Dragonflies and damselflies join the insect cornucopia. Later ripening Common Elderberries (*Sambucus canadensis*), Viburnums, and Winterberry Holly (*Ilex verticillata*) provide berries and fruits to feed the wildlife. As fall comes, the wetland vegetation takes on magnificent shades that complement the colors of the surrounding trees.

Huntley Meadows is a special place and well loved by the public. The Virginia Native Plant Society designated it as a registry site many years ago. As noted on our website, “The registry is a voluntary program designed by the VNPS to protect the plant treasures residing in natural communities throughout Virginia. Landowners who agree to register their properties as Virginia Native Plant Sites take an important step toward preserving the natural features of the land.”

I enjoy visiting this special place regularly throughout the year. Watching the seasonal progression and the adaptations of the plant and animal life is a rewarding experience. Our wonderful native plants support so much life. I hope that all of our members have a natural area near them where they can follow the seasonal changes. Natural areas need our protection and love. ❖

Huntley Meadows Park



Huntley Meadows Park consists of 1,500 acres nestled within some of the densest development in the Alexandria area of Fairfax County. The main entrance is about a mile from Richmond Highway (Route 1), on Lockheed Boulevard. The park is owned and operated by the Fairfax County Park Authority. The Friends of Huntley Meadows Park is a non-profit community group dedicated to preserving and protecting the park's natural resources.



WANT TO VISIT?

Using a GPS to find Huntley Meadows Park by name is unreliable. Instead, enter the street address 3701 Lockheed Blvd, Alexandria, VA 22306. The final destination should show the corner of Harrison Lane and Lockheed Boulevard.



A WEALTH OF NATIVE PLANTS

Clockwise, from left: An expanse of Swamp Rose-mallow (*Hibiscus moscheutos*); a Swamp Rose-mallow in bud; a Great Spangled Fritillary on Purple Milkweed (*Asclepias purpurascens*); Cardinal Flower (*Lobelia cardinalis*); and Turk's-cap Lily (*Lilium superbum*). Top, view from the observation tower in the early morning. (Nancy Vehrs photos)



ON THE COMPLEXITY OF SIMPLES

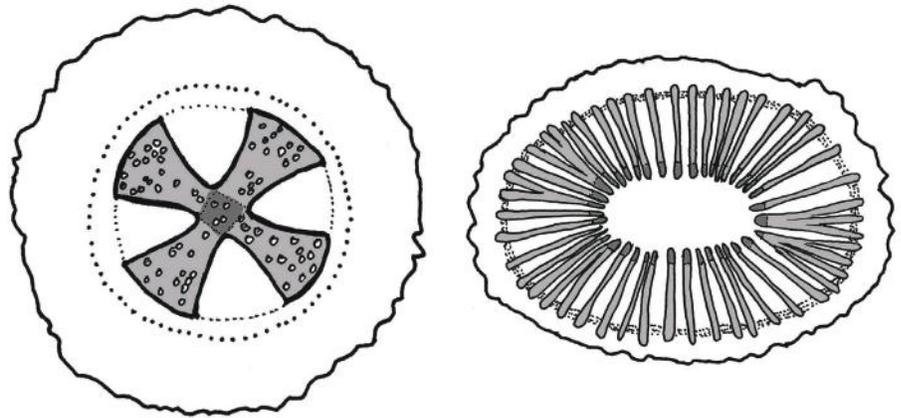
Pharmacognosy and *Actaea racemosa*

Article and illustrations by W. John Hayden, Botany Chair.

Pharmacognosy, a discipline at the intersection of botany and medicine, deals with knowledge about medicines derived from plants (Youngken 1950). A central goal of pharmacognosy is the accurate and consistent taxonomic identification of medicinal plants and medicinal plant products. Unlike drugstore pill bottles, medicinal plants in nature do not come with labels. One aspect of pharmacognosy, then, is the identification of whole plants found in nature. Much as in field botany and plant systematics, this aspect of pharmacognosy involves learning to recognize species by overall appearance (gestalt), or by dichotomous keys, or both.

