

On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

Program Schedule – Summer 2016

Saturday, June 18, 10:00 am – Noon – Gott Fen, Portage County. MEMBERS ONLY. Rick Gardner, ODNR Division of Natural Areas & Preserves Botanist, and Adam Wohlever, Northeast Regional Preserve Manager, lead the trip to this state nature preserve to see the showy lady's slipper orchid and results of our stewardship days cutting the invasive European buckthorn. Gott Fen harbors more than 20 state-listed species including the largest population of showy lady's slipper in the state. Other rarities include round-leaved sundew, grass-of-parnassus, shrubby cinquefoil and northern bayberry. One of the finest boreal fens in the state. The site, normally closed to the public, does not have a trail system, and visitors are asked to wear appropriate footwear for wet conditions. Prepare for wet walking, knee-high boots recommended. Some poison sumac occurs on the property as well.

Directions: take St Rt 43 south through Streetsboro to St Rt 303, turn right (west). Parking will be at the north end of the Target parking lot where we will carpool to the site. **Registration required and limited due to fragile habitat:** To register call Judy at 440-409-1688 or email judysbarnhart@gmail.com.

Saturday, July 16, 10:00 am – Noon – Liberty Park, Summit County. Twinsburg City Park Naturalist Stanley Stine begins the day with a tour of the new nature center before a short walk down to the ledges area. Enjoy a packed lunch before heading over to the office area where Stanley has been experimenting with native plants in various garden and meadow plantings for nearly two decades.

Directions: exit I480 east at Rt 82, Cannon Road. Head east past Rt 91, Darrow Road, to Liberty Road. Turn left (north) on Liberty to Post Road. The nature center parking area will be on the right across from Post road. **Registration:** To register call Judy at 440-409-1688 or email judysbarnhart@gmail.com.

Saturday, August 6, 10:00 am – Noon – Guy Denny's Prairie, Fredericktown, Ohio. Guided by Guy Denny. This prairie is one of the best and most established examples of Ohio's prairies. Vital to the survival of many native pollinators and birds, prairies are remarkably diverse and biologically productive landscape features. **Location:** 6021 Mt. Gilead Rd. (SR 95), Fredericktown, Ohio 43019.

Directions: Details of meeting times and locations for carpooling will be provided upon registration. Travel time is approximately 2.5 hours from the eastern suburbs of Cleveland. **Pre-registration is required:** Call Kathy at 440-477-5468 for more information. 40.465756 -82.636583 W

Request for Proposals for 2016 Annual Grant

The Native Plant Society of Northeastern Ohio is accepting applications for our 2016 Grant(s). We will consider projects that demonstrate excellence in research, conservation, or education that clearly support the mission of the Native Plant Society of Northeastern Ohio. The amount of each grant will be up to \$500. The number of grants available will be dependent on funding. Submissions must be received by 5:00 PM Friday, September 16, 2016. The grant(s) will be awarded at the Annual Meeting of the Society October 29, 2016. For more information on the grant and how to apply please see our website www.NativePlantSocietyNEO.org or contact Kathy Hanratty at nativeplantsocietyneo@gmail.com.

Board

President	Kathy Hanratty
Vice President	Judy Barnhart
Treasurer	Lisa K. Schlag
Secretary	Charles Fletcher
At Large	Diane Christensen
At-Large	Jane McCullam
Founding President	Ann Malmquist†

Standing Committee Chairs

Program	Judy Barnhart
Journal & Media	Diane Christensen
Special Events	Kathy Hanratty
Grant & Awards	Open
Marketing	Open
Webmaster	Lisa K. Schlag
Membership	Jane McCullam

On The Fringe

The Journal of the Native Plant Society of Northeastern Ohio is published four times a year at Novelty, Ohio. ISSN 8756-6087. Questions or comments are welcome and may be addressed to chief editor, Diane B. Christensen, 8400 Top Rail Lane, Novelty, OH 44072; 440-666-4870, dbpolice@roadrunner.com; or co-editors Bill Oberdick, 986 Bushwood Ln., Columbus, OH 43235-5016; 216-392-7027, bill2016ober@gmail.com or Jane McCullam, 9880 Fairmount Blvd., Newbury, OH; 44065, cattermole@windstream.net, 440-338-3253.

The Mission of the Native Plant Society of Northeastern Ohio is to promote the study, appreciation and conservation of the native plants and plant communities of Ohio.

High Hopes for Fungi Sent to Space Station

By Deborah Netburn

Scientists are sending four strains of fungi to the International Space Station to see what happens when the tiny organisms contend with the stresses of micro-gravity and space radiation.

It's not just for kicks.

The researchers say that placing those fungi in an extraterrestrial environment could prompt them to produce new medicines for use on Earth—and perhaps even on long-term space missions.

The experiments will be among the first to explore the intersection of pharmaceutical science and space exploration, said principal investigator Clay Wang of the University of Southern California, who studies ways to make medicines with the help of natural organisms.

Some members of the vast fungus kingdom have been beneficial to humans.

Scientists have long known that certain species of fungi create molecules to help combat stressful situations.

By harvesting those molecules, called secondary metabolites, researchers have been able to make drugs that have changed the trajectory of medicine.

The most famous of those is penicillin, an antibiotic produced by members of the *Penicillium* genus when they are exposed to bacteria.

NASA has previously sent bacteria and yeast to the International Space Station, but this will be the first time the space agency will grow fungi inside the space laboratory in an attempt to produce new medicines.

Article featured in the April 4th, 2016 edition of the South Florida *Sun Sentinel* newspaper. Deborah Netburn writes for the Tribune Newspapers.

Sex in the Garden: It's Wilder Than You Think

By William Cullina and Greg Lowenberg

“Do I need to plant more than one of these to get fruits or seeds?” We often hear this at our New England Wild Flower Society nurseries. It’s a simple question, but one that is vital to botanists, farmers, and gardeners—not to mention the plants themselves—and the answer is not so simple.

Unlike the birds, the bees, and the rest of the animal kingdom, plants cannot actively choose their sexual partners. There are no mating songs, ritualized displays, or weekend crises to aid them in selecting the fittest consorts. They have to depend on the capriciousness of birds, bumblebees, or gentle breezes, which move pollen or transport seeds while going about their own pursuits. Yet plants do have subtler ways of controlling their sexual reproduction.

The whole point of sexual reproduction is to keep the gene pool as diverse as possible. The best way for plants to accomplish this is by systems that favor outcrossing by another individual within the same species. Some plants will accept their own pollen, but the majority cannot or will not, so the problem is deciding whose pollen tubes will have access to whose ovaries (where the eggs reside). In this article, we’ll look at some of the sexual variations present in our New England flora, explore the barriers against self-fertilization, and in the process answer the simple question posed above.

