



On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

2004 Endowment Grant

This year the two top applicants for the Endowment Grant were so close that it was decided by the Board to award the grant to Shya Chitaleay and give a one-time gift of \$500 to the Ohio Botanical Garden.

Shya Chitaleay, Paleobotanist

Cleveland Museum of Natural History

The 360 Million Year Old Ohio Forest

Hundreds of pieces of plant fossils have been collected from our local Upper Devonian Cleveland Shale and stored in the Cleveland Museum of Natural History. A whole lycopsid fossil tree was salvaged during the construction of Interstate-71 and described in a 1996 publication under the name *Clevelandodendron ohioensis* gen. and sp. nov. The name was selected to celebrate the bicentennial of the city of Cleveland. This slender tree is significant globally in the evolution of the modern clubmosses called *Isoetis, quillwort*.

In studying of the Cleveland Shale plants for the last 20 years, it has been found that along with these many clubmosses there are also fossils of other trees called *Archaeopteris*, (Progymnosperms), some bushy ferns, algae and bryophytes, demonstrating the diversity in the Cleveland Shale Flora of Ohio.

The project of restoration of this Late Devonian Forest of Ohio started around three to four years ago. Descriptions, identifications, and naming of the different clubmosses, ferns and other trees represented in the fossil collection are yet to be done, a task that will take at least two more years.

Ohio Botanical Garden

The Garden, founded by Hope Taft at the Governor's Residence, will represent Ohio's many geographical regions and native plant species.

Mrs. Taft's hope is that the thousands of visitors who tour the grounds will learn more about Ohio's diverse climate and geologic history. Over 20 regional gardens will recreate eco-systems from all over the state and will demonstrate the residential use of native plants. There will be a cranberry bog, an orchard and vine garden, an Appalachian garden, a Lake Erie dune garden, an Allegheny garden, and a Prairie garden.

Mrs. Taft has herself been digging along side volunteers, to rescue plants from construction sites. Botanists, horticulturists, landscape architects and even members of the Native Plant Society have worked on this project.

The project is funded through the Governor's Residence Foundation, to ensure the longevity of this project; it will not be affected by changing administrations.

In her thank you note to the Society, Mrs. Taft wrote: "We will use [the funds] to expand the woodland shade garden into a meadow garden designed like a typical English border garden.... Thanks for the very special and generous gift from the Native Plant Society."

Farewell and Thank You, Jean

At the Annual Dinner Jean Roche, our president for the last four years, passed the torch to Judy Barnhart. No one will ever know how much Jean gave in terms of her time or herself. She was very much a hands-on president, active in all phases of the Society, much to its benefit. Perhaps one of her major accomplishments was the advent of the Journal. She was in on the very beginning of planning and helped to raise funds for the first issues. After the Journal was on its feet, she adopted a hands-off policy, letting the editors do their job without any interference. Planning the annual program schedule, she coordinated the efforts of the committee and saw that the final product was printed and mailed. Jean worked hard to see that the Annual Dinner and speaker were successful. She worked to establish communication with other groups and facilitated sharing field trips and programs.

Jean will be sorely missed. She is moving to southern Florida in March and looks forward to being working with former vice-president George Wilder on the flora of Florida. We wish her every happiness and success in her new life and will welcome her back whenever she returns to visit children and grandchildren.

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NOTE: This will be my last article as president of NPS. Thank you all for your support over the last four years. It has been a very special privilege to be a part of this extraordinary Society and I want to extend my thanks and good wishes for a great future.

A Day With Mushrooms and Wild Horses

Jean Roche

Considering that the NPS trip on Sunday, September 26, began at a point some 2 hours away from the Cleveland area, it was very well attended. Our group including leader, Tom Sampliner, gathered at Spittle's Restaurant in Coshocton and was joined there by Dick Grimm and Jack Frantz of The Ohio Mushroom Society.

The weather on the ride to Coshocton was cool, cloudy and often foggy. The dampness, as it turned out, was just perfect for mushrooms. Tom led us to a woodlot near Willis Creek which at first glance looked rather ordinary. So much for first glance. The place had an impressive number of mushrooms and fall orchids. With the help of our Mushroom Society friends, we identified a surprising number of edible mushrooms and discovered that identification is not a simple business. Although color can tell you when a mushroom is definitely not edible, it cannot be depended upon to signal when it is. If the flesh of the mushroom turns red or blue when broken, it is a signal that it should be left alone. There was one fungus that turned a bright cobalt blue, pretty but certainly not to be placed on the menu. Even if pressure applied on the surface causes the fungus to show a slightly yellow color they are suspect. The message was clear - leave the I.D. to the experts!

The same site yielded two orchids; the promised autumn coralroot and rattlesnake plantain were present in abundance. Wintergreen was also onsite and made a nice comparison when side by side with the rattlesnake plantain. The coralroot was still in bloom and though very tiny, an exciting find for photographers.

After a leisurely lunch at Spittle's Restaurant with our friends from The Ohio Mushroom Society, we started off to *the Wilds*. Local residents at the restaurant shared the news of recent flooding that made it necessary to take a lengthy route around so we arrived later than expected. However, the staff at *the Wilds* could not have been more generous and hospitable. *the Wilds* is a beautiful game preserve and ecological restoration project in Cumberland, Ohio. It is on the site of an old strip mining area covering more than 30,000 acres which has been reclaimed and replanted with grasses. *the Wilds* uses 10,000 acres of the original site. It is home to more than two dozen species of protected animals from Africa, Asia and North America. The African Southern white rhinoceros, Asian Przewalski's horse and the rare Indo-China sika deer are a few species that are managed and bred at this wonderful place.

The species list distributed by *the Wilds* is impressive. It includes native plants, ferns, grasses, fish, reptiles, amphibians, mammals, birds, dragonflies, butterflies and moths. A new butterfly conservation initiative was begun this year.

This is a wonderful place for the whole family with shuttle buses and a tour bus out into the fields with the animals. We owe a great deal of thanks to Nicole Cavender, Director of Restoration Ecology at *the Wilds*. If you missed this trip, check out the beautiful website [<http://www.thewilds.org/>] and make it on your own. It's worth it!

The 2005 Program and Field Trip Schedule will be mailed to the membership along with a form for 2005 membership renewal.

Field Trip Ethics

Periodically, it is appropriate to remind members and guests alike of the obligation to follow conduct required of participants upon all Native Plant Society field trips. Members are bound by a specific code of ethics forbidding not only digging, but any other type of disturbance to the plants we are looking at, including innocent trampling. Furthermore, pruning by photographers is also forbidden. Members and their guests are also required to be cautious about disclosure of site information if the area is home to rare species, private land, or public but with restricted access. After all, we are charged with a duty of stewardship. Conduct is set forth in our Constitution and by-laws and will be periodically reprinted or summarized in pertinent parts to educate new members, guests, and the public. Members are responsible for the conduct of any invited guests.

Apparently, some participants have taken the view that unless a species is expressly set forth upon the state heritage list in a high category, harvesting is in their view permissible. This is incorrect. Some species may be common enough to not warrant a current listing upon a heritage list, yet they require a certain delicate symbiosis or perhaps take many years before capable of flowering. Therefore, the blanket prohibition from harvesting.

Plant Detectives: Rattlers Don't Rattle They Whirr-rr!

by Barbara Plampin

Plant detectives aren't always in hot pursuit of glamorous orchids. When, in 1997, I talked my friend Myrna Newgent into helping me repay a favor to the Indiana Heritage Trust (IHT), our quest was Rough Bedstraw (*Galium asprellum*), a vine which "clings tenaciously to clothing."

The Alberta (Canada) Research Council wanted "a few hundred seeds, perhaps 5 or 6 grams" from NW Indiana for a possible biocontrol, along with a gall mite, of the European False Cleavers (*G. spurium*), a severe threat to the province's safflower crop. IHT would supply permits for collecting in DNR preserves.

Though Bog Bedstraw (*G. labradoricum*) is state-listed and Cleavers (*G. aparine*) furnished no-lump mattresses for pioneers, bedstraws had always meant burs and bewilderment to me. But I owed that favor. Swink and Wilhelm placed Rough among the smooth-to-smoothish fruited Bedstraws and said, "Leaves and stems very harsh, strongly retrorsely scabrous," i.e., with stiff, downward-pointing hooked hairs. The plant grew in "alkaline wet thickets, sprawling over other vegetation." Seeds would ripen during late summer heat when wetlands temperatures soar 10 degrees higher than the weatherman's high.

Official lists suggested searching a fen known for quicksand, poison sumac, and, unknown to us, that reptile proposed for federal listing, the Eastern Massasauga rattler (*Sistrurus catenatus catenatus*), bite supposedly not fatal.

Fortunately, buckthorn-clearing had carved out two quicksand-free sites, the first a charming little "room" with six-inch-wide rills bordered with Grass-of-Parnassus (*Parnassia glauca*) and the little green zippers of Marsh Club Moss (*Selaginella apoda*), but no Rough Bedstraw.

Whirr-rr! Whirr-rr! Whirr-rr!

Through the undergrowth, we spied the chunky, gray-sided, black-spotted side of a Massasauga. We stiffened. He

(or she) whirred (not rattled) again, and still whirring, slithered off into more distant cover, head and tail remaining invisible. We departed rather quickly.

At site two, noteworthy not only for Fringed Gentian (*Gentiana crinita*) but also for Poison Sumac (*Rhus vernix*), we found our sticky quarry clambering, mercifully, over "other vegetation," and yes, the vine was as sticky as described. We happily popped the tiny black seeds into glassine envelopes to mail to Alberta.

Favor repaid, we did make expenses, but the recognition list omitted Myrna's name. We never learned whether the seeds helped rescue the safflower crop. Perhaps the verdict is still out.

Addendum: On a subsequent spring visit to site 2, we hikers safely viewed at length "the all of it": the chunky head, body, and rattles of a somnolent, sunbathing Massasauga. We'd come to look for White Lady Slippers.

Books:

Britton and Brown. *An Illustrated Flora of the Northern United States and Canada*. Dover, 1970 (1913).

Conant and Collins. *Reptiles and Amphibians: Eastern/Central North America*. Third Edition. Peterson Field Guides. 1991.

Swink and Wilhelm. *Plants of the Chicago Region*. Fourth Edition. Indiana Academy of Science. 1994.

Yatskievych. *Field Guide to Indiana Wildflowers*. Indiana University Press, 2000.

Barbara Plampin is a trustee of the Shirley Heinze Environmental Fund, and a member of Save the Dunes Council. She has a Ph.D. in English literature from the University of Michigan. Botany has been her avocation all her life.

Reprinted from the Indiana Native Plant and Wildflower Society News, Autumn 2003.



Rough bedstraw

What Is A Wildflower?

