



On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

RENEW NOW

Our membership year runs from January to December.

Please renew at the highest possible level.

If you have not renewed by March 30, you will no longer receive On the Fringe.

As you will note from the message at the top of this page, **dues are due**. Memberships run from 1 January to 31 December, and brings the Journal of the Native Plant Society to your front door. This year we are giving credit to anyone who joined the Society from October on. Please send in your dues in a timely manner because the Journal alone takes a lion's share of our operating budget. It is expensive and time-consuming to have to call all the membership and remind them. Look at the mailing label on the back of the Journal: if there is an X, then your dues are due. Please renew at the highest category possible for you.

In this issue you will find the year's schedule of field trips and lectures. In the past only a few events have been well-attended. A lot of hard work has gone into creating a program that is both entertaining and educational. Activity leaders give time to lecture or lead us. Your attendance and interest are the only way we can thank them adequately.

The Journal will continue to publish for another year thanks to the monetary support of the ladies of the Akron Garden Club and a Foundation. We need articles from qualified writers. Submission of an article is not a guarantee of publication, and articles may be edited.

(continued on page 3)



When you complete your Ohio tax return, remember the Division of Natural Areas and Preserves. Your donation will make a difference. Check the box for "Nature Preserves, Scenic Rivers and Endangered Species" and donate all or part of your tax refund to this important program.

Since its inception in 1984, this program has significantly benefited the Division of Natural Areas and Preserves, the Ohio Department of Natural Resources. Funds from this program can be used for land acquisition, new facility development, and special projects (biological inventories, research grants, and interpretive materials). The Ohio Revised Code specifies that the fund cannot be used for salaries of permanent employees, administrative costs, or routine maintenance.

Over the years, the Division has protected numerous tracts of land using funding from this account. Kent Bog State Nature Preserve (Portage Co.), Sheepskin Hollow State Nature Preserve (Columbiana Co.), Davey Woods State Nature Preserve (Champaign Co.), Swamp Cottonwood State Nature Preserve (Medina Co.), and Sears Woods State Nature Preserve (Crawford Co.) are just a few sites that have been acquired with check-off funds.

(continued on page 3)

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On The Fringe, The Journal of the Native Plant Society of Northeastern Ohio, is published four times a year at Novelty, Ohio. Questions or comments are welcome and may be addressed to the Editor, npsohio@hotmail.com, or to Ann Malmquist, 6 Louise Drive, Chagrin Falls, Ohio 44022; 440-338-6622, inky5@juno.com

2002 Program Schedule

Unless otherwise indicated, call Jean Roche for information or reservations: 330-562-4053

Jan. 26, Sat.: Slide show for everyone at the Chagrin Falls Library. **Plants and scenes from Native Plant Society field trips in 2001. 2pm**

Feb. 10, Sun.: “Wildflowers encountered in May in the Smokies.” Slides by the Schmitthenners. Look About Lodge, South Chagrin Reservation, **2pm**

Mar. 3, Sun.: **New England Mountain and Coastal Wildflowers** with Marvin Smith. A joint meeting at The Wilderness Center with The Botanizers. For car pooling and/or RSVP, call Jean Roche at 330-562-4053. **2pm in Wilmot.**

May 4, Sat.: **Spring Ephemerals** at Eagle Creek State Nature Preserve, led by Emliss Ricks. Spectacular display in a floodplain forest with sphagnum bog and observation tower. **9am**

May 19, Sun.: Sedges. **Selected Carex species of Cuyahoga County.** Starts with a brief laboratory workshop, led by George Wilder. Cleveland State U Biology lab & Parma’s West Creek Preserve. Call George within 3 days of the trip if you wish to attend: 216-687-2395. **9am**

Jun. 8, Sat.: **Kelley’s Island.** Joint trip with Northeast Ohio Naturalists (NEON) led by Jim Bissell, Curator of Botany, Cleveland Museum of Natural History. Bring lunch and ferry fare. Meet at Paladino ferry at **9am** Registration limited. Call 216-231-4600 ext 219

Jun. 15, Sat.: Mayer property, Chesterland. Join Bill Hudson of Chagrin River Land Conservancy for a plant

survey of this newly preserved property in Chesterland with rolling hills, lush fern covered ravines and a swamp forest along a tributary of the East Branch of the Chagrin River. Take St. Rt. 6 east of Rt. 306 approximately 2 miles to Sperry Road. Turn right(south) approx. ¾ of a mile to 11154 Sperry. Follow drive up hill to grassy parking area. Call Judy to register: (440)564-9151 (H) or (440)286-9504 (W).

Jul. 28, Sun.: **Dry-Oak Forest** at State Road Park, Parma, a remnant of the original upland dry oak-hickory-beech forest. Led by George Wilder. Call George within 3 days of the trip if you wish to attend: 216-687-2395. **9am**

Aug. 25, Sun.: Bog plant community at **Jackson Bog.** Led by Emliss Ricks. A boreal fen remnant with many rare plants. **9:30am**

Sep. 28, Sat.: **Highland Heights Community Park,** a superb natural area in suburban Cleveland. On Wilson Mills between Lander and Bishop Roads. Led by Suneeti Jog, (W) 216-687-2316 or (H)440-460-2301. **9am**

Oct. 12, Sat.: **Late Fall Orchids and Gentians.** Cuyahoga Valley National Park. Led by Tom Sampliner. Meet at Happy Days visitors’ center on Rt. 303 east of Peninsula. **9am**

Oct./Nov.: Annual Dinner and Meeting. Place and date to be announced.



Orchid Class at Holden Tom Sampliner, past president of NEONPS, will be teaching a class on “**Orchids of the Great Lakes Region**” at the Holden Arboretum as part of their Winter Class schedule. The three sessions will be held at the Corning Visitors’ Center on January 6, 19, and 23 from 7 to 8:30 pm. Tom will illustrate his lectures with the fine collection of photographs he has taken over the years. Please call the Holden Arboretum for further information or to make reservations for the classes: (440)-946-4400.



Lash’s Bog Preserved Our congratulations to The Wilderness Center on their acquisition of the 120-acre property near Brewster containing this important sphagnum bog. They will work to restore the land surrounding the bog to its natural state.

“The Best Mistletoe in Ohio”

A couple in this Ohio River village say they are happy to share the uncommon plant that blossoms on their property each winter. People are drawn to the towering maples along the river each December to behold branches laden with fresh green mistletoe and its tiny white berries. Most try to shake the branches to free the mistletoe and collect a few of the holiday sprigs known for inspiring stolen kisses in doorways.

One botanist calls the property of Ralph and Jan Lavender the best mistletoe location in Ohio.

“It's an extraordinary stand. There aren't that many trees of that stature left along the river,” said Marilyn Ortt, a botanist who retired from the Ohio Department of Natural Resources and is collaborating with another botanist, Judy Dumke, to inventory of all the mistletoe in the state.

Most mistletoe grows wild in the South and Southwest United States, as well as in Europe. Virtually all of Ohio's mistletoe grows on trees along the Ohio River, from Washington County to almost Cincinnati. The Lavenders' property, about 100 miles southeast of Columbus, used to be called Water Street, but last year Mrs. Lavender persuaded the Village Council to rename it Mistletoe Lane. The mistletoe had adorned their dozen or so maple trees even before they moved there in 1965. It grows year-round, but it's only in the winter that the white berries appear.

“That's what the birds eat. It's like God is providing for the birds,” she said.

Mistletoe is a partly parasitic plant, Ortt said, performing its own photosynthesis to produce green leaves, but drawing its water and nutrients from the tree. Like a shrub, its clumps grow larger and larger, and it thrives high in trees where it gets plenty of light, she said.

The botanists are just a few of the people who have wandered into the Lavenders' front yard to gaze in wonder at the mistletoe. During the years, utility workers with electric and telephone companies have brought cherry pickers to pluck mistletoe, the family said.

The holiday sprig has enchanted people for centuries. The Celtic Druids considered mistletoe sacred. They used it to ward off disease and promote fertility. Mistletoe is called *herbe de la croix* in French Brittany, based on the legend that Christ's cross was made from its wood. People in the Middle Ages hung it in their homes to dispel evil spirits. And enemies who met beneath a tree bearing mistletoe were known to lay down their arms and greet each other, a custom that may have led to the tradition of kissing beneath the sprigs. When the kissing custom began, a berry was plucked after each smooch. Pretty as the berries are, though, they are poisonous to humans.

The Lavenders say they are proud of their designation as the owners of the best mistletoe trees in Ohio.

© The Associated Press. From *The Akron Beacon Journal*, Dec 24, 2000. Reprinted with permission.



...Dues (con't)

Finally, at the Annual Dinner, the Board revived an old tradition by giving a \$500 grant from the Endowment Fund, which cannot be used for any other purpose. The Grant went to our old friend and supporter, Jim Bissell, head of botany and natural areas at the Museum of Natural History. The money will be matched by the 1525 Fund and used to protect more of Singer Lake. The Endowment fund was established at the Dinner in 1985. At that time, interest rates were such that \$5000 ensured the \$500 Grant. Today that figure is impossible. Your Board will be searching for ways to increase the fund so that it can generate the money needed. It is one way we can give back to all those who labor in the field of Botany. Watch for news about this project. -AKM

...Tax Checkoff (con't)

Seasonal staff since July 1, 2001 have been paid from the Check-off Account. These staff have been accomplishing a tremendous amount of work especially in the Division's battle against invasive species. Since these staff cannot conduct routine maintenance, the majority of their time is being spent on ecological management, and control of invasives has become a top priority

If you are not receiving a refund, direct donations to the program can be sent to: Ohio Department of Natural Resources, Division of Natural Areas and Preserves, 1889 Fountain Square Court, Columbus, Ohio 43224-1388. All donations are eligible as a charitable contribution under IRS regulations

Mix or Match? The Right Seed for the Right Bird

Any restaurant operator will tell you, it may be “Location, location, location,” that attracts customers initially, but it's that the quality of the food that brings them back. Even if your birdfeeder is the only one in the neighborhood, you will have strong competition – birds that have been raised with a feeder from birth still gather more than 80% of their food from natural sources. So, here's all you need to know to stock your feeders with the *creme de la crop*.

Start with **SUNFLOWER**. It's number one on the preference list for all your favorite birds including cardinal, chickadee, nuthatch, finch, titmouse and more, but it comes in a variety of forms – black oil or striped, in the shell or out, whole or chipped, straight or mixed. The distinction between black oil and striped sunflower is more a difference in size than taste. A striped sunflower seed is generally much larger and can weigh from six to ten times as much as a single black oil seed. This means that your birds receive more nourishment from each striped sunflower seed, but it is more difficult for the smaller birds to crack. Therefore, feeding striped sunflowers favors the larger birds, cardinals, blue jays, doves, over smaller birds, chickadees and finches.

Sunflower seeds are also available with the shell removed. This can be desirable to your birds because it provides access to their favorite food without the effort of cracking the shell. From your point of view, feeding sunflower hearts or shelled sunflower eliminates the shell mess below your feeders, and greatly inhibits germination of any seeds that find their way to the ground. However, in addition to higher cost, removing the shell shortens the “shelf-life” of the seeds, and decreases their resistance to moisture during periods of wet weather. Sunflower chips are simply shelled sunflower seeds that have been broken into pieces small enough to be accessible in a finch feeder.

NUTS, primarily peanuts, are another highly prized treat for birds visiting your feeders. Nut lovers include chickadee, nuthatch, titmouse, blue jay, and woodpeckers, but other birds, including cardinals will eat a peanut as a special treat. Nuts can be served as part of a mix, or in feeders designed especially for the clinging birds that prefer these morsels.

