On The Fringe
Journal of the Native Plant Society of Northeastern Ohio

Note from the President

Hello Everyone,

I hope that you have had a lovely summer. As we move toward autumn, it seems a good time to talk about our year so far and the things that we look forward to for the rest of 2014.

Our new website has been a smashing success and continues to evolve, thanks to our Webmaster, Lisa Schlag. It is exciting to see each new addition and the number of people visiting the site. For those of you on Facebook, check out the Native Plant Society of Northeast Ohio Facebook page. I hope you will 'Like' our page!

Our *On the Fringe* Journal continues to be one of the best publications of its kind–thanks to the hard work and dedication of our Executive Editor, Diane Christensen, and Co-editors, Bill Oberdick and Jane McCullam. Did you know that the Journal is requested for their collections by libraries and museums as far away as England?

We have had a very well-rounded and well-attended group of walks and programs so far this year and will cap it off with some wonderful late summer, fall and early winter programs. We are always looking for new ideas for programs. If you have a suggestion for a speaker, walk or other program, please contact Judy Barnhart or me, and we will do our best to get it on the schedule for next year.

Our Annual Meeting and dinner will once again be held at the beautiful and elegant Pine Lake Trout Club, thanks to members Diane and Bill Christensen. We look forward to hearing from our guest speaker, Rick Gardner. In addition, the recipient of our Annual Grant will be present to discuss his project.

2014 is an election year for the Native Plant Society. We are hoping for many more people to step forward to become involved on the board. If you are interested in joining our board, please contact any board member for details.

Sincerely,

Kathy Hanratty, President

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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 Diane B. Christensen, 8400 Top Rail Lane, Novelty, OH 44072; 440-666-4870, dbpolice@roadrunner.com; or Bill Oberdick, 986 Bushwood Ln., Columbus, Ohio 43235-5016; 216-392-7027, bandbober@wowway.com.

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.

Program Schedule – Autumn 2014

Saturday, Sept. 20, 10:00 am - Noon – Lake Erie Bluffs, Lake Metroparks. Lake Metroparks biologist John Pogacnik will lead us on a tour of this nationally significant, successful modern conservation project. The 600-acre property includes wetland, meadow, and lakefront habitat used by rare and common plant and animal species. The mix of 40-foot high beach bluffs and open sandy and cobble beach across 9,000 feet of shoreline are the site's dominant features, largely unspoiled by previous development. The beach area hosts trees, shrubs, and small plants, including the majority of the park's rare plants. **Directions:** 2901 Clark Rd., Perry Township, OH 44081. Take Rt. 2 East to where it ends and becomes Route 20. Follow Route 20 to Blackmore Rd. Turn left (north) and follow Blackmore Rd. until it ends. Turn right (east) onto Clark Rd. Entrance to the park will be on the left (north). Call Kathy Hanratty at 440-477-5468 to register.

Saturday, Oct. 25, 10:00 am – Gott Fenn Stewardship Day, Portage County. Rick Gardner, ODNR Division of Natural Areas & Preserves Botanist, and preserve manager Adam Wohlover lead this trip to cut European buckthorn, which is invading the fen. 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 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. Registration required and limited due to fragile habitat. Call Judy to register at 440-564-9151 (H).

Annual Meeting of the Native Plant Society of Northeastern Ohio
Saturday, November 1, 2014
5:30 p.m. to 8:30 p.m.

Annual Meeting of the Native Plant Society of Northeastern Ohio will be at the Pine Lake Trout Club 17021 Chillicothe Rd., Chagrin Falls, OH 44023. Our guest speaker this year will be Chief Botanist of the Ohio Department of Natural Resources, Rick Gardner. An Ohio native, Rick has been a field botanist in Ohio for many years. He has a degree in Botany from Miami University. In 2011 he was a University Scholar at the Ohio State University Herbarium, studying the *Cyperaceae* (sedges) of Ohio. Rick will take us back in time when Ohio was a wild place with abundant wildlife, towering trees, miles of buffalo trails, salt licks, prairies, dark and dismal swamp forests, and reminders of past great cultures.

Ohio Natural Areas and Preserves Association Stewardship Opportunities
All start at 10:00 am
All Programs Require Pre-registration

Individuals wanting to participate should contact Guy Denny by phone (740) 694-6087 or by email (guydenny@centurylink.net) well in advance so he will know how many to expect.

Saturday Oct. 11, 2014 – Kent Bog: remove woody invasives.
Saturday Nov. 1, 2014 – Jackson Bog: remove woody invasives.

Geauga Park District Board Proposes Troubling Changes

Recent actions by the newly appointed Geauga County Park District board of directors that alter the "Statement of Purpose" of the park district pose a serious threat to conservation in Northeast Ohio. Geauga County is home to the headwaters of three rivers that flow to Lake Erie. Much of the land held in our parks is vital to the health of these headwaters. Our Geauga County Park District owns much of the land that protects and buffers these headwaters. Geauga County Park district was created to Conserve, Preserve and Protect the natural resources of the state. Conservation is the reason the state established County park districts. Recent Changes to the "Statement of Purpose" put recreational uses on par with conservation in the parks. Some of the "recreational" activities listed in the new park board's permitted activities list include (but not limited to): ATV use, Animal Propagation, Construction, Firearms Range, Firewood operations, Forestry Practices, Gas and Oil Drilling, Excavation and Earthwork, Snowmobiling, Splash Parks and Swimming Pools. Not only do many of the activities listed not fall within the scope of the original intent of the parks, many of these things are outright commercial uses of our public land. Many will require significant disruption to natural areas, compaction of native soils and disruption to natural habitat, putting at risk native plants and animals.

The proposed changes to the parks' "Statement of Purpose" have been made with no public notice or opportunity for public comment.

