Sempervirens
Summer 2016 The Quarterly of the Virginia Native Plant Society

Annual Meeting to Celebrate Our Natural Heritage

By Mary Rhoades, President, New River Chapter

The New River Chapter invites you to Celebrate Our Natural Heritage with them at the 2016 Virginia Native Plant Society Annual Meeting, to be held Sept. 9–11 in Blacksburg.

That theme was chosen because 2016 is the 30th anniversary of the Virginia Natural Heritage Program. It is important that we recognize the contribution that program has made to Virginia and thank the dedicated people who work there, often under adverse conditions and with limited resources. We have invited the three regional stewards from Southwest Virginia to be our guests at the meeting as one small way of showing them that we appreciate their hard work. The speakers both Friday and Saturday evenings will be Heritage staff members.

In planning our field trips and events for this September, we aimed for diversity. Some of you are quite familiar with the wildflowers in Virginia, but don't know as much about trees. You will have a chance to expand your knowledge at this year's meeting because there will be three field trips devoted to trees.

Art, history, and music. The Annual Meeting will have something for all those interests as well. Art lovers will want to see the Hahn Horticulture Garden on the Virginia Tech campus because the summer Art in the Garden installation will still be available for viewing in September. Last year a stroll through the garden

Among the field trips offered at the Annual Meeting is a lichen walk, on which particpants might see *Cladonia cristatella,* British Soldier Lichen (above). Taking a hand lens along on this walk would be a good idea. (Photo by Gary Cote)

treated the visitor to whimsical cows made from abandoned fuel-oil tanks, dancing metal skeletons, and 8- to 10-inch "minions." Only one field trip includes that garden, but you can go on your own. It is about 10 minutes from the hotel and free of charge.

If you like history, you will have two chances to visit Smithfield Plantation in Blacksburg. The property will be on both the Saturday afternoon and the Sunday morning garden tours. It includes a house built in 1774 by the prominent Preston family, as well as various garden features. If you want to tour the house, however, you will have to visit it in your free time. Smithfield is about a 10-minute drive from the hotel. There is a fee for the house tour. Parking is free. The garden at the history museum in Christiansburg is also on the schedule.

Music makes any event special, so we have booked two groups to play for our social hours. Blacksburg is a university town, with plenty of professional musicians, but we chose bands made up of talented local amateurs to provide background music. On Friday evening Simple Gifts of the Blue Ridge will play a mix of traditional folk music and other selections. Their instruments include hammer dulcimer, flute, guitar, and percussion. On Saturday night the Blacksburg Panjammers, a steel drum band, will entertain us.

If you've never been to Blacksburg, you definitely should come. One of the most apt adjectives to describe Blacksburg is convenient. It's a town with a big heart, lots of intellect, and scenic surroundings. Urbanites can relax and enjoy a weekend of relief from hectic city traffic. The schedule is designed to be relaxing also, with plenty of time to transition from one activity to another. And, finally, we don't want anyone to be left out. If you are among the people who hesitate to attend these meetings because you are afraid you will not be able to keep up with the group on field trips, the Blacksburg conference is for you. We have some very easy trips to offer. See you in September! ❖

Sept. 9–11

DETAILS START ON PAGE 6!

From the President

Volunteers Are the Backbone of Our Society

Ah, the lazy days of summer are finally upon us after the frenzy of spring. Every weekend is filled with events in the spring, and the call of the ephemerals is loud and frantic. Summer blooms seem to enjoy a longer season, and the warm weather demands a slower pace. Let's savor the summer!

I had the distinct pleasure of participating in the magical VNPS field trip to Southwest Virginia at the end of April led by Gary Fleming and coordinated by Sally Anderson. Elsewhere in this issue Marjorie Prochaska writes about this amazing week-long event. These multiday trips are much in demand, but they require committed volunteers to coordinate and lead them. We can always use help if you're willing to share your time and efforts.

Volunteers are the backbone of an organization like ours. We appreciate all levels of membership and involvement, but without our volunteer leadership, the VNPS would cease to exist. Many opportunities are lost because of the lack of volunteers. Exhibition tables at festivals and school events, community plantings, invasive plant removal, presentations to garden clubs and other groups all take hours of volunteer time. In this fast-paced world of ours, I understand that there are so many demands on our time, but the more volunteers we have, the less onerous the task for any one member.

Outstanding volunteer Alan Ford

Recently I had the opportunity to nominate an outstanding volunteer in Fairfax County for a Cox Conserves Heroes Award, and I chose Alan Ford, president of our Potowmack Chapter and a tireless volunteer. Cox Conserves Heroes is an awards program created by Cox Enterprises and the Trust for Public Land that "honors volunteers who create, preserve, or enhance the shared outdoor places in our communities." Alan won in the Northern Virginia area and will compete at a statewide level for funds for a nonprofit organization. He is a passionate conservationist who volunteers his leadership skills to the Potowmack Chapter and to the Plant NoVA Natives Marketing Campaign as its co-chair. Wearing his trademark straw hat, Alan contributes his muscle to the battle with invasive plants at Fairfax County locations such as the Marie Butler Levin Preserve and the Fraser Preserve. He also serves as an Audubon at Home Ambassador, making home visits and recommendations for enhancing habitat at the homeowner level. In addition, he is an active Master Naturalist and one of the VNPS Grass Bunch, a group of members who learned to identify grasses so that they could impart the knowledge to others. And, he still works full time! He truly deserves this recognition for his herculean efforts.

I would be remiss if I did not recognize the volunteer service of Sherrie Burson, who served as recording secretary on our VNPS board for several years. Sherrie and her family recently moved from their home in McLean to the former home of her parents on Cape Cod. Secretary is an unheralded but necessary position, and Sherrie excelled at it in her quietly competent way. She will be missed and we wish her well. Betty Truax, of the Jefferson Chapter, stepped up and offered her services to fill this important position.

Volunteers also organize our annual meeting. New River Chapter president Mary Rhoades, Beth Umberger, and others have worked very hard to create a memorable experience for us this September. Elsewhere in this issue you can read about the many and varied field trips Mary has coordinated to appeal to everyone's interests and abilities. We'll have engaging evening speakers and chances to socialize with fellow native plant enthusiasts. We hope to welcome new and old friends to this weekend in the university town of Blacksburg and urge you to register soon.

Please consider volunteering your services to your chapter or at the state level. You can be rewarded with the satisfaction of serving our environmental mission and meeting friends along the way. The future of the organization is in your capable hands.

—Your President, Nancy Vehrs

Virginia Natural Heritage Program Receives Conservation Awards as the Baton Is Passed

From Your Natural Heritage Program

By Tom Smith

I am very pleased to share with you the news that the Virginia Natural Heritage Program has been honored with two international conservation awards, making it the only natural heritage program to have received two top honors in the same year. The program was singled out for outstanding conservation impact among the 80 natural heritage programs that make up an international conservation network across the United States, Canada, and Latin America. In addition, I was presented with NatureServe's first Lifetime Achievement Award.

NatureServe is the nonprofit conservation organization that coordinates the Natural Heritage Network, and they announced the awards in April at the annual Biodiversity Without Boundaries conference, in Puerto Rico. A special thank-you to the Virginia Native Plant Society for having nominated the Natural Heritage Program for the outstanding conservation impact award.

