On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

Spring 2008 Events

Great Smoky Mountains Spring Wildflower Pilgrimage

April 23-27, 2008: The Great Smoky Mountains National Park 58th Spring Wildflower Pilgrimage is a five-day event in Great Smoky Mountains National Park consisting of a variety of wildflower, fauna, and natural history walks, motorcades, photographic tours, art classes, and indoor seminars. Most programs are outdoors in the Park, while indoor offerings are held in various venues throughout Gatlinburg, TN.

For information about registration, go to www.springwildflowerpilgrimage.org/

Flora-Quest '08: Exploring Ohio's Wildest Landscape
Shawnee and The Edge! May 2 - 4, 2008

Open to the general public, Flora-Quest '08 field trip schedule and registration are now on-line. Our group size has enabled us to offer deeply discounted prices on lodging at Shawnee. Call **1-800-282-7275** for your special rate on lodging when booking as a Flora-Quest patron. Master Gardeners and Ohio Certified Volunteer Naturalists may use these events for their educational requirements.

What to Expect

Established in 2007, Flora-Quest is a hands-on learning adventure focusing on wild plants. Centered at the beautiful Shawnee State Park resort in the middle of Ohio's largest contiguous forest, the 65,000-acre Shawnee State Forest, a mind-boggling array of plants is at our fingertips. Roughing it is hardly necessary; facilities at the lodge are top-notch and good hotels are within 25 minutes in the city of Portsmouth.

Just to the west of Shawnee is the sprawling Edge of Appalachia preserve. Filled with unusual habitats and possessing one of the state's highest concentrations of rare plants, the Edge is a botanical paradise. Flora-Quest trips are split between Shawnee and the Edge, and these packages offer participants the greatest botanical adventure to be had in Ohio, at the best time of year to explore this region. Upwards of 1,000 species of native plants are found in this area – there are only about 1,900 natives in all of Ohio.

In addition to learning about common plants, most of which we'll see in profusion, Flora-Quest participants will also have the opportunity to observe a number of great rarities. Particularly noteworthy are the Appalachian plants found no further north than Shawnee. Newcomers are often amazed to see southerners like umbrella magnolia, pinxter-flower azaleas, and early stoneroot in the forest. Each trip option includes two expeditions – one to Adams County and the Edge of Appalachia region on one day, and Shawnee State Forest and vicinity the other day. All trips will find an ENORMOUS array of flora, far beyond what brief descriptions can convey. Also, one trip from each of the five options will visit a locale for Wherry's Catchfly, Flora-Quest 2008's signature plant. This stunning rarity is worth the trip alone!

We are fortunate to have some of Ohio's most gifted botanists and naturalists leading Flora-Quest expeditions. All of them know the area well, and are very familiar with the plant life of the region. Their leadership is invaluable, as first-timers (even second, third, and fourth!) are often overwhelmed by the vastness of Shawnee and the Edge, and scarcely know where to begin. Most of our guides are also well-versed in other facets of natural history, such as birds, butterflies, mosses and lichens, geology, etc. which only adds to the enjoyment of the trips.

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We thank all those who have remembered to renew their memberships for 2008, and we remind those who have not yet done so that this will be your last issue of *On The Fringe*.

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Program Schedule Spring 2008

Apr. 26, Sat: Birds and Botany at Bacon Woods, - 8:00 A.M. **Lorain County.-** Join Western Cuyahoga Audubon Society in a joint trip to visit Bacon Woods with an amazing display of spring wildflowers as well as birds including the Cerulean Warbler. We'll pull a few invasive garlic mustard plants along the way. Pot luck picnic after hike, bring a dish to share. Directions: Take Rt. 2 west to Baumhart Rd., exit south to North Ridge Rd. Turn right on North Ridge 2 miles to a "T". Turn right past Vermillion Rd. Bear left, go down hill. Entrance on right just before bridge over Vermillion River. Call Diane to register and for carpool information: 216-691-1929 (H) 440-666-4870 (Cell)

May 3, Sat.: Spring Wildflower Workshop, 9:00 A.M. – **Deep Woods Shelter, Big Creek Park, Geauga County** *(9160 Robinson Rd., Chardon, 44024***)** –From trilliums to mayapples, learn to identify the wonderful diversity of woodland spring wildflowers, including common families, in this basics of flower identification workshop using Newcomb's Wildflower Guide. Books available for purchase. Directions: Take I-90 east to Rt. 44, go south 2 miles to Clark Rd. Turn left and head east 1 mile to Robinson Rd. Turn right. Park entrance is on the right 1 mile. Bear left and continue all the way to back parking area. Call Judy to register: 440-564-9151 (H) or 440-286-9516 Ext 2011 (W).

May 17, Sat.: Wildflowers of Cox Preserve – 10:00 AM.- **Medina County (***7960 Wooster Pike, Seville, OH*) Join Natural Areas staff naturalist Judy Semroc on this joint trip with Northeast Ohio Naturalists (NEON) for a wildflower trek in of one of Cleveland Museum of Natural History's newest preserves. It is one of the nicest examples of a Beech-Sugar Maple forest in northeast Ohio. (Spring ephemerals found throughout the preserve include white trillium, wild geranium, sweet violet, false and true Solomon's seal, bishop's cap, dwarf ginseng and false mitrewort. Mature cucumber magnolia trees in the heart of the forest add to the species diversity.) Directions: From Medina Square, go South on Route 3 (South Court St, later called Wooster Pike) approx. 5.7 miles. to a very long drive, just after a field on the right side of the road. If you see a large, square farm house, or reach Kennard Rd. you've gone too far. Call Diane to register: ***(H) 216-691-1929 (W) 440-603-7195.***

June 14, Sat: Morgan Preserve Plant Survey - 9:00 Am. - **Portage County** Join us for our annual plant survey for the Western Reserve Land Conservancy as we explore this 558-acre property the Conservancy is working to preserve. Containing 390 acres of high-quality category 3 wetlands including blueberry bogs, forested swamps and vernal pools, it is located at the boundary of the Cuyahoga River watershed and the Mahoning River watershed. Waterproof boots recommended. Directions: From Interstate 80 take Rt. 44 south approx 1.6 miles to Nicodemus Rd. Turn left ½ mile to a sharp bend. Small parking area on right at bend. Call Judy for reservations: 440-564-9151 (H) or 440-286-9516 Ext 2011 (W).

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(**Spring Programs** *continued from last page*)

June 21 , Sat. Kitty Todd Preserve – 10:30 A.M. Lucas County *(10420 Old State Line Rd., Toledo)*
Celebrate the summer solstice with a special visit to The Nature Conservancy's Kitty Todd Preserve with manager Gary Haase during the start of the peak flower bloom. This preserve protects one of the finest remaining examples of northwest Ohio's Oak Openings region and is home to the globally endangered black oak savanna community. Directions: Take Rt. 2 west to Airport Highway. Turn right (north) on Eber Rd. which dead ends at Old State Line Rd. Turn left and follow signs to preserve parking on the right. Parking limited. Call Ami to register and for carpool information. *(H) 216-561-7059 (Cell) 216-571-9242*

Flora-Quest 08 (*continued from page 1)*

The center of activities is the beautiful Shawnee Lodge and Resort, and we have arranged a special discounted rate. The accommodations and food are outstanding, with 50 rooms in the lodge and 25 cabins available, or the alternate, nearby camping. Steve McKee and Martin McAllister will treat you to interesting keynote presentations. Steve is Director of Gorman Nature Center in Mansfield, and a veteran botanist. Martin is a field manager for the Ohio Division of Natural Areas, grew up near Shawnee, and is intimately familiar with the specialized natural history of the region. An added bonus, John Freudenstein, Director of the Ohio State University Herbarium, will present a program about orchids, the most sought after plant in Shawnee. There will also be special evening field trips, and local vendors. Discount rates are also available at the nearby Ramada Inn in Portsmouth.

May is a time of rebirth in the natural world, and there is no better place to be than in the wildlands of Adams and Scioto counties to experience spring. We hope to see you at Flora-Quest May 2-4, 2008!

Please, visit our website at **www.flora-quest.com** for more information.

* Flora-Quest is supported in part by the Scioto-Foundation. Ohio State University Extension endorses the credit hours for participating in Flora-Quest for Master Gardeners and Ohio Certified Volunteer Naturalists.

West Virginia Wildflower Pilgrimage

May 8-11, 2007: **47th Annual West Virginia Wildflower Pilgrimage** at Blackwater Falls State Park, Davis, WV. Participants will choose one tour a day. For more information please call Emily Fleming or Vicki Hash at (304) 559-2754 or write WV Division of Natural Resources, State Capitol Complex, Building 3, Room 669, Charleston, WV 25305.

FRIDAY, MAY 9, 2008

TOUR	NAME
1.	Smoke Hole
2.	Dolly Sods Wilderness Hike
3.	Germany Valley
4.	Dolly Sods
5.	Wildflowers Galore & Jennings Randolph Lake
6.	Smith Mountain Road
7.	Plants, Animals and Geology of Canaan Valley
8.	Blackwater Canyon Mountain Bike Tour
9.	Hands Lens Exploration of Trees, Ferns and Mosses of Cathedral
10.	Ferns & Birds
11.	Natural History of WV Wildflowers
12.	Wildflower Identification Workshop

SATURDAY, MAY 10, 2008

TOUR	NAME
1.	Seneca Rocks Birding Tour
2.	Sinks of Gandy & Spruce Knob
3.	Shale Barren
4.	Stuart Knob Hike
5.	Upper Dry Fork/ Southern Canaan Valley
6.	Dolly Sods
7.	Bear Haven - Bickle Knob Tower
8.	Fernow Forest
9.	Mcgowen Mountain Walking Tour
10.	Jenningston - Gladwin
11.	Red Creek Trail for Wildflowers & Birds
12.	Orienteering

The Great Oak

Robert L. Tener

It is difficult at times to know what is one's favorite tree. Especially is this true for me, having grown up on a farm in southern Ohio with a father who loved trees, could tell at a glance their species, age, and how much timber would be in them. But granting that one can have many loves, some of my favorites are the oaks and their many beneficial members of the Fagaceae family.