Plants are Gender Benders

In most animal species, individuals are found in one of two genders (or sexes), and reproduction is almost always a fertilization event between two individuals of opposite sex. By contrast, the plant world has a dizzying array of breeding systems. Plant populations with strictly unisexual (either male or female) individuals can be found in only about five percent of the New England flora. The condition in which individual plants produce either male or female flowers (but not both) is called “dioecy” (die ee’see), and a particular species with unisexual individuals is referred to as “dioecious” (die ee’ shus). In the New England flora, the largest single group of dioecious species is the willow family *Salix spp.* See the table next page for more examples.



Chionanthus virginicus, Fringetree, is a dioecious native tree
Photo taken from <http://forestry.about.com>

A far larger proportion of our flora consists of species whose individuals have both male and female parts, whether within a flower or on different flowers borne on the same plant. Such plants are commonly called “hermaphrodites,” but there are several forms under that heading.

- Species whose individuals bear only bisexual flowers—having both male and female parts within each and every flower—are referred to as “synoecious” (sin eee’ shus) and constitute the largest group, about 85% of the New England flora. These plants are often referred to as having “perfect” flowers.
- Species whose individuals bear unisexual flowers, with both male and female flowers on the same individual plant, are called “monoecious” (mon ee’ shus), and make up about eight percent of the New England flora. Monoecious plants are well represented in wind-pollinated species such as sedges and trees (most of our conifers, and many deciduous, flowering trees).
- A small percentage of species are referred to as “polygamous,” with a mix of bisexual and unisexual flowers found on the same individual. The carrot family, *Apiaceae*, is a good example. In this plant family, many species produce both bisexual and male flowers in the same flower head (umbel), but the ratio may vary among umbels. There are other interesting combinations in other plant taxa.
- A few species have “mixed” systems, with populations or individuals exhibiting sometimes one system, and sometimes another, often depending on environmental conditions.

SOME NATIVE DIOECIOUS SPECIES

Acer negundo, box elder
Antennaria dioica (and some other spp.)
Aruncus dioicus, goatsbeard
Carex, sedge (only a few spp.)
Celastrus scandens, American bittersweet
Chionanthus virginicus, fringetree
Comptonia peregrina, sweetfern
Cotinus obovatus, American smoke tree
Croton alabamensis, Alabama croton
Diospyros virginiana, persimmon
Epigaea repens, trailing arbutus
Eriogonum (some spp.), wild buckwheat
Fraxinus spp., ash
Gymnocladus dioicus, Kentucky coffee tree
Ilex spp., hollies
Juniperus spp., red cedar, juniper
Lindera benzoin, spicebush
Madura pomifera, Osage orange
Morus rubra, red mulberry
Myrica pensylvanica, bayberry
Nemopanthus mucronatus, mountain holly
Nyssa sylvatica, tupelo, black gum
Osmanthus americanus, devilwood
Populus spp., aspen, poplar
Rhus spp., sumac
Salix spp., willow
Sassafras albidum, sassafras
Shepherdia canadensis, buffaloberry
Thalictrum dioicum, early meadow rue
Thalictrum pubescens, king of the meadow
Zanthoxylum spp., prickly ash

There is Strength in Diversity

It is important to think about plant gender and a plant's reproductive success from both the male and female point of view. In non-dioecious species (95% of our flora), individuals can act as both males (releasing pollen and successfully fertilizing a flower's eggs) and as females (having fertilized eggs in their flowers from which they produce seeds). When a plant simultaneously functions as both a male and a female, its success is not always equal. In other words, one plant in a population can be acting primarily as a male (donating pollen), while another can be more successful as a female (making seeds), with wide variation between the extremes among different plants. Evidence

from scientific studies of flowers indicates that male reproductive success may be as, or more, important than female function in the evolution of attractive features such as petal size and shape, flower number, scent, nectar guides, and color.

Why is it necessary for gardeners to be aware of all these sexual variations? For starters, saving seeds only from robust plants that excel in their female function (seed set) may not capture a full range of genetic diversity. Male success is sometimes the result of subtle differences in flowering time, especially of pollen release. A longer blooming season might best be captured by saving seeds from a wide variety of individuals, and not just the few that happened to bloom at the same time. Even on an individual plant, collecting seeds from flowers that bloom both early and late can maximize diversity.

Avoiding Self-fertilization

Many plant species are self-fertile—able to produce viable seed without the aid of another plant—but have mechanisms to promote cross-fertilization and reduce self-pollination. In monoecious species, for example, it is common for male flowers to release their pollen before the female flowers on the same plant are receptive to pollen. Pollinators such as bees may move pollen among the flowers of a single plant, but there will be very little effective self-fertilization. In some species with bisexual flowers, the female phase begins first and finishes before the anthers release pollen, and in other species it happens in the reverse order. Even the physical separation of male and female parts within the flowers of some species can reduce self-pollination.

On the other hand, many plant groups have developed physiological and chemical mechanisms to inhibit self-fertilization, even when self-pollination does occur. This “self-incompatibility” is found in a large number of New England Angiosperm plant families, possibly more than half of the genera (see table next page). Self-incompatibility is genetically controlled, and involves a variety of features. In some cases, a pollen grain that lands on a stigma of the same plant is prevented from germinating by chemicals on the stigmatic surface. In other species, the pollen grain will germinate and begin to develop a pollen tube, but pollen tube growth ends quickly before it has a chance to grow all the way down the style to the plant's ovary. This unique marvel of cellular rejection is a direct reversal of the familiar immune system function, in which an organism rejects foreign material. In self-incompatibility, cells of the same genotype are rejected and cells of different genotypes are accepted.

Keys to the Garden of Natural Delights

Abundant fruit and seed production is obviously important for the long-term survival of a plant species, but it is also important for all the animals (including humans) that depend on it for food. To ensure a reliable food supply, we have influenced and manipulated plant reproduction in many ways since long before recorded history, and these experiments have been largely successful. In modern times, the nursery and agricultural industries have moved increasingly toward standardization, using cloning to produce genetically identical plants. While successful in the short-term, such strategies can backfire. Nature, in the interest of hardiness and adaptability, overwhelmingly seeks genetic diversity over sameness. If your goal is to garden in a sustainable and ecologically informed way, knowledge of dioecious and self-incompatible plants is both important and rewarding. Here are a few tips.

