



On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

Annual Dinner Speaker

This year's Annual Dinner will be held, as in the past, at the Cleveland Museum of Natural History. Our speaker is sponsored jointly by the Native Plant Society of Northeastern Ohio and the CMNH Explorer Series of lectures. The date will be a Friday evening in September.

Our speaker this year will be Joan Iverson Nassauer, Professor of Landscape Architecture in the School of Natural Resources and Environment at the University of Michigan. She has been named a Fellow by the American Society of Landscape Architects (1992), and a Distinguished Practitioner of Landscape Ecology (1998) by the International Association of Landscape Ecology – US. Her work focusing on the relationship between aesthetics and ecology has offered strategies for basing ecological design on strong science and interdisciplinary collaboration, and these strategies have been applied internationally. Her research investigating public acceptance and the cultural sustainability of environmentally beneficial landscape change has received numerous awards, including the First Place award for Environmental Research from the Federal Highway Administration in 2003, and National ASLA Merit Awards for Research.

She has worked with colleagues in ecology, civil engineering, forestry, and hydrology to develop and implement ecosystem management plans for rural landscapes, for urban watersheds, and to retrofit 19th century cities and 20th century suburbs to improve their ecological health – particularly through low impact storm water management and brownfield redevelopment. Current research projects relate to anticipating and monitoring rural landscape change in the US and Europe, ecological alternatives to sprawl, and ecological implications of brownfield design for redevelopment.

Nassauer's book *Placing Nature: Culture and Landscape Ecology* (1997) from Island Press, defines cultural sustainability for ecological design, and her new book with Mary Santelmann and Don Scavia, *From the Cornbelt to the Gulf* (2007) from Resources for the Future Press, discusses how alternative agricultural policies could alleviate hypoxia in the Gulf of Mexico and improve the water quality and biodiversity of agricultural landscapes. Her books will be available at the talk.

Each year the Native Plant Society of Northeastern Ohio gives a \$500 grant to a person, persons, or organization working in the field of botany or conservation. An endowment fund was originally set up with the intent that the interest earned would cover the cost of the grant. With lower interest rates these days the NPS has had to supplement the grant with donations. Please consider a contribution to the annual grant in addition to your annual membership. Thank you.

Grant Announcement

The Native Plant Society of Northeastern Ohio hereby announces that it will consider applications and nominations for an Annual Grant to be awarded to a person or persons working in the field of botany or conservation that demonstrates excellence in research, conservation or education, including land trusts, organizations, and causes that clearly support the Mission of the Ohio Native Plant Society.

The mission includes:

- Conservation of all native plants and natural plant communities through habitat protection and other means
- Public education and appreciation of native plants
- Proper ethics and methods of natural landscaping
- Surveys and research on native plants and publication of the information
- Cooperation with other programs and organizations concerned with the conservation of natural resources.

The amount of the grant will be \$500.00. Deadline for submissions is September 1st and will be awarded at the annual meeting in September.

Applications should include contact information, summary of the project, and how money will be used. Awardee will be asked to give a brief presentation on the project the following year at the Annual Meeting.

Please e-mail your request to bunchberry1@netzero.net or submit 3 copies to: Judy Barnhart, President, Native Plant Society of Northeastern Ohio, 10761 Pekin Road, Newbury, Ohio 44065.

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The Journal of the Native Plant Society of Northeastern Ohio is published 4 times a year at Novelty, Ohio. ISSN 8756-6087. Questions or comments are welcome and may be addressed to Jane McCullam, 9880 Fairmount Road, Newbury, Ohio 44065, 440-338-3253; cattermole@alltel.net; or to Ann Malmquist, 6 Louise Drive, Chagrin Falls, Ohio 44022; 440-338-6622, inky5@juno.com

Program Schedule Summer 2008

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).

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

July 12, Sat. MUSHROOM FORAY AND PRAIRIE WALK – 9:00 AM. – Mt. Gilead State Park, Morrow County - Join the Ohio Mushroom Society as they search the grassy edges and woodlands of Mt. Gilead State Park for a variety of fungi including Chanterelles. Specimens will be collected and brought back to picnic area for identification. Afterwards, view Guy Denny's beautiful 20-acre prairie nearby. Prairie walk at approximately 2:30 P.M. Pack a lunch or there is plenty of food available at Interstate 71 and SR. 95 confluence. It's only a mile to the prairie from there. Directions: Take Interstate 71 south to SR. 95 exit to Mt. Gilead. Turn right (west) approximately 8 miles to park on right. Meet at main pavilion parking lot, attached just west of the Campground entrance. Call Tom Sampliner to register at (216) 371-4454.

July 24, Thurs. LAKE PLEASANT – 9:00 AM. - Union City, PA Jim Bissell leads this combined trip with Northeast Ohio Naturalists (NEON) to this pristine glacial lake in NW Pennsylvania to look for aquatic plants including water marigold. Directions: Take Interstate 90 east into Pa. In Erie take Pa 8 Exit 29 Hammett/Parade St. Turn right onto Wattsburg Rd. (Pa 8) 2.2 miles. Turn right on Tate Rd. 0.3 miles Turn left on Lake Pleasant Rd. 5.1 miles. Turn right on Valley Rd. 0.5 miles. Meet in field station parking lot. Call Diane to register: 216-691-1929 (H) 440-666-4870 (Cell)

July 26, Sat. MANTUA BOG STATE NATURE PRESERVE – 10:00 A.M. – Portage County ODNR State Botanist Rick Gardner and preserve manager Adam Wohlever lead this special trip to see the bunchberry and other bog and fen species in one of the best alkaline fens in Ohio not open for public visitation. Registration limited for this fragile habitat. Call Judy for reservations and directions: 440-564-9151 (H) or 440-286-9516 Ext 2011 (W).

August 16, Sat. OHIO PRAIRIE NURSERY AND HIRAM FIELD STATION - 9:00 AM. - Portage County (11961 Alpha Rd. Hiram 44234) Looking for a natural alternative to landscaping? Get an overview of prairie ecosystems at Ohio Prairie Nursery, tour the prairie in bloom, and see how you can create your own prairie. Afterwards, visit the 400 acre James A. Barrow Field Station at Hiram College for a special tour of the diverse habitats with Professor of Biology and Director of Field Station Academic Programs Matt Hils, including old fields, wetlands, flood plain along Silver Creek, and mature Beech-Maple forest. Bring a picnic lunch to enjoy at the center. Directions: From the intersection of Rt. 44 and Rt 82 head east 3.3 miles to Alpha Rd. Turn left 0.6 miles to nursery. Call Judy for reservations: 440-564-9151 (H) or 440-286-9516 Ext 2011 (W).



SCIOTO
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Appalachian Butterfly Conference *Saturday, August 9th & Sunday, August 10th*

Shawnee State Forest and the Edge of Appalachia Preserve. Adams and Scioto counties, Ohio.

Mark your calendars! If you like butterflies, you'll not want to miss this first-ever conference. Shawnee and the Edge of Appalachia preserve offer some of the best butterfly-watching north of the Ohio River. Racking up a list of over 60 species during the course of this weekend isn't out of the question, and many species will be found in huge numbers. In addition to an abundance of common species like Spicebush Swallowtail, Red-spotted Purple, and Great Spangled Fritillary, much rarer butterflies can be found. These include Hayhurst's Scallopwing, Gemmed Satyr, Juniper and White-M hairstreaks. This region of southernmost Ohio can also be great for finding good numbers of southern immigrants like Cloudless Sulphur, Little Sulphur, Sachem, and Checkered White.

We are pleased to have Jaret C. Daniels, author of *Butterflies of Ohio*, as the Saturday evening keynote speaker. Dr. Daniels is a noted butterfly conservationist, professional photographer, and avid field researcher.

Both Saturday and Sunday feature field trips led by experts, focusing on finding maximum butterfly diversity. These trips should be an excellent chance to improve butterfly identification skills, learn more about butterfly natural history, and maybe even see some new species. As added perks, plant and bird enthusiasts will be wowed by some of the most incredible biodiversity found in Ohio.

Registration is now open!

See <http://www.flora-quest.com/butterflies.html> for more information and updates, or google Appalachian Butterfly Conference. Questions? Contact Jim McCormac at 614-265-6440, or jim.mccormac@dnr.state.oh.us

Kent State University Press has just announced the coming publication of an important book for those interested in conserving our native floral and faunal heritage.

Wild Ohio

The Best of Our Natural Heritage

by Jim McCormac and Gary Meszaros

2008, 208 pp

ISBN 978-0-87338-985-3

Paper, \$24.95

Estimated publication date: December 2008.

May be pre-ordered at <http://upress.kent.edu/> or by phone at (419) 281-1802

The authors feature approximately forty sites, encompassing nearly every type of habitat found in the state and representing all regions of Ohio. Naturalist Jim McCormac's descriptive text provides an overview of each site and tips for visitors. Gary Meszaros's stunning photographs highlight the visual beauty of each area's flora, fauna, and landscape. Every section includes a description of the physiographic province and a map of the sites.

Ecological Bridges

by Tom Stanley

With the growth of Western Reserve Land Conservancy into 14 northeastern and north central counties, we have now effectively created a "bridge" between four distinct bioregions. Are you aware that a person standing in a corn field in Huron County is actually standing in the eastern edge of the Great Plains; and if this same person travels to a sugarbush in Trumbull County, they are now at the western edge of the Allegheny Mountains? Did you know that the forests in Stark County are the northern extent of the Central Hardwood Forest region that begins at the Gulf of Mexico; while the cool, shady ravines of Geauga County represent the southern extent of the Boreal-Hardwood Forests that have their northern beginning well into Canada?

This reality defines the conservation opportunities and challenges that are presented by the great diversity of life that is found in what we all know of as the Western Reserve; a greater diversity in a region our size than almost anywhere else in the country.