There are 300 to 400 species of oaks throughout the world, divided into three subgroups, two of which are native to the United States: the annual fruiting White Oaks and the biennial fruiting Red-Black Oaks. Of these at least 15 are indigenous to Ohio, including Portage county where my wife and I live on our small private arboretum. The White Oaks have rounded, wavy, or smooth edge lobed leaves without bristle tips, and sweet edible acorns. The Red-Black Oaks have sharply lobed leaves with bristle tips or smooth edged leaves. Their acorns mature in two years and are often bitter tasting. The third subgroup is the Evergreen Oaks native to the far East and the Mediterranean region.

Oaks connote strength, virility, heroic qualities, and are often associated with political history, kings, and wise men. They withstand powerful storms and harsh winds because of their deep growing tap roots. They stand majestic in deep temperate forests along with Birch, Beech, and Hickories. Some are deciduous, others are semi-evergreen and may keep their leaves green through November in Portage county. In keeping with Ockham's razor they have male and female flowers on the same tree, the male ones appearing in May or early June as long loose hanging catkins presenting their pollen to the wind to carry to the sticky small female flowers growing in the axils of, the unfolding leaves. This reproductive pattern suggests an ancient origin for Oaks long before the advent of insects, probably during the lower Cretaceous. It's possible to imagine Oaks growing where Brachiosaurus and Apatosaurus dinosaurs roamed and surviving the orogeny of the Rocky and Andes mountains. But then it takes big trees to live with big events.

Oaks get along well with each other, being gregarious, and so they have no trouble hybridizing. Thus among the 15 species native to Ohio there are at least 13 different hybrids so that in general one can say some 15% of the trees in Ohio are Oaks. Of these some of my favorites here at High Hawk are the English Oaks (*Quercus robur*) and its columnar variety, the Willow Oak (*Quercus phellos*), the Swamp Oak (*Quercus bicolor*), the Pin Oak (*Quercus palustris*), the Shingle Oak (*Quercus imbricaria*), the Scarlet Oak (*Quercus coccinea*), and Nuttall Oak (*Quercus nuttallii*), *Quercus* is Latin for Oak and comes from two Celtic words, *cruer* meaning "fine" and *cuex* meaning "tree." Great. The ancient Celtic people recognized a fine tree.

Although my Swamp and Willow Oaks are about 20 feet tall and catch my eye when I go for a walk, my favorites are the English Oaks which I planted as small seedlings and are now almost 25 feet tall. Of these I especially like two columnar English Oaks which are in tune with the land. Over 25 feet tall, they hold themselves together in graceful pillars of green, fluttering in the summer breeze like cranes on a mating flight. Their leaders seem to push holes in the evening sky. One of them I planted as an acorn that I had picked up on the Kent State University campus.

White Oaks which are very much like English Oaks are often called Fork Leaf White Oak, Ridge White Oak, and Stave Oak. Their name is *Quercus alba*, *alba* meaning white, the general color of their wood. The acorns of the White Oak group can be dried and pulverized to make a sweet tasting mast, good eating for birds, swine, and people. The acorns of the White Oak , which I collect whenever I can, are fine to nibble on when I take a long walk. The lower sturdy out-

thrusting branches on the older Oaks are fine for hanging ropes on for small swings.

The Greeks, Romans, Celts, and Druids held the White Oak to be sacred. The English always cut their Yule log from a White Oak. In the United States its acorns provided food for many Indian tribes.

Another of my favorite Oaks is Nuttall's Oak, a member of the Red-Black group. It caught my attention because it was discovered by Thomas Nuttall who came to America as a 22-year-old apprentice printer and self-made naturalist on board the storm-battered Halycon in 1808. He wandered through the Great Lakes region and discovered the oak that bears his name today (*Q. nuttall*). He was close friends with Richard Henry Dana and John K. Townsend. He and Townsend became famous ornithologists.

One more Oak I have been looking for and have so far had no success in finding one or its acorns is the Lea Oak (*Q. leana*), a hybrid between *Q. imbricaria* and *Q. velutina*. This is a rare oak of long pendulous branches, a bit more common in Summit and Trumbull counties. It was first discovered by Nuttall in 1859 and is one of the more common hybrids.

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Kellerman, W.A. *Ohio Forest Trees,*. 1895.
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Robert L. Tener is a member of the Native Plant Society of Northeastern Ohio. He lives in Rootstown, Ohio.

Violets/Violaceae

How did the violets in your yard grow this spring? What? You don't have any? You don't want any? You never noticed? What a shame! You're missing one of nature's great connections.

My yard hosts violets and, yeah, if you want a perfect, monocultural, green lawn, violets are a kind of pest. But the anal-compulsive yard keeper misses so much. For all my violets, I also have lots of fritillary butterflies, both greater and lesser, and violets are the larval plant food for fritillaries. Most species of these butterflies are single-brooded. They over-winter as tiny larvae before emerging in the spring to feed on violets and then completing their life cycle.

The violet is the state flower of Illinois, Wisconsin, New Jersey, and Rhode Island (Ohio's is the carnation). The common blue violet (*Viola sororia*) has flowers and leaves on separate stalks. The heart-shaped leaves grow to five inches with scalloped margins. The fruit is a three-valve capsule. If you look closely near the ground on some plants, you will find flowers that stay shut and are self-fertilized. The whitish fruit then produces seeds that are propelled not too far from the mother plant. If you've ever disturbed the seed bank around violets, you know they are not stingy when it comes to producing seeds.

The leaves of violets can be cooked as greens or used in salads. They taste like, let's see–munch, munch—like weeds! But, what the heck! They're rich in Vitamins A and C—just don't harvest any with caterpillars on them. The flowers can be made into candies and jellies. That seems like a lot of work, however.

There are 22 genera and 900 species of violets found throughout the world. Not as impressive a number as goldenrod or snapdragons. Still, if that means fritillaries in my yard, I'll take violets over a perfectly green lawn any day.

These Ohio violets are federally endangered: Missouri violet, Northern Bog Violet, Prairie violet, Primrose-leaved violet, Walter's violet, and Wedge-leaf violet.

Reprinted from *The Bark*, newsletter of the Native Plant Society of the Miami Valley, late Spring 2001.

Recovering Ohio's Native Treasures

Jo Meyerkord

The Center for Plant Conservation salutes the Native Plant Society of Northeastern Ohio, because we know you appreciate your native plants! Native plants are the hallmark of home, the tapestry of the familiar landscapes we hold dear. They are also incredible resources for food, fiber, medicines and unknown future needs of man. They deserve attention and good stewardship, yet today 15% of our native flora is documented to be in steep decline or considered at risk.

We know you value your Ohio natives for more than their role in your own identity and sense of place, and you want to preserve these precious assets. The US Fish and Wildlife Service has listed five species in Ohio as endangered or threatened under the Endangered Species Act. Within the state, the Ohio Department of Natural Resources Division of Natural Areas and Preserves administers the state laws protecting plant biodiversity and has listed 425 as endangered or threatened. The Center for Plant Conservation's Participating Institutions are currently working with 19 Ohio native species, securing them against extinction. You can review them by clicking on "National Collection" on our website: www.centerforplantconservation.org, and searching for Ohio.

Headquartered in St. Louis, CPC is a network of 36 botanical institutions involved in the study, preservation, conservation and restoration of the nation's imperiled native plants. The network of botanists has been studying imperiled plants for more than 20 years. CPC's goal is to recover all imperiled plants across the country, so that native plants are thriving again.

Unlike popular garden ornamentals, many native plants have had little research attention and little is known about their basic biology, propagation, restoration, or management needs. Fortunately, scientists at CPC's network institutions, the Cincinnati Zoo & Botanical Garden and The Holden Arboretum in Kirtland, Ohio, are working hard to collect, clean and store seed for future restorations. These two institutions have a strong commitment to imperiled plants of the state.

Securing and restoring vulnerable plant species is challenging and involves many different scientific specialties. Collaboration is essential to succeed in restoring these species, and CPC is all about partnerships! CPC institutions are working in communities nationwide monitoring, securing seed and working with local and federal agencies to restore habitats and rare populations. Partnerships with the Ohio Natural Heritage Program and similar organizations make it possible to make a difference on the ground within the state. Find those working to conserve plants in Ohio on our website in our conservation directory which is searchable by state.

Lakeside Daisy, *Tetraneuris herbacea* Greene

Named for Lakeside, Ohio, which is not far from the Lakeside Daisy's best-known site, this rare and beautiful wildflower is able to grow where few others can -- in the full sun on dry limestone bedrock. Unfortunately, the prime conditions for Lakeside Daisy are also prime conditions for quarrying. Limestone quarrying has been conducted in this plant's dry prairie habitat in Ohio for more than 150 years. While plants have sometimes reappeared at specific sites about 15 to 20 years after quarrying operations in those particular areas have stopped, an abundant comeback of the Lakeside Daisy has never been seen. Former populations in Illinois have been completely destroyed by quarrying and industrial development.

The Ohio Department of Natural Resources tried for years to purchase the land that was this plant's only known home in the United States. Their desire to obtain the land was further fueled by the discovery of many other rare plants growing on the quarry site, including Garber's sedge, a state endangered species, and four state threatened species: alpine rush, little green sedge, narrow-leaved blue-eyed grass, and great plains ladies' tresses.

In 1988, the state succeeded in purchasing a 19-acre portion of abandoned quarry. This parcel is now a nature preserve, and every May visitors can enjoy a spectacular array of yellow flowers reaching toward the sun. Other hopeful developments have emerged for Lakeside Daisy. In 1989, the Ohio Department of Natural Resources began introducing the species to Kelleys Island in Lake Erie. And just recently, a small population of the plant was reported in Michigan. At The Holden Arboretum curators have succeeded in germinating seeds of Lakeside Daisy in their greenhouses. They have also raised some of the plants to reproductive maturity and have found that they fruit and re-seed readily in cultivation.

