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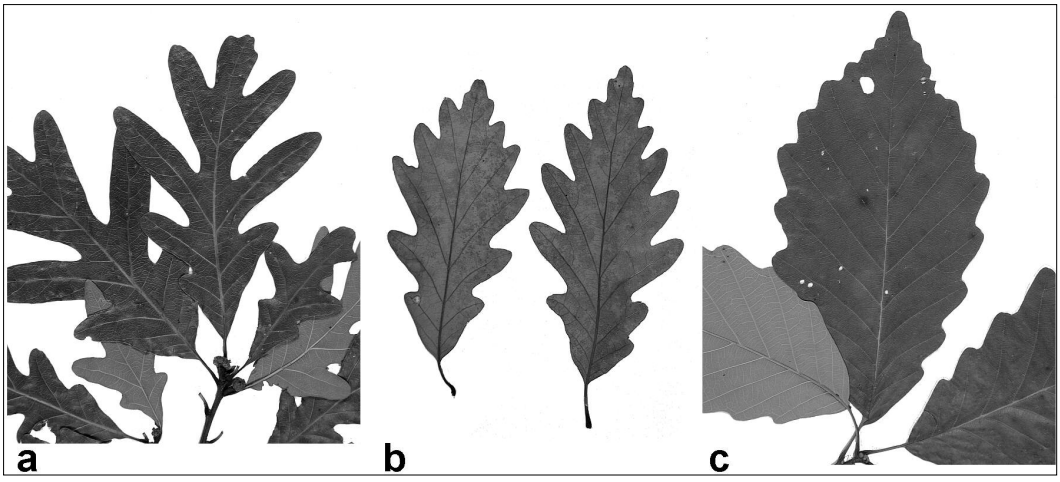
Conserving wild flowers and wild places

Hybrid oaks: Full of vexation and wonder

Distinguishing different species of oak in the forests of eastern North America can be challenging. For one thing, there are simply a lot of different species to sort out. A recent reference (Stein et al. 2003), describes 50 species in the genus *Quercus* occurring naturally east of the 100th meridian, and 90 species are distinguished for all of North America north of Mexico (Nixon 1997). With so many species to parse, confident identification requires careful study of leaves, stem and leaf hairiness, and fully mature acorns with their caps. But care is not always enough, because in addition to the identification challenges inherent in any species-rich group, many oaks hybridize with closely related species, and hybrids, by their nature, blur what should be clear-cut distinctions between species.

Hybrids parented by the VNPS Wildflower of the Year for 2011, white oak (*Quercus alba*), offer a case in point. White oak is known to hybridize naturally with post oak (*Q. stellata)*, overcup oak (*Q. lyrata*), bur oak (*Q. macrocarpa*), chestnut oak (*Q. montana*), chinkapin oak (*Q. muehlenbergii)*), dwarf chinkapin oak (*Q. prinoides*), swamp white oak (*Q. bicolor*), and swamp chestnut oak (*Q. michauxii*). Further, given the opportunity in gardens and arboreta, our native white oak will hybridize with the English white oak (*Q. robur*). Reproductive promiscuity is not unique to white oak; post oak will also form hybrids with most of the species known to cross with white oak, and most of those species can parent multiple hybrid lineages as well. Many of these hybrids have been given formal scientific names, the most up-to-date listings of which can be found in Nixon (1997).



One example of hybridization among species of the white oak group; a. white oak, Quercus alba*; b. hybrid oak,* Q. x saulei *(=* Q. alba x montana*); c. chestnut oak,* Q. montana.

As one might expect, hybrid oaks blend the characters of their parent species. Typically, one finds mixed combinations of the

(See Hybridizing, page 6)

From the president . . . . . .

Watch for buds bursting, figuratively and literally

Hello Friends,

*First an update: Some months ago we reported here that VNPS had joined the Maryland NPS and an individual in a complaint against the National Park Service opposing a transfer of 15 acres of land from Fort Dupont Park, one of the Circle Parks, to the District of Columbia. Washington, D.C., was going to allow expansion and new construction of sports facilities by a private group. The land was adjacent to an upland gravel terrace forest, a type that is being lost to development in Northern Virginia. We opposed the transfer of Park Service lands in general, but were especially concerned over the likely effects of the construction on the forest. The suit asked for a full Environmental Impact Statement rather than the Environmental Assessment that had been conducted, which had failed to consider impacts on the forest. After negotiations that set certain transfer terms, the suit was discontinued. The terms commit the District to develop and maintain the new facilities so as to minimize impact on the forest. The buildings will meet LEED (Leadership in Energy and Environmental Design) standards and the D.C. Green Building Act. Public access is guaranteed. All projects will be subject to review by the National Capital Planning Commission, which will allow for input into mitigation measures to protect the forest. As Kirsten Johnson, President of MNPS, stated in her article (*Marilanica*, Fall 2010), "Our ongoing study of the areas turns out to mean a lot more than simply some fun Sunday outings."*