"NatureServe is thrilled to recognize the Virginia Natural Heritage Program, now in its 30th year, for exceptional efforts over the past decade to conserve Virginia's native plants, animals, and natural habitat," said Mary Klein, NatureServe president and CEO, in presenting the program award. "The staff's ability to establish partnerships, leverage new technologies, share innovations across the network, and impact on-the-ground conservation is evident in the program's many accomplishments."

"Thirty-six species new to science, 313 species newly discovered in Virginia, 760 natural communities and rare species protected on our 63 Natural Area Preserves—the numbers speak for themselves," said Molly Ward, Virginia secretary of natural resources. "I am so proud of the biodiversity conservation work these public servants have done for our citizens."

In presenting me with NatureServe's Lifetime Achievement Award, Klein noted my contributions to the birth, growth, evolving, and big thinking of NatureServe and its member programs, all of which have helped NatureServe grow into a premier international conservation organization. I was extremely touched by the many kind words including those from Robert L. Jenkins, The Nature Conservancy's first vice president for science programs and the individual who conceived of and launched the Natural Heritage Network.

Jason Bulluck, left, is the new director of the Virginia Natural Heritage Program, replacing Tom Smith, now DCR deputy director of operations. (Photo by Betty Saxman/DCR)

I have had the incredible honor of being a part of that network for 36 years and of serving as the director of the Virginia Natural Heritage Program since 1991, working alongside an amazing team of scientists, resource professionals, and passionate, dedicated partners like VNPS. I was promoted to be the Department of Conservation and Recreation's deputy director of operations in March, and we are fortunate that Jason Bulluck, who has been with the program for the past nine years, has been hired as the new Natural Heritage director.

Help us celebrate our 30th Anniversary and check out the stories, challenges, and advice in our 30for30 Series at http://www.dcr.virginia.gov/natural-heritage/thirtyyears ❖

Learn more about Virginia's natural area preserves at www.dcr.virginia.gov/natural-heritage.

VIRGINIA NATIVE PLANT SOCIETY

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Nancy Vehrs, President
Nancy Sorrells, Editor
Karen York, Office Manager

Next submission deadline: August 1, 2016

Botanizing Southwest Virginia: Six Days, 380 Species

The group thought that the Raven Cliff Furnace was the perfect location for a group photo so Gary Fleming set up his tripod and snapped some with his remote control.

The last week of April found 20 of us well into the Ridge and Valley Province of Southwest Virginia. When we had heard that premier botanist Gary Fleming would be leading our spring excursion, the trip filled up fast. We had six days of botanizing with Gary and no rain, in spite of daily predictions of afternoon showers. Gary had provided us with a list of some three dozen noteworthy plants we could expect to see, and we delightfully checked off some each day. We were in a city park, federal forests, state parks, natural area preserves, and one Nature Conservancy property. Each day got better, and the diversity dazzled us.

A few eager beavers tagged along with Gary as he visited Green Hill Park in Salem our first night there. We spent our first full day in Falls Ridge, managed by The Nature Conservancy. There on the edge of the Pedlar Hills, in an area underlain by dolomite, we saw our first Addison's Leatherflower (*Clematis addisonii*), endemic to four counties in the state. We saw Yellow Buckeye (*Aesculus flava*) blooming each day, and we soon learned that we had a moss enthusiast in Gaylan Meyer, who pointed out the first of many mosses he was to show us, Feather Comb Moss (*Ctenidium molluscum*), a chartreuse number made for stroking. Our first photo op was at Bradley Falls, underlain with travertine, formed by the rapid precipitation of carbonate minerals out of the ground water. Also of note was the only Golden-seal (*Hydrastis canadensis*) we saw on the trip. It's a pretty thing, and I wish we had seen more. We noticed the species diversity plummet as we left the calcareous soil of the dolomite to climb up a shale ridge, with its nutrient-poor acidic soil. We finished the afternoon by interrupting some ravens incubating their nests high up a rock face.

Our second day out we carpooled to New River Trail State Park, a 57-mile linear park stretching from Pulaski to Galax. We followed an abandoned railroad right-of-way for part of it to reach a rich north-facing cove. Two-flowered Melic (*Melica mutica*), a grass with gaping, pendulous spikelets, charmed us growing in the profusion of Wild Columbine (*Aquilegia canadensis*) and Moss Phlox (*Phlox subulata*). We saw Tennessee Starwort (*Stellaria corei*), on the state watchlist, whose sepals are twice as long as those of *S. pubera*. Also present in abundance was Green Violet (*Hybanthus concolor*). In the areas we visited, some southern species reach their northern limits and northern species reach their southern limits. This is the case with the Canada Yew (*Taxus canadensis*), which we saw growing on the rock face and again along the top.

On Wednesday, at the Raven Cliff area along Cripple Creek in the Jefferson National Forest, we met botanist Fred Huber, who had been with Gary on a trip to Maple Flats during our last Annual Meeting. We entered a karst landscape, and Gary called our first sinkhole a "karst window," because a stream emerges from a cave and then flows back underground. The second sinkhole was awesome and entailed a descent one had to make very carefully. After lunch, on the hike to Raven Cliff, we found Carolina Saxifrage (*Micranthes caroliniana*), with its broadly dentate, long-petioled leaves, growing out of rock crevices. I understand how one might get hooked on mosses. On our last walk of the day we stopped for a group picture in front of an old iron furnace. Gary was able to show us a small population of Woodland Strawberry (*Fragaria vesca* var. americana), which differs from *F. americana* by its somewhat truncated lobes at the end of the leaf. The distinction was difficult to see.

On Day Four we drove to Pinnacle Natural Area Preserve, one of the first six natural area preserves dedicated in Virginia. We were met by

Red Trillium (*T. erectum*) along a slope next to the New River Trail. (Photo by Nancy Vehrs)

Natural Heritage Regional Supervisor Claiborne Woodall, who led us to view the Pinnacle along the deep winding gorge cut by Big Cedar Creek before it empties into the Clinch River. We saw Carolina Green-and-gold (*Chrysogonum virginianum* var. brevistolon) scattered throughout. It is hard to believe it's on the state watchlist. During all our hiking, Carrie Blair stuck close to Gary, meticulously recording every species we saw, all 380 or so. We had more to see, but next Claiborne led us west through Cleveland and past the failed coal-fired power plant in Carbo to a splendidly rich cove forest alongside a gravel road. There we were met with all the beauty that Gyandotte Beauty (*Synandra hispidula*) had promised. The slope was covered with it, interspersed with Dwarf Larkspur (*Delphinium tricorne*). Across the road were stands of Fernleaf Phacelia (*Phacelia bipinnatifida*) and Miami-mist (*P. purshii*).

The next day we drove from our base in Abingdon to Natural Tunnel State Park. Southwest Steward Stephen Grayson showed us the incredible diversity of the area. Canada Bluets (*Houstonia canadensis*), rare in Virginia, were blooming everywhere. An especial pleasure was the blooming Umbrella Magnolia (*Magnolia tripetala*), which we could see from the bridge over Stock Creek. The 10-story-tall tunnel is impressive, as it still houses working tracks. We saw a train enter the tunnel later in the day as we hiked along the creek, working to keep our ferns straight. How about Glade Fern (*Homalosorus pycnocarpos*)? I would be lost without *Peterson's Field Guide to Ferns* [*& Their Related Families of Northeastern and Central North America*], by Cobb et al. Gaylan pointed out the properties of Fan Moss (*Forsstroemia trichomitria*) growing on a tree trunk in moist habitat. At the end of each day we were ready for dinner, but we hated to leave.

