

NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO

Founding Chapter Of

THE OHIO NATIVE PLANT SOCIETY

6 Louise Drive
Chagrin Falls, Ohio 44022
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On the Fringe

THE JOURNAL OF THE OHIO NATIVE PLANT SOCIETY

Volume 7

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No. 2

**SATURDAY, MARCH 4th, 1-3 P.M.
Cleveland Museum of Natural History**

Dr. Warren Stoutamire is an internationally known authority of the ecology of orchids will present a slide program and demonstration of orchid ecology and seed germination. **Limit 30. Fee: \$5.00**

IMPORTANT ANNOUNCEMENTS. PLEASE READ!!

\$5,000 PLEDGE - At the Annual Dinner it was announced that the eight chapters of the Ohio Native Plant Society had pledged \$5,000 to the Center for Plant Conservation in Massachusetts. This money, doubled to \$10,000 by a matching grant, will be used by The Holden Arboretum to secure, for perpetuity, the existence of **Silene regia**, the Royal Catchfly, a plant of Federal concern. The plant, now under cultivation at the Arboretum, will be researched for its propagation and survival needs and will be reintroduced to its natural habitat as well as being kept at Holden. In addition, seeds will be stored at a national seed bank so that the genetic material is secured forever. Royal Catchfly is found in prairie remnants in four counties west of Columbus.

The money is being raised through the distribution of a poster featuring the eight flower logos of the chapters of the Ohio Native Plant Society. The Royal Catchfly is one of those flowers as it is the plant of the Columbus chapter.

For every **\$10 or more donation** given to the Society for the protection of **Silene regia** the donor will receive a free poster. Posters are available at The Cleveland Museum of National History, The Garden Center of Greater Cleveland, The Holden Arboretum, and the Fireside Book Shop in Chagrin Falls. Posters may be obtained by contacting the office of The Ohio Native Plant Society at 6 Louise Drive, Chagrin Falls, OH 44022, phone (216) 338-6622.

ANNOUNCEMENTS - Continued

DUES ARE DUE!!! There are still about half of our membership who have not yet renewed. If your Journal is stamped on the address page with a large red renewal notice, this is your last issue of the newsletter unless you send in your check. It is very sad to lose a member. Don't let it be you!!

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JOURNAL SUBSCRIPTIONS - The Journal is a privilege of membership in the Northeast Ohio chapter. Subscriptions are available to members of other chapters at \$7.50 per year for six issues. Send check to 6 Louise Drive, Chagrin Falls, OH 44022, made out to Native Plant Society. We urge people to join the chapter nearest them, even if they do subscribe to the Journal.

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POST OFFICE PROBLEM - The January issue of the Journal was mailed from the Chagrin Falls Post Office on Tuesday, December 20, 1988. We know that it was sent to the Main Post Office the next day. However, some of our members in surrounding areas had not received their Journal by the 25th of January 1989. If you are one of these people please contact Mr. Tom Westlake at the Main Post Office, telephone no. 443-4510. He has been most helpful in this matter, but he must know who, where and what. This issue will be in the mail no later than February 15, 1989. If you do not receive it in two weeks (by the first of March) please notify Mr. Westlake **at once**.

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It is with regret that we inform you of the death of member Bill Hartman. Bill was a member from the beginning and was most active in recruiting new members for us. He was a manager at Breezewood Garden Center in Bainbridge and was widely respected for his knowledge of native plant cultivation and was the resident expert on the use of native plants in landscaping.

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The Canadian Wildflower Society publishes a quarterly magazine, **WILDFLOWER**. Many of the informative articles are germane to Ohio's native plants. This is a high-quality publication with drawings and photographs, professionally done. For information write to: Canadian Wildflower Society, 75 Ternhill Crescent, North York, Ontario, Canada M3C 2E4. Membership is \$25 in US dollars.

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Quoted from the Dawes Arboretum Newsletter: "Tropical rainforests are critical to the health of our global environment. They're the winter home of our song birds, home to half the world's plant varieties, and they regulate our global weather patterns. **At the current rate of destruction (100 acres per minute) this precious resource will be wiped out in our lifetime.**" Just in case this statistic does not impress you, at 100 acres per minute the 3000+ acre Holden Arboretum would vanish in 30 minutes!! Extinction is forever. Preservation is up to YOU.

PROGRAM:

- ✓ **March 2 (Thursday) Cleveland Chapter - 7-9 P.M. at Chagrin Falls Library** - This is the annual slide night. Bring slides of plants and places which were photographed in 1988. Chagrin Falls Library is located at 100 E. Orange St., east of Main St.
- ✓ **March 4 (Saturday) Cleveland Chapter - 1-3 P.M. at Cleveland Museum of Natural History.** Dr. Warren Stoutamire from The University of Akron is an internationally known authority on the ecology of orchids. He will present a slide program and demonstration of orchid ecology and seed germination. **Limti 30. Fee: \$5.** Please call 338-6622 to register.
- March 10 (Friday) Cincinnati Chapter - Annual Dinner** at Northern Hills Fellowship, Fleming Road. 5:45 P.M. Dinner; 7:30 P.M. "Flowers in Textiles and Costume Art."
- March 11 (Saturday) Lisbon Chapter - 11 A.M.** - Field trip to Gaston's Mill for identification of local winter birds.
- March 12 (Sunday) Cincinnati Chapter - Field Trip** to Miller Sanctuary, ODNR, Highland County. (Snow Date: 3/19)
- 2 **March 18 (Saturday) Wilderness Center - 1:30-4:00 P.M.** - Field trip on identification of Shrubs in winter. Leaders, the Schmitthenners. The group will assemble at the Interpretive building, then drive to selected areas of the Killbuck Wildlife Area.
- March 18 (Saturday) Dayton Chapter - 1:30 P.M.** - Maple syrup making at Hueston Woods, 5 miles north of Oxford. Meet at the Beach parking lot.
- March 20 (Monday) Columbus Chapter - 7:30 P.M.** - Land Preservation Specialist Jan Williams from the Division of Natural Areas and Preserves will explain nature preserve dedication procedures, the natural landmark system, and introduce some of Ohio's newest nature preserves.
- March 20 (Monday) Dayton Chapter - 7:30 P.M. at Cox Arboretum** - Dane Mutter of the Dayton-Montgomery Park District will talk about native landscaping.
- ✓ **March 23 (Thursday) Cleveland Chapter - 7:30 P.M. at Holden Arboretum** - Jim Bissell, botanist and natural areas coordinator at The Cleveland Museum of Natural History will present a program on invasive species of plants and their threat to natural areas throughout northeastern Ohio.
- March 25 (Saturday) Lisbon Chapter - 11 A.M.** - Field trip to Guilford Lake and Salem Reservoir for waterfowl and other birds. Meet at Mark's Landing.
- March 28 (Tuesday) Lisbon Chapter - 7 P.M. at JVS** - Program will be on identification of wildflowers of Columbiana County.
- April 1 (Saturday) Athens Chapter - 9 A.M.** - Field trip to Strouds Run State Park (parking lot at the dam, off US Rt 50). Salamanders, frogs and early wildflowers. Scott Moody, leader.