The literal definition of a wildflower is simply "the flower of a plant not in cultivation." There simplicity ends. Our own experiences and prejudices, where we live, romantic allusion, biology, history, and a host of other factors shape our individual reactions to the term wildflower. The old axiom that one man's orchid is another man's weed is nowhere more true than in the interpretations of what a wildflower is.

A weed is a plant out of place. While sunflowers and clover may be beautiful along a road, they may not be acceptable in a rose garden, where, according to individual evaluation, they may be considered out of place.

Except for horticultural hybrids, clones, and man-made cultivated varieties, all flowering plants are or have been wildflowers somewhere. Many of us think of wildflowers as delicate, ephemeral plants that appear from season to season and then disappear. This concept limits the terms almost exclusively to herbaceous annuals, biennials, and perennials. Annuals complete their life cycle from seed-germination to seed bearing in one growing season. Biennials require two growing seasons to complete their cycle; the seed germinates the first year and produces a basic rosette of foliage that survives the winter; the plant blooms the second year. Perennials are longer-lived plants that die back to the ground level at the end of the growing season.

The term native plant adds additional confusion to the question "What is a wildflower?" The two terms overlap but are not synonymous. Native plants are those that have existed in particular landscapes for a very long time; ferns, horsetails, and skunk cabbage, for example, have existed through the ages.

Where and how our native wildflowers originated is a question that is unanswered. Fossil remains reveal evidence and indicate the origins of some species living today. Many of today's plants are very old, some surprisingly young. Through mutation and natural hybridization over long period of time, new species arise. Through study of fossil pollen grains and chromosomes with their component genes it is possible to identify the mass of genetic diversity available to create new species. From this information we gain insight into how new species of plants come to exist.

INTRODUCTIONS

The European migrations brought thousands of wildflowers to North America. Many are considered weeds and there can be no doubt that some are, but since beauty is in the eye of the beholder there is little need to worry about such a distinction.

Wildflowers came with the Spanish to Florida, Mexico, and eventually California; they came with the English, Dutch, Germans and Scandinavians who settled the Atlantic seaboard and moved westward. As time passed more people came, and with them came plants of all kinds. Some were brought by intent; some came as hobos using whatever form of transport was available to them. The great appeal of most of the immigrant wildflowers is their very commonness; they are available everywhere to everyone.

This mass movement of people brought about a mass movement of plants. Some came as weeds in agricultural crop seeds; other in cereals and grains; in packing materials such as straw and hay; in ship's ballast; in pants cuffs, in seams, and other articles and parts of clothing, in soil clinging to boots and shoes, and in household goods and supplies. Others were brought as herbs for flavoring, dyes, scents, and medicinal remedies, and some very few came as garden ornamentals. Many of these plants found new homes for themselves by escaping from gardens and cultivated fields, and spreading beyond wagon trails and roadsides to become so widely distributed that they are now assumed to be native plants.

THE FUTURE

The world in which many wildflowers grew and flourished, their native habitat, is disappearing, necessarily so because the population has doubled in the past fifty years. Meadows and fields and wild places have been filled with grids of housing developments, shopping malls, industrial parks, and ribbons of highways. A century ago, William Cullen Bryant looked with his poet's eyes at America's "unshorn fields, boundless and beautiful", and with his poet's voice said, "I think I hear the sound of that advancing multitude which shall soon fill these fields."

And the multitudes have come! We can, however, plan to keep some of nature's bounty in suitable places, if we have the knowledge and foresight. Public areas are natural locations for planting wildflowers and native plants. The right-of-way along the roadsides, public parks and parklands, historic restorations, campuses and school grounds are excellent candidates for wildflower plantings, as are private lands such as residential developments, corporate parks, churchyards, and our own homes – in appropriate areas of course. We are not advocating doing away with pleasurable green lawns and shrubs! But there are many instances when they can be mixed with nature.

Reprinted from The National Wildflower Research Center

The Problem:

North American Native Plants That Invade Slovakia and Central Europe

By Daniela Michalkova

During the year of my internship at Cuyahoga Valley Environmental Education Center (CVEEC) I tried to get to know some of the North American native plants. The climate of Ohio is approximately the same as that of Slovakia, but the plants are very different. I fell in love with the tulip trees, red maples, sassafras and sycamores that surrounded me in Ohio. In Europe, I was accustomed to seeing these trees only in botanical gardens and parks. But I also found in the United States a group of plants I knew very well. For example, purple loosestrife, garlic mustard, Queen Ann's lace, Canada thistle, and others. I was surprised that these "peaceful weeds", as I knew them from my home in Slovakia, are considered to be invasive in the U.S.

As an environmental educator at CVEEC, I taught the students about a great threat to wild life – the so-called invasive species. Having had the experience of fighting invasive plants outside the North American continent, I tried to teach my students that the problem of invasive plants is a global problem affecting large areas in Slovakia, and in Europe as well. Invasive non-native species threaten the native biological diversity by displacing native plant species.

A great many plants invasive to Europe come from North America. The most dangerous and aggressive invasives native to the U.S. belong to Composite family (Asteraceae). There are 8 genera with about 17 species, which are invasive to Slovakia and Central Europe in general. Some of them might rapidly spread even in their native areas in the U.S. In this article, I would like to tell you more about 4 of these invasive genera and about the control management strategies we use in Slovakia.

Aster (*Aster*)

Very unpleasant invasive plants belong to a genus *Aster*. There are about 6 species and their hybrids that invade Slovakia. They came mainly from the eastern part of North America and were introduced to Europe as decorative species for horticulture in 19th century. Later, they escaped from the gardens



Aster novi-belgii

and spread into natural areas.

One of the most invasive of the Asters is New York Aster (*Aster novi-belgii* L.). This plant is 2 to 4 ft. tall. Its leaves are about 3 in. long, narrowly lance-shaped and slightly clasping the stem. It blooms from August until October. The flowerheads are 1 – 1 ¼ in. wide, rays are purple and the central disk is yellow. The New York Aster sexually (generatively) reproduces by seeds and non-sexually (vegetative reproduction) by underground stems called rhizomes.

The New York Aster grows usually at lower altitudes in lowlands and hilly areas. It tolerates a wide range of environmental conditions and quickly colonizes recently disturbed sites. The species spread rapidly along the rivers. It is not unusual to see large and dense growths of the New York Aster on the riverbanks and on the road sides.

Ragweed (*Ambrosia*)

Ragweeds are annual plants that grow all around the United States. The non-native Giant Ragweed (*Ambrosia trifida* L.) also grows infrequently in eastern Slovakia and in the future might become a large invasion.

The Common Ragweed (*Ambrosia artemisiifolia* L.) is already invasive to Slovakia. It is very common in the warmest, southern part of the country. It grows in fields, waste places, junkyards and railroad embankments. The hairy

branching stem is 1/3 – 6 ft. tall. Leaves are divided into narrow toothed or lobed segments. Greenish male flowerheads are borne in slender spikes. Female flowers are in clusters at leaf bases. The Common Ragweed blooms from August until October. An average plant produces about 2,000 seeds.

Ragweeds are known for the problems they cause among hay fever victims. The drab male flowerheads release vast quantities of pollen into the air. Each grain is covered with minute hooks, so it clings to the bronchial tissue of humans and causes bad allergies.

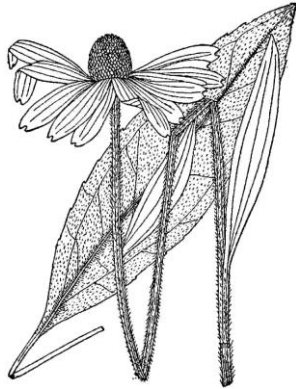
Experience shows that the most effective control is the mechanical removal of the plants before blooming



Ambrosia artemisiifolia

to avoid seed production. In smaller areas hand pulling is successful and in larger areas, it is common to mow the invasive plants.

Coneflower (*Rudbeckia*)



Rudbeckia hirta

Who would expect that even the pretty Black-eyed Susan (*Rudbeckia hirta* L.) is an invasive species! It was brought over to Europe, together with Tall Coneflower (*Rudbeckia laciniata*, L.), from the U.S. for decorative use in gardens. These perennials have escaped to the wild and displaced

the native vegetation. They grow in a wide range of environments and prefer moist areas. Especially the Tall Coneflower grows rapidly along the rivers, reservoirs, lakes and railroad embankments because the water movement and busy railroad traffic helps seed dispersal.

The Tall Coneflower is up to 8 ft. tall. Lower leaves are pinnately divided into 3-7 irregularly lobed leaflets. Flowerheads are 2 ½ - 4 in. wide. The rays are yellow and the central disk is a brownish-yellow knob. The flowers bloom from July until October.

Goldenrod (*Solidago*)

Canada Goldenrod (*Solidago canadensis* L.) and Late Goldenrod (*Solidago gigantea* Aiton) are common species of North American Goldenrods and are invasive to Slovakia. They were introduced to Europe as decorative and honey-producing species.

The Canada Goldenrod and Late Goldenrod look very similar. The leaves are narrowly lance-shaped and sharply toothed. The yellow flowerheads are in dense, arching clusters. The Canada Goldenrod is 1 – 5 ft. tall. The main stem is smooth near the base and downy above. The individual tiny flowers are 0.5 mm (1/50 in.) in diameter. The Late



Solidago canadensis

Goldenrod is 2 – 8 ft. tall. The main stem is smooth and grayish-green; the base is reddish. The flowers are 1 mm (1/25 in.) in diameter.

Both species are extremely effective colonizers due to their growth habit as well as high seed production. In addition to the seeds, the Goldenrods also reproduce non-sexually by rhizomes. They colonize moist or dry open places, disturbed and idle sites, waste places, roadsides, railroad embankments and fields.

Methods of control

After having established successfully, these invasive plants are able to dominate the sites for decades and replace the native species. In the process of protecting our native biodiversity, it is necessary to invest a lot of effort to control the invasives.

Slovakia as a member of the European Union has incorporated the control of invasive plant species in its legislation. The Slovak National Council has laid down an Environmental law no. 543/2002 that facilitates the protection of national biodiversity. In 2003 the Ministry of Environment of Slovak Republic designed the Edict no. 24 with a list of invasive plant species and methods of their control. The invasive species are controlled by the Slovak National Park Service that cooperates with the owners of the properties.

The Slovak NPS uses different control methods depending on the kind of propagation of a target invasive species and the population size. The most common is mechanical control. Initially, people control the annual and biennial invasives by preventing the plants from producing seeds. It includes physical removal such as cutting, hand-pulling and mowing plants before blooming. It has been shown to be effective to graze the sheep and cattle in areas with sparse growth of invasive plants. This method does not destroy the invasive population completely, but it helps decrease its vitality. The invasives with the generative as well as vegetative reproduction (Asters, Coneflowers, Goldenrods) are also controlled mechanically by ploughing flat and large areas. The seeds of some native plants that can out-compete the invasives have to be sown in the disturbed soil. Without this step the invasive species will quickly re-establish from the root fragments. Fire is not a common method, because it could harm the non-target plants and animals that are part of the ecosystem.