Educating the public on native species is a crucial tool in spreading the word of Ohio's imperiled natives. Conservation education starts early. In a recent survey, a surprising number of students were unable to identify plants as being alive. Parents and educators may be interested in "Plants in Peril, a guide to exploring biodiversity and rare native plant conservation for middle school educators." This lesson plan was developed by CPC as a means to reach youth with native plant information and help start a dialogue with kids about native plants. Available at the CPC website by clicking on "Education Tools," the topics include biodiversity, rare native plants, challenges to saving plants in peril, multiple student activities, ideas for action projects, and additional resources.

While CPC's institutions are working everyday with our scientific standards and protocols to make a difference for Ohio's vulnerable plants, it is a big job. In addition to partnerships with agencies, there is a role in support, education, and volunteerism for everyone who wants to help. You may already be active in helping control invasive species, monitoring rare plant sites, cleaning seed or entering data for a conservation project. If you're just getting started, the conservation directory is a good source of information.

Building support for plant conservation and stewardship is one of CPC's priorities. CPC has established a plant sponsorship program to build sustainable funding for vulnerable plants. For each sponsored species, funds are provided annually to assist in restoration efforts. These funds have already significantly supported work for the lakeside daisy. If you'd like more information about CPC or plant sponsorship for other species, visit our website www.centerforplantconservation.org or call 314-577-9450. Let's work together to make sure Ohio's imperiled plants populations are restored for future generations!

Jo Meyerkord is Communications Coordinator for the Center for Plant Conservation at the Missouri Botanical Garden in St. Louis.

The Happy Herbivore: Fairy Spuds

By Scott D. Appell

One of our prettiest and earliest-blooming wildflowers—spring beauty *(Claytonia virginica)*—is also a delicious vegetable. It may be the definitive tater tot. Native to moist woodlands, sunny stream banks, and thickets in eastern North America, this low-growing plant has tiny underground tubers that can be prepared and eaten just like potatoes. Indeed, another common name for the spring beauty is the "fairy spud."

A member of the Portulacaceae, or portulaca family, and a cousin to other well-known wild edibles such as purslane *(Portulaca oleracea)* and miner's lettuce *(Montia perfoliata),* spring beauty is one of about 15 species in the *Claytonia* genus. The genus is distributed throughout North America and Australasia and has long been a source of good snacking. Both the Iroquois and Algonquin dined on the boiled or roasted tubers of *Claytonia virginica.*

A perennial herb, spring beauty usually grows about six inches tall and eight inches wide. It sports grass-like, succulent, dark green leaves. In early spring, dense racemes of star-shaped, pink-tinged white flowers appear and last for about a month. When spring beauties blossom in large drifts across the landscape, the effect is stunning.

The tubers are found about two to three inches under the soil and measure from a half inch to two inches in diameter. In his classic culinary field guide, *Stalking the Wild Asparagus,* Euell Gibbons wrote a

Spring Beauty, *Claytonia virginica*

charming chapter on these wild edible treats. He remarked that the "spuds" don't really taste like potatoes at all but rather are sweeter in flavor, like boiled chestnuts, though with a softer, smoother texture.

However, even back in 1970, Gibbons sounded a note of caution and restraint. He warned against over-harvesting the tubers in the wild and diminishing the plants' flowering display. "The tubers are good food for the body," he wrote, "but after a long winter, the pale-rose flowers in early spring are food for the soul."

These days, wild collection of spring beauty and other native plants is controversial, due to issues of sustainability. (In at least one state—Massachusetts—spring beauty is now listed as endangered!) In any case, it's not necessary to harvest native edibles when we can grow them at home as a renewable delight.

Spring beauty is easy to grow in the garden and makes a handsome addition to the sunny or partially shaded wildflower collection. Just make sure to purchase your plants from nurseries that propagate their plants on-site rather than dig them from the wild. One good source is Gardens of the Blue Ridge (P.O. Box 10, Pineola, NC 28604; 704-733-2417; www.gardensoftheblueridge.com).

Hardy from USDA Zones 5 to 9, spring beauty is more often than not an ephemeral; the foliage tends to wither and fade away over the summer. Propagation of the plant is via autumn-sown seed or small tubers. Grow it in a humus-rich but sharply drained soil. If your soil is a little too sodden, work in plenty of sharp sand or turkey grit.

It's best to harvest the tubers when the plants are in full bloom. This can be a challenge given the charming nature of the flowers. It also takes a lot of tubers to feed one person. However, damage to spring beauty beds can be minimized by replanting the tiniest of the tater tots and letting the beds rejuvenate for a couple of years between harvests.

The tiny, sweet tubers are high in potassium and vitamin A and are a good source of calcium and vitamin C. They can be eaten raw, boiled, fried, roasted, or mashed. They're good in stews or casseroles or cooked with peas like new potatoes. The young foliage and stems may also be eaten raw in salads or steamed and served as greens. The flowers make an attractive edible garnish for hors d'oeuvres, cheeses, patés, and the like.

The easiest way to prepare the tubers is by washing them and boiling them in lightly-salted water for 10 to 15 minutes, depending on size. When cooked, drain the tubers, anoint them with a little olive oil or a knob of unsalted butter, add salt and pepper to taste, and garnish with chopped parsley, chives, or chervil. Some people prefer to peel off the jacket before eating their fairy spuds, but I like to gobble them whole.

Reprinted from *Plants & Garden News*, Spring 2006; Brooklyn Botanical Garden.

The Plant Conservation Alliance (PCA)

The PCA is a consortium of ten federal government Member agencies and over 225 non-federal Cooperators representing various disciplines within the conservation field: biologists, botanists, habitat preservationists, horticulturists, resources management consultants, soil scientists, special interest clubs, non-profit organizations, concerned citizens, nature lovers, and gardeners. PCA Members and Cooperators work collectively to solve the problems of native plant extinction and native habitat restoration, ensuring the preservation of our ecosystem.

http://www.nps.gov/plants/intro.htm

Geauga Park District
Burton Wetlands Nature Preserve
15681 Old Rider Road, Burton Township

Burton Wetlands Nature Preserve in Burton Township is a 287-acre parcel that includes the Charles Dambach Preserve. Located within the upper Cuyahoga River watershed, Burton Wetlands was officially dedicated in 1999 as an Ohio State Nature Preserve.
It is Geauga Park District's intent to protect this natural area in perpetuity

A designated National Natural Landmark, Burton Wetlands, and the White Pine Bog system south of Pond Road, is widely considered to be the most ecologically significant area in Geauga County, and among the most significant in Ohio.

History
Burton Wetlands was purchased through a series of acquisitions in the 1980s. The property surrounding Lake Kelso, purchased from Eric Westgren, once housed a private fishing club from the 1950s to the 1970s. The Dambach Preserve, named for renowned conservationist and onetime Burton resident Charles A. Dambach, was previously owned by The Nature Conservancy.

Habitats
Today, Burton Wetlands remains part of a 1,000-acre system of kettle bogs, lower slope seeps, and wet flats known as the Cuyahoga Wetlands, an area that has remained relatively undisturbed since the last Ice Age. In addition to Burton Wetlands, Ohio's finest remaining wetlands also include the neighboring **White Pine Bog Forest**, owned and managed by The Nature Conservancy, and **Fern Lake**, owned and managed by the Cleveland Museum of Natural History. Together, Geauga Park District, The Nature Conservancy, the Cleveland Museum of Natural History, and the City of Akron, which also owns land in the region, are instrumental in the cooperative management and preservation of the ecologically significant Cuyahoga Wetlands and its threatened and endangered species.

Burton Wetlands Nature Preserve supports many rare and unusual bog plants, including green woodland orchid, cranberry, leather-leaf, tamarack trees, bunchberry, and the carnivorous pitcher plant. When viewing Lake Kelso, visitors must stay on the boardwalk and observation deck to avoid the lush poison sumac along the lake's edge.

Some of the uncommon animal species found here include northern waterthrush, veery, spotted turtle, and four-toed salamander. Bird watchers will not be disappointed, as at various times throughout the year, bald eagles, ospreys, tundra swans, common loons, and a wide variety of migrating ducks and geese are spotted on Lake Kelso.

Due to the vulnerability of park's aquatic habitats, public boating and fishing is not permitted on Lake Kelso.

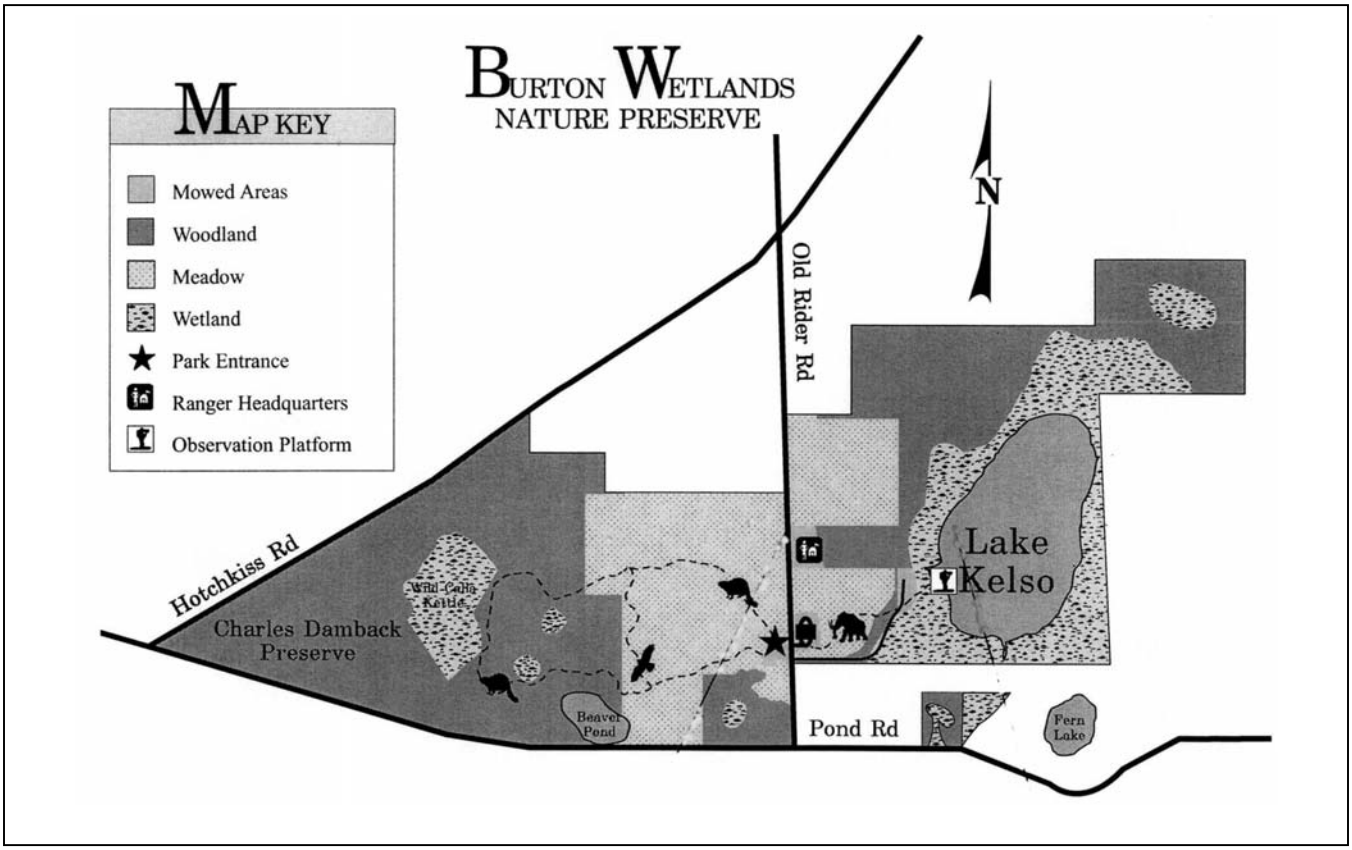
Trails
More than 1.5 mile of trails travel through Burton Wetlands

