

# NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO

Founding Chapter Of

THE OHIO NATIVE PLANT SOCIETY

6 Louise Drive  
Chagrin Falls, Ohio 44022  
(216) 338-6622

*On The Fringe*

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Volume 4

March/April 1986

Volume 2

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## PROGRAMS AND FIELD TRIPS:

- ✓ **Saturday, March 15, 1:00 - 4:00 p.m. Museum of Natural History:**  
Bob Bartolotta, botanist with the Museum will give a class on mosses and liverworts. This is Bob's area of expertise and we will cover physiology, identification, books on the subject, etc. This will be a workshop using microscopes and hand lenses and you will learn how to make your own collection. Fee: \$5.00 Member - \$7.50 Non-Members. Brown bag lunch.
- Saturday, March 15 or 22, The Wilderness Center.**  
(Date and time depending on leader.) A moss trip is planned to the Beach City Wildlife Area. Wilmot members watch your March cards. Other Chapters, contact Bobbie Lucas at 644-7682.
- Monday, March 17, 7:30 p.m. - Columbus Chapter at Spring Hollow Nature Preserve.** "Wildflowers of Ohio and the Stories Behind Their Names", an illustrated talk by Robert Reed.
- ✓ **Friday, April 4, 7:30 p.m. - Holden Arboretum.**  
Dr. Lazarus Macior of the University of Akron will give a lecture on "Co-Adaptation of Flowers and their Pollinators". It will cover what attracts insects, such as color, odor, form, and how flowers use pollination to reproduce. Dr. Macior is a recognized authority on this special field and is widely published.
- ✓ **Saturday, April 19, 11:00 a.m. - Wildflower walk at Pee Wee Hollow** in Northwest Wayne County to see early wildflowers, details Bobbie Lucas.
- ✓ **Sunday, April 20, 9:00 a.m. - Field trip to Clifton Gorge and Cedar Bog.** Perfect time for *Trillium rivale*. Contact Jean Willis, Columbus.

**Monday, April 21, 7:30 p.m. - Spring Hollow Nature Preserve:**

"History of and Common Spring Wildflowers of Black Hand Gorge" by Jean Willis.

**Saturday, April 26, 9:30 a.m. - Big Creek Park, Geauga County Parks.**

A naturalist will lead us on a wildflower foray into one of the unique areas of Geauga County's park system. Meet at Maple Grove and we will walk the Trillium Trail.

**Saturday, May 3 - Eagle Creek Preserve in Portage County.**

The Wilderness Chapter can be contacted for a time.

**Sunday, May 4, 1:00 p.m. - The Wilderness Center.**

A wildflower trip at TWC guided by the members.

**May 17 & 18 - The Wilmot Chapter** plans an overnight trip to the Hocking Hills area. Overnight housing will be arranged.

**Friday, March 14, 8:00 p.m. - "Botanizing in West Sumatra"** by Dr. William Meijer, the University of Kentucky. Cincinnati Chapter.

**Saturday, March 29, 12:00 noon - Gorge Hike at John Bryan State Park** with Vic Soukup (513/761-2568) of the Cincinnati Wildflower Society.

**Sunday, April 13, 2:00 p.m. - Cincinnati Chapter at California Woods Nature Preserve** with Earl Thirey.

**Saturday, April 26, 10:00 a.m. - Cincinnati Chapter field trip to Adams County** for the spring plants of the prairie.

**FOR MORE SPECIFICS CONTACT:**

**Wilmot Chapter** - The Wilderness Center Botanizers call Bobbie Lucas at 644-7682.

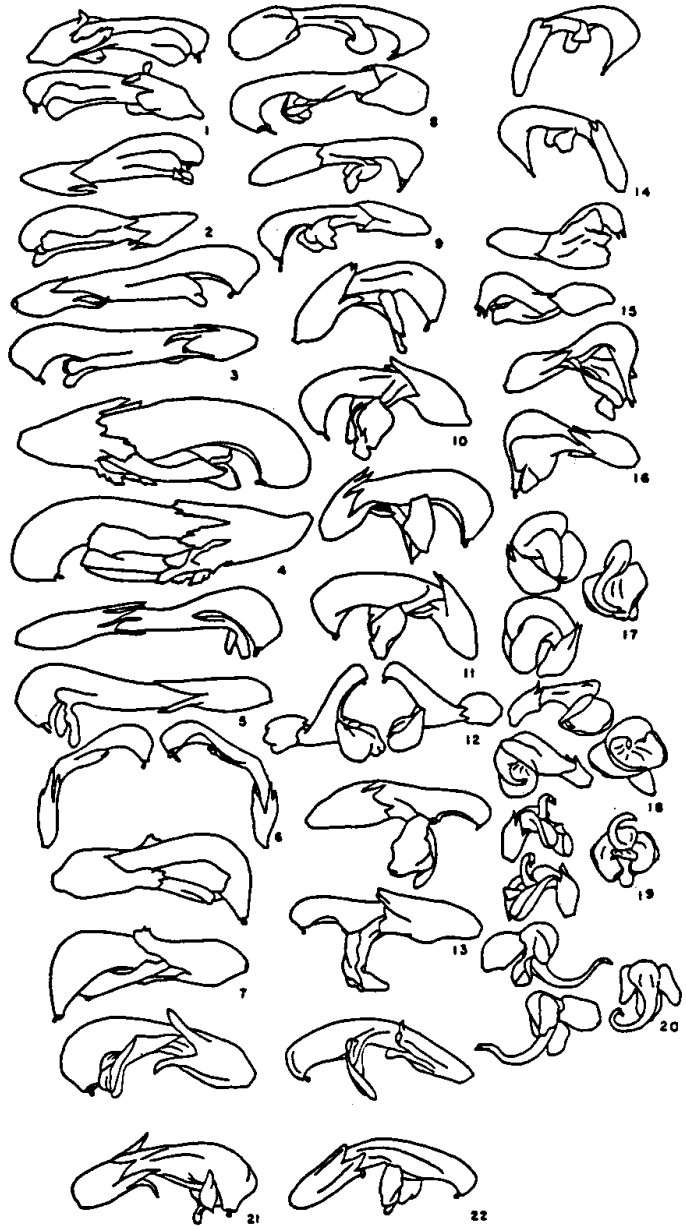
**Cincinnati Chapter** - Cincinnati Wildflower Society call Vic Soukup at (513) 761-2568.