PROGRAM - (Cont'd)

April 1 (Saturday) Dayton Chapter - Time to be announced. Tour of Wilberforce Woods with Mark Ray.

April 7 (Friday) Cincinnati Chapter - 7:30 P.M. at Avon Woods Outdoor Education Center - "A Photographer's Perspective of Wildflowers." by Terry Duffy, Free-lance photographer and instructor.

April 8 (Saturday) Cincinnati Chapter - Field trip to Camp Kern, Warren County.

April 13 (Thursday) Cleveland Chapter - 7:30 P.M. at Garfield Park Nature Center - Chuck Thomas from the Cuyahoga County Engineers Office has been studying the plants of the Tinkers Creek valley for many years. He will present a program entitled A Floristic Study of the Tinkers Creek National Natural Landmark. Garfield Park Nature Center is located at 11410 Broadway Ave., in Garfield Hts.

April 15 (Saturday) Wilderness Center - 10 A.M. to 5 P.M. - Field trip to Jefferson Lake State Park. Leader, Jerry Yoho. We tentatively plan to meet at the Park at the boat dock for a picnic lunch at 12 noon. Plan on arranging your own transportation with other members. Jefferson Lake State Park is about 10 miles northwest of Stubenville in Jefferson County, just north of Rt. 43.

April 15 (Saturday) Lisbon Chapter - Time and location to be announced. Wildflower identification walk.

April 15 (Saturday) Athens Chapter - 8 A.M. - Wildflower Walk led by David Horn (birds, salamanders, snakes as well). Meet at the parking lot by the dam of Fox Lake. Travel west of Athens on SR 56, south on Co. Rd. 19 for 1.1 miles, west on Co. Rd. 10 for 1.5 miles, then northwest on Township Rd. 29 (gravel) for .9 miles.

April 17 (Monday) Columbus Chapter - 6:30 P.M. - Extended Services Director Alan Cook of Dawes Arboretum will lead us on a tour of Dawes for spring wildflowers. Meet at 6:30 at Dawes in Newark. Car pool to leave Spring Hollow at 5:45.

April 17 (Monday) Dayton Chapter - 6:30 P.M. at Cox Arboretum - Tour the wildflower garden at the Cox Arboretum. At 7:30 Alex Pearl, Director, will speak about New Happenings at the Arboretum.

April 22 (Saturday) Cincinnati Chapter - Field trip to Miami County Parks.

April 25 (Tuesday) Lisbon Chapter - 7 P.M. at JVS - Dwight Jacobs present a program on warbler identification.

April 28 to April 30 (Friday evening - Sunday) Wilderness Center - Field trip weekend to Lake Vesuvius, Wayne National Forest, just north of Ironton on SR 93. Camping and motel options will be available. The Lake Vesuvius areas has a rich spring flora, a beautiful lake, rock overhangs and several trails. We may have to walk about 5 miles on good trails to see some of the more interesting flora. Leader, the Schmitthenners.

OHIO WETLANDS: THE PEATLANDS - Part I by Dr. Barbara Andreas
(Sphagnum dominated kettle-hole bogs)

The passage of the Clean Water Act brought into focus the alarming rate of the degradation of U.S. wetlands. Organizations like Ducks Unlimited, The Nature Conservancy, Trust for Public Lands, the Division of Wildlife and the Division of Natural Areas and Preserves of the Ohio Department of Natural Resources, to mention a few, recently concentrated their efforts on the preservation of wetlands. Two problems that complicate wetland preservation are defining what constitutes a wetland, and what boundaries are necessary in order to protect the hydrology of the area. The classical definition of a wetland is provided by the U.S. Fish and Wildlife Service, Environmental Protection Agency and Army Corps of Engineers: "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetland ecologists are now concentrating on identifying the physical parameters that keep a wetland "healthy." Developing a classification system for wetlands based on vegetation type is critical so that scientists can use a common terminology when communicating, much like the need for a scientific name of an organism so that one knows more clearly to what a reference is made.

The type of plant community and the degree of vascular plant diversity occurring in a wetland is determined by 1) rate of water movement, 2) depth of water, 3) chemistry of water and surrounding substrate, 4) source of water entering the wetland, 5) the impact of run off from the surrounding upland, and 6) the amount of disturbance. Wetlands generally are open areas where tree species may be present, but the trees are usually stunted and not part of the dominant vegetation. An exception to this last criterion is swamp and floodplain forests. These are closed canopy wetlands and will not be discussed in this article.