Kathy Hanratty,
President

Read more on this topic by going to this link to the minutes of the June 10, 2014 Geauga Park District Board of Commissioners meeting:
http://reservations.geaugaparkdistrict.org/documents/2014/June-10-2014-Board-Meeting-Minutes.pdf#search=

Wetland Indicator Status Rankings: What Do They Mean And Why Do We Care

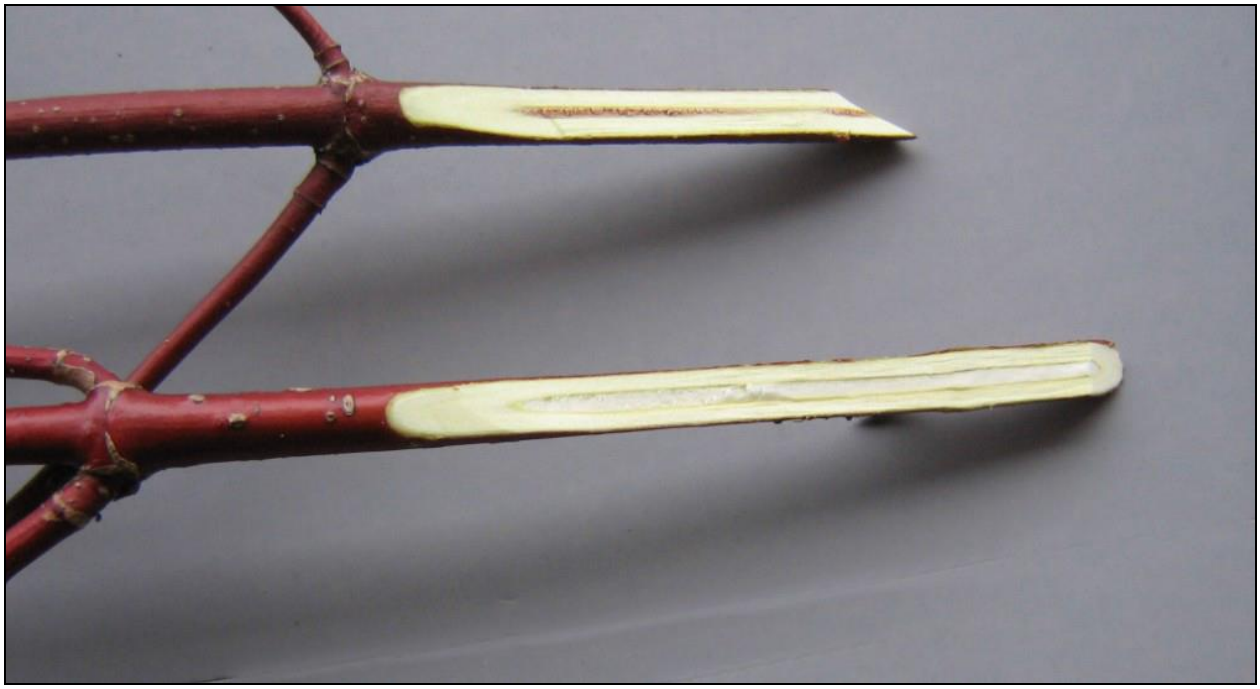
By Joseph M. McMullen

In the wetland science field, the limits of jurisdictional wetlands can be very important. One of the parameters used to define an area as wetland or upland is vegetation, particularly whether the dominant plants in the community are wetland or upland species. Anyone who has ever tried to determine whether an area is dominated by wetland or upland vegetation has toiled over the wetland indicator status rankings of plant species. What are these rankings and what do they mean?

Wetland indicator status rankings are a measure of a plant's fidelity or faithfulness to wetland or upland site conditions. A plant species is given a wetland indicator status ranking based on its affinity to wetlands or uplands. A species that is always or almost always found in wetlands is given a ranking of a wetland obligate (OBL). It is assigned to this category because it is considered to be obligated to occur in wetland areas. It has a great fidelity to wetlands; it seldom if ever strays into uplands.

Some examples of wetland obligates in our area are: cattails, *Typha spp*., skunk cabbage, *Symplocarpus foetidus*, marsh marigold, *Caltha palustris*, soft-stem bulrush, *Schoenoplectus tabernaemontani*, several important manna grass species, *Glyceria spp*., rice cut grass, *Leersia oryzoides*, buttonbush, *Cephalanthus occidentalis*, and leatherleaf, *Chamaedaphne calyculata*.

A plant species that is always or almost always found in uplands is designated in the indicator status of upland obligate (UPL). A good example in our area is maple-leaved viburnum, *Viburnum acerifolium*. It is a species whose roots would not tolerate venturing into the zone of frequent soil saturation. It would not grow in areas where water is close to the surface, but thrives in deep, well-drained soils free of the anaerobic (without oxygen) conditions found in water-logged soils. Upland obligate species favor areas where they can send their roots exploring deep into the soil and still find plenty of oxygen without dipping their fine hairs into an oxygen depleted zone caused by water saturation.



Our two red-stemmed dogwoods are both facultative wetland species FACW. They are distinguished by the color of the pith, with silky, *Cornus amomum,* being brown and red-osier, *C.sericea,* being white. Red-osier also exhibits larger lenticels.



Cypress knees, a good example of pneumatophores.

Between the indicator status categories of OBL and UPL, there is a large group of plants that occur in both wetland and upland conditions. The many plants that straddle wetland and upland situations are designated as facultative species. Within the broad facultative category there are three indicator status rankings, which are: facultative wetland (FACW), facultative (FAC), and facultative upland (FACU). Plants are designated in these categories depending upon their frequency of occurrence in wetland or upland conditions, that is, to what extent they are affiliated with wetlands or uplands.

A facultative wetland (FACW) designation means that a species is usually found in wetlands, but occasionally occurs in uplands. This is the more recent definition promoted by the National Panel in the update of the National Wetlands Plant List (Lichvar and Minkin 2008, Federal Register 2011), but I like the original definitions in the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and used by Reed (1988), which are based on a frequency of occurrence of a species in a wetland or an upland, i.e., how often you see a given species in a wetland or upland situation. Under these definitions, a FACW species occurs 67% to 99% of the time in wetlands, but could occur in uplands up to one-third (33%) of the time.

We have many good examples of FACW species in New York, including: American elm, *Ulmus americana*, silver maple, *Acer saccharinum*, black willow, *Salix nigra*, speckled alder, *Alnus incana*, steeplebush, *Spiraea tomentosa*, winterberry holly, *Ilex verticillata*, common reed grass, *Phragmites australis*, purple loosestrife, *Lythrum salicaria*, soft rush, *Juncus effusus*, and sensitive fern, *Onoclea sensibilis*.

The facultative (FAC) status ranking, which is what I would describe as "straight" FAC, means that a plant occurs with equal frequency in wetlands or uplands. Plants in this category are not faithful to wetlands or uplands, but can often be found in either area. Red maple, *Acer rubrum*, is probably the classic example of a straight FAC species. Red maple occurs in more states in the United States than any other tree species. Its broad geographical distribution is perhaps a result of its ability to grow in wet and dry site conditions, reflective of its FAC ranking. The only tree species in North America with a broader distribution than red maple is trembling aspen, *Populus tremuloides*, a FACU species. Other examples of FAC species include box elder, *Acer negundo*, balsam fir, *Abies balsamifera*, and nannyberry, *Viburnum lentago*.