**Columbus Chapter** call Jean Willis at 614/882-4644.

**THE FERNFLOWERS (PEDICULARIS) AND THEIR POLLINATORS - A STUDY IN CO-ADAPTATION** by Lazarus Walter Macior.

One of the largest genera of flowering plants in the north temperate zone, with an estimated 900 species, is **Pedicularis**. A member of the snapdragon family (Scrophulariaceae), the genus has two-lipped bilaterally symmetrical flowers ranging in form from almost tubular to something that closely resembles an elephant's head (Fig. 1-22). Virtually all species studied thusfar have the same basic chromosome number suggesting relatively little genetic variation in the genus, but within this limited hereditary range there has been enough room for great floral diversification. We may never understand all the factors responsible for floral variation in **Pedicularis** (Li 1951), but we can be sure that floral form is closely tied to function, and the function of all flowers is the sexual reproduction of the plant following pollination, fertilization, and seed development.

The **Pedicularis** flower has an upper lip formed from two fused petals joining a tube at their base and forming a hood (galea) at their apex. Within the galea are concealed four anthers that shed pollen downward when disturbed. The style extends through the upper lip so that the stigma protrudes slightly beyond the galea. The galea may end abruptly with or without two small lateral teeth, or it may be variously extended and contorted as a tube (rostrum), which forms the "trunk" in the Elephant Heads, **Pedicularis groenlandica** (Fig. 20). The lower lip of the



Figures 1-22. Flowers of *Pedicularis*, X1.3. 1. *P. furbishiae*, 2. *P. semibarbata*, 3. *P. bracteosa*, 4. *P. capitata*, 5. *P. grayi*, 6. *P. rainierensis*, 7. *P. lanceolata*, 8. *P. canadensis*, 9. *P. crenulata*, 10. *P. langsdorffii*, 11. *P. sudetica*, 12. *P. verticillata*, 13. *P. kanei*, 14. *P. parryi*, 15. *P. labradorica*, 16. *P. ornithorhyncha*, 17. *P. contorta*, 18. *P. racemosa*, 19. *P. attollens*, 20. *P. groenlandica*, 21. *P. cystopteridifolia*, 22. *P. oederi*.

flower combines three petals visible distally as a central and two lateral lobes. These petals extend basally to complete the corolla tube. Flowers with deeper corolla tubes usually contain nectar at the base. Shorter tubes lack nectar, but the galeas of the latter flowers are extended as a curved rostrum. Flower color is either cyanic (white, pink, magenta) or xanthic (yellow, orange, scarlet). No blue flowers occur. All species thusfar studied are odorless.

**Pedicularis** flowers, like all others, produce seed as a result of pollination, the transport of pollen from the anthers of one flower preferably, but not necessarily, to the stigma of another. **Pedicularis** pollen is transferred by hummingbirds foraging for nectar and more commonly by bumblebees foraging for nectar and/or pollen. Nectar is energy food for young and adults; pollen is larval food rich in body-building protein. Since bees eat only nectar and pollen; their life cycle is obligately and closely tied to flowers. Reciprocally, since **Pedicularis** flowers are wind- or self-pollinating, they are obligately dependent upon animal pollen vectors. This interdependence of flowers and pollinators has apparently produced remarkable reciprocal adaptations of the flowers and their pollinators in terms of form, function, and seasonal cycles (Faegri and van der Pijl 1979). Over the past twenty years I have enjoyed discovering just how **Pedicularis** flowers and their pollinators interact in the reproductive cycles of both (Macior 1982).

In the spring, our Wood Betony, **Pedicularis canadensis** (Fig. 8), is pollinated by queen bumblebees foraging in an upright (nototribic) position for nectar at the base of its deep corolla tube (Macior 1968b). Pollen sifts from the anthers in the galea onto the head-thorax area atop the bee, while the stigma protruding from the tip of the galea picks up pollen previously deposited there by another flower (Fig. 25, 26). **Pedicularis kanei** in the Yukon Territory and Alaska, **P. parryi** and **P. crenulata** in the Colorado Rocky Mountains, and **P. oederi** and **P. verticillata** in alpine and subarctic regions of North America and Japan function similarly in the springtimes of their respective regions (Macior 1970, 1975, 1983).

In late spring and early summer-blooming species, late flying queen bumblebee queens pollinate **Pedicularis** species in the same manner since their flowers are similar to those of spring-blooming ones (Fig. 23), but the first emerging workers of the annual bumblebee colonies are small and short-tongued. Unable to reach nectar in the deep floral tubes, they hang inverted from the galea and scrape pollen from the anthers, while pollen is transferred to the stigma touching the ventral (sternotribic) part of the insect (Fig. 24, 27, 28). Flowers with this pollination mechanism are found in the Rocky Mountains (**Pedicularis bracteosa**, **P. cystopteridifolia**, **P. grayi**, on Mount Rainier (**P. rainierensis**), and in the subarctic (**P. capitata**, **P. langsдорffii**, **P. sudetica**) (Macior 1973.)