Seldom, however, do entire plants possess desirable medical properties. Rather, depending on the species, useful compounds tend to be concentrated in just one or a few plant organs. In the case of *Actaea racemosa* (Black Cohosh), the Virginia Native Plant Society's 2017 Wildflower of the Year, medicinal properties are concentrated in the roots and rhizomes (see sidebar). For other medicinal plants, leaves, flowers, fruits, or seeds are prized.

Typically, once a medicinal plant is found, only the organs with medicinal properties are harvested, and these crude bits of plant matter are known as simples. Simples are usually dried for storage and subsequently may be shredded or pulverized. Obviously, it is just as important to be confident of the identity of one's stockpile of simples as it is to know their sources in the field. Consequently, pharmacog-



Figures 1 and 2. Root and rhizome of *Actaea racemosa* as seen in cross section. Dark-gray regions represent first-formed (primary) xylem, light gray represents later-formed (secondary) xylem. Figure 1. Root; central diamond-shaped area of primary xylem; the Maltese cross-like pattern develops as secondary xylem is added to the root. Figure 2. Rhizome; xylem in the form of radially elongate patches of cells; primary xylem is innermost. Figures 1 and 2 redrawn by W. John Hayden from *Wintermute* (1905).

nosy also strives to provide means for identifying isolated and dried plant organs, whether intact, sliced, diced, or powdered. Identification of simples is, thus, a particularly challenging aspect of pharmacognosy, which by necessity adopts the tools and techniques of comparative microscopic plant anatomy. This article explores anatomical aspects of Black Cohosh used in pharmacognosy to aid in identification of this significant medicinal plant. Much of the information discussed here was developed in the late 19th and early 20th centuries, but remains relevant today.

Before delving into the details of Black Cohosh's microscopic structure, it is worth noting that the diversity of plant form (sometimes referred to as disparity) is pervasive at all levels of biological organization. From whole plant architecture to the microscopic bumps on pollen grains, the plant kingdom encom-

passes a staggering array of forms. It is disparity of form that allows allergists to identify pollen grains caught floating in air or investigators to identify fragments of leaves or stems found at crime scenes. Pharmacognosy similarly exploits this fundamental disparity of plant form. The whole point, of course, is to guarantee correct identity of natural medicine ingredients and to guard against adulteration.

A noteworthy aspect of the roots and rhizomes of *Actaea racemosa* is that their internal tissues are yellow, a somewhat unusual feature that certainly helps in identification when confronting an apothecary's simple. But other plants in the Buttercup Family (Ranunculaceae) and the closely related Barberry Family (Berberidaceae) have similar yellow pigments in their roots and rhizomes. Consequently, additional anatomical details of each organ are required to assure correct identification.

Black Cohosh in the Wild: Let It Be!

Black Cohosh is in demand as a medicinal plant because it produces a number of biologically active compounds. In addition to antioxidant caffeic acids, multiple steroidlike triterpenes, and a number of different alkaloids and amines, are present. In short, there are many different molecules that interact with the nervous system and hormonal regulation. In fact, so many biologically active compounds are present that scientific deciphering of their collective modes of action is a complex and ongoing endeavor. Nevertheless, Black Cohosh remains a popular herbal medicine, widely available in health food stores as a dietary supplement. While the Virginia Native Plant Society takes no position on the efficacy of Black Cohosh in treating any of the several conditions for which it has been and continues to be promoted, VNPS is vigorously opposed to the collection of Black Cohosh, or any other wild plant, from the wild for medicinal purposes. Black Cohosh is amenable to cultivation; therefore, demand for herbal Black Cohosh should be met without depletion of its native populations. ❖

ROOTS

Roots of vascular plants always have a central core of water-conducting xylem tissue, flanked by patches of sugar-transporting phloem. The pattern of xylem and phloem, as viewed in root cross sections, may take the form of a simple narrow ellipse, a triangle, a diamond, or a polygon of five or more sides. Most often, young roots of Black Cohosh have a central diamond-shaped patch of xylem cells, but many other plants also have essentially the same pattern. The pharmacognocist must then turn to older roots. In *Actaea*, additional (secondary) xylem cells form along the sides, but not the tips, of the young root's initial, diamond-shaped, patch of xylem, resulting in a distinctive Maltese cross pattern in older roots (Figure 1); this is unique to *Actaea*. In contrast, most dicot roots add secondary xylem in a pattern that quickly assumes a circular outline. The distinction between older roots of *Actaea* and just about everything else is clear-cut.