SAFFLOWER is a seed frequently found in higher quality mixes, and is also available *à la carte*. Since the preference for safflower among your birds is generally lower than for sunflower, its advantage comes from its exclusivity. Starlings, grackles, cowbirds, and other blackbirds, as well as **SQUIRRELS WILL NOT VISIT** a feeder filled only with safflower, but cardinals, chickadees, nuthatches, finches, bluejays, doves and other backyard “favorites” will enjoy this special offering.

Niger **THISTLE** is imported from India and Africa and is sterilized by the USDA to inhibit sprouting. It is a very fine black seed that is highly prized by goldfinches and other finches, and should be fed in finch feeders with tiny holes specifically designed for this seed. Niger thistle along with sunflower chips are typically the primary components of finch mixes, which are also blended commercially for use in these specialized feeders.

MILLET is a fine round seed found in many wild bird seed mixes. Millet seeds range in color from a pale tan (or “white” millet) through gold and red. Lighter colors are generally considered to be higher on the preference list than the darker millets. In a mix, millet is often the seed that is “scratched out” of the feeder. It is eaten below the feeder by birds in the ground feeding group including doves, sparrows, juncos, and cardinals.

CORN is another seed that is best suited for ground or platform feeders. Because of its large, hard kernel, corn must be cracked before it is available for most of these ground feeding birds. As with sunflower, cracking the kernel eliminates the potential for germination, but decreases its shelf- life and weather resistance.

Reprinted from *Wildlife Garden* Newsletter, Fall 2001

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BOOKS

If you missed your chance to buy these two books at the annual dinner, here's ordering information.

Seventh Catalog of Vascular Plants of Ohio.

Edited by Tom S. Cooperrider, Allison Cusik, and John Kartesz.

The Ohio State University Press, Chicago distribution Center, 11030 S. Langley Ave., Chicago IL 60628. 773-568-1550,

www.Ohiostatepress.org

Cloth: \$65.00, paper: \$29.95; \$4.00 shipping.

Orchids of Indiana. Michael Homoya.

Indiana University Press, 601 N. Morton St., Bloomington IN 47404. 812-855-8054

Cloth: \$34.95. Write or call for shipping information.

Cleveland Museum of Natural History's Natural Areas Program

By Jim Bissell

The Museum manages 25 natural areas totaling 3,228 acres: Lake County's Mentor Marsh is the largest natural marsh along Ohio's Lake Erie shoreline northeast of Cleveland; Cottonwood Hollow, a preserve that harbors the only location for swamp cottonwood in Lake County; Fern Lake Bog, Koelliker Fen, Taber Preserve and Soubusta Woods in Geauga County; Grand River Terraces and Kolff Riffle along Ashtabula County's Grand River, the North Kingsville Sand Barrens, Cathedral Woods, Blakeslee/Barrows Preserve, Hubbard Preserve, Hadlock Preserve, Kickel Preserve and Pymatuning Creek Fen, all in Ashtabula County; the Medina Sanctuary floodplain woods on the West Branch Rocky River in Medina County; Joyce Preserve in Hocking County; Groves Woods and Chamberlin Forest in Trumbull County; Singer Lake Bog in Summit County; and six preserves on Kelleys Island in Erie County. Fern Lake, Koelliker Fen, Cottonwood Hollow, Mentor Marsh, the North Kingsville Sand Barrens, Kelleys Island tracts, Cathedral Woods, Pymatuning Creek Fen, Blakeslee/Barrows Preserve, Hubbard Preserve, Hadlock Preserve, Joyce Preserve, Singer Lake Bog and the Grand River Terraces have statewide significance based upon plant communities and rare species.

The Museum has six parcels on **Kelleys Island**, totaling 116 acres; the Glade, Coleman Tract, Scheele Preserve, Sweet Valley Preserve, Woodford Woods and Long Point Preserve. Many species in the limestone-based island do not occur within the Cleveland region. Typical species on the island, such as hackberry and prickly ash, are noteworthy butterfly host plants. Nine rare plants, listed by the Division of Natural Areas and Preserves, occur on the Museum island properties. The Scheele Preserve has one of six occurrences of rock elm (*Ulmus thomasi*) in Ohio. Rock elm is currently listed as Threatened in Ohio.

Fern Lake Bog is one of four high-quality tamarack bogs remaining in Ohio. Eighteen plants on the bog margin, including pitcher plant, two species of sundew and two species of cranberry, are on the Ohio Heritage Plant list. The Museum holdings at Fern Lake include three-fourths of the shoreline.

The 691-acre **Mentor Marsh** preserve protects two-thirds of the largest coastal marsh between Sandusky Bay and Presque Isle, Pennsylvania. Acquired by the Museum in 1965, the property was dedicated as the first State Nature Preserve in 1971.

The **Medina Sanctuary** is a high-quality floodplain forest along the west branch of the Rocky River. The preserve is an important resource for the Museum Future Scientists, a program of field studies in natural history for students ages 14 through 18. In 2001, twenty-one species of Odonates (dragonflies) were found at the Sanctuary.

The 669-acre **Grand River Terraces** preserve has a one and one-half-mile frontage on the river. The first parcel, totaling 306 acres, was given to the Museum in 1982. In 1998, the Museum acquired three additional tracts at the Terraces; the 140 acre SUAWA Forest, the 100-acre Schweitzer Tract and the 50-acre Kolff Riffle. In 2001, the 73-acre Sundberg parcel was purchased. The Terraces has one of the finest and largest hemlock swamps in Ohio and the largest Ohio population of the State-Threatened dewdrop. SUAWA Forest has the State-Endangered mountain rice-grass (*Oryzopsis asperifolia*) and the only Ohio occurrence of large toothwort (*Dentaria maxima*). The Kolff Riffle supports 11 species of mollusks. Two of the mollusks, black sandshell (*Ligumia recta*) and round pigtoe (*Pleurobema sintoxia*), are rare in Ohio. The riffle is also a spawning site for native walleye. Six State-Endangered birds nest at the Terraces.

Groves Woods, comprising 155 acres, was given to the Museum in 1986. Located along the western slope of the Grand River Valley, Groves Woods is a rich mixed forest. It contains a lavish array of wildflowers, birds and amphibians.

Koelliker Fen, a 13-acre preserve purchased by the Museum in 1989, is one of the finest glacial fens in Ohio. The fen has one of ten state occurrences of small purple-fringed orchid in Ohio. Several very uncommon moths are found at Koelliker Fen because of its vast array of plants.

The 118-acre **North Kingsville Sand Barrens** preserve, purchased by the Museum in 1990, is the only high-quality fossil dune ridge that has been preserved within northeastern Ohio. Sand barrens are among the rarest natural communities within the Great Lakes and the Museum Barrens is ranked among the top three in Ohio. The property supports four State-Endangered plants, one Threatened plant and several Potentially-Threatened plants. The property has a fine population of native lupine and can accommodate extensive educational use.

Cottonwood Hollow, given to the Museum in 1990, is one of the most unusual geologic features known in Lake County. Two isolated plant populations, swamp cottonwood and mountain cress, occur on ancient lake bottom sediments within an abandoned creek valley channel. No other populations of swamp cottonwood are known in Lake County.

Pymatuning Creek Fen, comprising 215 acres, is one of the most significant fens known in the state of Ohio and has many endangered and threatened plants including the largest known population of the State-Endangered spreading globe-flower. The half-mile section of Pymatuning Creek through the preserve has a diverse assemblage of mollusks including a Federally-Endangered clubshell. More than half of the preserve has been dedicated as a Scientific State Nature Preserve.

The 15-acre **Cathedral Woods** preserve is the only high-quality example of old growth hemlock-hardwood forest on beach ridge sands in the Cleveland region. Two Endangered plants, rosey twisted-stalk and striped maple, and one Threatened plant, Appalachian sedge, occur on the preserve.

The 110-acre **Chamberlin Forest**, given to the Museum in 1995, has a spectacular display of wildflowers, including acres of squirrel corn and hillsides covered with white trillium. It is one of several Museum preserves where a breeding population of pickerel frogs has been documented.

The **Blakeslee/Barrows Preserve**, a pristine 140-acre tract along the Conneaut Creek, is a mosaic of three parcels purchased by the Museum in 1996 and 1997. Many rare plants have been found on the property including pumpkin ash, clinton's wood fern and deer's-tongue arrowhead. Some of the wetlands within the floodplain also support breeding populations of wood frogs, mole salamanders and spring peepers.

Soubusta Woods, comprising 59 acres, was given to the Museum in 1998 by Mr. Edward Soubusta. Basswood, tulip, red oak and black cherry are frequent within the drier beech/sugar maple forest. Nearly every wildflower one would expect in a typical beech/sugar maple forest occurs in the woods, such as white trillium, red trillium, fake solomon's seal, true solomon's seal, marsh violet, halberd leaved violet, sweet white violet, blue cohosh, jack-in-the-pulpit, wild geranium, spring beauty, squirrel corn and dutchman's breeches. Some of the birds in the woods include wood thrush, scarlet tanager, hooded warbler, redstart and ovenbird.

The **Joyce Preserve**, a 300-acre conservation easement in Hocking County, contains sandstone hollows and rich mature forests. Two rare cliff plants grow on the preserve, round-leaved catchfly and sullivania. Hermit thrush was found nesting at the preserve in 2001.

Singer Lake Bog, comprising 120 acres, is one of the largest bog systems remaining in Ohio. The mile-long wetland supports more than two dozen state-listed plants. In addition, the bog harbors the only known population of the racket-tailed emerald dragonfly and a rare moth, the two-lined powder moth. Singer Lake is the second location in the state for two rare dragonflies, the chalk-fronted corporal and the elfin skimmer.

Hubbard Preserve, a 203-acre conservation easement on Conneaut Creek, is a rich complex of hemlock ravines, floodplain meadows, vernal pools and shale cliffs.

Taber Preserve, a 20-acre preserve on the Chagrin River, contains high-quality floodplain, channel marshes, hemlock-hardwood forest and mixed forest.

The 120-acre **Kickel Preserve** is located in Ashtabula county. The Preserve supports a large stand of hummock-hollow swamp forest. Canopy dominants include yellow birch-tupelo-red oak-American elm-silver maple-beech and black cherry.

The **Hadlock Preserve**, a 54-acre forest preserve with three-quarter mile frontage on the Ashtabula River, has the only Ohio population of lance-leaved grape fern. The preserve also contains pristine vernal pools and has a nice display of spring wildflowers.



Deciduous Evergreens: Your tree may just *look* dead!

Doug Dudgeon, Assistant Horticulturist, Dawes Arboretum

Certain trees that look like evergreens during the growing season are not really evergreens at all. There are a number of deciduous conifers that are often mistaken for evergreens simply because they have needles, cones, and exhibit the appearance of being a coniferous evergreen. Come Fall, the needles turn brown and fall off just like any deciduous tree. So it is important to understand not all trees that appear to be evergreens are necessarily evergreens.

There are four deciduous conifers that you may encounter in landscapes or arboreta. The dawn redwood (*Metasquoia glyptostroboides*) was discovered in isolated parts of China in 1941 after it was thought to be extinct. It has a very straight trunk, is fast-growing (50' in 15-20 years) and thrives in well-drained, acid soil in full sun. It can reach heights of 70-100' with a spread of 25'. It is in the redwood family (Taxodiaceae).

Bald-cypress (*Taxodium distichum*), also in the redwood family, is native from southern New Jersey, along the Atlantic coast and is prevalent in northern Florida, Louisiana and parts of Texas. It is the most prevalent tree found in the bayou. Bald-cypress has a buttressed lower trunk and the characteristic "knees" or aerial parts of its root system that are believed to be an

adaptation for gas exchange in waterlogged soils. It can grow 50-70' high in 30-50 years. It will do well in moist, or even wet, acid soil; but surprisingly will grow well even in dry soil.