With rare exceptions, mid-summer blooming species of *Pedicularis* have short, nectarless floral tubes and a galea extended into a twisted rostrum. Most are pollinated by worker bumblebees grasping the bottom of the galea with their jaws and vibrating pollen from the anthers, while the stigma, protruding from the rostrum, contacts residual pollen on the bottom of the bee (Fig. 29). Two exceptions occur. In Elephant Snouts, *Pedicularis attollens* (Fig. 19), the bee grasps the tiny flower with its jaws so that its face presses against it. Vibration releases pollen from the galea on to the head, while the curving "trunk" presses the stigma at its tip against the bee's forehead. In Elephant Heads (Fig. 20, 30), the bee straddles the "trunk", grasps the elephant's "face" with its jaws, and vibrates pollen, which scatters from the elephant's "mouth" dusting the bee's entire body. The "trunk" embraces the bee between thorax and abdomen contacting pollen on the anterior dorsal side of the abdomen with the stigma at the tip of the "trunk". These vibration type flowers are found in the Rocky Mountains (*P. groenlandica*, *P. racemosa*), on Mount Rainer (*P. contorta*, *P. ornithorhyncha*), in the subarctic (*P. labradorica*), and in the Sierra Nevada of California (*P. attollens*) (Macior 1968a, 1977).

Only one *Pedicularis* species in North America is an autumn bloomer. The Swamp Lousewort, *Pedicularis lanceolata* (Fig. 7) of our marshes has a long, nectarless corolla tube. Worker bumblebees hang

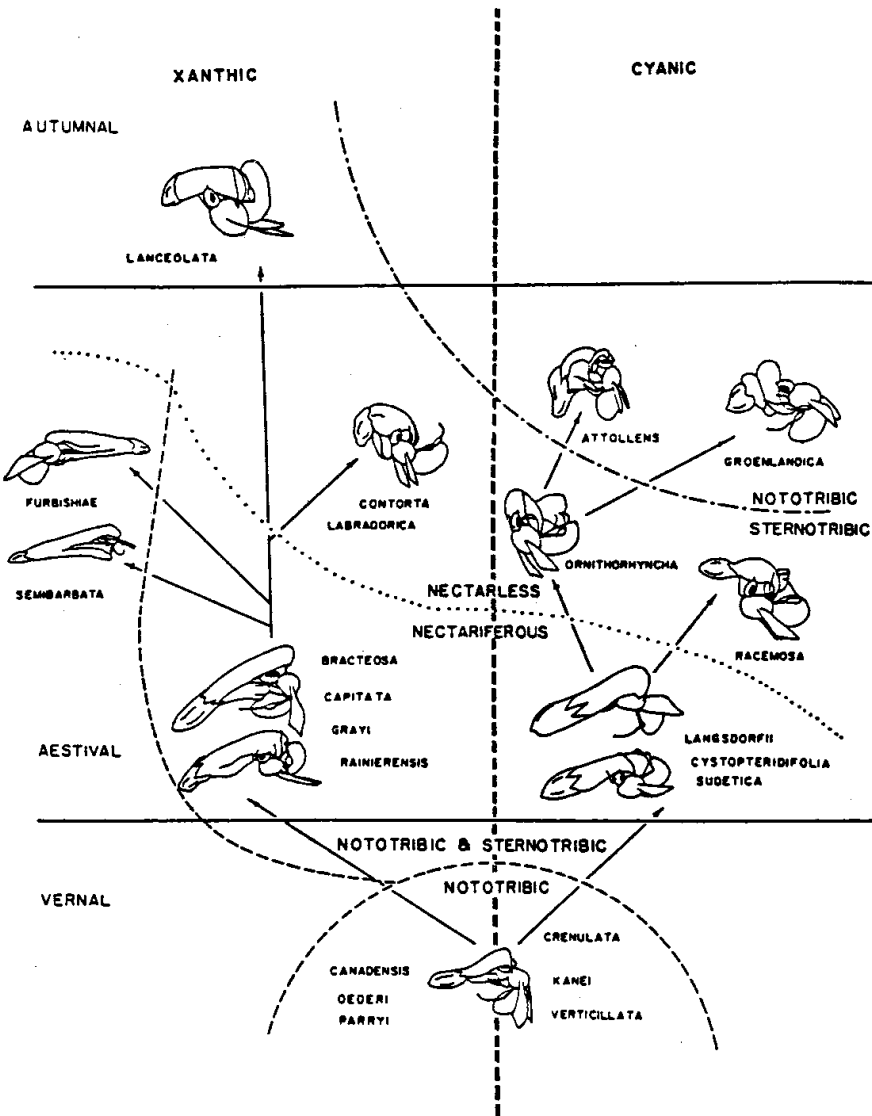


Figure 35. Phenological relationships of pollination mechanisms of 22 species of *Pedicularis*.

inverted from the galea and swing the hinged lower lip aside to scrape pollen from the concealed anthers, while the stigma contacts pollen on the ventral side of the thorax or abdomen (Macior 1969).

To understand the interrelationships of **Pedicularis** and its bumblebee pollinators, we must consider the coadaptive form and function of both. Insects are attracted to the flowers by pollen, nectar, and color. Pollen is deposited in more or less specific pollinator body locations. Much of it is groomed from the body by scraping of middle legs crossed above and below head, thorax, and abdomen. It is deposited in "baskets" on the shanks (tibiae) of the hind legs by running the pollen-laden middle legs through a comb-blade scraper in the hind leg ankle joint. The crossed grooming legs, however, cannot contact pollen along the midline of the insect's body from the face over the thorax and abdomen and underneath the abdomen and thorax. It is precisely along this midline region that the stigma of each **Pedicularis** flower touches residual pollen needed for pollination. Insects foraging for nectar are all contacted on the dorsal surface, while those collecting pollen generally pollinate with their ventral surface.