When other control methods are ineffective, it is appropriate to use herbicides. The chemical control is a good solution during late stages of invasion when the populations are large and well-established. Synthetic herbicides are applied to the above-ground part of the

plant. It is necessary to only use herbicides that do not contaminate soil or surface and ground waters. The brands of herbicides used in Slovakia are for example, Roundup – Biaktiv, Glialka 36, Rodeo, Garlon 4, etc.

Biological methods are not very popular in Slovakia. The use of the natural enemies of the invasive species to reduce its population appears to be a smart idea, but introducing of a non-native predator to an ecosystem is very risky without knowing all of the potential hazards. Intensive research is necessary in this area.

The environmental methods are very interesting. They prevent the creation of environments that could possibly be colonised by the invasive species by restoration of disturbed and idle sites, junkyards, and waste places through cleaning and replanting with native plants to avoid further invasion. This preventive method is very difficult considering the needs of the environment we live in.

It shows to be most effective to use the combination of all the available control strategies. A proper timing of follow-up treatment is necessary.

Conclusion

Everyone who has ever tried to control the invasive species knows it is a hard work. It sometimes feels as if we are fighting in vain like “tilting against wind mills” but it is not in vain, even if complete eradication of invasive non-native plants from a site is not possible. The protecting of the biodiversity in its local beauty is the most important goal we try to achieve. The invasive species are now really a global problem, and therefore, it is valuable to share our experiences and help each other to reach our mutual goal.

References

- Cvachova, A., Chromy, P., Gojdicova, E., Leskovjanska, A., Pietorova, E., Simkova, A., Zaliberova, M., 2002: *Handbook to the Identification of Chosen Invasive Plant Species*. The National Nature Conservation Organization of the Slovak Republic, Banska Bystrica. 62 pp. (in Slovak)
- Cvachova, A., Gojdicova, E., 2003: *Guidelines to the Invasive Plant Species Control*. The National Nature Conservation Organization of the Slovak Republic, Banska Bystrica. 65 pp. (in Slovak)
- Jarolimek, I., Zaliberova, M., 2001: *Convolvuletalia sepium*. In: Valachovic, M. (ed.), *Plant communities of Slovakia. 3. Wetland Vegetation*. pp. 23 – 49. Veda, Bratislava. (in Slovak and in English)
- Newcomb, L., Morrison, G., 1977: *Newcomb's Wildflower Guide*. Little, Brown & Co., Boston – New York – Toronto – London, 490 pp. (in English)

About the author

Daniela Michalkova lives in Slovakia, Europe. She has been fascinated with nature and plants since her childhood. As a girl scout she has learned how to use the medicinal plants and she would change her favorite self-made herb tea for no other drink!

Daniela received her master's degree in botany from the Comenius University in Bratislava. In the school year 2003 – 2004 she worked at the Cuyahoga Valley Environmental Education Center in Peninsula, Ohio. The Cuyahoga Valley Center is a sister center to the Slovak ecological organization DAPHNE, Daniela's former employer. She has recently begun her PhD. studies in botany at the Slovak Academy of Science in Bratislava, Slovakia.

The Sweetness of Conservation

Working in Central America through the 1990s, Allen Young showed that cacao plants promote animal biodiversity when they are grown under the shade of tropical trees. Now the Milwaukee Public Museum zoologist is applying that knowledge to save rainforests--one chocolate bar at a time.

Young and the museum had a chocolatier develop a candy bar that uses a specific type of Costa Rican cacao bean. The goal is to encourage local farmers to choose environmentally friendly cacao farming over banana agriculture, which involves flattening large tracts of rainforest. If demand for the chocolate grows, the farming practice "could catch on and spread throughout Central America," predicts Young.

Launched last fall, Cacao de Vida (Chocolate of Life) has been selling at select museum shops and may soon be available in stores nationwide. Fellow rainforest researcher Russell Greenberg, director of the Smithsonian Migratory Bird Center and an advocate of "shade-grown" coffee beans, says Young's idea of combining environmental research with a consumer product may start a trend. "If this becomes a model for other countries," he says, "it could have a large impact on global conservation."

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AMERICAN BEECH: A CLIMACTIC FOREST TREE

Gordon Mitchell

All plant communities exist within a continuous dynamic state. These plant communities are constantly changing over time. As time goes by, one plant population within a community may dominate over another plant population within that same community, and may even replace it. Ultimately, these plant communities reach a climactic state, where one specific plant population will completely dominate over all of the other plant populations. These climactic plant communities all have large populations of certain plant species that are indicators of that climactic community. One such example of a climactic plant species is the American Beech (*Fagus grandifolia* Ehrhart).

The American Beech is a member of the Beech Family (*Fagaceae*) and of the *Fagoideae* Subfamily. The generic name, *Fagus*, is the Latin name for *phago*, which is Greek for “to eat”. The specific epithet, *grandifolia*, is Latin for “large leaved”. Previous scientific names for this plant have been *Fagus americana* Sweet and *Fagus ferruginea* Aiton.

The common name, “beech” (or *beece*), shares its Anglo-Saxon origin with “book” (or *boc*). Both of their common name origins may trace back to a time when early man drew upon the bark of the European Beech (*Fagus sylvatica* L.), a cousin of the American Beech.

At different times and places, the American Beech had gone under different common names. Such common names were Beech, Carolina Beech, Initial Tree, Red Beech, Ridge Beech, Stone Beech, White Beech, and Winter Beech.

The American Beech is native to the eastern third of the United States, with the exception of Florida and vicinity, and to parts of eastern Canada. Before the Ice Age, its range may have been considerably wider, perhaps even covering all of North America.

The American Beech is a very common tree in Ohio. In many parts of Ohio, this tree is accompanied by its co-climactic species, the Sugar Maple (*Acer saccharum* Marshall).

The habitat of the American Beech mainly consists of fertile, moist, well-drained, alluvial soils and of shady areas. The early European settlers saw this tree as an indicator of rich fertile soil and built their homesteads on that spot.

Unfortunately, the American Beech does not readily tolerate urban areas. It is highly susceptible to damage from various urban pollutants, such as carbon monoxide, ozone, sulfur dioxide, and salt. It would not be prudent to plant this tree as an ornamental in an urban landscape.

The American Beech is slow growing and a long-lived (up to 300-400 years) tree. It is also highly shade-tolerant.

Height: 50-120 feet.

Diameter: 1-4 feet.

Crown: Dense. Rounded. Wide-spreading (about 40-70 feet). Symmetrical.

Bark: Smooth and thin throughout its entire lifetime. The bark is about ½ inch thick. This bark is blue-, light-, or silvery-, or steel-gray with some mottled black patches or spots. Some say that the bark has a ghost-like appearance. Because the bark is thin, it is susceptible to fire damage, frost cracks, and sunscald.

Unfortunately, this smooth bark attracts tree carvers. The early surveyors carved upon this tree to mark their corners and boundaries. In 1760, frontiersman Daniel Boone killed a bear and recorded the kill on a nearby American Beech. That carved message stayed on that tree until it finally fell in 1916. Lovers frequently carve hearts and/or their initials on these trees. Once the tree is carved, those markings remain upon that tree throughout its entire lifetime. Those carved markings can open the tree to numerous fungal infections. Many American Beeches in our public parks show remains of carvings, which are most prominent upon the first 6 feet of the tree’s height.

This bark also has some edible and medicinal uses. A tea made from the bark was used externally as an astringent for treating skin rashes. The bark tea was also used internally for various respiratory ailments and as a febrifuge (fever reducer). The inner bark was sometimes dried, ground, and used as a flour substitute. The bark can also be used for tanning leather. The bark is the only part of the tree that can be harvested year-round.

Leaves: Deciduous. Simple. Opposite. On the twig the leaves are arranged in 2 horizontal rows. Each leaf is about 1-7½ inches long, about 1-3 inches wide, and is elliptical, lanceolate, oblong, or ovate. The leaf base is rounded or wedged and the leaf tip is pointed. The upper leaf is a smooth, glossy dark blue-green and the lower leaf is a smooth or hairy light yellow-green. The leaf margin has many coarsely or sharply serrated, incurved teeth. A single leaf has 1 sunken mid-vein with 9-16 pairs of parallel pinnate veins. These veins terminate at a tooth located upon the leaf margin. There is a ¼-½-inch long, downy petiole and 2 small stipules located at the base of that petiole. The leaves are thin and have a leathery or a papery texture. The leaves are rich in potassium (potash) but are poor in calcium. During the fall, these leaves may turn golden yellow or bronzed brown. Some of the leaves may persist upon the tree throughout the winter.

These leaves have some practical uses. The young leaves are tender and will make a good potherb. The boiled leaves can also be used as a decoction or as a poultice for treating burns, scalds, and frostbites.

However, excessive consumption of these leaves can be

toxic. The early settlers also stuffed mattresses with these leaves because the leaves' fragrance was believed to have repelled insects.

Twigs: Slender. Rounded. Red-brown, olive green, or gray. Zig-zag. Hairless or partially hairy. Its pith is continuous and round. A short side spur may be present on the twig. The leaf's narrow stipule scars, located near the semicircular leaf scar, nearly encircle the twig. These twigs have true end buds.

The twig does have some medicinal uses. A decoction made from the twig was once used for treating lower back pain.

Buds: Slender. Lanceolate. Yellow or light red-brown. About ¾-1 inch long. Sharp pointed. Have 8-24 overlapping scales. These buds are usually diverged from the twig at a 45-degree angle.

Flowers: Monoecious. Flowering season is usually April and May.

Male (staminate) flowers are yellow-green and have 8-10 stamens with light green anthers, a 4-8 lobed calyx, and no corolla. The flowers are arranged in a ¾-1-inch diameter globular cluster. Each cluster is attached to a 2-inch long slender and hairy stalk and is usually located in the lower leaf axils. The pollen is wind-borne and can cause hay fever in some people.

Female (pistillate) flowers are about ¼ inch long and have 3 styles, a 3-celled ovary, a 4-6 lobed calyx, and no corolla. The flowers are arranged in spiked clusters of 2-4, and are bordered with hairy, narrow, pointed, red scales. The clusters are attached to a short stalk and are usually located in the upper leaf axils.

Fruit: The fruit consists of ¾-1½ inch long, short-stalked, red- or green- brown, shiny bract husks with soft, recurved, fine burs or prickles. After the first frost, these husks usually split open into 4 quarters to reveal 2-3 triangular beechnuts. Each beechnut is about ½-¾-inch long, shiny, oily, and brown. The fruits mature the first year. The tree may begin producing fruits after its 10th year but only produce good fruit crops about every 2-8 years. Some husks may persist upon the tree throughout the winter. Fruiting season is usually August to November.