Facultative upland (FACU) species are those considered to usually occur in uplands but occasionally are found in wetlands (Lichvar and Minkin 2008, Federal Register 2011), or as originally defined occur 67% to 99% of the time in uplands, but may be found up to 33% of the time in wetlands (Environmental Laboratory 1987). There are many FACU designated plants in New York, and probably a lot of them should be designated as UPL species.

Examples of FACU species are: black locust, *Robinia pseudoacacia*, sugar maple, *Acer saccharum*, blackberry, *Rubus allegheniensis*, Canada goldenrod, *Solidago canadensis*, tall goldenrod, *S. altissima*, sweet vernal grass, *Anthoxanthum odoratum*, leeks, *Allium tricoccum*, and garlic mustard, *Alliaria petiolata.*

It should be noted that indicator status rankings can vary for a given species by geographic region. A species may be FAC in one region, but FACU in another. This was recognized in the original rankings in Reed (1988), which were assigned by nine different regions in the United States. Many plant species, especially those with a broad distribution, occur in slightly different site conditions in different parts of their range. In the Appalachian uplands where I am from, black cherry, *Prunus serotina,* is a tall growing, majestic tree species of deep upland soils. But in Maine, I have seen it growing as a scrubby floodplain species. Many other species vary in their fidelity to wetlands or uplands in different parts of their range.

So why do some plant species tolerate wet conditions while others do not? A lot of the reason is related to the ability of a species to capture oxygen, especially the ability to move oxygen and other gases to their root system. A good review of the mechanisms involved in how water level changes affect plants is presented in Teskey and Hinckley (1977).

Oxygen is needed by the roots of plants. Water in the soil for an extended period forces the soil oxygen out and creates anaerobic conditions. This is why all the trees die when a new beaver dam results in the long term flooding of a forested area.



Pneumatophores on red mangrove photographed in Antigu

Plants that can survive growing in areas where water occurs must have mechanisms or structures to capture oxygen. The classic example of such a structure is a pneumatophore (literally meaning "to carry air"). Pneumatophores are best exemplified by cypress knees, which occur on bald cypress, *Taxodium distichum*, a southern, narrow-leaved deciduous tree species whose natural range extends north into Delaware. Cypress knees are woody projections that extend up vertically above the surface of the water from the underlying roots. Because the tops of these cypress knees are exposed to the air they can "carry air" back down into the roots under the water surface. (Actually, I think a better name for these projections would be cypress shins; if you have ever waded through a flooded bald cypress forest you end up constantly smacking your shins against these knees.)

Good examples of pneumatophores are also displayed by species of mangrove, especially black mangrove, *Avicennia germinans*, and red mangrove, *Rhizophora mangle*. Red mangrove is the species that you probably commonly associate with the intertidal areas of subtropical and tropical regions. Interestingly, mangrove thickets are the most important intertidal community in the world; in subtropical and tropical zones these thickets replace the intertidal Spartina marshes we find in our temperate zone.

The pneumatophores of mangroves are cigar-shaped structures that project up from the soil/substrate surface. During low water their exposed surfaces gather oxygen for the underlying roots. If you get a chance to visit these communities, you will find these upward projecting pneumatophores carpeting the ground.

In New York and the rest of the northeast we do not have a tree species that will tolerate extended periods of water inundation during the growing season. There is no companion species to bald cypress with pneumatophore capabilities in the northeast. In our area there are actually very few woody species that tolerate extended periods of inundation. One of our few good examples is buttonbush.

While we don't have many inundation-tolerant woody species in the northeast, we do have many wetland and floodplain species that have the ability to produce adventitious roots when wet conditions persist during the growing season, which helps these species to survive when flooding occurs.

Adventitious roots are different than pneumatophores in that they originate on the trunk or stem of a plant usually above the root system. Technically, true roots are produced from the meristematic (actively dividing) tissue called the pericycle. Roots not formed by the pericycle are called adventitious roots. These "water roots" develop on plant stems where roots are not normally found.



Adventitious roots on spotted jewelweed, *Impatiens capensis*, a facultative wetland plant.

When flooding or other wet conditions occur during the growing season and the roots are deprived of oxygen, some plant species can produce these adventitious roots. It is important to note that the presence of adventitious roots tells us that the water inundation occurred when the plant was active (i.e., during the growing season).

Most people think of willows, Salix spp., when it comes to woody species growing in wet conditions, and this group can produce adventitious roots, but there are many other species in our area that have this ability. Black ash, *Fraxinus nigra*, green ash, *Fraxinus pennsylvanica*, silver maple, *Acer saccharinum*, and even silky dogwood, *Cornus amomum*, can produce adventitious roots. In interior Alaska I have seen adventitious roots projecting out from the base of 3-foot diameter balsam poplar, *Populus balsamifera*. This ability helps these species survive in wet conditions; it broadens their fidelity range and extends their wetland indicator status ranking into wet situations.

Wetland obligates that grow in areas of constant water inundation, some of which grow submerged below the surface of the water, usually have other abilities to capture air in some way. Some have arenchymous tissue (spongy tissue with air passages) that traps air. Next time you are in a patch of soft-stem bulrush, take a look at a cross-section of one of the stems and note the air filled cavities within. This is arenchyma tissue that provides pathways for air to submerged portions of the plant, and this type of tissue is common in many wetland species.

When you are out in the field this summer, assess what plant species you see growing in wetlands or upland conditions. Make a note of what wetland indicator status ranking you would place these species in and compare them to the existing or proposed rankings. It is an interesting exercise.

The current indicator status rankings of plants are being revised. Lichvar and Minkin (2008) explain the concepts of the changes, and Federal Register (2011) explains the process. If you are interested in the currently proposed changes, just go to: https://rsgis.crrel.usace.mil/apex/f?p=703.

Joseph M. McMullen is with Terrestrial Environmental Specialists, Inc.

Reprinted from the New York Flora Association quarterly newsletter. Winter 2012, Vol 23, No 1. The full citations of the references in the text have been omitted here, but can be found in the original article at: http://www.nyflora.org/files/9013/6672/0442/2012_-_Vol._23_2_errata.pdf.

Bring Back the Monarchs



There is a threat to the monarch butterfly migration—one of the largest of its kind in the world, stretching from central Mexico to southern Canada. This threat is a clarion call to restore native plants and ecosystems. Only 3% of the original tall grass prairie remains, so each backyard must become a 21st century wildlife refuge. Learn about the monarch, its migration and preferred host nectar plants, and what you can do to ensure its survival.