Bumblebees are red-blind but can see ultraviolet light as a color. Compared to the visual spectrum of humans, bumblebees see less long-wave and more short-wave radiation with peaks of vision in the yellow, blue-violet, and ultraviolet. Xanthic flowers attract by their yellow color and cyanic flowers by their blue and ultraviolet components. Blue flowers would be very attractive, but apparently **Pedicularis** does not have the inherent genetic capacity to produce them.

The seasonal variation in floral form and function parallels that of the annual development of bumblebee colonies. Queens mated the previous summer emerge from isolated hibernation in the spring to establish their nests in abandoned rodent nests. Honey-pots are first provisioned before brood cells are constructed in the colony, so nectar is the primary food resource needed and is provided by all spring-blooming **Pedicularis** species. The deep nectariferous corolla tubes conceal nectar from a host of short-tongued insects flying at this time but accommodate the long-tongued bumblebee queens. When brood cells are established in early summer, pollen, the body-building protein source needed for rearing larvae, is at a premium and is gathered by increasing numbers of workers from **Pedicularis** species almost all of which are vibration mechanisms without nectar. In all **Pedicularis** flowers, pollen is concealed in the galea so that only insects able to discover it and extract it by intricate body maneuvers can use it for nest provisioning. The study of pollination syndromes in **Pedicularis**, therefore, is a study of a close seasonal coadaptation between pollinators and plants (Fig. 31).

It has been supposed that the genus **Pedicularis** originated in the Altai Plateau of the Himalaya and spread both westward through Eurasia

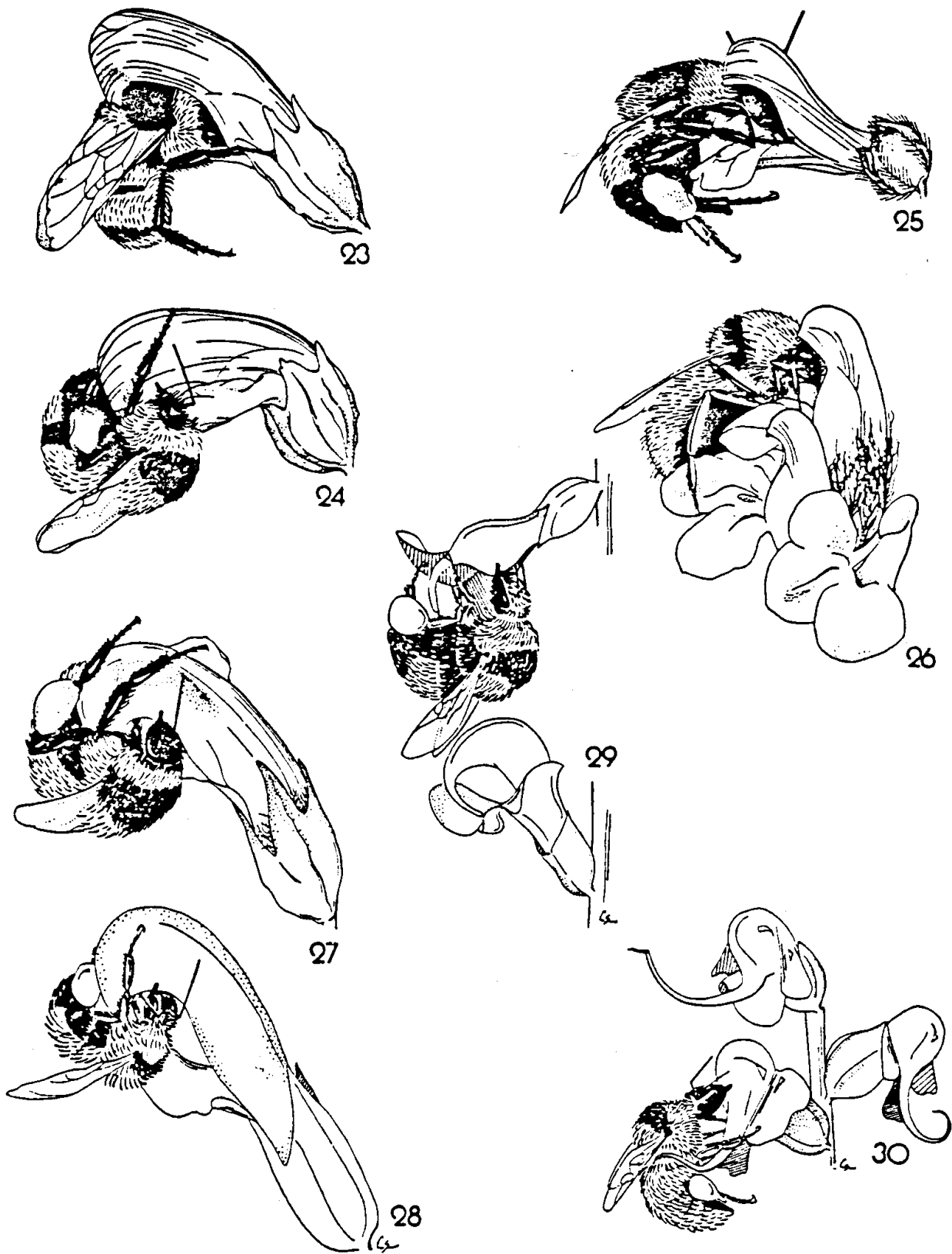
to the Alps and Scandinavia and eastward through Asia to Japan and to North America across the Bering Strait between Siberia and Alaska when a land bridge connected them and a moderate climate prevailed (Limpricht 1924). During the course of its travels, the genus apparently proliferated new species, some of them, like the rare and endangered Furbish Lousewort (***Pedicularis furbishiae***) of Maine-New Brunswick (Macior 1978), being extremely local (endemic) in their distribution. This putative dispersion and diversification of the genus has led to many questions bound to stimulate further research. First, is the pollination syndrome pattern established by research of North American species paralleled in other isolated biogeographic regions (Kwak 1977)? Six ***Pedicularis*** species studied recently in the mountains of Japan have similar structural, functional, and seasonal adaptations (syndromes) in pollination to those in North America. My American and Japanese colleagues plan to join me in a continuation of this research. Eventually, we hope to extend our field work to the Himalaya, where the genus was born. Secondly, have species which extended their ranges across the Pacific Basin undergone local changes in isolated populations in North America, Japan, and elsewhere (Hara 1962; Savile 1967, 1977)? We already know, for example, that the ***Pedicularis oederi*** population on the alpine tundra of the Beartooth Plateau (Montana-Wyoming) has a different nectar composition than that of the alpine population on Midoridake (Green Mountain) in Hokkaido, Japan's north island.

