# 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*


**Volume 4** **September/October 1986** **Number 5**


## ANNUAL DINNER - DECEMBER 5TH

**PROGRAM AND EVENTS:**

**September 11** (Thursday) **7:30 P.M. - Brecksville Nature Center, Cleveland Chapter**
Ian Adams, Cleveland MetroParks authority on fungi, will talk to us on fungi identification and lore. Since we will be at the Brecksville Reservation bring a supper and take a walk through the lovely prairie right next to the Center.

**September 12** (Friday) **Avon Woods Outdoor Education Center, Cincinnati Chapter**
6:00 P.M. picnic supper - 6:45 P.M. Trail hike - 8:00 P.M. Members' Sharing Night

**September 13** (Saturday) **9:30 A.M. - Brecksville Nature Center - Cleveland Chapter**
Karl Smith, Naturalist at the Brecksville Reservation, will guide us through the prairie that he has created. Things should be at their very best and it will be an opportunity for you to see the grasses and forbs that are unique to this ecosystem.

**September 15** (Monday) **7:30 P.M. - Cox Arboretum - Dayton Chapter**
Native tree identification with Alan Bunker of the Department of Forestry, ODNR

**September 15** (Monday) **7:30 P.M. - Sharon Woods MetroPark Conference Center, Columbus Chapter:** Members will tell what they did and where they went during the summer and share slides of new or interesting plants they found.

**September 20** (Saturday) **10:00 A.M. - Dayton - Dayton Chapter**
Fens of Western Greene County, a display of rare native plants in some seldom seen alkaline bogs. Reservations to Dave Nolan 513/879-7655.

**September 21** (Sunday) **2:00 P.M. - Wilderness Center**
Tree walk guided by the Wilderness Center Botanizers.

**PROGRAM & EVENTS - Cont'd**

**October 4** (Saturday) **9:30 A.M. - Cuyahoga Valley National Park - Cleveland Chapter** Gail Corbett, PhD in Botany, will lead us on a walk in the Park to identify Fall composites, her specialty. Meet at Jaite Headquarters area - Riverview and Vaugh Roads.

**October 10** (Friday) **8:00 A.M. - Avon Woods Outdoor Education Center - Cincinnati Chapter:** A lecture by Dr. Jerry M. Baskin of the University of Kentucky on "Plants Endemic to Cedar Glades of the Eastern United States."

**October 11** (Saturday) **10:00 A.M. - Cedar Bog State Memorial, Urbana - Dayton Chapter:** A nature walk will be conducted of this unique wet prairie area. The group will then go to John Bryan State Park in Yellow Springs for a picnic lunch. Clifton Gorge and Glen Helen are minutes away.

**October 11** (Saturday) **1:00 P.M. - Cox Arboretum - Dayton Chapter**
The Miami Valley group will be leaving the Cox parking lot to drive to the Hayes Arboretum in Richmond, Indiana. This is a widely recognized Midwest Arboretum just an hour from Dayton.

**October 16** (Thursday) **7:30 P.M. - Holden Arboretum - Cleveland Chapter**
Dr. Charles King, Director of the Ohio Biological Survey and Chairman of the Natural Areas Council, will give us a lecture on the Darby Plains area west of Columbus. This is an area rich in history and harbors the last remnants of the wet prairies of Ohio as well as many rare and endangered plant species. Dr. King is a nationally recognized authority on this area.

**October 20** (Monday) **7:30 P.M. - Cox Arboretum, Dayton Chapter**
Medicinal uses of native plants and their conservation with Victoria Parrata, chartered herbalist and lecturer at WSU College of Medicine.

**October 20** (Monday) **7:30 P.M. - Sharon Woods MetroPark Conference Center**
**Columbus Chapter:** "Having your own Swamp." Jim Davidson will share experiences he had in finding, buying and managing his own 5 acre swamp. His management efforts have been toward improving the area for both wildlife and plants.

**October Wilderness Center** - No information at press time. Contact Bobbie Lucas if interested.

**Athens Chapter** will be having their first meeting early in September but did not have a final day at publication time. If interested, contact Ingrid Chorba.

**Contacts for further information:**

| | | | |
|---|---|---|---|
| Athens | - | Ingrid Chorba | 614/592-2543 |
| Cincinnati | - | James R. Innis, Jr. | 513/385-0670 Evenings |
| Cleveland | - | Tom Sampliner | 216/932-3720 Evenings |
| Columbus | - | Jim Stahl | 614/882-5084 Evenings |
| Dayton | - | Ellen Fox | 513/897-8139 |
| Wilderness Center | - | Bobbie Lucas | 216/645-0302 Evenings |

**EDITOR'S NOTE:**

We have, in the Cleveland area, two outstanding representatives of a prairie. At The Holden Arboretum - Brian Parsons has in just two years created a splendid example. When we visited there on August 3rd it was a blaze of color that was surpassingly beautiful. It is one of Holden's gifts to northern Ohio and a great credit to Brian the Magician.

At Brecksville Reservation of Cleveland Metro Parks - Karl Smith has built another and older prairie of equal beauty and interest. Please stop by and see these works of art to gain some idea of what a prairie is all about.

**THE PRAIRIE**

**Introduction:** Prairie is the name of a unique ecological system. As with all ecosystems, its parts—climate, plants, animals—are interrelated and constantly changing. It is characterized by a plant cover of grasses and wildflowers, rather than trees or shrubs. Prairie animals are specially adapted to thrive on "grasslands" rather than in a forest or a wetland.

"Prairie" is the French word for meadow. The early French explorers had no other word to describe the open, grass-covered, treeless landscape they found in middle North America. Neither did the English settlers; they adopted the name prairie.

Prairies were very productive, each year converting the sun's energy into a wild forage crop sufficient to feed, over their original expanse, 30 million bison—from 40-pound calves to 2,000-pound bulls. The prairie supported a wide variety of animal life and soil fertility was gradually built up.

The prairie has largely disappeared from the Middle West. We have substituted a different kind of tall grass for big bluestem. Today's grazers are fattened in feed lots. But there is a strong and growing interest to preserve and restore prairies, to enjoy the esthetic and economic values which the prairie can afford us.

**THE PRAIRIE BEGINS:** The Rocky Mountains rose 80-100 million years ago, and the sea which covered central North America retreated. These mountains significantly altered the climate, and the complex environment characteristic of the prairie was formed. Although little is known about their evolution, because herbaceous plants are difficult to trace through fossil records, prairie plants seem to have evolved in this special climate from surrounding vegetations.