STEMS.

Unlike roots, xylem and phloem tissue in stems of flowering plants form distinct clusters called vascular bundles, usually with xylem cells occupying the inner portion of the bundle and phloem present in the outer portion. In young stems of eudicots these vascular bundles are disposed in a ring near the stem surface. Sections of young rhizomes (horizontal basal stems) of *Actaea racemosa* reveal a notably large number of vascular bundles, a salient detail, but not definitive for identification. However, the pattern of accumulating additional (secondary) xylem cells marks *Actaea* rhizomes as unique among medicinal plants. Via secondary growth, over time, new xylem cells are added to indi-

vidual vascular bundles, resulting in elongate radial strands of xylem tissue (Figure 2). In contrast, most dicots produce secondary xylem in the form of concentric rings—the same pattern seen in growth rings on tree stumps.

In summary, yellow roots with a Maltese cross pattern of xylem and yellow rhizomes with multiple, radially elongate, patches of xylem will confirm unknown samples as Black Cohosh. Now, imagine the documentation of anatomical details such as these for all plants with important medicinal properties, and you have a glimpse of the discipline of pharmacognosy. Knowing one's simples is no simple matter! ❖

WORKS CITED

- Wintermute, R.C. 1905. A treatise on Macrotys. Drug Treatise No. XIII, issued by Lloyd Brothers, Cincinnati.
- Youngken, H.W. 1950. Textbook of pharmacognosy. The Blakiston Co., Philadelphia.



VIRGINIA NATIVE PLANT SOCIETY

Sempervirens (ISSN 1085-9632) is the quarterly newsletter of the Virginia Native Plant Society, Blandy Experimental Farm, 400 Blandy Farm Lane, Unit 2, Boyce, Va. 22620, 540-837-1600, info@vnps.org. Nancy Vehrs, President; Nancy Sorrells, Editor; Karen York, Office Manager. Original material in *Sempervirens* may be reprinted if credit is given to the Virginia Native Plant Society, to *Sempervirens*, and to the author of the material, if named. Readers are invited to send letters, news items, and queries for consideration. E-mail items to Nancy Sorrells at lotswife@comcast.net.

Next submission deadline: Oct. 30, 2017



A Black Bear snacks on bearcorn in Shenandoah National Park. (Denise Machado photo)

Conopholis americana Bearcorn Launches a Journey of Discovery

By Karen Fall, Piedmont Chapter

The first thing to address is the common name. Bearcorn (*Conopholis americana*) has other common names, but I prefer this one for several reasons:

1) The most common name, Squawroot, can be offensive to some Native Americans. The term squaw is likely a phonetic rendering of the Algonquian word *squa*, meaning young female, but it can have a derogatory meaning in Mohawk. I think it best to err on the side of respect and avoid using it. Additionally, Blue Cohosh also goes by Squawroot. Because both plants have been used in addressing female issues they are easily confused, as evidenced by some of the information I found on the Internet. (Lesson learned. Use the scientific name when searching and stick to research studies.)

2) Another common name that can cause confusion is Cancer Root. It likely came about due to the tuberlike haustorium that forms where this par-

asitic plant attaches to the host root. Some believe the name arose from the plant's use as a treatment for cancer, but I found no evidence of that. I prefer to avoid confusion and not use this common name.

3) Bearcorn is the most descriptive common name and what I've settled on. Quite simply, when the plant is fruiting it looks like an ear of corn and it is an important food for bears. There's nothing controversial or confusing in that. Bingo.