Help bring the monarchs back by:

- Planting native milkweed in your yard and encouraging local government to plant it in parks.
- Joining programs to monitor monarch butterfly movements and presence in your area. Visit the North American Butterfly Association website, naba.org, for details about getting involved.
- Writing local and state legislatures to encourage them to include milkweed among the plants that are seeded along highway roadsides, especially those that follow monarch migratory routes. Get involved in pushing legislatures to set aside larger tracts for milkweed.

There are a number of websites devoted to making milkweed more readily available. Here's one online source listing six nurseries in Ohio as well as where you can get free seeds: http://Livemonarch.com.

This article is based on material taken from *The Turk's Cap*, The Newsletter of the Delaware Native Plant Society, Fall 2013, Vol 16 No 3; *Monarch Butterflies: The Last Migration* by Benjamin Vogt; and the website listed above.

Distinguishing Between Grasses, Sedges and Rushes

Adapted from Royal BC Museum of British Columbia

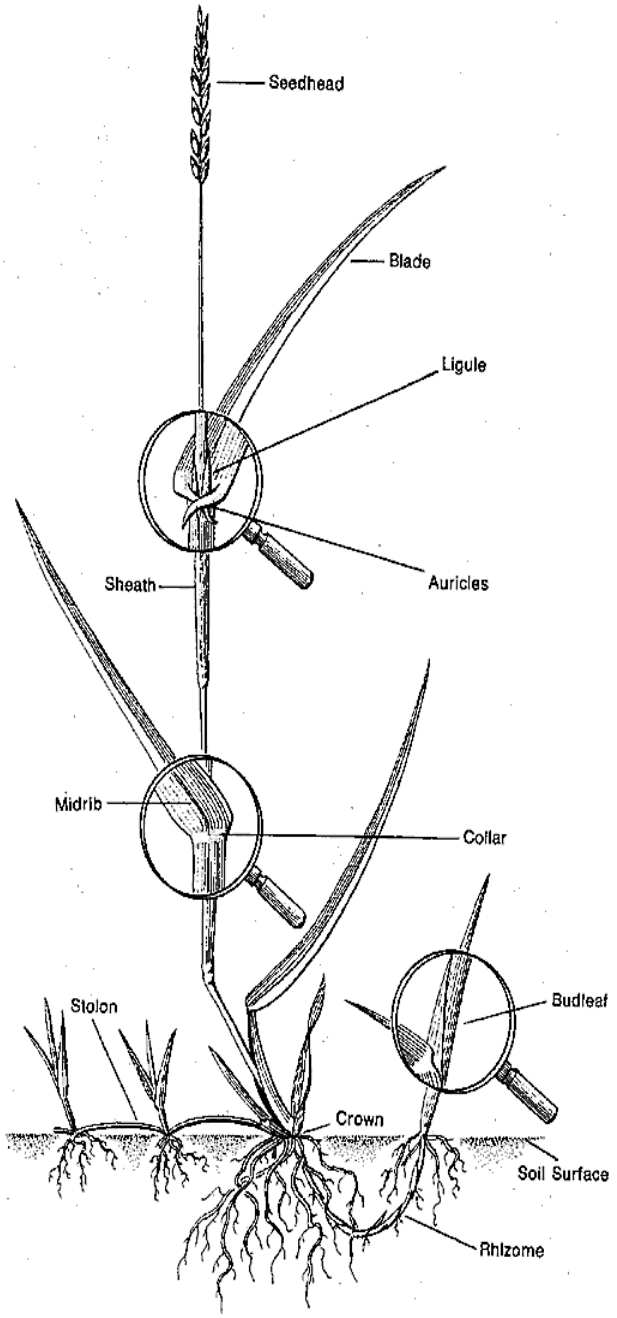
Grasses, sedges and rushes can be challenging to identify. Following is a primer to help in deciding whether you are looking at a grass, a sedge, or a rush. Grasses have their leaves arranged in ranks of two, and a ligule is often present. By contrast, sedges and rushes have leaves arranged in ranks of three, and the ligule is poorly developed or absent.
Another distinctive sedge characteristic is their triangular shaped stem. Remember the adage, "sedges have edges," thus they are not grasses.

GRASSES
Stem almost all hollow, round, or sometimes flattened, with joints. Single seed in each flowering scale. Leaf sheath is open at the back.
SEDGES
Stem solid and mostly triangular but some round or square, no joints. Single seed in each flowering scale. Leaf sheath is closed at the back.
RUSHES
Stem solid and mostly round. Several seeds in each pouch. Regular flower made up of three outer and three inner scales and one pouch. No ligule. Leaf sheath is closed at the back.

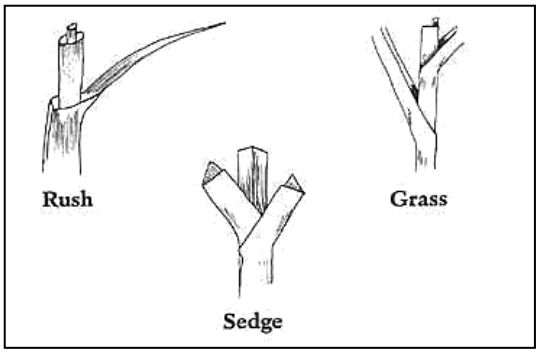
All three groups of the grasslike plants (grasses, sedges, rushes) are monocotyledons. All three groups produce mostly narrow leaves with parallel veins. Generally, if the stem is hollow you have a grass. There are very few grasses that have solid stems. To be certain that the stem is hollow, cut it open between the nodes. If the specimen has a solid stem, it is not likely a grass. Peel back the leaves (if there are any) and note whether the stem is round, that is, if it easily rolls between your fingers, or whether it is angular. Plants with angular stems are usually sedges, those with round stems are rushes.

The Sedge family, *Cyperaceae*, has many genera, not all of which have angular stems. The "sedges have edges" character applies mostly to true sedges in the genus *Carex*. Many bulrushes or tules in the genus *Scirpus* have round stems. To be certain that a plant is a member of the Sedge Family you must examine the flower. The individual flowers are borne in the axil (inside face) of a single, scalelike bract. This contrasts with grasses that have two bracts immediately associated with the individual flower (lemma and palea). Sedges and grasses have one seed for each flower, in contrast to the rushes, which have a three-part capsule filled with many small, black seeds.