A land bridge formed between North America and Asia about 35,000 years ago when the sea level fell 300 feet. Forerunners of the camel and horse left America, but elephants, bison, bear, deer, and humans migrated to the continent. The early native Americans, living on the prairie, were farmers and gatherers. They depended on produce from garden plots or gathered from the wild for their livelihood. Our written history records the plains Indians as hunters. But many of them were eastern forest tribes driven onto the prairie by European settlement.

**THE NORTH AMERICAN PRAIRIE:** It occupies that part of our continent between the forest and the desert, between rain and drought. It was once continuous from Indiana to the Rockies, in lands where corn and cows have taken its place.

**AND ALMOST ENDS:** There was a day when the wind blew free and strong off the Gulf of Mexico and onto the prairies. These vast grasslands offered no trees or mountains to stop the breeze and it blew from what is now Texas northward for 2,000 miles to the arctic forests of Alberta. The wind whipped the mighty land of grass into undulating oceans of green. It blew dust into the eyes of a million buffalo and grizzled the hair of the antelope. It whistled and whirled through a thousand prairie dog towns and rocked meadowlarks on their slender perches. From the lands of the Blackfoot, Hidatsa and Pawnee to the domain of the Cheyenne, Kiowa and Comanche the wind blew and the sun shone above. This was the prairie.

Then the ocean breezes carried the white man to this new land, and it was all to change. A million square miles of grassland became a million square miles of checkerboard grain fields and grazing lands. The wind erased the last trace of the wandering buffalo and the native Indian who followed it relentlessly. Today, the fences of zoos confine the former denizens of the grassland and paved highways pass through the sterile lands of Indian reservations. The plants of the prairie today can be seen only in forgotten corners of grain fields, along unused roadsides, or in a tiny tract of a university arboretum. What the prairie farmer could not plow he used for his cattle, which ate the tender stalks of the tall grass and allowed it to be replaced by weeds and dust. The wind still blows free, but it finds a different land today. The prairies are gone...

The vast midwestern grassland is gone, but the prairie is neither lost nor forgotten.

The most rapid changes in the prairie have come in the last 200 years. Native grasses have been replaced by corn; bison, deer and other grazers have given way to cattle; Native Americans have been replaced by European immigrants.

**AN EXTREME CLIMATE:** The prairie climate is influenced by the rain shadow of the Rockies. The prairie is a land of extreme variability —warm, dry summers and cold, dry winters. Rainfall varies from 40 inches per year on the eastern border to 10 inches per year on the western edge of the prairie. Temperatures may hit summer highs over 110°F., and winter lows of -40°F. Temperature can rise or drop as much as 60°F in only a few hours with a chinook wind in spring or an advancing cold front in winter. And in places the wind blows almost constantly.

Silene regia

Over the eons of time, prairie plants have survived climatic changes, fire, and drought, and today's prairie plants are adapted to harsh conditions.

**FIRE PRESERVES THE PRAIRIE:** Prairie fires were caused naturally by lightning, or started by Indians to drive game, kill unwanted insects, make better pastures and make travel easier.

The prairie wildfire must have been a magnificent spectable: beautiful but threatening. Alfred Brunson, a Methodist circuit rider, writing in 1835, described it:

> "The last twelve miles we traveled after sundown & by firelight over Prairie, it being on fire. This was the grandest scene I ever saw, the wind blew a gale all day, the grass was dry. . .In high grass, it sometimes burns 30 feet high, if driven by fierce winds. By light of this fire, we could read fine print for 1/2 a mile or more."

Prairie fires are very intense. They can heat surface soils to temperatures over 400° F. in a minute or two. But the soil is a good insulator and the fires travel quickly. At depths of as little as one-half inch, the soil temperature may be unaltered.

Nicholas A. Woods, writing in 1861, advised that to escape fires on large prairies one had to "ride madly before the wind" ten miles ahead of the flames while lighting small fires. Then he could ride on the scorched path to escape the flames. This course of action was impossible if the fire occurred in June when the grass was the tallest because the path would be too hot for a horse to step down on. In such cases, the only thing to do was "to slay and disembowel the horse, and literally creep into the cavity till the flames have passed. . . There are instances of this resource having sometimes saved the lives of Indians and hunters. . ."

Prairie plants have lived with fire a long time. They store their food and growing buds underground, ready to go back to work once the fire passes. Plant growth is enhanced by recycling of nutrients, quicker warming of black soils, and removal of dead material by fire. Fires also maintain the prairie in many areas, keeping the invading forest at bay.

> "We began to see the advancing fire towards evening on the prairie, three miles west of us; and, before twelve o'clock, it became a serious affair. The wind was from the southwest, and pretty strong, and the fire progressed rapidly. . .The roaring terror came through the woods with awful grandeur. Large trees, as well as all smaller vegetation, quickly fell before the ruthless invader."

**DISTINCTIVE ANIMAL LIFE:** Animals make up the portion of the prairie ecosystem which uses, either directly or secondarily, the tremendous supply of plant material produced on the prairie.

The giant of the prairie beasts is the bison or buffalo. An estimated 30 million of these animals occupied the original grassland. These large grasseaters were

relatively low on the food chain. They were pursued by wolves, and when they died their bones were picked clean by coyotes, foxes, magpies and insects. Bison, elk and deer fed on the grasslands of Wisconsin. Mountain sheep were common to the plains farther west. With the settlement of the prairies, all were pushed into remote areas.

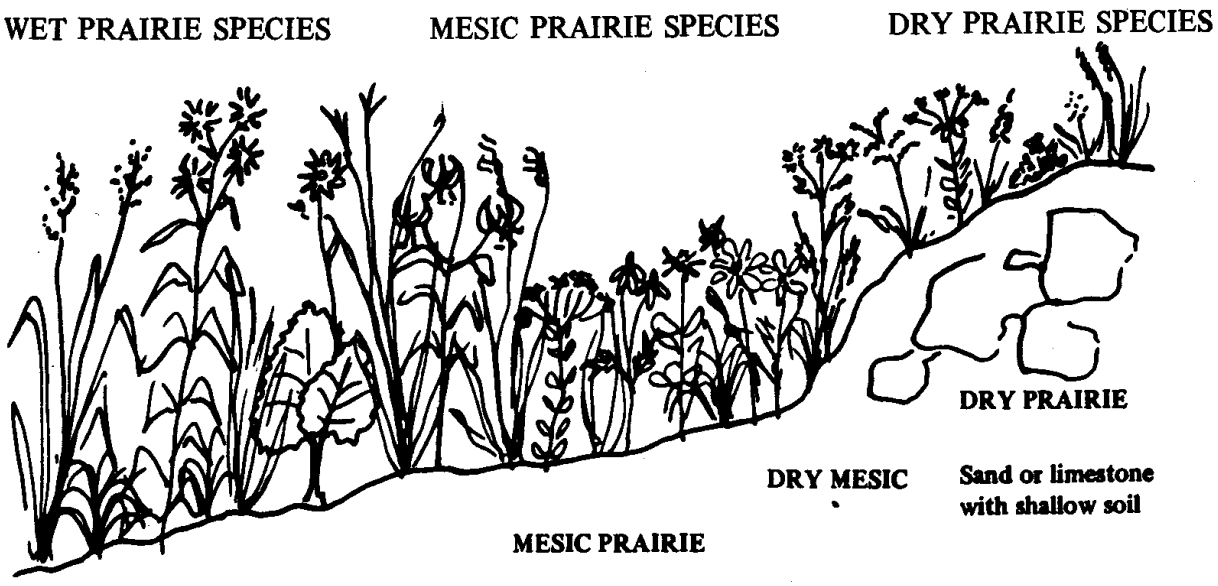
The courser of the plains is the pronghorn or antelope, a creature distinctive to North America. Keen eyesight and great speed aid its survival in open terrain.