*If you want to get to know your forests better, lots of our chapters have tree ID walks this time of year. Learning shape, bark, and buds can be very interesting, and you get to see where all the bird nests were, just which plants stay green underneath them, and what pops up first in spring. I've been watching a few native columbines (*Aquilegia canadensis*) that inhabit a tiny limestone outcrop behind my house for Project Budburst, and in mid-January after several snows and lots of freezing weather they are just now giving up and starting to wither! Project Budburst is a nationwide program that follows the phenology, or study of cyclical and seasonal phenomena in nature, of a selected group of plants. You can join in at their website—just search for Project BudBurst online.*

Looking forward to buds bursting!

Your President, Sally Anderson

Visit Carolina's Green Swamp or the Kansas tallgrass prairie with VNPS

June 4-5 Green Swamp Tour

The Green Swamp, once estimated to cover 200,000 acres, is located in southeast North Carolina. It is known for its combination of longleaf pine/wiregrass savannas and pocosins (wetlands) and is considered one of the richest areas botanically along the Atlantic Coast. The Green Swamp is home to at least 14 species of native carnivorous plants, among which is the rare Venus flytrap, *Dionaea muscipula*, which blooms in early June. It is also home to many species of native orchids and rare animals, one of which is the endangered red-cockaded woodpecker.

The tour will encompass several locations in the Green Swamp area including the Nature Conservancy's Green Swamp Preserve and the Nature Conservancy-managed Boiling Springs Lakes Preserve. David McAdoo, a member of the North Carolina Native Plant Society and co-founder and past president of the Native Orchid Conference, Inc., will be the guide.

Two fishing cottages along the shores of one of the largest Carolina bay lakes have been reserved for lodging. They will be available from Friday afternoon, June 3, until Monday morning, June 6. Rooms will be double or triple occupancy depending on the number of participants. A full kitchen in each cottage will be available for use.

The cost of the tour is $125, which includes three nights' lodging, field trips, and fees, and lunches in the field. Participants are responsible for all other meals and transportation to North Carolina. Transportation while on the tour will be by carpool.

For this tour, reservations and a $50 deposit are needed by April 1, and full payment is due by May 1.

June 11-18 Kansas Prairie Tour

The Kansas Prairie Tour will visit tallgrass prairies from eastern Kansas, where the rare Mead's milkweed, *Asclepias meadii*, can be found in prairie remnants, to a natural wetland in the Smoky Hills of central Kansas. The majority of the tour will be centered in the Flint Hills region of Kansas where most of the remaining undisturbed tallgrass prairies can be

(See Sign up, page 5)

Blacksburg art students give to Flora of Virginia Project

Students at Blacksburg High School recently donated $161 to the Flora of Virginia Project in what we think is the first gift to the Flora Project by school students. More interesting still is how the students raised the funds for this gift: they held a bake and art sale, but with a difference. The art—and the baked goods—had the theme of native Virginia plants.

Lou Greiner, a nature sculptor and a member of the Blue Ridge Wild Flower Society, was slated for an exhibition of her miniatures in November and December at the Montgomery Museum in Christiansburg. To coincide with the show, she offered two workshops to art classes at the Blacksburg school and at nearby Christiansburg High School.

At Blacksburg, she worked with art teacher Jessica Pace-Berkeley to design a workshop in which advanced beginners learned to sculpt native plants using a polymer clay similar to the medium Greiner uses in her work. They were encouraged to insert, as Greiner does, an animal into the plant sculpture—"botanicals and critters," Pace-Berkeley called it. Christiansburg students worked in scientific illustration.

Greiner spoke with Sally Anderson, VNPS president, who provided flyers on the Flora Project, and, using field guides, students learned about the importance of native plants. Pace-Berkeley encouraged the students to sketch before they embarked on the sculpting.