I was introduced to Bearcorn by a Shenandoah National Park ranger while on an interpretive hike that had become my weekly routine as a volunteer there. The ranger pointed out some Bearcorn and gave enough information to get me curious.

(That's an interpretive pro for you.) He didn't know what he'd started! I learned Bearcorn had no chlorophyll. What? There are plants without

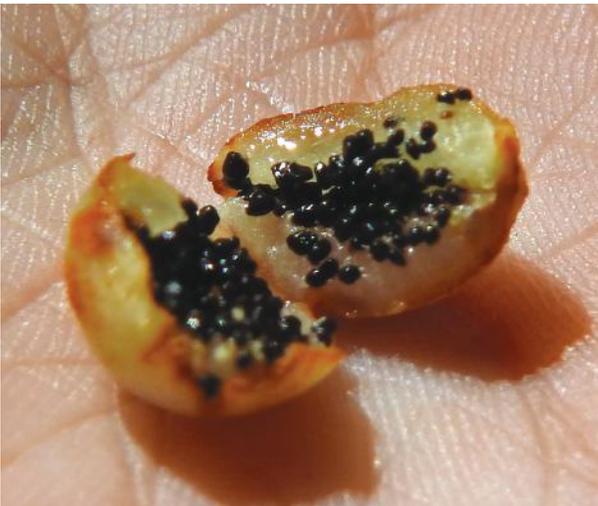


Bearcorn (above) pushes up from the forest floor. Top right, Bearcorn seed. Below right, cutting a kernel in half reveals its tiny black seeds. (Karen Fall photos)

chlorophyll? No photosynthesis? The journey began. Each week after that when we got to the Bearcorn along the trail I'd burst out with what I'd learned, but more on that later.

It's true. Bearcorn does not have chlorophyll and so is nonphotosynthetic. It is a holoparasite, meaning it is completely dependent on its oak tree host for survival. Bearcorn attaches to the roots of oak trees, mainly Red Oak, to get its nutrients.

There's a very interesting thing here. Oak trees have important symbiotic relationships. Bearcorn is found to attach only to the oak's mycorrhizal roots. Mycorrhizal associations involve relatively young tree roots. It is young roots not far from actively growing root tips that are anatomically structured and physiologically inclined to be active in mineral absorption. As tree roots age, the surface tissues involved in mycorrhizal activity are shed as the root undergoes secondary growth (becomes thicker). This means that the mycorrhizal association needs to reform continually as tree roots extend through the soil. Not so for *Conopholis*; once it makes a connection with host xylem (and phloem, presumably) it remains



develops seed pods (capsules) that give it its corn cob look. They are said to have a bitter taste, which I confirmed, but, though it isn't mentioned in any research I could find, I discovered that the capsules lose their bitterness and have a hint of a nutty flavor when older and looking overripe. The protein/fat/carb content of these capsules is like that in blueberries and blackberries. This is where bears come in.

One study found that "Northern red oak produced 65.7% of annual bear food calories; squawroot ranked second, producing 15.8%; these two species accounted for 81.5% of the caloric production during 1995." This is what puts the "bear" in "Bearcorn." And putting the Bearcorn in the

bear is what disperses the seeds.

It turns out the seeds are smart. They germinate only if near their vital host, making this determination by detecting a chemical in the soil exuded from the oak's root system. These same chemicals promote the growth of mycorrhizae. To quote Alice, "Curiouser and curiouser!"

Now what about the scientific name, *Conopholis americana*? Cono means cone, and pholis means scale. This again describes the look of the plant, like a scaly pine cone. That got me to wondering and wandering down another path. The spiral pattern of pine cones is often used as an example of the Fibonacci sequence (a series of

numbers in which every number after 1 and 2 is formed by the sum of the preceding numbers). In a pine cone, contiguous cone scales define two spiral patterns, both ascending from the base, one in a right-handed spiral, the other forming a left-handed spiral; remarkably, the number of right- and left-hand spirals on a given cone is never the same, but the numbers observed are always part of the Fibonacci sequence! I checked the spiral patterns in Bearcorn and, yes, I found the Fibonacci numbers 5 and 8. I'll leave it at that, but hopefully it's enough to rouse yet more curiosity and research.