A number of animals live under the prairie, rather than on top of it. The best known of these is the prairie dog. Others include the badger, the thirteen-lined ground squirrel and a wide variety of rodents. Snakes and reptiles seek shelter and food in rodent holes. The black-footed ferret, perhaps the rarest prairie mammal, is a predator adapted to seeking out animals in these burrows.

Among the most conspicuous birds of the grassland are those which hunt for a living. Eagles, hawks, owls, and other feathered predators take advantage of the open skies to capture prey. The prairie offers a north-south corridor for many migratory species. It is a relatively safe corridor, with no great expanses of desert or open water to cross. The prairie chicken, dickcissel and bobolink, among others are distinctive birds becoming rare as the prairie shrinks.

In sheer numbers, insects are the most important "animals" in the grasslands. More insect species are found in the prairie than in any other ecosystem. Some aid flower pollination; others, such as grasshoppers, are the primary herbivores. Grasshoppers form the base of many food chains, but they can also be a scourge of agricultural crops as in the great locust plagues from 1874 to 1877.

Each species prefers a different diet, providing a myriad of food chain relationships among the diverse prairie plants and animals.



**PRAIRIE VARIATIONS:** The prairie is divided into five types: wet, wet mesic, mesic, dry mesic, and dry, depending on the type of soil and amount of moisture. There is no sharp distinction between the types; one type blends imperceptibly into the next. On moist soils, the prairie becomes marshland, dominated by sedges rather than grasses. Prairies frequently grade into oak forest through a transition zone, the oak savanna.

Each plant species has individual preferences for soil type, moisture and a variety of other factors. As habitats differ among prairies, so do plant species. One must use care, however, when reading the prairie landscape.

Some plants are particular about where they live and make good indicators of the type of prairie. Others are tolerant of a wide range of conditions.

**A PARADE OF PLANTS:** ". . . In early stages of its growth, the grass is interspersed with little flowers, the violet, the strawberry blossom and others of the most delicate structure. When the grass grows higher, these disappear, and taller flowers displaying more lively colors, take their place; and still later a series of still higher but less delicately-formed flowers appear on the surface."

Prairie grasses and plants parade their floral colors across the landscape from the first prairie willow of April to the last bottle gentian in late September. They march quickly. About 17 new species come into flower each week, bloom for a short time, and move on to seed production. This rapid succession reduces competition and gives each plant its time and place in the sun. It also keeps pollinators busy all season by allowing insects to have a continuous diet—without periods of overwork or starvation.

**HOW THE PRAIRIE PLANT SURVIVES:** Molded by fire, extremes of heat and cold, wind, and very dry conditions, prairie plants have evolved into specialized organisms—organisms adapted to conserving water and surviving fire. How do they do it?

1. Prairie plants put two-thirds of their growth underground. Long roots reach deep into the soil for moisture; food reserves are protected from above-ground extremes.

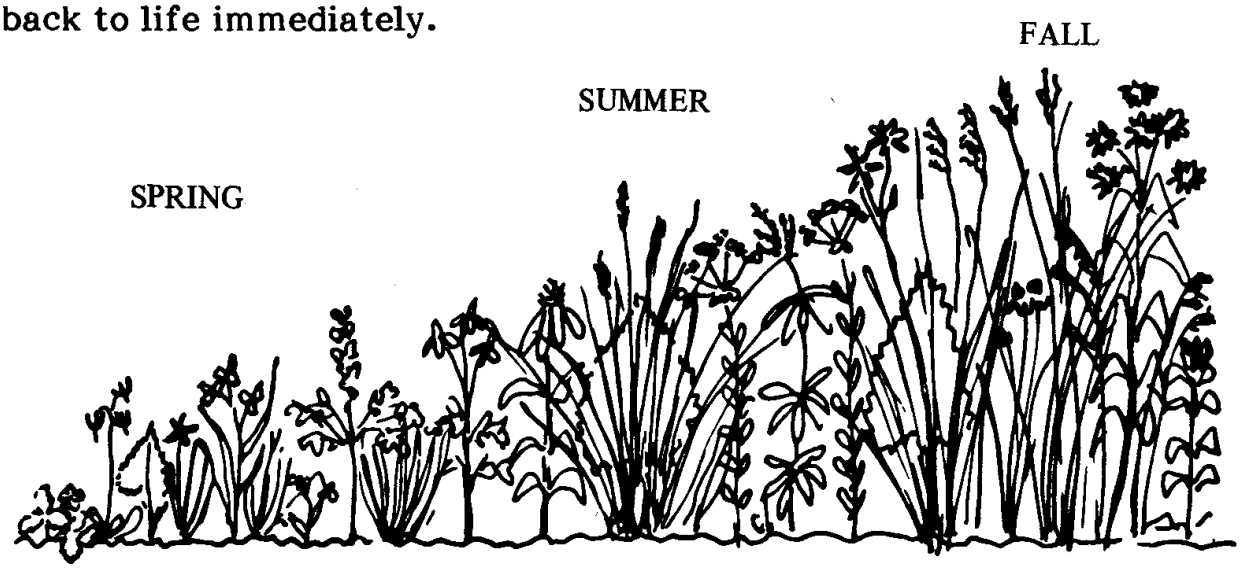
2. Prairie plants keep exposure of above-ground parts to a minimum. They have leaves which are finely divided, slender, vertical, or which can be curled or rolled; or they have fuzzy hairs on stems or leaves and sticky plant juices to prevent water loss.