We climbed to higher elevations our last day, beginning with a hike up the trail to Mount Rogers. We were thrilled to find Fraser's Sedge (*Carex fraseriana*) in bloom, a first for Gary and probably for many of us. There were hillsides of it, as well as Ramps (*Allium tricoccum*). We nibbled on them, agreeing that they had so much pizzazz, they didn't need salt or garlic. The other pleasure in this habitat was the Fraser Magnolia (*Magnolia fraseri*), flowering bravely in the cooler air. We saved the summit of Mount Rogers for another day and headed up the road to Dave's Branch Cove, probably the richest site we visited. The ground oozed water, and we found Yellow Mandarin (*Prosartes lanuginosa*), Eastern Rose Mandarin (*Streptopus lanceolatus*), and Large-flowered Bellwort (*Uvularia grandiflora*) in an abundance that left us speechless.

We hiked briefly on Elk Garden Trail, then drove into fog to the summit of Whitetop, the second-highest mountain in Virginia. We touched briefly on the Appalachian Trail, then entered the forest. It is almost exclusively a Red Spruce (*Picea rubens*) forest, a remnant of the Ice Age extending at high elevations all the way to Georgia. Spring had begun a month earlier, but only a few ferns or herbs were pushing their way through the cushion of needles, mosses and rotting logs. It was quiet, simple, and mystical. Gary allowed as how this was his favorite habitat. Gary and Gaylan showed us a liverwort, the Three-lobed Bazzania (*Bazzania trilobite*). As we left the forest, the clouds parted, and we were able to look southeast across the bald and vow to come back soon.

On our way home through Konnarock, we came to a place where the Appalachian Trail meets up with the Virginia Creeper Trail, and we hiked briefly on the AT. There Gary found the Painted Trillium (*Trillium undulatum*) he had been looking for. It was wonderful to realize that we never lose the joy we have when we find what we are searching for.

—Marjorie Prochaska, First Vice President

Gary Fleming spent much time in various positions taking just the right shot such as this one of Fringed Phacelia (*Phacelia fimbriata*). (Photo by Nancy Weiss)

ANNUAL MEETING 2016

Celebrating Our Natural Heritage

FROM MOUNTAIN LAKE TO THE NEW RIVER AND BEYOND

Virginia Native Plant Society Annual Meeting
September 9–11, 2016
Days Inn, Blacksburg, Va.

Hosted by the New River Chapter

How now, brown cow? Old fuel oil tanks make wonderful cows such as this one on display in the Hahn Horticulture Garden at Virginia Tech for the 2015 Art in the Garden installation. (Photo by Linda Shanock)

Schedule

FRIDAY, SEPTEMBER 9
WARM HEARTH VILLAGE COMMUNITY CENTER, BLACKSBURG

3–5 p.m. State Board meeting

DAYS INN

4–5:30 p.m. Registration
5:30–6:30 p.m. Social hour. Cash bar
6:30–7:30 p.m. Buffet dinner
7:30–8:30 p.m. *Claiborne Woodall:* Natural Area Preserves of Southwest Virginia

SATURDAY, SEPTEMBER 10, DAYS INN

7:30–8:30 a.m. Registration and field trip group organization
9–4:30 p.m. Field trips
5:30–6:30 p.m. Social hour. Cash bar.
6:30–7:30 p.m. Buffet dinner
7:30–8:30 p.m. Annual business meeting, President Nancy Vehrs
8:30–9:30 p.m. *Chris Ludwig:* An overview of the biological diversity of The Cedars in Lee County, Va., with emphasis on its natural communities and botanical treasures

SUNDAY, SEPTEMBER 11, DAYS INN

9–noon Field trips

Directions

Take Interstate-81 to Exit 118 B, and follow signs toward Blacksburg. You will be on the Rt. 460 Bypass. Your GPS unit and maps app will probably tell you to take Exit 3AB to get to the hotel, but that route will take you through stoplights and business traffic. Instead, take Exit 5A, go up the ramp to the stop sign and turn left onto Industrial Park Drive. At the stoplight turn left onto Rt. 460 East Business. Go through one stoplight, then turn left at the next light, and immediately left into the Days Inn parking lot.

Accommodations

The conference hotel is the Blacksburg Days Inn, 3503 Holiday Lane, Blacksburg (just off Rt. 460 Business). The special Annual Meeting rate is $67.38 (tax included) per room per night, and is good for Friday and Saturday. Deadline for reserving a room at that rate is Friday, Aug. 26. The hotel is saving 40 rooms with two double beds, and 10 rooms with one king bed. All rooms are nonsmoking. Each room has a small microwave and a small refrigerator. A hot breakfast is served each morning. Call 540-951-1330 for reservations, and mention the Virginia Native Plant Society. A list of restaurants and places to visit will be in your registration packet.

FIELD TRIPS

Saturday, September 10

FULL-DAY TRIPS, DEPART 9 A.M., RETURN BY 4:30 P.M.

1. ___ Blue Ridge Parkway We'll start south of Floyd and drive north, stopping with limited walking to visit overlooks, wet areas, and meadows to see Blue Lobelia, Cardinal Flower, Sneezeweed, Southern Lady Fern, Rattlesnake Fern, Ironweed, Common Milkweed pods, and New England Aster, as well as beaver dams. No special equipment needed. Bug spray, rain gear, and sturdy shoes are a must. Bring lunch and drink. Leader, Butch Kelly, former Interpretive Park Ranger for 13 seasons. Group limit, 15.

2. ___ Poor Mountain Natural Area Preserve We'll explore the largest known population of the globally rare Piratebush, a rare, hemiparasitic shrub that thrives in the oak–pine forest. Moderately difficult 2-mi. hike. Leader, Ryan Klopf, Natural Heritage Steward. Group limit, 10.

3. ___ Mountain Lake Ramble Explore montane forests near Mountain Lake, one of only two natural lakes in Virginia. Hike the easy War Spur Trail in Jefferson National Forest to see a remnant Red Spruce population and a dramatic rocky overlook. Eat your packed lunch at Mountain Lake Biological Station, followed by a tour. Then view late-summer flowers on station trails. Leader, David Darnell, New River Chapter. Group limit, 15.

4. ___ White Rocks/Potts Valley Rail Trail White Rocks Campground is in the George Washington and Jefferson national forests, on the West Virginia line. Take the 1.3-mi. Virginias Walk, looping through the forest. After lunch, drive a short way to the Potts Valley Rail Trail, also in the National Forest. Level walking in a forest with rich flora. Leader, David Jones, New River Chapter. Group limit, 12.

5. ___ Sinking Creek Wetland and Sinking Creek Mountain Multifaceted loop trip stops first at a marl marsh on Sinking Creek, then on Sinking Creek Mountain to see species of xeric sandstone woodlands. On the trail see Swamp Thistle, Carolina Hemlock, and Mountain Quillwort. Cover 3–5 miles, depending on a group decision that day. Gentle grades. Leader, Tom Wieboldt, Associate Curator, Massey Herbarium at Virginia Tech. Group limit, 10.