In the Western Reserve, we have the opportunity to see tulip poplar and white oak trees growing virtually side by side with northern white cedar and quaking aspen. The former growing as far south as northern Florida, but no further north than Lake Erie; while the latter grow as far north as Hudson Bay, but the southern extent of their range ends within the Western Reserve. A dedicated birder might find the more southern-nesting hooded warbler in the same forest as the northern-nesting mourning warbler. Overlapping their breeding ranges only in our backyard, the furthest extent of their respective ranges are nearly 2,000 miles apart. There is no need to venture to the prairies of western Nebraska to sight the grassland-nesting dickcissel or to the old-growth forests of eastern New York to find a red-shouldered hawk's nest. There are neither dickcissels in eastern New York nor red-shouldered hawks in western

Nebraska, but both are here in the Western Reserve.

By now most have heard about the native brook trout rediscovered twenty years ago in several streams in Geauga County: but did you know that these small, brightly colored fish represent the western edge of the historic range of this species and are the only native brook trout in Ohio? Or that the America badger, the short-legged, foul-tempered member of the weasel family, which can be found as far west as California, goes no further east than mid-way across Ohio? The examples of natural diversity in our region are nearly endless across every phylum and division within the animal and plant kingdoms. We may not be the easiest place in the country to be a sports fan, but nobody, and I mean nobody, tops us in biological diversity.

This privilege brings with it special conservation challenges. Species are always more vulnerable at the edges of their range. Necessary conditions for survival are typically marginal; nearly too cold or too hot, soils too acid or too alkaline. Favorable conditions for parasites, diseases, or predators may tip the balance. Life is tough on the fringe. Protection of rare, critical habitats may be the only way to achieve success. Timing may be paramount as well, because once a species on the margin of its range is lost it is difficult, if not impossible, to get it reestablished.

The word *bridge* has many definitions and uses. Perhaps a better understanding of the unique ecological bridges within the Western Reserve will help us better close the gap between the present and the future. Between where we are today and where we must get to in order to protect our legacy of the unique natural diversity found here in the Western Reserve.

Reprinted from *Connections*, the quarterly publication of the Western Reserve Land Conservancy, Spring 2008.

Stemless Blue Violets in Central Pennsylvania

by Carl S. Keener and Warren Leitzel



Viola affinis



V. cucullata



Viola hirsutula

With some 400 species confined mainly to the North Temperate regions (Gleason and Cronquist 1991), the genus *Viola* has been a source of wildflower delights. Species of *Viola* can be classified roughly into several groups, based largely on flower color and presence or absence of aerial stems. Except for two annual species in our flora (the wild pansies), all other species are perennials. Stemless violets are so named because they have more or less prostrate thickened stems at the ground surface from which both leaves and flowers emerge. In this article, we are focusing on the stemless blues, a notoriously difficult taxonomic group. Part of the reason for the difficulty in determining species limits is that violets in this group hybridize frequently, and this fact should be kept in mind when attempting to identify stemless blue violets. Moreover, they often have two sorts of flowers — those that open (chasmogamous) producing cross-fertilized seeds and those that remain closed (cleistogamous), thus producing self-fertilized seeds. In this article we aim to 1) present a usable key to the species of stemless blues in central Pennsylvania, and 2) portray a brief review of the taxonomic difficulties in this group.

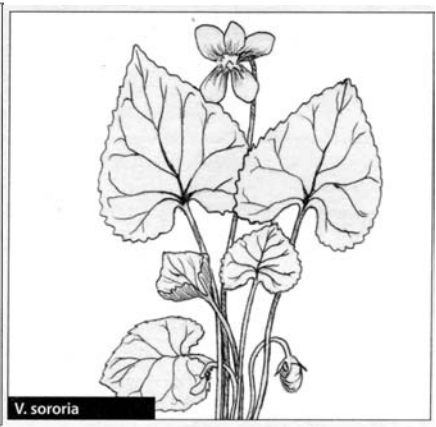
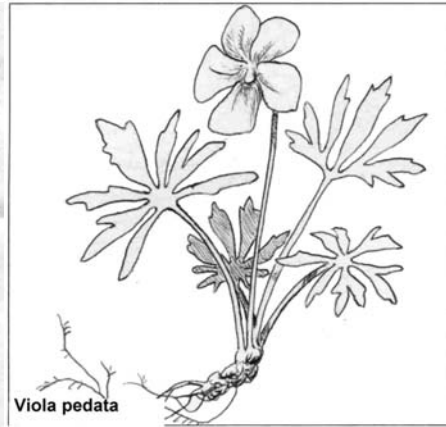
According to Ballard (2000, 2007), there are nine species of stemless blue violets in Pennsylvania, of which eight species occur in

central Pennsylvania. *Viola brittoniana* Pollard occurs in eastern Pennsylvania, but doesn't reach into the central regions, and hence is excluded from the following summary (see notes under *V. pedata*). When one compares the treatments of Russell (1965), Cronquist (Gleason and Cronquist 1991), McKinney (1992), Gil-ad (1997), Ballard (2000, 2007), Haines (2001), and McKinney and Russell (2002), it is quite evident that, except for uniform agreement on the identity of *V. cucullata* and *V. pedata*, all other species have been variously treated by these authors. For example, Russell (1965) recognizes 15 species of stemless blues in Pennsylvania, whereas Cronquist (Gleason and Cronquist 1991) describes only seven species. It is not our purpose here to elaborate on all these taxonomic treatments, and the reader is urged to consult the various accounts of the authors listed above. We are following Ballard's recognition of species and floral treatment, largely because he has written the keys for Rhoads and Block's *The Plants of Pennsylvania* (University of Pennsylvania Press 2000; 2nd ed., 2007). In identifying species of the stemless blue violets, important features to look for include the leaves (shape, lobing, and pubescence of the blades), hairs on the insides of the petals, and habitat.

Key to Species

(Based on Ballard, 2000: 703; 2007: 514, and McKinney and Russell, 2002)

1. When flowering (anthesis), at least some leaf blades lobed or dissected....2.
1. When flowering, no leaf blades lobed or dissected, but merely serrate along the margins....5.
2. Leaf blades dissected nearly to the base; petals lacking hairs (beard)....**V. pedata**.
2. Leaf blades coarsely incised or toothed; at least some petals with hairs (beard)....3.
3. Leaf blades much longer than broad; teeth, if present, restricted to lower third of blades; sepals long-tapering, acute apically....**V. sagittata**.
3. Leaf blades typically not longer than broad; lobes usually at least to the middle of blade; sepals oblong, obtuse to rounded apically....4.
4. Leaves mixed, the early spring and late summer leaves usually unlobed; central division of midseason leaves unlobed, the lateral divisions lobed....**V. palmata**.
4. Leaves all variously lobed; central lobe of midseason blades as deeply lobed as the lateral lobes....**V. subsinuata**.
5. Leaf blades generally distinctly longer than broad....6.
5. Leaf blades generally as broad as long or broader....8.
6. Foliage moderately to densely pubescent; leaf blades oblong to elliptic-ovate, broadly tapering to subcordate basally; petioles usually shorter than the blades during anthesis, longer when plants are in fruit....**V. sagittata**.
6. Foliage glabrous or essentially so; leaf blades ovate, more or less cordate basally; petioles at least twice as long as the blades in later anthesis and when plants are fruiting....7.
7. Peduncles (flower stems) more or less equally as long as the petioles (leaf stems); lateral petals bearded with long threadlike hairs; spurred petal densely bearded; sepal auricles < 1 mm in fruit; seeds light to medium brown...**V. affinis**.
7. Peduncles (flower stems) generally conspicuously longer than the petioles (leaf stems); lateral petals bearded with short clavate (club-shaped) hairs; spurred petal glabrous; sepal auricles 3-10 mm in fruit; seeds olive-black....**V. cucullata**.
8. Peduncles generally conspicuously longer than the petioles; sepals long tapering, sharply acute at the tip; lateral petals bearded with short clavate (club-shaped) hairs; sepal auricles 3-10 mm in fruit....**V. cucullata**.
8. Peduncles equal to or slightly longer than the petioles; sepals oblong to lance-ovate, obtuse to rounded at the tip; lateral petals bearded with long threadlike hairs; sepal auricles < 2 mm in fruit....9.
9. Spurred petal moderately to densely bearded; leaves glabrous except for scattered hairs on the upper leaf surfaces near the margins, commonly purple flushed but with distinctly paler veins....**V. hirsutula**.
9. Spurred petal glabrous or with a few hairs within; leaves commonly moderately to densely long-pubescent throughout, uniformly green....**V. sororia**.



1. ***Viola affinis* LeConte, LeConte's V.**; infrequent; wet places, alluvial deciduous woods, bogs, gravelly shores, marshes, pastures, etc. Recent taxonomic studies are not in agreement concerning this species (e.g., see McKinney 1992 and Russell 1965). According to Ballard (2000, 2007), *V. affinis* is distinguished from *V. cucullata* on the basis of its long thin hairs on the lateral petals (vs. club-shaped hairs), bearded spurred petals (vs. glabrous spurred petals), short auricles in the fruiting material (vs. longer auricles—ear-like posterior appendages of the sepals), peduncle length \pm equal to petiole length (vs. peduncles exceeding petiole length), and general habitat preferences (alluvial woods, etc., vs. open wet areas). (See also notes under *V. sororia*.)

2. ***V. cucullata* Alton, Marsh Blue V.**; frequent, although less so in Centre and adjacent counties northward; open wet areas — swamps, wet meadows, and bogs. A distinct species, about which there is uniform taxonomic agreement (see notes under *V. affinis*). In this species, the peduncles (flowering stems) are considerably longer than the petioles (leaf stems). Note, too, the club-shaped hairs found in the lateral petals.

3. ***V. hirsutula* Brainerd, Southern Wood V.**; infrequent south of Centre Co., rare northward; rich, relatively dry, deciduous woods, thickets, and clearings. A distinctive species.