Now about where all this curiosity led me. The Shenandoah National Park ranger invited me to become a volunteer. I've been soaking in nature at Shenandoah for about 25 years (not going to do that math), and often remarked how great it would be to live and work there. I now live about five miles from a park entrance, and work there. I might want to be more specific about what I mean by "work," but just know that I'm loving being a volunteer. So, for me the therapeutic value of Bearcorn is that it can make dreams come true. I hope curiosity leads to the same for you.

All this research illuminated a web of connections among Red Oaks, Bearcorn, Black Bear, mycorrhizae, root systems, parasites, hosts, Fibonacci numbers, park rangers, and volunteers. Bearcorn clearly demonstrates: we are all in this together. ❖

WORK CITED

Inman, R.M. 1997. Caloric production of black bear foods in Great Smoky Mountains National Park. Master's thesis, University of Tennessee. http://trace.tennessee.edu/utk_gradthes/7

Karen Fall is a Virginia Master Naturalist and a volunteer at Shenandoah National Park.

in place for a period of years. Consequently, there is not much opportunity for direct interaction between *Conopholis* and mycorrhizal fungi found on the same host tree's roots. Further, *Conopholis* has no roots, so there is no way for it to form mycorrhiza-like interactions directly with a fungus; however, mycorrhizal-derived mineral nutrients may well enter host tree xylem or phloem and from those host tissues find their way to *Conopholis*.

Bearcorn lives up to 10 years and doesn't seem to harm the oak tree. In its first four years it is below ground developing its root relationships. After that it emerges above ground in early spring. Once it blooms, it

Entertainment by Northern Neck Orchids

In mid-May, 15 native-plant enthusiasts spent three days exploring Virginia's Northern Neck, particularly enjoying several species of orchids in bloom. The group met at Westmoreland State Park. Although best known for birding, fossil collecting, and its magnificent view of the lower Potomac River, Westmoreland has a broad range of coastal native plants. Retired park manager Paul Billings led us on a hike along Big Meadow Trail to Fossil Beach, where we were rewarded with a great view of the Potomac's white cliffs. Although we did see some wonderful wetland plants, we also got a good feeling for the plants that used to be there. Big snags of hardwood trees stand in the now brackish water brought in by sea-level rise, and *Phragmites australis* ssp. *australis* thrives. It reminded us of how important it is that we continue to preserve the wild spaces that are left and try to fight the invasions within them.

The second site we explored was the Rappahannock River Valley National Wildlife Refuge's Wilna Pond section. Lauren Cruz, the refuge's wildlife biologist, gave a short presentation about the refuge. Next, Virginia master naturalists Earline Walker and Nora Kroll showed us the native plant garden that they and fellow master naturalists established at the education center. We then strolled along the woodland trail around the pond itself, which features a blanket of Yellow Pond-lily (*Nuphar advena*).

Probably the most precious site we visited was Hickory Hollow Nature Preserve. Hickory Hollow's 254 acres of mixed pine-hardwood forest,

ravines, and Cabin Swamp form an important habitat for the crown jewel of Vir-

ginia's native orchids, the Kentucky Lady's-slipper (*Cypripedium kentuckiense*), which was in bloom. Cabin Swamp is a globally rare Coastal Plain Basic Seepage Swamp natural community and an exceptional-quality wetland community that supports a very high diversity—perhaps 500 plant species—including several coastal plain–mountain disjuncts. Other plants included Showy Orchis (*Galearis spectabilis*), Dwarf Ginseng (*Panax trifolius*), Marsh Marigold (*Caltha palustris*), Primrose-leaved Violet (*Viola primulifolia*), and one of the coastal plain's few populations of False-hellebore (*Veratrum* sp.), as well as a variety of sedges and grasses.