Saturday, September 10, Morning

HALF-DAY TRIPS; DEPART 9 A.M., RETURN BY NOON

6. ___ Stadium Woods Visit this rare urban old-growth forest at the edge of the Virginia Tech campus. Predominantly White Oak, the 12-acre woods has more than 50 trees 250–450 years old. At least 60 native plant and 80 bird species have been identified. Friends of Stadium Woods formed in 2011 to ensure that this unique remnant remains a research and teaching laboratory. Leader, Jeff Kirwan, retired, College of Natural Resources and Environment. Group limit, 12.

7. ___ Falls Ridge Preserve (Nature Conservancy property) Part of a rugged ridge rising from the valley of the north fork of the Roanoke River, Falls Ridge boasts a spring-fed travertine waterfall 80 ft. high. The Salem Fault divides it into Precambrian limestone and shale/sandstone, generating a diversity of wildflowers and smaller plants. Some are rare, such as the Allegheny Plum, Goldenseal, and Addison's Leatherflower. Bradley Trail is a 1-mi. loop of moderately easy walking with a short steep section. Leader, Pat Polentz, New River Chapter. Group limit, 12.

8. ___ Lichen Walk in Wildwood Park Explore this small urban forest in the heart of Radford, featuring lichens of bark, fence post, and limestone. A variety of autumn wildflowers will also be visible. Mostly easy, with some short, steep sections. Bring a good hand lens. Leader, Gary Cote, professor at Radford University. Group limit, 10.

9. ___ Garden Tour- AM (Graff home; Montgomery Museum) The Graff sisters' ¾ acre in Christiansburg includes a greenhouse and 16 raised concrete beds, which give 900 lbs. a year of more than 20 types of vegetables. Featured are a shade garden, rain garden, wildflower meadow, and a water garden. Animals include a least weasel and beneficial insects. At the Montgomery Museum the herb garden established by the New River Master Gardeners more then 25 years ago has morphed into a pollinator garden. Insect activity is recorded in a journal. Leader, Beth Umberger, New River Chapter. Group limit, 12.

10. __ Campus Tree Walk Start from the Virginia Tech Drill field and go down Strouble's Creek to the Duck Pond gazebo. Return and walk up the Drill Field section of campus. We'll identify trees and discuss their pathologies, sites, and biology. Easy walk of less than 2 mi. Leader, Jay Stipes, retired Virginia Tech professor of plant pathology and an expert on Dutch elm disease. Group limit, 12.

Saturday, September 10, Afternoon

HALF-DAY TRIPS; DEPART 1:30 P.M., RETURN BY 4:30 P.M.

11. __ Stadium Woods See No. 6. Leader, Rebekah Paulson, co-director of Friends of Stadium Woods. Group limit, 12.

FIELD TRIPS

12. __ Big Tree Hunt Explore the urban forest of the Virginia Tech campus and search for some of the states's largest trees. Measure trees and calculate a score for nominating a "big tree." Learn about common environmental problems urban trees face. Easy walk of approximately 2 mi. Leader, John Seiler, professor, Virginia Tech College of Natural Resources and Environment. Group limit, 15.

13. __ Wildwood Park This park, a ravine with a creek running through it, divides Radford into east and west sections. Though small, it's rich in flora with open meadow and forested slopes. A wide, paved path makes for easy walking. Trails in the woods on the west side have some short steep sections, but that will be optional for participants. Total distance, about 2 mi. Leader, Carol Schwobel, New River Chapter. Group limit, 12.

14. __ Claytor Lake State Park After an introduction to the park and some local history, you'll have free time to pursue your interests. Rent a boat or paddleboard at the marina and spend an hour on the water, go birding, or stay for a walk along a trail and learn about the status of invasive species at the park and efforts to balance conservation and recreation. For boat rental costs, go to www.claytorlakewatersports.com. $5 per car to enter the park. Leader, Mary Rhoades, New River Chapter. Group limit, 12.

15. __ Garden Tour - PM (Smithfield Plantation and Leslie home). Historic Smithfield, built in 1774, has a period garden with culinary and medicinal plants used by settlers. Grounds include a memorial grove of native plants and a heritage apple orchard. There will be a brief talk on medicinal plants used in the Civil and Revolutionary wars. House tour not included. Part two: When Suzie and Randy Leslie moved into their 1930s-era Blacksburg home 16 years ago, the 1.5-acre lot was dominated by grass, boxwood, and mature trees. Suzie has worked to shrink the lawn and create a nature retreat and outdoor classroom. Eighty species of birds, including 20 species of warblers, have visited the water feature and surrounding gardens. Generally level and easy to walk. Group limit, 12.

Sunday, September 11, Morning

HALF-DAY TRIPS; DEPART 9 A.M., RETURN BY NOON

16. __ Stadium Woods See No. 6. Leader, Jeff Kirwan. Group limit, 15.

17. __ Hahn Horticulture Garden and Smithfield Plantation It's hard to find a more beautiful place to spend Sunday morning than the Virginia Tech Horticulture Garden, a 6-acre garden including a perennial border, water gardens, and shade and meadow plantings. Original artwork is displayed throughout. Free and open to the public from dawn to dusk. Led by horticulture staff. Smithfield Plantation: See No. 15. Led by Smithfield Plantation staff. Easy walking; not more than 1.5 mi. Group limit, 15. Leader, Lucinda Jennings, New River Chapter.

18. __ Wildwood Park See No. 13. Group limit, 15.

19. __ Pollinator Garden at Pandapas Pond With more than 70 species of insect-beneficial plants, nearly all native to the area, the garden began in 2008 to give visitors ideas for backyard habitat and highlight the beauty of native plants. A rain garden was added several years later. The garden is in the George Washington and Jefferson national forests a short walk from Pandapas Pond, one of the area's most popular outdoor recreation sites. Plants include Golden Alexander, Wild Blue Indigo, Joe Pye Weed, Hoary Mountain Mint, and milkweeds. Easy, about 2 mi. Leader, Barbara Walker, New River Chapter. Group limit, 15.

20. __ Lichen Walk on Gateway Trail Walk along the Gateway Trail, connecting Blacksburg with the national forest property at the top of Brush Mountain. Because there is less pollution there and the environment is acidic, the lichen flora should include species not seen in Wildwood Park. The trail goes uphill, but we will go slowly. Leader, Gary Cote, New River Chapter. Group limit, 10.

21. __ Paddle Tour, Claytor Lake Register for a leisurely 2-hour, 1-mi. paddle tour along the shore and view trees and plants including the rare fern *Cheilanthes feei*. We will launch our boats at the public boat landing (no fee). Thunderstorms cancel. **Must bring your own kayak or canoe and life jackets.** Leader, Mike Williams, New River Chapter. Group limit, 7 boats.

22. __ Pandapas Pond Tree Walk Get to know your Appalachian friends a little better on a slow-moving cocktail party–style walk. John will introduce you to their personalities, stories, preferences, and forest gossip. No cocktails will be served on this 1-mi. walk over gentle terrain (at Pandapas Pond in the national forest. Leader, John Peterson, College of Natural Resources and Environment, Virginia Tech. Group limit, 15.