"Native plants were emphasized, but it wasn't easy to stick to natives at that time of year, so some cultivars were used as well. And for the most part, they used their drawings," Greiner said. She demonstrated the clay technique creating trillium, "mainly because it's 3, 3, and 3, very simple. I told them they could use their drawings and do the flower they had researched, or they could use the trillium."

Students made sculptures in parts. "We used a low-temperature clay, so it didn't need to be fired in a kiln," said Greiner. "I'd oven-cure it and take it back to them, and they'd paint and glaze it. It was one of the best workshops I've done in a long time."

"My only requirement was that it have a base, a stem, a leaf, a flower, and a critter," said Pace-Berkeley. In addition to trillium, plants included the morning glory, buttercups, dogwood, and sunflower, provided with birds, the praying mantis, or ladybugs.

"Coming here after school and during lunch, they couldn't work on these projects enough," she said. "We also made art cakes and pies and brownies and muffins, made them floral in design." A *Helianthus* cake proved especially palatable. "One girl took Oreos and made them the centers in the sunflower paintings by Van Gogh, and someone else used textured icing to re-create the cypress trees in *The Starry Night*," another Van Gogh.

A trillium sculpted by an art student at Blacksburg High School, using polymer clay. The sale of these and other works, including botanical cakes, raised money for the Flora of Virginia Project.

For the opening, on Nov. 5, the students' gallery was created in the museum's library. "Sue Farrar, executive director, hung all the drawings she could from both classes," said Greiner, "and the sculptures were displayed on a large table."

"The students went to the opening reception, and now they've been in a museum, and that's a good thing for high school students," Pace-Berkeley said. "People came up to me and talked about the Flora of Virginia Project, because most of them had never heard about it before." Flyers on the Flora Project were available at the show as well, "so that people could understand why the student work was there," Greiner said.

Recognized regionally and nationally, Greiner was artist-in-residence at Georgia's Callaway Gardens in the spring of 2006. In 2007, the Smithsonian Institution commissioned her to do three botanicals, which have now been installed in its National Museum of Natural History.

"I personally think, I told Jessie, that the reason I came up with this was a) it totally ties in with what I do and b) if it weren't for someone protecting and documenting things like this, I wouldn't have subjects!" Greiner said. "I feel like it's so crucial for anyone doing wildlife and botanicals to recognize that," she added.

Bland Crowder, associate director, Flora of Virginia Project

Don't miss these upcoming native plant events

Saturday, March 26, 10 a.m.-1 p.m., Arcadia Field Trip (Blue Ridge Wildflower Society). Search for early spring ephemerals such as bloodroot, bird's foot violet, and toothwort. Bring a drink and snack. Easy walking. Meet at Bojangles restaurant in Daleville and carpool. Contact Rich Crites 540-774-4518.

Sunday, March 27, 10-2 p.m., Garlic Mustard Pull (Piedmont Chapter) at Marjorie Arundel Trillium Trail, a VNPS registry site at G.R. Thompson WMA in Linden. Come for any time period to help eradicate garlic mustard. IT IS HELPING! If you plan to spend the day, pack a lunch. The first 15 participants will receive a complimentary wine tasting voucher from Fox Meadow Winery. For information, contact Richard Stromberg at 540-631-0212 or risy@embarqmail.com.

Monday, March 28, 7-8:30 p.m., Blue Ridge Wildflower Society meeting, "Cooking with Native Plants" by Smith Mountain Lake chef Mark Crim. Demonstration and sampling. Roanoke Church of Christ, 2606 Brandon Ave. Contact Rich Crites 540-774-4518.

Saturday, April 9, Blacks Run cleanup, Harrisonburg, (Shenandoah Chapter), Barbara McSweeney at 540-363-1116 or barbmcs@newhopetel.net

Sunday, April 10, meet at 9 a.m., Second Sunday Walk, U.S. National Arboretum (Piedmont Chapter), Join Carrie Blair for a walk through this living museum. Par-

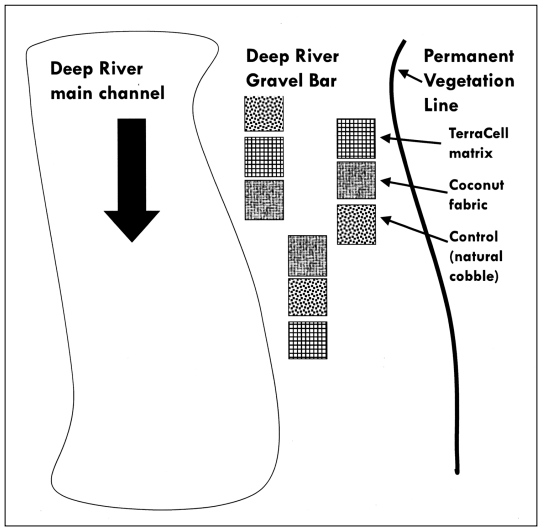
(See Events, page 8)

Harperella

Working to bring a plant back from the brink

Monitoring a test plot.