These beechnuts are eaten by many species of mammals. These mammal species include the Raccoon (*Procyon lotor*), the Opossum (*Didelphis virginiana*), the Black Bear (*Ursus americanus*), the Chipmunk (*Tamias striatus*), the Red Squirrel (*Tamiasciurus hudsonicus*), the Gray Squirrel (*Sciurus carolinensis*), the Fox Squirrel (*Sciurus niger*), the Red Fox (*Vulpes fulva*), the Gray Fox (*Urocyon cinereoargenteus*), the Eastern Cottontail Rabbit (*Sylvilagus floridanus*), and the White-tailed Deer (*Odocoileus virginianus*). Beechnuts are also used to fatten domestic livestock.

Many bird species eat these beechnuts, too. These bird species include the Ruffed Grouse (*Bonasa umbellus*), the Wild Turkey (*Meleagris gallopavo*), the Northern Bobwhite (*Colinus virginianus*), the Wood Duck (*Aix sponsa*), the Tufted Titmouse (*Parus bicolor*), the Black-capped Chickadee (*Parus atricapillus*), the White-breasted Nuthatch (*Sitta carolinensis*), the Rose-breasted Grosbeak (*Pheucticus ludovicianus*), the Common Grackle (*Quiscalus quiscula*), and the Blue Jay (*Cyanocitta cristata*).

The beechnut was also a favorite food of the Passenger Pigeon (*Ectopistes migratorius*). In a single day, a one pigeon probably consumed about 1 pint of these beechnuts. The removal of many American Beech trees for eventual conversion into farmlands partially contributed to the extinction of the Passenger Pigeon.

The beechnuts also have some edible and medicinal uses for humans. Not only are the beechnuts edible, they are said to be sweet and nutritious. They contain about 22% protein, about 42% fat, and contain various minerals like calcium, chlorine, magnesium, phosphorus, potassium, silicon, and sulfur. These beechnuts can be eaten raw or roasted or can be crushed into beechnut butter. The beechnuts contain edible oil that is used in cooking. The early settlers dried and roasted the beechnuts (at 320 degrees F. for about 30-40 minutes) and then used them as an inferior coffee substitute. The Native Americans sometimes chewed upon these beechnuts whenever they need an anthelmintic (intestinal worm remover). In some areas, these beechnuts are collected and are then sold in local stores.

Unfortunately, excessive consumption of the raw beechnuts can be harmful. The beechnuts, especially the skin, contain saponin-like toxins and fagin, a narcotic, alkaloid-like compound. Mild symptoms of these poisonings may include fatigue, headaches, vertigo, and stomach and intestinal troubles. These mild symptoms may start within 1 hour and may last for up to 5 hours. More severe symptoms may include kidney, liver, and respiratory problems.

Roots: Shallow. Has a taproot. The roots may send up sprouts that could completely surround the tree. The roots may be parasitized by the wildflower Beechdrops (*Epifagus virginiana*), which has scaly leaves and no chlorophyll. Because these roots are shallow, they are vulnerable to compaction, droughts, fires, floods, and salt.

Wood: The wood is close-grained, hard, heavy, strong, tough, and shock-resistant. However, it is not durable and does not season well. The heartwood is light red-brown and the sapwood is thin and pale.

The wood contains oil that resists and repels electricity. The American Beech is one tree species that is least likely to be struck by lightning. Because of that, many early settlers planted the American Beech around

their homes in hopes of preventing lightning strikes. Despite this statistic, it is not recommended that persons stand under an American Beech during an electrical storm to test that theory.

The wood is used for baskets, boxes, butchers' blocks and other woodenware, charcoal, cheap furniture, clothes pins, cooperage, flooring, fuel, hangers, pallets, pulpwood, railroad ties, shoe lasts, tool handles, and veneer. This wood does take well to preservatives. If steamed, this wood can be bent into a variety of shapes. If the wood is burned, its ashes become a major source of potash.

The wood also has some edible uses. The sawdust can be added to flour and it does not release any flavors or odors. When gnawing this tree, the American Beaver (*Castor canadensis*) will eat some of the wood.

Pests: There are some diseases and insects that will attack the American Beech. About 75 species of wood rot fungi attack this tree. Some of the insect pests that attack this tree are the Beech Blight Aphids (*Grylloprociphilus imbricator* or *Fagiphagus imbricator*), the Forest Tent Caterpillar (*Malacosoma disstria*), the Gypsy Moth (*Lymantria dispar*), and the most serious of them all, the Beech Scale (*Cryptococcus fagisuga* or *Cryptococcus fagi*).

The Beech Scale is an alien insect that arrived in Nova Scotia around 1890. By 1932, this insect had spread throughout the Atlantic Maritime Provinces and into Maine. Presently, the Beech Scale is found in Quebec, Ontario, New England, New York, New Jersey, Pennsylvania, parts of Michigan, and has even been seen in northeastern Ohio.

The Beech Scale insect has mouthparts that pierce the bark to suck out the sap. Although the insect itself is not a threat to the tree, the holes left by the piercing mouthparts invite the infection of the Beech Bark Disease.

There are two species of fungi that cause the Beech Bark Disease, the native *Nectria galligena* and the non-native *Nectria coccinea* var. *faginata*. The spores of both of these fungi are carried by wind or by other insects. Once infected, this disease causes cankers in the tree. These cankers will spread and will eventually girdle the tree. However, about 1-5% of the American Beech trees have some sort of resistance. Perhaps these resistant trees will produce resistant offspring.

The best defense against this disease is the remove the Beech Scales from the trees before they can pierce the bark. Some methods, like tree removals or various biological controls, can be effective. However, selective spraying of the tree is probably the most effective method available.

Conclusion: The American Beech is truly one of eastern America's greatest tree species. Maximum efforts

should be made to ensure that this tree survives and remains for future generations.

REFERENCES

- Barnes, Burton V., and Warren H. Wagner, Jr. *Michigan Trees*
- Brown, H.P. *Trees Of New York State*
- Eastman, John, and Amelia Hansen. *The Book Of Forest and Thicket*
- Farrar, John Laird. *Trees Of the Northern United States and Canada*
- Charles Fergus and Amelia Hansen. *Trees Of Pennsylvania and the Northeast*
- Graves, Arthur Harmount. *Illustrated Guide To Trees and Shrubs*
- William Carey Grimm. *The Illustrated Book Of Trees*
- Lassoie, James P., Valerie A. Luzadis, and Deborah W. Grover. *The Illustrated Book Of Trees*
- Leopold, Donald J., William C. McComb, And Robert N. Muller. *Trees Of the Central Hardwood Forest Of North America*
- Little, Elmer L. *The Audubon Society Field Guide To North American Trees (Eastern Region)*
- Little, Elbert L. *Forest Trees Of the United States and Canada*
- Martin, Laura C. *The Folklore Of Trees and Shrubs*
- Miller, Howard H, and H. E. Jaques. *How To Know The Trees*
- Mohlenbrock, Robert H., and John W. Thieret. *Trees*
- Peattie, Donald Culross. *A Natural History Of Trees Of Eastern and Central North America*
- Petrides, George A. *Eastern Trees*
- Plotnik, Arthur, and Mary Phelan. *The Urban Tree Book*
- Preston, Richard J., Jr. *North American Trees*
- Rupp, Rebecca. *Red Oaks and Black Birches: The Science and Lore Of Trees*
- Smith, James Payne ,Jr. *Vascular Plant Families*
- Sydnor, T. Davis, and William F. Cowen. *Ohio Trees*
- Beech Bark Disease.
www.dnr.state.oh.us/forestry/Health/beechnbarkdisease.htm

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*The more clearly we can focus our attention
 on the wonders and realities of the universe
 about us, the less taste we have for
 destruction.* -----Rachel Carson

Botany 101– seventeenth in a series

More on Plant Hormones III

by Dr. Rebecca Dolan

Continuing the series of columns on plant hormones, there are three more to discuss.

Ethylene is an unusual plant hormone in that it is a gas. When you hasten a fruit's ripening by putting it in a bag, you are using ethylene.

Those tasty winter tomatoes in the grocery are picked green and gassed to make them ripe (so, okay, ethylene doesn't always do us a favor). This gas causes the breakdown of pectin, the natural "glue" that holds plant cell walls together. This allows fruits soften. Starches are converted to sugars. Pigment changes give a visual clue that a fruit is ripe.



Female Cucumber Flower



Male Cucumber Flower

Likewise, ethylene promotes **abscission**, or drop from the branch, in leaves and fruits. It is used commercially to make mechanical harvest of some fruit easier. Ethylene interacts with gibberellins to influence whether flowers in **monoecious** plants will be male or female. Remember wondering when you would get a female flower on a cucumber or squash plant? The first flowers are always male. No fruits can be set until female flowers appear.

Abscissic acid is a plant hormone that inhibits growth of dormant buds and the germination of seeds. It also induces closing of stomata, the openings in leaves where gases enter and leave. Water vapor also leaves through these holes, and

plants under water stress increase their production of abscissic acid in order to close stomata.

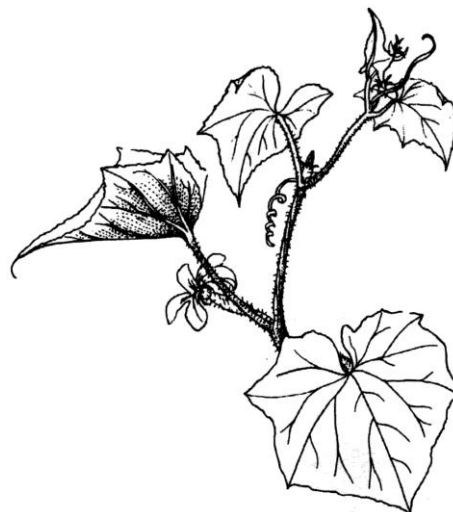
Florigen means "flower maker" and is a hormone thought to trigger flower development. Some plants respond to certain day lengths, or photoperiods, by flowering. Florigen is thought to be produced in leaves that are sensing day length. It then travels through the phloem to stimulate buds. The compound involved has not yet been identified.

As you can see, plant growth and development is mediated by the interaction of hormones. All six hormones I have discussed, **auxin, cytokinins, gibberellins, abscissic acid, ethylene, and florigen** interact to produce the features of plants.

This information comes from my favorite botany text: *Biology of Plants* by Raven, Evert, Eichorn, and Evert, 6th edition. It is published by W.H. Freeman & Co. (ISBN: 1572590416) and is available through Amazon.com for about \$100. It is a great reference and has a beautiful cover!

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

Illustrations by Jan Glimn Lacy, botanical illustrator, from her book *Botany Illustrated*.