23. __ Geology of Falls Ridge Preserve See No. 7. Leader, Don Rimstidt, retired Virginia Tech geosciences professor. Group limit, 12.

REGISTRATION FORM

Celebrating Our Natural Heritage

FROM MOUNTAIN LAKE TO THE NEW RIVER AND BEYOND

Virginia Native Plant Society Annual Meeting
Sept. 9–11, 2016, Days Inn, Blacksburg

Name _____ Phone _____

Second person in party_____ Cell phone_____

Mailing address _____

E-mail address (print carefully) _____

Signatures: 1st person _____(required)

2nd person_____(required)

Registration fee is $100 per VNPS member. This includes dinners and speakers on Friday and Saturday nights and field trips Saturday, and Sunday. Some trips have additional fees. Registration closes Tuesday, August 30. **Signatures** *are required on all registrations. By signing this, the above registrant(s) shall hold harmless the Virginia Native Plant Society, including its staff, volunteers, and those designated to serve as their provider.*

Calculate your cost

Registration per VNPS member (or family)	$100 × number of attendees: _____ = $_____	
per non-VNPS member	$130 × number of attendees: _____ = $_____	
Saturday box lunch (optional)	$10 × number of attendees: _____ = $_____	**Total:**
Friday program/dinner only	$21 × number of attendees: _____ = $_____	$_____
Saturday program/dinner only	$50 × number of attendees: _____ = $_____	

Lunches Saturday full-day field trips: you may order a box lunch or bring your own. Saturday half-day trips: you may order a box lunch, bring your own, or visit a restaurant (many close to the hotel). No box lunches will be available on Sunday trips.

For optional Saturday box lunch ($10 extra) indicate your preference:

Chicken salad on homemade croissant___ Pimento cheese on homemade bread___

Please note any food allergies or dietary restrictions:

Field trip selections List trip numbers, as given with descriptions. Field trips are limited to a certain number of participants. Please see the description regarding details and any additional costs and entrance fees. You may participate in a Saturday morning trip and another Saturday afternoon trip. If registering for more than one person, put the number of people under each field trip choice.

Saturday, All Day	**Saturday Morning**	**Saturday Afternoon**	**Sunday**
1st _____	*1st* _____	*1st* _____	*1st* _____
2nd _____	*2nd* _____	*2nd*_____	*2nd*_____
3rd _____	*3rd* _____	*3rd* _____	*3rd* _____

Mail this form with credit card information or a check payable to VNPS to: VNPS Annual Meeting, 400 Blandy Farm Lane, Unit 2, Boyce, VA 22620. For more information, contact VNPS Office Manager Karen York at 540-837-1600,or info@vnps.org

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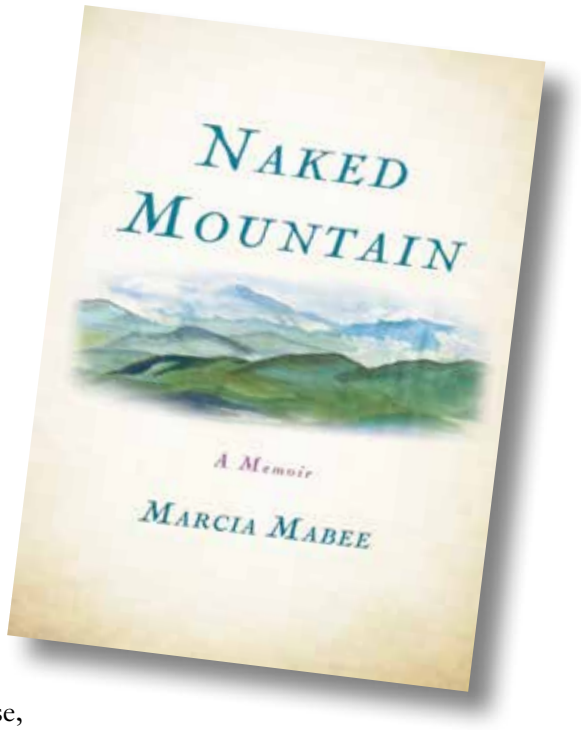
SPEAKERS AND HIGHLIGHTS

Marcia Mabee's Book Will Be Available at Annual Meeting



This excerpt from chapter one of my forthcoming book, Naked Mountain, A Memoir, *describes the purchase of Naked Mountain in 1988 by my husband, Timothy Bell, and me. Bought as a weekend getaway from our pressured, traffic-clogged lives in Northern Virginia, we were initially clueless about the natural world wonders that awaited us on the mountain. Years of delightful wildlife encounters and eventually a spectacular botanical discovery transformed us into passionate conservationists. In 2006, our property was dedicated by the Virginia Department of Conservation and Recreation as Naked Mountain Natural Area Preserve. —Marcia Mabee, VNPS Conservation Chair*

The next day, we had a date to drive up Naked Mountain with the property owner. We were very excited about seeing the land up close, and especially to see whether the views met our hopes and expectations. At the juncture of Routes 639 and 641, we met John Plummer. A tall, heavyset man with silver hair, he greeted us heartily. Plummer had owned the 283.7-acre property that encompassed most of the mountain and summit for ten years. He was a Washington federal employee and used it as a hunting preserve. "I really enjoyed owning this property. Did a lot of good hunting here, but mainly I just liked getting out into the woods. My wife and daughters, they're fifteen and seventeen, don't like it down here. Nothing for them to do. They like to go to the beach. So I'm ready to sell."

We transferred to his jeep and drove along Route 641, a winding state gravel road flanked at first by hay fields, then by mature forest. The road followed Dutch Creek, a narrow stream of falling white water that we could glimpse down the steep hillside far below. The area was a tucked-away corner of the world whose few residents, Plummer told us, still did not have electricity.

After driving a mile along its base, we turned off to go up the mountain. The road suddenly became more like a trail. The jeep rocked and bucked its way up through deep ruts and nearly sank into scoured-out spots where rainwater had formed small ponds. After two miles, the road ended abruptly at an elevation of 1,900 feet. We got out of the jeep and continued the climb through the forest on foot. After scrambling over rocks and logs for three hundred more feet, we began to wonder where we were headed and whether we would ever be able to see anything.

Finally, we emerged from the woods into a small clearing. There, at last, the view revealed itself, and it did not disappoint. It was a feast of beauty—layer upon layer of green and then blue hills becoming progressively higher, until they merged with the horizon about twenty miles in the distance. The whole vista was about forty miles across to our left and right, the foreground lush with still-green hardwoods, the farthest mountains nearly sky blue in color.

I was especially struck by how remote from human activity this mountaintop view made me feel—not a farm or structure in sight all the way to the higher peaks of the Blue Ridge. We would truly be immersed in nature in this place, an experience I was just beginning to realize I craved.

Tim said just one word—"beautiful"—as he reached for me. I replied, "Yes, I thought there would be views, given how the mountain is situated. But this is better than I could have imagined." With our arms around each other, we knew we had found what we were seeking.