Species Name: *Ptilimnium nodosum*
Common Name: Harperella
Family: Apiaceae
Reintroduction Initiated: 2006
Location: North Carolina
Length of Monitoring: 2006-present (ongoing)
Factors Tested: Streambed stabilization materials



Planting diagram for Ptlimnium nodosum *reintroduction that shows the positioning of each plot and within plot treatments with 70 plants in each plot per treatment (TerraCell®, coconut fabric, and natural cobble).*

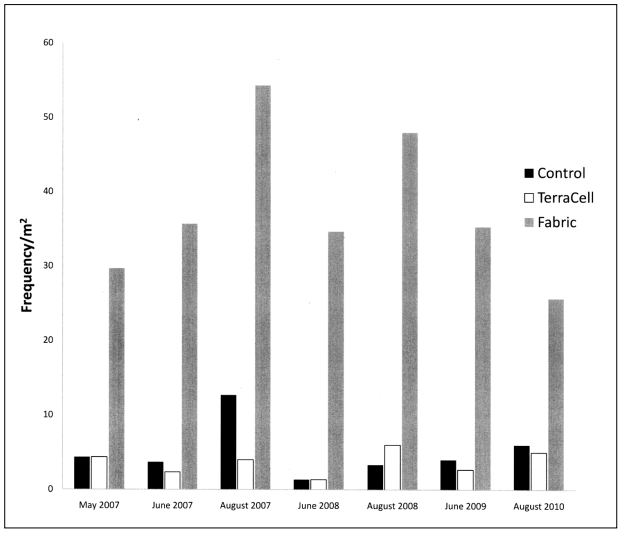
Ptilimnium nodosum (harperella) is a federally endangered emergent aquatic plant with 13 remaining populations in the eastern United States—down from 26 in 1988—with only one natural occurrence in North Carolina, on the Tar River. Historically two additional populations were located along the Deep River in North Carolina, but because of severe population decline, in 1997 North Carolina Botanical Garden (NCBG) staff rescued the eight remaining individuals from one of these populations for ex situ propagation at the garden. The second population went extinct.

The fact that the NCBG as part of the Center for Plant Conservation (CPC) partnership is working hard to bring harperella back from the brink of extinction is directly due to the $10,000 VNPS sponsorship of the rare *Ptilimnium nodosum*. That amount was set forth in the VNPS November 2004 fundraising letter as what was needed to sponsor the plant. Only one population of harperella is known to exist in Virginia. By early 2005, VNPS members had met and exceeded the goal by $800. The additional amount was put toward efforts to save Kentucky ladyslipper.

The mission of the Center for Plant Conservation is to conserve and restore the imperiled native plants of the United States in order to secure them from extinction. The CPC is a network of 36 leading botanic institutions including the NCBG. Founded in 1984, the center operates the only coordinated national program of off-site (ex situ) conservation of rare plant material. This conservation collection ensures that material is available for restoration and recovery efforts for these species. CPC also works in research, restoration, technical assistance, education and advocacy through the efforts of the network and the national office.

The purpose of the NCBG project was to create a self-sustaining harperella population near the historical site on the Deep River, using ex situ-propagated plants. Staff designed the reintroduction to test the efficacy of using streambed stabilization treatments (TerraCell® and coconut fabric) in comparison to planting in natural cobble. These treatments were chosen because it is particularly challenging to establish an emergent aquatic plant that occupies the uncertain habitat of riverine gravel bars. TerraCell® is a plastic-celled stabilization material within which harperella can be planted, and coconut fabric is a combination of coconut fibers and a fine plastic netting through which vegetation can be planted. The natural cobble represented a quasi-control treatment, where harperella was

(See Harperella, page 5)



Frequency of Ptilimnium nodosum *per plot and treatment type.*

Harperella results still being studied for success rate

(Continued from page 4)

planted in an unprotected, but natural, substrate.