- **Spot the clones** — In almost all cases, a cultivar (designated by a capitalized, non-italicized name in single quotes such as *Lonicera sempervirens* ‘Alabama Crimson’) is a clone. Therefore, whether you plant one or one hundred, if the species is self-incompatible, you will get no seed. A trend now is to use a trade-marked name rather than a cultivar designation, as in *Magnolia virginiana* Moonglow®, but these trade-marked plants are clones as well.
- **Plant “local”** — Two individuals of the same species that originate from very different parts of the country may have non-synchronous bloom times and will therefore fail to cross-pollinate. Since flowering cues such as day length, mean temperature and the duration of winter vary from one region to another, try whenever possible to plant local ecotypes (plants of local wild region) that have co-adapted to the regional cues to assure they bloom at the same time. Just because a plant is being sold locally does not mean it is from local genetic stock. Our nursery has implemented a program to propagate local ecotype plants wherever possible, and these will be labeled as such.
- **Be a matchmaker** — Many species prefer pollen from somewhat unrelated individuals over their own or their siblings’ pollen. If you find that your plum or viburnum sets small quantities of fruit, try planting another individual from a different source.
- **Cope with youthful gender confusion** — Certain clonally propagated dioecious shrubs such as *Ilex verticillata*, winterberry holly, are labeled as either male or female, but as often as not, dioecious species grown from seed will not be mature enough at time of purchase to identify by sex. This is a common problem with species like spicebush or bayberry. If you do happen upon them in flower, the male plants typically have three or more grainy yellow anthers circling inside the petals, while the females have one prominent, often whitish, postil tipped with sticky stigma in the flower’s center. When in doubt, plant three to four seedlings to increase the odds of having both sexes. There is no hard and fast rule as to how close together insect-pollinated plants, or for that matter wind-pollinated males and females, need to be for effective pollination, but we consider within 50-100 feet to be safe.

SOME SELF-INCOMPATIBLE GENERA AND FAMILIES

Asteraceae, including many of the cultivated wildflowers such as *Symphotrichum*, *Eurybia*, *Helianthus*, *Eupatorium*, *Echinacea*, and *Rudbeckia*
 Some Boraginaceae
 Most Brassicaceae
 Campanulas and many Campanulaceae
 Ericaceae, including *Rhododendron* and *Vaccinium*
 Some Fabaceae, e.g., *Trifolium*
 Some Liliaceae
 Lonicera
 Oenothera and other Onagraceae
 Many Poaceae (grasses)
 Primulaceae
 Some Ranunculaceae
 Many Rosaceae, including *Malus* and *Prunus*
 Castanea and other Fagaceae
 Some Solanaceae, including *Lycopersicum* and *Nicotiana*
 Viburnum

- **Mix it up** — Information about self-incompatibility is sparse for non-economically important plants, but it is a very common strategy to prevent self-fertilization. Therefore, try to plant at least two to three genetically different plants (i.e., not clones) in proximity.
- **Go a little crazy** — If you have a mixed planting with several closely related, self-incompatible species such as *Echinaceas*, coneflowers, the high likelihood of hybridization means that seed collected from the mixed planting will not be true to type. You will want to avoid this if you are growing seed for restoration or wish to propagate true species. But if your goal is to experiment, hybridization can result in some interesting combinations.
- **Sometimes it's just for fun** — Flowers such as *Trillium grandiflorum* 'Multiplex' that are fully double (all their sexual parts grow to be petals instead of pistils and stamens) cannot set seed

or produce pollen. They may produce nectar, and they are often beautiful to us, but they are useless as far as the plant is concerned.



Echinacea paradoxa, Yellow Purple Coneflower, is a self-incompatible native perennial.
Photo taken from <http://garden.virtualindustry.org>

So what is the answer to our original question: “Do I need more than one of these plants to get fruits or seeds?” As we’ve seen, variety is literally the spice of life for most plants. Though we may be accused of cliché—or a shameless attempt to pump up nursery sales—it takes at least two to tango. So, to be on the safe side, plant at least three!

Reprinted from *New England Wild Flower*, the Journal of the New England Wild Flower Society, Fall/Winter 2005, Vol 9, No 2.

Folklore:

Ohio's Native Wild Onions

By Guy Denny



Wild leek or ramps,
Allium tricoccum, flower

Wildflower books usually call them wild leeks as do most “flatlanders” like myself. However, to any West Virginian worth his salt, they are ramps! This is the most sought after of all our native wild onions. In the “wild and wonderful mountain state,” ramp festivals are a long established tradition in Appalachian Mountain culture.

Native American Indians and the European settlers who followed used the onion-scented leaves and bulbs as a seasoning, made soups from them, and, for those hardy individuals strong of palette and weak of nose, ate them raw. Some Indian tribes, such as the Cherokees, also used these and other wild onions for medicinal purposes. Nodding wild onion leaves were eaten to treat colds, and juice from the crushed bulbs was used in the treatment of earache and insect stings.

Wild leek or ramps, *Allium tricoccum*, can be found growing in moist, rich forest soils throughout Ohio. The conspicuous, lily-of-the-valley-like leaves are among the first wildflower leaves to make an appearance in early April, often forming large colonies carpeting the forest floor. However, this species has the curious habit of not blooming until July after the leaves have withered away. Only then does its leafless

flower stalk or scape emerge. The naked scape is about 6-12" tall and terminates in a hemispherical cluster or umbel of numerous greenish-white flowers. Eventually each flower in the umbel is replaced by a papery capsule containing three shiny black seeds, which look just like buckshot. The specific name *tricoccum* means "three-seeded." The Latin name *Allium* is the ancient name for garlic.

Actually, we have two distinctive varieties of wild leeks in Ohio. The more typical is *A. tricoccum* var. *tricoccum*. It is larger, has broader leaves, red pigmentation on its petioles and appears early in spring. The smaller variety, *A. tricoccum* var. *burdeckii*, has conspicuously narrower leaves, no red pigmentation, and emerges later in spring but flowers in June instead of July. This latter variety was named in honor of Dr. J. H. Burdick, who in 1877 was the first botanist to notice and describe these variations in the species.

Wild leek is one of three species of wild onions native to Ohio. The other two species also have edible bulbs and leaves, which are used for seasoning in soups and salads and eaten raw. Like wild leek, wild garlic, *A. Canadensis*, is common and widespread

throughout the state. It is a species of flood-plains and meadows. In addition to its strong oniony odor, it can be recognized by its long, narrow, grass-like leaves and by the onion-like bulblets which often replace the flowers at the top of the scape. It might be confused with field garlic, *A. vineae*, an invasive, wide-spread weed species of onion introduced from Europe which also has bulblets. The big difference between the two is that the grass-like leaves of field garlic are round and hollow while those of our native wild garlic are flat and solid.

The third species native to Ohio is nodding wild onion, *A. cernuum*. Its nodding flower head, comprised of a cluster of numerous pinkish-white flowers, makes it the most attractive of all the wild onions native to Ohio. All parts of this species also possess the odor of onion. Nodding wild onion is primarily a prairie species which occurs across the Great Plains west to the foot of the Rocky Mountains. In Ohio it can be seen in dry prairies and prairie fens, where it often grows in abundance.

Nodding wild onion is especially common around the shores of southern Lake Michigan.