The parking area off Old Rider Road marks the head of two trails, one heading to the east towards Lake Kelso, the other to the west into Dambach Preserve. The pergola provides a convenient and comfortable assembly area for small groups at the head of the .22-mile Glacier Trail, which leads from the parking lot to the boardwalk and observation deck overlooking Lake Kelso. These allow closer observation of wildlife and the bog habitat, and also maintain safe and easy access over sensitive wetlands.

The 1.12-mile Kettle Trail, located on the west side of Old Rider Road, enables hikers and cross-country skiers to get a closer look at the rolling glacial topography of a large meadow, as well as a forest with oak, beech, and maple trees. Visit a beaver pond, observe native white pines and see lush ferns on the eastern edge of the Wild Calla Kettle.

Directions
From I-422: Travel I-422 to Route 44 exit. Turn north toward Chardon, and travel 4.2 miles to Pond Road. Turn east on Pond Road, continuing 1.4 miles, staying to the right as the road forks. Turn north onto Old Rider Road. Park entrance is .2 mile on the east side of the road.

From the North: Travel south on Route 44 approximately 1 mile south of Route 87. Turn east onto Burton Heights Blvd. Follow Burton Heights Blvd. approximately 1 mile, around the bend to Old Rider Road. Cross Hotchkiss Road. Travel 1 mile to the park entrance on the east side of the road.



Burton Wetlands Nature Preserve is a 287-acre system of boreal forest, glacial relic ponds, and wetlands located in Burton Township. The area supports several rare and endangered plants, including the northern rein orchid, cranberry plants, and the carnivorous pitcher plant. Some of the rare animal species are the nesting brown creepers, northern water thrush, very, spotted turtles, and four-toed salamanders. This is a common stop for migrating waterfowl. Burton Wetlands was officially dedicated in 1999 as an Ohio State Nature Preserve in accordance with provisions of the Natural Areas Preservation Act of 1970. Burton Wetlands Nature Preserve is now open to the public from 6:00 a.m. until 9:00 p.m. daily.

Book Review: **Wayne Grady, The Great Lakes**.
Photos by Bruce Litteljohn, Illustrations by Emily S. Damstra
Greystone Books, 2007, 351 pp; hardcover, $42.95
ISBN 978-1-55365-197-0

An excellent new book, of great interest to our members, has just been released and it is one you will want to own. Get your pencil and take down this information. The title is **The Great Lakes**: **the natural history of a changing region**, by Wayne Grady. It is not cheap - $42.95 – but it can be bought through Amazon at a reduced cost. The author has won several prestigious awards for his writings, and reading this book may lead you to want to read others by him. Having the largest supply of fresh water in the world, about 20 percent of the world's total supply, has led other states to eye the Great Lakes with some covetousness. That may lead to the controversy ending up in Washington. The book is a compelling exploration of the biology and ecology of a vital, ever-changing terrain. Topics covered are: The Boreal Forest, The Canadian Forest, The Carolinian Forest, The Great Lakes-St. Lawrence Forest. and Life in the Margins, and other subjects of interest. The animal and plant life of each region are discussed, giving us an overview of the ecology of the area. Immensely readable with beautiful illustrations, it should be on everyone's reading list.

Running Before Ice

World Distribution of Temperate Hardwood Forest Species

Marion T. Jackson, Professor Emeritus of Ecology, Indiana State University

When European colonists arrived at American shores in the early 17th Century, many of the hardwood forest trees they encountered were tantalizingly familiar. They recognized oaks, beeches, maples, elms, ashes, willows, birches, chestnuts, hawthorns, sycamores, lindens, walnuts, and other genera of trees, but not hickories—hickory is a New World genus, not native to Europe. They also noted, on closer inspection, that all the New World species were different from those "back home." How could this be?

Likewise, when American military personnel served in China during World War II, or in Korea during the Korean War, several of the tree genera present there gave them some feeling of home. Again, they discovered oaks, maples, gums, sassafras, tulip trees, elms—and even coffee tree, yellowwood, and rhododendron, if they looked in certain select sites.

How do "sister species" of these important hardwood tree genera happen to occur at sites so widely separated about the Earth?

To understand these widely disjunct biogeographic distributions, we need to examine the fossil record of hardwood forest communities dating back to the early Tertiary geologic period of some 60-70 million years ago, a time when many present-day hardwood tree genera, such as Magnolia, Liriodendron, Sassafras, and Liquidambar, had newly evolved.

At that time, the Eurasian land mass essentially encircled the northern polar region, except for the northern Atlantic Ocean, with Asia and North America being connected by a very wide land bridge across the present Bering Sea. This huge circumpolar land mass was generally low in elevation, uniformly quite moist, and exceedingly warmer than are northern North America and Eurasia today. As a result, the Arcto-Tertiary Temperate Hardwood Forest was essentially continuous from Greenland to Alaska to Siberia, and thence to Scandinavia.

Late in the Tertiary geologic period three major events occurred simultaneously (not literally, but over several million years—almost an eye-blink, geologically speaking):

First, as continents jostled for position via plate tectonics (continental shifting), this launched a period of very active mountain building across much of the globe. During a period of several million years, mountain ranges known today as the North American Rockies; South American Andes; European Alps, Pyrenees, and Scandinavian Ranges; and Asian Himalayas arose or greatly increased in elevation.

Second, as land masses elevated, the climates of the Northern Hemisphere cooled dramatically, eventually culminating in the onset of the Ice Ages typical of the Late Pliocene and Pleistocene Epochs.

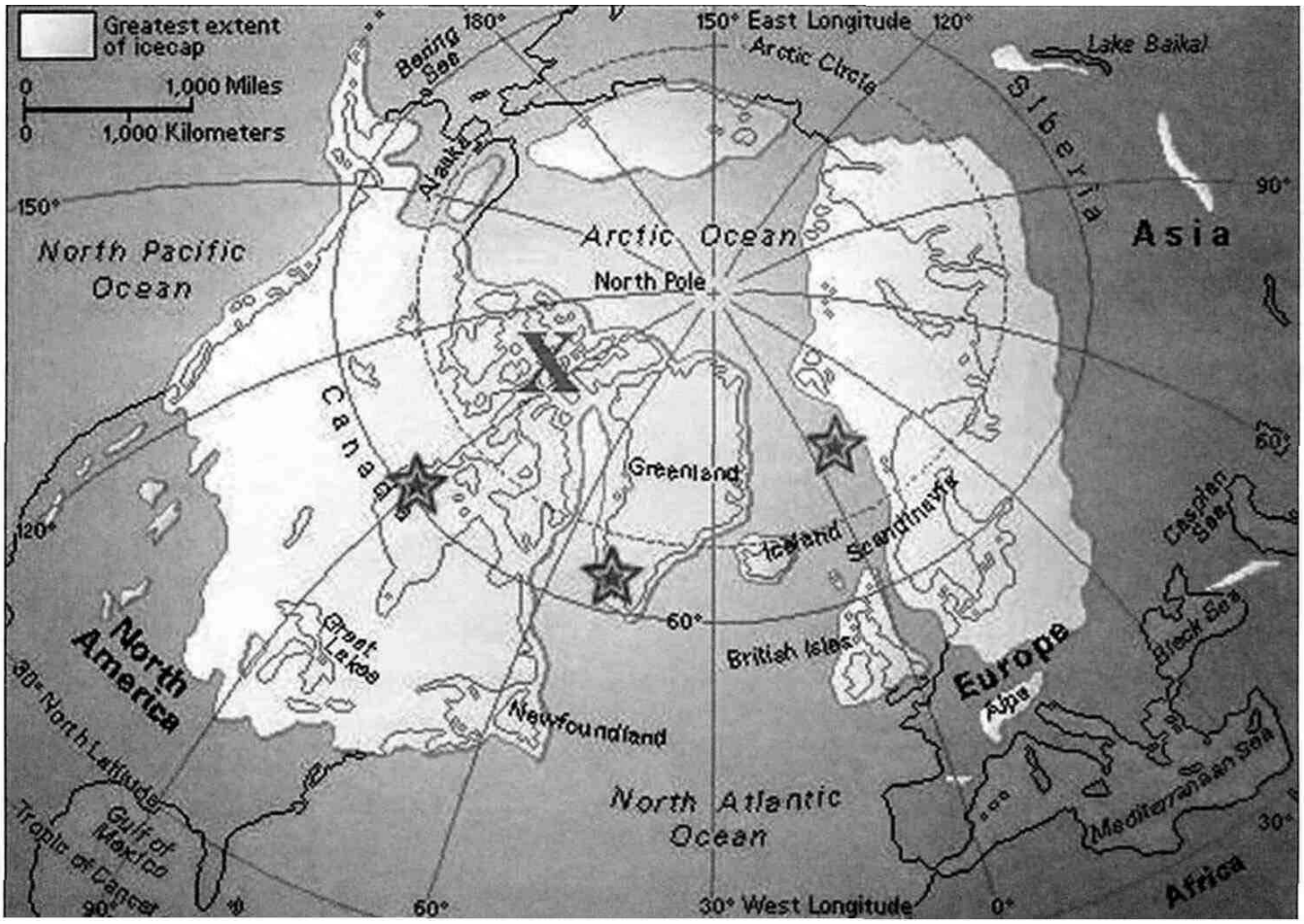
Third, the newly formed high mountains influenced wind flow and precipitation patterns, causing huge rain shadows to develop in the lee of mountain ranges, resulting in the development of (or expansion of) extensive grasslands and/or deserts.