In June 2006, NCBG staff planted 70 individuals in each of nine experimental plots, representing three replicates of three treatments, for a total of 630 plants. The reintroduction site was approximately 100 meters downstream of the historical harperella station within the Triangle Land Conservancy's Second Island Preserve in a semi-permanent cobble bar.

Of the 630 original plants, 314 survived the first growing season: 139 in the coconut fabric, 106 in the TeraCell®, and 69 in the natural cobble. Note that two flood events occurred—one and two days after the reintroduction—both covering the plants with approximately one meter of water. Additional plants were undoubtedly lost to repeated floods over the first growing season and unexpected herbivory by deer, Canada geese, and muskrats. The results are clear, however, that the coconut fabric stabilization treatment was most effective over the establishment phase and afterward.

Within the first growing season, considerable flowering and vegetative reproduction occurred. Approximately 800 inflorescences were produced that contained an estimated 320,000 flowers. Although we did not collect seed production data, we estimate that over 600,000 seeds were produced over the growing season.

Because of harperella's vegetative reproduction habit, following individuals in subsequent years was not possible. Staff therefore established permanent plots of one square meter, subdivided into 100 cells, each being 10 square centimeters, in each treatment and replicate, and scored for harperella presence/absence. They noted flowering/fruiting, but did not make counts. Monitoring data from 2007 to 2010 show that there has been a general decline in the permanent plots except for one coconut fabric plot (plot 1), one TerraCell® plot (plot 2) and one control plot (plot 1), where there is a slight increase (Fig. 2). It is important to note that numerous individual plants were seen outside of the permanent plots and in adjacent permanent plots, which shows that recruitment is occurring and that the appearance of general decline within the reintroduction site may be in part an artifact of constraining our sampling within plots. Tracking population expansion will require modifying the spatial extent of our sampling to determine if the reintroduction established a self-sustaining Harperella population

The predicted medium- to long-term success of our reintroduction is based on several factors. Because our Harperella reintroduction occurs in a semi-stable cobble bar within the primary Deep River channel, flood scouring and debris deposition will present ongoing threats and opportunities for expansion. And because Harperella is an emergent plant, herbivory from waterfowl, mammals, fish, and turtles is possible. But because harperella is an herbaceous perennial with adventitious root growth, a profligate seed producer, and can reproduce vegetatively from fragmentation and plantlet formation, on-site survival and dispersal to other locations is likely.

Johnny Randall and Mike Kunz, NCBG

•Sign up for swamp and prairie trips now

(Continued from page 2)

found. Long before the grasses have grown to their full height, the native wildflowers color the prairies. This tour is scheduled to take advantage of the wildflowers' peak season of bloom.

The tour will visit the Tallgrass Prairie National Preserve (which now has its own herd of bison), Konza Prairie Biological Station, Maxwell Wildlife Preserve, Kaw Heritage Trail and Kanopolis State Park, and others. The tour will also visit a working ranch and hear the owner's perspective on native plants. And plans are being made to meet with members of the Kansas Native Plant Society at one of the destinations. Optional activities that you might enjoy are the Friday Kaw Intertribal Pow Wow and the Saturday morning parade in Council Grove, a part of Washunga Days.

A two-story ranch house located near the historic Santa Fe Trail has been reserved for the group. Rooms will be double or triple occupancy, depending on the number of participants. A full kitchen is available for use. The ranch also has trails that can be explored.

Cost for the tour is $450 which includes all lodging, field trips, and fees, and lunches in the field. Participants are responsible for all other meals and transportation to Kansas. For this tour, registrations and a deposit of $200 are needed by April 1, and full payment is due by May 1.

For those who will be flying to Kansas, reservations should be made for arrival at the Kansas City, [Mo.] Missouri International Airport [RCI] by early afternoon on June 11. For return flights, on June 18, a late morning or early afternoon departure would be preferable. Transportation while on tour will be by private car/carpool for those who plan to drive or rent a car. For those who fly, transportation will be arranged if the need arises and the costs will be shared by the riders. Please inform us if you are in need of this option so that plans can be made.

Questions for either trip can be directed to Linda Wilcox at 757-468-4346 or w8n2cwildflowers@cox.net or the VNPS office at 540-837-1600 or vnpsofc@shentel.net.