It has been reported that the French explorer LaSalle, wrote the

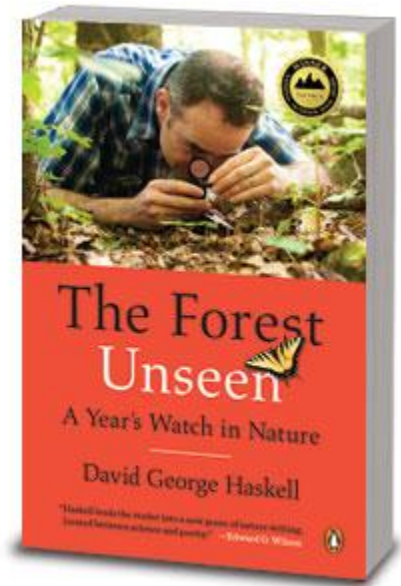


Nodding Wild Onion, *A. cernuum*
www.missouribotanicalgarden.org

Algonquian Indian name for this plant, *Chigagon*, on an early map of the southwest shore of Lake Michigan. This Indian name means "skunk place" and referred to the pungent aroma generated while walking across these wet prairies trampling wild onions along the way. The Europeans who later established a thriving settlement on this site continued to use the Indian name "*Chigagon*" for their settlement. In making the Indian name easier for them to pronounce, however, they corrupted it into the name of a city we know today as "Chicago."



Newly emerging leaves, Wild Leek or Ramps, *Allium tricoccum*
 Photo taken from davesgarden.com

Book Review:**The Forest Unseen****By David George Haskell****Publisher:** Penguin Publishing Group, 2013**Pages:** 288 pages**ISBN-10:** 067002337X**ISBN-13:** 9780143122944**Paperback, Kindle, and used books****Price:** \$6.50 to \$12.65 (price varies)**Size:** 5 × 7.8"

Over the course of a year, University of the South biology professor Haskell makes frequent pilgrimages to a meter-wide spot along a slope in an old-growth Tennessee forest. During his visits, he peeks beneath the leaf litter, shivers at the howls of coyotes, and watches the light change as he gazes up at the green canopy of July or November's bare twigs. Turning the patch of forest into his own natural laboratory, he reveals the science behind these moments of beauty, delighting in the resourcefulness of spring wildflowers and musing on the ecological partnerships that sustain lichens and other creatures. Throughout, Haskell shows the complexity and interdependence of the natural world, in which even the golf balls thwacked from a nearby green play a role. The Buddhist art of the mandala becomes a central reference point for the project, which contemplates the importance of close observation of the world around us. In the end, Haskell finds that even this tiny scrap of woods contains a teeming soup of life beyond the comprehension of our limited human senses. Yet for him, this awareness of his own "ignorance" is a joyful one, the web of life for him transcendently tangled. This informative and inspiring meditation will give curious readers a few new things to pay attention to when walking through the woods.

Review by Publishers Weekly, found on the www.barnesandnoble.com.

In addition to his review from Publisher's Weekly, the On The Fringe editors would like to give the perspective of Dot Simonds, a member of our Society. Here are her thoughts:

Do you love the woods in all seasons? This is a good read and adds to your pleasure seeing the world at your feet. The author observed his mandala circle in a patch of old-growth forest for a year-round study of changes in "Forest Unseen."

Each short chapter in the book is filled with life's renewal. The author explains the specific changes in the sight of insects helping each other survive sometimes in dreadful ways, morning birds with their songs of joy, first blossoms in pretty dresses flirting with bees looking for nectar and pollinating in exchange. He explains the science that binds together the tiniest microbes to larger mammals.

Month by month, life changes in the mandala to protect and preserve the next generation. Summer winds bid farewell as the mandala circle prepares the long wait for the next season.

Not only instructive, the author writes with poetic description, sometimes gentle humor, a little quirky like Thoreau.

Easy reading, a new book at the library.

Review by Dot Simonds, a member of the Native Plant Society of Northeastern Ohio.

Types of Ohio Wetlands Part I

By Ray Stewart



Wetlands are found around the world wherever there are bodies of water. Coastlines that have not been altered by human development often have a transition zone between open water and upland that is inundated much of the time or has saturated soils. Ocean shores have a variety of wetlands that are adapted to regular tidal pulses and to salt water. Mangroves in tropical areas fill these niches and provide many benefits where they reduce the impact of storms and provide habitat to fish and birds. Inland, freshwater wetlands have neither of these influences and may appear away from or along with lakes and rivers.

Wetlands are sometimes thought to be a mere transition zone between water and land. Wetland habitats, however, have characters of their own that are quite distinct from uplands, lakes and other habitats that are found adjacent to the wetlands. There are many definitions for wetlands but certain characteristics are universal. Wetlands experience frequent high water levels with soils that have developed in the presence of water, and are distinct from those soils that are well aerated. As a result, wetlands support plant communities that tolerate or even require the moisture and low oxygen conditions that exist in them.

Ohio has a diverse landscape that stretches from the Ohio River to the south up to Lake Erie in the north. We have the Allegheny plateau in the east and the vast flat remnants of the Great Black Swamp in the northwest. The Appalachian foothills of the Hocking Hills region in Ohio's southwest provide high relief and drainage. The Southeast has the long Miami Valley that cuts through a geologic bedrock called the Cincinnati arch. All of this is profoundly affected by the glaciation that gouged out the great lakes, changed the course of the Maumee River and established the Ohio River

valley as the new route for waters leaving Pennsylvania on their way to the Gulf of Mexico. These glaciers draped across the northern and western counties of Ohio smoothing the topography and leaving deposits that contribute to the diversity of wetlands throughout the state. These descriptions of wetland types in Ohio will look at the variations of hydrology (water characteristics), landscape and plant communities that distinguish the various forms of wetlands supported in Ohio. The first of this series will describe a specific kind of wetland known as a marsh. In common or regional usage, these areas may go by many different names which according Merriam-Webster Dictionary include; bog, fen, marsh, marshland, mire, moor, morass, muskeg, slough (also slew or slue), swamp and wash.

Marsh

Marshes are possibly the most beloved of all wetlands. They have a broad vista, often extending out to open waters. They are busy and vibrant places populated by an intriguing variety of birds that are marsh dependent. Herons and egrets wade in the shallow waters, while ducks seasonally descend in epic numbers. Plants grow from spongy bottoms, some remain submerged, while others like the white water lily float at the surface. Others, including pickerel weed and cattail are emergent, rising above the surface, providing seclusion for secretive birds and insects. Possibly one of the most productive ecosystems on the planet, marshes convert the essential elements of water, mineral and sunlight into living tissue at a higher rate than a mature forest or prairie. Fish often use the submerged complexity as nurseries where the many layers of vegetation provide refuge and nutrition.



Meadowbrook Marsh Marblehead Ohio

Photo taken from

<http://jimmacormac.blogspot.com/2012/08/rare-plant-found-at-meadowbrook-marsh.html>

Great Lakes Coastal Marsh

Along Lake Erie, marshes were once extensive. Before settlement most river mouths were hosts to marshes and estuaries, waters that were sometimes river influences and sometimes lake influences. These embayments were sometimes cut off from the lake by

drifting beach sand. Especially in the western basin, from about Sandusky westward the coastline is so shallow that wind-related seiches once flooded far inland. Extensive marshes merged gradually into vast slowly drained swamp forests. As cities and industry became established in the 19th century, successful and wealthy sportsmen established many shooting clubs in this area for recreation based on the superabundance of waterfowl. The extensive protected habitat we find today in this region, both public and private, is a legacy of that era and interest. Ottawa National Wildlife Refuge and Magee Marsh are examples of now public assets. Winous Point on Muddy Creek Bay in Sandusky Bay is the premier private marsh in this region.