4. ***V. palmata* L., Early Blue V.**; frequent south of Centre Co., infrequent northward; rich, relatively dry, open woods, disturbed ground, and woodland edges. A variable species in which the leaves are mixed (heterophyllous) - the early spring and late summer leaves are usually not lobed, whereas the midseason leaves have 3-5 primary segments with the central division usually unlobed (cf. *V. subsinuata*, a homophyllous species with 5-9 (-16) lateral leaf segments). (*V. triloba* Schweinitz in some treatments.)

5. ***V. pedata* L., Birdfoot V.**; infrequent south of Centre Co., absent in Centre Co. and northward; occurs in dry open woods, rocky sandy or shaly banks, roadside banks, etc. A distinctive glabrous species, with conspicuous stamens, beardless petals, deeply cut leaf blades and frontally flattened corollas (petals collectively), well-known for its color forms, especially those with the upper two dark violet petals. *Viola brittoniana* Pollard, which occurs in eastern Pennsylvania, has leaves deeply cut like *V. pedata*, but differs from *V.*

pedata with its bearded lateral petals, corolla orientation, and inconspicuous stamens.

6. ***V. sagittata* Alton.** Two varieties: *V. sagittata* var. *sagittata*, Arrow-leaved V.; infrequent to frequent, but rare southeastward from Centre Co.; occurs in dry open woods, disturbed ground, fields and woodland edges. *Viola sagittata* Aiton var. *ovata* (Nutt.) Torrey & A. Gray, Ovate-leaved V.; frequent; occurs in dry open forests, woodland edges, clearings, fields, slopes, and disturbed ground. These varieties may be separated as follows:

Foliage glabrous to moderately short-pubescent; leaves erect; blades oblong-lanceolate to long-triangular, commonly shallowly to deeply lobed basally with linear segments; petioles much longer than the blades.... *V. sagittata* var. *sagittata*.

Foliage densely short-pubescent; leaves prostrate to weakly ascending; blades elliptic to ovate, at most coarsely serrate basally; petioles distinctly shorter than the blades at anthesis, up to as long in fruit.... *V. sagittata* var. *ovata* [= *V. fimbriatula* J. E. Smith].

Older treatments usually recognized *V. fimbriatula* as a species distinct from *V. sagittata*. See Yost (1987) for a study of the plasticity of the petioles in these two taxa.

Additional taxonomic work on this group would be desirable.

7. ***V. sororia* Willdenow, Common Blue V.**; common throughout; meadows, open woods, roadside banks, and disturbed areas. An extremely variable species due to extensive hybridization and wide habitat preferences. Both Russell (1965) and Gil-ad (1997) consider the *V. sororia* complex to consist of six species, whereas McKinney (1992) describes one species (*V. sororia* with four varieties, including var. *affinis*). In following Ballard (2000), we are recognizing both *V. sororia* and *V. affinis*, separable on the basis of leaf shape, and presence or absence of hairs (beard) on the spurred petals. Some older manuals (e.g., Fernald 1950, 1033) recognized both *V. sororia* and *V. papilionacea* Pursh. However, in his extensive studies of the violets in eastern and central United States, Norman Russell concluded that "there is no such violet [as *V. papilionacea*]. All herbarium material so annotated is easily referable to other species, especially *V. affinis* and *V. sororia*. *Viola papilionacea* has been a myth, a catch-all for almost any glabrous or near-glabrous stemless blue violet with uncut leaves" (Russell 1965, 53). Russell also pointed out that *V. sororia* can be "difficult to characterize at times," inasmuch as it tends to freely hybridize with other species. Arthur



V. sagittata var. *ovata*



V. sagittata var. *sagittata*



V. subsinuata

Haines suggested that in urban and suburban areas plants typically identified as *V. sororia* are "actually hybrids with *V. cucullata* [= *V. x bissellii* House]. These plants have a relatively high frequency of white corollas with blue stripes or splotches. They can be recognized by their intermediate morphology — sepals with a few cilia, particularly near the base; leaf blades with sparse pubescence on the upper surface; and hairs with a rounded apex on the lateral petals" (Haines 2001, 63). For additional comments on the frequent hybridization within this group of stemless blue violets, see especially Russell (1965), McKinney (1992), and Haines (2002).

8. *V. subsinuata* **Greene, Violet**; rare; occurs in rich open mesic woodlands and cliffs. Similar to *V. palmata* except in *V. subsinuata* all the leaves are similar in shape (homophyllous; cf. leaves of *V. palmata*). In some treatments, this species is recognized as *V. palmata*, but this name has been misapplied — see McKinney (1992) and Haines (2002) for additional comments.

Note:

The accompanying sketches are based on herbarium material housed at Penn State. The list of voucher specimens is available from C. S. Keener (kux@psu.edu).

Acknowledgements:

Thanks are due Andrew Beierle and Harry Henderson for their useful comments on an earlier draft of this article. This article is dedicated to the memory of the late George Beatty, indefatigable naturalist with a keen eye for rare plants and whose infectious knowledge spurred CSK and many others to a better understanding of the violets in our flora.

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Missing, Presumed Extinct:**The Heartbreak of *Psoralea*****Carol Ann McCormick, Assistant Curator, University of North Carolina Herbarium**

Many first-time visitors to the University of North Carolina Herbarium ask, "Do you have any really rare plants?" My answer is, "Yes, hundreds! This is the main repository for rare plants inventoried by the North Carolina Natural Heritage Program." If that fails to impress, I show them Accession #566869: *Psoralea stipulata*—now categorized as *Orbexilum stipulatum* (Torrey & Gray) Rydberg—collected by C. W. Short in 1842.

Orbexilum stipulatum, commonly called Falls-of-the-Ohio scurfpea, is an ivory-billed woodpecker of the plant world: It was last seen in 1881 and is presumed extinct. Biologists cling to the hope that it too will be rediscovered. All known specimens of *Orbexilum stipulatum* were collected between 1835 and 1881 from a single location: Rock Island, Falls of the Ohio. Though some herbarium specimens claim this location as Indiana or Ohio, the river channel is within the Commonwealth of Kentucky (the Northwest Ordinance of 1787 defined the Indiana state line as the north bank of the Ohio River¹). The Falls of the Ohio is a 26-foot drop over a series of rapids and rock shelves in a 2-mile stretch of the Ohio River. Louisville, Kentucky, and Clarksville, Indiana, grew up at this navigational barrier. Rock Island, one of the larger islands in the cataract, "is (or was) a small Devonian limestone island of the Falls of the Ohio River and within the Louisville, Jefferson County, Kentucky, corporate limits. Most of the island was destroyed in the 1920s as a consequence of building U.S. Dam No. 41...and the Louisville Hydroelectric Plant."²

Charles Wilkins Short, M.D. (1794-1863) made many collections of *Orbexilum stipulatum* over a 20-year period, all from Rock Island. The UNC Herbarium specimen, collected by Short in 1842, is in perfect condition.

Asa Gray (1810-1888) praised Short as "the first in this country to prepare on an ample scale dried specimens of uniform and superlative excellence and beauty...the vast improvement in the character of the dried specimens now generally made by our botanists may be mainly traced to the example and influence of Dr. Short."³

Will Falls-of-the-Ohio scurfpea be rediscovered in the wild? Suitable habitats—flood-scoured riverbank bedrock, gravel bars, and limestone barrens and glades—exist nearby in Kentucky and Indiana.



Falls-of-the-Ohio scurfpea (*Orbexilum stipulatum*).
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913.

Happily, another Rock Island refugee was recently discovered in Indiana. *Solidago shortii*, named in honor of C. W. Short by Asa Gray, had disappeared from Rock Island by the late 1860s. It was believed extinct until a population was discovered in 1939 by Dr. E. Lucy Braun in Kentucky more than 160 km east of Rock Island. In 2001, during a botanical inventory of the Blue River in Indiana, researchers found a population of *S. shortii*. This site is "perhaps Indiana's largest and most diverse example of the brush prairie gravel wash community...situated at the base of a south-facing slope bordering the Blue River...18 km upriver from the Ohio River."⁴

Is *Orbexilum stipulatum* alive and well, lurking on some gravel island in southern Indiana or northern Kentucky, awaiting rediscovery like *Solidago shortii*? Perhaps, but optimism must be tempered by the probable lack of a seed source: Although he observed the plant over a span of 20 years, Short never saw it in fruit, nor was he able to cultivate it.⁵ For now, all we have are herbarium specimens. While the UNC Herbarium is proud to be the conservator of such a rare specimen, we sincerely hope not to add many more species to our "exist only as herbarium specimens" list. Our goal is to preserve the flora of forests, streams, dunes, and islands so we can enjoy them where they belong—in the wild.

This article originally appeared in the North Carolina Botanical Garden Newsletter 35(5): 8.

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Reprinted from *INPAWS Journal*, Indiana Native Plant and Wildflower Society, Winter 2007-08

One of a Kind: False Mermaid

By Tom Sampliner

Along streams and in wet woods at this time of the year, a sprawling weak-stemmed annual puts in an appearance. This seldom-appreciated species taxonomically stands by itself in North America. Leaves are in threes or fives and are lance to oblong shape. Each leaflet is very narrow and short. In fact, the entire aspect is as if very young plants were newly emerged above ground from where they had been deliberately planted.

As the title indicates, I am writing about the native plant called the false mermaid, *Floerkea proserpinacoides*, the sole occupant of the Limnanthaceae family in North America. So under-appreciated is this plant that I have yet to attend a walk where most of the participants can recognize the plant. Many think it is some young stage of a fern. After all, the compound narrow leaflets certainly resemble a finely cut fern. Hardly anyone ever appreciates that it is

in full flower when I stoop down to acquaint those around me on the walk with the species.