Thirdly, analysis of genetic variation within and between ***Pedicularis*** species by electrophoretic enzyme isolation has been initiated that may help us understand ancestral genetic relationships and derivations of species. We hope to extend this research through recombinant DNA techniques.

To some, the study of ***Pedicularis*** I have just described may appear to be a trivial pursuit, something to occupy leisure hours or academicians in "ivory towers." After all, ***Pedicularis*** is just a weed even though Emerson observed that a weed is just a flower the virtues of which we have yet to recognize. Like fruit flies, which have contributed so much to our basic knowledge of general genetics, ***Pedicularis*** and all other organisms are means by which we discover the laws by which Nature works. Every kind of living creature has something to teach us, something with which to nourish our minds if not our bodies. It is for us to emphasize our unique humanity by striving to understand the world about us including the little Wood Betony that will grace our forest floors in the springtime.

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Lazarus Walter Macior, Professor of Biology, The University of Akron, Akron Ohio 44325.



Figures 23-30. *Bombus* pollinating *Pedicularis* flowers. 23. *P. langsdorfii*, 24. *P. langsdorfii*, 25. *P. verticillata*, 26. *P. kanei*, 27. *P. sudetica interior*, 28. *P. bracteosa latifolia*, 29. *P. racemosa*, 30. *P. groenlandica*.



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**IMPORTANT NOTICE**

Your newsletter is always mailed several days before the first of the month in which it is issued. If all goes well, you should receive it no later than the 10th of the current month.

However, we have received reports that some of our members did not receive the January newsletter until the first of February or later. It is imperative if your newsletter is delayed, that you let us know. We are pursuing the problem with the Postmaster of Cleveland and on to Washington. We need to know exactly which post offices of delivery are affected.

**NOTICE ON NEWSLETTER SUBSCRIPTION FOR STATE MEMBERS**

With members around the state transferring their membership from the Northeast Chapter to their local charters, it should be noted that they will cease to receive the newsletter. Therefore, in order to continue to receive the newsletter, subscriptions are available at the rate of \$7.50 per year. Send check made payable to: Native Plant Society, 6 Louise Drive, Chagrin Falls, Ohio 44022.

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## PRESIDENT'S COLUMN

As this newsletter goes to press the skunk cabbage is pushing its head above ground, and within days we will spot the first coltsfoot turning the roadsides to gold.

Take careful note of the programs from other chapters. I highly recommend the Wilderness Center trip to Hocking Hills in May. Until you see this area at peak of bloom you haven't lived. A good opportunity to get to know the very knowledgeable and interesting members from Wilmot. The Columbus chapter trip to Clifton Gorge will be right at the peak of bloom for the Snow Trillium. The Gorge is a splendid sight at any time of year but it is particularly lovely in April.

Our Bill for the Trillium grandiflorum as state wildflower has passed its first hearings in committee with flying colors. The legislators were particularly taken with the fact that the dictionary lists trillium and trilobite (the new state fossil) one after the other as both are "three-lobed". How lucky can you get?!? The only state in America with matching fossil and wildflower!! Hopefully the Bill will be voted out of committee this week and onto the main floor.

Please take note of the four short articles by our committee chairs. They have described what they hope to accomplish and how, so please volunteer some of your time and efforts. Each of the chairmen is an authority in the field he is heading up and you could learn a lot from them as well as having a good time.

To those of you who renewed so promptly, thank you and thank you again. To those of you who have not, **THIS IS YOUR LAST NEWSLETTER**. So please let us hear from you. Each name on the membership list is a vital and necessary person to this group and I don't want to lose any of you! Regrettably, Bob Faber has decided that we must cancel any attempt to put on a bus trip to the Pine Barrens for this year. He received only two letters of inquiry from our January newsletter article, and he says that it is too late to attempt to try to get more support. We will continue to hold this plan for the future, and with better advance planning, we should be more successful next year.

The Dayton chapter had an informative meeting at the home of Mrs. John Aull in January. The prospective members are enthusiastic about the idea of the group, but they are having difficulty finding someone willing to assume the leadership role. They are working diligently on the problem, and I will be down there on March 17 to stir things up. Dayton is a very active area and there are many groups for the naturalist to become involved with. Our contact, Paul Knoop, is sure we will get going and be part of the exciting Dayton scene.

## **PRESIDENT'S COLUMN - Cont'd**

The Bill in the Ohio House referred to in the last newsletter concerning the Grand River Canal and Dam is temporarily suspended. The testimony of people like Jim Bissell and Bev Danielson so alarmed the legislators about the threat to the environment that they have gone back to the drawing board. However, keep alert! A Substitute Bill is likely to emerge any day.