Larches (*Larix* sp.) are stately trees, usually growing to a height of 80' with a 30' spread. They are in the pine family (Pinaceae). Eastern Larch (*Larix laricina*) is native to the northern part of North America and is often found in boggy sites. The last of the deciduous conifers, golden-larch (*Pseudolarix kaempferi*), is seldom seen outside of arboreta and botanic gardens. It usually grows to a height of 30-50' with a spread of 20-40'. It is a beautiful specimen tree, doing best in moist, well-drained, acid soil in full sun.

All of the trees mentioned here can be seen at The Dawes Arboretum. Our Cypress Swamp is a favorite destination for visitors. Contact the Horticulture Department for the specific areas where the other trees mentioned in this article may be found on the grounds.

Reprinted from *The Dawes Arboretum Newsletter*, December 2001. *The Dawes Arboretum is in Newark OH.*
www.dawesarb.org

Mallows

By Perry Peskin

The scene is the fifth-grade class in Mt. Royal Elementary School, in Cumberland, a medium-sized industrial town in the Allegheny Mountains of western Maryland. The time: a balmy spring afternoon in 1939. The instructor: Miss Fuller—tall, with gray hair in a bun, the science specialist of Mt. Royal, also the sixth-grade teacher, the principal, and a tyrant. The subject: the weekly nature-study class (probably mandated by the State Board of Education), which today is to be devoted to the wild-flowers of Maryland. We have had “drill,” and now we have “recitation.”

“Perry Peskin, are you paying attention?”

“Yes, Miss Fuller.”

“Very well. What’s this plant?” She holds up a flashcard depicting some gaudy white and pink flowers, each about the size of a coffee cup and of a type I have never seen before. In fact, as I look back, most of the pictures she has been showing us have been of unfamiliar plants, more common around Chesapeake Bay and the Atlantic seaboard of eastern Maryland than in the mountains around Cumberland. From personal experience in tramping through the hills behind our house, I know only two wildflowers by name—johnnyjump-ups and moccasins, and the state of Maryland hasn’t seen fit to put these on a flashcards. However, since this is recitation, and everybody has to be tested and given a grade, in these rote-memory days, I make a wild guess.

“I think it’s a mallow.”

“Right, but what kind?”

Even at the age of ten, I have a healthy appreciation of the absurd and can never resist a good pun. I decide to play dumb and put it in the form of a question.

“Marsh -mallow?” There is a pregnant pause, followed by a slight restless stirring in the class. Even some 50 years later I can still hear it. Evidently Miss Fuller hears it too because she quickly says, “That’s right. Swamp rose-mallow,” and holds up the next picture. But it’s too late.

In defiance of Miss Fuller’s rule about talking out of turn, my good friend Jennings blurts out, “He said marshmallow!” In a split second I can hear the word marshmallow being taken up by the other thirty pupils in the class. I have committed the unforgivable. I have brought laughter and merriment into Miss Fuller’s nature-study class.

As a result of this incident, Miss Fuller, who always practiced strict mirth control, remembered me very well the following year when I entered the sixth grade, and she and I...



Cotton *Gossypium hirsutum*
©1998 The New York Botanical Garden

But let’s not dwell on the past. Suffice it to say, she never forgot me, and I never forgot mallows.

* * * * *

Eight years later, as a sophomore at Case Western Reserve University, in Cleveland, Ohio, where my family had been living since 1943, I had just chosen my major as English with biology as a minor, in preparation for a career as a high-school teacher. In the required botany classes, conducted mostly by the learned and affable Benjamin (“Pat”) Bole, I learned about the families and evolution of the flowering plants, as well as the importance of their scientific names. For instance, I found out for the first time that the johnnyjump-ups and moccasins in the Cumberland woods should really be called bird’s-foot violets *Viola pedata* and pink lady’s-slippers, *Cypripedium acaule*.

I also learned that the mallows were among the most distinctive and important of the major plant families in North America. If it weren’t for the mallows of the genus *Gossypium* (especially the tropical American species *G. hirsutum*, still found wild in southern Florida and the Keys), we wouldn’t have any cotton fiber for clothing and textiles. Other mallows like the hollyhocks and rose-of-Sharon provide beautiful garden ornamentals. The largest genus, *Hibiscus*, supplies the familiar shrubby hibiscus, or rose-of-China, *H. rosa-sinensis*, an indoor plant inhabiting every hotel lobby from Florida to Patagonia. *Hibiscus* also gives us the vegetable okra, the main ingredient in chicken gumbo soup.

Mallows look different, too. Their leaves are usually lobed, recalling those of maples, and their flowers are often large and brightly colored, with five semicircular petals arranged like a bowl or cup (or a dish antenna in certain of the *Hibiscus* clan). The numerous male, pollen-bearing stamens give off a fragrance attractive to insects and are combined, within a structure called the *column*, with the pollen-receiving pistils, where the seeds will eventually be produced. Like the orchids, which are considered the most advanced plant family and have a similar structure, the mallows are designed to be *cross-pollinated* (pistil of one plant receiving pollen from another) by insects and produce a high percentage of fertile seeds. The conspicuous column in the middle of the flower, a sort of trademark, enabled students like myself to recognize mallows whenever I saw them.

And I began to see them everywhere. *Gray's Manual of Botany* lists 33 well-established mallow species from 12 genera for northeastern US and Canada alone. Some, like the common mallow *Malva neglecta*, had small white or lavender flowers and crawled along the ground, others, like the musk mallow *M. moschata*, were medium-sized upright plants with fairly large pink or white flowers and grew in open fields. But these were European invaders, accustomed to living in dry, disturbed areas.

The native American mallows of the genus *Hibiscus* were tall, conspicuous plants with huge flowers, like those of hollyhocks, and preferred salt or fresh-water marshes. In the Lake Erie marshes between Toledo and Sandusky, Ohio, I finally found Miss Fuller's swamp-rose mallow *H. palustris* in its natural habitat. It grows up to 7 feet tall and has showy pink flowers, sometimes as wide as 8 inches across—dinner-plate size. (A color variation on the Atlantic coast has white flowers with a red center.)

A shorter plant related to the rose-mallows, the seashore mallow *Kosteletzkya virginica*, has smaller, more lavender-colored petals and grows in brackish marshes and on sandy shores of the Atlantic and Gulf Coasts from Long Island to Texas. I first saw it on Chincoteague Island, Virginia, at the National Wildlife Refuge.

Wherever I have traveled in the past twenty years looking for endangered plants, it seems as if I am always bumping into new species of mallows. Partly because they have big, colorful flowers and partly because they prefer to grow out in the open in disturbed areas like roadsides, meadows, river banks, flood plains, and railroad rights-of-way, they tend to stand out more than plants in other families.

Basically a tropical, Mediterranean, and warm temperate group, mallows are much commoner in southern latitudes than in northern, with virtually none on high mountains above timber line or in the Arctic. In the deep South, every grassy stretch beside the road seemingly yields a species of *Sida*, usually *S. rhombifolia*, a mallow that produces a small white flower at every leaf axil. When the roadsides are mowed, this plant becomes a creeper with every new leaf accompanied by a white flower

In Florida one can easily find the tropical mallow Caesar weed *Urena lobata* featuring large white flowers with red centers. Like cotton, it is one of many American mallows utilized for their fibers.

South Texas has its gorgeous red mallow, the Turk's cap or sleeping hibiscus *Malvaviscus arboreus* var.

drummondii, so called because it never opens completely; and the yellow Rio Grande mallow *Abutilon hypoleucum*.

In Georgia I encountered a large roadside hollyhock-type mallow with cream-white petals, the pineland hibiscus or comfort root *Hibiscus aculeatus*.

Even the oases of the Southwestern desert have their full complement of colorful mallows, such as the apricot-orange globe mallows of the genus *Sphaeralcea*, and the desert five-spot of the Mohave *Eremalche rotundifolia* with its pink cup-shaped flowers marked by a large, dark-red spot at the base of each petal.

Although not North American, the large, colorful native mallows of the Hawaiian Islands certainly qualify under the Endangered Species Act of 1973 as deserving federal

protection, for they are among the most endangered plants in the US and the world. With their best lowland locations taken over by agriculture, urbanization, and the introduction of aggressive foreign trees; and with many of their mountain habitats eaten down to the ground by feral goats, these rain-forest mallows (as well as other endemics, such as the tree lobelias) survive only in wildlife refuges and private preserves. In February 1997 I was lucky enough to see one species of native hibiscus in bloom at the Limahuli Botanical Preserve, on Kauai, the least disturbed of the larger islands in the Hawaiian chain. Limahuli is one of several dozen American arboreta and botanical gardens licensed to propagate endangered native plants for eventual distribution into the wild.

The melodious Polynesian

language, as spoken in Hawaii, is like Greek: it has a name for everything, including every plant in the island flora. At Limahuli I saw the bushy hibiscus from the Waimea Canyon area (and only from that area), which the Hawaiians call *koki'o ke'oke'o*. (This sounds something like koh-KEE-oh KAY-oh-KAY-oh.) Botanists have given it the much more prosaic name of *Hibiscus waimeae* var. *hannerae*. It has large white flowers with a long, bright scarlet column. Its future is uncertain. Many of the Hawaiian native plants, perhaps including this one, are pollinated by small birds of the honey-creeper family, found only on the Hawaiian Islands and in decreasing numbers, and their future is uncertain too.

* * * * *

All the time that I was seeking out new plants, including mallows, in the South and West, I had not forgotten a pet project of mine – to find the four very rare eastern mallows listed in the 1950 *Grays Manual*. These were sturdy plants well adapted to withstand the bitter winters and short growing seasons of the Midwest and the Appalachians, yet



Seashore mallow *Kosteletzkya virginica*
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extremely local in distribution, suggesting a pattern of slow decline to extinction. The four species consisted of the Virginia mallow *Sida hermaphrodita*, the glade mallow *Napaea dioica*, the Kankakee mallow *Iliamna remota*, and the Peters Mountain mallow *I. corei*.

The first of these should be renamed the West Virginia mallow since most of the populations are in a narrow band across that state (basically the Kanawha River Valley) and in the Ohio Valley of neighboring Kentucky and Ohio. There is also a widespread but declining population in the Potomac and Susquehanna drainages of Pennsylvania, Maryland, and the District of Columbia. A few outlying locations in northeast Indiana (discovered in the 1980's by state of Ohio botanist Allison W. Cusick); northwest Ohio; and formerly in Michigan, Tennessee, and Virginia add to the confusion as to the exact extent of the original range of this rare plant.

In late July 1986 I spent a week in southern Ohio trying to locate and photograph all the great rare Ohio plants I had heard about for so long, including the Virginia mallow. Without the help of members of the Ohio chapter of the Nature Conservancy, especially Marilyn Ortt of Marietta, I doubt if I would have found one-tenth of those species on my own, especially the mallow, which is abundant but in very scattered locations on the wide flood plain of the Ohio River.

Using Marilyn's directions, I followed Ohio 7, the twisty road that parallels the meanderings of the Ohio River in the southeastern part of the state, from Marietta to beyond Gallipolis (pronounced GAL-la-po-LEECE), an old town founded by French settlers. I was told to look for the village of Clipper Mills, just a wide spot on Ohio 7 and not even on the road maps. Approaching Clipper Mills, I could see the big barges slowly moving down the river, and the fertile flood plains occupied either by farms or giant factories and power plants. Very little appeared in a natural state, either in Ohio or across the river in West Virginia.

Gradually the roadside vegetation changed from short grass to a dense curtain of Johnson grass *Sorghum halepense*, an invasive plant of Mediterranean origin, growing over 10 feet tall. Interspersed with these giants were unfamiliar hairy, mullein-like plants with spikes of large yellow flowers resembling those of snapdragons. These proved to be mullein foxgloves *Dasystoma macrophylla*, coarse relatives of the beautiful, but parasitic, false foxgloves (now classified as *Aureolaria*) found in oak woodlands. The mullein-foxgloves must be of an ancient lineage of plants because their present-day distribution includes only North America and Madagascar, an unlikely combination of geographical areas and probably dating back



Virginia Mallow *Sida hermaphrodita*
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to the Cretaceous Period, over 60 million years ago, when all the world's continents were connected for the last time.