Cucumber Vine

Grass Pink Orchids: The Calopogons

By Tom Sampliner

Every June in our region, I look forward to renewing acquaintance with a vibrant hot pink orchid commonly called the grass pink (*Calopogon tuberosus*). In specialized wetlands, primarily fens and bogs, during mid-June, look for a spire arising from a white underground corm that holds aloft a number of non-resupinate florets. The technical word just used refers to the fact that the lip has not twisted on the small stalk called a pedicel while developing so that the lip remains in the uppermost position rather than having rotated 180 degrees. A lip is typical of orchids in general in that it functions as an airport landing runway for insect visitors. It can be confusing for the novice to determine in this genus what is lip since this part is divided into two portions growing in exactly opposite directions, making for a most unusual configuration. The bipartite lip is divided into strap-shaped parts, with the one pointing upward being hinged at its base, while the other is a mirror image in the opposite direction. The hinged uppermost portion is a visual attractant having a bright yellow crest on the lip surface with a tight cluster of hairs protruding from this spot. These act as a deceptive attractant to insect visitors who hope they are coming in for a pollen meal only to find no reward at all. However, an amusement park ride of sorts awaits those of suitable size. If the proper bulk is present, the upper hinged lip is bent downward to meet the grooved slide of the lower portion of the lip, throwing the insect visitor upon his back for a ticket-less slide down the lower lip and in the process, accomplishing pollination. Experienced observers have reported that naïve young bumblebees seem to be most victimized by this deceit in the plant world. Where are the investigative reporters?

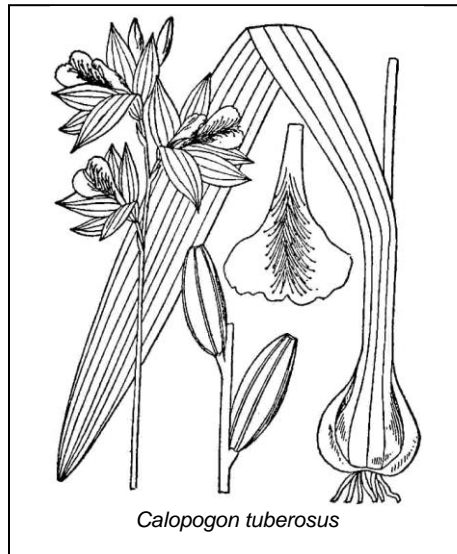
In Ohio, we are limited to just the one representative of the genus. For others, it is necessary to go farther south. In North America, we have four currently recognized species and one named variety. Starting with the species one may view here in Ohio, *Calopogon tuberosus*, I will describe the visible traits. It is written that our species stands from 25-75 cm tall. It puts forth anywhere from a couple to over a dozen florets which open in a slow progression, as opposed to other species which open all at once. It is also noteworthy of our species that there is no noticeable narrowing anywhere along the perimeter of either the sepals or the other petals. Furthermore, none of the lateral or dorsal parts of each flower manifest any recurvature. Both the plant and the flowers of this species are large as compared to others in the genus and the various flower parts are the broadest. The

middle sepal, also called the dorsal, measures greater than two centimeters. Petals are broad and spreading. Leaves are flat and about 1 cm. wide; in contrast to the leaf of variety *simpsonii* the leaf is not inrolled to form a slender tube. Flower color would qualify as hot pink, offset by the earlier mentioned upper lip brush. This plant can appear in an all-white color form; forma *albiflorus*. It extends in range all across the northern half of the U.S. and well on up north across Canada; in fact, it can be found from Newfoundland all the way south to both Cuba and the Bahamas. However, far south it is replaced by the named variety. So take pride that our local species has the widest range of all its genus mates. A frequent growing companion is another pink orchid called the rose pogonia (*Pogonia ophioglossoides*). This latter species is a much smaller plant with a single flower to each stalk. The lip of this orchid is lowermost in

position; resupinate. It is a more delicate pink highlighted by a runway of yellow hairs that form its airport runway up the lip. Speaking of growing companions, even the experienced eye can be fooled while looking for these little gems. Similarly colored flowers such as rhexia, the meadow beauties, and the marsh pinks, sabatias and one of the milkworts in the south, “drumheads” (*Polygala cruciata*) play constant tricks upon the eye.

The bearded grass pink (*Calopogon barbatus*) is one of the two smallest flowered species in the genus. This species grows perhaps half as high as our local species. It ranges from North Carolina south through Florida then

west to Louisiana. Of the species, this one does exhibit perhaps one of the greatest tolerances for diversity. Typically, it does frequently grow with such carnivorous plant companions as: sundews, the *Drosera*; pitcher plants, the *Sarracenia*; and the butterworts, the *Pinguicula*. The middle sepal is 2 cm. or less in length. An important trait is that the lateral petals are widest below the middle as one looks toward the base. This basal bulge is highly noticeable and quite helpful in the field for recognition. For the beginner, it is helpful to note the lateral petals are the lowermost of the two sets of lateral plant parts. Orchid writers state this is the earliest species to flower deep in the south. Especially in Florida, it seems to be a growing companion of another genus mate, the pale grass-pink (*Calopogon pallidus*). One expects to see this orchid most frequently in wet, nutrient-poor soils in the company of carnivorous plants; obviously this requires open sunny areas. Another observation is that *C. barbatus* does not



seem to show a white color form while the frequent companion, *C. pallidus* does.

The many flowered grass-pink (*Calopogon multiflorus*) is our next stop. This small flowered species also opens flowers simultaneously. The middle sepal measures less than 2 cm. The lateral petals are widest above the middle, toward the apex. To my eye, the bulge on this species doesn't seem as dramatic as in *C. barbatus*. However, the pink color in this species is much more dramatic than the others perhaps due in part to a uniform-colored, more vibrant tight cluster of yellow hairs upon the uppermost lip. While dramatic color is expected there seems to be only reports of pale pink variants but no all white-flowered forms. Habitat for this species is the most distinctive of all the genus members. It prefers open pinelands with an under story of saw palmetto (*Serenoa repens*). The under story must have burned 3-6 weeks prior to your visit to enable witnessing prime bloom. Though this also amounts to an open sunny habitat and the substrate can be wet and host to carnivorous plants, it is by far the driest of all the species. It takes some training of the eye to begin to recognize the proper appearance of the under story to expect to see this orchid in bloom. All burns do not appear equal and the degree of openness of the pinelands can be critical. This April was my best encounter with this species as I saw a number of prime blooming specimens under ideal condition. I find it to be the most handsome of the species quartet.

Calopogon pallidus, the pale grass pink, is a fascinating species of small to medium sized flowers opening a few at a time. Distinctive to this species is the strongly ascending and forward pointing lateral petals giving some resemblance to the protruding horns of some animal. Another important trait would be the two broad lateral sepals that arch backward toward the flower stalk resembling the wings of some insect in takeoff position. Since both species are

frequent companions, these two traits are quite helpful in the field in separating them. Both species are widely encountered in northern to central Florida and become rare farther south. *C. pallidus* is said to be the second most common and widespread species of this group in the eastern U.S. Because of the usually pale color, the yellow lip crest seems quite pronounced in this species. There is a named all white color form for this species, *C. pallidus* forma *albiflorus*. It is also written that this species has flowers opening slow enough in succession on any one stalk that you frequently encounter fruits, open flowers and buds on the same stalk.

(*Calopogon tuberosus* var. *simpsonii*) is the named variety of the species seen only south of the Mason-Dixon Line. This variety is restricted to the extreme south of eastern U.S. all the way westward to Texas and Louisiana. It is a robust plant with large flowers. One can separate it from the grass pink we have based upon habitat alone. The variety will be found in open prairie marls. In south Florida this variety completely replaces *C. tuberosus* variety *tuberosus*. It does show an all white color form and this has been named forma *niveus*. Since both manifestations of *C. tuberosus* are robust, it can also be quite helpful to look at leaf distinction in areas where their ranges overlap. In *simpsonii* the leaf is extremely narrow and inrolled making a slender tube contrasting to the more traditional leaf of the usual representative for the species.

As you travel the eastern portion of our country, be sure to look for these striking orchids in all their appearances from species to variety and color form. A visual treat awaits you and your camera.

Tom Sampliner is a past president of the Native Plant Society of Northeastern Ohio, a photographer, and natural areas tour leader.

Tom Sampliner's Short Nature Study Courses For Winter

The Wild Orchids Across North America

Nothing brings to mind far-away adventure in exotic places like mere mention of wild orchids. It greatly surprises Ohioans that our state is richly endowed in orchid species. In fact we have almost one-fifth of the species across North America. In this course, which can range from one session to say a dozen, we will explore the world of native orchids, seeing fantastic shapes, pollination relationships, strange growing habits such as upon rocks or even in water. One orchid genus which makes its way into Florida provides a commercial crop – you know it as the flavor, “Vanilla”. Learn more and enjoy a slide illustrated course of a length you feel comfortable with. Fee negotiable.

Fantastic Fungi: Myths, Lore, Legends, Culinary, Herbal, and Medicinal Fact and Fiction.

Everyone has an opinion about mushrooms. Many fear them. Others diligently hunt them for culinary, herbal or medicinal purposes. They play a necessary role in

decomposition. They play an equally important role in enabling other things to successfully grow and prosper. Learn how to identify, photograph, and observe these fantastic members of their own kingdom. Learn of the rich lore throughout history surrounding these important living things.

Wildflowers

Throughout the growing season nature provides a colorful palette of blooming plants that decorate any type of habitat. Some have value commercially. Others provide a feast for birds and animals. Others have become aggressive pests. Many are desired for cultivation in the garden. Learn, aided by colorful slides, how to identify and know the wildflowers.

Each topic is available in from one to multiple session with each geared to the education, sophistication and desires of your group. Fee negotiable. Call Tom for information: 216-371-4454

Siegenthaler Esker State Nature Preserve

The Preserve

The face of west-central Ohio as we know it today is a result of the advances and retreats of several continental glaciers. These large ice sheets scoured the bedrock surface and carried forward sand, gravel and boulders, redepositing them when it melted back. This glacial till assumed many different forms depending on how it was deposited. Although the last continental glacier melted out of this region nearly 17,000 years ago, the mantle of till it left behind remains little changed. To those who know its language, the landscape of this area tells a fascinating story of the battle between ice and sun.

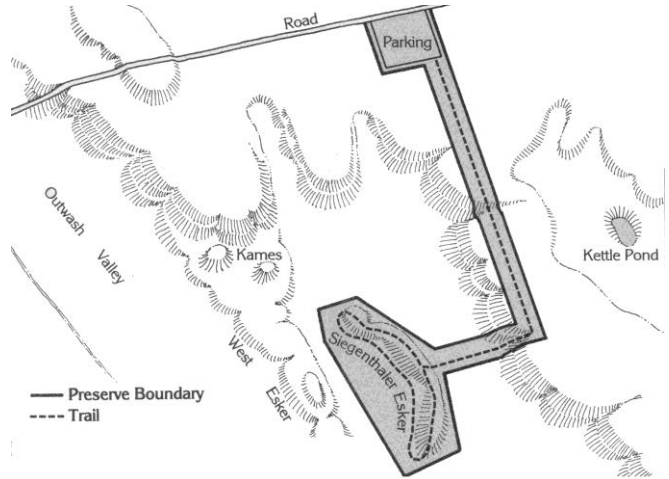
Siegenthaler Esker State Nature Preserve protects a small but interesting piece of that story. These 36 acres were donated by Mr. and Mrs. Vaughn L. Siegenthaler whose generosity has ensured that this landscape will continue to inspire the curiosity of future generations.