A few weeks later, Naked Mountain was ours. It actually cost less than any of the Wintergreen resort homes we had seen a few weeks earlier, probably because it had no structures and did not appear to have commercial value. We were now the owners of property that afforded stunning views of one of the oldest mountain ranges on the planet. Right away, it began to redefine how we thought of ourselves. I loved the

realization I own a mountain! I felt as if there was more to me and my life now, more than just my career. It was as if another sentence had been added to my internal bio: "Marcia S. Mabee, PhD, is a consultant to public health organizations seeking Washington, D.C., representation before Congress and the Executive Branch. She is engaged to be married to Timothy Bell and will soon be a stepmother to his daughter, Susan. She and Mr. Bell own Naked Mountain in Nelson County, Virginia."

And Tim, for his part, liked watching people's reactions when he began telling them, "I bought a mountain for Marcia." ❖

Marcia Mabee is a retired Washington, D.C., lobbyist. After serving as professional staff for a committee of Congress, she represented nonprofit public health associations before the Executive Branch and Congress for 25 years. She holds multiple advanced degrees, including a Ph.D. in health policy, an M.P.H., and an M.S.W. She has been published in The American Journal of Surgery *and* The Journal of the American College of Surgeons *and has written chapters for medical and nursing textbooks. She writes a blog (www.nakedmountain.net) about living in the middle of the Naked Mountain Natural Area Preserve, a property she and her deceased husband, Timothy Bell, purchased in 1988. An ovarian cancer survivor, she also writes about cancer and grief recovery.* Naked Mountain, A Memoir *is her first book.*

The book, to be published Sept. 6, will be available for sale and signing at the Annual Meeting. Excerpt copyright © Marcia Mabee; reprinted with permission of She Writes Press.

SPEAKERS AND HIGHLIGHTS

Speakers Will Focus on Natural Heritage

It was no accident the New River Chapter selected "Celebrate Our Natural Heritage" as the theme of the 2016 Annual Meeting. This year marks the 30th anniversary of the Virginia Natural Heritage Program, and both speakers are with Natural Heritage and will talk on natural area preserves in Southwest Virginia.

Claiborne Woodall

Chris Ludwig

On Friday Claiborne Woodall will give an overview of several preserves in the region. A Kentucky native, he has called Southwest Virginia home for 17 years. He earned a B.S. degree at Sewanee, majoring in natural resources and history. After working at Tall Timbers Research Station in Tallahassee, Fla., he earned a master's in forestry at the University of Massachusetts, Amherst, where he studied forest ecology, silviculture, and wildland fire-behavior prediction.

Claiborne worked for The Nature Conservancy for two years before moving to Abingdon in 1999 to serve as the first southwest region steward with Natural Heritage. From 2001 through 2004, he was natural areas fire manager, administering a prescribed fire program in fire-dependent natural communities on the preserves. Since 2005 he has been regional supervisor, natural areas steward, and western fire manager. Claiborne lives near Abingdon with his wife, Kristy, and daughters Anna and Grayson.

Saturday night's banquet speaker, Chris Ludwig, will discuss The Cedars Natural Area Preserve, a special place that was the focus of the Virginia Native Plant Society's 2015 fundraising campaign.

Ludwig has been with Natural Heritage since 1988. For 10 years he was staff botanist, traversing the state in search of rare plants and significant conservation sites. Since 1998 he has been chief biologist, directing a team of botanists, zoologists, and ecologists in a quest to identify rare species populations and significant natural communities in Virginia.

In 2001 he co-founded the Flora of Virginia Project, formed to produce the first modern manual to the vascular plants of Virginia. The *Flora of Virginia,* of which Chris is a co-author, was published in 2012 and is in its second printing.

Chris's wide range of interests in biology is reflected in his other professional experiences. Chris has worked as an ornithologist with the U.S. Fish and Wildlife Service, a butterfly surveyor with the Maryland Natural Heritage Program, a data technician in the bird skeleton collection at the Smithsonian Institution, and an ecologist with The Nature Conservancy.

Chris and his wife, Jolie, live on 10 woodland acres in far western Hanover County. They enjoy occasional visits from their grown daughters Jane and Rachel and, when time allows, visit other countries in search of birds and exciting natural history experiences. ❖

Figure 1. Downy Rattlesnake Plantain, *Goodyera pubescens*.

Figure 2. Seeds of Downy Rattlesnake Plantain as viewed through a compound microscope. The dark central mass of cells is the embryo; thin-walled empty cells constitute the seed coat.

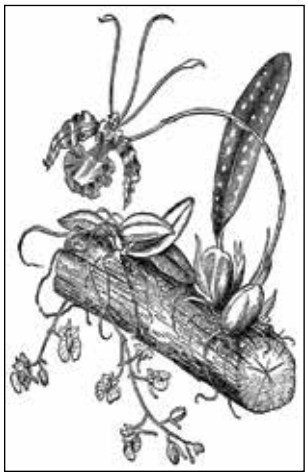


Figure 3. Some tropical epiphytic orchids. From Asa Gray's *How Plants Grow: A Simple Introduction to Structural Botany* (New York: American Book Company, 1858).

Endless Symbioses Most Intricate*

Article and photographs by W. John Hayden, Botany Chair

When I was much younger than I am now, I enjoyed reading science fiction. Much of what I read so long ago is irretrievably lost in the nooks and crannies of memory. But one story left in me a lasting impression. I can remember neither title nor author, but the plot involved, as usual, intrepid explorers discovering alien new worlds. One such exploration involved a world bathed in an ocean teeming with life. Initially the biologists among the spaceship crew were eager to retrieve samples, but everything they tried to pull out of the ocean was attached to something else. Big kelp-like algae were intimately entwined with lobster-like animals that were, in turn, connected to other life forms, and those to still others, and so on. All efforts to retrieve a single specimen failed, because every organism in that fictional watery world was physically connected to every other. As described in the story, this world of total symbiotic connection intimidated and repulsed the explorers, who soon blasted off to other worlds and other adventures.

Like the characters in the story, I found the story's depiction of rampant symbiosis and interconnectedness of species to be disturbing, at least initially. Perhaps what troubled me stemmed from the fact that, at that time of life, as young people do, I was busy constructing my own sense of self, whereas the creatures on that alien planet seemed to have scarcely any vestige of self or individuality. At that same time, I was beginning to learn about the life forms of planet Earth by poring through field guides—both the Golden Guides and Peterson series were important to me in those days—and the glimpses of life on this, my own planet, as depicted in these field guides, clearly emphasized the individuality of species. That fictional watery world of pervasive symbiosis was just shockingly strange to me at that time.

But I am older now, and I have learned a lot more about life on planet Earth since reading that science fiction story. And that fictional world no longer seems as strange to me as it once did. Most life forms on Earth are not as connected in a direct and physical way as those depicted in the story, but the creatures of Earth are most certainly connected ecologically; all are part of the web of life. Each species impacts many others.

Orchids, such as our Wildflower of the Year for 2016, Downy Rattlesnake Plantain (*Goodyera pubescens*) (Fig. 1), exemplify the interconnectedness of life on Earth. As would be the case for many kinds of plants, pollination comes readily to mind as a prominent example of mutualistic symbiosis. Downy Rattlesnake Plantain is pollinated by bumblebees and other native bees. The bees gain nectar and the orchid gets an efficient means to move pollen from one flower to another; each organism gains benefit from the interaction, the very definition of mutualism. Pollination by bees is widespread among the orchids, but there can be much variation in the nature of the pollinator reward (nectar, resin for building nests, and fragrance for attracting mates), and the choreography of bee behavior in the flower is as varied as the sizes and shapes of orchid flowers.