As I approached the sign proclaiming the town limits of Clipper Mills, I again felt the road hemmed in by tall plant growth, not Johnson grass, but a 10-foot-high hedge of a skinny, leafy plant with scattered bunches of small white flowers, so insignificant that they hardly registered from a distance. Could this modest, colorless plant be the rare Virginia mallow?

Parking off the road, I got out to inspect its features close up. The toothed leaves were lobed something like a maple – well, that would fit the mallow family. But the umbels of white flowers with notched petals about a half-inch long – what self-respecting mallow would have flowers so small and inconspicuous? What gave the whole puzzle away, however, was the light lavender mass of stamens wrapped around the pistils – small, to be sure, but a genuine column just the same.

Also the habitat was right: in an open field or flood plain; with no trees; in a sunny, dry, and disturbed area; on poor soil. For most members of the mallow family, these conditions would fit, plus a railroad track somewhere in the picture, because railroads typically were built on flood plains—the land is cheaper and more level—and they were often elevated on a roadbed of rocks or cinders, providing the necessary drainage most mallows require.

A day or so later, I happened to be driving through West Virginia on I-77 to make better time from Marietta to the southernmost counties of Ohio, because following the river on Ohio 7 can be maddeningly slow. As I exited from the interstate, I must have made a wrong turn because I was now driving along a quiet back road beside the Kanawha River near the town of Leon. As the road made a sharp turn following a bend in the river, I came face to face with an extensive colony of Virginia mallow on the banks of the Kanawha, just where the books say is the largest concentration of the plant in the country.

Several experts on plant distribution within Ohio believe that the Kanawha was part of a pre-glacial river system that originated in western North Carolina, where the New River flows today. From there it made its way north into the valley of the present Kanawha, then west for a short distance in the present valley of the Ohio before heading north again through western Ohio, northern Indiana, and northern Illinois. This large river, called the Teays (pronounced taze) after a town in West Virginia, finally emptied into a salt-water extension of the Gulf of Mexico where the Mississippi Valley exists today.

After the last glacial period up to the present time, a period of about 12,000 years, all the water that has drained off the western slopes of the Appalachians has flowed into a new outlet—the Ohio River—because the original bed of the Teays through the Midwest has been buried under gravel and glacial deposits. However, the distribution of plants, fish, and aquatic invertebrates like crayfish still indicates the outlines of the ancient river system. The western localities of the Virginia mallow from Indiana to West Virginia fit the pattern to a considerable degree.

Mallow number two on my wish list—the glade mallow *Napaea dioica*—differs from the Virginia mallow in two respects: it is a one-species genus, that is, without any close living relatives; and is most abundant in the states of the Old Northwest, bounded by the Ohio and Mississippi Rivers (Ohio, Indiana, Illinois, Michigan, and Wisconsin), where it was first discovered in *glades*, an old word meaning meadows and grasslands, now superseded by *prairies*. Since the genus probably didn't evolve in the Old Northwest, which was mostly under ice during the last

glaciation, plant geographers have looked for its origins in the bordering states, where it has also been reported: Pennsylvania, Minnesota, and Iowa. In the last two states, a “driftless area” has been discovered in the upper Mississippi Valley which apparently was shielded during the last glaciation from the advance of the ice sheet from Canada. It was like an island of refuge for plants surrounded by a sea of ice. Several rare plants of the Midwest, such as the northern monkshood *Aconitum novaboracense*, supposedly originated in the driftless area during glacial times.

However, a recent report (March, 1998) of a new location for the glade mallow in southwest Virginia, near the valley of the New River, ties it more closely to the southern Appalachians and the ancient Teays River system. At all events, the original range of this species will have to be reevaluated.

Nevertheless, all of these topics were far from my mind when, one day in late August of 1989, I received a map I had requested from a friend working in the Ohio Department of Natural Resources (ODNR) in Columbus. I had heard that there were glade-mallow sites within a few hours of driving time from Cleveland, and since I report all the rare plants I find to ODNR, they were happy to send me the map on condition that I would report my findings.

The site turned out to be on a railroad track about 80 miles south of Cleveland in a rolling plateau area not far from the old religious colony of Zoar, now a picturesque

restored village. When I arrived at the designated spot, I recognized the same unfavorable environmental conditions that discourage most plant families but seem to favor the mallows: a heavily trafficked highway, on one side of which was a large truck depot and on the other a high railroad embankment.

Scrambling up to the top of the steep bank on hands and knees wasn't exactly easy, especially with the loose, rocky soil, the many clumps of thorny blackberry canes, and a colony of tall nettles *Urtica procera* to navigate around.

Finally up on top, I looked down on the other side and beheld a lush, green golf course. Nestled between it and the railroad tracks was the Tuscarawas River. The whole mallow pattern was there.

I didn't walk very far along the tracks before I sighted a long line of unfamiliar, bushy plants over six feet high, very leafy with a scattering of small flowers and broad, many-lobed lower leaves. This proved to be the glade mallow. I counted at least fifty plants.

Although the white flowers of the glade mallow resembled those of the Virginia mallow in size and in the pale lavender

columns, there were subtle differences. The petals of the glade mallow were typically rounded, almost semicircular in form, and lay, fairly flat, with a relatively small column. In contrast, the petals of the Virginia mallow were more oval-shaped and longer, with a short split in each one, and were drastically swept back from the longer column, instead of sheltering it.

The most obvious difference between the two species, both of which can reach 10 feet in height, lies in the basal leaves of the glade mallow. I couldn't recall any North American plant that has leaves similar in size and shape. One would have to go to the tropical rain forest to find trees of the fig family, such as the *Cecropia* of tropical Latin America, with the huge, dissected circular leaves, each with multiple large-toothed lobes, 9 to 11 in all, that distinguish the glade mallow. How this coarse, bristly, weedy plant got the name *Napaea*, literally, “a nymph of the glades,” can be attributed only to the ironic sense of humor of the early botanists.

One wonders what the function of these giant, umbrella-like leaves could have been originally—perhaps to shade out seedlings of any plant, including its own offspring, that might compete for space in its habitat.

The small population of glade mallows in Ohio received a big boost in 1991 when well over 100 plants were found growing at Wright-Patterson Air Force Base on the site of a proposed water-treatment plant. They were removed and



Glade mallow *Napaea dioica*
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transplanted to a nearby ODNR preserve, called Huffman Prairie, which already had a stand of glade mallows. With these and other sites, Ohio has probably one of the most stable and least endangered populations of glade mallows in the country.

Although the history of these two mallows in pre-settlement times can never be fully known, they probably were always rare because of their adaptation to wetlands, the only large areas free of a forest canopy. The last glacier apparently drove them to refuges, especially in the southern Appalachians, and when the ice receded, they came back to the Midwest via the ancient Teays River system. When a hot, dry climate change, called the Xerothermic Period, occurred around 8,000 to 4,000 years ago, these two species probably had their heyday, because prairies succeeded forests in many parts of the Midwest. Later the pendulum swung the other way when the forests reclaimed the grasslands, and now agriculture and urbanization are taking their toll of both habitats. However, these two mallow species are survivors. Russian scientists during the Cold War period researched the Virginia mallow intensively for possible economic uses and discovered that each plant could produce an annual crop of 10,000 seeds, a sort of "disaster insurance" that comes into play when their habitat changes. Their story is not finished by a long shot.

While the origins of the Virginia and glade mallows remain partly obscure, the Kankakee mallow's ancestors definitely came from the Rocky Mountains, the only place in the world where the genus *Iliamna* occurs. The mountain hollyhocks, as they are called, flourish in the Rockies from the foothills up to 9,000 feet, and from British Columbia to Arizona—perhaps enduring the harshest weather and terrain of any mallows in North America. Though on the average smaller than the garden hollyhock *Althaea rosea*, which was brought over from Eurasia, the dense, pinkish-white to rose-purple spikes of the mountain hollyhocks, with their cup-shaped flowers up to two inches in width, rank among the showiest of the Rocky Mountain flora. Since they prefer, like almost all mallows, to live in open areas, such as stream banks, road cuts, and rocky hillsides, visitors to Glacier or Yellowstone National Parks can spot them almost from the first day.

When the 1950 *Grays Botany* was published, the Kankakee mallow's only known residence was Altdorf Island in the Kankakee River—a remarkably limited habitat for any species. Apparently it was one of many western plants that migrated eastward in response to the Xerothermic Period and evolved into a separate species. (The eastern prickly-pear cactus, now known as *Opuntia humifusa*, is perhaps the most famous example.) Later the Kankakee mallow was found in northern Indiana on or near a railroad bridge that crossed the Elkhart River, not far from the headwaters of the Kankakee, although in a different drainage system. Later still, botanists found a third location in the James River Gorge of southwestern Virginia.

It is entirely possible that intense exploration of other river systems will reveal hitherto unknown populations of the Kankakee mallows. Less than ten years ago Ohio botanists were amazed when a riverbank species in the rose family, the Virginia spiraea *Spiraea virginiana*, a conspicuous shrub with large showy dusters of white flowers, was discovered in the flood plain of the Scioto River, near where it meets the Ohio. Up to that time, this federally endangered plant had never been found outside of deep valleys of the Appalachians from West Virginia to Tennessee and North Carolina.

Will the Kankakee mallow ever pop up in southern Ohio? It is roughly halfway between Indiana and Southwestern Virginia and has many river valleys to provide suitable habitat, without many people nearby to notice a colony of mallows. The sad truth about this type of disturbed terrain is that it is often impassable, either on foot or by boat. Immense quantities of boulders, fallen trees, mud, and quicksand deposits, not to mention manmade debris, create insuperable barriers to plant investigation and at the same time form the underpinnings of new forests, which will be swept away in flood time. Islands that have enlarged and elongated after one flood can be eroded away overnight from the next. Only plants like the mallows that sink deep roots and disperse large numbers of water-proof, long-lived seeds can survive under these constantly changing conditions.

My first experience at a Kankakee mallow site was a disappointment but could have been a disaster. In the third week of July 1979, I had just driven my young daughter to a summer camp in Indiana. I had been reading that the Kankakee mallow could be found on Altdorf Island in Kankakee River State Park near Bourbonnais, Illinois, about 56 miles southwest of Chicago and about 25 miles from the Indiana border. It seemed a simple side-trip to take before returning home.

I really should have written to the park naturalists at Kankakee River before setting off, because when I arrived at the visitors center, one of the staff members was very discouraging: "Yes, that's the famous island that is still the home of the Kankakee mallow, first discovered there in 1872," and "No, the mallow probably isn't in flower yet," and "No, there are no boat trips to take visitors to the island, but you can rent a canoe at the campground," and "Before you leave, take a look at the picture of the mallow on the wall by the door."

I looked longingly at the picture, which showed a dense stand of the mallow in bloom, much like a bed of hollyhocks in an English garden. I didn't tell the naturalist that I had never paddled a canoe in my life, but I drove over to the campground anyway. Perhaps I could hire the services of someone with that skill.

The young woman managing the campground was very friendly: "No, there isn't anyone around here who has time to take you over right now, but maybe you won't need a boat."

"How's that?"

“Actually the river's very shallow. Probably not above your knees. You could easily wade over there and back.”

I looked at the island, only about a tenth of a mile away, and then at the river, flowing at a fast clip and probably cold. Yet this idea sounded very tempting. It wouldn't take too long to wade over, and since I might not be able to come back here again...

“Of course,” the young woman continued, “You'll have to watch out for any deep holes.”

“How deep?”

“Five or six feet.”