3. Some plants avoid survival problems by completing their entire life cycle in a few moderate weeks of spring. Many of them form hard seed covers to protect seeds until conditions are proper for germination.

4. Prairie plants are perennials—staking out and holding their territory from year to year against vigorous annual plants.

5. Pollination takes advantage of the constant wind and the abundant insect life found on the prairie.

6. Fire may wither the leaves and stems, but large root systems and underground buds allow prairie plants to spring back to life immediately.




**Grass is short. Early blooming plants don't have to be very high to get sunlight.**

**Grass is much taller. Most blooming plants are as tall as the grass. Spring bloomers are dying down to rest until next year. It is very shady under the dense tall grass, so very few seedlings survive.**

**Many blooming plants are quite tall--up to 10 feet.**

---

Parts of "The Prairie" have been reproduced from the "Prairie Primer" by Nichols and Entine. It is highly recommended and can be purchased from Agriculture Bulletin Bldg., 1535 Observatory Drive, Madison, WI 53706. Write for details.

* * * * * *



* * * * * *

Subscriptions to **"On The Fringe"** are available to other Chapter members for **$7.50** per year (6 issues). Send check to: 6 Louise Drive, Chagrin Falls, OH 44022.

* * * * * *

## PRESIDENT'S COLUMN

Zonkers!!! The new Dayton Chapter, the Native Plant Society of the Miami Valley, whose first meeting was June 16th, has **already** saved a prairie! Now THAT is the heighth of achievement. From the Chapter president's letter: "As you can see, we are on our way! The most rewarding thing is that we have saved a small area of prairie along U.S. 35 in Greene County. After phone calls, letters, site visits, etc., by a number of persons, two of us are to meet there in the morning with an ODOT official and local engineers and they say it need not be bulldozed." 'Way to go, Dayton!!!

The Cincinnati Chapter also has a star in their crown. Former president Vic Soukup has been granted a $1,000 grant by the New England Wild Flower Society for tissue culture research. "Dr. Valerie Pense and Dr. Victor Soukup of the University of Cincinnati will be concentrating on Trillium grandiflorum which takes 7 years or more to bloom from seed. These researchers each have backgrounds in tissue culture and taxonomy and together have authored one of the first papers using laboratory methods of propagating Trillium species. Let's hope that the information gained over the next three years will allow nurseries to begin production of this garden specialty." Hats off to Vic!

In June I received an unexpected but extremely pleasing letter from Ingrid Chorba in Athens who had just received her Masters in Botany from Ohio University and wanted a project to undertake. We raced down there in 98° heat and met with an enthusiastic and talented woman who will surely stir up Southeastern Ohio. The organizational meeting is in early September and we will be hearing more from her.

Some of you have asked who wrote that super article on Cranberry Bog in the June newsletter. Guy Denny wrote the ODNR booklet from which the article was an excerpt. Once again we are in Guy's debt.

And speaking of being indebted, Dick Moseley, Chief of Natural Areas and Preserves, drove all the way from Columbus on the morning of July 26th to lead us on an outstanding hike through Irwin Prairie, Lou Campbell Preserve and Kitty Todd Preserve. We saw many rare and unusual plants, the weather was perfect, and those of you who didn't come surely missed a great day. Many thanks, Dick.

Duane Ferris has agreed to chair the 1986 Nominating Committee and has appointed two associates. He will report at the meeting of September 11th at Brecksville on the slate of officers for 1987, and nominations from the floor will be taken at that time. This is the year of the big change in officers, so if you want to serve, speak up!

I want to remind you that the Annual Dinner is Friday, December 5th. We are preparing the publicity on Peter Raven, and we have an **internationally** recognized authority this year. He has just won a 5 year $240,000 tax free MacArthur Fellowship to pursue his own interests. Needless to say, it is recognition of his tremendous accomplishments and talents. He is a dynamic speaker, so keep the date in mind.

We have just completed the 1987 Program and Field Trip schedule and there are some great surprises in store for next year. They will be announced on December 5th at the Annual Dinner.

We had a fabulous summer trip around the Gaspe Peninsula and through the Maritime Provinces. We walked in vast bogs where there was no evidence of humankind for miles around, where Arethusa orchids carpeted the mat, and where the only sound to be heard was the wind soughing across the bog. We dug fossils in the most famous bed in the world at Miguasha, relics of plants from Devonian times. We saw where Cartier and Cabot and Champlain landed, and where the Acadians were so shamefully driven out. The Maritime Provinces are a land of enchantment and beauty. The Canadian National Parks are of two kinds: Historical and Natural. No expense is spared in their upkeep. Visit there as soon as you can!

We will not be with you for the September or October activities as we are off on the trip of a lifetime, six weeks of the Grand Tour of Europe. No botanizing **this** time - just lots of scenery and history. More in November.

* * * * * * *

**STICKY BUSINESS: The milkweed: peril-filled pollination** by Christian Autotte

For eons, most flowering plants have produced abundant pollen as separate, dust-sized grains, trusting pollination to both wind and visiting insects. The milkweed, however, like the orchids, has evolved a different way of delivering its pollen: gift-wrapped in small packets.

The packets of pollen, called pollinia, come in pairs and are pulled out from the stamens by unsuspecting insects who have come to drink the sweet and abundant nectar. As the insect walks over the flowers, it inadvertently puts its foot into small slits between adjacent stamens that surround the central style of the pistil. The slits contain a trap: when the insect attempts to pull its foot upward and out, the foot becomes caught in the notch of a connecting clasp, which attaches two pollinia from adjacent stamens.

As the insect struggles to free its foot, the two pollinia clasped to the foot are extricated from the stamens. The mechanism can be easily demonstrated by inserting a needle into one of the slits; moving the needle towards the centre of the flower will make the pollinia appear almost magically.

Things are not always simple for the insects. To pull out the pollinia requires a certain strength; if the insect is too small or too weak, it may not be able to pull its foot free. During the flowering season, a visit to a milkweed patch will reveal a number of trapped insects. Even large butterflies, moths, or robust bumblebees can succumb to this entrapment.

But for the vast majority of insects that survive, the mission has only begun. Conscious or not of the precious cargo attached to its feet, the insect will visit other flowers in its constant search for food. With luck, one of the hitchhiking pollinia will be caught within the slit of another flower and lodge against the receptive stigmas within the flower's crown where the pollen grains can germinate. Ultimately, only a few flowers will be pollinated, which explains why there are so few seedpods, sometimes only one or two per plant.

It could be argued that this complicated pollination mechanism is inefficient, and statistics tend to agree. Yet the unorthodox milkweed is thriving.

---

The above article has been reproduced from **Nature Canada**, Summer 1986.