The preserve trail is about one mile in length and mostly level, the short climb onto the esker being the steepest of its few slopes. Despite its small size, the preserve contains a number of interesting habitats which add to its value.

Glacial Features

An esker is a narrow ridge of stratified material (till that has been sorted and deposited in layers according to grain size by running water). Steep sides and a sinuous shape are common features. Most eskers were formed in tunnels carved through the lowest level of the glacier by meltwater streams. When the glacier finally melted away, the rocks, sand and gravel dropped in the bed of the stream remained as an esker to mark its course.

Eskers are usually discontinuous and this one is no exception. The ridge just south of the main esker is part of the same ancient streambed. The ridge to the west represents a separate channel cut through the ice. It is lower and wider than the main esker, which may indicate that it is made of a different



mix of sand and gravel, or may reflect an unknown change of conditions in the melting ice sheet.

The small knolls north of the eskers are kames, piles of gravel dropped into pits and crevices in the glacier by meltwater streams flowing on top of the ice. The small pond to the east is known as a kettle and was formed when a block of ice was left behind and was surrounded by till. When it melted, a depression remained which filled with ground water. Eskers, kames and kettles are called "ice contact features" because they were formed in or against ice.

The wide, flat valley west of the eskers is an outwash channel made of gravel melted out of the glacier and deposited in sheets in front of its retreating edge. The presence of outwash and ice contact features show that the ice was stagnant or in retreat when they were made. During the formation of this landscape, the glacier was melting back to the north and the meltwater streams were flowing south.

Siegenthaler Esker State Nature Preserve is presently open by permit only. Directions to the site will be given when a permit is issued. For more information contact the Division of Natural Areas and Preserves, Fountain Square, Building F, Columbus, OH 43224.

Reprinted from an Ohio Natural Areas and Preserves State Nature Preserve information sheet.



Shingle Oak

Indiana Ferns and Their Haunts Part II: Ferns of the Forest

by Michael Homoya

Estimates vary, but it's thought that approximately eighty percent of Indiana was forested prior to statehood. Outside the northwestern part of the state, where the vast grasslands of the Grand Prairie once occurred, our state was forested with a great variety of tree species, especially oak, hickory, ash, and maple. And even on the landscape in central Indiana, where currently a seemingly, mostly treeless plain of agricultural land predominates, an extensive forest once occurred. Thus, it should come as no surprise that there are more fern species found in forest communities than in any other habitat.

The predominant forest type occurring over most of the state is commonly referred to as mesic upland forest. This is a shady habitat that is consistently moist but well drained, with lots of "fluffy" humus naturally incorporated into the soil. In other words, save for perhaps the shade, it's the quintessential environment for almost every desirable garden plant you've ever tried to grow! And like those garden plants, our native ferns thrive in that seemingly perfect substrate. While mesic forests predominate in the state, slightly better-drained forests exist as well, referred to as dry-mesic forests, followed on the continuum by dry forests. Most ferns of non-wetland forest habitats occur on mesic sites, followed by dry-mesic, and dry. (Ferns of wet forests will be discussed in the segment on wetland habitats). The following is not an exhaustive list of forest ferns, just some of the more common and interesting ones.

In early spring the first fern in mesic forests to emerge its fiddlehead is the fragile fern (*Cystopteris protrusa*). It commonly forms large carpets, mixing in well with the myriad of spring ephemeral wildflowers. These early leaves are generally sterile, and smaller than the fertile leaves that follow, the latter approximately 12 inches or so in length.

As the spring season progresses other fronds unfurl from their fiddleheads, including some of the largest, showiest ferns in the state. These include glade fern (*Diplazium pycnocarpon*), silvery spleenwort (*Deparia acrostichoides*), lady fern (*Athyrium filix-femina*), and locally, Goldie's fern (*Dryopteris goldiana*). These ferns especially enjoy moist, deep ravine habitats, a common setting found in the rugged hills of south-central Indiana, as well as along



from left to right:

- Maidenhair (*Adiantum pedatum*)
- Broad Beech (*Phegopteris hexagonoptera*)
- New York (*Thelypteris noveboracensis*)
- Ostrich (*Matteuccia struthiopteris*)
- Fragile (*Cystopteris protrusa*)
- Red-Stemmed Lady (*Athyrium filix-femina* forma *ruballum*)

dissected tributaries to larger streams and rivers throughout much of the state. The delicate maidenhair fern (*Adiantum pedatum*) is another fern fond of deep ravines.

One of my favorite woodland ferns is the interrupted fern (*Osmunda claytoniana*). This large fern is not common, but can be found locally throughout much of the state in rich, highly organic soils. It tends to prefer soils that are acid, and thus it is uncommon, if not absent, from the central counties. It looks like a cinnamon fern (*O. cinnamomea*), but can be distinguished from it by the occurrence of fertile segments interspersed between sterile segments of the large fern frond. The cinnamon fern has completely separate fertile and sterile fronds.

Another fern of acid soils is the New York fern (*Thelypteris noveboracensis*). This colonial fern is most common in the hill country of south-central Indiana, as well as drier portions of the flatwoods characteristic of the southeastern part of the state. It looks like a miniature version of an ostrich fern (*Matteuccia struthiopteris*).

Speaking of the latter, I would say hands-down that it is the most commonly cultivated hardy fern in the state. It also happens to be a native fern of Indiana, but not a common one. It thrives in well-drained substrates, but some of the best stands I've seen have been sandy terraces on floodplains of creeks and small rivers. Some of the best areas to check for this fern are along the borders of Sugar Creek in Turkey Run and Shades state parks.

One of the attractive ferns of dry mesic forests is the broad beech fern (*Phegopteris hexagonoptera*). It is fairly common, but often tends to get obscured by surrounding plants. Christmas fern (*Polystichum acrostichoides*) does well in a variety of moisture classes, including dry-mesic. It is one of our few evergreen ferns. Also evergreen are some of the grape ferns (*Botrychium* spp.) These rather odd looking ferns are also known as bronze ferns, due to the rusty

coloration of those that get exposed to full sunshine in the winter.

Of the forest ferns, perhaps bracken (*Pteridium aquilinum*) is the one most tolerant of dry conditions. It grows on the dry hills of southern Indiana, as well as in the deep sand forests and savannas in the northern part of the state.

Ferns that can take the driest conditions of all are those which occur on rock substrates. The latter habitat types, and the ferns which occupy them, will be the subject of the next segment of this series.

Mike Homoya is author of Orchids of Indiana, published by the Indiana Academy of Science in 1993, and is a botanist with the Indiana Department of Natural Resources, Division of Nature Preserves.

Reprinted from the *Indiana Native Plant and Wildflower Society News*, Summer 2003

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Book Review

Carolyn Harstead

Weeds in My Garden

Observations on Some Misunderstood Plants

by Charles B. Heiser

Timber Press, April 2003

ISBN: 0881925624

Horticulturists, botanists, gardeners and even individuals who just like plants should find this material interesting and informative. It is obvious on page after page that Heiser's long-term fascination with weeds has led him to scientific observations and precise collection of data. He is a true teacher, aptly demonstrated by the clear concise organization of this manuscript.

In addition to being scientifically accurate and well organized, I found the text readable and charming.

Charles Heiser's wry sense of humor made me chuckle time and again as I read the manuscript. Bits of poetry, limericks, personal asides, and uniquely phrased quotes from 1633, written by the well-known English herbalist John Gerard, add spice and liveliness to what might otherwise be a dry tome. Heiser's gentle touch creates a delightful perspective on those maligned plants we refer to as weeds.

Heiser discusses characteristics of over 100 flowering weeds. A brief, simple description of the family of each entry gives the reader that necessary "peg to hang his hat on" to begin the organizational process.

Next, Heiser discusses the scientific name of each entry. Each plant's genus and specific epithet is known as its binomial. I often refer to the binomial as the plant's "Social Security number" for this narrows down the multitudes to one specific individual. However, unlike our dull Social Security numbers (which only reveal where the recipient

initially registered) binomials provide a vast wealth of information about a given plant. Heiser packs a lot of fascinating and historical information into each of these identifying paragraphs, which he entitles simply, "The Name."

In "The Time and Place" he lists bloom time as well as plant origin. "The Description" is a botanical description of each plant, and even in the absence of accompanying line drawings or photographs, these descriptions can serve to accurately identify a given plant (although Heiser apologizes to his fellow botanists and recommends using a field guide for this purpose).

As a gardener, I found the sections entitled "The Virtues" the most useful and enjoyable. His notes are thorough, interesting, and readable. He includes information about how weeds were utilized by Europeans, Native Americans, and early settlers, and includes medicinal and culinary uses. He even shares insights about his own personal uses. For example he relates that pigweed (*Chenopodium berlandieri*) is "one of the few weeds that I would be willing to eat on a regular basis as a vegetable." He tells of using privet around the back yard of his first home and wonders if it is so named because it affords privacy. He describes using spurge (*Euphorbia* spp) to remove his own warts, and tells of a friend who smokes mullein leaves for bronchitis. Heiser obviously loves to experiment and even planted kudzu in his IU garden, thinking Bloomington's winter was too cold for it to survive. Alas, it did survive and performed true to form. Heiser reports that he spent several hours ridding his garden of this noxious weed.

Reprinted from the *Indiana Native Plant and Wildflower Society News*, Autumn 2003.

Easy-to-Grow Native Grasses For Eastern North America

The grass family, *Gramineae*, is one of the largest and most widespread families of flowering plants – yes, *flowering* plants – in the world. The grass family has the third largest number of species globally, after the Orchid and Daisy families (*Orchidaceae* and *Compositae*, respectively).

Grass flowers are so tiny you may never have noticed them. In fact, grasses have evolved without colourful or scented sepals and petals to attract pollinators. They rely on wind pollination. Each tiny flower is enclosed in a bract, which looks like a scale. The flowers are clustered together in a spike.

Along with one-quarter of all flowering plants, grasses are monocotyledons. This means they sprout with one seed leaf or cotyledon and the leaves have parallel veins.

Grasses are distinctive because they continue to grow after being cut. Growth arises from the base up, like a fingernail, rather than unfolding from the bud. This is an adaptation to grazing. They have jointed stems and a complex but subtle flower structure.

The stems are hollow except at the point where the leaf is attached. Look closely at the stem and you will notice that most are round.