I looked at the island again and then at the smooth-flowing river and then at a preview of tomorrow's headlines in the Kankakee newspaper: PARK POLICE DRAG RIVER IN SEARCH OF OHIO VISITOR. After studying that image, I thanked the friendly campground manager and departed. For the next ten years, having given up exploring river bottoms and flood plains, I put the Kankakee mallow out of my mind.

In early 1989 my wife Carol and I attended a three-day Spring Wildflower Symposium at Wintergreen, a resort condominium complex in the Blue Ridge Mountains of southwestern Virginia, on our way home from a visit to Williamsburg. The lectures and field trips were very enlightening. One of the speakers was a professor of botany from nearby Lynchburg College, Dr. Gwynn Ramsey, who showed us his slides of the flora of the James River Gorge, including, in all its glory, the Kankakee mallow. Up to that time, I wasn't aware of the James River population at all, so after the lecture, I asked Prof Ramsey if I could accompany him on his next walking trip up the Gorge, and he agreed. We would meet around August first, when the mallows would be in good bloom.

The end of July found me again in the southern Appalachians, by now my favorite stamping grounds. On the morning of August first near the bridge where the main highway crosses the Gorge below the Cashaw Dam, at Snowden, Virginia, Dr. Ramsey was waiting for me with one of his graduate students. We descended cautiously into the rocky gorge on a gentle slope until we found a railroad track that provided easier walking. I smiled to myself as I recognized all the familiar conditions here that were ideal for mallows: rock-strewn river bottoms, railroad track, and open woodlands, although with the dam controlling the periodic floods, perhaps the woodlands would become denser and less disturbed as time went by, thereby limiting the population of the mallow.

Prof Ramsey was pointing out some small plants growing along the track: the forked chickweed *Paronychia fastigiata*, a tiny-leaved matlike plant of the pink family, native to disturbed areas of the South, such as shale barrens; an introduced composite, the annual wormwood *Artemisia annua* which may some day replace quinine as a cure for malaria; and—“Uh, oh, I feel a train coming!” Prof. Ramsey pointed to the rail he was standing on, which carried tiny vibrations. He was correct: the train came roaring through shortly after we scrambled off the tracks.

Reaching a clearing, we discovered among the rocks between the railroad tracks and the river the object of our search: three green-stemmed plants about 5 feet tall with ascending branches and large maple-like leaves, each stem topped with a few large, handsome lavender-pink flowers, about 2 inches across. Outside of the rose-mallows I couldn't recall a more striking member of the family, certainly a far cry from the Virginia and glade mallows.

As its name indicates, this Virginia population of *Iliamna remota* is far removed from its Rocky Mountain homeland, by about two thousand miles, and grows in a more scattered fashion than in the picture of the Altdorf Island colony I had seen 10 years before, but it was the Kankakee mallow just the same. Face to face with one of the rarest plants in the east, I felt very fortunate to have met one of the few people in the country who knew its location.

* * * * *

This still leaves, among the four rare Eastern mallows, the Peters Mountain mallow *Iliamna corei* unaccounted for, and I doubt if I will ever see it. Ever since the colony took a population nosedive in 1986, its site on a sandstone outcrop on one mountain in southwestern Virginia is strictly off limits to visitors.

The near-extinction of this species and its gradual resurrection presents a case-history of the stresses that endangered plants face all over the world. Discovered in 1927 by Dr. Earl Core, considered in his time the greatest authority on southern Appalachian plants, it was at first considered a geographical subspecies of the Kankakee mallow until several “splitters,” including M. L. Fernald, editor of the 1950 *Gray's Botany*, noticed many differences. Compared to the Illinois population of the species (Fernald didn't know of the Indiana and James River colonies.), this mountain mallow was shorter, had a different leaf shape, and lacked fragrance, among other traits. Therefore, it was distinct enough to rate as a separate species.

Whatever the cause—the unavailability of ground water on the sandstone outcrops, or the extreme surface



Kankakee mallow *Iliamna remota*
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temperatures in summer—evolving as a separate species inadvertently qualified the Peters Mountain mallow for protection under the Endangered Species Act of 1973—and it really needed it. Constituting originally about 50 individuals when discovered, the population of the mallow declined to 3 in 1986, due partly to browsing by deer and feral goats and partly to competition with a tall, sunflower-like composite, leafcup *Polymnia canadensis*, never known from this area of western Virginia until logging had thinned out the forest cover.

Worse yet, the population had reached such a critically small size that it was no longer cross-pollinating. Self-pollination produced infertile fruits that fell off before setting seed, and thus no new plants were seen sprouting nearby. This is the fate of many plant populations on islands, such as the numerous species of native trees in the Hawaiian archipelago, and is a condition that usually precedes extinction.

However, under the terms of the Act of 1973, the government was empowered to step in and fund public or private agencies to save the mallow, once a recovery plan was in place. First, botanists at Virginia Polytechnic Institute and State University at nearby Blacksburg, by sifting through the leaf litter in the area where the surviving mallows were growing, found over 95 seeds. Why hadn't they germinated? Tests revealed that the seeds were fertile, but the tough seed coat had to be nicked with a razor-blade to allow the embryos to sprout.

Tough seed coats are a natural characteristic of plants living in the open, such as in grasslands. When these habitats are invaded by tall or densely bushy woody plants that would shade out the native grassland species, the seeds of these plants remain dormant and cease to germinate until a natural or manmade fire removes the competing intruders from the habitat. The heat from the fire also weakens the seed coat and allows germination to proceed at a rapid pace.

The Virginia botanists found that nicking the seed coat produced many healthy mallow seedlings, which grew to maturity in the greenhouses of the university. Through cross pollination, thousands of fertile seeds resulted, and their offspring were ready to be returned to the wild. However, the National Forest Service policy of fire suppression had to be relaxed on Peters Mountain.

In 1992, the Nature Conservancy, a private conservation organization that specializes in protecting habitats of rare species worldwide (it currently protects the Elkhart River site of *I. remota*,) acquired the mallow site on Peters

Mountain and has been managing it ever since. The major management tools have been fences to keep out deer and goats; removing the leafcup and other aggressive plants; and strategic burning of the area (called “prescribed fires”) every spring.

After the 1992 burn only 4 out of 12 mallow seedlings survived their first year, but after the 1993 burn, 400 seedlings appeared! Even if only 20% survived, the species was literally (and figuratively) out of the woods. Since trampling of plants by unauthorized visitors is a very real threat to the mallows atop Peters Mountain, I doubt if I'll ever get a chance to see this species in the wild until laboratory germinated and greenhouse-grown seedlings are transplanted to other suitable habitats in the area. This seems to be a successful trend, especially with low populations of animals. Just in the past decade the Fish and Wildlife Service has introduced California condors into Arizona, an area where the species once existed, in the hope that a new population will thrive.

* * * * *

However, I don't mind waiting until a rare species has made a real comeback. I've seen more than my share of mallows already, including many of the native species in eastern North America listed in *Grays Manual*.

There are still a few foreign invaders that have eluded me. Paging through the mallow family in Gray just the other day, I noticed that I've never seen the European *Althaea officinalis*, a close relative of the garden hollyhock *A. rosea*. *A. officinalis* has a very local distribution, bordering marshes from Quebec south to Virginia and westward to Michigan and Arkansas. With its many whitish or pink flowers, blooming from August to October; deep scarlet column, and erect stem up to four feet

in height, it is quite attractive. Like many other mallows, it is also a useful plant. The bark of its perennial root yields a sweet mucilaginous paste formerly employed in medicine and in making a type of spongy candy, before the modern ingredients of corn starch, cane sugar, and gelatin replaced it.

You guessed it. *Althaea officinalis* is the marsh mallow. As I sit back in my easy chair, sipping a cup of herbal tea flavored with hibiscus flowers, I imagine I hear a ghostly chuckle—the spirit of Miss Fuller having the last laugh.

The author thanks Allison W Cusick, Chef Botanist for the Ohio Department of Natural Resources, for the reprint of an important article on the Virginia mallow, of which Cusick is co-author: Spooner, D.M., Cusick, A. W., et al. 1985. “Observations on the Distribution and Ecology of *Sida hermaphrodite* (L.) Rusby (Malvaceae)”. *Sida* 11 (2): 215-225. The author also wishes to acknowledge the recent



Marsh mallow *Althaea officinalis*
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discovery of *Napaea dioica* in Virginia as reported in *Wieboldt, T.F. and Wieboldt, A., March 1998. Special Collections. Castanea 63: 88.*

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Perry Peskin is a member of NEONPS. Reprinted from *Wildflower*, Autumn 1998.



Names of Some Native Ohio Plants A Quiz

Tom Cooperrider

Within each group, match the common name to the scientific name.

Level 1. New kids on the block.

- | | |
|-------------------------|-----------------------------------|
| 1. Flowering Dogwood | a. <i>Acer rubrum</i> |
| 2. Ohio Goldenrod | b. <i>Cornus florida</i> |
| 3. Red Maple | c. <i>Liriodendron tulipifera</i> |
| 4. White Oak | d. <i>Pinus strobus</i> |
| 5. Eastern White Pine | e. <i>Quercus alba</i> |
| 6. Large White Trillium | f. <i>Solidago ohioensis</i> |
| 7. Tulip-tree | g. <i>Trillium grandiflorum</i> |
| 8. Common Blue Violet | h. <i>Viola sororia</i> |

Level 2. Students. "Gaudeamus igitur . . ."

- | | |
|---------------------|--------------------------------------|
| 9. Ohio Buckeye | i. <i>Acer saccharum</i> |
| 10. Christmas Fern | j. <i>Aesculus glabra</i> |
| 11. Eastern Hemlock | k. <i>Asclepias syriaca</i> |
| 12. Sugar Maple | l. <i>Asimina triloba</i> |
| 13. Marsh-marigold | m. <i>Caltha palustris</i> |
| 14. Common Milkweed | n. <i>Cercis canadensis</i> |
| 15. Pawpaw | o. <i>Polystichum acrostichoides</i> |
| 16. Redbud | p. <i>Tsuga canadensis</i> |

Level 3. Seasoned veterans.

- | | |
|-----------------------|-----------------------------------|
| 17. Golden Alexanders | q. <i>Arctostaphylos uva-ursi</i> |
| 18. Bear's-foot | r. <i>Dodecatheon meadia</i> |
| 19. Featherfoil | s. <i>Eupatorium coelestinum</i> |
| 20. Kinnikinnick | t. <i>Hottonia inflata</i> |
| 21. Mandrake | u. <i>Peltandra virginica</i> |
| 22. Mistflower | v. <i>Podophyllum peltatum</i> |
| 23. Pride-of-Ohio | w. <i>Polymnia uvedalia</i> |
| 24. Rose-pink | x. <i>Sabatia angularis</i> |
| 25. Duck-potato | y. <i>Sagittaria latifolia</i> |
| 26. Tuckahoe | z. <i>Zizia aurea</i> |

Answers can be found in the *Seventh Catalog of the Vascular Plants of Ohio*. Ohio State University Press, 2001

Garlic Mustard Control

by Rich Dunbar

The Indiana Native Plant and Wildflower Society has contributed \$2,000 toward this research.

If you have been fighting the spread of garlic mustard across your local woods, there may be hope on the horizon. The search in Europe for a biological control for garlic mustard is going well. [Note: garlic mustard is native to Europe, where it is grown as a potherb, and where it does not spread rampantly and destructively through shady areas as it does on this continent.] They have found five weevils in the same genus, *Centorhynchus*, that look promising. Different weevils within this same genus specialize in feeding on the roots, stems and flowers. One lays eggs on roots in the fall, through the winter under the snow, and into the spring. Researchers are making good progress on learning to raise these insects so they will have enough to work with.



Garlic Mustard
(*Alliaria petiolata*)
by Jeanette Ming

The next step is to make sure they cannot feed and reproduce on plants other than garlic mustard. Biologists in North America have been sending native wildflowers to the lab in Switzerland so they can be tested.