If pollination is successful, and it often is for Downy Rattlesnake Plantain, the result is a capsule full of seeds. Orchid seeds are minute, dust-like, and easily dispersed by wind; they are also produced in prodigious numbers. Small, light-weight seeds, however, cannot contain much in the way of stored food for the future seedling. In fact, orchid seeds have essentially no stored food at all; they consist merely of a thin seed coat and a tiny embryo (Fig. 2). It really does take a microscope to perceive them in detail.

So how do orchid seedlings get established without a stash of food to draw upon for their earliest efforts at existence? To answer that question it must first be acknowledged that many orchid seeds simply perish. Passive dispersal by wind will drop many seeds in spots not at all favorable for growth. A lucky few, however, will come to rest in a spot with

adequate moisture, some—but not too much—light, and one more essential ingredient: the right fungus.

Initial stages of orchid seed growth may occur without fungal interaction, but to continue growing and developing the orchid embryo must encounter a fungus that penetrates the seed and interacts with the embryo. Not all contacts between an orchid and its symbiotic fungus work. Sometimes the fungus consumes the orchid just as any pathogenic fungus digests cells of its host plant. Sometimes the orchid kills the fungus, and, if so, the baby orchid soon dies of starvation. Other times the orchid and fungus are compatible, and orchid cells are able to obtain essential nutrients from the fungus, permitting it to grow, albeit slowly at first. When a successful symbiosis is established, the fungus and orchid embryo form a structure called a protocorm, a slowly growing ball of orchid cells and fungal hyphae (chains of fungal cells). It can take weeks to more than a year for the little green protocorm to acquire sufficient nutrients from its fungal associate and grow large enough to form its first root and leaf—and once a leaf has formed, the baby orchid can begin the process of photosynthesis in earnest. The situation is analogous to mycorrhizae, but the orchid seed tissue penetrated by the fungus is not a root and it is difficult to imagine that the minute orchid embryo has much to give the fungus. But once the seedling makes leaves and roots, mycorrhizae in the strict sense can form, the orchid receiving mineral nutrients from the fungus and the fungus receiving carbon compounds formed by photosynthesis in the plant. It is sobering to think that every orchid you encounter in nature owes its very existence to early nutritional assistance from a fungus.

Many orchids, especially those in the tropics, cling to life on the bark of a tree (Fig 3). Such species are termed epiphytes, and the symbiotic relationship between orchid and tree is characterized as commensal, beneficial for the orchid, but with neither benefit nor detriment to the tree. Epiphytic orchids are not parasites; their roots penetrate only the most superficial layers of bark, and the orchid receives no nutritional benefit from the tree. In extreme cases, however, heavy epiphyte load on a tree can lead to the breaking of branches or the interception of significant amounts of sunlight that would otherwise have illuminated leaves of the tree. In most cases, however, presence of a few epiphytes is of no consequence to the tree.

Other orchids, like Downy Rattlesnake Plantain, are terrestrial, rooted in soil. As any organic gardener will tell you, soils are (or should be!) swarming with microbes (bacteria, protozoa, algae, invertebrates, and so on) and macroscopic life forms (worms, insects, burrowing vertebrates). It is life in the soil that controls the cycling of mineral nutrients and the penetration of oxygen and water between soil particles. Terrestrial orchids, like all higher plants, benefit greatly from activities of myriad life forms in soil.

Of course, not all interactions between plants and other species help the plant. Many woodland orchids, including Downy Rattlesnake Plantain, and especially their flower stalks, are relished by deer. In this case, the orchid's lost reproductive potential is the browsing animal's gain, i.e., a nutritious morsel of food. And it is not just the occasional deer that eats or preys upon or infects orchid plants. All sorts of hungry insects and pathogenic fungi and bacteria are ready, willing, and able to convert orchid biomass to that of their own species. Sometimes the orchid wins, sometimes it loses, but win or lose, the life of an orchid is inextricably intertwined with a multitude of other species.

This essay has focused on connections between orchids and other forms of life. Similar stories of ecological connectedness could be told for any species, only the details would differ. Life on Earth is, indeed, woven into a complex fabric. What might first appear to be an individual organism will prove, on careful study, to be one of the numerous interconnected threads that make up the tapestry of life. And that tapestry, followed with patience and persistence, will be found to encompass the entire biosphere—much like the alien life forms in that story I read so long ago. Little did I know then that a piece of juvenile fiction would become central to my understanding of biology. ❖

**The title echoes "... endless forms most beautiful ...," words used by Charles Darwin in the closing passage of his* Origin of Species.

WHAT DID JOHN MUIR SAY?

A wonderful quotation sums up the pervasiveness of symbioses among the life forms of Earth: "When one tugs at a single thing in nature, he finds it attached to the rest of the world." This aphorism is commonly attributed to John Muir, and it certainly sounds like something he might have said. Unfortunately, according to the Sierra Club—and they ought to know—these are not the words of their founder. What Muir wrote is, "When we try to pick out anything by itself, we find it hitched to everything else in the universe." The same sense is there, but the compass of Muir's actual words is far greater and, consequently, their pertinence to the ecology of the blue marble that we call home is less direct, less compelling—which, no doubt, explains the popularity of the misquoted version. For a discussion of Muir's words on this subject, actual and misquoted, see: http://vault.sierraclub.org/john_muir_exhibit/writings/misquotes.aspx ❖

Winter Workshop 2016

Exploring Plants and Their Friends

By Marjorie Prochaska
First Vice President

For the VNPS Winter Workshop at the University of Richmond this March, Sally Anderson invited a superb quartet of speakers to engage us by exploring plant, insect, and fungal relationships above and below ground. Our first speaker, Gary Krupnick, heads up plant conservation in the botany department at the Smithsonian Institution's Museum of Natural History. As curator of the "Losing Paradise? Endangered Plants Here and Around the World" exhibit there, Gary devised a simple analytical process, which uses herbarium specimens to assess the likelihood that a known plant species is threatened or endangered. As a member of the White House Pollinator Task Force, he is well positioned to explain what we as a country are doing to protect our pollinators. Members of only four classes of Animalia (birds, insects, mammals, and reptiles!) have evolved to pollinate up to 90 percent of the world's flowering plants. Approximately 75 percent of our food crops rely on pollination by animals.

A 2007 National Academy of Science study—*Status of Pollinators in North America*—concluded that there was much we do not know about pollinators. It recognized that both cultivated and managed populations of pollinators and native species are in decline. In many cases, we do not know what pollinates a plant species, although fortunately, many plants have multiple pollinators. The same phenomena that led to threatened and endangered plant species—habitat loss and degradation, pollution, climate change—affect pollinators as well. Many recommendations followed, all involving money for intense, long-range, and coordinated studies.