Our visit to the preserve coincided with the arrival of a team of botanists from Virginia's Department of Conservation and Recreation, the Smithsonian Institution, and Longwood Gardens, there to hand-pollinate the Kentucky Lady's-slippers.

Another precious site we visited was in Chilton Woods State Forest, a Virginia state forest near Warsaw, in the Rappahannock River watershed. Most of the forest's trees are Loblolly Pine (*Pinus taeda*), with areas of mixed pine and hardwood. The Showy Orchis, Pink Lady's-slipper (*Cypripedium acaule*), Large Whorled Pogonia (*Isotria verticillata*) in fruit, Puttyroot (*Aplectrum hyemale*) in



Cathy Mayes and Sally Anderson rescue a Kentucky Lady's-slipper from the grip of a Hog-peanut vine. (Nancy Vehrs photo)

bloom, and Downy Rattlesnake-plantain (*Goodyera pubescens*) were seen here, along with Large Twayblade (*Liparis liliifolia*), several types of ferns, including Christmas Fern (*Polystichum acrostichoides*), Sensitive Fern (*Onoclea sensibilis*), and Cinnamon Fern (*Osmundastrum cinnamomeum*), Deerberries (*Vaccinium stamineum*), and huckleberries (*Gaylussacia* spp., related species found blooming side-by-side enabling easy comparison), blooming Partridge Berry (*Mitchella repens*), Violet (*Viola* sp.), Common Bluets (*Houstonia caerulea*), and white native Dwarf Azalea (*Rhododendron atlanticum*).

The last tour was held in a cold, heavy rain at Hughlett Point and Dameron Marsh natural area preserves. Hughlett Point offers several excellent examples of tidal and non-tidal wetlands, as well as exemplary undeveloped beaches, dunes, and upland forests. The adjacent 316-acre Dameron Marsh contains one of the most significant wetlands on the Chesapeake Bay for marsh-bird communities. The marsh supports impressive salt marsh communities, sand beach, and upland forest habitats. We were lucky enough to spot Southern Twayblade (*Listera australis*) and Small Green Wood Orchid (*Platanthera clavellata*).

—Cathy Mayes, Treasurer

Beauty and Potential Travesty on Miracle Ridge



Visitors to Miracle Ridge, left, make their way up the steep slope in Bath County (Meghan Williamson photo). Lynn and Bill Limpert stand beside a massive Sugar Maple on the Little Valley Slope Conservation Site. (Courtesy Bill Limpert)

Spending time in a forest that's hundreds of years old recently gave some Virginia residents and community members the opportunity not only to experience the majesty of the Allegheny Mountains, but also to visit areas that would be destroyed by construction of Dominion Energy's proposed Atlantic Coast Pipeline. This 600-mile pipeline would carry natural gas from wells in West Virginia, across Virginia, and deep into North Carolina. The pipeline is 42 inches in diameter until it reaches the North Carolina line where it continues as a 36-inch pipe. There is also a 20-inch-diameter spur to Hampton Roads. Further south, a second similar project, the Mountain Valley Pipeline, is being proposed by another company. The Virginia Native Plant Society has gone on record as opposing both pipeline projects.

Bill and Lynn Limpert are the owners of the threatened land in Bath County. Wishing to educate people about the pipeline's impacts and to share the beauty of their forestlands, they welcomed curious residents, botanists, community organizers, and

members of the press to explore their ancient ridgetops in early May.

Since this group's visit, the Limpert property has been designated as part of the newly developed 533-acre Little Valley Slope Conservation Site created by the Virginia Department of Conservation and Recreation's Division of Natural Heritage (DCR/DNH).

Natural Heritage's site report describes the tract as "a rugged Ridge and Valley site that includes an intact NW slope and associated forest ecosystem," noting that large portions of the tract had probably never been timbered. Numerous small karst features, such as sinkholes, are found nearby. Heritage ecologists gave the site a biodiversity significance ranking of B2—rank of very high significance.