Certainly one is best armed with some type of magnifier to see, let alone appreciate, the flowers. There are three parts to each tiny floret on a relatively long stalk emerging from the leaf axils. The greenish-white flower color allows it to blend in with the rest of the fresh young spring vegetation. Each floret looks like a miniature green version of a bellwort, to make a comparison most folks may recognize. If one uses a hand lens, you can detect that there are glands alternating with the three petals. Stamens number 6, ovaries are 3, sharing one common style. The fruit is an achene and fleshy.

Tom Sampliner is a member and past president of the Native Plant Society of Northeastern Ohio, a botanical photographer and tour guide.



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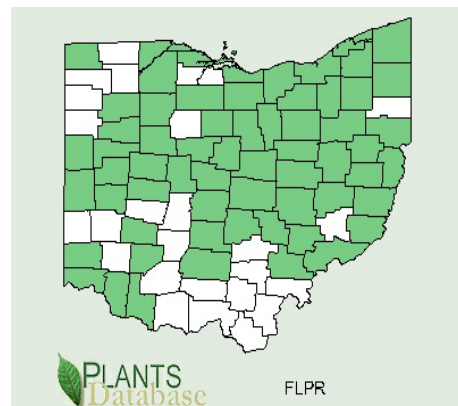


Photo © Carol Gracie 2001. From website of the Connecticut Botanical Society.

BOTANIZING 101

The Power of Observation**Rebecca Dolan, PhD, Friesner Herbarium, Butler University**

The sine qua non of botanizing is putting correct names to the plants you find growing in the wild. Here are some things to keep in mind when you come across a plant you would like to identify.

They all involve heightening your skills of observation. Practicing these skills is one of the things I like best about botanizing, and from what I have read, exercising all the senses involved should ward off the declining mental acuity that comes with aging—I hope so anyway.

Surroundings. First, take a look at your surroundings. Habitat is a major clue. Most plants are fairly specialized in where they grow. Are you in the woods? Along a stream or creek? In a prairie or meadow? These are examples of stable plant communities.

Other kinds of habitats are referred to in manuals as "disturbed" or "waste-places." These are habitats that share the condition of being more-or-less-frequently disturbed by plowing (farm fields), mowing (yards, roadsides), herbiciding (railroad rights-of-way), or even natural events like flooding. Certain kinds of plants are more likely to be found in each habitat type. When you gain some familiarity with what will be found where, it narrows the focus of your search for identifying clues.

Soil. Next, what is the soil like? Wet? Sandy? Soil characteristics can be clues to plant identity.

Cultivated plant? This can be tricky but is often an important clue: Could your plant have been planted and be part of old landscaping, or are you in an area where it could have recently escaped from cultivation? Wild plant identification manuals won't include cultivated plants, and you could spin your wheels thumbing through the pages for a mystery plant that is not truly wild. When I suspect a mystery plant is a cultivated plant, I use Michael Dirr's *Manual of Woody Landscape Plants* or Steven Still's *Manual of Herbaceous Ornamental Plants*.

Woody or herbaceous? Is the plant woody (a tree, shrub, or woody vine) or herbaceous? Try bending the stem. Be aware that some young trees and shrubs don't seem to have wood yet.

Leaves and stems. Look at the arrangement of the leaves on the stem or twig. Are the leaves opposite, alternate, or whorled? Are there winged extensions on

the stem, or any pores or markings, thorns or prickles? Other extras on or near the leaf stalks, like stipules or tendrils? Are the leaves simple or compound? Furry or smooth? The same color on top and bottom? Pull off a leaf. Does it have milky sap? Do the crushed leaves have a scent? What is the pattern of the veins in the leaves? These features will be helpful with identification, and may allow you to tell if the plant is, for example, a monocot, which limits the possible identifications.

Flowers. Look for a specimen with flowers. Flowers differ much more between species than leaves do. Many plant families have easily recognizable distinguishing characteristics. The most common plant families in Indiana were covered in my Botany 101 series. When looking at a new mystery plant, try to discern the flower arrangement on the stem, or the inflorescence type, then examine individual flowers for numbers of parts (sepals, petals, stamens). Manuals for herbaceous plants often have plants arranged by flower color, again refining the focus of the search for your mystery plant.

Cross-check. Have some guesses? Use Google image search to check it out. Go online to www.google.com, click on the Images link, then type in the name of the plant you think it is, and press Enter. You will be rewarded with multiple thumbnail photos and/or drawings of the plant you typed in, and you can click on any thumbnail for a larger view and further information to help you verify your find.

You are also welcome to come by the Friesner Herbarium at Butler University for help with identification (phone ahead to 317-940-9413). Mary Welch-Keesey, Consumer Horticulture Specialist, Purdue University, Department of Horticulture and Landscape Architecture, is always glad to help, too (317-630-3257). Outside Indianapolis, call Purdue toll-free at 888-398-4636 and ask to be transferred to Mary or to the Purdue Extension office in your county. Mary and I will also attempt to identify plants from digital photos sent via e-mail (rdolan@butler.edu, marywk@purdue.edu). It's much easier with a plant sample in hand, but we love ID challenges. We always learn something and get a chance to hone those observation skills.

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

Springville Marsh State Nature Preserve

161-Acre Cattail marsh with remnant sedge meadows, waterfowl, rare fen plants

Visitors to Springville Marsh State Nature Preserve have a unique opportunity to observe and study the beauty of nature and to reflect on the past. Three factors have had a marked effect on this resource. First, abundant groundwater, surfacing as many cool, calcium-rich springs, continues to nourish the special plant life found here. Also, many Ice Age plant species and others that are newcomers provide this preserve with a remarkable and diverse inventory of flowering plants. Third, the uniqueness of the marsh has survived despite past agricultural and industrial disruption.

Springville Marsh is an unequaled nature preserve in northwestern Ohio. It is the largest inland wetland in this part of the state. The preserve is notable for several reasons. Growing within the preserve are several Canadian and Atlantic coastal plain species, which became established here shortly after the Ice Age.

Some of these plants are threatened and endangered species in Ohio. Fen orchids, bottle gentian, Kalm's lobelia and little yellow sedge can be seen along the boardwalk. One of Ohio's largest populations of twig-rush, a typical Atlantic coastal plain species, is located throughout the preserve. There are also smaller areas of more northern plants, such as Ohio goldenrod, grass-of-Parnassus and shrubby cinquefoil. The sedge meadows, shrubby thickets and vast areas of cattail marsh provide excellent opportunities to observe wildlife.

Preserve History

Springville Marsh is a remnant of the Big Spring Prairie. The entire area was not immediately settled by the pioneers. The very wet terrain made much of the area unsuitable for agriculture. However, the abundant wildlife made it excellent for hunting and trapping. Perhaps for these reasons, the U.S. government gave 16,000 acres to the Wyandot Indians in 1818.

In 1833, the Treaty of Greeneville opened the area to settlement and the value of land for agriculture began to increase. At first, the dense mat of sedges and grasses was used as pastureland for horses and cattle or cut for hay. In the fall, the dried fields were burned in order to make mowing easier the next season.

In 1877, the Hocking Valley Railroad came through the Big Spring Prairie. Sparks from the steam locomotives became another source of fire during the dry autumn months. During this period, many ditches were dug to remove surface water. Artificial drainage enabled the settlers to grow corn, celery, onions, and potatoes, and still allowed them to use areas for pasture. In the early 1900s, the area known today as Springville Marsh was primarily an onion farm.

About 1937, the Smith Agriculture Chemical Co. bought the land and began mining "muck" from the property. The "muck", as it is commonly called, is a rich source of calcium. Two small-gauge engines and 12 cars carried the dredged muck to the main line, where it was shipped to fertilizer companies to be used as a filler. Since 1956, when mining was discontinued, Springville Marsh has been relatively untouched.