Hybridizing tendencies can be perplexing

(Continued from page 1)

parents' characteristics, or intermediate character states, or both; rarely, an extreme expression of one parental character can be observed. So, when identifying oaks, one needs to be prepared to encounter specimens that scramble the usually encountered character patterns. It could be worse, though. For one thing, oaks hybridize only within closely related groups of species. White oaks hybridize only with other species classified in the white oak group, i.e., trees with rounded leaf lobes and acorns that mature in a single year (several of which are listed in the previous paragraph). Similarly, various species from the red/black oak group, trees with bristle-tipped leaf lobes and acorns that mature over the course of two seasons, hybridize with each other. But hybrids between the white oak group and the red/black oak group simply do not occur. Further, many plant groups with rampant hybridization also exhibit additional complexity resulting from polyploidy, whole-genome multiplication in which complete sets of chromosomes become duplicated in hybrids and their offspring. Mercifully, polyploidy is virtually unknown in the oaks, even among the hybrids. In fact, chromosome numbers throughout the oak family (oak, beech, chestnut, etc.) are monotonously uniform: 12 chromosomes in each pollen and egg cell and, hence, 24 chromosomes in all other cells (half of which came from the pollen parent and half from the egg parent).

Clearly, at a practical level, the existence of oak hybrids can complicate species identification. Oak hybrids also present some theoretical issues. In theory, species maintain their genetic integrity by reproducing within closed gene pools. Said another way, breeding populations of a species remain isolated from the breeding populations of other species. The integration of ideas about gene flow within species and barriers to gene flow between different species are at the heart of what has become known as the biological species concept, developed largely by Ernst Mayr and colleagues in the 1930s and 1940s. In essence, the biological species concept posits that one or more aspects of the biology of two different species should operate to prevent their interbreeding or, more subtly, to minimize gene flow between them even if occasional hybrids do form. These biological factors have come to be known as reproductive isolating mechanisms. These isolating mechanisms are credited with great theoretical significance because, in the absence of genetic isolation, species would lose their distinctiveness, hybridizing rampantly, and blending insensibly with others.

So-called external (or extrinsic) reproductive isolating mechanisms prevent interbreeding from occurring in the first place; several of these (or their breach) can be illustrated (or postulated) with white oak and its known hybrids. For example, in nature, the English (*Q. robur)* and North American (*Q. alba*) white oaks occupy different continents, a distance more than sufficient to isolate the wind-blown pollen of each from reaching the stigmas and ovules of the other. However, when English oaks are cultivated in the U.S. and our white oaks are cultivated in Europe, their natural geographic barrier is breached and hybrids, called *Q. x bimundorum* ("of two worlds"), form. In this case, under natural conditions, the geographic barrier is sufficient to provide genetic isolation between these two species, and hybrids form only as a consequence of human activity.

Within its native geographic range—which is most of eastern North America—the ecological range of *Q. alba* is also quite broad. But white oaks don't grow everywhere. Sites with nutrient-poor and droughty soils tend to support the growth of post oaks better than white oaks, and swamp white oaks are much better adapted to soggy wet bottomlands than ordinary white oaks. To some extent, then, despite broad overlap in their geographic ranges, ecological factors tend to segregate the parent trees by their preferred habitat, and that may help to limit whole-sale cross-pollination between these species—limit it, but not totally prevent it, because we do have hybrid trees as testimony to the occasional failure of these ecological barriers. It is not difficult, for example, to imagine white oak pollen blowing to droughty ridgetops or swampy bottomlands. Of course, the further a given pollen grain travels from its source tree, the greater its probability of dropping out of the air, so ecological separation may offer some partial measure of genetic isolation, even among wind-pollinated oaks.

The timing of pollen release and stigma receptivity may well be another external mechanism that imperfectly separates the breeding pools of species within the white oak group. Sometimes called seasonal isolation, this factor for oaks might be better described as temporal isolation because most oaks shed pollen more or less coincident with spring bud break, and the timing differences between different oaks are likely to be on the order of just a few days or weeks. I know of no detailed comparative phenological data for the hybridizing white oak group species discussed above. By analogy, however, there is some evidence that live oak (*Q. virginiana*) and sand live oak (*Q. geminata*) from the same general region shed their pollen a few weeks apart from each other, so it is conceivable that timing differences could serve to separate white oak from its nearest relatives at least some—maybe most—of the time.