And finally, I would like to share with you a quotation from John Burroughs "Words of Life Anthology" that Jeanne Furst sent to me in the hospital. I would think all of you might want to put this up where you could see it every day. "If I were to name the three most precious resources of life, I should say books, friends, and nature; and the greatest of these, at least the most constant and always at hand, is nature. Nature we have always with us, an inexhaustible storehouse of that which moves the heart, appeals to the mind, and fires the imagination -- health to the body, a stimulus to the intellect, and joy to the soul. To the scientist, nature is a storehouse of facts, laws, processes; to the artist she is a storehouse of images, fancies, a source of inspiration; to the moralist she is a storehouse of precepts and parables; to all she may be a source of knowledge and joy."

## **NATIVE PLANTS PREFERRED - A SYMPOSIUM ON THE USE OF NATIVE AMERICAN PLANTS IN AMERICAN GARDENS - MARCH 15 & 16**

The interest in using native plants in gardens, yards, commercial areas, and along roadways and highways has grown in recent years. The American Horticultural Society, the U.S. National Arboretum, and the National Wildlife Federation are pleased to announce the presentation of "Native Plants Preferred," a symposium on the use of native American plants in American gardens. At the symposium, you will learn how to:

- design with native plants, flowers, trees, and shrubs
- blend wildflowers and grasses
- establish a successful meadow garden
- buy, conserve, and propagate native plants

Practical approaches to working with native plants will be offered. Experts and researchers in the native plant field will lecture, answer questions, and share new information about wildflowers and other native plants which improve the environment around us, beautify, and enrich our lives. This informative symposium is planned to further your knowledge of these beautiful gifts of nature, our American native plants.

For more information: Nat. Wildlife Fed., 8925 Leesburg Pike, Vienna, Virginia (703) 768-5700. Copy of registration must be sent for one or both days.

## RAVINE PROJECT

I always know when it's close to being spring. I walk out to my mailbox and for a change, there is something other than bills; seed catalogs. They arrive in profusion. This heralds the beginning of a busy season for us all, the ravine project being no exception.

Last year much was accomplished, but this is a new year with new goals. Help is needed eliminating non-native weeds, planting bare areas with native plants and shrubs, maintaining established plantings and general clean-up. I would like to hear from members interested in working this year. We have our list from last year and those people will be notified of dates and times. If you have not worked at the Ravine, it is a very rewarding feeling to work in this lovely woodland area located behind the Garden Center of Greater Cleveland across from the Natural History Museum. One hour, one day or more can help contribute to the growth and preservation of a wonderful woody area. Please contact Larry Giblock at 272-5852.

## SEED EXCHANGE

Helping to foster further interest in native plants, our Society will sponsor a seed exchange. The exchange will provide members with the means to carry them into the interesting and challenging field of propagation and culture. Other members will be challenged by the intricacies of seed collecting.

To alleviate the negative impact of seed collecting on natural habitats, much of the (especially woodland) seed will be collected in gardens - providing the source plants are of local origin. Meadow and roadside flowers will be less restricted.

A seed list and order form will be issued in fall. Small packets of seed will be supplied for a nominal fee, initially to members only. Requests for large amounts of seed (for meadow plantings, etc.) will be considered on an advance notice basis only. We will not stockpile large amounts of seed for an uncertain future.

If you are willing to supply, process and mail seed or help in any other way - please contact: Tom Yates 256-3746 or write: 9224 Sperry Road, Mentor, Ohio 44060.

**We also need a working, household size refrigerator.**

## SLIDE "HERBARIUM"

The idea behind a slide herbarium is to have a collection of slides of botanical subjects which would be used to aid the identification of plants. It would include ferns, grasses and grasslike plants such as sedges and rushes, trees, shrubs, as well as the more typical flowering plants.

Gathering a collection of slides which is reasonably complete is a formidable task. Add to this the cataloging and storing of these slides and we have a major undertaking. Fortunately, a collection of botanical slides is already started at the Cleveland Museum of Natural History. The collection is far from complete but does form a nucleus on which to build. We expect to be adding to the collection on a regular basis but any help would be extremely useful.

We propose that adding to this collection be one of the projects of the Native Plant Society. I am sure that there are many members of the Society who are capable of making the kind of slides which could be a part of this collection.

The slides would be donated to the Museum and would become the property of the Museum. This is not to say that the slides would be unavailable to anyone but Museum personnel. They would be cataloged and stored in the library where they can be viewed by interested person. There is a Simon viewer available for looking at slides. If, for any reason, any of the slides would be used in any publication, the maker would be given full credit.

All slides must be sharp and properly exposed. The species should be identified and the location where the slide was made should be specified along with the date the slide was taken.

In order to be truly useful, more than a picture of the flower is needed. Slides of each species should include a slide showing the entire plant, perhaps two different views of the flower, and slides showing any special characteristics of the plant. If possible, a slide of the fruit would be desirable. The suitability of the slide for incorporation into the collection would be decided by museum personnel.

This kind of cooperative effort by members of the Society and museum personnel could result in a slide collection second to none.

If there are any questions about anything said here please contact Jack Selby at 543-8632.

## WETLANDS - PART ONE: TRENDS, DEFINITIONS AND VALUES

by J.K. Bissell, Cleveland Museum of Natural History

Growing numbers of people within recent decades have begun to recognize wetlands as a valuable and vulnerable resource. The U. S. Fish and Wildlife Service began using the term "wetland" in 1952 (OTA - 1984). Through the 19th century, wetlands were generally regarded as worthless sections of the landscape. A 1984 report from the U. S. Office of Technology Assessment entitled **Wetlands Their Use and Regulation** provides a good historical account of wetlands trends in the U. S.; including federal programs which have had both positive and negative impacts on the nation's wetlands. Throughout this paper, OTA - 1984 will refer to the 1984 Office of Technology Assessment Report. According to the OTA - 1984 Report, the federal government gave away 65 million acres of wetlands to 15 states for the expressed purpose of development through the Swamp Lands Act of 1849, 1850 and 1860. The OTA - 1984 Report states that the Fish and Wildlife Services (FWS) estimates there are 90 million acres of wetlands in the lower 48 states and 30 to 50 percent of the original wetlands in the lower 48 states have been converted. In rough approximation about 100 million acres have been lost.