As cooling trends and drought patterns intensified and deepened, the once-vast circumpolar temperate hardwood forest became fragmented. The remnants were forced to migrate southward especially, and also eastward or westward toward refuges, each having an environment amenable to temperate hardwood forest species—namely Eastern North America, Western Europe, and Southeast Asia—where this vegetation type resides today.

As the climates continued to cool drastically at the onset of the Pleistocene Ice Age, the hardwood forests migrated southward (or attempted to do so) over a several thousand year period, moving seed by seed, during hundreds of thousands of tree generations, to refuges in more favorable climes. Pollen profiles from bog and lake sediments trace the path of these tree migrations, and the trees we find today tell us that the outcomes of these migrations were by no means uniform.

In Eastern North America, the low-lying Appalachian Mountain Chain, oriented basically north-south, provided an essentially continuous migration corridor to refuges in the coves of the Southern Appalachians, with their environment most suitable to hardwood forest species. It was here that a multitude of deciduous hardwood tree species were able to "over-winter" the rigors of the Ice Age. As a result, Great Smoky Mountains National Park has the richest assemblage of temperate hardwood tree species anywhere in the world. Interestingly, the Mixed Mesophytic cove forests of the Southern Appalachians today have a very similar generic composition of trees to what occurred in the Arcto-Tertiary forest of 60-70 million years ago.

Extent of all glaciations over the last three million years, superimposed on each other. The stars mark center points of different glaciations; the X marks magnetic north. Image courtesy of Jno Cook.



In contrast, the east-west mountain ranges of southern Europe (the Alps and Pyrenees) lay athwart the migration path of the trees attempting to "escape" the southward-moving Pleistocene ice sheets. Many of the trees could not survive the rigors of the high-elevation mountain passes, especially in the taller Alps, so that many species of hardwood trees became extinct when they found themselves with their backs literally to a wall of advancing ice masses.

As a consequence, the native hardwood tree species richness of Europe today is only a fraction of that occurring in the Eastern U.S.—only around 100 in Europe versus about 400 in the Eastern U.S.—and Indiana has about the same deciduous tree floral diversity as does all of Europe!

As the climate warmed, and the ice sheets covering much of the Northern Hemisphere receded at the close of the Pleistocene, the tree migration reversed in the glaciers' wake and moved back northward onto the newly minted soils of the de-glaciated landscape, a process that was still ongoing when the European settlers arrived at America's shores.

Now, a footnote to explain the origin of "sister species" that occur in the widely separated Temperate Deciduous Forest regions of the Northern Hemisphere: The primary reason that species are sisters rather than identical (for example, *Liriodendron tulipifera* in the Eastern U.S. versus *L. chinensis* in China) is that the geographic range separation near the end of the Ice Age resulted in the evolution of parent species into two or more daughter species. Each new species became more precisely adapted to its new surroundings during the millennia since the Pleistocene retreat, and gene flow was prevented between the isolated populations by the barrier of geographic distance.

Reprinted from INPAWS Journal, Indiana Native Plant and Wildflower Society, Winter 2007-8

BOTANIZING 101

Cracking the Nutt. of Plant Name Authorities

Rebecca* Dolan, *Ph.D., Friesner Herbarium, Butler University

Novice botanizers rejoice! With this article, Becky Dolan inaugurates a new series for those of you just learning the ropes of seeking out, identifying, and appreciating plants in the field.

You may be familiar with the formal presentation of scientific plant names that gives every plant species a binomial (two-part) Latin name consisting of the genus and a specific epithet. But what about those mysterious names and abbreviated names that sometimes follow them, like L. or Muhl. or Nutt.?

These names, sometimes called the "authority," carry important historical information. They are the namers or "authors" of the species. So when a botanist uses the formal presentation including the name, the botanist is referring to the plant given this name by this person.

Scientific plant naming conventions are quite precise for good reason. There can be confusion out there in the plant world. Although electronic record keeping and communication make errors less likely than before, it is still possible for different authorities to apply the same name to more than one plant. Also, concepts of species are somewhat plastic, based on opinion, so the use of an authority name means "this species as it was envisioned and described by the named authority and as is represented by the type specimen the authority assigned to it."

The conventions of plant nomenclature dictate that new names be published, so knowing the authority can help you track down the publication in which a particular combination of genus and specific epithet was first used. That publication will have the authority's description of the species and often the rationale for considering the species new to science. For example, you may find a key comparing features of the species to related species, helping to define its unique features.

Confused? A few examples may help:

***Cornus florida* L. Flowering dogwood**

Flowering dogwood was first described as new to science by Carolus Linnaeus (Carl Linné, 1707-1778), a Swedish botanist credited with creating the two-part scientific name format. Before Linnaeus' work, formal plant names could have up to 7 or 8 parts. He worked during a period of burgeoning exploration in the New World, when many newly discovered species were sent back to European experts for identification. It turns out the European flora is not very diverse, and the existing naming system, easily applied to these few species, was woefully inadequate to handle the great variety of new plants streaming in from the Americas. This influx of undescribed plants helped lead to the development of the simplified two-part system. Linnaeus named many of the plants native to Indiana, so the "L." authority is often seen in reference books even though he never traveled to North America.

***Chelone obliqua* L. var. *speciosa* Pennell & Wherry Rose turtlehead**

When two botanists coauthor a paper that names a new plant, both of their names are shown, connected by an ampersand. Linnaeus described this species. Pennell and Wherry described and named the variety.

***Ranunculus fascicularis* Muhl. ex Bigelow Early buttercup**

Bigelow published the valid, accepted species description, but he credits Muhlenberg with originally recognizing the plant as new to science.

***Carya ovata* (Miller.) K.Koch. Shagbark hickory**

By the time the latter-day botanists of recent years came along, most species had already been identified and named. However, ideas sometimes change about how a species should be classified. When a species is given a new treatment that moves it from one genus to another, the original authority is retained in parentheses, followed by the name of the authority who made the change. Reasons for moving species between genera include examination of specimens not previously seen that provide more information; new techniques, such as better microscopes or biochemical analysis of DNA sequences, that suggest different affinities; and the personality and philosophical bent of the authority. Some are "lumpers," not prone to ascribe significance to minor character differences; others are "splitters" by nature.

***Platanthera peramoena* (A. Gray) A. Gray Purple fringeless orchid**

Gray first described "peramoena" in one genus and subsequently transferred it to *Platanthera*.

***Silene regia* Sims Royal catch-fly**

This wonderful prairie plant was reportedly first collected by Thomas Nuttall. Nuttall brought it to England, where it was described and published by Sims. Sims gets all the credit.

***Penstemon deamii* Pennell Deam's beardtongue**

Specific epithets are sometimes based on names. A plant may be named in honor of original collectors or discoverers, like Deam's beardtongue, named by Pennell.

***Streptanthus brachiatus* Hoffman spp. *hoffmanii* Dolan & Lapre Socrates Mine Jewelflower**

I had the chance to work with some very cool plants that grow in Lake, Napa, and Sonoma Counties in California. These are restricted to serpentine rock outcrops and are found nowhere else. A colleague and I published a paper describing a new species and a new subspecies of an already recognized plant that had been named by Hoffman (named above). Our treatment therefore was convincing to the two reviewers and editor of the journal that published our work. Later, our subspecies, but not our species, was further accepted by the experts who published the most recent ***Flora of California***. By not including our new species in the book, they showed they felt it was not distinct enough to warrant a new name, most likely because they felt its characteristics were within the range of variation of an already named plant. Our subspecies *S. brachiatus* spp. *hoffmanii*, however, has come into use and is listed in the United States Department of Agriculture PLANTS Database (plants.usda.gov). I hope both our accepted subspecies and our less widely accepted species will be recognized when the Flora of North America publishes its volume that includes the mustard family (Brassicaceae), of which *Streptanthus* is a member. This is how new names come into use.

To help standardize the usage of abbreviated forms of names, an official list of author names is maintained by the Royal Botanic Gardens, Kew, in England. You can search for complete names to match abbreviations, and vice-versa, at www.ipni.org/ipni/authorsearchpage.do.

Reprinted from INPAWS Journal, Spring 2007

Plan Now For Your Spring Planting

Spring is just around the corner, and it is time to plan what your needs will be for those warmer days of April and May when we like to dig in the soil. It might even help you to get on the web sites of our native plant nurseries. See what they have listed and get your plant list together. Some of the nurseries have catalogs that you can request, and be sure to share with you friends, kin folk, and fellow native plant enthusiasts.
Listed below are some sources of native plants in the West Virginia/southeastern Ohio/southwestern Pennsylvania area.