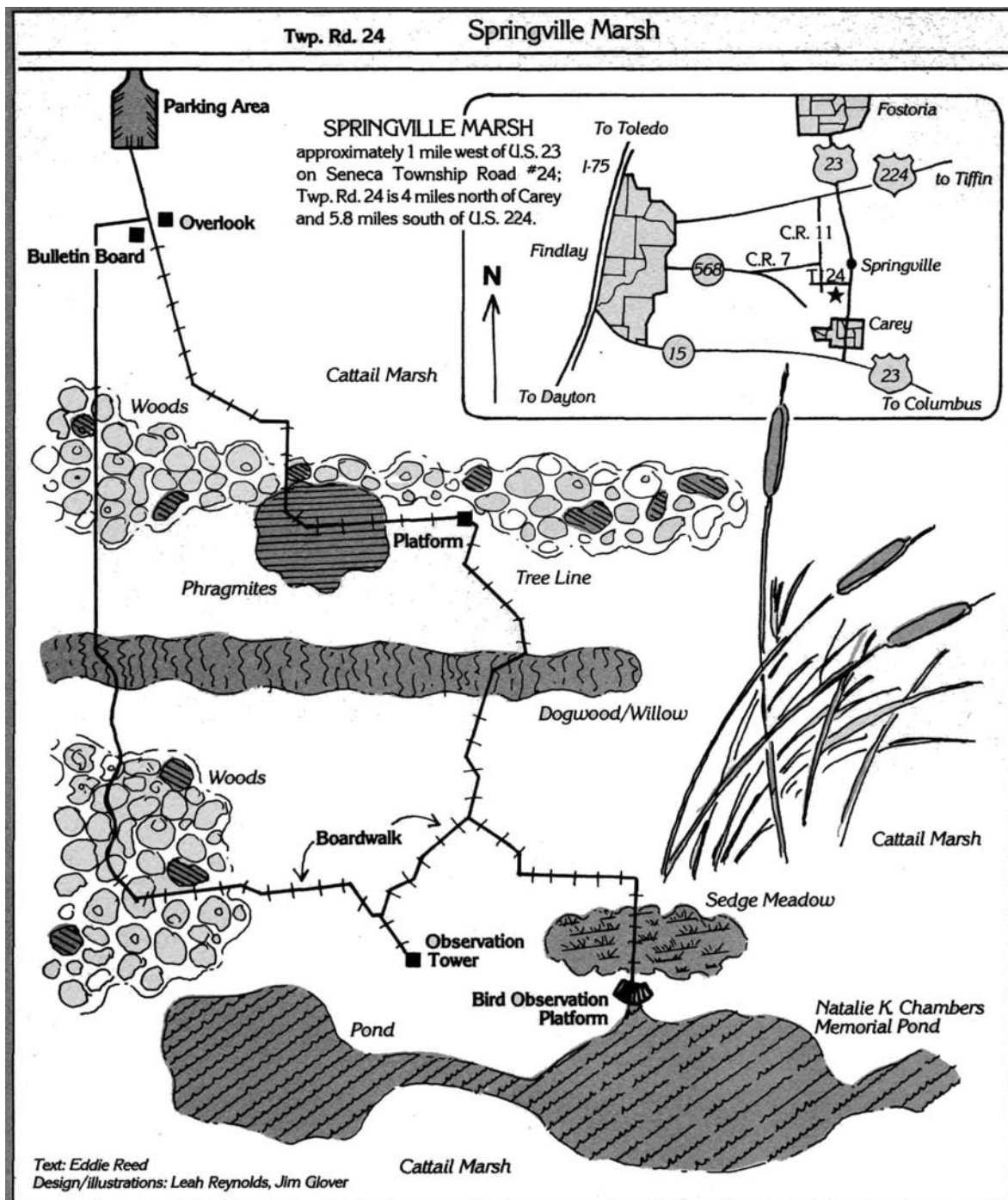
Purchase of the Marsh

In 1978, realizing the importance of the marsh property, several concerned citizens started a fund-raising project that led to the purchase of the land. These citizens formed the Springville Marsh Committee. This committee, which functioned under the auspices of The Nature Conservancy, was able to buy the land; in 1981 it transferred the marsh to the Ohio Division of Natural Areas and Preserves.

Today, more than 2,600 feet of boardwalk makes the northern part of the marsh comfortably accessible to even the least experienced nature enthusiast. The boardwalk leads to an observation platform with a secluded view of one of the largest ponds. It continues to an observation tower, uniquely constructed 10 feet in the air for a view not only of several ponds, but of the entire area in any direction. From here, the boardwalk goes to a wooded path leading back to the parking lot.

Location

Located in Seneca County 3 1/2 miles north of Carey on U.S. Route 23 / SR 199; proceed 1 mile west on Township Road 24 (Muck Road) to the preserve parking lot.



Reprinted from an ODNR Publication.

For more information visit the ODNR web site at <http://www.dnr.state.oh.us/>

BLACK WALNUT

Gordon Mitchell

Most of us like to eat walnuts. We eat them plain or we mix them with other foods that we enjoy. Walnuts can be easily purchased at almost any supermarket. However, the walnuts that we buy at the store are actually the English, French, Madeira, Carpathian, Persian, or Common Walnuts (*Juglans regia* L.). These walnuts were originally from Eurasia but are now cultivated in the United States, especially in California.

There are a few Walnut species that are native to America. One that is native to Ohio is the Black Walnut (*Juglans nigra* L.). The Black Walnut is a member of the Walnut Family (Juglandaceae). The generic name, *Juglans*, is from the Latin word, *Jovis glans*, which means "Nuts of Jupiter." Jupiter (or *Jovis*) was the Roman name for the Greek God, *Zeus*. A walnut was considered to be a nut of a God. The specific epithet, *nigra*, is Latin for "black". A scientific synonym for the Black Walnut is *Wallia nigra* (L.) Alefeld.

The common name, Walnut, is from the German word, *Welshnuss*, which means "foreign nut", probably because the Common Walnut had traveled all over Europe. The common word, "nut", came from the Latin word, *nux*. Other common names for the Black Walnut are the American Walnut, Eastern Black Walnut, and Walnut.

The Black Walnut tree is a shade-intolerant tree. It is a fast-growing tree when young and is a long-lived tree, sometimes living for up to 250 years.

Allelopathy

The Black Walnut is an allelopathic tree. It contains toxic chemicals that inhibit the presence of other plant species.

This tree contains juglone, which is an allelopathic quinone that is toxic to other plants and that inhibits their growth. Juglone is highly concentrated in the buds, the hulls, and the roots. It is less concentrated in the leaves and in the stems.

When the juglone is contained within the tree, it is in the form of a glycoside, hydrojuglone, which is clear and non-toxic. When it comes into contact with the air, the hydrojuglone becomes the light brown and toxic juglone.

Juglone is either leached into the soil from the fallen leaves or is exuded from the tree's dead or living roots. Juglone raises the pH of the adjacent soil, which affects many nearby plant species. Some species cannot

tolerate juglone and other species can tolerate it. Young Black Walnut seedlings cannot tolerate juglone.

Juglone can also have adverse affects on animals. Horses are especially susceptible to this chemical. Bedding made of Black Walnut sawdust can make a horse very ill.

To help ensure propagation of the Black Walnut, many species of rodents (*Rodenta*) will bury these nuts away from the tree in small caches. Some of these caches may be up to 50-100 feet from the tree. The buried nuts that are not recovered may later germinate.

Lumber Uses

The wood of the Black Walnut is probably the most valuable wood in North America. It is easily worked, takes a fine polish, and is used for airplane propellers, cabinetry, coffins, furniture, gunstocks, interior finish and paneling, shipbuilding, veneer, waterwheels, and woodenware. It was a highly popular furniture wood during the 19th Century.

Gunsmiths favored this wood because there was less jar and recoil. The old saying in the military, "to shoulder walnut," used to mean enlisting into the military.

The demand for Black Walnut wood is so high that it was almost harvested into extinction. It takes nearly a century for a Black Walnut lumber tree to fully mature. A fully mature tree, which is now quite rare, may be worth tens of thousands of dollars to a lumber mill. This tree is so valuable that thefts of these trees have occurred. There have even been Black Walnut tree rustlings occurring here in Ohio.

When the Black Walnut trees were more common, they were also used for charcoal, fence posts, fence railing, firewood, and railroad ties. The wood was first exported to England in 1610.

Edible Uses

The kernels or nutmeats are edible, tasty, and oily. Many people say that they taste better than the store-bought walnuts. These nuts are highly nutritious and contain beta-carotene, protein, vitamins A, B (thiamine, niacin, and riboflavin), and C, and the minerals iron, magnesium, phosphorous, potassium, and sodium. They also contain the fatty acids, linoleic acid and linolenic acid.

These nuts can be eaten straight or can be mixed with other foods. Many recipes using the walnuts were

listed in Martha Washington's *Booke of Cookery*. However, excessive consumption of these walnuts may have a laxative effect on some people.

Walnuts can even be made into walnut butter. However, this butter should be refrigerated to keep the oils from going bad.

The nuts are also eaten by many species of animals, especially squirrels. By observing the holes on the nutshells, one may be able to identify some of the species that consumed the nuts. The Eastern Fox Squirrel (*Sciurus niger* L.) and the Eastern Gray Squirrel (*Sciurus carolinensis* Gmelin) make two large holes on each side of the nutshell. The Red Squirrel (*Tamiasciurus hudsonicus* [Erxleben]) makes a hole from only one end. The Southern Flying Squirrel (*Glaucomys volans* [L.]) makes 4 circular side holes.

These nuts can be ground and used as feed for livestock. However, the husks and moldy nuts are toxic to livestock.

The sap of the Black Walnut contains sugar. Like the sap of the Maple trees (*Acer* sp.), it can be tapped and boiled down to sweet syrup. Unlike the Maple Syrup, this syrup has a high concentration of a more processed sugar, which is similar to white sugar.

Medicinal Uses

Aside from the lumber and the food uses, the Black Walnut had medicinal uses. Different parts of the tree served different purposes.

The bark was made into a tea and was used as an emetic and as a purgative. The bark tea was also used as an astringent, a wash, or as a gargle for sore mouths, sore throats, or diphtheria. The bark was chewed as a treatment for toothaches. The bark was also used as a poultice for wounds, headaches, inflammations, and snakebites, or for treating various skin ailments, such as eczema or ringworm.

The fruit's husk (or hull) was chewed for treating colic. The juice was used as a gargle, a purgative, and a vermifuge. The husk was also used as a poultice for inflammations, athlete's foot, ringworm, toothache, warts, and hemorrhoids.

The leaves were used as an antifungal, an astringent, a salve, and a tonic. A leaf tea was used for treating sores and running ulcers.

Even the nuts had medicinal uses. The oils from the nut were used externally for treating skin ailments, wounds, and toothache. The nutmeat was supposed to cure mental illness. According to the medieval *Doctrine of Signatures*, because the shell and the kernel resembled the human brain, it was believed that all walnuts could cure mental illnesses.

The leaves and the fruit both contain ellagic acid. Ellagic acid may have some anti-cancer properties.

The husks contain tannin, juglandic acid, juglandin, and juglone. The toxic juglone has sedative properties, which are similar to diazepam. Juglone may have antibiotic or antifungal properties and may also be used for treating cancer.

Other Uses

The fruit of the Black Walnut serves other purposes. The husks were used in tanning leather. The bruised husks were once used to stun fish, but it is now an illegal practice in most areas.