Federal involvement in wetlands protection began in the 1930s with the Migratory Bird Conservation Act of 1929 and the 1934 Migratory Bird Hunting Stamp Act. However, while one branch of the federal government promoted wetlands protection, the Agriculture Conservation Program in 1940 authorized the Department of Agriculture to assist landowners in wetlands drainage projects. Beginning in the 1960s, the federal government began to pass legislation limiting assistance with wetlands drainage, and cost-sharing for wetlands drainage was virtually eliminated by the late 1970s (OTA - 1984).

During the early 1970s, as public awareness of the multiple values of wetlands grew, Congress passed Section 404 of the Clean Water Act (1972). Section 404 authorizes the U. S. Army Corps of Engineers to regulate activities that involve dumping of dredged or fill material into waters of the United States, including wetlands. Section 404 also allows for input from other federal agencies such as EPA, FWS, and the States (OTA - 1984). One problem with Section 404 is the lack of a definition for what a wetland is. As a consequence, the Corps definition of wetlands includes 64 million acres in contrast to the FWS definition, which accounts for 99 million acres within the contiguous United States (OTA - 1984).

The U. S. Supreme Court, in a unanimous decision, recently upheld

## WETLANDS - Cont'd

the Army Corps in prohibiting a developer from filling in a wetland near Lake St. Clair in Michigan. This Supreme Court ruling affirmed that under Section 404, the Corps regulatory authority covers wetlands not actually abutting navigable waters. The Supreme Court ruling also upheld the Corps and EPA definition of a wetland as "those lands that are inundated or saturated by surface or groundwater 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."

The 1985 Farm Bill contains some provisions which should promote preservation of wetlands. The "swampbuster" provision of the 1985 Farm Bill will prohibit federal subsidies from going to farmlands converted from wetlands. The "set-aside" provision of the 1985 Farm Bill allows farmers, who owe money to the Farmers Home Administration (FHA), to set aside wetlands on their property for a 50-year-plus conservation easement, and the value of the set-aside wetlands can be applied against the farmer's FHA debt.

In recent decades, many federal and private wetlands protection projects have been based upon ecological services provided by wetlands, esthetic appeal of wetlands and opportunities for education and research within wetlands. Some of the ecological services which wetlands provide include the following: flood control, erosion control, groundwater recharge, sediment trapping, pollution filtration, nutrient recycling, nutrient sorption, wildlife habitat and food chain support.

Food chain support is one of the most important ecological services provided by wetlands. Wetlands are some of the most productive ecosystems in the world. Much of the energy-rich compounds and minerals contained within living reed and cattails at Mentor Marsh are eventually processed into the food chain through decomposition. Bacteria, fungi, protozoans and a multitude of invertebrate larvae feed on the mass of dead plant material. Invertebrate larvae, including midges and mosquitoes are probably the major processors of the organic ooze in Mentor Marsh. Some larvae feed on the decomposers; bacteria, fungi, and protozoans, while other larvae directly digest the decomposing plant tissues in the marsh. The steps in the food chain; from midges and mosquitoes up to frogs, fish, marsh wrens, swallows and dragonflies are reasonably well publicized. Wetlands can and in many cases do supply food chain support to adjacent terrestrial ecosystems. As an example, many birds and mammals that live in dry uplands travel to wetlands to obtain food. In other instances, strong winds can drift large numbers of flying insects produced



## **WETLAND - Cont'd**

from a wetland into nearby terrestrial ecosystems and thereby provide a significant source of food outside the wetland. Coastal wetlands such as Mentor Marsh are important nursery and feeding areas for many kinds of fish which live in Lake Erie.

**Classification of Wetlands and Deepwater Habitats of the United States** by Cowardin et al. (1979), published by the FWS, is one of the best references available for wetland classification and terminology. Unfortunately, this widely-used FWS 1979 Classification has recently gone out-of-print. Throughout this paper, "FWS 1979 Classification" will refer to the Cowardin et al. (1979) Classification.

Wetlands, according to the FWS, "are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following 3 attributes: (1) at least periodically, the land supports predominantly hydrophytes, (2) the substrate is predominantly undrained hydric soil, and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year" (Cowardin et al. 1979).

The FWS Classification System (Cowardin et al. 1979) defines a depth of 2 meters (6.6 feet) as the boundary between wetlands and deepwater habitats. The 2-meter depth has been chosen as the boundary between wetlands and deepwater habitats because emergent aquatic plants normally do not grow where water depth exceeds 2 meters. The presence of emergent aquatic plants in waters deeper than 2 meters extends the traditional wetland boundary further into the deepwater habitat.

In the next issue of this newsletter, **Wetlands - Part Two** will be an introduction to the new wetlands classification system of the U. S. Fish and Wildlife Service.

## **REFERENCES**

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe, 1979. Classification of Wetlands and Deepwater Habitats of the United States, U. S. Fish and Wildlife Service. FWS/OBS - 79/31. Washington, D.C.

Wetlands: Their Use and Regulation (Washington, D.C.; Office of Technology Assessment, OTA - O - 206, March 1984).

## CONSERVATION ALERT

In this issue Jim Bissell begins a two-part series on wetlands. This is a subject we have been trying to approach for over a year and we think it is vital that our members become aware of this important environment and what threatens it.