Grasses evolved during the Cenozoic era, 65 million years ago, and today can be found worldwide in all types of ecosystems. In fact, they are the most numerous plant type found in Arctic regions.

Far from boring, grasses offer colour, texture, form, and winter interest to a garden.

In the fall, some grasses turn colours such as bronze and burgundy, and they make a terrific contrast to other flowering plants.

Most grasses require very little water or maintenance.

After planting grasses in your garden and seeing them dance in the wind, you'll wonder why you waited so long to add them to your little bit of nature.

Small to Medium-Sized Grasses

Sweetgrass *Hierochloa odorata*

Native Habitat: Moist meadows, shores and bog margins.

Garden Conditions: Grows in partial to full sun in wet to moist soil, sand or loam.

Form and Flower: Flowers appear in the spring and are bell-shaped and arching. The attractive clusters are shiny tan, bronze or purple. The leaves become very fragrant when dried and are used by North American First Nations in religious ceremonies. Sweetgrass

grows up to 60 cm (2 ft) in height and can spread vigorously by rhizomes.

Range: Circumboreal, south to New Jersey, west to Arizona.

Bottlebrush Grass *Elymus hystrix* (syn. *Hystrix patula*)

Native habitat: Found in woods and open clearings. **Garden Conditions:** Dappled light, moderate to full shade. Grows in dry to moist sandy loam soils with good drainage.

Form and Flower: Flower clusters are arranged perpendicular to the stem and resemble an actual bottlebrush. It grows naturally interspersed among other woodland plants.

Flowers June to August. Grows 60-120 cm (2-4 ft).

Range: Nova Scotia and Quebec to North Dakota, south to Virginia and Oklahoma.

Little Bluestem *Schizachyrium scoparium*

Native habitat: Fields, prairies and open woods.

Garden Conditions: Full sun and dry soil. Will not tolerate competition, An important species of tallgrass and mixed grass prairies.

Form and Flower: The flowers line the branches and appear in late summer. Grows 20-80 cm (8 in-2.5 ft) in height. In the fall the leaves turn red at the tips.

Range: New Brunswick to Alberta, south to Florida and Mexico.

Medium to Large-Sized Grasses

Canada Wild Rye *Elymus canadensis*

Native habitat: Moist to dry fields and meadows, dunes, bluff, and stream banks.-

Garden Conditions: Wide range of conditions in full to partial sun, moist to dry soil, clay, loam or sand. Drought-tolerant. Good for covering a bare area while other prairie species become established.

Form and Flower: Blooms in late summer. The graceful arching seed heads turn sandy as they ripen and are very distinctive and decorative. Grows 1-1.5 m (3-5 ft).

Range: New Brunswick to Alaska, south to North Carolina, Texas and California.

Big Bluestem *Andropogon gerardii*

Native habitat: Prairies, savannah and meadows.

Garden Conditions: Full sun to light shade. Dry to mesic soil (sand, loam or clay). Drought-tolerant.

Attracts birds and butterflies. A major component of tallgrass prairies.

Form and Flower: Flowers are reddish-blue short spikes that resemble a turkey's foot, August to October. The seed heads ripen to a golden brown. Attractive bronze foliage in the fall. It grows in clumps to 75-150 cm (2.5-5 ft) in height.

Range: Quebec to Saskatchewan, south to Florida and Arizona.

Switchgrass *Panicum virgatum*

Native habitat: Prairie, open woods, marsh edge, coastal dunes, shores and brackish marshes.

Garden Conditions: Full sun. Dry to moist soils, sand and loam. **Form and Flower:** Flowers are borne singly at the ends of branches in a very open form. Delicate-looking. Flowers are purple from August to October and the seed heads are tan to brown in colour. Grows in a clump 40 cm-2 m (16 in-6 ft) in height.

Range: Nova Scotia to Manitoba and Montana, south to Arizona and Mexico.

Indian Grass *Sorghastrum nutans*

Native habitat: Tallgrass prairie (moist or dry) and open woods. **Garden Conditions:** Full sun to partial shade. Dry to mesic soil (sand, loam or clay), well-drained. A signature plant of tallgrass prairie ecosystems. Birds feed on the seeds.

Form and Flower: Flowers are small and bright yellow and appear in the late summer. The seed heads are golden brown, forming upright plumes in the fall. Grows 1-2.5 m (3-8 ft).

Range: Throughout North America.

Other Good Grasses

Canada Bluejoint *Calamagrostis canadensis* is a rapidly spreading, sod-forming grass that is useful for erosion control on wet sites, Grows 50-150 cm (20 in-.5 ft) in height.

Range: Greenland to Alaska, south to North Carolina, Missouri and Arizona.

Poverty Oat Grass *Danthonia spicata* grows 10-60 cm (4 in-2 ft) in infertile soils.

Range: Newfoundland to Florida, west to BC and south to Mexico

References

Grasses: An identification Guide, by Lauren Brown, 1979, Houghton Mifflin Company, New York.

Manual of Vascular Plants of Northeastern United States and Adjacent Canada, 2nd edition, by H.

Gleason and A. Cronquist, 1991, The New York Botanical Garden, New York.

100 Easy-to-grow Native Plants for Canadian Gardens, by Lorraine Johnson, 1999, Random House of Canada, Toronto.

Guide to Flowering Plant Families, by Wendy Zomlefer, 1994, The University of North Carolina Press, North Carolina.

Reprinted from the North American Native Plant Society, Autumn 2003

[The naming of plants is a difficult matter. It isn't just one of your holiday games. You may think at first I'm as mad as a hatter When I tell you a plant must have two Latin names. *Apologies to T.S.Eliot.* -Ed.]

Nomenclatural Etiquette

Robert J. Bartolotta

Carolus Linnaeus (1707-1778) born Carl von Linné in Upsala, Sweden is known as the father of nomenclature, the naming of organisms Our modern taxonomic systems for plants and animals date back to his two benchmark publications *Species Plantarum* (1753) and *Systema Naturae* (1758). Linnaeus's great contribution includes binomial nomenclature or the two-word scientific name for a species.

The scientific name of a species is a binomen consisting of two words, the first word is the genus which is a noun, and the second word is the specific epithet which is an adjective. It is incorrect to speak or write the name of a species using the specific epithet only, however it is often done for the sake of brevity.

For example, the species name for Sugar Maple is *Acer saccharum*, not just the word *saccharum* alone. Singular and plural are spelled the same for the word "species", the word "specie" does not exist in nomenclature. In pronunciation, the "c" in the word species has either the "s" or the "sh" sound. In print, the scientific name is italicized; in writing, the scientific name is underlined.

Robert J. Bartolotta is Outdoor Education Coordinator in the Education Division of the Cleveland Museum of Natural History

Seeds For the Future Held at Millennium Seed Bank

Michael Sawyer

It was precisely a year ago now that I found myself in the West Sussex countryside, south of London, visiting the facilities of Kew Garden's Millennium Seed Bank. It all began with a casual word mentioned by a friend at the Natural History Museum's Herbarium. Steve Cafferty works at the Herbarium on the Linnean Typification Project, and we had been looking at the Clayton Herbarium specimens sent to Europe over 250 years ago, now part of the collection of the Natural History Museum in London. As we sat drinking tea in the staff lounge, mostly talking about Virginia, John Clayton, and the early trade in botanic specimens from the New World, Steve suddenly mentioned that I really should visit the Millennium Seed Bank. Two or three phone calls later, arrangements were made and later that week I was heading south on the M23 with the Quaker friend with whom I had been staying, toward Kew Garden's Wakehurst Place, site of the seed project.

Wakehurst Place, formerly a country estate dating from the 13th century, with a large 16th century manor house surrounded by acres of landscaped gardens and pastureland, provides the setting. One approaches the Millennium Seed Bank site from atop a slope as the facility is built into the rural hillside. Before you, unobstructive to the bucolic vista beyond, is a long horizontal building comprised of a series of low arches. Glass, steel, and concrete form a non-assuming structure designed for efficiency and nestled into the landscape. The first impression of this understated structure belies the extraordinary facility housed within.

Entering the visitors' hall you immediately become aware that this is not just the usual tourist stop. Yes, there are informative display panels running vertically down the length of the hall explaining the importance of plants to humanity with an emphasis on threats to global bio-diversity. But this is a working building first and a visitors' center second. A full turn reveals that you are standing in a large glass enclosure. Through thick glass walls you see scientists and staff busy going about their work, and suddenly you get the sense that it could be you who is on display. Like Alice gazing into the looking glass for the first time you are confronted with two worlds and wonder to which one you belong. But through advance arrangements made in London, I was able to enter this other world where I met Clare Tenner, International Programme Officer, for a private tour and a rare look beyond the glass.

With security passes in hand, one enters through a series of doors. A long corridor reveals laboratories

branching off to the side where seed samples, collected from all over the planet, are starting to be cooled and dried. Staff here are assessing, cleaning, and x-raying the seed, all within sight of visitors just beyond. As important as this first phase is in the seed conservation process, the real story lies underground, where the seeds are actually held for storage.

Descending a large spiral steel staircase, the reflection of which in the surrounding glass walls seems to form a double-helix, an interesting coincidence in this story of genetic preservation, you enter the underground level. Here, after passing through additional security, one is able to access the storage chambers and final processing rooms of the seed bank.

Having been cleaned, counted, and quality assessed above, seeds arrive in this area of reduced humidity and temperature, gradually beginning the storage process. Relative humidity at this point is around 15 percent. Sensors here constantly monitor the air for external radiation and in the event of the detection, the chamber automatically seals, preventing contamination of the seed; a poignant reminder of the nature of the 21st century world in which we live. The walls of the chamber have been designed to last 500 years. Within this chamber are the actual cold storage units housing the seeds at temperature -20 degrees Celsius and with a final relative humidity of less than 10 percent. Under these conditions seed are thought to be able to remain viable for not just decades but hundreds of years.

Apart from the seed processing and storage units, the building also contains living quarters for researchers and students who come from all corners of the globe for training in seed collection and conservation. Bedrooms for these international guests open onto a corridor surrounding a sunken courtyard planted with native British species. The project offers training in all aspects of seed collection and conservation, including theory and practice. Such training is an essential component of its many partnerships with various governmental and non-governmental organizations world-wide.

Reflecting back on those 250-year-old herbarium specimens in the Natural History Museum, only half the age these walls in the Millennium Seed Bank are designed to endure, I thought "How might the world change? How might the world be 250 years on?"

We can't predict the future but we can look to trends of the recent past and, seeing the environmental degradation and loss of bio-diversity, get a sense of the

direction of things to come. Who knows what benefits or secrets of medicine yet to be discovered these plants may possess should the plants themselves still exist? Will populations in the wild be wiped out by development or unforeseen events? And what may be the impact of genetic engineering? Could genetically altered plant material escape cultivation and perhaps cross back into wild plant populations? No one knows, which is precisely why measures are being taken now to preserve species worldwide.