These wetland habitats are largely managed for waterfowl in the interest of duck hunters. Without the sportsman, it is unlikely that so much wetland habitat would have survived. These same areas are home to many of our endangered and threatened species. Birding, a passive leisure activity, contributes millions of dollars to the local economy. The spectacle of bird diversity brings people from all of the world to witness bird migration where western Lake Erie marsh land provides superior stopover habitat.



Pontederia cordata L., Pickerelweed
Photo taken from <http://plants.usda.gov/>

Reprinted from the Ohio Wetlands Association newsletter, October 2015.

This is part one of a two-part series. The second part, describing wet meadows, bogs, and fens, appears next.

~The OTF Editors

Types of Ohio Wetlands Part II Wet Meadows, Fens, and Bogs

By Ray Stewart and Mick Micacchion



Silver Lake Fen

While marshes often occur at the perimeter of larger bodies of water, or in extreme headwater locations, other wetland types are frequently surrounded by dry land. Consider wet meadows and fens whose waters arise from underground. Ground water may be deep in some areas, accessible only to deeply rooted plants or by digging wells. In some areas, unusual geologic formations and the contours of the landscape conspire to intercept and expose that water to the surface.

Wet meadows may have formed naturally at the elevation of nearby bodies of water or in depressions. They could also form in land that has been cleared of forest and when found too wet to plow were turned into pastures. Along with grasses wet meadows can include a variety of rushes and sedges or flowering plants like sweet flags, *Acorus americanus*. Under constant grazing the soft rush, *Juncus effuses*, thrives and may move into dominance, being of no interest to cattle it can grow unchecked. Many wet meadows contain a diversity of herbs with flowering times dispersed throughout the growing season. The changing landscape provides abundant foraging for pollinating insects and a delightful turnover in color and texture throughout the year. Within this notion of wet meadows, there are many variations depending on the degree, depth and duration of water as well as their historic uses, disturbance and succession. Often a botanical delight, these meadows can contain many rare or limited range plant species along with more common flowers that display bold and colorful blooms. A healthy wet meadow often qualifies as a high quality wetland.

Fens also find their water from below. Though they receive rain water just as the rest of the landscape, they are largely dependent on groundwater. Often seen with

springs, fens can occur at the headwaters of streams. In Ohio, fens are often associated with porous limestone bedrock or are found where glacial deposits contain sand and gravel that allow an abundant and relatively rapid flow of water beneath the surface.

Minerals in the earth dissolve into the waters that feed fens. Often these are calcium rich and alkaline. The upland landscape is more likely to be slightly on the acid side of the pH scale. A confusing overlap of wetland types can sometimes occur where an acidic bog is next to a fen. Moreover, plant communities may develop that release acidic by-products into otherwise alkaline waters. For those who hope to distinguish among these wetlands that may have characteristics somewhere along a pH gradient, three distinctions are made. A rich fen ranks higher on the pH scale, being are roughly neutral to alkaline, 7.0 on the pH scale or above. A medium fen would be slightly acidic placing it at a pH from about 5.0 to 6.0. A poor fen has a low pH, in the range of 3.5 to 5. This low (acidic) pH is more characteristic of a bog. Though the chemical and botanical lines can blur between bogs and fens, the hydrology is the salient distinguishing feature. Bogs are mostly supplied from above by rain water and tend to be closed hydrologic systems, leading to their acidity. Fens are supplemented with mineral rich water from below, which reaches the surface, or near surface, and then flows through the fen and along the contours of the landscape, discharging to a stream, lake, or other wetland within the local watershed.

Reprinted from the Ohio Wetlands Association newsletter, December 2015.

This is part two of a two-part series.

~The OTF Editors

Winous Point Marsh Conservancy

By Ray Stewart

Since the very earliest days of settlement, the marshes in and around Sandusky Bay have been appreciated for their abundant and diverse wildlife. Flocks were so dense that some very hardy market hunters were able to take dozens of ducks in a single shot. They worked year around providing food for a growing population. Others visited, shooting duck for sport, recreation and the comradery of their peers. In 1856, the Winous Point Shooting Club (WPSC) was founded on the north shore of Muddy Creek Bay, a shallow extension of Sandusky Bay. Although not the first such club, it is today the longest continuously operated private shooting club in the United States.

WPMC is at the forefront of invasive species management working with 19 partners focusing mostly on Phragmites.

The sportsmen of Winous Point were also naturalists and included the founders of the Cleveland Museum of Natural History (CMNH), a close association that continues to this day. By the late 19th century, settlement in NW Ohio had increased dramatically. Land was cleared, wildlife was harvested, wetlands were

drained, and exotic species were introduced, including the common carp. The numbers and variety of ducks visiting Muddy Creek Bay declined significantly. Suitable waterfowl habitat had shrunk in size, and remaining marshes declined in quality due to siltation from upstream land clearing and from the destructive behavior of carp pulling up marsh plants and churning up sediments from below. The vast Lake Erie marshes no longer supported wild rice, wild celery, American lotus and the emergent plants that provided breeding and stopover habitat for birds. Fluctuating lake levels contributed to the loss of coastal wetlands and made the future of marsh-dependent wildlife populations uncertain.

The men of WPSC were determined to apply their considerable scientific acuity, political influence and financial resources to correct the situation. Dikes were constructed to manage water levels. Club rules were imposed to restrict duck hunting within a reduced non-breeding season. Policies were established by the state legislature, and wildlife management became the law of the land. Their pioneering efforts influenced law and practice across the region. In 1946, and ever since, the manager of WPSC has been a wildlife biologist. The first was Frosty Anderson, recommended by Aldo Leopold, author of *A Sand County Almanac*. Since then there have been more than fifty graduate student research projects conducted at or vitally assisted by Winous Point.

For over 160 years the caretakers of Winous Point have had an ethic of preservation. In 1999, they took their ethic to new levels. The non-profit Winous Point Marsh Conservancy (WPMC) was founded as the managing unit for the property and with a mission “to protect, restore, enhance, and wisely manage coastal wetlands and watersheds in southwest Lake Erie.” Most of the marsh is now owned by the WPMC. While WPSC still exists, it is only active to support its members during duck season. The most significant activities at Winous Point are now conservation, research and education.

Along with the management changes, there were physical changes made as well. The clubhouse redesign incorporated these same expanded values. The 19th century clubhouse structure had seen many hard times exposed to



extreme weather conditions on the marsh as well as the test of time. The current clubhouse was designed with broader purposes in mind. The new building design expanded the capabilities of the conservancy to do research and education with expanded office space, a historical museum and a classroom, in addition to the traditional accommodations for club members. The classroom is used all the time by various groups for lectures, meetings, and symposia. It has proven to be very successful in playing a catalytic role in raising awareness of conservation management. Chace Anderson, who chairs the WPMC as well as the board of directors at the CMNH, stated that the research

is now regional because the Marsh ecosystem is regional. The Conservancy partners with the other big interests in the area like Ottawa National Wildlife Refuge and Ducks Unlimited. Mr. Anderson says that it is most gratifying to see growth at WPMC in education and research. At the same time the Marsh conservation acreage continues to expand.