We are still a long way from having controls to release here. Even if the insects continue to do well there will still need to be a number of years of testing to make sure they will only feed on garlic mustard, and not harm the native plants we are trying to protect. So don't stop pulling garlic mustard yet. But take heart that help may be on the way.

Rich Dunbar is Northeast Regional Ecologist, IDNR NaturePreserves Reprinted with permission from Natural Area News, Winter 2001, No. 11

INVASIVE PLANTS OF OHIO

Narrow-leaved and Hybrid Cattail *Typha angustifolia*, *T. Xglauca*

DESCRIPTION:

Narrow-leaved cattail is a non-native, invasive plant that hybridizes with the native broad-leaved cattail (*T. latifolia*) to produce the invasive *T. Xglauca*. All three aquatic perennials may grow up to a height of 10 feet and produce a velvety brown spike of flowers. The flower head of the hybrid and the narrow-leaved cattail have a gap of 14 inches between the male and female flowers, while the native species has both flower types next to each other. The leaves of cattail originate from the base and spread outward. The narrow-leaved and hybrid cattails have leaves that are 1/4 - 3/8 inch across; the native cattail's leaves are wider at 1/2 - 1 inch. A starchy rhizome forms beneath each plant.

HABITAT:

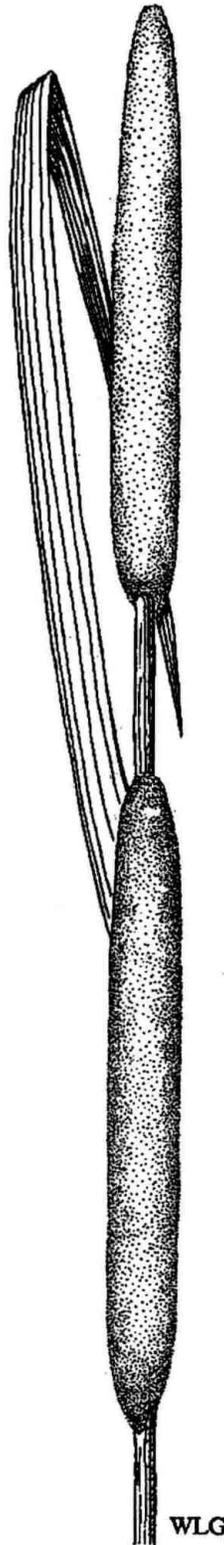
Stands of cattail can be found in a wide variety of wetland habitats, including marshes, lakeshores, river backwaters and roadside ditches. This prolific plant can grow in disturbed areas, as well as brackish, and polluted water of depths nearing 3 feet.

DISTRIBUTION:

Narrow-leaved cattails are believed to have been introduced to the Atlantic seaboard from the dry ballast of European ships. This plant has since spread westward and occurs throughout much of the United States. The hybrid cattail is concentrated in the northeast, but may occur wherever both the native and the narrow-leaved species are present. All three taxa are found throughout Ohio.

PROBLEM:

Narrow-leaved and hybrid cattail will out-compete native plants in wetland systems. These plants establish dense monocultures that enable them to shade out native vegetation. They are also thought to be allelopathic, producing chemicals which discourage growth of other plant species. Cattails reproduce both vegetatively by rhizomes and sexually through massive amounts of seed.



CONTROL:

Mechanical: Manipulation of water levels can kill cattails by inhibiting airflow from the cattail shoots to the roots. Removing the dead leaves and submerging the shoots in early spring will eliminate gas diffusion and “suffocate” the plant. In situations where water level manipulations are either not feasible or appropriate, pulling, cutting and bulldozing treatments have been used with some success. In the case of bulldozing, the benefits in effective removal may not outweigh the costs of disturbing the wetland. **Chemical:** Wick and spray applications of a systemic herbicide such as Accore®, Rodeo®, or Glypro® followed by manual clipping and removal of stems may prove to be successful. Re-treatments are usually necessary due to the extensive root system. **Biological:** Currently there are no biological control methods for cattails.

ADDITIONAL INFORMATION

SOURCES:

Grace, J.B. and J.S. Harrison. 1986. The Biology of Canadian Weeds: *Typha latifolia* L., *T. angustifolia* L. and *T. Xglauca* Godr. Canadian Journal of Plant Science 66. 361-379.

Hoffman, R. and K. Kearns, eds. 1997. Wisconsin Manual of Control Recommendations for Ecologically Invasive Plants. Bureau of Endangered Resources, Wisconsin Department of Natural Resources.

Motivans, K. and S. Apfelbaum. 1987. Element Stewardship Abstract for *Typha* spp. The Nature Conservancy.

Illustration reprinted with permission from *The Illustrated Companion to Gleason and Cronquist's Manual: Illustrations of Vascular Plants of Northeastern United States and Adjacent Canada*, copyright 1998. The New York Botanical Garden.

Reprinted from *Invasive Plants of Ohio Fact Sheet 11*, Ohio Department of Natural Resources, May 2000

Botany 101 - fifth in a series

Other Flower-Related Terms

Becky Dolan

Recall that the parts of the four whorls of a typical flower are: sepals, petals, stamens, and carpels (sometimes called pistils). Flowers that have all these four parts are referred to as **complete**. Flowers missing a



perfect complete

whorl are termed **incomplete**. In



perfect incomplete

somewhat amusing phraseology, flowers that are missing either male or female parts are termed **imperfect**, vs. **perfect** flowers



imperfect pistillate

that have both stamens and carpels. In slightly different nomenclature, single flowers with both male and female parts are also called **hermaphroditic**.



imperfect staminate

Some plants have separate, imperfect flowers on the same individual. These plants are **monoecious** (from the Latin for "one house"), while plants that have separate-sex imperfect flowers on entirely different individuals are termed **dioecious** ("two houses").

Another feature of their anatomy that can help distinguish between species is the location of the ovary relative to the other floral parts. If the ovary is borne below the other parts, it is **inferior**.



inferior ovary

You can see an inferior ovary in apples and crab apples. Remnants of the rest of the flower can often be seen on the bottom of the fruit opposite the stem. **Superior** ovaries have the sepals, petals and stamens attached below the ovary.

Symmetry of the entire flower is also often diagnostic. Flowers



superior ovary

with **radial symmetry** can be divided in half along many axes and still result in mirror images. These flowers are regular or **actinomorphic**. Phlox and strawberry have regular flowers.

Irregular flowers are bilaterally symmetrical or **zygomorphic**. They can be divided in half in only one way to produce mirror images. People are irregular in this regard; only by dividing down the center of the forehead can you produce two parts that are mirror images of each other. Many plants in the mint and snapdragon families, as well as orchids, are irregular.

I tell my students that botany is like learning a foreign language with all its specialized terminology. Okay, one more: flowers that are borne directly on the stem (lacking a peduncle) are **sessile** flowers.

Becky Dolan is Director of the Friesner Herbarium at Butler University.

Illustrations by Jan Glimn Lacy

A Guide To Wildflowers In Winter Herbaceous Plants Of Northeastern North America

Carole Levine

illustrated by Dick Rauh & Samuel Ristich

Yale University Press, Box 209040, New Haven, CT
06520-9040, 1995.

xiv +329pp. +19pl. \$45 (cloth), \$20 (paper).

Book review by James S. Pringle

There are a few other books on the subject, but none approaches *A Guide to Wildflowers in Winter* in the number of species covered or in the thoroughness with which they are illustrated. Although the book is compact, 391 species are given full coverage, and an additional 191 are briefly contrasted. It includes 48 grasses, whereas in a book that might appear to be an alternative there are only four. There are 30 asters and 23 goldenrods, including those mentioned as "similar species," and a page of illustrations of goldenrod galls. There is a primary key to all groups plus supplementary keys for use with groups such as the carrot and sedge families. This is a reference for those who really need to identify herbaceous plants in the winter condition, suitable not only for floral artisans but also for those doing floristic, ecological, or environmental-impact studies.

The area covered corresponds approximately to the historic "Gray's Manual range," but, as acknowledged by the author, more emphasis is given to plants of the Atlantic seaboard than to plants of the interior. Consequently, such species as *Aster tenuifolius* and *A. subulatus* are included but *Geum triflorum* (which has fruits of very different appearance from those of the "*Geum spp.*" illustrated) and *Zigadenus elegans ssp. glaucus* are not. Not only are herbaceous flowering plants included, but also some of the "fern allies" and ferns with relatively durable fronds.

Because flower parts essential for the determination of families are often absent in winter, the arrangement of the plants is largely by what an English naturalist might call "jizz" and occasionally by habitat, rather than taxonomic. Therefore, although most of the Asteraceae appear in a special section on that family, the burdocks, cockleburs, and beggar-ticks are placed with other genera having burs or stick-tights, such as the sanicles, enchanter's-nightshades, and tick-trefoils. Although far from dichotomous, the table of contents will serve much as a key would, guiding the user to groups such as "Plants bearing fruits with barbs, burs, needles, or spines and stems without spines or bristles," "Plants bearing fruits appearing as strings of beads," or "Plants bearing fruits enclosed in inflated papery calyces." Sometimes, however, all or most of the plants grouped in such an artificial category turn out to be in the same family.

Since many plants in the mint family, Lamiaceae, are superficially similar in winter, I was pleased by the detailed illustrations contrasting the distinctive persistent calyces of many genera. I was also favorably impressed by the

illustrations and discussion of the achene types and associated structures in the Asteraceae. Photographs of the rosettes or short, leafy stems of plants that have green leaves all winter are yet another commendable feature, as they show nuances of texture exceeding what is feasible in line drawings. Most are good, but some are weak in contrast, such as the common St. John's-wort, which is barely perceptible against the soil. Unfortunately, they lack indications of size. For all one could tell from these photos, the tiny leaves of bluets, *Hedysotis* [or *Houstonia*] *caerulea*, might be as large as those of speedwell, *Veronica officinalis*. This is a valuable, much-needed reference, especially in these days when environmental-impact assessments are often demanded quickly, without regard for the season.

Reprinted from *Wildflower*, Summer 2000



Web Sites of Interest

www.kih.net/aspi/EHE1.htm

Forest preservation techniques and other video tapes about pollution prevention from Appalachia – Science in the Public Interest.

www.nysaes.cornell.edu/ent/biocontrol

Overview of biological control of pests and nuisance organisms

www.princetonol.com/groups/mg/beneficials.html

Profiles of beneficial insects

www.knps.org/Wildflowers

Wildflowers of Western Kentucky is a full color guide to the wildflowers of western and central Kentucky and surrounding regions, with photos and descriptions of more than 210 wildflower species.

www.nps.gov/plants/alien/

Weeds Gone Wild: Alien Plant Invaders of Natural Areas is a web-based project of the Plant Conservation Alliance's Alien Plant Working Group, that provides information for the general public, land managers, researchers, and others on the serious threat and impacts of invasive alien (exotic, non-native) plants to the native flora, fauna, and natural ecosystems of the United States. This site provides a compiled national list of invasive plants infesting natural areas throughout the U.S., background information on the problem of invasive species, illustrated fact sheets that include plant descriptions, native range, distribution and habitat in the U.S., management options, suggested alternative native plants, and other information, and selected links to relevant people and organizations.

Tallgrass Prairie

By Gordon Mitchell

When the Europeans (most of them from the British Isles) first landed upon our eastern shores in the early 17th Century, they discovered an almost unlimited abundance of forested lands. These enormous forested lands would provide both obstacles and opportunities to these early settlers. It would be over a century before the settlers would reach the prairies.

The Spanish and the French discovered the prairies long before the British did. The 16th Century Spanish conquistadors, Eke Francisco Vasquez de Coronado or Hernando De Soto, first discovered the prairies in their searches in the American Southwest for gold, silver, and other valuable treasures.