Wetlands, in a broad sense, include the following types of communities: rivers, streams, ponds, lakes, marshes, shrub swamps, bogs, fens, swamp forests, and floodplain forests. These communities represent a continuum and it is often difficult to classify even a small geographical area as one community type. More often than not, a natural area represents an integration of two or more plant communities. Wetlands are frequent within glaciated Ohio where there is less local relief than in the unglaciated portions of the state. In addition, wetlands typically occur near a major divide (for instance, the divide between the St. Lawrence and Ohio River drainage systems that occurs across northern Ohio) where water can accumulate and form wetlands.

Rivers, streams, lakes and ponds are recognized by the presence of open water which clearly defines them as wetlands. Generally, rivers and streams do not contain a high diversity of vascular plants. Shade and a strong current deter plant growth in woodland streams. Where oxbows form and the waters are quiet, numerous plants become established. Plants typical of partially shaded to sunny streams and rivers include water willow (*Justicia americana*) and twisted sedge (*Carex torta*).

Glacial lakes and ponds and well-established artificial lakes are frequent throughout northern Ohio. These are also open water communities. Waters with a low pH, deep water and strong waves deter vascular plant growth. Conversely, shallow, quiet, neutral to alkaline waters are rich in species diversity. Typical vascular plants associated with lakes and ponds include coontail (**Ceratophyllum demersum**), Canada waterweed (**Elodea canadensis**), duckweed (**Lemna minor**), spatter-dock (**Nuphar advena**), water lily (**Nymphaea odorata**) water-milfoil (**Myriophyllum spicatum**) and a variety of pondweeds belonging to the genus **Potamogeton**. With the exception of a few kettle lakes surrounded by extensive peatlands, most lakes in Ohio have been greatly disturbed, primarily from changes in nutrient levels from surrounding dwellings, changes in turbidity from the introduction of carp and nutrients, and from muddy run-off from the uplands.

Marshes are the wettest of the closed water communities. A marsh is an open (no canopy) community with an abundance of herbaceous vegetation that is made up of grasses and grass-like plants, including rushes, reeds, grasses, sedges, and cattails. The variety of different types of species found in a marsh is limited. Marshes tend to be dominated by a particular species, most often cattails (**Typha sp.**). Waters of a marsh are usually standing or slow moving. Surface water level may fluctuate, but the rooting zone remains saturated. The water in marshes is circumneutral to alkaline. Some plants found in marshes include sweet-flag (**Acorus calamus**), sedges (**Carex spp.**), bur-reed (**Sparganium americana**), manna grasses (**Glyceria spp.**), cut rice-grass (**Leersia oryzoides**) and reed canary grass (**Phalaris arundinacea**). Ironically, few species found in marshes are restricted to this community. Soils of marshes occasionally contain decayed plant material, but also have a high mineral content and are not classified as a muck.

Shrub swamps are communities where the soil is saturated for part of the year and dry, or at least portions are dry, for the remainder of the year. Shrubs found in this community are taller than breast height, grow in clumps, and include willows, meadow-sweet, buttonbush, alder, arrow-woods, roses, and dogwoods. Low growing shrubs and herbaceous species are not common under the tall shrubs. Some of the species that do grow in this community include cinnamon fern (**Osmunda cinnamomea**), sedges (**Carex spp.**), smartweeds (**Polygonum spp.**), false nettle (**Boehmeria cylindrica**), swamp milkweed (**Asclepias incarnata**), marsh marigold (**Caltha palustris**) and beggarticks (**Bidens spp.**). Because of the distribution of the shrubs by clumps, the ground surface is undulating and tussocky. The soils tend to be circumneutral to slightly acidic and are mineral in content. Ponds and channels are common in shrub swamps, especially those dominated by buttonbush.

PEATLANDS

Peatlands are characterized by soils made up of partially decayed organic matter of plant origin. This matter may be herbaceous vascular plants such as cattails, sedges or grasses, or may be mosses, specifically members of the genus **Sphagnum**. Peat growth is initiated by the presence and retention of water and peat has the ability to hold water against drainage. Peatlands sometimes are confused with marshes and shrub swamps.

The occurrence of peatlands in Ohio is somewhat predictable. First, with the exception of a few peatlands that occur in glacial alluvium at the border of Wisconsinan and Illinoian glacial boundaries, all Ohio peatlands occur in the area of Wisconsinan glaciation. Secondly, these peatlands are associated with glacial features such as kame and esker complexes (ridges of glacial drip deposited by subglacial streams or ponded deposits); outwash deposits (sand and glacial deposited by glacial meltwater in front of the end moraine); and lacustrine (glacial lake) deposits. Third, approximately 95% of the peatlands mapped to date occur on buried river valleys that were obliterated with the advance of Pleistocene glaciation. Fourth, most peatlands form in the headwaters of drainage systems, about 2 million years ago. Fifth, Ohio's peatlands vary in elevation from 110 to 218 m above sea level. Finally, acidic peatlands generally occur in depressions, but otherwise there is no distinctive relief pattern for more alkaline peatlands.

Peatlands frequently are associated with a muck soil type (**Carlisle muck**) or another organic soil association. However, there are numerous areas mapped which indicate an organic soil that no longer supports peatland vegetation. In addition, some peatlands are so small in area covered that the soil maps do not distinguish soil types at that level.

Alfred Dachnowski investigated the distribution of Ohio peatlands and published his results in 1912. He estimated that less than 1% of Ohio's land surface was in peat deposits at the time of the arrival of the early European settlers. I estimate that close to 75% of the areas discussed in Dachnowski are now completely gone, or have been disturbed to the point where peatland vegetation is no longer the dominant flora. Today few floristically intact peatlands remain. For that reason, taxa confined to peatlands are locally "rare", and numerous peatland taxa are on the Ohio rare plant list.

Peatlands have disappeared because of some of the following reasons:

1) Drainage. Peatlands were drained and converted to truck farms and other types of agriculture. Large areas of muck soil that are presently farmed are located around the towns of Carey, in Crawford County, and Hartville, in Stark County.