A recent acquisition is known as the Metzger Farm, which has been restored to marsh. Another property known as Horseshoe Marsh has undergone a major restoration. Still another project filters water out of the watershed by reconnecting 1500 acres of diked wetlands to drainage ways coming from 2000 acres of farmland, thus improving water quality and flood control in the watershed.

The operations at WPMC are headed by John Simpson and two full time employees. There is usually a complement of interns, graduate students and researchers. Some of the research includes bird banding. The Ohio Wetlands Association visited Winous in 2013 when Keith Norris was banding and monitoring shore birds. In 2015, we were fortunate to show up just as a King Rail was removed from a trap and fixed with a radio transmitter.

WPMC is at the forefront of invasive species management, working with 19 partners focusing mostly on *Phragmites*. John Simpson is a key player in the Lake Erie Cooperative Weed Management Area (CWMA) that included 5,200 acres along the US coast of the western basin last year. Beyond invasive species WPMC is active with the Lake Erie Marsh Management Association, which is enhancing best management practices regionally. Anderson says that John is “a soft spoken pied piper, able to bring people together, quietly mobilizing people to get things done.”



For over 160 years the caretakers of Winous Point have had an ethic of preservation. In 1999 they took their ethic to new levels.

Reprinted from the Ohio Wetlands Association newsletter, October 2015.



Photo taken from <http://burdzbuttz.blogspot.com>

Invasive Plant:**Bird's-Foot Trefoil, *Lotus corniculatus* L.**

COMMON NAMES: birdfoot deervetch, bird's-foot trefoil, bloomfell, cat's clover, crowtoes, ground honeysuckle

NATIVE ORIGIN: Europe

DESCRIPTION:

A perennial, fine-stemmed, leafy legume, pea family, *Fabaceae*, that grows 6-24 inches in height. Erect stems are nearly square, emerge from a single root crown and have many branches that can become tangled and matted. Clover-like leaves are pinnately compound, alternate, and consist of three oval leaflets and two smaller leaflet-like stipules that grow at the base of the leaf stalk. Flowers are bright yellow, sometimes streaked with red, ½ inch long, born in flat-topped clusters of three to six at the end of stems, and bloom from June to frost. Clusters of slender brown to black seed pods are cylindrical, resemble a bird's foot, and contain 10-20 seeds that eject when mature. The deep, branched root system has a 3-foot long taproot and secondary roots from rhizomes. It reproduces by seed, rhizomes and above ground runners that form fibrous mats.

**HABITAT:**

It is located in roadsides, waste areas, fields, prairies, wildlife openings, and open disturbed areas. It tolerates a variety of soil types including dry, moist, hardpan or droughty soils. It is a common lawn weed in western NY.

DISTRIBUTION:

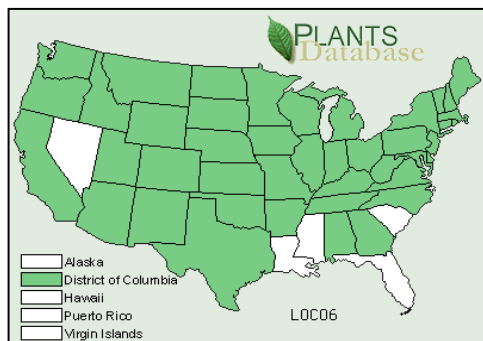
This species is reported from states shaded on Plants Database map below. It is reported invasive in CA, IL, MN, MO, OR, TN, VA, WA, and WI.

ECOLOGICAL IMPACTS:

Bird's-foot trefoil creates tangled mats of dense growth that can choke out other plants. It spreads to threaten the diversity of native plants.

USES:

Erosion control: Birdsfoot trefoil is used along roadsides to control wind and water erosion.



Wildlife: As ground cover, it provides green cover most of the year and blooms profusely. It is used for pheasant cover on shooting preserves and around ponds at duck clubs.

Livestock: This species is used for green chop, hay and pasture. It is seeded in combination with grass and grazed as a non-bloating legume. It yields 4 tons of hay per acre on deep, well-drained soils receiving irrigation or adequate rainfall. As a dryland pasture legume, birdsfoot trefoil produces 20% more growth after July 1 than most dryland grass legume mixtures.

Photo taken from <http://www.invasive.org/weedcd/species/5949.htm>

Information taken from the USDA Forest Service, Forest Health Staff, Newtown Square, Invasive Plants website (http://www.na.fs.fed.us/fhp/invasive_plants) and plants.usda.gov/factsheet. References were omitted.

Beautiful Plants for Rain Gardens and Damp Spots

By Lori Athey



Urban rain garden in Wilmington

Do you have a spot in your garden that stays wet for 3 to 36 hours after a rainstorm? Maybe you have a rain garden, designed to capture and purify water runoff, or perhaps you live along a stream or floodplain. Lucky you! You can grow a host of native plants that the rest of us would need to pamper. Due to Delaware's location along the coastal plain of the eastern seaboard, we are blessed with many different types of wetlands and many excellent plants from which to choose. Here are just a few.

You may already know about the River Birch, *Betula nigra*, with its peeling salmon colored bark, or the Red Maple's, *Acer rubrum*, stunning fall color. But have you considered Blackgum, *Nyssa sylvatica*, which produces berries for early migrating birds and rivals the Red Maple with its reddish-purple fall color? For those with less space, try the Sweetbay Magnolia or the Pawpaw. Sweetbay Magnolia, *Magnolia virginiana*, grows 15 to 25 feet tall and displays

fragrant white flowers during May and June. The immature fruit looks like a small pickle, gradually turns pink, then splits to reveal red seeds relished by the birds. Plant this small tree near an open window or patio where you can enjoy its fragrance. The Pawpaw, *Asimina triloba*, is the primary larval food source of the rare Zebra Swallowtail butterfly. It grows 15 to 20 feet tall in full sun, but may become a shrub in shady locations. It has large, tropical-looking leaves and its fruit, eaten by people and wildlife, tastes a bit like banana.

Popular shrubs for wet spots include Winterberry, *Ilex verticillata*, Inkberry, *Ilex glabra*, and Buttonbush, *Cephalanthus occidentalis*. Also consider Swamp Azalea, *Rhododendron viscosum*, Virginia Sweetspire, *Itea virginica*, and Possumhaw, *Viburnum nudum*. Swamp Azalea grows approximately 7 feet tall by 5 feet wide, with fragrant white flowers in June. Virginia Sweetspire grows about 5 feet tall, is adaptable to almost any location, and is ornamental in 3 seasons. After the blood-red fall foliage drops, the exposed deep maroon twigs provide winter interest. In the spring this small plant is covered with frothy white flowers on weeping racemes. Possumhaw grows to about 8 feet in height. It has lustrous deep green leaves turning a nice burgundy color in fall. With a nearby pollinator, the lacy white spring flowers transform into pink berries during the summer, eventually becoming blue then black before the birds eat them.