Geography, ecology, and timing of pollen release may provide some genetic isolation between the various species of the white oak group, but the well-documented existence of hybrids indicates that these potential barriers are, at the very least, somewhat porous for oaks.

In addition to external isolating mechanisms, the biological species concept also incorporates so-called internal (or intrinsic) isolating mechanisms that operate as barriers to gene flow between species in spite of the occasional formation of hybrids. In essence, internal isolating mechanisms posit the existence of genetic incompatibilities between the two genomes combined via hybridization. For example, a hybrid embryo may form, but not survive to the point of birth (animals) or seed germination (plants); alternatively, hybrids may survive, but fail to form gametes, as in sterile mules and various sterile hybrid plants. In both cases, the opposing sets of genes from the two parent species fail to work together in a coordinated way and the hybrid is impaired in one way or another. In theory, then, such hybrids represent dead ends in terms of potential gene flow between their parent species. Clearly, in the case of oaks, hybrids do form and they can grow to become mature trees that shed pollen and bear

(See Oaks, page 7)

•*Oaks*

(Continued from page 6)

acorns. So, it seems that the internal isolating mechanisms of hybrid inviability or hybrid sterility don't apply.

There is one last internal isolating mechanism that might apply to white oak species: hybrid breakdown. The core concept behind hybrid breakdown is the idea that while hybrids may form, grow, and reproduce, the hybrids themselves and their offspring simply may not be as well adapted to their environment as either of their parents and so the hybrids—and their offspring—simply fail to thrive and suffer higher mortality than either of their parent species, thus limiting the degree of genetic mixing that occurs between the parental species. Does hybrid breakdown serve to isolate species of oak known to form occasional hybrids? That's hard to say. Documenting hybrid breakdown requires detailed study of every pertinent individual of the two parental species and all their hybrid offspring within breeding (or crossbreeding) populations over multiple generations. That's a lot of work for annual plants which complete a generation every year; but nearly impossible when individual oak trees may take a few decades to reach reproductive maturity, and then continue to shed pollen and disperse acorns for a few hundred years. It would be interesting to know, for example, if hybrids of white oaks ever attain great age similar to that commonly observed in "pure" white oaks.

So what does this all mean? For one thing, because of the multiple hybrid combinations known to occur among white oak group species in nature, application of the biological species concept might lead one to consider all members of the white oak group as a single interbreeding gene pool and thus one big, morphologically diverse species! And ditto for the red/black oaks prone to hybridization. This possibility was discussed formally by Burger (1975) but he and subsequent botanists have rejected such an extreme, although fully logical, deviation from traditional species concepts among the oaks. The key seems to lie in the numbers. Yes, white oaks do form hybrids with at least eight other species in eastern North America, but the vast majority of white oak trees encountered in any forest or woodlot fall easily within the traditional morphological concept of *Quercus alba*. Hybrid individuals, though certainly present here and there, are relatively rare, and oaks assignable to traditionally recognized species are extremely numerous. Even rarer are instances of hybrid swarms, populations composed of hybrids and all manner of intermediates between their parent species. Without a doubt some mixing of genes between different oaks does occur, but not at a rate sufficient to threaten the genetic integrity of each species as a whole.

This essay opened by framing the existence of oak hybrids as a vexing roadblock to specimen identification; one often hears reference to hybrid oaks cast as an annoyance to straightforward identification and classification, and I'll admit that I have adopted that tone on occasion, myself. But maybe there is value in thinking about hybrid oaks from a different perspective. The white oak group species of the forests of eastern North America are sympatric over tremendously large areas, they all flower roughly at spring bud-break, they are passively pollinated by wind, and they are certainly capable of forming hybrids . . . so how is it that hybrids are relatively rare? How do the species involved remain reasonably distinct from each other? Rather than vexation, maybe we should adopt an attitude of awe and respect for the complexity of biological processes that, playing out on continental scales, involving untold millions of individual trees, and millennial time frames, challenge our best efforts at comprehension. White oaks are such common trees, who could imagine that their coherence as a species could be so wonderfully complex to contemplate?

W. John Hayden, Botany Chair

See the address label for your membership expiration date

VNPS Membership/Renewal Form

Name(s)_____

Address_____

City_____State_____Zip_____

___Individual $30 ___Student $15

___Family $40 ___Associate (groups) $40*

___Patron $50 ___Sustaining $100

___Life $500

*Please designate one person as delegate for Associate membership

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_____Check if you do not wish your name to be exchanged with similar organizations

_____Check if you do not wish your name to be listed in a chapter directory

Which chapter do you wish to join? (See www.vnps.org)_____

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Membership dues are tax deductible in the amount they exceed $5. Contributions are tax deductible in accordance with IRS regulations.