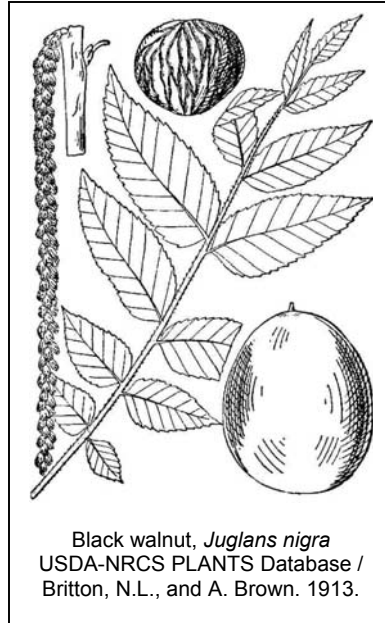
The husks were also used in making a yellow-brown to black dye for cotton and wool cloth. To make this dye, the husks were first soaked and then boiled in water. The solution was then strained and cooled. Afterwards, the cloth was placed in the solution, boiled, and then simmered for about 1 hour.

To avoid staining the hands when peeling off the husk, it is best to use gloves. Promptly applying lemon juice or bleach to the stained hands may sometimes remove the stains. Handling the husks (and the leaves) may cause contact dermatitis to some people.

It may be helpful to store the fruits in a pile and to allow the hulls to dry. Dry husks are soft and brittle and are easier to remove.

After the husks are removed, the nuts should be spread out and thoroughly dried for about 2-3 weeks before consuming them. Undried nuts may become moldy.

The hard nutshells were ground and had a few uses. They were used as an abrasive material for polishing metals, cleaning jet engines, scrubbing smokestacks, and as blasting grit. They were also used as anti-slip agents for tires, as activated charcoal, and as filler for spices or for textured paint. The Middle Woodland Indians of Ohio and Indiana carved some of these shells into shapes of birds or used them as pierced earrings.



Remains of some of them have been found while excavating their mounds.

The nutmeat oil was boiled from the ground nuts. It was used in making hair oil, artists' paint, and soap.

The bark had some uses. It was used for tanning leather or was used as a dye. The brown bark made a yellow to brown dye and the black bark made a black dye.

The leaves also had their uses. They were used for making a green dye. These leaves were also used as an insect repellent.

Because of Black Walnut's popularity, it was preserved or planted on many new farms and homesteads. George Washington planted some at Mount Vernon, and Thomas Jefferson planted some at Monticello.

Pests and Diseases of the Black Walnut

The Black Walnut is susceptible to a number of animal pests. The Eastern Tent Caterpillar (*Malacosoma americanum*), the Luna Moth caterpillar (*Actias luna*), the Walnut Datana caterpillar (*Datana integerrima*), the Walnut Sphinx caterpillar (*Laotloe juglandis*), and the Walnut Lace Bug (*Corythucha juglandis*) all eat the leaves. The Black Walnut Curculios (*Conotrachelus retentus*) attacks the young shoots. The Walnut Blister Mite (*Aceria erinea*) produces felt-like galls on the leaf's underside. The Walnut Shoot Moth caterpillar (*Acrobasis demotella*) attacks the terminal buds. The Fall Webworms (*Hyphantria cunea*) build their unsightly nests at the ends of the tree's branches. The Ambrosia Beetle (*Xylosandrus germanus*) bores under the bark. The Oystershell Scale (*Lepidosaphes ulmii*) sucks the sap from the tree. The Yellow-bellied Sapsucker (*Sphyrapicus varius* L.) drills unsightly holes in the

bark to get to the sweet sap. The Whitetail Deer (*Odocoileus virginianus* [Boddaert]) will browse upon these twigs.

A number of diseases also attack the Black Walnut. Some of them are Bacterial Blight (*Xanthomonas juglandis*), Bull's Eye Spot (*Cristulariella pyramidalis*), Spot (*Mycosphaerella juglandis*), and Walnut Anthracnose (*Gnomonia leptostyla*). Other diseases are Nectria Canker (*Nectria galligena*), Fusarium Canker (*Fusarium* sp.), Cytospora Canker (*Cytospora* sp.), and Armillaria Root Rots, (*Armillaria mellea* and *Armillaria taboscens*).

Description

Height: 70-150 feet.

Diameter: 2-8 feet.

Trunk: The trunk is clear, straight, and deeply divided.

Crown: The crown is broad, open, and round. It may spread for up to 50 feet.

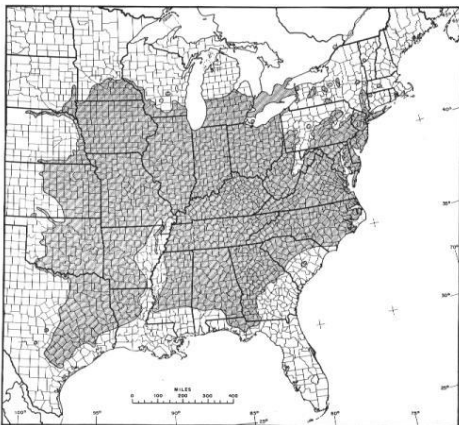
Branches: The branches are heavy and alternate.

Leaves: The leaves are alternate, pinnately compound, and deciduous. The leaves are about 8-24 inches long. The leaf petioles are stout and hairy. When crushed, these leaves may either emit a spice-scented or a pungent aroma. These leaves emerge late in the spring and drop early in the fall. In the fall, these leaves turn yellow or brown. Each leaf has about 7-25 leaflets (usually in odd numbers) and has a smooth rachis. The terminal leaflet is either absent or is very small. Each leaflet is alternate, cordate, lanceolate, narrow, oblong, or ovate. The leaflet is about 1½ to 5 inches long, about ½ to 1½ inches wide, sessile or short-stalked, has finely irregular toothed margins, and has an asymmetrical base and a pointed tip. The leaflets are smooth and dark or yellow-green above and are lighter and finely hairy below, especially along their veins.

Flowers: The flowers are small, green, and monoecious. These flowers are wind-pollinated. The pollen may cause hay fever to some people. Flowering season is usually April to June.

The female flowers are arranged solitarily or in clusters of 2 to 5 short oval spikes. Each flower has a 4-lobed hairy calyx, no corolla, a 2-lobed style, and a 2-lobed feathery stigma that is yellow-green with a red tinge. The male flowers are arranged in narrow, 2- to 5½ - inch long, single-stem catkins. Each flower has a 6-lobed calyx, no corolla, and about 8-40 stamens with purple anthers. To avoid self-fertilization, the male flowers usually bloom first.

Fruits: The fruits are arranged in drooping clusters of 1 to 3. Each fruit is globose, ovoid, or spherical, is about 1½ to 3 inches in diameter, and is surrounded by a



The range of black walnut.

tight, 1-piece, thick, yellow-green, fleshy or slightly hairy drupe. When the nuts ripen, these drupes (hulls or husks) turn brown. Fruiting season is usually September to November.

Inside of the drupe is a single, dark brown or black, rounded or oval nut. This nut is about 1¼ to 1½ inch in diameter. The nutshell is hard, thick, dark brown to black, and has irregular corrugated furrows and grooves or ridges.

Inside of the shell is the nutmeat or the kernel. This kernel or nutmeat is 2- to 4-celled at the base.

The trees begin to produce fruit after about 20-30 years of age. A given tree usually produces a good crop about every 2 to 3 years. Trees in open areas usually produce more fruit than trees in wooded area. In a good productive year, one Black Walnut can produce up to 3000 fruits.

Roots: The young trees set a deep taproot during their first year. As the tree matures, its roots become both shallow and wide spreading. These widespread roots may extend up to twice the length of the crown radius.

Twigs: The twigs are brown, stout, rigid, and brittle. The young twigs are lighter and have rust-colored hairs. The older twigs are darker, smooth, and have orange lenticels. These lenticels allow oxygen intake into the tree during the winter months. These twigs have a bitter taste

The pith is light brown to cream-colored and is chambered. These chambers are separated by woody diaphragm partitions.

The leaf scars are obcordate, 3-lobed, hairless, and are deeply notched on their upper margin. These leaf scars have 3 groups of bundle scars that are arranged in a U-shaped line.

Buds: The terminal bud is blunt, ovoid, light gray, slightly hairy, and is about ⅓-⅜ inch long. The lateral buds are hairy, gray-white, about ⅛-¼ inches long, and are superposed above the leaf scar. These buds have very few bud scales.

Bark: The young bark is gray or light brown and scaly. The older bark is dark brown to black and has deep furrows with rounded or sharp, intersecting, blocky ridges

Wood: The wood is heavy, hard, strong, durable, shock-resistant, ring-porous, and is close- and straight-grained. It won't easily check, shrink, swell, warp, or splinter. Its heartwood is dark purple-brown to black and its sapwood is light yellow.

Habitats: Mixed mesophytic forests, rich woods, uplands or bottomlands, open areas, roadsides. They prefer alkaline soils. These trees may be solitary or in small groves. They are rarely found in pure stands.

Range: The Black Walnut is found in the eastern half of the United States, except for the extreme northeast and the extreme southeast.

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

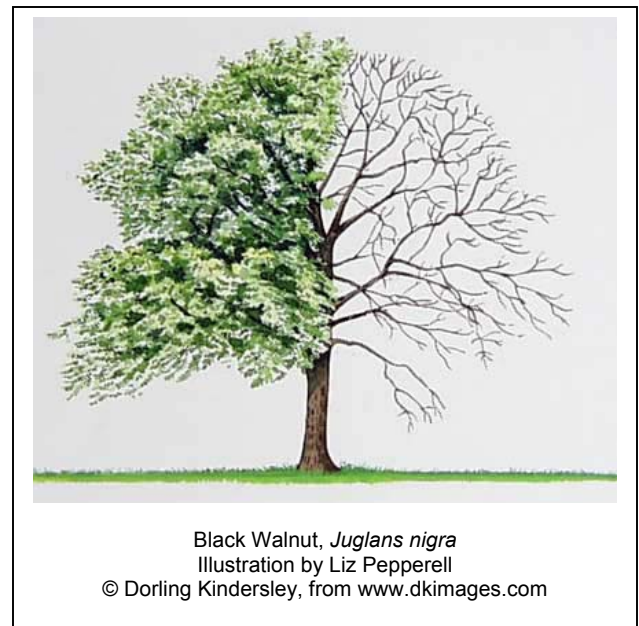
Wildflowers That Flourish Under Walnuts

Chris Brewster, West Central Chapter president, Indiana Native Plant and Wildflower Society.