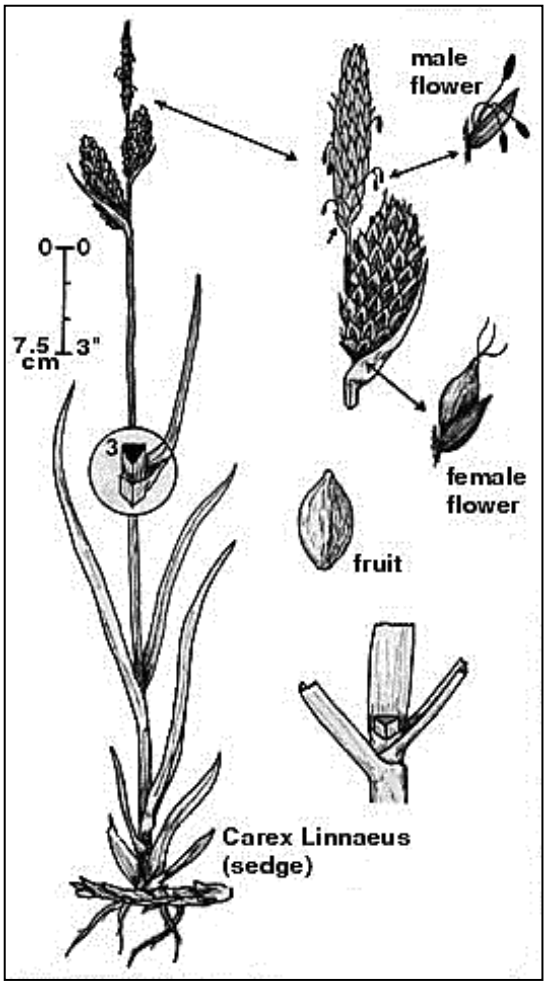
Grass Characteristics:



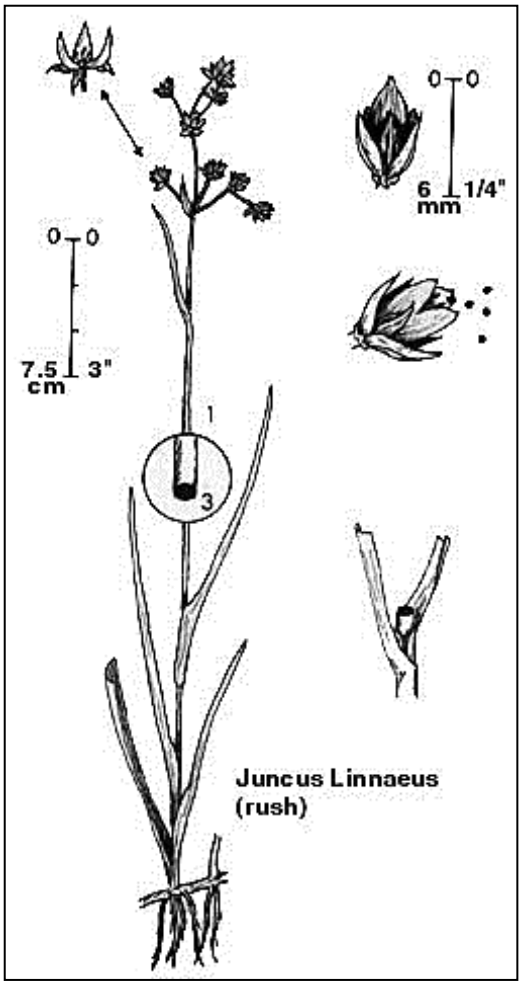
Rushes, *Juncus* and wood rushes, *Luzula* in the Rush Family, *Juncaceae* have solid stems. The flowers usually consist of two series of three petal-like structures, which are actually the sepals and the petals that surround the pistil. Using a hand lens you can see that these look like the petals of a miniature brownish lily.



Sedge Characters:



Rush Characters:



The original article was adapted from the website of the Royal BC Museum of British Columbia and is reprinted from there.

Reprinted from *Native Plant News*, the newsletter of the North Carolina Native Plant Society, August-September 2011.

Lake Katharine State Nature Preserve

Lake Katharine is a "must see" adventure. It's a wonderful place for true nature lovers because Ohio's State Nature Preserves are primarily intended for passive recreation, nature observation, research, and education. The park is a magnificent natural area consisting of nearly 2,000 acres of rolling wooded hills, dense vegetation, and several miles of hiking trails. The rich Appalachian forest is cut by three deep ravines. These ravines are filled with magnolias, eastern hemlock, sweet gum, birch, and beech. The Preserve is also home to a variety of diverse spring wildflowers. One of the preserve's main focal points is its clear water lake, which is surrounded by sandstone cliffs. Along Calico Bush Trail there is a stunning display of wild flowers in late April and early May, making it a popular spring hike. The Pine Ridge Trail crosses Rock Run offering hikers a unique glimpse of the babbling creek that supplies Lake Katharine's sparkling water. The dry ridge tops support an association of mountain laurel, Virginia pine and oak. The preserve has many native orchids as well as diverse spring flora. Lake Katharine harbors the state's largest and finest populations of bigleaf and umbrella magnolia trees, both state-listed species.



Photo taken from www.theadventuretrail.com.

The Ohio Department of Natural Resources (ODNR) lists Lake Katharine as being one of the eight best preserves in the state for viewing spring wildflowers. The terrain is also interesting; it features many sandstone cliffs and outcroppings. If you look closely at the sandstone, you might notice round, quartz pebbles embedded within it. These pebbles were smoothed while rolling along the bottom of the ancient Teays River, a river system that was destroyed by glaciation some two million years ago. Lake Katharine truly is a great place to escape the buzz of everyday life and rejuvenate your spirit.

Location and Directions

Lake Katharine State Nature Preserve is in southeast Ohio's Jackson County. It was dedicated as a state nature preserve through the foresight and generosity of two long-time business partners, Edwin A. Jones and James J. McKitterick. It is owned and administered by the State Division of Natural Areas and Preserves and comprises 2,019 acres.

The nature preserve is centered at Lake Katharine, an artificial lake. The valley is a small gorge, located in southerly extensions of the same geological series of rocks that forms the Hocking Hills Region. The bluffs are formed of weathering-resistant sandstone, including the blackhand sandstone.

The stream that drains the lake is a tributary of Little Salt Creek, which flows through the eastern end of the reserve.

This nature preserve represents the northernmost extension of some southern species, such as bigleaf magnolia (*Magnolia macrophylla*) and umbrella magnolia (*Magnolia tripetala*), but also includes more northerly species such as wolf-foot clubmoss (*Lycopodium clavatum*).