The Winter 1985 issue of "**Wilderness**", the magazine of the Wilderness Society, is devoted to wetlands and we recommend you read it as soon as possible. In the lead editorial, T.H. Watkins states:

"We are still creatures of the water; in fact, of water--most of our very bodies are made of it. We should be able to understand then with a certain clarity exactly how important it is to us as human creatures living on a shared planet that the meeting of earth and water--we call it here the wetlands--be maintained, nurtured, protected. We literally cannot live without it.

But we are human and therefore too often perverse, and if we do understand our dependence upon this scattered and varied resource, we frequently act as if we do not. This is no casual complaint, not one more reflexive bleat of protest from one more extreme environmentalist. As all three authors in this special issue of **Wilderness** make clear with a numbing and unmistakable certainty, we face a state of emergency whose reality is no longer a matter of debate. **We are losing the wetlands**, hundreds of thousands of acres of them every year, square miles of them sucked dry, filled, poisoned, vandalized; freshwater and saltwater marshes, swamps, bogs, pocosins, potholes, ponds, and lakelets--all disappearing at a rate that has long since gone beyond alarming. The U. S. Fish & Wildlife Service says so; the U. S. Geological Survey say so; the National Wetlands Inventory says so; statewide conservation committees and commissions say so. There may be quibbling over the precise dimensions of the disaster, but no one is currently denying its presence. Nor, unhappily, has anyone come forward with a single magic solution, since no such legerdemain can possibly exist. If the remaining wetlands are to be saved--and if some of those lost are to be reclaimed--then the means to do so will be as varied and complex as the resource itself. That they must be saved is as certain a fact as our need for oxygen."

Anyone who has explored a wetland in any form, anywhere in the Country, must have fallen victim to the mystery and uniqueness of that ecosystem. Be it Morgan Swamp, Gott Fen, Cuyahoga River lowlands in Ohio--or a Carolina pocosin, a Dakota pothole, or a Maine bog--the flora and fauna are incredible.

Yet, here in northeast Ohio, we do our utmost to destroy our wetlands. We dump garbage and trash into them; we channel them dry; we spray them with terrible poisons to avoid the mosquitoes and succeed instead in destroying an entire food chain; and worst of all, we use them as convenient but highly illegal brine disposal pits.

## CONSERVATION ALERT - Cont'd

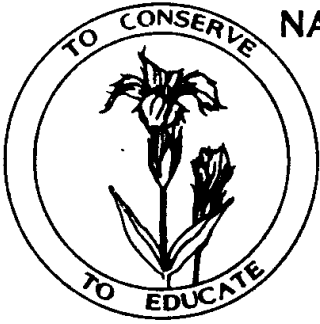
But, in the meantime, who will speak for the birds and plants and animals of the wetlands? This was their bailiwick long before man came upon the scene. It is we naturalists and environmentalists, amateur and professional, who must keep an eye open for those who would defile our wetlands. Take license numbers and call the nearest police authority. It is each individual's responsibility to take the initiative. We cannot let "John" do it. We must be the guardians and defenders of the wetlands and learn to live in harmony with this most necessary of environments.

AKM

### HOLDEN ARBORETUM'S MAY SYMPOSIUM

The brochure for Holden's May Symposium was unavailable at this time, but following is the basic structure of this year's Symposium:

- Friday May 16:** Keynote Speaker Stuart L. Udall - "Ecological Imperatives - Now & Tomorrow" A wine and cheese reception will follow the lecture.  
7:45 p.m.
- Saturday, May 17:**
- 8:00 a.m. Continental breakfast and registration.  
9:15 a.m. Habitat Protection & Management - Nat'l Perspective  
Dr. Larry Morse, Nat'l Staff Botanist, The Nature Conservancy.  
Reg. Perspective - Richard Moseley, Chief, Div. of Natural Areas and Preserves.  
Robert Read, Ecologist, Wisc. Dept. of Nat. Resources.
- 12:00 noon Buffet Luncheon  
1:00 p.m. Ex-Situ Species Preservation - Nat'l Perspective  
Dr. Donald Falk, The Center for Plant Conservation.  
Reg. Perspective-Joyce A. Powers, Prairie Ridge Nursery. William Brumback, Propagator, New England Wildflower Society.
- 3:30 p.m. Legislation - Action & Opportunities, Nat'l Perspective - Dr. Faith Campbell, Natural Resources Defense Council. Dr. John Fay, Botanist, Office of Endangered Species U.S. Fish & Wildlife Service.
- 6:30 p.m. Buffet Dinner  
7:45 p.m. Conference Summation, Dr. William Jordan, III, Editor, Restoration and Management Notes.
- Sunday, May 18:** Optional Field Trips: 1) Grand River Terraces, 2) Lake Erie Shoreline-Mentor Marsh-Headlands Dunes  
9:00 a.m. 3) Hol. Arb: Stebbins Gulch, 4) Hol. Arb: Wildflower Garden-Bole Woods-Pierson Gorge, 5) Rocky River Reservation-Cleveland Metro Parks.



**NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO**

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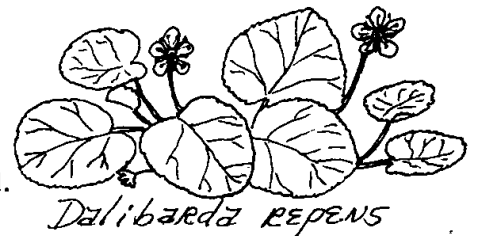
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Memberships are **DUE FOR RENEWAL** on January 1, 1986. Please continue to support your Society and renew at the **highest** possible category. Those of you who send us Sustaining and Patron memberships are enabling us to go on with our worthwhile projects. An active membership just about pays for the newsletter costs. However, economics aside, we need **EACH** of your memberships, and each year we get stronger and better. The 1986 Program and Field Trips schedule will be well worthwhile.

Please enroll me as a member of the NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO.

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