**FIELD STUDIES IN NATURAL HISTORY - GRASSES AND THE PRAIRIE**
**MIAMI WHITEWATER FOREST by Jeff Knoop**

**WHAT IS AN OHIO PRAIRIE?** Most people do not consider Ohio to be a prairie state, yet it is known that prairie originally existed in 50 of Ohio's 88 counties. These prairies, however, are not stereotype climatically controlled prairies; i.e., vast stretches of grasses extending from horizon to horizon as one might see in the Great Plains of the semi-arid Central United States. Instead, Ohio's prairies are small and scattered, ranging in size from less than one acre to possibly several hundred acres, existing in a spectrum of different environmental conditions: from wet to dry soils, from ridge top to valley bottom, and from sandy lake beaches to deep loamy soils.

All of the areas in Ohio that are favorable for prairie development do exhibit one common factor - that of plant stress. All of Ohio's prairie sites, for one reason or another, exhibit extreme environmental conditions that produce a high amount of plant stress not conducive to the growth of woody vegetation. Prairie plants, due to their evolutionary nature, have adapted to withstand a variety of stressful environmental conditions. In such an area, prairie growth; i.e., an association or aggregate of specific grasses and flowering forbs, is favored over the development of woodland and its specific vegetation. When the stress factor surpasses the threshold for tree growth, prairie plants can move in and, given time, a prairie community can become established.

Prairie sites in Ohio can be found under a diversity of conditions. These include:

1. **Slump Prairies** - These highly unstable areas are generally located along major stream channels. These sites are typically steep, gravelly, well drained soils, high in clay with a southern exposure.

2. **Wet Prairies** - Sometimes referred to as prairie fens (bogs) these areas are usually too wet to support extensive tree growth. Special prairie plants, sometimes called wet prairie indicators, become established and a sedge meadow with associated forbs develops. Cedar Fen in Champaign County is one example.

3. **Beach Prairies** - These prairies are confined to northwestern and north central Ohio where extensive sand deposits exist. The prairies here are found on the drouthy, sandy beach soils. The Oak Openings near Toledo represent this prairie type.

4. **Dry Ridgetop Prairies** - Generally found in hilly southern Ohio and along the high, gravelly river bluffs in western Ohio, as in Adams County.

5. **Other Native Prairie Sites** - Include Marsh borders, areas of thin soil, especially where bedrock is near the surface, and cliffs.

6. **Refuge Prairies** - I call these "residual prairie pockets" for they can hardly be considered true prairie communities. They represent a collection of prairie plants preserved through cultural default. These include railroad, utility, and highway right-of-ways, old cemeteries, fence rows, and abandoned fields. Look for these prairies in areas where original prairie was known to exist.

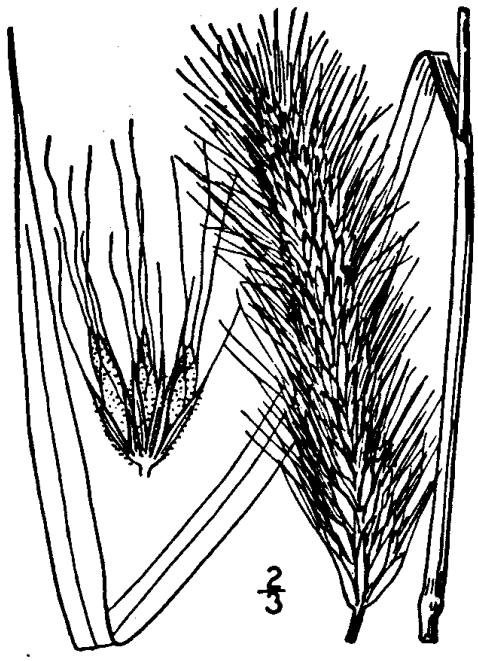
**HISTORY OF PRAIRIE IN NORTH AMERICA:** About 30 million years ago, the uplift of the Rocky Mountains intercepted the humid western winds and created a "rain shadow" which provided opportunity for plants with moderately low moisture requirements to evolve and survive in the interior of North America. This was the birth of the greatest expanse of grassland on the fact of this planet - an intricate ecosystem which the English called "prairie," a word of French origin meaning meadow.

If you have not by now, you will soon realize that there are numberous definitions for prairie. Some consider it a mood. Others a state of mind. Technically, a prairie, not unlike all other ecosystems, is identified by the types of plants that grow there. In a sense it can be described as a native North American grassland, composed of mostly perennial grasses and other flowering plants, in which grasses constitute much of the vegetative cover.

Just when the prairie community reached the area known as modern day Ohio is a question of speculation. It has, however, been surmised that a great eastward push or migration of the prairie ecosystem occured in recent geological time.

The reason for prairie migration into the humid east was due primarily to regional climatic change after the retreat of the last glacier. Some 10-12,000 years ago warm, dry winds began to invade the eastern United States. This period, referred to as the Xero-thermic (warm, dry) era, lasted several thousand years. During this extensive drouthy period, western and southern prairie species migrated into Ohio and took up refuge in many parts of Ohio - primarily the west-central sections (Clark, Darke, Greene, Champaign, Union, Madison and Pickway counties).

Elymus canadensis




The earliest push of the prairie into Ohio during the xero-thermic period (3-5,000 years ago) was primarily climatically controlled. The rainfall in western Ohio was so low (possibly one-third less than today) that the hardwood forest began to retreat while the prairie moved in to thrive. In recent time (past 1,000 years), Ohio has once again returned to a humid climate.

Therefore, the Ohio prairies are no longer climatically controlled but, as described earlier, are controlled by physical features of the Earth's surface (soil conditions, slope, aspect, etc.).

Just how widespread prairies were in Ohio at the climax of the xero-thermic period, is not known. However, it is known that when Ohio was first settled it contained close to 4,000 square kilometers (1,500 square miles) of prairie. since settlement, prairie has vanished rapidly. They have been plowed over, paved under, and overrun by competitive alien weeds. Today, there exist no native, natural prairie in Ohio greater than 35 hectares (50 acres). All the remnant prairies left in the state probably do not constitute one square kilometer.

Without human assistance, most of our remaining prairie sites and prairie plants would probably disappear under the continuing impact of man's activities. However, certain areas are now being obtained and/or managed as prairie by non-profit organizations such as The Nature Conservancy, museums, county park districts, Ohio Department of Natural Resources, and nature centers. They see the prairie as a true American Community, rich in diversity and natural heritage and without which mankind and Mother Earth would be poorer.