The preserve features three principal trails: the one-mile Calico Bush Trail, the two-mile Salt Creek Trail, and the 2.5-mile Pine Ridge Trail. The western portion of the preserve is off-limits to visitors, and is reserved for scientific research.

Lake Katharine is located two miles west of Jackson off of State Street (also known as County Road 76 or Beaver Pike). Take County Road 85 (also known as Lake Katharine Road) to get to the parking and trail system at the end of Lake Katherine Road. The preserve is almost due south of, and an hour and a half from, Columbus.

This article was based in part on material taken from http://naturepreserves.ohiodnr.gov/lakekatharine, and http://en.wikipedia.org/wiki/Lake_Katharine_State_Nature_Preserve.

Invasive Plant:

Controlling Japanese Barberry: Alternative Methods and Impact on Tick Populations

By Jeffrey S. Ward, Scott C. Williams, and Thomas E. Worthley



Photo taken from www.nps.gov/plants/alien
James H. Miller, USDA FS

ABSTRACT
Japanese barberry, *Berberis thunbergii*, is classified as invasive in 20 states and 4 Canadian provinces. It is also established in another 11 states. In addition to forming dense thickets that can inhibit forest regeneration and native herbaceous plant populations, barberry understories can harbor greatly enhanced levels of blacklegged ticks, *Ixodes scapularis*, which transmit the causal agents of several diseases, including Lyme disease (Williams and others 2009).

Since 2006, alternative methods to control barberry have been examined on 122 plots at 22 sites in southern New England and New York. Plot sizes ranged from 0.1 to 0.6 acres. Initial treatments (prescribed burning, mechanical mowing with a rotary wood shredder or with a brush saw, and directed heating with a propane torch) killed the aboveground stems in early spring. All initial treatments were equally effective in reducing clump size and cover (Ward and others 2009). Treatment costs ranked from least to most expensive were: prescribed burning, mechanical mowing with a brush saw, directed heating with a propane torch, and mechanical mowing with a rotary wood shredder. Without a follow-up treatment, individual clumps recovered to 50 percent of original size within 16 months of initial treatment (Ward and others 2010).

Follow-up treatments in July to kill the small sprouts that developed from the root crown included foliar application of triclopyr or glyphosate, and directed heating. Directed heating treatments were repeated in October.

Effectiveness of follow-up treatments varied by initial size of barberry clumps. Mortality was greater than 86 percent for clumps smaller than 4 feet with directed heating or herbicide treatments. However, directed heating was less effective than herbicides for larger clumps (≥ 4 feet); mortality was 65 and 90 percent, respectively. All follow-up treatment options reduced barberry cover by 90 percent or more. Follow-up herbicide treatment costs were one-sixth that of directed heating. Regardless of follow-up treatment, some clumps will survive and additional treatments the following summer will be needed for eradication.

Control of Japanese barberry had an effect on earthworm biomass ($F = 6.86$, d.f. = 2, $P < 0.003$). Earthworm biomass averaged 197 pounds per acre where barberry was controlled and 535 pounds per acre in dense barberry infestations. By comparison, earthworm biomass was 304 pounds per acre in adjacent forests without barberry. The high earthworm biomass may have contributed to the low litter weight on plots with barberry infestations, 2.3 tons per acre, compared with 5.0 tons per acre observed on our prescribed fire plots without barberry.



Photo taken from www.invasive.org

A surprise benefit of controlling Japanese barberry is the reduction of blacklegged (or deer) tick populations. Relative to adjacent plots where barberry infestations were left untreated, white-footed mice, *Peromyscus leucopus*, on plots where barberry was controlled had 27 percent fewer larval ticks. Controlling barberry also reduced the density of adult ticks by 58 percent. In addition,



Photo taken from www.invasive.org

tick infection prevalence with the spirochete, *Borrelia burgdorferi*, the causal agent of Lyme disease, was much higher in barberry infestations. As a result, 166 ticks per acre were infected with *B. burgdorferi* in untreated barberry infestations compared with 50 infected ticks per acre where barberry was controlled and only 20 infected ticks per acre in adjacent forests without barberry. Thus, controlling Japanese barberry can improve public health by reducing both the number of blacklegged ticks and *B. burgdorferi*-infected ticks that commonly feed on humans. Japanese barberry can be effectively controlled in a single growing season by integrating an initial early-season treatment (prescribed fire or mechanical) that kills the aboveground tissues, followed by a mid-summer follow-up treatment such as directed heating or targeted herbicide application. Although time consuming, propane torches provide a nonchemical alternative in forests, nature preserves, parks, or other ecologically sensitive areas where herbicide use is restricted and where barberry infestations are still light.

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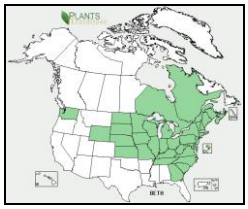

USDA Plant Range for *Berberis thunbergii*


Photo taken from www.nps.gov/plants/alien.

The content of this paper reflects the views of the author(s), who are responsible for the facts and accuracy of the information presented herein.

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Article downloaded from http://www.nrs.fs.fed.us/pubs/gtr/gtr-p-78papers/68wardp78.pdf on March 30, 2014.

Folklore:

Gardening With Native Plants: Sassafras, *Sassafras albidum*

By Bob Edelen



Flower
Photo taken from
www.delawarewildflowers.org

NATURAL HISTORY

My first experience with sassafras was as a youth visiting relatives in the hills of Virginia for a family outing. One of the 'treats' prepared by my cousins was a large jug of sassafras tea made as I recall by steeping the dried root bark in boiling water. As I recall, it tasted somewhat like—sassafras, but that was a long time ago, and I haven't taken the opportunity to repeat the experience! But I still manage to grasp a leaf from a sassafras tree and crush it to share its yummy fragrance with grandchildren when they come for a visit. The name scientific name is *Sassafras albidum.* The name 'Sassafras,' applied by the Spanish botanist Monardes in the sixteenth century, is said to be a corruption of the Spanish word for saxifrage, with *albidum* meaning white. More recently a whole slew of common names have been applied, depending on geographical distribution or perhaps just the observer's view or use of the sassafras! Some common names include sassafras, common sassafras, smelling stick, saloop, white sassafras, ague tree, cinnamon wood, gumbo file and mitten tree. The latter applied to the form the leaves take, all resembling mittens!