Dominion's proposed route for the pipeline runs along 38 miles of mountain ridgetops, which would need to be flattened in a manner similar to mountaintop removal to create a permanently cleared 75-foot-wide right-of-way. That ridgetop leveling would include the Limpert property, which they call Miracle Ridge. Bill explained that Dominion's documented plans for dealing with the removed soil and rock are as simple (and as destructive) as discarding it

along the steep slopes that lead to pristine streams not far below.

Not only are the 300-plus-year-old trees at stake, but so too is the unique ecology of a rare eastern old-growth forest. Attendees walked through its open understory, sheltered by the towering maples and oaks. Guests who have bushwhacked their way through Virginia forests were awed at the natural lack of lower shrubs and briars, as the mature canopy above shades the forest floor. As we strolled through the forest, herbalist Diana Sicilia noted Cleavers (*Galium aparine*), Common Yarrow (*Achillea millefolium*), plantain, Usneas (lichens), morels, wood-ear mushroom, reishi mushroom, and lion's-mane fungi, all of which she identified as either edible or medicinal.

Later, as hikers hugged one another and expressed gratitude for their time in the old-growth forest, Bill and Lynn appeared thankful for the opportunity to share the magnificence of their home. Bill recounted the frustration they have felt over the lack of response and respect from institutions reviewing the pipeline proposal, which threatens to take personal property for the private gain of Dominion's shareholders. "But meeting folks like you all," he said, "well, that has been the one bright spot."

The site was included in an Aug. 17 letter from DCR about the pipeline to the Federal Energy Regulatory Commission from Thomas Smith, DCR deputy director of operations. "DCR-DNH continues to recommend the avoidance of all conservation sites intersected by the pipeline footprint," Smith wrote. The 16-page document can be found at <http://tinyurl.com/dcr-letter>.

Meghan Williamson, a native of western Virginia, develops and helps protect sustainable communities in rural areas. (Nancy Sorrells assisted with the article.)

Help Needed in Finding Rare Bumblebee on Pipeline Paths

The federally endangered Rusty-patched Bumblebee (*Bombus affinis*) has been documented on the Duncan Knob Access Road Conservation Site in Bath County, site of a proposed access road for the Atlantic Coast Pipeline. The occurrence of this rare pollinator (G1, S1) has led to the request by the group Wild Virginia for members of the public to search for and help document this species along the path of both the Atlantic Coast and the Mountain Valley pipelines.

The bumblebee once lived in the grasslands, tallgrass prairies, and other habitats of the upper Midwest and the northeast, but the degradation of those habitats caused its decline. Rusty-patched Bumblebees live in underground colonies and produce males and new queens in



The distinctive characteristic of this rare bumblebee is the patch of rust-colored fuzz on its back. (Photo by Dan Mullen, from a USFWS bulletin)

late summer. All of the bees have entirely black heads, but only workers and males have a rusty-reddish patch centrally located on the back.

These insects need a variety of native flowering plants until late

fall because they are one of the last bumblebee species to go into hibernation. Searchers should look in areas filled with blooming pollinator plants. If you see what you think is a Rusty-patched Bumblebee, *do not capture it*. Photograph it instead. For bees photographed on national forest land, e-mail photos and location information to Steve Tanguay (stanguay@fs.fed.us). For help identifying bees photographed on private land crossed by the pipeline projects, send the same information to T'ai Roulston (tai.roulston@virginia.edu).

For more information about the species and how to identify, visit these sites: <https://www.fws.gov/midwest/endangered/insects/rpbb/factsheet-rpbb.html> and http://www.xerces.org/wp-content/uploads/2008/09/Eastern_Bumble_Bee.pdf. ❖

Printed on recycled paper 

Please note the expiration date on your mailing label and renew accordingly.



Virginia Native Plant Society
Blandy Experimental Farm
400 Blandy Farm Lane, Unit 2
Boyce, VA 22620
www.vnps.org

Non-Profit Organization
U. S. Postage
PAID
PERMIT NO. 76
Harrisonburg, VA