2) Recreation. Peatland depressions were flooded and cottages built along the shores. Many of these summer cottages eventually became full-time residences. The communities of Myers Lake and Congress Lake in Stark County, and Twin Lakes and Brady Lake in Portage County, are examples of this.

3) Mining. Peat has been mined in Ohio primarily for horticultural use. Today at least four active peat mines report their tonnage extracted to the Division of Geological Survey, ODNR. Many other smaller operations exist. McCracken Cemetery Bog in Champaign County is an example of an active peat mine. In addition, numerous peatlands have been destroyed in the process of extracting sand and gravel. The disappearance of Labrador tea (**Ledum groenlandicum**), one of two locations ever known in Ohio, occurred when Way Swamp, Portage County, was mined for sand and gravel.

4) Agricultural and Sewage Run-Off. Agricultural run-off increases the nutrient load of peatlands and changes the community in such a way that non-peatland species can now out-compete the typical peatland flora which is adapted to a nutrient-poor environment. Singer Lake and Caston Road Bog in Summit County are examples of this effect. In addition, turbidity of the open water changes with run-off due to the increase in growth of phytoplankton. Numerous sandy-bottomed glacial lakes have succumbed to this effect.

5) Canal Building. The water levels of glacial lakes were changed so that the lake could be used as feeder lakes for the Ohio canals. Buckeye Lake, Licking County, St. Mary's Lake, Auglaize County, and Summit Lake, Summit County, once had a peatland flora growing along their margins.

6. Road Building. When the natural drainage in a peatland is blocked, the area upstream often becomes flooded while the area downstream becomes dry. In both cases, the vegetation changes. The building of I-76 on the west side of Akron drastically altered the peatland where Norton Bog is located.

7) Power Boats. Wave action formed from the wake of power boats breaks up the peatland mat. This has been well-documented at Buckeye Lake in Licking County. It has also occurred at Aurora Lake, near the junction of Summit, Cuyahoga and Portage Counties.

On a broad scale, peatlands can be divided into two categories, bogs and fens. The first part of this two-part paper deals with bogs. In a later issue we will turn to fens. A sphagnum bog is considered to be a habitat that 1) develops in an area where drainage is blocked and there is little or no circulation water, 2) contains a **sphagnum**-dominated ground layer which accumulates to form a more or less continuous mat, 3) has a shrubby vegetation dominated by members of the heath family (**Ericaceae**) and a depauperate (poorly developed) herbaceous layer primarily dominated by members of the sedge family (**Cyperaceae**) and 4) has a water pH between 3.5 and 5.5.

Bog waters are brown due to an accumulation of organic material. In Ohio, plant communities with the above characteristics are referred to as sphagnum bogs, leatherleaf bogs, ericaceous shrub bogs, tamarack bogs, and more recently, ombrotrophic to weakly minerotrophic peatlands. Ombrotrophic water originates from rain and minerotrophic water is mineral nourished from surrounding soil.

A fen is characterized by having: 1) relatively clear water coming from an artesian source which surfaces as springs or seeps, 2) a wet, springy calcareous substrate which supports minerotrophic species of mosses with little **Sphagnum**, 3) vegetation dominated by members of the sedge family (**Cyperaceae**), sunflower family (**Compositae**), rose family (**Rosaceae**) and grass family (**Gramineae**), with shrubby cinquefoil (**Potentilla fruticosa**) usually present, and 4) water pH between 5.5 and 8.0. In Ohio, plant communities with the above characteristics are meadow-like and are referred to as sedge meadows, wet prairies, shrubby cinquefoil bogs, 'fen' bogs, and more recently, moderately minerotrophic to strongly minerotrophic swamps.



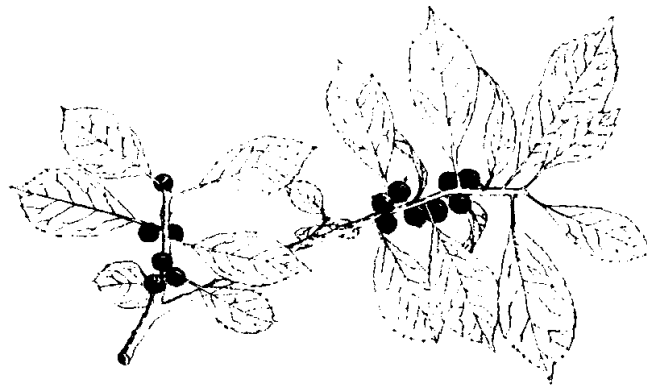
Nemopanthus mucronatus. mountain holly.



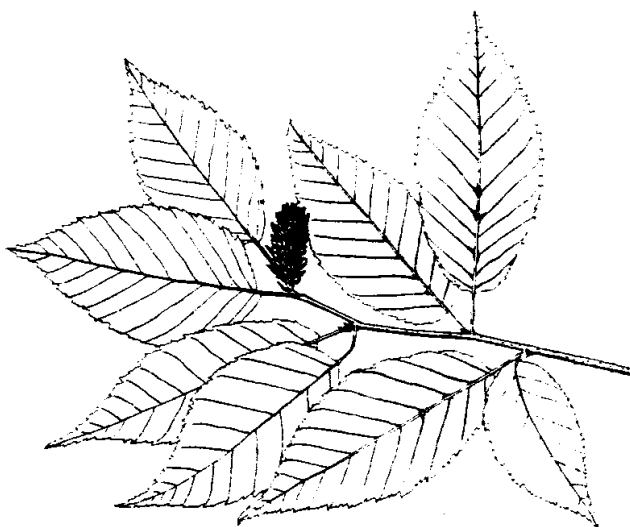
Gaylussacia baccata. huckleberry.



Vaccinium corymbosum. high-bush blueberry.



Ilex verticillata. Michigan holly.




Betula alleghaniensis. yellow birch.



Chamaedaphne calyculata. leatherleaf.