Workshop attendees crowded the auditorium at the University of Richmond to learn about plants' fascinating and varied relationships with other organisms. Below, speakers Paulette Royt and Gary Krupnick chat during a break between workshop sessions. (Photographs by Nancy Vehrs)

In 2014, President Obama issued an official memorandum outlining a federal strategy for promoting the health of honeybees and other pollinators. One goal is to restore or enhance up to 7 million acres of land for pollinator habitat. The Pollinator Task Force was created the next year. If you have been following the plight of the Monarch Butterfly, you know what we can do nationally and in our own backyard: plant pollinator gardens in whatever patch of land we can dedicate to the purpose.

Next on stage was Kal Ivanov, an ant expert who recently joined the staff of the Virginia Museum of Natural History in Martinsville. He explained that ants function as ecosystem engineers. With their tunneling, which can extend six meters into the soil, ants decrease soil density and increase its porosity as well as its mineral and nutrient levels. There are around 12,500 ant species worldwide, with about 1,000 in North America. We know of 107 species in Virginia, but there are probably more. These wonderful insects, which farm, herd, gather, and construct, form mutual relationships with plants in which both species are helped—think ants carrying away the elaiosomes (nutrient-rich seed appendages) of Bloodroot (*Sanguinaria canadensis*), or commensal relationships, in which one species is helped and the other unaffected—think of ants licking up the sugars on budding peonies. They also guard the nectar of Passionflowers (*Passiflora* spp.) by patrolling to keep away nectar thieves, saving the nectar for the hummingbird pollinator. Plants

can also produce domatia, internal plant structures that can house ants, or Beltian bodies—lipid-rich food structures that feed ants. For more on ant adaptations, consider tackling that giant in the field, *The Ants*, by Bert Holldobler and E.O. Wilson.

Microbiologist Paulette Royt, recently retired from the faculty of George Mason University, addressed us after lunch on the partnership between fungi and plant roots known as mycorrhizae (literally fungus root). I had no idea so many plants were dependent on fungi in the soil to thrive. Mycorrhizal fungi form relationships with 80–90 percent of all vascular plants, greatly expanding the function of plant roots. Multiple forms of mycorrhizal associations are known (see *Sempervirens*, Summer 2015: 10–12). In endomycorrhizal associations, fungal hyphae penetrate root cells and form minute treelike structures (arbuscules) that facilitate transfer of water, minerals, and nutrients between the mycorrhizal partners. Unable to photosynthesize, fungi eagerly accept the transfer of sugars, amino acids, and fatty acids from the plants, while in turn transporting to the plant the macronutrients nitrogen, potassium, phosphorus, calcium, sulfur, and magnesium, as well as trace amounts of a half-dozen more items required for plant growth. Endomycorrhizal fungi also produce glomalin, a glycoprotein found on the surface of living fungal hyphae that also persists in the soil long after the fungi that made the glomulin die. Glomalin helps bind soil particles together and accounts for 5 to 27 percent of the "fixed" organic carbon in the soil—it is thus a significant factor in carbon sequestration of soils.

We learned that one plant might have many mycorrhizal fungi, and that one mycorrhiza can associate with multiple plant hosts. Also, many

Kal Ivanov described interesting ways in which ants' and certain plants' life histories are intertwined, to the benefit of both parties.

weeds are nonmycorrhizal, permitting them to thrive in a soil that has been degraded or otherwise shocked, as by fire. If we remove the topsoil, we remove the fungi. So much in nature points to the health of the substrate, in this case the soil, that we are urged not to overfertilize, not to use pesticides, not to overwater, and not to till. The soil is rather to be treasured as a storehouse for healthy plant growth.

Dennis Whigham, of the Smithsonian Environmental Research Center in Edgewater, Md., addressed the obligatory relationships between plants and their mycorrhizal fungi. Orchids, the focus of Whigham's research, depend entirely on fungi for their nutrition—often a specific fungus. In orchid–fungus interactions, almost all benefits accrue to the orchid. Still, of the 62 species in Virginia, over half are endangered. We are losing orchids, and scientists do not know why. It is the goal of the North American Orchid Conservation Center (NAOCC), which Whigham was instrumental in founding, to better understand the relationship between orchids, their seeds, and their fungi. The Small Whorled Pogonia (I*sotria medeoloides*) and the Large Whorled Pogonia (*I. verticillata*) are both nonclonal, that is, they must produce fruit and seed to reproduce—underscoring the importance of fungi in the population dynamics of these orchids. Further, they can go dormant in the wild, suggesting that they can survive without leaves, without photosynthesis, for a full season or more, perhaps by taking nutrients from their fungal partners. Scientists do not know if this is exactly how orchids survive prolonged dormancy, and no laboratory has ever germinated an *Isotria* seed.

Another goal, then, for NAOCC is to develop protocols for propagating native orchids. NAOCC is networking to protect habitat and to restore native populations, but there is opportunity for the passionate volunteer to become involved in collecting both seed and fungi for propagation in public and private gardens, after instruction in techniques and collecting permissions, of course. I think the folks at NAOCC would be tickled pink to have a half dozen or so of us from VNPS, or even a chapter, come forward to make a commitment to become involved. I am pursuing further information on this to make available in a future issue. In the meantime, consider visiting http://northamericanorchidcenter.org. ❖

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A Legend Passes
Remembering Mary Berg

Mary Berg at her "Tripetala Site," in Gloucester County. (Photo by Phillip Merritt)

We lost Mary Hyde Berg on Thursday, June 2, in the morning. A few hours later her granddaughter Kathleen called Gus Hall with the news, mentioning congestive heart failure among other conditions.

Mary received a B.S. degree in biology at the College of William and Mary, after raising three children with Sven Dan Berg, foundry master at Colonial Williamsburg. She had a plant biosystematics class with Gus and did a floristic study of Gloucester's Clay Bank, her home county and region.

Working for a teaching certification, she taught at Lafayette High School in Williamsburg, where I was her supervising teacher. Mary's career was in the Hampton school system, teaching biology with her unique perspective on all things growing. She continued studying and collecting plants throughout her life, donating more than 1,200 specimens to the William and Mary herbarium.

Donna Ware was doing a plant survey in Gloucester and found Umbrella Magnolia (*Magnolia tripetala)* growing not far from Mary's family home. Donna said: "It is a rich ravine–swamp site with several Mountain–Coastal Plain disjuncts, including *Aralia racemosa, Aralia nudicaulis,* and *Quercus muhlenbergii,* in addition to the *M. tripetala*." With her home site already a private nature preserve, Mary bought this property and others and placed them under conservation easement.

Teta Kain recalled that Mary Hyde served on the board of directors of Friends of Dragon Run for many years and did plant identification on Big Island for the group.

Ellen Bombalski Smyth commented: "I have never known anyone quite like her. Her powers of persuasion convinced me in a matter of minutes of meeting her to serve as a committee chair on the board of the Clayton Chapter. I have rarely found anyone with Mary's ability to combine technical facts, historical understanding, and common sense. Conversations with her often gave me much to think about.

Nicky Staunton said Mary's "spiciness added to VNPS endeavors, and noted that she supported the Flora of Virginia Project generously."

Gus remembers his contacts with Mary Hyde always had the possibility of surprise, because she thought originally, without stereotypes. Her conversation was unpredictable and surprising, often with historical or literate references.

Missed and loved by all, Mary Hyde Berg.

—Helen Hamilton, John Clayton Chapter