These plants can survive under black walnut trees despite the juglone produced by the trees.

Bergamot, *Monarda fistulosa*
 Bloodroot, *Sanguinaria canadensis*
 Ginger, *Asarum canadense*
 Herb-Robert, *Geranium robertianum*
 Jacob's Ladder, *Polemonium reptans*
 Jerusalem Artichoke, *Helianthus tuberosus*
 Merrybells (Large-flowered Bellwort), *Uvularia grandiflora*
 Solomon's Seal, *Polygonatum commutatum*
 Spiderwort, *Tradescantia virginiana*
 Trillium, Large-flowered, *Trillium grandiflorum*
 Trillium, Nodding, *Trillium sororia*
 Violet, Canada, *Viola canadensis*
 Violet, Common blue, *Viola sororia*
 Virginia Waterleaf, *Hydrophyllum virginianum*

Reprinted from the *INPAWS Journal*, Spring 2006.



Fighting Invasives in Ohio's Special Places

Preserves in Lake Erie watershed challenged by non-native plants: Erie Sand Barrens * Headlands Dunes * Irwin Prairie * North Pond * Sheldon Marsh

Non-native invasive plants are one of the biggest threats to Ohio's native plant communities. Nearly 100 of these non-native plants are invasive in Ohio's natural areas, including along the coastal landscape of Lake Erie.

Invasive plants:

- displace or crowd native plant species
- impact wildlife which rely on native plant communities for food, shelter and breeding habitat
- form monoculture plant communities which reduces biological diversity

Protecting biodiversity

Recognizing the importance of protecting and restoring natural habitats, the Division of Natural Areas and Preserves is fighting the challenges of non-native invasive plant communities in Ohio's special places. ODNR's Office of Coastal Management has provided critical funding to assist in combating the challenges of invasive plants in the Lake Erie watershed. A rich variety of plant and animals species is a key component of a biologically diverse environment. Natural Areas and Preserves staff use a variety of eco-management techniques to control invasive plant species in Ohio's state nature preserves.

Management techniques include:

- hand pulling and cutting
- mowing
- herbicide treatment, such as spraying
- prescribed burning

Taking a closer look at invasive plant communities

State nature preserves located along Lake Erie's coast and within its watershed provide a glimpse into the ongoing challenges faced by land managers across the United States.

Wetlands provide unique challenges for management because of the variables including: dense vegetation; standing water; and the tremendous numbers of fish, reptiles, amphibians, and other wildlife dwelling in our wetlands.

Headlands Dunes

Harboring plants usually found along the Atlantic coast, Headlands Dunes protects an isolated extensive sand dune shoreline along Lake Erie. Atlantic Coastal Plain species, such as beach grass, sea rocket, seaside spurge, purple sand grass and beach pea, persist on the preserve's sand dunes. But look closer and you'll spot invasives, such as sweet clover, crown vetch and purple loosestrife, growing in this special place. The division is focusing its efforts on maintaining or expanding the beach dune community by hand pulling invasive plants and applying wetland-approved herbicides.

Erie Sand Barrens

After seeing its landscape of prairie grasses and stunted oak and hickory trees, early settlers deemed Erie Sand Barrens unfit for farming. Today, this special place is a link to Ohio's glacial past because it harbors an interesting mix of rare plants along the top and bottom of its sandy ridges. Rare plants, such as Virginia meadow beauty and twisted yellow-eyed grass, thrive in the wet depressions of the barrens. Other unique plants, like partridge-pea and prairie milkweed, grow along the higher ridges and knolls of the preserve. Erie Sand Barrens is managed to perpetuate its unique sand barren plant community, as seen in pre-settlement days. This requires the removal of plants which are native, but also invasive. Although native plants are not usually considered invasive, the black locust and aspen populations at Erie Sand Barrens threaten the rare plant community. The division manages the site to ensure that such areas remain open. Removal of these woody species is done both mechanically and by controlled prescribed burning.

Sheldon Marsh

Few areas in northern Ohio can match Sheldon Marsh in habitat diversity. Located adjacent to one of the last undeveloped stretches of shoreline in the Sandusky Bay region, the preserve protects important coastal habitats. Preserving and managing habitat is key to the survival of native plant and animal communities at Sheldon Marsh. The preserve is known to attract nearly 300 bird species including numerous shorebirds attracted to the shallow waters and mudflats of the wetlands behind the barrier beach. The division faces a variety of invasive plants throughout the preserve. Phragmites and purple

loosestrife can be found along the preserve's wetland habitats, while garlic mustard and bush honeysuckles are gaining a foothold in the site's wooded areas. The division's invasive management activities throughout the preserve will help maintain native diversity in the coastal wetland and protect the outstanding spring wildflower display within the coastal woodland. Ohio's Lake Erie islands draw thousands of visitors to the natural features and recreational opportunities found there. Two state nature preserves found on Kelleys Island, a short ferry trip from Marblehead, protect remnants of the island's natural past.

North Pond

As one of the last natural marshes in Ohio's western Lake Erie basin, North Pond protects an excellent example of emergent and submergent aquatic plant communities. The 36-acre preserve is home to many rare plants and animals including Wapato, also known as pond arrowhead. Along the beach, purple sandgrass and seaside spurge can be found. Purple loosestrife, Phragmites and flowering rush are examples of the invasive plants found at North Pond. Stands of Phragmites can be seen from the preserve's observation deck, instead of the open waters and native vegetation that should be dominating the area. The division uses

wetland-approved herbicides to control the encroaching invasive species.

Irwin Prairie

Prairies might not come to mind when you think about coastal preserves, but Irwin Prairies' wet meadow habitat is located within Lake Erie's watershed. The rare Oak Openings plant community found at Irwin Prairie is threatened by dense stands of glossy buckthorn, an invasive woody shrub. Maintaining the wet sedge meadow found at Irwin Prairie demands aggressive invasive management activities, including herbicide application, mowing and controlled burns.

You can help!

What may look like a pretty flowering bush or brightly colored wildflower may in reality be a destructive plant in a natural areas setting. By eliminating invasive species in your own backyard and by using native or non-invasive plants instead, you too will be promoting biodiversity.

Together, we can protect and preserve the best of Ohio's Lake Erie coastal habitats.

Reprinted from

<http://www.ohiodnr.com/dnap/invasive/lakeeriefights.htm>

An ODNR web site. See the site for pictures.

Got Shade? A "Take It Easy" Approach for Today's Gardener by Carolyn Harstad

Photographs by Carolyn Harstad. Drawings by Jean Vietor
Indiana University Press, 2003, ISBN 0-253-21625-7

Book Information:

392 pages, 91 color photos, 102
b&w illus., bibl., index, 7x9
Paper; \$24.95
ISBN 0-253-21625-7

Whether it's urban, suburban, or rural, nearly every property has some shade, if only on the north side of the house. Many are blessed with giant trees. Under such conditions, you may think it is impossible to have an interesting garden without a lot of work. Not so if you are willing to learn about the plethora of easygoing horticultural gems that don't require full sun.

Carolyn Harstad organizes this book around the principle that an interesting shade garden is well balanced and has a variety of plantings. Early chapters focus on designing the low-maintenance garden. Further chapters discuss small trees, shrubs, dwarf conifers, vines, ground covers, ferns, grasses, perennials, woodland wildflowers, spring bulbs, and annuals (yes, there ARE annuals that enjoy shade!). She discusses hundreds of shade-tolerant plants hardy in Zones 4-8, suggests how they may be used and combined, and recommends methods to cut garden maintenance. With its informative text, accurate

drawings, and colorful photographs, this book is a "must have" for gardeners across much of North America.

Carolyn Harstad is author of *Go Native! Gardening with Native Plants and Wildflowers in the Lower Midwest* and is co-founder of both INPAWS (Indiana Native Plant and Wildflower Society) and the Indianapolis Hosta Society. She now lives in Minneapolis.

Jean Vietor graduated from Indiana University in Fine Art. She has exhibited mostly nature paintings for 33 years. Her media include watercolor, transparent acrylic, acrylic on canvas, computer art, and polymer clay art.

To order, call 1-800-842-6796 or log on to <http://iupress.indiana.edu>

Email Carolyn at: pharstad@iupui.edu

Reprinted from *The Indiana Native Plant and Wildflower News*, Winter 2003.

Connecting an Oak Tree to the Animals That Depend Upon It

By Joan Maloof

This morning, early, I saw a gray squirrel (*Sciurus carolinensis*) crawling through the branches of the oak tree in my backyard. When the squirrel got as far out as it could go on the smaller branches, it made a big leap to the adjacent magnolia tree (*Magnolia x soulangiana*). I have witnessed that squirrel take this route many mornings. After crawling through the magnolia's outer branches, the squirrel climbed down the trunk to the ground. Both the squirrel and I were looking to see where the cats were at that point, but the only animals that gave the squirrel any trouble were the birds, who swooped in, screeching and scolding. Cats have been the death of many young squirrels, I thought, but squirrels have been the death of many young birds, too.

The squirrels were not always in my yard. They are there now because of the oak tree. It is a cherrybark oak (*Quercus pagoda*); at least I think it is. Oaks are difficult to tell apart. There are 43 kinds of oak in the eastern United States alone, and they often hybridize, which makes identification even more complicated. I have frequently seen botanists, too time-limited for a thorough identification, just give up and put a tree into one of the big categories of "white oaks" or "red oaks" without determining the species. If you want to sound like one of these "experts," all you need to know is that white oaks have rounded leaf lobes and red oaks have pointed leaf lobes.