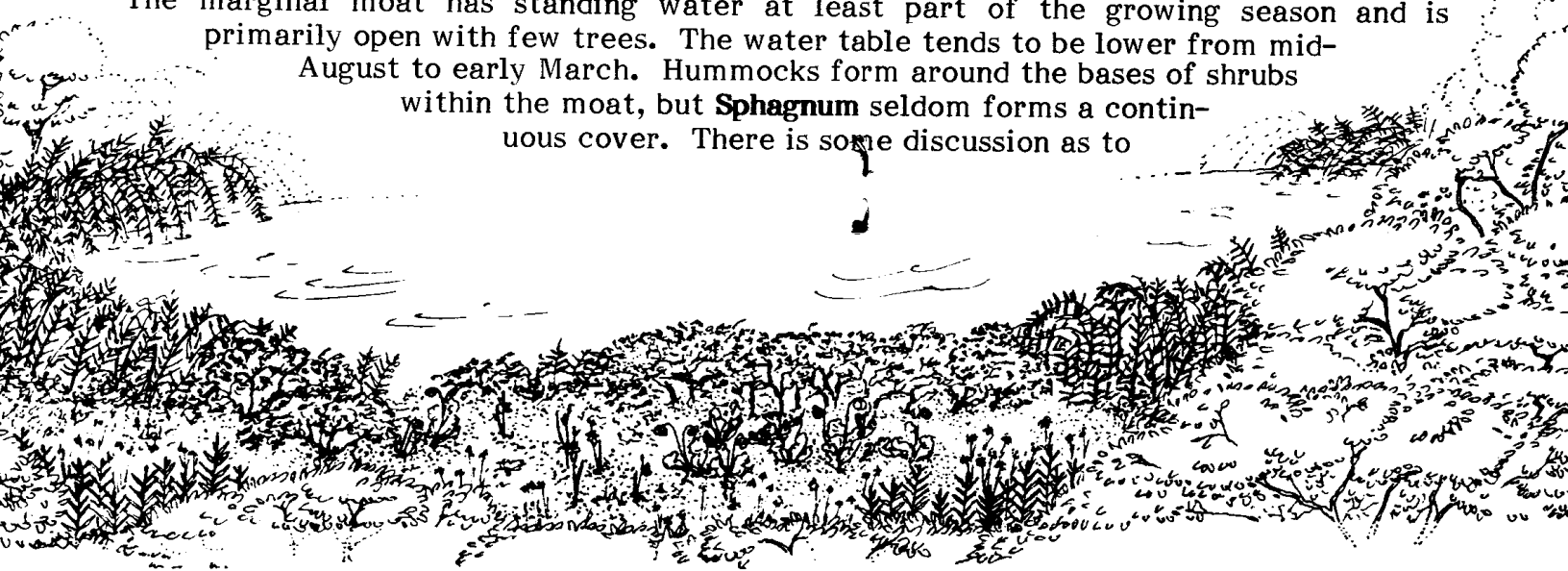
SPHAGNUM-DOMINATED KETTLE-HOLE BOGS



Among the rarest type of Ohio peatland is the kettle-hole bog that exhibits concentric vegetational zonation containing *Larix laricina* (tamarack). Kettle-hole bogs are basin-type wetlands that are underlain by peat and have a *Sphagnum* mat surrounding a lake in a glacial kettle-hole or similar depression. A good example of this type of community is Fern Lake Bog in Geauga County or Triangle Lake Bog in Portage County. The occurrence of kettle-hole bogs in Ohio is noteworthy because these sites are at the southernmost edge of glacially-created kettle-hole bogs in eastern North America. Overall, these communities are similar in latitude, geologic age and flora to ones found in New York and New Jersey. Based on pollen studies and radiocarbon dating, Linda Shane (1987) from the University of Minnesota estimated that some of these areas in north-eastern Ohio have been ice free, and available to vegetation growth since 15,700 B.P. (before present). Peatlands in northern lower Michigan have been subject to peatland development for about 10,000 years (Schwintzer, 1978), and those around the Red Lake peatland area in Minnesota, from about 1,950 + or - 65 years B.P. (Glaser, et al, 1981).

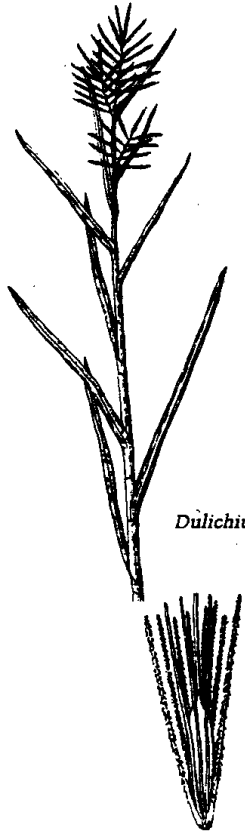
Kettle-hole bog formation at these sites appears to be similar to the model proposed by Kratz and DeWitt (1986) where the organic soil of the depression can be separated into a floating mat, which encroaches upon the open lake, and a grounded mat. The grounded mat (Figure 1) may be divided into a zone of compaction where there is active peat accumulation, and a zone of equilibrium where there is no peat accumulation. Between the zone of equilibrium and the upland is a region referred to as the marginal moat, lagg or marginal fen. From the marginal moat to the open lake, there is a swamp thicket-tall shrub zone, a treed bog zone, a tall shrub zone, and a low shrub zone (Figure 2). Theoretically, it is thought that the kettlehole will eventually be filled with organic material and eventually become solid. This may or may not happen, depending on several factors. A major one is changes in water level that may open up an area that was once closed. Fires in peat deposits in kettle-hole bogs destroy accumulated peat. A fire, at least according to Dachnowski, changes the vegetation to include more species not typically found in peatlands.

The marginal moat has standing water at least part of the growing season and is primarily open with few trees. The water table tends to be lower from mid-August to early March. Hummocks form around the bases of shrubs within the moat, but *Sphagnum* seldom forms a continuous cover. There is some discussion as to





Larix laricina, tamarack.