Doyle Farm Nursery
158 Norris Road, Delta, PA 17314
Phone/FAX:717 862-3134
Email: jld@doylefarm.com
Web site: doylefarm.com

Doyle Farm Nursery specializes in native perennial grasses and herbs. They have a large variety of plants to choose from. All plants are grown outside so they do not have to acclimatize when first planted.
Located in York County Pennsylvania. Plants are high quality and most are sold in "pots" that are quart or gallon size. They will ship but it is cheaper to pick up gallon size containers at the nursery. Prices are generally $5-6 for quart size and $8-13 for gallon size.

Elk Ridge Nature Works, LLC
Ron Boyer & Liz McDowell
Phone: 301 895-3686
Email: info@elkridgenatureworks.com
Web site : elkridgenatureworks.com

A very nice selection of native plants grown on site in Garrett County in western Maryland. Ron and Liz are very helpful and have a nice selection of Mid-Appalachian wildflowers, grasses and rushes. You can purchase the plants at the nursery (by appointment), at local festivals & farmers markets, as well as, several plant events in the Mid-Atlantic region.

Enchanter's Garden
Peter Heus
HC 77, Box 108
Hinton, WV 25951
Phone-FAX: 304 466-3154

Enchanter's Garden offers a wide variety of wildflowers, grasses, sedges and about 30 trees/shrubs. Most plants are in quart size containers. A listing of plants by common and scientific names and the prices, can be mailed to customers. To buy plants you need to make an appointment and visit the nursery. Plants are no longer sold by mail order as they were a few years ago.

Porterbrook Native Plants
Dr. Frank Porter
49607 St. Rt. 124
Racine, OH 45771
Phone: 740 247-4565
Email: info@porterbrooknativeplants.com
Web site: porterbrooknativeplantS.com

We gladly accept small online orders from those unable to visit the nursery. Unless otherwise stated, all plants cost $5.00 each plus the actual cost of postage. Plants will be sent via USPS. You can pay by personal check or money order made out to Frank W. Porter.
The web site lists several hundred wildflowers, sedges, grasses, etc., with descriptions of foliage, flowers, height, hardiness zones, sun/shade preference and other useful information. If you have questions, email: info@porterbrooknativeplants.com There is also a page on rock gardens and a note that Frank sells many native trees and shrubs that are not listed on the web site.

Sylva Native Nursery and Seed Co.
Mike Hollins - President
3815 Roser Road
Glen Rock, PA 17327
Phone: 717 227-0486
FAX: 717 227-0484
Email: sylvanat@aol.com

Sells a wide variety of seed mixes, seedlings and tublings of wildflowers/herbs, trees and shrubs. Excellent selections of wetland species. Mike often collects seed and material from West Virginia.

Sunshine Farm and Gardens
HC 67 Box 539B Renick, WV 24966
Phone: 304 497-2208
Email: barry@sunfarm.com
Web site: sunfarm.com

Barry Glick is the owner, brains and energy behind Sunshine Farm and Gardens that grows over 10,000 perennials, bulbs, trees, shrubs, sedges, wildflowers and specializes in hellebores. This nursery is primarily wholesale but offers limited mail order to home gardeners where they have no established retailers. No one else in our area offers as many plant species.
The web site is very interesting, colorful and loaded with nice information. Barry offers tours, workshops and lectures to groups.

Windbeam Way Nursery
Doug Jolley
PO Box 37
Heaters, WV 26627
Phone: 304 765-2608
Email: aplectrumwv@yahoo.com

Windbeam Way Nursery offers a selection of all native azaleas indigenous to the eastern US. Native rhododendrons and other ericaceous (heath) plants are available. The nursery also offers perennials, shrubs and trees which are attractive to backyard birds and butterfly gardens. A one-acre display garden, showcases mature specimens of much of what is for sale. Group garden tours and presentations to organizations are arranged by appointment. The nursery is open Fridays thru Mondays during April, May, and June. Visitors should call in advance.

Reprinted from *Native Notes*, the West Virginia Native Plant Society Newsletter, December 2006.

Native Plant Activists

From the web site of Biological Diversity: EQUAL PROTECTION FOR PLANTS

To confront the problem of plants' second-class status in conservation laws and budgets, we launched a campaign to amend the federal Endangered Species Act, improve funding, and change other laws to provide plants with the same protection as other species. We produced a report detailing the Barriers to Native Plant Conservation in the United States and regularly provide Congressional testimony presenting recommendations for policies to improve plant protection. In September 2007, we led a number of scientific organizations in submitting a letter to Congress protesting the exclusion of plants from HR 3221, a bill aimed at protecting wildlife from climate change.
http://www.biologicaldiversity.org/campaigns/native_plant_conservation/index.html

Blue Camas, *Camassia quamash*

by Joe Arnett

On both sides of the Cascade Mountains, blue camas (*Camassia quamash*) offers one of the most alluring displays of spring flowers in the Pacific Northwest. When Meriwether Lewis first surveyed this region, he noted this striking lily in stands that to his eye resembled lakes of blue water. Along with its close relative, giant blue camas (*C. leichtlinii*), blue camas continues to be a signature species of grassy balds in the San Juan Islands, and east of the mountains camas still forms pools of deep blue in dry grasslands that burst into color in the flush of spring. As in many places that soon dry up, flowering happens quickly, presenting a spectacular, if ephemeral, view.

Blue Camas, *Camassia quamash*

This species was the most important "garden plant" of the first people here, people who subsisted by hunting, fishing, and gathering wild plants. However, obtaining camas required more than just gathering. Exceptional camas patches were weeded, periodically burned to keep them free of shrubs, and harvested by the families and tribal groups that tended them. This was gardening in a real sense, and people developed strong bonds to traditional gathering areas. The Nez Perce War flared when settlers began plowing camas lands to convert them to European-style agriculture.

This attachment to camas was based on necessity: the plant was a mainstay for people east of the mountains and also important in coastal areas. The bulbs are rich in an indigestible carbohydrate, inulin, which is converted to usable fructose by cooking. The food value is high, and cooked material yields large amounts of sugar, approximately one-third of the dry weight of the bulbs.

When eaten raw or only partially cooked, the plants can produce substantial amounts of intestinal gas, as Captain Lewis eloquently noted: "...when in the Indian hut I was almost blown out by the strength of the wind."

Large volumes of camas bulbs were baked in stone-lined pits that may still be found near traditional camas-gathering areas. David Douglas, a famous early botanical explorer in the Pacific Northwest, reported on this roasting process. First, a large fire was built in the pit, heating the stones thoroughly. Then the fire was removed, and up to a hundred pounds (45 kilograms) or more of bulbs were piled in its place. Sometimes other plants, including red alder (*Alnus rubra*) or madrone (*Arbutus menziesii*) bark, were added to give the cooked product a reddish color, and black lichens (*Bryoria* spp.) could be added to raise its value for trade. The bulbs were then covered and a fire was built again on top. Baking may have extended for up to two days. Cooked and dried bulbs were second in importance only to smoked salmon as a trade item.

To dig camas bulbs and then render them edible required a large amount of labor, performed almost entirely by women. While a man's attractiveness as a potential husband was based partially on his success at hunting and fishing, a woman was valued for her ability to gather volumes of camas bulbs. An average day of harvest may have yielded a bushel of the bulbs, and it has been estimated that one woman with a digging stick could harvest as many as two tons (2,000 kilograms) of bulbs in a year.

Though the bulbs were traditionally gathered after the flowers had withered, weeding was done during flowering. The primary objective was to remove death camas (*Zygadenus venenosus*), which often grows mixed with blue camas. With much smaller, white flowers, death camas is easy to distinguish from blue camas when the plants are flowering, but at the time of

harvest the two species appear identical. Death camas is well-named: fatalities were not rare. Full-grown cattle have died from eating it, and even mortality of bees visiting the plants has been reported. The poison involved is an alkaloid neurotoxin called zygacine. This provided strong motivation to weed camas beds in preparation for the time of harvest, and anyone eating these plants was well-advised to pay attention to taxonomy.

However, eating death camas is not always fatal. I heard about a young child a few years ago who ate some of the plant, out on one of the remote islands where medical help was not quickly available. Thankfully the child survived. And sometimes there are near misses. One day on a field trip in Deception Pass State Park in Washington we came upon a man and his young son busily digging up bulbs along the trail, presumably to eat. Among the plants they had gathered was death camas. In addition to his behavior being illegal and inappropriate in park lands, the man's ignorance could have been fatal. We asked him if he knew what he was digging. "Wild onion", he replied. We warned him about the danger of the plants he had.

Six species of Camassia are recognized in North America. Blue camas is the most widespread one in the west, ranging from British Columbia to Alberta and south into California and Utah. Giant blue camas grows from southern British Columbia to central California, and two other western species are more restricted: Cusick's camas (*C. cusickii)* in northeast Oregon and adjacent Idaho, and Howell's camas (*C. howellii*) in southwest Oregon. In the east, wild hyacinth (*C. scilloides*) is found from Texas and Georgia to Ontario and Pennsylvania. Prairie hyacinth (*C. angusta*) is less widespread, restricted to the central portion of the range of wild hyacinth.

The words camas and quamash both came from Chinookjargon names for blue camas. Death camas, placed in the genus Zygadenus, is a fairly close relative, though in native languages the names for the plants are not similar; the first people's system of naming was based on use, not similarity or genetic relationship. Zygadenus and Camassia are both traditionally placed in the Lily Family, Liliaceae. More recent treatments tend to subdivide this family into several others. These genera are included in the "hyacinth group", which some authors segregate into a separate family, the Hyacinthaceae.

As the name indicates, blue camas blossoms are most often a deep clear blue, borne in showy narrow racemes, and an individual flower may be an inch and a half (four centimeters) across. Occasional individuals with pure white flowers can be found, and there is also regional variation in the flower's shade of blue or violet. Eight subspecies have been described. Typical of lilies, the corolla consists of six tepals, which in Camassia are nearly all identical. Blue camas is unique in the genus in having flowers that are slightly irregular, with the lowest tepal separated from the others and curving outward from the stem. The fruit is a three-parted dry capsule, bearing seeds that are characteristically black. The leaves are basal and linear, growing from a deep bulb. Blue camas is apparently still a rarity in modern gardens. I have a single plant in my yard, a survivor salvaged by a friend from a construction site. Reports of success in the garden or in restoration sites are mixed, and I suspect that camas requires very specific soil and moisture conditions to thrive. Where it occurs in nature it is often quite vigorous, growing in dense and healthy-looking patches. If natural settings provide the best guidelines, as I believe, blue camas needs somewhat acidic soils, high in organic content, moist in winter and spring but drying completely in summer.