The 17th Century French voyageurs, couriers de bois, Recollect and Jesuit Priests, who traveled from their bases in eastern Canada, observed the prairies while canoeing the Great Lakes and the Upper Mississippi regions in their searches for beaver pelts, Indian trading, and religious conversions. Robert Cavalier, sieur de La Salle; Henri de Tonty (or Tonti); Nlichel Aco (or Accoult); Father Louis Hennepin; Daniel Greysolon, sieur de Duluth (or Du Lhut); Louis Joliet (or Jolliet); Father Jacques Marquette; and Father Claude Jean Allouez were just a few of these people.

Many of these explorers, especially the missionaries, kept detailed journals of their expeditions and even recorded some observations of the prairies. It was the French who first used the name "prairie" (or "prerie"), which means "meadow" or "grassland". The British and the Americans retained that name because they simply lacked a better name for it.

The prairies probably originated in North American nearly 60 to 65 million years ago (around the end of the Mesozoic Era) with the early uplifting of the Rocky Mountains (sometimes called the Laramide Revolution). The Rockies continued to rise for another 40 million years, with another major uplifting about 15 million years ago. This created a "rain shadow" on the eastern side because most of the atmospheric moisture, which was transported from the Pacific Ocean by the westerly winds, had precipitated while crossing the mountains. Present-day prairie plants probably appeared in North America, east of the Rockies, about 25 million years ago, during the Miocene Epoch of the Tertiary Period and the Cenozoic Era.

The prairies, which presently stretch from Canada's Prairie Provinces to Texas, had endured numerous extreme climatic changes that altered their distribution. Over the last two million years, during the Pleistocene Epoch of the Quaternary Period and the Cenozoic Era, at least four major glaciations; the Nebraskan, the Kansan, the Illinoian, and the Wisconsinan; drastically altered the North American landscapes. These glaciations (or ice

ages) brought thick, massive ice sheets that blanketed much of the continent. When last of the ice sheets finally melted about 10,000 years ago, the landscape was then blanketed with northern coniferous trees. When the climate became warmer the northern conifers were replaced with eastern deciduous trees.

Over time the climate of North America became even warmer and drier and that favored the grasses over the trees. At one time these grasses extended eastwardly across North America to as far into the east as present-day Pittsburgh. This eastward extension is commonly referred to as the Prairie Peninsula, as was named and studied in 1935 by Ohio State University Botany Professor Edgar Nelson Transeau.

A few thousand years later the climate again became cooler and wetter and that brought back the trees. The former Prairie Peninsula is now a Prairie Archipelago. Archaeologists have theorized that many of the prehistoric earthworks in the Midwest were constructed at the time period when the prairies covered most of that region. It would have been much simpler to construct the earthworks with fewer trees in the way.

The total land area in North America that was covered by prairies when the Europeans arrived was approximately 1.4 million square miles. That covered about fifteen percent of the North American continent.

Because the climate adjacent to the east of the Rocky Mountains is the driest (about 16 inches of rain a year), the prairie grasses are about 6-18 inches tall. This is the short-grass prairie. As one travels about two hundred miles to the east, the amount of rainfall increases due to more moisture in the air that is being brought up north from the Gulf of Mexico. When the annual rainfall increases to 20-24 inches a year the short grasses are replaced by the 2-4 feet tall mid- or mixed grasses. Still farther east (such as near the Mississippi River), the annual rainfall reaches 40 inches a year and the mid- or mixed grasses are then replaced by the 6 feet tall grasses. East of the Mississippi is the transitional zone between the tall grasslands and the eastern forests. As a general rule, the prairies and forests do not coexist because the prairie grasses cannot tolerate the shade from the trees and the seeds from the trees cannot establish themselves within the thick sod of the prairie grasses. Any area that would have trees, individually or collectively, in a prairie is referred to as a savannah. Stands of trees thriving in the prairies, which resembled islands in a sea of grass, were often referred to as "groves" and many of them have even been given names by the early settlers. Only a few tree species are easily adaptable to the prairies. Bur oak (*Quercus macrocarpa*) is one such species because its long taproot can resist droughts and its thick bark can resist fires. This very

indistinct fine between forests and prairies can easily fluctuate as the climate becomes drier or wetter.

All of the prairies of North America have continental climate. This means that there are no large bodies of water to moderate the temperatures. Continental climates have cold winters, hot summers, and short springs. All of the prairie's flora and fauna have developed adaptations to this climate.

Although there were prairie remnants in Ohio, Indiana, Michigan, and Ontario; the larger prairies were not seen until one crossed the Wabash River into Illinois. The tallgrass prairies cover a large triangle that stretches northwest from northern Indiana through Illinois, through southern and southwestern Wisconsin, and through southern and western Minnesota to southeastern North Dakota. From there the tallgrass prairies extend southward through eastern South Dakota, eastern Nebraska, eastern Kansas, and northeastern Oklahoma. From there the tallgrass prairies extend northeast through Missouri and back to northern Illinois. Iowa is the only state that is completely located within the tallgrass prairies.

When the first settlers, who had lived amongst the hardships and the dangers of the deep forests, reached the larger prairies in the early nineteenth century, they felt awed, alone, and intimidated by its great size, vastness, and monotony. A few felt uplifted and cheerful about it and may have even likened the prairie with its colorful flowers (forbs) to the Garden of Eden. Many settlers simply referred to these prairies as "barrens," "openings," "plains," or "wastelands." Most of the people did not believe this land was capable of growing any crops. After all, if the land didn't grow trees, then it was considered to be worthless. Some even said that any land claims in the prairies should be returned to the General Land Office because of their worthlessness. Instead, some American settlers looked to Canada and its forests to be used as land for conquest and for future settlement. The prairies may have been partly to blame for the War of 1812.

Until the 1820's and the 1830's, very few of the settlers settled in the prairies. Afterwards, the settlers arrived in large numbers from all over the eastern states and from much of Europe. Some of them arrived and settled individually and some of them arrived and settled in large colonies.

Many who had crossed the prairies wrote descriptions and their impressions of them. When President Thomas Jefferson purchased the Louisiana Territory from the French in 1803, he sent out two major expeditions to explore this new territory and to record their findings. Meriwether Lewis and William Clark mentioned the prairies in their journals of their expedition up the Missouri River to the Rocky Mountains and to the Pacific Ocean. So did Zebulon Pike on his expedition across the western plains to the Rocky Mountains. Later prairie travelers; such as American poet William Cullen Bryant, American author Washington Irving (*A Tour of the Prairies* – 1835), American journalist Edmund Flagg (*The Far West* – 1839),

English author Charles Dickens (*American Notes* – 1842), and French author Alexis de Tocqueville (*Democracy in America* – 1835); also wrote about them.

The first prairie settlers usually settled close to the rivers and streams. This was where they found the trees they needed for fuel and to build their homes. Some of the tree species found in this area were Cottonwoods (*Populus*), Willows (*Salix*), American Elms (*Ulmus americana*), Black Walnuts (*Juglans nigra*), Green Ashes (*Fraxinus pennsylvanica*), Hackberries (*Celtis occidentalis*), American Basswoods (*Tilia americana*), and Boxelders (*Acer negundo*). The waterways also provided a source of water and a means of transportation.

Because the prairie sods and prairie roots were tough, thick, and wiry plowing them was a strenuous task. The wrought iron and wooden plow that had worked so well in the lighter forested soils in the East did not fare so well in the loamy prairie soils of the Midwest. Many settlers resorted to using their axes to tear up the tough prairie sod. Plowing was usually done when the grasses were green so that the overturned sod would not sprout up any new shoots. After the sod was plowed it still took about two or three years for it to sufficiently decompose. The prairie soils also stuck to the plowshares, and moldboards frequently had to be removed and cleaned. Sometimes, it took five to ten yoke of oxen and a team of men to plow the prairies. A better plow was needed to do the job.

In 1833, John Lane, Sr., invented some plowshares of polished steel to which the prairie soils would not adhere. Unfortunately, he only made a few of them and did not patent his invention. In 1837, John Deere, an Illinois blacksmith from New England, improved upon the polished steel plowshare and, along with James Oliver, marketed it. Unfortunately, this new polished steel plow would sometimes break while performing its task. In 1868, John Lane, Jr., invented a three-layered polished steel plow with a softer iron center that would not break so easily. Even with these new steel plows, the first few plowings were still difficult. It sometimes took several plowings over several years to make the soil tillable. Some farmers, who could not afford their own plows, hired special teams of "sodbusters" to do their plowing for them. These teams usually charged anywhere from \$2.00 to \$4.00 per acre, with the first sod breakup starting around \$2.50 per acre. (The cost of the acre of land was less.) The first person to break the sod in a given community was usually held in high esteem by the neighbors.

Some of these prairies grew in wet soils. Because these areas probably had standing water during the wetter seasons, they frequently bred mosquitoes that carried the ague (malaria). These wet prairie soils had to be drained before they could even be plowed. Although drainage ditches did drain much of the surface water, it would take tile drainage, which began in the late 19th Century, to drain the subsurface water and to make the soil dry enough to plow.

Probably the greatest threat facing the early prairie inhabitants was fire. As dangerous as it was, fire was actually beneficial to the prairie because it destroyed the invading woody vegetation and favored the forbs and grasses. Fires were also a benefit to the prairies by recycling nutrients back into the soil in the form of ashes and by early soil warming when the blackened ground absorbed more heat from the sun. (Today, many prairie managers use fire as a management tool to maintain the prairies in their present conditions). Prairie fires were most common during the spring and fall dry seasons.

Before the settlers arrived, prairie fires were usually set by lightning or by the Native Americans who used it as a tool to clear land for crops, to improve pasturage, to herd buffalo and other large game, to fight nuisance insects like mosquitoes, and as a weapon in warfare. Many tribes called prairie fires "The Red Buffalo" because, like the buffalo, it just totally consumed the grass.

The number of prairie fires actually increased the first few years after the settlers arrived. Some of the reasons for the increased number of prairie fires were careless campers' campfires, sparks from homestead chimneys and from steam locomotive smokestacks, and sparks from discharged firearms. Many early settlers wrote of how the flames lit up the sky by night and how the smoke darkened the sky by day. As the land was plowed up and more trees were planted, the number of prairie fires decreased.

Many tragic stories have been told of early travelers and early settlers who perished in these fires. Sometimes entire homes, families, and even whole communities fell victims. Wise travelers always carried matches so that if they saw a fire heading their way they could start a backfire and then stand in the newly blackened area. Wise settlers always plowed two or more sets of furrowed strips around their homesteads and then burned the prairies between these strips to make their own firebreaks. However, on a windy day some fires were able to jump over these firebreaks. Some of the settlers who did fight the fires did so by smothering them with wet blankets or by dragging animal hides over these fires. (However, these settlers only battled the side fires, not the head fires.) During a prairie fire, whole communities were expected to assist in fighting them. Most people who perished in the prairie fires had simply panicked and tried to outrun them. Some fires traveled faster than a fleeing horse or other animal. Chief Sitting Bull of the Sioux tribe used to teach schoolchildren about the dangers of running from a prairie fire and of the importance of staying put in a non-grassy area.

Most prairie plants have enormous root systems that are extensively branched and have deep taproots. These taproots, sometimes as thick as a person's finger, can go as deep as twelve feet. These deep taproots could more easily find water during dry spells and could more easily resist droughts. These roots are also fast-growing and can grow up to one-half an inch a day. The roots may live up to

twenty years and, when they die, add organic matter to the prairie soils. Much of what we now know about prairie roots is due to several decades of extensive research done by Professor John E. Weaver, a plant ecologist at the University of Nebraska. Aside from their deep taproots, over one half of their biomass (either measured in weight or in volume) is underground. Because most of the living and growing parts are underground, grasses can easily survive fire and grazing. Trees, on the other hand, have less than half of their biomass underground.