Good herbaceous plants for damp spots include Blue Flag Iris, *Iris versicolor*, Swamp Rose Mallow, *Hibiscus moscheutos*, and Cardinal Flower, *Lobelia cardinalis*. Other perennials include the Joe-Pye Weeds, *Eutrochium* Raf., Turtleheads, *Chelone L.*, and Marsh Ladies Tresses, *Spiranthes odorata*. The different species of Joe-Pye Weed grow from between 2-7 feet tall with pink/mauve flowers from mid-July through mid-September. Preferring full sun, they attract many species of butterflies including swallowtails and monarchs. The two species of Turtlehead have pink or white flowers from mid-August to mid-October with



Virginia Sweetspire, *Itea virginica*
Photo taken from Gopixpic.com



Lobelia cardinalis Cardinal

Photo taken from <http://pinterest.com/pin/>

deep green foliage. Marsh Ladies Tresses is a hardy orchid and happiest in shade. Plant this where you can see its delicate white spires in September and October, which rise above glossy green basal leaves.

Finally, don't forget the fern family. Several that will reward you include the Ostrich Fern, *Matteuccia struthiopteris*, Royal Fern, *Osmunda regalis*, and Cinnamon Fern, *Osmundastrum cinnamomea*.

The plants described in this article thrive with plenty of water. One way to easily ensure proper watering is to collect it from your roof into a rain barrel and attach a hose that leads into your garden. Using rain barrels also helps to ensure plenty of available water during drought seasons, helps the environment by reducing storm water runoff, and saves money over time. Rain barrels are especially effective when funneling into a rain garden or low area that collects and absorbs water slowly. For more information about the benefits of rain gardens and how to install one on your property visit www.raingardensforthebays.org.

Lori Athey is a Backyard Habitat Coordinator at Delaware Native Plant Society.

Reprinted from *The Turk's Cap*, the newsletter of the Delaware Native Plant Society, Summer 2015, Vol 18, No 2.

National Pollinator Week is June 20 – 26, 2016

The Waggle Dance

The Waggle Dance is a term used in beekeeping and ethology for a particular 'figure-eight dance' of the honey bee. By performing this dance, successful foragers can share, with other members of the colony, information about the direction and distance to patches of flowers yielding nectar and pollen, to water sources, or to new nest-site locations. Austrian ethologist and Nobel laureate Karl von Frisch was one of the first who translated the meaning of the waggle dance.

A waggle dance is made up of one to 100 or more circuits. Each circuit has two phases. These phases are the waggle phase and the return phase. When a bee returns to the hive after finding a good food source, it performs the dance. The bee will run through a small wave-like pattern called a waggle run or waggle phase. After this, it will turn to the right and circle back to the starting point (the return phase). It will then do another waggle run and then turn to the left and circle back to the beginning. The waggle phase of the dance is the most notable and informative part of the dance.

The direction and duration of waggle runs show the direction and distance to flowers. Flowers that are located directly in line with the sun are shown by waggle runs in an upward direction on the vertical combs. If the flowers are at an angle to the right or left of the sun, the waggle run is done at the same angle to the upward direction. The distance between hive and flowers is shown in the duration of the waggle runs. The farther the flowers are from the hive, the longer the waggle phase. For every 100 meters the flowers are distant from the hive, the waggle phase lasts about 75 milliseconds.

How can honeybees communicate the locations of new food sources? By pairing the direction of the sun with the flow of gravity, honeybees are able to explain the distant locations of food by dancing. "The Waggle Dance of the Honeybee" details the design of Von Frisch's famous experiment and explains the precise grammar of the honeybees' dance. Watch the video, "The Waggle Dance of the Honeybee", put out by Georgia Tech College of Computing at: www.youtube.com. <https://youtu.be/bFDGPgXtK-U>.

Information taken from <https://simple.wikipedia.org/> and <https://youtu.be/bFDGPgXtK-U>.

Interesting Factoid:**“Leaves of Three, Leave Them Be”**

Poison ivy is the ultimate weed that no one wants. *Toxicodendron radicans*, commonly known as poison ivy, is a poisonous North American flowering plant that is well known for causing an itching, irritating, and sometimes painful rash in most people who touch it. *Toxicodendron* comes from the Greek words *toxico* (poisonous) and *dendron* (tree or plant).

It is native throughout the United States in a large variety of locations including dry or wet woodlands, thickets, valleys, clearings, fencerows, roadsides and waste ground. It primarily appears as a bushy, erect or trailing shrub or as a woody climbing vine. All parts of the plant contain a toxic plant oil called urushiol (you-ROO-she-all), which can cause significant and long-lasting skin irritations (allergic dermatitis) in most human beings. Infection can occur from direct contact with the plant, indirect contact (e.g., dog, rake or shoes) or from breathing smoke from a fire of plant material. Some humans seem to be immune. The species is variable in its appearance and habit, and despite its common name, it is not a true ivy, *Hedera*.

The following three characteristics are sufficient to identify poison ivy in most situations: (a) clusters of three leaflets, (b) alternate leaf arrangement, and (c) lack of thorns. Although a number of other plants fit this simplified description, any plant with these criteria should be prudently avoided by people unfamiliar with identifying poison ivy. Identification by experienced people is often made difficult by leaf damage, leafless conditions during winter, and unusual growth forms due to environmental and/or genetic factors. The appearance of poison ivy can vary greatly between environments and even between individual specimens within a single area.

Interesting Facts:

- Urushiol is a transparent, non-volatile oleoresin, which turns into a brownish lacquer when oxidized; the non-volatile nature of urushiol allows it to adhere to objects such as skin, clothes, gloves, and animal fur.
- Urushiol is a persistent chemical and remains active at all times of the year. The poison remains active even after the plant is dead and can remain active for as long as a year.
- Urushiol is found in nearly all parts of the plant. It is produced in the plant's resin ducts and is produced year round. Urushiol is present in the leaves, stem, fruits, flowers and roots of the poison ivy and sumac plants. The leaves, especially young ones, contain the most toxin.
- The oil can remain on tool handles and clothing for as long as a year. Dogs and cats can carry its potency on their fur. This is why you can come down with a rash without having seen poison ivy in months.
- Never try to burn a poison ivy plant. Burning releases the toxin. The smoke can affect not only skin but also nasal passages, throat, and lungs.
- It only takes 1 nanogram (1 billionth of a gram) to cause an allergic reaction. A single pinhead can have enough urushiol to affect 500 people.
- While our planet is experiencing global warming, it is having an effect upon poison ivy. Increasing atmospheric CO₂ is enabling poison ivy to thrive, and the result is that these plants are producing a more toxic form of urushiol at higher rates. The potential impact this increase will have on humans, population sensitivity rates, and changes in effects is at present unknown.
- Did you know mangoes belong to the same plant family as poison ivy and that the skin of a mango can give you that same great contact dermatitis as if you played with poison ivy? Obviously people eat mangoes all the time. The edible portion isn't going to cause you problems. However, the vine of a mango contains sufficient urushiol to cause a reaction that rivals or exceeds that from poison ivy. The