As these topics are being debated, quietly, seeds are being collected and stored in the English countryside, a genetic snapshot, frozen in time, of the world as we have inherited it in the early years of the new millennium. And hopefully, once again, like those 250-year-old Clayton Herbarium specimens, plants and seed will be making the transatlantic voyage to Europe. In

the 18th century it was about scientific discovery, exploration, even novelty that those early botanic specimens were sent over. In the 21st century, reflecting the uncertainty of our time, plants will now be sent over for safekeeping, for survival. Ninety-five percent of British flowering species have been collected, and the goal of the Millennium Seed Bank is to shelter 10 percent of worldwide flowering species by 2010.

Persons interested in participating or knowing more about this project can contact me by e-mail: michael@dds.nl or by mail at: M.A. Sawyer, Nassaukade 68-2, 1052 CR Amsterdam, The Netherlands.

Reprinted from the Bulletin of the Virginia Native Plant Society, August 2003

Why We Cannot Ignore Invasive Plants

By Elizabeth J. Czarapata

Something has become glaringly apparent to me over the last 10 years or so, ever since my concern about invasive weeds firmly took hold: greater education about the fragile and amazing natural world that surrounds and sustains us could not be more needed.

A tragedy is silently but relentlessly unfolding before our eyes, but so many cannot see. All around the world, as the human population becomes increasingly mobile, the spread of ecologically invasive plants is taking its toll. Yet few people recognize these weeds of the wild or are aware of the consequences of allowing them to proliferate.

As defined by an Executive Order from President Clinton in 1999 that called for increased national attention to, and coordination of, control of invasive non-native species, an "invasive plant" is "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." (Alien plants are also sometimes referred to as exotic, non-native, or non-indigenous species.)

It is important to note that the vast majority of non-native plants, about 85 percent, cause little if any environmental damage, other than perhaps taking up space that could be occupied by native species. They politely occupy their place in the landscape and pose little threat to natural areas. Even our food supply is primarily made up of exotic species.

But some exotic plants are not so innocent. Once removed from their native habitats, they begin to

reproduce abundantly in their new settings, causing significant environmental disruption. Invasive plants have competitive advantages over native plant species that often include:

- An absence of the insect predators and plant diseases that helped to keep their numbers in check in their homelands.
- A longer growing season that allows them to shade out native plants before the natives have a chance to grow, or to take more than "their share" of moisture and nutrients from the soil.
- An astonishing ability to reproduce and form colonies in disturbed soil due to rapid growth rates and massive seed or shoot production.
- The capacity to adapt to a wide range of growing conditions.
- Effective means of spreading.

If a plant happens to be "blessed" with all of the above characteristics, it is sure to be an ecological nightmare. The impact that invasive weeds can have on our quality of life can be staggering. Allowing them to proliferate has many consequences.

Invasives shade or crowd native plants out of existence. High quality woodlands, normally bursting with springtime beauty and diversity, are being quietly and sadly transformed into haunting Eurasian jungles of buckthorn, honeysuckle and garlic mustard. The amazing springtime arrangement of diverse

wildflowers, the "Mona Lisas" of our woodlands that delight so many, is being lost in the process.

Trilliums, Jack-in-the-pulpits, ferns, lady's-slippers, shooting stars, violets, wild geraniums, Mayapples, trout lilies, doll's eyes, Dutchman's breeches, and so many other treasures of our time will be gone forever unless more is done to save them soon.

Our mighty oaks, unusually sensitive to intense shade as saplings, are being overwhelmed by common buckthorn. Once the older trees eventually die, there will be no young oaks available to replace them. Name just about any other native tree such as hickory, ironwood, ash, beech, basswood, butternut, aspen, sugar maple, cherry or elm. It will eventually lose in a face-off against buckthorn. To lose these vital components of our woodlands is unthinkable.

Similar stories of native plant decline due to invasive weeds can be told about our wetlands or aquatic areas and prairies.

Invasive weeds destroy wildlife habitat and food sources. Having evolved with native plant species, our wildlife often relies on them for survival. If invasive weeds cause the diversity and quantity of native plants to diminish, the diversity and quantity of native wildlife will diminish as well.

The economic impact of invasive weeds is staggering, costing the U.S. economy over \$35 billion a year. Besides decreasing property values, invasive weeds are a major threat to tourism (hunting, fishing, swimming, hiking, photography, birding and other activities), forestry and agricultural production. They are often thorny, scratchy, poisonous, or simply too dense to get through, limiting access to recreational and other areas.

Other Impacts Caused By Invasive Weeds

- Soil instability and run-off may increase.
- Herbicide use increases the longer invasive weeds are ignored.

- Hybridization (crossing) with native species can occur, potentially leading to loss of original strains.
- Insect life cycles, microbial activity, soil characteristics and other natural processes can be altered.
- Water quality and quantity may decrease.
- Threatened and endangered species, particularly vulnerable to environmental disruptions, undergo rapid decline once areas are infested with invasive weeds.

To the untrained eye, the lush, green landscapes often associated with invasives may create the illusion of a vibrant, flourishing ecosystem when, in fact, many species have been lost and complex natural processes have been disrupted. But this is one environmental problem we can do something about.

Early detection and monitoring of natural areas can make a huge difference in the effort required for invasive weed control, the cost of control, and the number of species saved. Properly trained individuals can often undo a lot of damage caused by invasives and help give future generations more than a weed patch for an inheritance.

The ability to properly identify invasive weeds and utilize safe and effective control techniques is vital. Insist that your legislators support greater funding for educational programs about invasive weeds, and get involved in control efforts.

Contact The Nature Conservancy, your local extension office, nature center, parks department, conservation organization, or state office of natural resources for more information. Invasive weeds cannot be ignored.

Reprinted from the July/August, 2002, issue of the *Wild Ones Journal*. Information adapted from "Invading Weeds - A Growing Threat To Biological Diversity, Upper Midwest."

Elder: Common Shrub Has Uncommon Number of Uses

by Vickie Shufer

I learned about elder (*Sambucus canadensis*) in college, in a poisonous and edible plants class that I was taking at the University of Louisville. I learned first that "all parts are considered poisonous except the flowers and ripe berries." (Alkaloids – cyanogenic glycosides) The flowers were said to be used "in pastries, eggs, pancakes, etc.; the fruit made into wine or jelly." I recognized the plant as one I had seen

growing up on the farm but never knew the berries were edible.

Elder is a native shrub with representatives throughout the United States. The most common one in the eastern U.S. is common elder (*S. canadensis*). There is also another elder, the red-berried elder (*S. pubens*), that is considered poisonous. I have only seen that shrub once in Virginia and that was on higher

elevation. There are also red-berried elders and black-berried elders on the west coast (*S. melanocarpa*, and *S. caerulea*) – the red fruits are considered poisonous, the black edible.

Finding elder is pretty easy. It starts blooming in May and can be spotted from the car while driving down the road. Look for its large, white flat-topped clusters of flowers growing on shrubs along ditches, stream banks, hedgerows, and swamps often, in places where you don't want to gather – roadsides, edges of sprayed fields, and polluted waterways. Leaves are opposite, toothed, and divided into 5-11 leaflets. When I spotted elder growing at my doorstep, I let it grow, as though it had been planted there. It was about four years old before it fully bloomed; the year before it had only a few clusters of flowers.

I waited until the flower heads had filled out and then used my pruning scissors to snip off some of the tiny flowers, minus the stems, into my bowl. I wanted to let most of the flowers remain on the plant to become berries. Soon after this I located a patch of elder plants in an area that was protected from most pollutants. A friend and I collected enough flowers to experiment making elder blossom champagne. A recipe from *The Wild Foods Forum* bimonthly newsletter (Vol. III, No. 4) sounded easy, and we had enough flowers to triple the recipe. The champagne had a great flavor, but a very low alcohol content. I continued experimenting with the flowers, using them in teas, fritters and omelets.

My most recent experiment happened by chance last June. I had gone paddling with my friend and co-author, Lillie Gilbert, on a small creek in northeastern North Carolina along with a few other people. It was a scouting trip for our next river guide. For me, I discovered some new foraging grounds. The banks on the north side were covered with elder, blackberries, and wild roses. Elder was past its peak, but I was able to find a few late-bloomers and clipped off several heads. To keep them fresh, I put them in a large zip-lock bag and added a little water. I also found some wild roses blooming and did the same with them. When I got home I cut off the flower heads from the elder and removed the rose petals from the stems and placed them in a clear glass bowl. I filled this with water and set it out in the sun for several hours to make elder/rose flower water that tasted delicious. To preserve the flower water, I added an equal amount of grain alcohol, put the mixture in a jar with a lid, and let it sit for about 10 days. Then I strained and bottled it.

Not only does elder flower water taste good, but it's also good for you. At the Appalachian Herb Gathering

in Ohio last summer, botanist and herbalist Christopher Hobbs referred to elder flowers as blood movers. If you were holding heat in one part of your body, as with eczema or other skin conditions, elder flowers would help clear the blood of heat and toxins. In the Native American Ethnobotany Database, Dan Moerman also listed elder flower as a blood purifier. In *The Cayce Herbal*, elder is recommended as a "stimulant to the urinary and reproductive systems and as an aid to digestion." According to Virgil Vogel, in *American Indian Medicine*, elder flowers and fruits were used "as a household remedy for diuretic and diaphoretic purposes." The Iroquois used the flowers in hot water for tea.

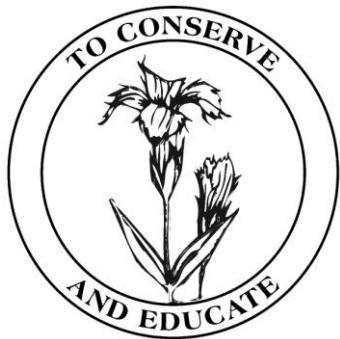
The flowers can also be dried. Native Americans would pick the flower heads and leave in heaps for a few hours until the petals fell off and would then dry them. Dried flowers can be steeped in hot water to make a tea. Following the flowers are the berries, developing first as little green balls that gradually turn red, then deepen to a purple and turn almost black before they are finally ripe. The berries can be removed by rubbing the stems gently between your fingers. I've used the berries to make elderberry wine, elderberry pies, and elderberry cake. Freshly picked elderberries still retain some of the strong flavor that some people find disagreeable. Drying them on trays in the sun improves the flavor.

Elder is easily started from seed. Scatter the ripe berries in disturbed soil in the fall in a sunny area. The next spring young shoots will spring up and start spreading.

Vickie Shufer, South Hampton Roads Chapter of the Virginia Native Plant Society. Illustration by Vickie Shufer.

Reprinted from the *Bulletin of the Virginia Native Plant Society*, August 2003





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- Promote cooperation with other programs and organizations concerned with the conservation of natural resources

On The Fringe

In this issue:

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