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www.vnps.org

Sally Anderson, President
Nancy Sorrells, Editor

•*Events*

(Continued from page 3)

ticipants will be carpooling. Meet at 9 a.m. at the Bloom grocery store in Marshall. Contact Carrie at 540-364-1232.

Saturday, April 16, Earth Day in Staunton, 9 a.m.-noon, & Shenandoah Chapter plant sale behind the farmers market. Barbara McSweeney at 540-363-1116 or barbmcs@newhopetel.net. Proceeds benefit Flora of Virginia Project.

Saturday, April 16, 10 a.m.-noon, Annual Calmes Neck Bluffs Wildflower Walk (Piedmont Chapter). A VNPS registry site, Calmes Neck Bluffs offers a rich mesic forest and ravines with spectacular masses of bluebells and other spring wildflowers along the Shenandoah River. Gary Fleming, vegetation ecologist with the Natural Heritage Program, will lead the moderate walk (expect to climb over downed trees). Bring lunch and chair and gather at river afterward. Contact Blanca Vandervoort at 540-837-1637 or cvanderv@nelsoncable.com.

Saturday, April 16, 9 a.m.-1 p.m., Buffalo Creek Field Trip (Blue Ridge Wildflower Society). Visit this VNPS Registry site with Rich Crites. Plants to see include bluebells, dwarf ginseng, walking ferns, and dwarf iris. Contact Rich Crites 540-774-4518.

Saturday, April 23, 10 a.m.-12:30 p.m. Booker T. Washington Monument Field Trip (Blue Ridge Wildflower Society). Marshall Daniels and Rich Crites will lead the group along the Jack-O-Lantern Trail in search of spring beauty, foamflower, Mayapples, bluebells, and pink lady-slippers. Moderate walking. Bring a lunch. Contact Marshall Daniels 540-721-8304.

Saturday April 30, Riverfest in Waynesboro includes Shenandoah Chapter plant sale at Farmer's Market as part of Riverfest. Barbara McSweeney at 540-363-1116 or barbmcs@newhopetel.net. Proceeds benefit Flora of Virginia Project.

Friday, Saturday, Sunday, May 6, 7 and 8, Garden Fair at the State Arboretum of Virginia in Boyce, Clarke County. Directions and information online, www.virginia.edu/Blandy.

Saturday, May 7, Roaring Run Furnace Field Trip, 9 a.m.-1 p.m. (Blue Ridge Wildflower Society) Join Butch Kelly and Rich Crites for a field trip to Roaring Run Furnace in the George Washington-Jefferson National Forest to see shale barren species and picturesque waterfalls. Trail is rolling, but not steep. Bring a lunch, sun screen, sturdy shoes and rain gear. Contact Butch Kelly at 540-384-7429.

Saturday, May 14, 9 a.m.-noon, Blue Ridge Wildflower Society Spring Wildflower Plant Sale, Virginia Western Community College behind the arboretum and greenhouse. Contact Rich Crites 540-774-4518.

Saturday, May 28, 10 a.m.-1 p.m., Rhododendron Day on the Blue Ridge Parkway. Meet leader Rudy Albert at the Peaks of Otter Visitor Center. We hope to catch catawba rhododendron at peak bloom on this overlook hopping expedition. Very little walking. Contact Rudy Albert at 540-774-2279.

Wednesday-Saturday, June 1-4, Native Plants in the Landscape conference, Millersville University, Lancaster, PA, For info, see www.millersvillenativeplants.org/

Wednesday-Saturday, July 27-30, The Cullowhee Native Plant Conference, Western Carolina University, Cullowhee, NC. For more information, go to www.wcu.edu/5033.aspd.

Ash borer class offered

The emerald ash borer beetle is an active threat to our ash tree species in the Fraxinus family. Now there is a free online course developed by Eric Wiseman, Virginia Tech professor of urban forestry, that will help identify and control this destructive insect. The course targets green space enthusiasts and green industry professionals with the intention of increasing our collective capacity to detect and manage emerald ash borer in Virginia. The course is eligible for CEUs from an assortment of professional organizations. For more information, visit http://www.hort.vt.edu/eab.