Sassafras is a small to medium-sized deciduous tree occurring from southwestern Maine, west to southern Ontario, and southwest to eastern Texas, and east to central Florida. As a tree, sassafras can attain an average height of 40 to 60 feet. The top three trees in the 'Big Trees of Delaware' are 59, 65 and 70 feet tall! Left to its own devices, the sassafras will spread by root suckers to form large colonies. Attractive, greenish-yellow flowers appear in clusters at the branch ends in spring. Flowers on female trees give way to small pendant clusters of bluish-black berries (drupes), which are borne in attractive scarlet cuplike receptacles on scarlet stalks. Fruits mature in the fall.

Sassafras is invaluable to wildlife. Sassafras leaves and twigs are consumed by white-tailed deer in both summer and winter. Sassafras leaf browsers include woodchucks, marsh rabbits, and black bears, and beavers will cut sassafras stems for winter forage. Sassafras fruits are eaten by many species of birds including bobwhite quail, eastern kingbirds, flycatchers, phoebes, wild turkeys, catbirds, flickers, woodpeckers, thrushes, vireos, and mockingbirds. Some small mammals also consume the fruits, and sassafras is a larval host or nectar source for spicebush swallowtail butterfly, Promethea silkmoth, and pale swallowtail butterfly.

For years, sassafras was grown for the supposed medicinal properties of the fragrant roots and bark, but it is the outstanding fall display of foliage which should bring it into the garden today. The large, multi-formed, five-inch leaves, fragrant when crushed, are bright green throughout the summer, but are transformed into magical shades of orange/pink, yellow/red, and even scarlet/purple in the cooler months of autumn, brightening the landscape wherever they are found. (These colors are especially prominent when sassafras is planted as a specimen or in a mixed shrubbery border, with a background of dark evergreens.)



Trilobed leaf
Photo taken from www.wikipedia.org

With its horizontal branches in tiered layers, its winter silhouette is also appealing. The flowers, which are among the earliest in spring, are very popular with honey bees and other insects. Songbirds devour the fruits as fast as they ripen. Sassafras (along with other members of the laurel family) is the host plant for the spicebush swallowtail butterfly. Sassafras foliage brightens the landscape with yellows, oranges and reds in autumn.



Sassafras albidum

WHERE TO GROW

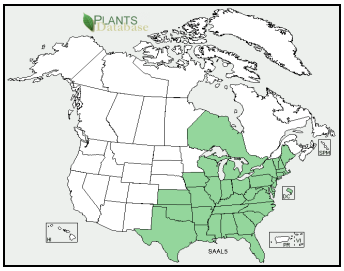
Given its excellent value to wildlife, ease of care, delightful fragrance, and beautiful yellow, purple and red fall color, sassafras deserves a place in your landscape. Naturally occurring in woodland margins, fence rows, fields, thickets and roadsides, sassafras is easily grown in average, medium, well-drained soil in full sun to part shade. It is excellent for naturalized plantings or screens where they are given lots of space to colonize or can be grown as a lawn specimen if root suckers are removed. Since both male and female trees are required for pollination, you will need trees of both sexes for fruit setting.

PROPAGATION AND CARE

Sassafras can be propagated from seed or root cuttings, but note that the large, deep taproot makes transplanting of established trees difficult. To propagate from seeds, collect the fruits when they are filled out and dark blue, but note they are quickly devoured by birds and other critters, so you will need to act fast! Macerate, clean, and air dry the seeds briefly. The seeds may then be directly sown outdoors or cold stratified in sand over winter to break dormancy and then planted out in early spring. Sassafras freely produces root suckers which may be taken in early spring before the plant leafs out.

LORE

Native Americans used sassafras extensively for many purposes. Infusions were used to kill parasitic worms; treat syphilis, colds and measles; reduce fever; control diarrhea; and relieve constipation. A tea was made from the bark and roots, and the dried leaves used as a spice to flavor foods. Early European settlers quickly adopted



USDA Plant Range for *Sassafras albidum*



Bark
Photo taken from the USDA website.



Fruit
Taken from www.*dendro.cnre.vt.edu*

sassafras tea, and oil of sassafras extracted from sassafras root bark was used as a food flavoring and was the basis of root beer. Gumbo filè powder, made from the ground, dried leaves of sassafras was used as a condiment and soup thickener in gumbo and other Cajun dishes. More recently, sassafras oils have been determined to contain a carcinogenic substance (safrole), and many of the former uses for the oils are now banned by the U.S. Food and Drug Administration.

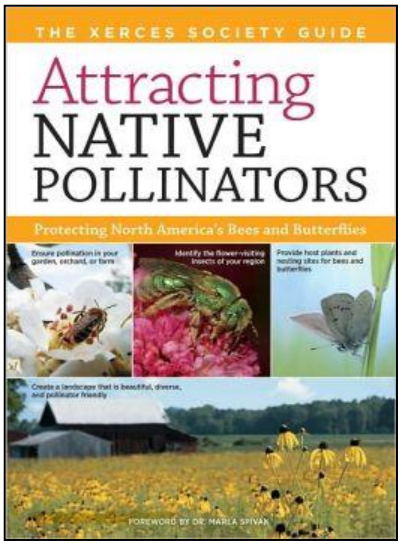
Sassafras wood has been used for cooperage, buckets, fence-posts, rails, ox yokes, cabinets, interior finish and furniture, and Native Americans used the wood for dugout canoes.

Oh, and don't forget, the next time you're out walking in the woods, grab one of the sassafras mitten shaped leaves and crush it for its delightful fragrance!

Reprinted from The Newsletter of the Delaware Native Plant Society, *The Turk's Cap,* Summer 2013, Vol. 16, No. 2.

Book Review:

Attracting Native Pollinators: The Xerces Society Guide, Protecting North America's Bees and Butterflies
By The Xerces Society (Author), Dr. Marla Spivak (Foreword)



Publisher: Storey Books, 2011
Pages: 384 pages
ISBN-10: 1603426957
ISBN-13: 9781603426954
Paperback and Kindle
Price: $22.78, Kindle: $14.99

Reviewed by Joyce Burian

This book offers "a complete action plan for protecting the bees, wasps, butterflies, moths, files and beetles that pollinate more than 70 percent of flowering plants. Without these bees and pollinators there would be no apples, pumpkins, strawberries or many other fruits and vegetables."

The publication includes life histories of North American pollinating insects, a pictorial guide to native pollinators, regional plant lists, case studies, and action plans to expand pollinator habitat. A comprehensive and compelling guide for naturalists, gardeners, educators, parents, and land managers, this is already a best seller at the Bowman's Hill Wildlife Preserve, and, in the words of Doug Tallamy, it "belongs on the bookshelf of everyone who values the future of the natural world."