Dulichium arundinaceum, the 3-way sedge,



Potentilla fruticosa, shrubby cinquefoil,



Carex canescens



Rhynchospora alba, white beak rush,



Calla palustris, the wild calla,



Decodon verticillatus water willow or swamp loosestrife.

what keeps the moat from filling in with "bog" species. The interaction of the mineral soil washing into the depression keeping it more nutrient-rich undoubtedly influences its vegetation. The width of the moat and dominant taxa vary from area to area, but species composition remains relatively constant. Some of the species found in this zone are: wild calla (**Calla palustris**), sedges (**Carex spp.**), three-way sedge (**Dulichium arundinaceum**), buttonbush (**Cephalanthus occidentalis**), winterberry (**Ilex verticillata**), rushes (**Juncus spp.**), swamp candles (**Lysimachia terrestris**), and many of the tree and shrub species typically found in the grounded mat.

The swamp thicket - tall shrub area occupies the largest percentage of the vegetated surface area of the depressions. This area is dominated by the same taxa that occur within the "ring" of tamaracks (see below), especially northern highbush blueberry (**Vaccinium corymbosum**). Winterberry (**Ilex verticillata**) is frequent within this region. Many shallow-water Ohio peatlands may be vegetated completely with plants typical of the swamp thicket - tall shrub area. Trees are scattered throughout this zone, and in some cases many of the trees are dead, probably due to flooding from cyclic water table fluctuations.

A "bog forest", in the context of more northern latitudes, is not well developed in Ohio **Sphagnum**-dominated bogs. However, a narrow, more or less concentric zone of trees may extend from 10 to 30 m from the open lake. Within this zone, tamarack (**Larix laricina**), yellow birch (**Betula alleghaniensis**), and black gum (**Nyssa sylvatica**) are prevalent. At Fern Lake Bog, in Geauga County, the hardwood species in this region were removed by beaver. Beaver have also cut tamarack, and those remaining show signs of stress from girdling and many crowns of the remaining tamarack are depauperate. From field inventories in 1984 and 1985, tamarack seedlings appeared in only 2% of the plots sampled at Fern Lake Bog. Medve, then a graduate student at Kent State University, studied Fern Lake Bog in the late 1950s. He noted a 41% decline in **Larix** between 1939 and 1958, but he did not offer an explanation.

Black gum is frequent in the tree zone of Ohio **Sphagnum**-dominated bogs. It is also found as a component of the tree layer of bogs in southern Michigan, but the taxon is rare above the 44th parallel and is not found in the lush bogs of northern Michigan. John T. Curtis, in the Vegetation of Wisconsin (1959), makes no mention of black gum associated with wetlands. Black gum, apparently, is not a component of New York bogs.

Black spruce (**Picea mariana**) is present in basin-type bogs in more northern latitudes, such as Michigan, Wisconsin and New York, but is not found in Ohio peatlands, nor elsewhere in the state. Although no historical records for this taxon is known from Ohio, Dr. Shane listed spruce in pollen profiles for northeastern Ohio.

The tall shrub bog zone within the "ring" of tamaracks is dominated by northern highbush blueberry, huckleberry (**Gaylussacia baccata**), mountain-holly (**Nemopanthus mucronatus**), tamarack and red maple (**Acer rubrum**). Northern highbush blueberry is most frequent in the open sun, and as tamaracks reach tree size, huckleberry and mountain-holly become prominent within the shade of the tamaracks.

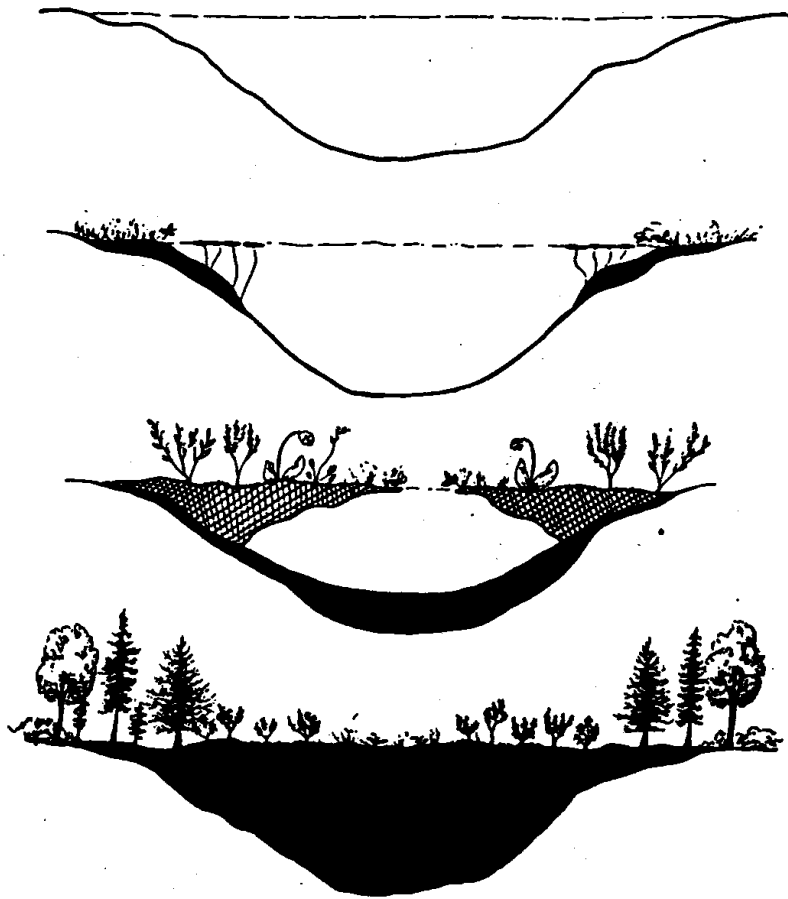
The floating, unconsolidated mat (Figure 1) in open-lake kettle-hole bogs usually range from 1 to 5 m in width. Dominant taxa in this area are swamp loosestrife (**Decodon verticillatus**) and leatherleaf (**Chamaedaphne calyculata**). These species act as purchases, or forerunner taxon, which arch out into the open water. Leatherleaf is found in the low shrub zone in peatlands throughout glaciated Eastern North America. In addition, there are several kettle-hole bogs in Ohio that are almost homogenous stands of leatherleaf (Barnacle Bog in Portage County is an example). Bog rosemary (**Andromeda glaucophylla**) and bog laurel (**Kalmia polifolia**), typically present in northern bogs, are absent from bogs and the modern Ohio flora; bog rosemary is known from historical Ohio records, but bog laurel has never been documented from the state.