## THE PRAIRIE COMMUNITY AND ITS CONSTITUENT PARTS

As stated earlier, a prairie, in general terms, is recognized by the kinds of plants that grow there. The most important family of flowering plants that usually dominate any prairie are the **grasses.** Constituting much of the vegetation cover, grasses generally fall in the range of twenty to eighty percent of the total plant cover.

Ohio prairies, due to the state's humid climate, fall within the realm of the Eastern Tallgrass Prairie. The name comes from the dominant grasses which can grow as tall as twelve feet. Grasses are very distinctive plants. They are characterized by round, hollow jointed stems; narrow sheathing leaf blades; wind pollinated flowers borne in spikes; long, fibrous root systems; and the ability to reproduce vegetatively by creeping, underground rhizomes or by the production of hard grain-like seeds. Below is a descriptive list of the commonest prairie grasses that one might encounter on a prairie visit.

**Big Blue Stem:** (Andropogon gerardi) 3'-8' tall. Probably the commonest prairie grass found in Ohio. Formerly dominated over 100 million acres of the original Eastern Tallgrass Prairie that extended from Iowa to Ohio. Grows in tough, virtually inpenetrable sod-forming clumps. The seed head branches into three points resembling a turkey's foot, hence the common name - Turkey Foot. Mature


Panicum virgatum

plant has a reddish cast in the Fall and is the tallest Ohio grass, obtaining a height of ten to twelve feet.

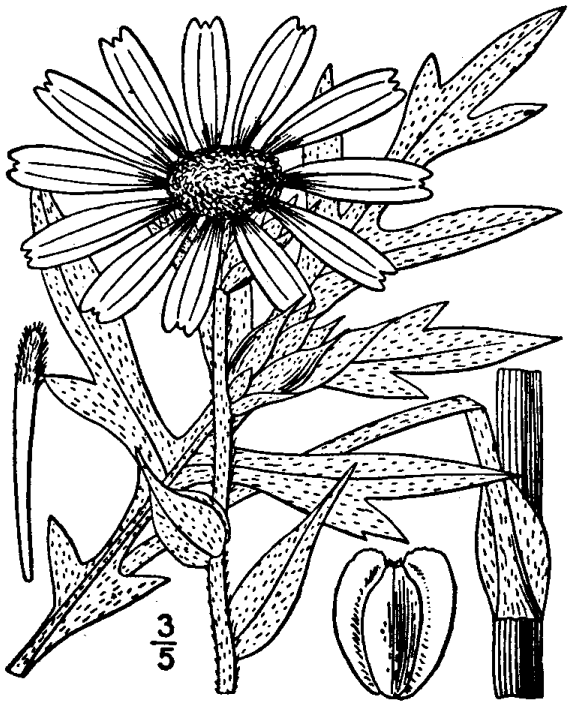
**Canada Wild Rye:** (Elymus canadensis) 4'-6' tall. This species has a rather woody, stout stem and, unlike Big Blue, occurs in loose clumps. The inflorescence (seed head) is a bristly spike and the awns are long and stiff. After the seed head appears, they tend to nod downward thus giving it another common name - Nodding Rye.

**Indian Grass:** (Sorghastrum nutans) 4'-8' tall. One of the most beautiful of the prairie grasses with its graceful, slender, tawny to brown plume-like panicle. The long slender blades taper to the base. Easily identified by the prominant claw-like ligule where the leaf blade attaches to the stem.

**Switch Grass:** (Panicum virgatum) 3'-6' tall. Another common grass of the Eastern Tallgrass Prairie. Grows in tight sod-forming clumps and easily spreads by the underground rhizomes. Easily identified by its loose, spreading panicle and a prominent nest of hairs where the leaf blade attaches to the stem. An adaptable species which is widely used by the Soil Conservation Service for its effectiveness in the control of soil erosion.

**Little Blue Stem:** (Andropogon scoparius) 2'-4' tall. A dominant grass of the original Western Shortgrass Prairie. This widespread grass occurs in all 48 of the lower states and usually occupies the driest of sites. A slender, graceful grass with an elongated inflorescence and a slender stem. Changes color in the Fall to a brilliant reddish-range.

Grasses may be the most important group of prairie plants in terms of dominance but when it comes to diversity, color, and complexity one must turn and look to the forbs. A forb is any herbaceous (non-woody) flowering plant excluding the grasses. A prairie may contain upwards of 100 or more flowering forbs that come in a variety of sizes, shapes, and colors. The following list contains a description of the most common forbs of the Ohio prairie communities.



Silphium laciniatum

**Purple Coneflower:** (Echinacea purpurea) Blooms July to October. 2'-3' tall. Reddish-purple rays are swept back around spiny dark daisylike heads. The stem is rough and hairy and the oval leaves are toothed.

**Compass Plant:** (Silphium laciniatum) Blooms July to August. Height to 9'. This tall, coarse species is a member of the sunflower family. The flowers are large (up to 5" in diameter), yellow, and have 15-20 rays (petals). This species has large, deeply cut leaves that have adapted ability to align themselves in a north-south plane. With the leaves perpendicular to the sun's rays,

they avoid the direct rays of the mid-days sun, hence cutting down on evaporation. This ultimately helps the leaves avoid over-heating which would result in excess loss of water.

**Prairie Coneflower:** (Ratibida pinnata) Blooms June through September. Height 3'-5'. The dropping rays give this flower a cone shape, hence the common name. One of the most productive seed producing plants of the prairie. The gray seed heads, which are high in oil, smell like anise when crushed.

**Butterfly Weed:** (Asclepias tuberosa) Blooms June through September. Height 1'-2' tall. The brilliant orange flowers of this species attracts many butterflies. The stem is hairy and the leaves linear with entire margins. A member of the Milkweed family but does not have milky sap. Indians chewed the underground stem as a cure for pleurisy. Hence another common name - Pleurisy Root.

**Prairie Dock:** (Silphium terebinthinaceum) In bloom July through October. Height 5'-7'. Easily recognized by the large heart shaped leaves which grow in a clump at ground level. This species is similar to the Compass Plant in the way of its flower's shape and size. The leaves are smooth on the front and rough on the back.

Since prairie plants live in stressful types of environments such as cliffs, steep banks, and other dry areas, they have developed a variety of unique adaptations that aid in the conservation of moisture. Several of these water conserving traits were mentioned above in the descriptions. A few more are listed below. Look for these adaptations on your next visit to a prairie.

1. The most ubiquitous adaptation from one prairie plant to the next can be found in the leaves. Some plants, such as Stiff Goldenrod, have thick, leathery leaves while others are smooth and waxy. The Blazing Stars (Liatris) have thin, narrow leaves. The Compass Plant, along with many others, have pinnitifid or deeply cut leaves. Plants like Butterfly Weed and Hairy Sunflower have bristly hairs. Grasses have the ability to roll their leaves which cuts down on the surface area exposed to the sun.