The grasses have adapted other ways of surviving the harsh prairie environment. Grasses can survive droughts because their long narrow leaves transpire less water than do the broadleaf plants. Grass leaves are vertically arranged and are able to receive sufficient sunlight required for photosynthesis.

Although many of the prairie forbs also have deep taproots, their leaves are broad and, therefore, provide more surface area for transpiration. These leaves have evolved some adaptations to slow down their rates of transpiration. Many have waxy, rough, leathery, fuzzy, hairy, or bristly surfaces; all of which reflect some of the sunlight. Many of the prairie forbs' leaves also have smaller surface areas, such as deeply cut leaf margins to allow for more air circulation. Some plants may even have their leaves close to the ground to keep them away from the drying winds.

Prairie topsoils are among the most fertile soils on Earth. Humus, partially decomposed organic matter, makes up about ten percent of these topsoils and gives the soil its dark color. These soils have been studied by pedologists (soil scientists) and were given the names chernozems or mollisols. The name chernozem comes from the Russian *chenyi*, meaning "black", and *zemlya*, meaning "soil". The name mollisols comes from the Latin *mollis*, meaning "soft." Unlike other topsoils, which harden when exposed to the sun, these organic topsoils remain soft. The prairie topsoils can have a depth of up to one to two feet but the forest topsoils may only have depth of a few inches. Prairie topsoils also make good insulators because they protect the roots of the plants from prairie fires and from other temperature extremes.

At the time of Ohio's settlement there were between 500 and 1500 square miles of prairies in this state. That covered about two and one-half percent of the land in Ohio. Ohio's Prairie Archipelago consisted of over 300 prairies that ranged in size from a few acres to several square miles. Many of Ohio's major prairie remnants can still be found in Adams County's bluegrass area, Erie County, Lucas County's Oak Openings area, the Sandusky Plains (Marion, Crawford, and Wyandot Counties), west-central Ohio (Dayton area), and the Darby Plains (Madison and Union Counties).

Gordon Mitchell is Preserve Manager for Columbus MetroParks.

Sheldon's Marsh State Nature Preserve

463 acres, Sandusky Bay area

Gene Wright, ODNR, Division of Natural Areas and Preserves.

Sheldon's Marsh State Nature Preserve and contiguous wetlands comprise some of the last remaining undeveloped stretches of shoreline in the Sandusky Bay region. As Ohio's once expansive coastal wetland habitat continues to disappear in the face of encroaching development, the importance of Sheldon's Marsh increases immensely.

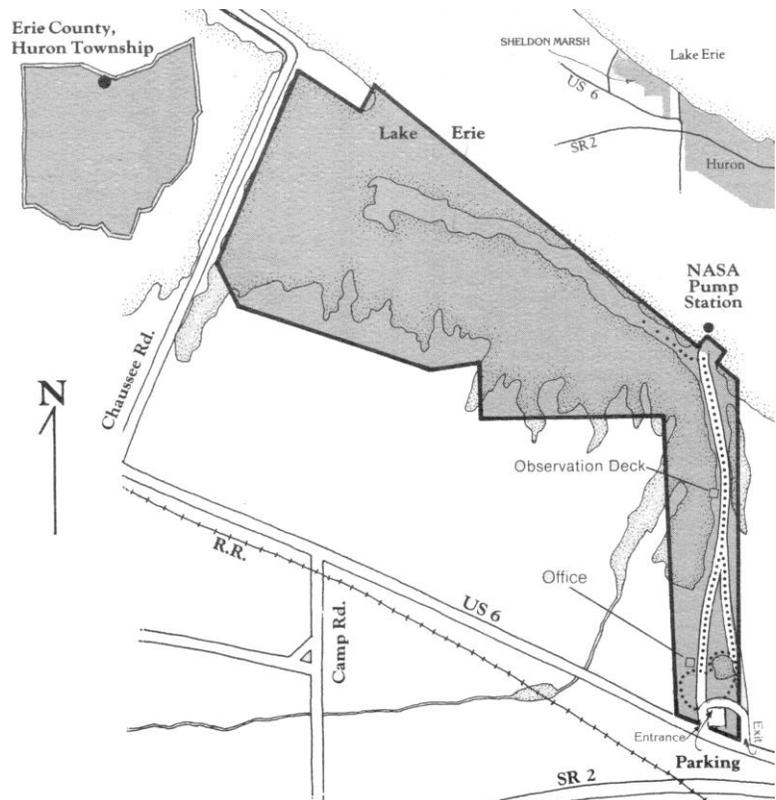
Preservation of habitat is seen as the key to survival of wild plant and animal communities, and this preserve contains many types of habitats, such as old field, hardwood forest, woodland swamp, cattail marsh, barrier sand beach and open water lake. All are relicts of the lake-marsh-forest ecosystem that originally encompassed thousands of acres along Lake Erie's western basin.

The elaborate entrance gates are all that remain of the original automobile entrance to Cedar Point Amusement Park. Near the turn of the century a motor road extended from Cleveland Road north to the lakeshore and then west along the beach to the park. The lake constantly washed away portions of the road and eventually forced park owners to construct an alternate route farther to the west of the present-day preserve entrance. Abandoned for many years, remnants of the original entrance road now serve as an ideal hiking trail through the preserve. From it one can observe many of the natural communities without disturbing them.

Although most coastal areas have been altered by human activities, this preserve remains relatively undisturbed because of previous landowner's concern for nature. In the early 1950s Dr. Dean Sheldon, a Sandusky physician, purchased a 56-acre tract of this preserve. An ardent conservationist, Sheldon spent many years managing the area for the benefit of wildlife. The results of his work are evidenced by the farm pond and the several introduced plant species that continue to provide food and shelter for many birds and mammals. Along the trails are rectangular, wooden nest boxes for eastern bluebirds and American kestrels. Nearer the water are several wood duck and tree swallow nest boxes placed by the Sheldon family, conservation groups, and local school children.

Recognizing the importance of this natural coastal habitat, the Ohio Department of Natural Resources purchased Sheldon's land in 1979. The property was combined with the adjoining 330-acre marsh and barrier beach and dedicated as Sheldon Marsh State Nature Preserve in 1980.

This preserve is known to attract nearly 300 bird species and provides habitat for many kinds of wildflowers. Spring is one of the best times to visit the marsh. From the middle



of April into June, the woodland floor is covered with blooming wildflowers. Dutchman's breeches, cut-leaved toothwort, and spring beauties are followed by trout lilies, trilliums, wild ginger, and wild geraniums. Also during this period many birds, particularly the colorful wood warblers, migrate to their breeding grounds in the north. Before crossing Lake Erie these tiny travelers stop briefly to rest and feed among the lush vegetation of the forest. Along the barrier sand beach, numerous shorebirds are frequently seen searching for food at the water's edge.

Summer residents include great blue herons, red-tailed hawks, black-crowned night herons, wood ducks, common terns, woodcocks, great horned owls, and numerous songbirds. Perhaps the most spectacular summer event is the blooming of the cardinal flower in the woodland swamp. Often described as America's most beautiful wildflower, its tall and brilliant red spikes are a magnificent sight.

Reprinted from the ODNR leaflet about Sheldon Marsh State Nature Preserve, a publication funded by the Natural Areas Income Tax Refund Checkoff Program.

More on Sheldon's Marsh:

The following is news relating to the irrigation waterway illegally dug through Sheldon's Marsh in 1999 by Barnes Nursery. Posted on the Friends of Sheldon's Marsh web site, www.sheldonsmarsh.org

October 10, 2001: We have a few items to bring to your attention: Recent aerial photos show clearly that Barnes' channel is filled with water while the Marsh is water starved. What influence does his water pumping especially through the recent dry summer have on the rest of the wetlands complex? A walk out to Sheldon Marsh will demonstrate that the wetlands are now filled with vegetation rather than the open water of the past. The lake level is low, but it would seem that conditions at our state nature preserve are being

impacted by the constant withdrawal of water for the nursery.

The Ohio Environmental Protection Agency (OEPA) water quality hearing for the Barnes' project has been cancelled again with no new date scheduled at this time.

Letters to Laura Fay at the OEPA are still acceptable and will be included in the public record. Please direct your letters to: Ms. Laura Fay, Section 401 Coordinator, Ohio Environmental Protection Agency, P.O.Box 1049, Columbus, OH 43216-1049. Or you can e-mail her at: Laura.Fay@epa.state.oh.us

Adam & Eve Go Wild, or The First Native American Crazy Glue

By Barry Glick

Now that I have your attention, what the hell am I talking about??? I'm talking about one of the many species of native Orchids that grow wild in these West Virginia Mountains.

"Adam and Eve" and "Putty Root" are two of the common names for *Aplectrum hymale*. Now, if you've read any of my previous columns, you know how I feel about common names. Not that I'm a snob trying to impress folks with my pseudo-intellectual grasp of the "dead" language of Latin, that's beside the point. It's just that the scientific names of plants usually insure that two people involved in a conversation about a particular plant can be reasonably sure, barring any meddling by some taxonomist who has probably never even seen a live specimen of that or any other plant, decides to rename it, that they are talking about the same plant.

Anyway.....getting back to the plant which is really what this story started out to be about, The scientific name tells you something about the plant. The generic name *Aplectrum* comes from the Latin, *A* (without) and *plectron* (spur), meaning that the flowers have no spurs. The specific epithet or second word, *hymale*, means Winter and refers to the fact that this Orchid has a solitary leaf that persists all Winter. This leaf can be up to 10" long and 3" wide with beautiful parallel silver veining. In the Spring, the leaf vanishes and a 12"-18" pencil-thick stem of greenish-yellow-purplish Orchid flowers appears.

In this instance, the common names are quite accurate, as they refer to two interesting characteristics of this unusual plant. First of all, "Putty Root" informs you of the fact that Native Americans used the glutinous matter derived from crushing the bulb of the plant to mend broken pottery and to fasten objects together. Adam & Eve is a reference to the growth habit of the bulbs as the leaf and flower arise from

the current seasons growth (Eve) while last years bulb (Adam), from which forth sprang Eve, is still present. One way of propagating the plant is to cut Adam away from Eve with a sharp knife and replant him. *A. hymale* usually sets copious amounts of dust-like seeds in attractive looking, pendulous pods. This is one of the easier Orchids to grow from seed. Pour boiling water over a pot of soil to sterilize it, let cool and sprinkle the seeds over the soil, cover with a dusting of fine Granite Grit to discourage the growth of lichens, mosses and algae and to prevent slugs from eating your seedlings, and set it outside and let nature take its course. The seeds will usually germinate the following Spring and in a few years you will have flowering size plants.

I can't really recommend companion plants for *Aplectrum hymale* because for my tastes, I have found that it looks best on its own in a natural looking colony. I'm sure that if space is a problem in your garden, you can use your imagination and find a pleasing neighbor for your plantings of it. Unlike some terrestrial orchids, there seems to be no apparent macrorhizal fungal requirement for these plants to grow happy and healthy in a normal garden environment.

Aplectrum hymale is a woodland plant that, in the wild, can be found in the shade of rich moist woods. If these conditions exist in your garden, they will be very happy there and before long you will have a nice little colony of these eye catching plants that's bound to strike up a conversation among visitors to your garden. You can then impress them with your command of Latin and some interesting trivia about the plant.

Reprinted from
<http://www.sunfarm.com/plantlist/AplectrumhymaleHTM.htm>

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Native Plant Society of the Ohio Valley
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In this issue:

Mallows – Perry Peskin
Name Quiz – Tom Cooperrider
Tallgrass Prairie – Gordon Mitchell
Cleveland Museum of Natural History
Natural Areas Program – Jim Bissell

Departments

Chapter Activities and 2002 Program
Ohio Natural Areas and Preserves: Sheldon's Marsh
Invasive Plants of Ohio: Narrow-leaved Cattail
Botany 101: Flower-Related Terms
Web Sites of Interest
Book Review

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