The Xerces Society is a nonprofit conservation organization that advocates for pollinator conservation.

Reprinted form *Twinleaf*, a publication of the Bowman's Hill Wildflower Preserve. Summer 2011, Vol 18, No 2.

We realize that this book review was originally written in 2011. In order to provide our readership with more current information, we have provided this link http://www.peer.org/assets/docs/fws/FWS_Memorandum.pdf. It is a letter, dated July 17, 2014 from the United States Department of the Interior, Fish and Wildlife Service, indicating that as a general matter it will no longer use neonicotinoids in its system as of January 2016.

OFT Editors

Hometown Habitat Video

Catherine Zimmerman of The Meadow Project has teamed up with entomologist Doug Tallamy, PhD, and the Chesapeake Conservation Landscaping Council to produce a new film: *Hometown Habitat*. She is requesting the public's support to finish the project.

In a short promotional video, Doug Tallamy speaks about the new film, which is a 90-minute environmental education documentary focused on showing how and why native plants are critical to the survival and vitality of local ecosystems.

Tallamy, whose research, books and lectures on the misuse of non-native plants in landscaping sound the alarm about habitat and species loss provides the narrative thread throughout *Hometown Habitat*. His message: "We can change the notion that humans are here and nature is someplace else. It doesn't have to, and shouldn't be that way." Each individual has the power to conserve resources, restore habitat for wildlife and bring beauty to their patch of earth.

Go to http://themeadowproject.com/ to watch this two minute promotional video.

Hike at Gott Fen State Nature Preserve

By Judy Barnhart

Thirteen people attended the second annual hike at Gott Fen State Nature Preserve with state botanist Rick Gardner to see the showy lady's slipper orchids. Despite the late spring, the orchids were in full bloom, with many more blooming than last year. The half mile walk down the uneven railroad tracks caused one couple to turn around before getting to see the orchids. Rick hopes someday the preserve will be more accessible. After checking out the areas we cleared of European buckthorn last fall on stewardship day, Rick commented on how much more open the site was. Marsh arrow-grass, *Triglochin palustris*, was blooming in greater numbers than in the past, and we got to see the sundew this year. (See the September 2013 Journal for the list of plants seen last year.) There still is another opportunity to help clear invasive species this fall, on Saturday, October 26, 2014, at 10:00 am. Call Judy at 440-564-9151 to register to help maintain this unique natural area that the Native Plant Society of Northeastern Ohio has adopted.



Parnassia palustris L., marsh grass of Parnassus
Photo and description by Tom Sampliner, former Board member of the NPSNEO. Photo not taken at Gott Fen.

Marsh grass is one of the most distinctly-colored flowers of late summer. Due to the rarity of habitat, it is not a common native plant. However, it is making a comeback in Gott Fen due to the stewardship of the Native Plant Society of Northeastern Ohio. This flower is at home in alkaline wetlands known as fens. A fen is by definition, alkaline (high PH number) substrate with fresh incoming sources of water generally in the form of seeps or springs. It is dominated by members of the Rose family, as well as by sedges and grasses.

Interesting Factoid:

Rubber from Goldenrod—Almost Famous

Goldenrod almost became an indispensable plant for American industry. In the early 1900s, Henry Ford developed mass production techniques for the automobile that made it widely affordable, and the United States' demand for rubber to make tires increased significantly.

At that time, West Africa (Nigeria, Liberia, and Leopold's Congo) and Malaysia were dominating the production of rubber, though rubber for the US industry was imported primarily from South America. Harvey Firestone, founder of Firestone Tire and Rubber, felt all of these sources could be shut off to American commercial interests in times of crisis, thereby crippling industry and any potential war effort. So he turned to Edison in the hope that he could discover way out of this potential problem, and Edison turned to botany. Edison set to work to find domestic (North American) species of plants that would prove as versatile as the rubber tree, *Hevea brasiliensis*, or at least good enough to establish domestic production and offset a growing reliance on overseas markets.

During WWI, the price of rubber rose from roughly 20 cents to more than two dollars a pound! It quickly became clear that depending on others for such an important commodity left the United States vulnerable, and the war meant we needed more rubber than ever for the production of cars, trucks, and tanks.

Interesting Factoids:

- In 1927, Henry Ford, and Ohio natives Thomas Edison and Harvey Firestone, formed the Edison Botanic Research Corporation of Fort Myers. Plants were collected in Florida and throughout the southern United States by field collectors. Plants were grown under controlled conditions in Florida and at Edison's laboratories in West Orange, New Jersey.
- Edison worked with two botanists to determine a suitable plant for rubber production. Eventually, over 17,000 plants were tested for the quality and quantity of rubber they produced. Edison finally determined that a species of goldenrod, *solidago leavenworthii* showed the greatest potential for domestic rubber production. (Honeysuckle and milkweed were also serious contenders.) It yielded a high percentage of latex, was plentiful and native to the US, and could be grown and processed within 12 to 18 months—a short enough time span to supply a war-time or other emergency demand. After two years of cross-breeding, a goldenrod was developed that yielded almost twelve percent rubber.



- Normally goldenrod grows to a height of two to four feet, but Edison developed a special fertilization and cultivation process that allowed the goldenrod to grow more than 10 feet tall.
- Ford gave Edison a Model T that had tires made from Goldenrod rubber. Unfortunately, this rubber had a low molecular weight with poor tensile properties.
- If you happen to visit the Thomas Edison National Historic Park in East Orange, New Jersey, you will see many goldenrod specimens here and there, with mounted specimens in his library and other specimens in his laboratory. You will see an apparatus that stretches across half a table, and you will see the product of this bizarre distillation, a container full of rubber produced from goldenrod. You will be reminded that, yet again, botany sits at the intersection of much of modern invention, commercial expansion, and geography.

Sadly, goldenrod never achieved fame. Thomas Edison died before he could bring his project into production, and soon afterward the government decided to invest in new German technology that made rubber synthetically from coal and petroleum products.

So Goldenrod came back from the brink of commercial necessity and returned to its relatively nondescript existence—until it blooms each fall in a burst of yellow, reminding us that sometimes beauty is enough.

Contents of this article were provided in part by Gordon Mitchell. Information was also taken from www.jstorplants.org, www.sciway.net, and www.grotenrathrubber.com. Gordon Mitchell works for the Columbus, Ohio Metroparks and was a member of the Central Ohio Native Plant Society, which merged with the Columbus Historical Society in the Spring of 2010.

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