Echinacea purpurea


2. Some prairie plants produce sticky resins throughout their stems and leaves. This again helps conserve water while protecting them from the hot, mid-summer sun. The rosinweeds (Silphiums), which include Prairie Dock, Whorled Rosinweed, and Compass Plant all contain a resinous type of protecting substance.

3. Prairie plants have developed deep and extensive root systems. Only one-third of the plant is above ground. The remaining two-thirds is composed of roots below ground. Root depth helps the plant to obtain water at all levels and during each season. The deep thick roots are so important that during the

first year of growth only one inch occurs above the ground while twelve inches grow below.

4. Fire has always been an important element of the prairie environment. True prairie plants are not damaged by fire as the roots remain alive and protected beneath the moist soil. Fire helps maintain the eastern prairie pockets by helping to kill off the prairie's worst enemy - invading trees and shrubs. Without fire, plant succession would eventually turn prairies into woodlands. Burning also removes dead plant material . . . stems, leaves, and seed heads. This accumulated material is called thatch or litter. In the spring after a burn, the litter free soil will warm more easily in the sun allowing nitrogen-fixing and decomposing bacteria to stimulate new plant growth. A burned prairie will produce 8,000 pounds of organic matter per acre while an unburned produces only 4,000 per acre.

Prairie communities are vanishing at an alarming rate. This is not only true in Ohio but throughout the Midwest and Great Plains as well. The prairie is an intricate and complex ecosystem in which few representative samples remain. With this is mind, Ohio prairie should be preserved for the following reasons:

1. Prairie is a significant part of our natural and historic heritage. Prairies made possible many of the rich soils of the Midwest which our nation depends on as a producer of food. In many areas, prairie greatly influenced and molded the lives of the early settlers.

2. Many prairie species are or could make excellent forage crops or ornamental plants if properly developed.

3. Some prairie plants may possess undiscovered properties that could have significant value as medicines or chemicals.

4. Morally, we are responsible for the maintenance and continuation of all biotic gene pools of which prairie is one. Genetically, prairie plants are among some of the best fire and drought-adapted plants in the world.

5. Prairie is a thing of great natural beauty which will be greatly missed if allowed to disappear. Prairie is an emotion, a mood, and an experience without which mankind would be poorer.

---

Jeff Knoop is the Acting Director of the Ohio Nature Conservancy and a member of the Dayton Chapter of NPS. Son of Paul Knoop, he was born to be a naturalist and a prairie expert.

* * * * * * * *

## TALLGRASS PRAIRIE MANAGEMENT AT THE AULLWOOD AUDUBON CENTER AND FARM IN DAYTON, OHIO by Paul Knoop

**Introduction:** The Aullwood Audubon Center and Farm is a 190 acre environmental education facility located 10 miles north of Dayton, Ohio. The original gift of 70 acres of land was given to the National Audubon Society in 1957 by Mrs. John W. Aull. In 1962 Mrs. Aull purchased an adjoining 120 acre farm and donated it, bringing the total acreage to 190. The entire area is managed to maintain maximum biological diversity which in turn enhances the educational potential of the site. Typical "old farm" environments on the original 70 acre site included meadow, old field, climax and second growth woodland, marsh and stream. Our hope was to establish a small tallgrass prairie on this 70 acre parcel of land. Early land surveys indicated that prairie had been present in the county prior to settlement, however, not on the Aullwood site. Our decision to establish a tallgrass prairie was based on its educational potential and the fact that prairie vegetation was a disappearing resource in Ohio.

**MANAGEMENT PROCEDURES:** Considerable effort went into selecting the planting site. The Aullwood staff sought guidance from Dr. Paul Sears of Yale University, Mr. Frank Preston of Butler, Pennsylvania, and Dr. J. T. Curtis of the University of Wisconsin. Valuable help was received from all these men on site selection and planting procedure.

The site selected was a gently sloping 2-1/2 acre portion of a 10 acre field containing well-drained Miami Silt Loam Soil at the upper end and poorly-drained Brookston Silty Clay Loam at the lower end. Vegetation on the site consisted of well established brome grass (Bromus inermis) which had been planted years earlier as a pasture crop. This species is highly competitive and very little other vegetation was evident at the time.

In the fall of 1959, prior to planting prairie seed, the 2-1/2 acre site was plowed and disked to eliminate the brome grass. During the same period prairie seeds were collected by hand from road sides in Adams County, Ohio. Adams County is unique in its botanical makeup, and small relic prairies in the area have a good representation of prairie species including: Sorghastrun nutans, Andropogon scoparius, A. gerardi, Echinacea purpurea, Liatris spp., Silphium terebinthinaceum, Ratibida pinnata, Solidago rigida, and Sabatia angularis.

Collected seeds were buried in soil for the winter, dug up and planted in the spring of 1960. We had enough seeds to plant approximately 1 acre of the 2-1/2 acre plot. Thereafter annual expansion of the prairie in 1/4 acre increments was continued until the 2-1/2 acre area was completed in 1968. Subsequent plantings after 1968 have increased the present tract to 10 acres.

From the beginning, management of this small prairie consisted almost entirely of burning and hand cutting of hardwood trees. At the time small prairie management was what might be called a "pioneering effort" as we had few models to follow.

We merely used our better judgment on the best technique to promote growth of prairie species. This judgment led us to a program of fall mowing and raking of litter and spring burning to control annual weed growth. Burning at the time was accomplished by spreading dry straw over the site and igniting it. Fall mowing and removal of litter in conjunction with spring burning was continued through the spring of 1963.

In 1963 all plots seemed to be doing well. There were well established clumps of big bluestem, little bluestem and Indian grass with a nice sprinkling of forbs. Our major concern was the seemingly increased dominance of grasses in proportion to forbs. We began to notice how rapidly the grasses grew after each spring burn how their increasing lushness competed with the forbs. It was at this time (spring 1963) that we went to a program of every other year burning as recommended by Kucera and Ehrenreich in an article in **Ecology** (1962) entitled, "Influence of Fire on Composition of Central Missouri Prairie." They found that "annual burning resulted in a uniform cover of prairie grass with a sharp decline in broadleaved species, whereas the effect of biennial burning was to maintain a mixture of both grass and broadleaved species."