One of the problems with identifying oaks to the species level is that their leaves are highly variable. If you pick 20 leaves from an oak tree, chances are that each one will look slightly different from the others. And the leaves from one tree may look very much like the leaves from another tree of a different species. Besides looking at the leaves, it is necessary to look at the buds, the bark, and especially the acorns. The problem with examining acorns is that they are usually out of reach on the tree, and once they fall to the ground they are rapidly eaten—or hidden—by the many species of wildlife that depend on these nutritious morsels, like the gray squirrels in my yard.

For 11 years I watched my oak tree produce acorns and wondered why there were no squirrels to eat them. What had happened here before I came that caused the squirrels to be absent? The only thing I could imagine was a combination of young men with shotguns and territorial dogs; both had lived here before me. Finally, in year 12, the squirrels returned to the tree, and there



Oak tree © Marc Epting

they have been living and breeding ever since. I am happy to see them—the landscape is much richer with them in it—and I will happily sacrifice a few flower bulbs to keep them here.

The Acorn and Its Associates

Although it may be difficult for humans to distinguish oak species, the squirrels are able to tell. Acorns from different species vary in the amount of nutritious fat and bitter tannins they contain, and also in the time of year they germinate. These factors determine whether a squirrel will eat an acorn immediately or bury it to eat later in the winter or the spring. If an acorn is of the type that sprouts in the fall, the squirrel will eat it right away—a germinated acorn is not as tasty as an ungerminated one. If they cannot eat the acorn right away, they nip out the tiny embryo from the nut, thus killing the seed and preventing germination. Acorns high in tannins store best through the winter. The squirrels know that and hide those acorns. Some are forgotten, and they may eventually sprout. So, even though the squirrels are responsible for killing many of the seeds, they are also important seed dispersers. From the tree's point of view, it is okay to have 99 of every 100 seeds eaten if the remaining one is taken to an area where it will germinate and grow.

Insect infestation is another factor that determines whether a squirrel will eat or store an acorn. A small beetle (*Curculio*) that looks like a miniature anteater feeds on acorns. The weevils crawl out of the ground during the summer months and begin climbing the

nearest oak tree. They climb high into the branches, hoping to find another weevil of the opposite sex. After mating, the female makes her way to a maturing acorn. At the end of her long, curved snout are jaws that can gnaw a circular tunnel in the acorn. The material she chews from the tunnel is digested as food, but that is not the reason she makes the tunnel. When the tunnel is completed, the female turns around and extends her ovipositor—a telescoping egg-laying appendage—into the hole, lays an egg, and seals the hole with a bit of her poop. A small white dot, from this fecal pellet, is the only way to tell from the outside that the acorn has a weevil egg in it. In a week or two the egg hatches into a small, worm-like larva that feeds on the flesh of the acorn. Eventually the mature acorn falls to the ground. Rather than avoiding these acorns, the squirrels relish the protein-rich condiment. Some of the larva-containing acorns escape discovery and produce the next generation of weevils. The full-grown larva chews an exit hole—the original hole made for the egg being much too small to allow passage of the fat larva—and crawls out of the acorn and down into the ground. There it writhes around in the soil, creating a small space where it will spend the next year. At the end of the year, the larva pupates and emerges as an adult weevil, which crawls up the nearest oak tree, and the cycle begins again.

Almost as wonderful as this life cycle is the fact that someone managed to discover it. Who could possibly have had the patience to follow and record the behavior of these insects? How long did he or she wait at the base of an oak tree for the adult weevils to emerge? Describing such life cycles and relationships is more natural history than what we today consider science. How many other ecological relationships are still undiscovered because natural history is no longer given the respect it once had and our biology students are now studying genomes instead?

A Universe in the Garden

The oak tree and the weevils also provide a food source for another organism—the acorn moth larva (*Cydia splendana*). The fertile adult female, a tiny black-and-white moth, lays her eggs on oak leaves. When the larvae hatch, they crawl toward the nearest acorns, their preferred food. But neither the adult moths nor the little larvae have a way to get through the acorn's shell. They depend on the holes made by the oak weevils and larvae. No oak tree: no squirrels, no weevils, no acorn moths. And how many other organisms would we lose as well? Without this oak, my yard would be a less ecologically rich and interesting

place. In some years oak trees produce a bumper crop of acorns—far more than in other years. Studies have shown that in these "masting" years, the mice that feed on acorns are also more abundant—and since mice are a preferred food of owls and other raptors, masting oak trees mean more owls. Want owls? Plant oaks. The mice that aren't eaten by hawks and owls can repay the oak for providing the food that kept them alive over the winter by feeding on the pupae of gypsy moth caterpillars during the summer. Caterpillars of the gypsy moth (*Lymantria dispar*), an invasive species from Asia, relish oak leaves and can defoliate whole forests, weakening the trees as a result. But eventually a caterpillar will stop feeding and form a pupal case in which it will metamorphose into a moth. The trees in a gypsy moth-infested forest have dark, brittle pupal cases hanging on their trunks. When mice eat these pupae, they help to prevent another generation of moths from maturing, mating, and laying eggs. Fewer acorns: fewer mice, more gypsy moth caterpillars.

Acorn production can also affect the abundance of deer. White-tailed deer are more likely to have twins the spring following a mast year. Besides acorns, deer also like to eat tree seedlings. When acorns are scarce, more of the seedlings will be "browsed," resulting in less cover and potentially greater mortality for songbirds.

Biochemists have worked out the intricate pathways of photosynthesis and aerobic respiration, and have even mapped the human genetic code; but the field we call ecology, the connections between organisms and their environment, is a huge canvas of the unknown. We put a few strokes on the canvas when we learn about connections—such as the one between the mice and the gypsy moths—but there are still far more gaps than there is knowledge to fill them.

We are beginning to understand the connections between oak trees and other species, but we still have much to learn. When it comes to other plant species—especially non-crop plants—we have almost everything to learn. We have been to the moon, but we still don't understand what is in our own backyards.

Adapted from Teaching the Trees: Lessons from the Forest, by Joan Maloof. Used by permission of the University of Georgia Press (www.ugapress.org). Copies of the book can be purchased at the BBG Gift Shop (for phone orders, call 718-623-7286) or online at www.bbq.org/qardenqiftshop

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

Two Major Successional Trees: Black Locust and Yellow Poplar

J. Dan Pittillo

Pioneers were challenged to clear their forested slopes in order to plant crops, especially corn, to provide forage for over-wintering livestock. One of the most frequent and difficult trees to remove was black locust (*Robinia pseudoacacia*). It often would seem that as soon as a young, vigorous sprout came up and was chopped out, another replaced it. These made cultivating the hillsides especially difficult and many expletives were expressed about those hellacious locust sprouts. Indeed, the roots of these trees extended deep in the often-rocky hillside soils. When I built my home, we excavated the site to a depth of nine feet the year before laying the foundation and during that summer young sprouts came up at this depth. They continue to sprout up on the old fields that I've pastured for the past 40 years. Black locust often fruits heavily and the seeds are quite viable but they usually develop only in bare ground, such as gardens or fields that have been under cultivation for some time.

There are many benefits of this native locust, often called white or 'yellar' locust. These terms apply to the same species with white locust referring to field-grown trees with wide sapwood that easily rots when used in the soil while the yellow locust is the woods grown tree (or those that mature in fields after a few decades). Yellow locust has a narrow sap-wood but mostly rot-resistant heartwood. One value that is often overlooked is the fact that *Robinia pseudoacacia* replaces a good deal of the nitrogen that quickly is leached from the soils after trees have been removed. This sets the stage for the future development of the secondary forest that replaces the locusts as they die out in a few years. At Coweta Hydrologic Laboratory near the NC-GA line this release of nitrogen made a dramatic appearance in the 1970's after watershed No. 6 developed a significant population of locust borers that caused the trees to release their nitrogen before the trees showed evidence of their demise.

Yellow poplar or tulip tree (*Liriodendron tulipifera*) is entirely different in its role in early succession. Instead of enriching the soil with nitrogen, it rapidly takes up the nutrients that are released as the leaf and twig litter from the slashed forest trees decompose. It seeds prolifically and these seeds germinate quickly in sunlit forest openings. The trees grow rapidly and will be over ten feet tall within 5-10 years. As forests have been timbered over the past century or more, the prominence of yellow poplar has

increased significantly, expanding in the cove forests and extending further upslope than previously.

Following the severe freeze that took place over the Easter weekend, we now have a rather "ratty looking" forest over much of the area. Many of the black locusts were killed back a couple years ago but this year the yellow poplar has been severely affected. It now appears some of the upper twigs and larger branches may not be able to leaf-out and will be shed as dead wood. Undoubtedly these twigs and branches will contain considerable nutrients that will return to the soil for later recycling back into the trees. As for the black locust, I found it necessary to cut over a dozen trees that were leaning over pasture fences and about half this many leaning toward our houses. While there will be differences in other regions where the phenological events were not as advanced as here in Cullowhee, I believe there will be similar processes taking place as we go forward in this climate change. So, if this process continues, I wonder what the effect is going to be on the forest as a whole. Maybe some of the answer is evident as we look back at the processes that have accompanied the climate change over the past 50,000 years as expressed by the paleoecologists (you might check Hazel Delcourt's *Forests in Peril* in this regard).

J. Dan Pittillo is Newsletter Editor for the Southern Appalachian Botanical Society.

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Black Locust
Robinia pseudoacacia



Yellow Poplar
Liriodendron tulipifera



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- Promote conservation of all native plants and natural plant communities through habitat protection and other means
- Encourage public education and appreciation of native plants
- Support proper ethics and methods of natural landscaping
- Encourage surveys and research on natural plants and publication of the information
- Promote cooperation with other programs and organizations concerned with the conservation of natural resources

On The Fringe

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