Reportedly the species grows readily from seed, flowering in two to four years, and commercial sources are available for seeds and for bulbs of plants produced from seed. Because of the increasing scarcity of native habitats, bulbs collected from the wild are not an appropriate source of plant material, with the exception of verifiable salvage efforts.

First Nations people still gather and consume blue camas bulbs, certainly more for their traditional and cultural nourishment than strictly for their carbohydrate content. And modern gardeners appear to have a hunger for the natural beauty of this native species, so rich in tradition and history with the people of the Pacific Northwest.

Joe Arnett has been a professional botanist in Washington State for over 20 years, specializing in rare plant studies, floristic inventories, and vegetation analysis. He teaches plant identification through the Washington Native Plant Society, the North Cascades Institute, and Bastyr University.

Reprinted from *The Blazing Star*, Newsletter of the North American Native Plant Society, Winter 2005.

Spring Ephemerals: Strategies Reconsidered

By George Ellison

There is a group of...wildflowers called spring ephemerals. They live on the forest floor below the towering deciduous canopies of temperate North America. They are very beautiful; but more than beautiful, they are very special in the time and place of their being. They have zeroed in on a lifestyle which is downright enterprising, and they live by a precise schedule that would impress the commuter who must make an 8:10 train each morning
— Michael Godfrey, A Closer Look *(San Francisco: Sierra Club Books, 1975)*

The distinctive group of wildflowers categorized as spring ephemerals includes some of the more showy and renowned species found in the Blue Ridge Province from southern Pennsylvania to north Georgia: white trout lily *(Erythronium albidum);* yellow adder's tongue *(E. americanum);* yellow trout lily *(E. umbilicatum);* squirrel corn *(Dicentra canadensis);* Dutchman's-breeches *(D. cucullaria);* Virginia spring beauty *(Claytonia virginica);* Carolina spring beauty *(C. caroliniana);* cut-leaved toothwort *(Dentaria laciniata);* and wood anemone *(Anemone quinquefolia)*. Peter White and the other authors of *Wildflowers of the Smokies* (Gatlinburg, TN: Great Smoky Mountains Natural History Association, 1996) noted that ecologists "speak of a group of species with similar broad adaptations as a 'guild.'"

As the name indicates, members of the spring ephemeral guild are of short duration. Leafing out from underground storage tubers, corms, bulbs, or fleshy rhizomes in rich deciduous woodlands, they flower quickly and are pollinated before the overarching trees have expanded their leaf buds overhead. Fruits ripen within weeks. Not long after the leaf canopy closes in late spring or early summer, the ephemerals will have died almost completely back, leaving little or no trace of their above-ground forms.

For the sake of clarity, I'll restate the spring ephemeral strategy. The plants in this group have high photosynthetic rates that allow them to rapidly accumulate carbohydrates and complete above ground growth in a few weeks. Within a short span of time, they generate and store enough reserves to last until the following spring. Ephemerals have obviously adapted so as to take full advantage of the direct sunlight that's available before energy-giving light levels drop – at which time, they become essentially dormant rather than unnecessarily expending energy to maintain foliage. In *Wild-flowers of the Smokies,* the authors also noted, in this regard, that, "If a plant leafs and flowers in different seasons then it has the problem of storing energy until flowering time, but if it does both at once, its leaves transfer energy-rich compounds directly to reproduction."

The designation “spring ephemeral” has at times been applied erroneously to other early-blooming woodland herbs such as bloodroot, Jack-in-the-pulpit, wild ginger, hepatica, woods phlox, and various species of trillium. But these species don't qualify for the ephemeral guild because they retain leaves and ripen fruit well after the leaf canopy closes. Slender fumewort *(Corydalis micrantha)* has also been cited as a spring ephemeral, but the plant doesn't qualify since it normally grows on sandy roadsides and in fields or waste places where its life cycle is not correlated with a woodland canopy sequence.

One advantage the ephemerals gain by flowering early is that they then have less competition from other plants for pollinating insects, primarily bumblebees, but also various sweat bees, flies, and butterflies. Pollination of Dutchman's-breeches (the dainty little plant with blossom spurs that make it look for all the world like pantaloons hung out to dry) and the closely related squirrel corn can only be accomplished when a bumblebee forces apart the partially fused petal tips to sip nectar with their long tongues. A closer look will sometimes reveal that a flower has been "robbed" by shorter-tongued honeybees that bore holes in the tips of the spurs.

Early spring pollinators are frequently slowed in their search for food by cold, rainy, or cloudy spells. In response, trout lilies have developed an ingenious backup system. To guard against an absence of pollinators, trout lily plants can also reproduce asexually via a fleshy bud (dropper) that forms at the end of a fragile white stem (stolon) attached to the base of the parent corm. This dropper stem can be ten inches. Dense colonies that form along creek banks are for the most part created from droppers rather than seed. Botanist Peter Bernhardt, author of *Wily Orchids & Underground Orchids: Revelations of a Botanist* (NY: William Morrow and Company, 1989), calculated that as many as ninety percent of all the trout lily species native to eastern North America are reproduced asexually.

When you happen upon a trout lily colony in early spring, note that the plants in bloom will all have two leaves. Botanists disagree as to whether the clones produced by droppers ever develop two leaves and flower, or whether only the seed-produced individuals flower. Be that as it may, individual plants take up to eight years to reach reproductive maturity. The yellow petals (actually "tepals" — an undifferentiated form between a sepal and a petal) are at first partially closed. Gradually, these reflex so as to fully expose the interior parts of the flower to pollinators.

Ephemerals need to be able to store food efficiently. Squirrel corn, for instance, has bright yellow nutrient-storage bulbs attached to its root system that resemble corn kernels. You can readily observe them without harming the plant by gently scraping back the leaf litter. Squirrels are reputed to harvest and store these bulbs in food caches; if so, they may inadvertently help distribute the plant.

In regard to ephemeral distribution tactics, the authors of *Wildflowers of the Smokies* made this acute observation: "There is another reason to fruit in spring. Many ephemerals are ant-dispersed. They have special adaptations to attract ants that carry their seeds to new places, even planting them in or on the mineral soil. Often the seeds carry a special oily body that is especially attractive to ants. Spring seems to be a good time to be ant-dispersed." And in *The Secret of Wildflowers: A Delightful Feast of Little-Known Facts, Folklore, and History* (Guilford, CT: The Globe Pequot Press 2003), Jack Sanders provided additional background:

> Some species of ants harvest and "plant"...certain other spring wildflowers in a symbiotic relationship myrmecochory – literally "ant farming." They are drawn to the seeds by small protuberances…that contain attractive oils and possibly sugars. The ants carry the seeds, sometimes as far as 70 yards, to their nests where they eat the treat. The shell, however, is too hard to open, so the ants discard the seed proper, often in an unused tunnel in the nest. Here, amid nutrients provided by the soil and accidentally by the housekeeping ants, the seed has a much better chance of producing a plant than one does dropped on the forest floor where it may be eaten by foraging birds and rodents. In some environments, myrmecochory also protects the seeds from wildflowers.

Complex adjustments of this sort by a guild of flowering plants to the canopy development of an upland deciduous forest — as well as to the needs of its animal residents — no doubt formed through a long period of coexistence. For me, this exemplifies a collective life, of sorts, whereby a community of animals and plants lives in harmony with a particular landscape.

This discussion of spring ephemerals appears in George Ellison's new book, Blue Ridge Nature Journal: Reflections on the Appalachian Mountains in Essays and Art, *published in 2006 by The Natural History Press, a subsidiary of The History Press in Charleston, SC. In addition to 30 essays devoted to the region's topography, plants, and animals, the volume features a decorative illustration for each essay as well as a section devoted to 40 full-color paintings by artist Elizabeth Ellison.*

Reprinted from *Notes of the Pennsylvania Native Plant Society*, Jan-Mar 2007.

Book Review: (A "Must Read")

Michael Shnayerson. Coal River

Farrar, Strauss, & Giroux, 2008 (Jan 8)

$25.00, 336pp, hardcover. ISBN-10: 0374125147

Through vivid first-person reporting and a thorough culling of court transcripts, newspaper clippings and corporate reports, Vanity Fair contributing editor Shnayerson (*The Killers Within*) has crafted an incriminating indictment of the Appalachian King Coal industry in West Virginia, and of the man he defines as its rapacious kingpin, Massey Energy's CEO, Don Blankenship. The author's sympathies lie clearly with opponents of mountaintop mining, most prominently young attorney Joe Lovett and citizen activist Judy Bonds. Both have fought against a form of mining that shears off the tops of hills and dumps rubble into valleys and streams—a process abetted by the collusion of the state's often-lackadaisical Department of Environmental Protection, the U.S. Army Corps of Engineers' propensity to grant stream-destroying permits without oversight, and the easing of environmental controls by the Bush administration. Shnayerson's compelling take on toxic mining methods and their heartrending impact on Appalachian inhabitants and their culture, has a wider focus than Erik Reece's 2006 title, *Lost Mountain*, which reported on one mountaintop's destruction, and strong echoes of the stomach-churning legal machinations recounted in Jonathan Harr's 1995 bestseller, *A Civil Action*.

Bio Blitz 2008

what: Summit County Metroparks is looking for volunteers to help inventory as many species as possible during a 24 hour "blitz." Different groups will be surveying different plant and animal species, they need people of all skill levels to assist.

Liberty Park is a newly acquired natural area. It presently consists of approx 1700 acres and is a critical link to several thousand additional acres including Tinkers Creek State Park and Twinsburg Bog. The BIO BLITZ will concentrate on 300 acres of newly acquired land that has had little done to it. The property contains a large spatterdock marsh, a small tall-shrub bog, a very nice beaver marsh, mature oak maple swamps and beech maple forests as well as floristically interesting successional habitats.