The every other year burning continued until 1974. At that time the prairie was approaching 10 acres in extent and we felt a need to evaluate our management program. After much study the decision was made to divide the area into 6 fairly even sized study plots and a different management technique was to be applied in each plot as follows:

**Plot 1** - Burn every year.
**Plot 2** - Burn every other year.
**Plot 3** - Mow every year in October.
**Plot 4** - Mow every other year in March.
**Plot 5** - Burn every third year.
**Plot 6** - Control area - no burning or mowing - control woody growth by hand cutting only.

The above management plan was followed until 1980 when it became apparent that plots 3, 4, and 6 were not doing well. Litter accumulation in these three plots became excessive and it became apparent that forb growth was being inhibited. In response to this problem we made the decision to divide the 10 acre prairie in thirds and burn one third every year. At present we feel comfortable with this management program as we feel in time it will give us some much needed answers to the problem of maintaining species diversity in small restored prairies. An inventory of prairie flora in the summer of 1981 resulted in a list of 102 prairie species presently growing in the Aullwood prairie. It is hoped that our diversified management program will allow all of these to persist into the future.

In conjunction with the above it should be added that the Aullwood prairie has become an important part of the total education program at the Aullwood Audubon Center and Farm. School classes visit and experience the prairie. The spring prairie burn has become an annual public event with as many as 300 people attending. In addition,

individuals and groups from around the country have visited to learn about small prairie restoration.

Several years ago a publication entitled "The Inland Sea - A Guide to Aullwood Prairie" was published and is now available for public use. This guide is another step in our continuing effort to develop public appreciation for the native American prairie.

**Literature Cited:** Kucera, C.L. and J.H. Enrenreigh, 1962. Some effects of annual burning on central Missouri prairie. Ecology 43: 334-346.

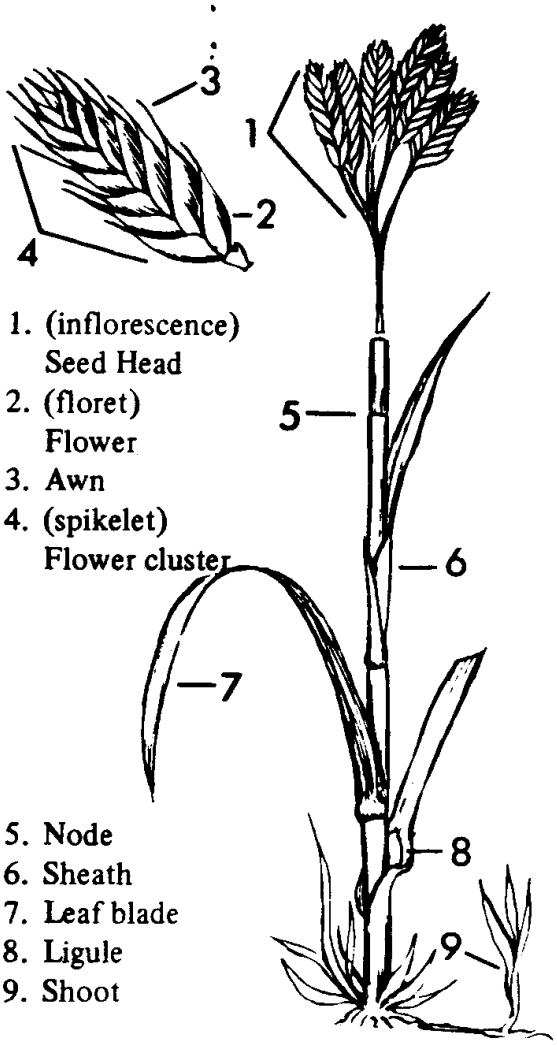
---

Paul Knoop is the Education Director of Aullwood Audubon Center and one of the founders of the Miami Valley Chapter of NPS.

* * * * * * *

## Plant Parts

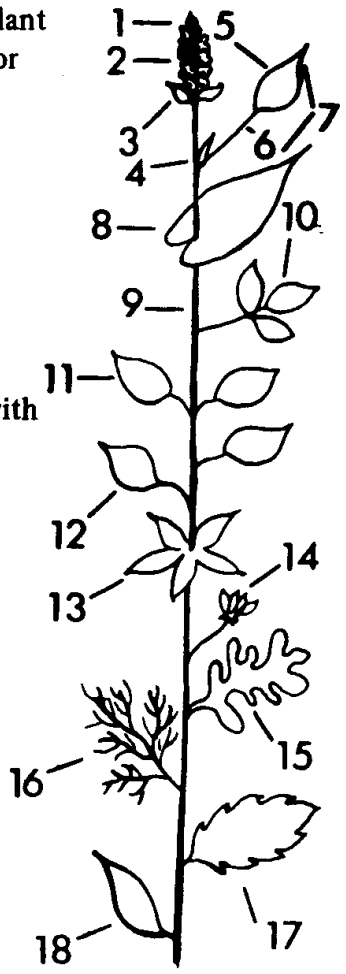
**Grasses**




1. (inflorescence) Seed Head
2. (floret) Flower
3. Awn
4. (spikelet) Flower cluster
5. Node
6. Sheath
7. Leaf blade
8. Ligule
9. Shoot

**Other Plants**

1. Terminal end of plant
2. Spike of flowers, or flower head
3. Bract
4. Stipule
5. Blade
6. Petiole (leaf stalk)
7. Simple leaf
8. Clasping leaf
9. Stem
10. Compound leaf (with three leaflets)
11. Opposite leaves
12. Alternate leaves
13. Whorled leaves
14. Flower
15. Margin lobed
16. Deeply cut leaf
17. Margin toothed
18. Basal leaf



# NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO

Founding Chapter Of

THE OHIO NATIVE PLANT SOCIETY

6 Louise Drive Chagrin Falls, Ohio 44022

NON-PROFIT
ORGANIZATION
U.S. Postage
**PAID**
Chagrin Falls, OH
Permit No. 11

Tom Sampliner
2472 Overlook Rd. #8
Cleveland Hts. Ohio
44106

---

NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO
Founding Chapter of The Ohio Native Plant Society

"to promote conservation of all native plants and natural plant communities through habitat protection and other means; encourage public education and appreciation of native plants; support proper ethics and methods of natural landscaping; encourage surveys and research on natural plants and publication of the information; and promote cooperation with other programs and organizations concerned with the conservation of natural resources."

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

☐ ACTIVE.....$ 7.50
☐ FAMILY .....$15.00
☐ SUSTAINING ...$25.00
☐ PATRON.....$50.00


Membership runs from January through December and is not pro-rated.

Make checks payable to: NATIVE PLANT SOCIETY
6 Louise Drive, Chagrin Falls, Ohio 44022

Name: _____ Phone: _____

Address: _____

City/State: _____ Zip: _____