At the interface between the floating mat and the grounded mat is the area where most herbaceous species typically associated with bog mats are found. Few areas in Ohio **Sphagnum**-dominated kettle-hole bogs contain large areas of open **Sphagnum** mat. Taxa in the open mat include cranberries (**Vaccinium macrocarpon**) round-leaved sundew (**Drosera rotundifolia**), marsh St. John's wort (**Hypericum virginicum**) white beak rush (**Rhynchospora alba**), pitcher plant (**Sarracenia purpurea**), wild calla and sedges. Virginia chain fern (**Woodwardia virginica**) is common in this region and is frequent throughout the entire depression to the marginal moat.

Unlike bog formation in more northern latitudes, sedges play little to no role in the formation of the floating mat in Ohio peatlands. Here that role is performed by swamp loosestrife and/or leatherleaf. Howard Crum (1988) considered sedges to be more important in mat formation in alkaline lakes than in acidic lakes, although some lakes in Northern Michigan and Wisconsin, with a range of pH close to those of Ohio lakes, have sedges as the invading species. Another distinction between Ohio bogs and those of more northern latitudes is that Ohio bogs typically do form a hummock-hollow topography. This is primarily due to climatic conditions that promote evaporation-transpiration so that, in Ohio, **Sphagnum** hummocks dry out as they rise above the water level. Ohio has no truly raised **Sphagnum** bogs. Here the mat is a more or less flat lawn dominated by **Sphagnum recurvum**. In the floating mat (from 1 to 5 meters from the open water), **Sphagnum** becomes established around the bases of swamp loosestrife and leatherleaf, and the moss layer reaches its best development in the shaded grounded mat under tall shrubs and under trees. We are often led to believe that the **Sphagnum** mat exists right out to the open water, but that is not the case. Other species of **Sphagnum** are present, including **Sphagnum magellanicum**, **Sphagnum capillifolium** and **Sphagnum fimbriatum**. Other moss genera present in the mat include **Aulacomnium**, **Dicranum**, **Leucobryum** and **Polytrichum**.

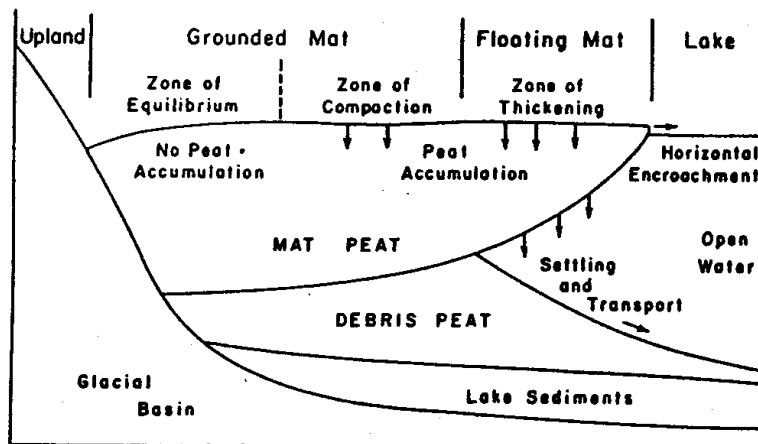
WATER CHEMISTRY

Factors affecting water chemistry of a wetland include: 1) the chemical composition of rain, 2) the bedrock geology of the catchment, especially for all surface and sub-surface water movement, 3) the topography of the catchment and its drainage systems, 4) the climate of the region as it affects physical weathering, and 5) biotic components such as aquatic and terrestrial plants and their rate of decomposition (Moore and Bellamy, 1974).



The development of a typical kettlehole bog through lakefill (Johnson, 1985).

KETTLE-HOLE BOG FORMATION



Conceptual model of the way small peatlands form around lakes in north temperate latitudes.

Kratz and DeWitt, 1986

Based on pH, conductivity, calcium and magnesium ions, there exists a continuum within peatlands. It is possible to separate peatlands into five broad categories, based on the four characteristics listed above. In ombrotrophic peatlands, nutrients and water primarily are brought into the system through rain, and values for the above characteristics are at the low end of the continuum. An ombrotrophic bog is often described as a "domed" bog or "raised" bog since the peat is elevated above contact with ground water. Semi-ombrotrophic bogs have low values for the characteristics mentioned above and have low species numbers, but water entering the system includes ground water and run-off. In weakly, moderately, and strongly minerotrophic peatlands, nutrients and water enter the system primarily through ground water and run-off, and values for the above parameters range to the high end of the continuum. Ombrotrophic, semi-ombrotrophic and weakly minerotrophic peatlands are often called "bogs," whereas moderately to strongly minerotrophic peatlands are called "fens." Using this system, Triangle Lake Bog is semi-ombrotrophic; Fern Lake Bog and Browns Lake Bog (Wayne County), weakly minerotrophic; and Jackson Fen (Stark County), Cedar Bog (Champaign County), and Prairie Road Fen (Clark County), strongly minerotrophic.

Sphagnum-dominated kettle-hole bogs are low in species numbers. Less than forty taxa occur within the ring of tamaracks at Triangle Lake Bog, and less than 60 taxa occur within the ring at Fern Lake Bog. When one eliminates the "flashy" species, such as pitcher plants and sundews, there are actually few taxa common to both ombrotrophic and minerotrophic communities.