Dinner will be provided Friday and Saturday.
Bring your own snacks and water.
Pack a lunch for the field on Saturday.
An area for camping will be available at no charge.
Sign up ahead to survey the species of your choice.

where: Liberty Park 3973 E. Aurora Rd. Twinsburg, OH 44087

when: 3:00 PM Friday June 27 through Saturday June 28, 2008

contact: Marlo Perdicas park biologist (330) 923-0720 or e-mail: mperdicas@summitmetroparks.org

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Bloodroot: A Red Puccoon

by Gordon Mitchell

When spring first arrives, the woods are filled with emerging young plants, representing many woodland wildflower species. One early spring wildflower starts with just a single stem, a single flower bud at the top, and with a single leaf enveloping that stem. That wildflower species is the Bloodroot (*Sanguinaria canadensis* L.).

Bloodroot is a member of the Poppy Family (Papaveraceae). The generic name, Sanguinaria, is Latin for "bleeding". (*Sanguinaria* comes for *sanguin* or *sanguis*, which is "blood".) The specific epithet, *canadensis*, is Latin for "Canada". The Bloodroot is our only native species in the Sanguinaria genus. Other scientific names for this plant have been *Sanguinaria australis* Greene, *Sanguinaria dilleniana* Greene, and *Sanguinaria rotundifolia* Greene.

At different times and places, other common names for this plant have been Boloroot, Coonroot, Cornroot, Indian Paint, King Root, Large-leaved Bloodwort, Large-leaved Sandwort, Panson, Paucon, Pauson, Puccoon, Puccoon Root, Red Indian Paint, Red Puccoon, Red Root, Sangdragon, Snakebite, Sweet Slumber, Tetterwort, Tumerick, Turmeric, and White Puccoon. Puccoon came from the word, *pak,* which is a Native American word for "blood."

History of the Bloodroot

Both the Native Americans and the early European settlers had various uses for the Bloodroot and its red latex sap. Many Native American tribes used the plant's red sap to dye their clothing, their arrow feathers, and their basketry. They also used the red dye as war paint and as an insect repellant. The early French in North America used this red sap to dye their wool. The French even exported some of this dye back to France.

The first European to record the Bloodroot was the English Captain John Smith, the leader of the Jamestown Colony in Virginia. In 1612, Captain Smith wrote, *"Pocones is a small root that groweth in the mountains which being dried and beate in powder turneth red and this they use for swellings, aches, anointing their joints, painting their heads and garments ".*

Folklore of the Bloodroot

The Bloodroot has played a role in American Folklore. According to one Native American tribe, this plant was used as a love charm. If the male rubs the red sap on his hand and then shakes the hand of the female he loves, she should want him within 5-6 days. In some cultures, people carried parts of this plant with them as a love charm to find love or as a good luck charm to ward off evil spells. In other cultures, this plant was placed near doors and windowsills of homes to guard against evil spirits.

Toxicity of the Bloodroot

The Bloodroot's red sap contains many toxic resinous and alkaloid chemicals. These chemicals are located throughout the plant, especially within the rootstocks. Plants found in areas of decreased sunlight or of decreased fertility had more alkaloids and plants found at higher altitudes had fewer alkaloids. Such alkaloid chemicals are the benzophenanthride isoquinoline alkaloids, such as sanguinarine. Other alkaloids consist of sanguidimerine, chelerythrine, homochelidonine, and protopine. This plant also contains citric acid and malic acid. Depending upon the amount of internal or external dosage, symptoms of some of these poisonings may consist of skin irritations, eschars (scabs), burning of mucous membranes, edema, dilated pupils, fainting, nausea, vertigo, labored breathing, shock, muscle and cardiac failure, coma, and even death. Sanguinarine can also cause vision problems, such as tunnel vision and glaucoma.

Medicinal Uses of the Bloodroot

Sanguinarine can be used as an anesthetic, an antiseptic, and as an anti-cancer drug. It may be used as a chemo-preventative against skin cancer, which was caused by UVB radiation from the Sun. The Sanguinarine increased production of Bcl-2 proteins, which killed the cells that were damaged by the UVB rays. The Sanguinarine also decreased production of Bcl-2 proteins, which are present in cancerous cells. However, Sanguinarine is safest and most effective if used in conjunction with a sunscreen.

Sanguinarine was sometimes used in both oral rinses and toothpastes as a plaque inhibitor and to treat gingivitis (swelling and inflammation of the gums). One brand of toothpaste and oral rinse currently uses trace amounts of Sanguinarine in their products. Sanguinarine may be second only to fluoride in fighting tooth decay. Even the American Dental Association (ADA) and the Food and Drug Administration (FDA) have seen some dental potential in Sanguinarine.

The Bloodroot had some other medicinal uses, too, especially from the rootstocks. The root was used as an appetite stimulant in small doses and as an arterial sedative in larger doses. One drop from the sap was placed upon a lump of maple sugar and was used as a common cold, cough, and sore throat medicine. A root tea was used internally for treating respiratory ailments like asthma, bronchitis, influenza, and whooping cough. It was also used for treating digestive and liver ailments, laryngitis, dizziness, skin ailments, irregular heartbeats, paralysis, fevers, rheumatism, sore throats, and ulcers. The tea was also used as a diaphoretic and as an emetic. Externally, the tea was used as a wash for burns and poison ivy. A root powder or tincture was used externally for burns, fungal tumors, ringworms, skin infections, snakebites, and warts. This plant was also used as snuff for treating nasal polyps. Bloodroot was listed in the *U.S. Pharmacopea* (1820-1926) and in the *National Formulary* (1925-1965).

Description of the Bloodroot

Perennial

Height: 3-12 inches. Stem: Smooth. Solitary.

Leaves: Solitary. Basal. Cordated (heart-shaped) or reniformed (kidney-shaped). Long-petioled. The leaf is glabrous or velvety, dark green above, light blue-green below, veiny, and is about 4-14 inches long. It is palmately scalloped with 3-9 rounded lobes. The leaf curls around the stalk when the plant first emerges in the spring to protect it from frost. The young leaf itself may be wrapped in a papery bract. (However, this plant is vulnerable to the spring frosts.) After the flower dies, the leaf and the veins may enlarge to allow for more surface area for more photosynthesis. The leaf finally dies out by mid-summer.

Flowers: White (or rarely pink). Solitary. Located at the top of the stem. Blooms before the leaf unfolds. The flower blooms only in full sunlight and closes at night. Each flower is radially symmetrical, is about 1-2 inches wide, and has 7-15 separate petals that may be up to 1 inch long (some of the alternating petals are shorter) and that only remain for about 1-2 days The flower also has 2 sepals that fall when the flower blooms and has about twice as many golden yellow stamens as petals.

These stamens have orange anthers. Because there are few flying insects in the early spring, this plant must produce a lot of pollen and may have to be autogamous (self-pollinating) to assure any pollination. These flowers may be fragrant. Flowering season is usually February to June.
The flowers are usually insect-pollinated. Although these flowers have no nectar, the insects are attracted to the flower by its golden yellow stamens. What flowers are not insect-pollinated are then self-pollinated.

Fruit: Capsule or pod. Each capsule is two-celled, yellow-brown, elongated, narrow, oblong, and is pointed at both ends. Each half of the capsule has a row of seeds. The capsule splits lengthwise to release many seeds.

Seeds: The seeds are glossy brown and are ovate. Each seed has a gelatinous crest or appendage on one of its ends. This crest is edible to many insect species, including ants. While carrying away these seeds to later consume the crests, the ants are also dispersing these seeds.

Rootstock: Rhizomatous. Thick. Horizontal. About 1-4 inches long. The rhizome is accompanied by many red rootlets. The sap in the rootstalks is of a brighter red color than in the rest of the plant. Other plants may sprout from that rhizome. These rhizomes may be harvested throughout the growing season. Habitat: Woodlands, streamsides, roadsides, and fencerows. Range: Eastern United States.

Reprinted from *The Catchfly*, Vol 19, No. 2, newsletter of the Central Ohio Chapter of the Ohio Native Plant Society.

Gordon Mitchell works for the Columbus, Ohio, Metroparks and is a member of the Columbus Native Plant Society

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Pepper and Salt *Erigenia bulbosa*

Barry Glick, Sunshine Farm & Gardens

One of the first ephemeral Spring natives to flower, and one of the most adorable plants ever, *Erigenia bulbosa,* brightens up the shade garden with its pure white flowers. The chocolate colored anthers contrast beautifully with the petals and are most likely the reason for one of the common names, "Pepper and Salt".

The genus name Erigenia comes from the Greek word *erigeniea* which means early born, a reference to how early in the season it flowers and the species bulbosa refers to the fact that it grows from a bulb-like rootstock.

Erigenia bulbosa is a great plant to use where you have plants like Hostas or some of the later emerging ferns planted. They occupy those bare spots that we have early in the Spring, as we impatiently wait for some of the later emergents to unfold their foliage and fill in those voids.

If you're lucky, they'll self sow around gently, but due to a reliable lack of pollinators that early in the year, you may want to get out there with your paint brush and help the process along.

The complete set of GROW back issues are now available on line at: http://www.sunfarm.com/picks/

Barry Glick, Sunshine Farm & Gardens, Renick WV 24966 USA

Chapters of the Ohio Native Plant Society

Cincinnati Wildflower Preservation Society
Dr. Vic Soukup
338 Compton Road
Wyoming OH 45215
513-761-2568

Central Ohio Native Plant Society
Dick Henley
11800 Poplar Creek Rd
Baltimore OH 43105-9407
740-862-2406

Native Plant Society of the Miami Valley
Nancy Bain
444 Acorn Drive
Dayton OH 45419
937-698-6426

The Mohican Native Plant Society
Mike Klein
1778 Dougwood Drive
Mansfield OH 44904
419-774-0077
mklein1@neo.rr.com

Native Plant Society of Northeastern Ohio
J. Bradt-Barnhart, President
10761 Pekin Road
Newbury OH 44065
440-564-9151
bunchberry1@netzero.net

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On The Fringe

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