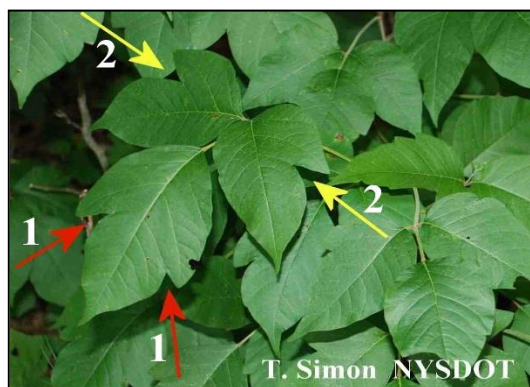


skin of the mango contains enough urushiol that if you are already sensitized to it, you will probably get contact dermatitis from exposure, usually on your hands, since most people don't bite into mangoes.

- Contrary to intuition and popular belief, however, scratching the blisters that form on skin does not spread the rash because the blisters themselves do not contain urushiol.
- What do you get when you cross poison-ivy with a 4-leaf clover? A rash of good luck!

A few native plants have some medicinal properties that may relieve some of the discomfort. Jewelweed, *Impatiens*, common witch hazel, *Hammamelis virginiana* L., and smooth solomon's seal, *Polygonatum biflorum* (Walter) Elliott, washes are effective. Poultices of the ragweeds, *Ambrosia* spp., or of the non-poisonous sumacs, *Rhus*, are also effective against this plant's discomfort. Jewelweed is also known as "touch-me-not." How appropriate!

This article was based on material taken from www.missouribotanicalgarden.org; theplantencyclopedia.org; www.wikipedia.com; www.almanac.com; www.dot.ny.gov/dangerous-plants/poison-ivy; *The Drunken Botanist* by Amy Stewart; and an article written by Gordon Mitchell, a member of the Native Plant Society of Northeastern Ohio.



Leaves can appear in many different forms. As shown above, the central leaf often has a notch on either side (red arrows numbered 1), while the two outside leaves are asymmetric, having a notch (yellow arrows numbered 2) on the side away from the central leaf. Note that the notches shown are larger than typical.

Sometimes, the leaves may have very small notches, as indicated by the blue arrows numbered 3, or may even have smooth edges. Sometimes, as indicated by the violet arrows numbered 4, the leaf margins may contain several notches. As indicated by the red arrow, numbered 5, young leaves often have a reddish tinge to them. Some very young leaves will be a dark reddish brown with just a hint of green. Note also that, in this sample, the bases of the leaves are close together. In the first image and the image below, note that there is a significant length of stem between the center and lateral leaves.

Humans Caused the Spread of Virus Harmful to Bees

The global spread of a virus that deforms the wings of honeybees and kills them in droves was caused by humans, new research has found.

According to the study published in *Science* in February 2016, the problem dates to the mid-20th century when Asian honeybees traded widely in the former Soviet Union were introduced to Europe and paired with honeybees there.

For centuries, Asian honeybees had learned to fend off a mite that used them as a host while feeding on their blood, but European honeybees did not recognize them as a pest.

To read the entire article, go to: www.isciencetimes.com/articles/6857/20140219/wild-bumblebees-deadly



Chapters of the Ohio Native Plant Society

The Native Plant Society of Northeastern Ohio

Kathryn Hanratty
PO Box 1064
Chardon OH 44024-9639
oldefarm@windstream.net
<http://www.nativeplantsocietyneo.org>

Cincinnati Wildflower Preservation Society

Christine Hadley, President
445 Ward-Koebel Road
Oregonia OH 45054
513-850-9585
cncywildflower.org
<http://www.CincyWildflower.org>

The Mohican Native Plant Society

Joanne Wrasse
1633 St.Rt.603
Ashland OH 44805
419-281-3690
jwrasse@zoominternet.net

The Botanizers

The Wilderness Center
Gordon T. Maupin
P.O. Box 202
9877 Alabama Ave. SW
Wilmot OH 44689-0202

MEMBERSHIP APPLICATION

Membership includes invitations to all field trips, programs, the Annual Meeting, and an online subscription to our quarterly journal, *On The Fringe*. Membership runs from January 1 to December 31.

NAME: _____
ADDRESS: _____
CITY: _____
STATE: _____ ZIP: _____
PHONE: (____) _____
E-MAIL: _____

(We will not sell or distribute contact information.)

Membership Types (circle type chosen):

Individual \$15; Family \$20;
Sustaining \$30; Patron \$50
Trillium Society \$100; Gentian Society \$200
Corporate Level \$250

☐ Check here and add \$10 to have a print edition of *On The Fringe* mailed to you.

Donations to the Endowment Fund to support the annual grant are always welcome.

The Annual Grant is offered for work in the field of botany or conservation that supports our mission and demonstrates excellence in research, conservation or education.

Make checks payable to:
The Native Plant Society of Northeastern Ohio
and mail to:

Jane McCullam
NPS Membership Chair
9880 Fairmount Rd.
Newbury, OH 44065-9712

RENEW NOW
Don't miss an issue of
ON THE FRINGE

*The Native Plant Society
of Northeastern Ohio
is a 501(c)(3) organization. Your donation is
tax deductible to the extent allowed by law.*

On The Fringe
8400 Top Rail Lane
Novelty, Ohio 44072

**DATED MAIL – DO NOT DELAY
RETURN SERVICE REQUESTED**



- Promote conservation of native plants and natural plant communities through habitat protection and other means
- Foster public knowledge and appreciation of native plants
- Support natural landscaping
- Raise awareness of the ethical issues regarding native plants
- Encourage surveys and research into native plant species and the publication of findings
- Promote cooperation with other programs and organizations concerned with the conservation of natural resources

On The Fringe

In this issue:

High Hopes for Fungi Sent to Space Station – Deborah Netburn
Sex in the Garden: It's Wilder Than You Think – William Cullina and
Greg Lowenberg
Folklore: Ohio's Native Wild Onions – Guy Denny
Book Review: The Forest Unseen – David George Haskell
Types of Ohio Wetlands Part I – Ray Stewart
Types of Ohio Wetlands Part II Wet Meadows, Fens, and Bogs – Ray Stewart
And Mick Micacchion
Winous Point Marsh Conservancy – Ray Stewart
Invasive Plant: Bird's-Foot Trefoil, *Lotus corniculatus* L.
Beautiful Plants for Rain Gardens and Damp Spots – Lori Athey
Website: The Waggle Dance
Interesting Factoid: "Leaves of Three, Leave Them Be" – Diane Christensen
Humans Caused the Spread of Virus Harmful to Bees

Journal
of
The Native Plant
Society of
Northeastern
Ohio

Volume 34, No. 2

June 2016