Dr. Barbara Andreas, a charter member of Native Plant Society, is Professor of Biology at Cuyahoga Community College, adjunct Professor at Kent State University, and received the National Stewardship Cup for her work with the Native Conservancy.

* * * * *

The following are important references for further reading on peatlands. Several will also apply to the second part of this article coming at a later date.

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BOOK REVIEWS:

WILDFLOWERS OF INDIANA, text by Fred Wampler, paintings by Maryrose Wampler. Hardcover, 10"x13", 80 plates, 197 pgs, \$39.50, Indiana Univ. Press, Bloomington, IN.

This is a breathtaking book filled with beauty on every page. Mrs. Wampler has invented a new watercolor technique that renders the flowers extremely life-like. There are over 300 species depicted in the 80 plates, grouped as one would find them in the field. The text is readable and informative, and an informative introduction takes us on a tour of Indiana's preserves.

This book is worth every penny! A joy to read on a winter day; a thing of beauty to possess. Available at Fireside Book Shop in Chagrin Falls. AKM

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A FOCUS ON PEATLANDS AND PEAT MOSSES, by Howard Crum in collaboration with Sandra Planisek. Pub. by Univ. of Michigan Press, 1988. \$49.50.

This book is richly illustrated with many fine botanical drawings and black and white photographs of the diverse vascular plants and habitats of the peatlands. The authors intend this to be a peatland primer, a student's guide to the habitats of the peatlands, focusing on the Midwest and Upper Midwest. It includes the classifications of peatlands, vegetation, hydrology, nutrient cycling, environmental stress and recommended use of peat and peatlands. There are several definitive chapters on the taxonomy of peat mosses, which is Crum's specialty. TLB

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Kentucky 5, 6, 7,
WESTVA
VIRGINIA SYMPOSIUM. The Virginia Native Plant Society and Wintergreen Resort are having their annual Wildflower Weekend on May 12, 13, 14, 1989 at Wintergreen, VA. This is an outstanding weekend! Your editor attended two years ago. Wintergreen is located on top of one of the highest mountains in the Blue Ridges with spectacular scenery. The weekend begins with registration and a lecture on Friday evening. Saturday there are field trips and classes and demonstrations all day with another evening lecture. Sunday is a repeat through the afternoon. The lecturers and field trip leaders are all East coast experts. The wildflowers are rich in numbers and diversity, and many habitats will be seen.

Registration for the weekend program is \$45 per person. Groups of 10 or more is reduced to \$40 per person. However, 3 days and 2 nights, including registration, for lodging in one of the Resort's condos, is \$116 per person. This is a DEAL! No meals are included.

Wintergreen is just south-west of Charlottesville, VA and just off the Blue Ridge Parkway. A lovely time of the year for a trip in that direction. If you go, be sure that you tell them you are from the Ohio Native Plant Society when you make reservations. See you there! 1/800/324-2200 for Registration. 1/804/324-2200 Ext 281 for information.

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andy howe 

PROPAGATOR'S PERSPECTIVE by Bill Brumback

Beware of "Imitation Propagation"

In the last several years, a number of new nurseries have been started that offer only propagated native plants. These nurseries, small firms located mainly in the South, were begun because their owners felt that the nursery industry should not contribute to the possible destruction of wild populations by selling plants that may have been unethically or even illegally collected. Although ethical collection of widespread, common species on a sustained-yield basis may be possible in some instances buying and selling only propagated plants assures that no native populations are being destroyed in order to bring wild species to horticulture.

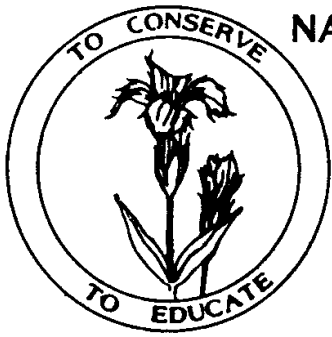
Following this logic, and expressing concern for our native plants, the public has begun to ask hard questions to the nursery industry about the sources of the plants being sold. As a result, several large, mail-order firms have recently declared that they will not sell any wild-collected material. Yet not all nurseries have followed suit; wild collected plants can still be purchased in large quantities. Furthermore, other nurseries, in an apparent response to public pressure on the issue of wild collection, are beginning to sell difficult or impossible to propagate plants (such as Trilliums and Pink Lady's-slippers, *Cypripedium acaule*) at very low prices under the headings, "Nursery Grown" and "Not Wild Collected."

But are these firms actually stating that the plants are propagated? No, they are not. I suspect that the term "Nursery Grown" is being applied to plants which are wild-collected and have been placed either in beds or containers at a firm calling itself a nursery until the plants are sold. How long a wild-collected plant has to remain at a nursery before it becomes "nursery grown" is unclear to me, but I am very sure that these plants were not propagated in the usual nursery sense.

If nurseries are going to practice this sort of "imitation propagation," then the buying public will need to be very vigilant. Don't be fooled! When you see difficult or impossible to propagate species (such as Trilliums and Lady's-slippers) being offered, be suspicious. When you see a catalog offering wildflowers for sale in large quantities at low prices, be suspicious. Look for the word "propagated" in the catalog. Most nurseries propagating native plants proudly state their ethics in no uncertain terms. In order to avoid semantic games, patronize the nurseries that are listed in the NEWFS Nursery Source list. Remember-Support a Propagator, Not an Imitator.

The NEWFS Nursery Source list is available from the Gift Shop. (\$6.95 includes postage and handling)

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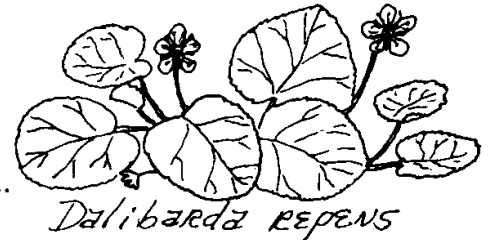
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