

Officer and board member nominations for 2009

The following slate of candidates for the board of the Missouri Native Plant Society has been submitted by the Nominating Committee for 2009.

- George Yatskiyevych — president
- Paul McKenzie — vice president
- Bob Siemer — treasurer
- Ann Schuette — secretary
- Leonard "Ted" Bolich — board member (3 years)
- Sherry Leis — board member (3 years, second term)

Membership is scheduled to vote on MONPS officers at the April 17 meeting in Sikeston, Mo. Additional nominations may be made through March 20. Please send them by e-mail or snail mail to:

Sherry Leis
533 S Forest Ct.
Springfield, MO 65806

E-mail prairienut@hotmail.com

For more information on the duties of any office, please contact the current person filling that position or Rex Hill.

From the outgoing president

Dear friends,

I am writing this on the occasion of the 30th Anniversary of the Missouri Native Plant Society.

Founded in Fulton, Missouri, in 1979, the Society has remained an active, viable organization, dedicated to the study, preservation, and encouragement for the use and protection of native plants in our state.

The organization remains strong with six regional chapters around the state and has close to 400 members. An unbroken string of quarterly field trips over the years continues to highlight special areas of the state, the plants and habitats found in those areas and the seasonal occurrences of those plants. These weekends have provided a forum for discussion, education, enjoyment, and, I think most importantly, fellowship amongst like-minded Missouri citizens with their focus on native plants. We have had joint meetings with societies in neighboring states, including Arkansas, Illinois, Iowa and Kansas, and our summer meeting this year in Springfield, Mo., is another one of those with our friends from Arkansas. That will take place on the weekend of May 29-31.

Our spring fieldtrip, on the weekend of April 17-19, will take us to Sikeston, Mo., (details on page 2) and give us an opportunity to meet with members of our newest chapter, the Perennis Chapter which covers the bootheel area of the state. Here we will have a chance to visit areas of remnant swamps, Crowley's ridge, and other Southeast Missouri habitats.

Our fall fieldtrip and meeting this year is a celebration of our 30th Anniversary back in Fulton. Plans are not yet complete, but if this letter reaches you either through your subscription to the *Petal Pusher*, or via another route, please consider joining us the weekend of Sept. 25-27. We will have an opportunity to visit several local areas of botanical interest and a chance to renew old friendships and share ideas associated with the mission of our Society.

I am a relative newcomer to the Society and am completing my fourth and final year as president. As I like to tell people, my main qualification is my inability to say "no." That is not unique, as I have come across many willing and enthusiastic members to help in the business and mission of the society, and that is our strength. It has made my job pleasant and relatively easy during my tenure in office.

For all of you and your contributions, I am very grateful. It has been a pleasure to serve you.

Rex Hill, president

Calendar of Events

Hawthorn Chapter

Feb. 19 Lunch with Native Plant Enthusiasts! 11:30 a.m. at the Uprise Bakery at 10 Hitt St., near Broadway

March 9: Regular Meeting at 7 p.m. at the Unitarian Church, 2615 Shepard Blvd. There will be a presentation of the budget, followed by a discussion, led by Glenn Pickett, about the possibility of offering grants to the Public Schools. We will vote on these issues. Information will be available in the March newsletter. Snacks are always welcome.

April 11: Native Plant Sale at Bradford Farm. 10 a.m. to 2 p.m. Event done in collaboration with Lincoln University. We plan to have a booth.

April 19: Earth Day (rain date April 26) Noon to 5 p.m. Please watch for additional information, and make a note on your calendar to come and help with our booth. This is a primary opportunity for us to connect with the public and teach interested individuals.

May date TBA: Dedication of Marge's Memorial at the Rocheport Park, followed by snacks and drinks at the home of Jean Graebner.

June 18: Bobwhite Quail/Native Plant Field Day at Bradford farm located in Columbia. Please plan to help with our booth.

Kansas City Chapter

Thursday March 19: 7 p.m. meeting at the Discovery Center, between KFC and Brush Creek at 4750 Troost, Kansas City MO. Program to be determined.

Saturday, April 11: Field Trip to Isley Woods Natural Area. Meet in the parking lot of Walmart on Highway 152 in Liberty. Take I-35 to Highway 152, go west to the first left turn, then south for about half a block. Walmart is on the east side of the road. For more information, contact Daniel Rice at (816) 461-0206 or drice95875@aol.com.

Osage Plains Chapter

Feb. 16: *Corylus americana*, the American hazelnut. The usefulness of this native Missouri shrub. It's not just for wildlife, recipe included. Presented by Dorothy and Jim Harlan. 7 p.m. Clinton MDC office. Contact Emily Horner, (660) 885-6981.

March 16: Prehistoric petroglyphs and the wondrous archeology of the Petrified Forest and desert Southwest. Whispers from the past. Ted Bolich 7 p.m. Clinton MDC office. Contact Emily Horner, (660) 885-6981.

April TBA: Annual field trip to the Peterman property. Expect to see beautiful spring ephemerals. 9 a.m. departure from the Clinton Public Library. Contact the Harlans, (660) 885-3350.

April 20: What's your favorite fern? The Jurassic plants of Missouri identified. Presented in part by Emily Horner. Bring in your unknown fern. Annual elections to follow. 7 p.m. Clinton MDC office. Contact Emily Horner, (660) 885-6981.

May 18: Genetic diversity and distribution of *Asclepias meadii* (Mead's milkweed) within Missouri. Presented by Josh Cromer, graduate student, Missouri State University.

Ozarks Chapter

Tuesday, March 17: Chapter meeting at 6:30 p.m. at the MDC Ozark Regional Office, 551 Joe Jones Blvd, West Plains. Christopher Crabtree (Department of Natural Resources) will present Missouri Mushroom Ecology, featuring awesome photographs of some very colorful and fascinating fungi. Chris will describe the ecology and habitat of some of Missouri's more interesting mushrooms, and will tell us when and where to find them.

Wednesday, April 15: Early evening field trip to enjoy spring wildflowers at a location to-be-determined somewhere near West Plains. Meet at Ozark Regional Office parking lot at 5:15 p.m. Call or email Susan Farrington for more information (417) 255-9561 x 307 susan.farrington@mdc.mo.gov

Tuesday, April 21: Chapter meeting at 6:30 p.m. at the MDC Ozark Regional Office. Theo Witsell (Arkansas Natural Heritage Commission) presents "Rare Plants and Habitats of the Interior Highlands of Arkansas: The Ozark Plateau, Ouachita Mountains and Arkansas Valley." He'll tell us about some of the botanical hot spots just to our south to explore, with a look at rare shale barrens, prairies, glades, seeps, depression wetlands, and other habitats of botanical significance and conservation concern.

Sunday, April 26 (afternoon): Field Trip. We'll travel to Shannon County to enjoy the peak of spring wildflower season. Location to be determined. Call or e-mail Susan Farrington for more information (contact info above).

Perennis Chapter

March 14: Native Plant Seminar, MDC Nature Center and Conservation Campus, Cape Girardeau. The Missouri Department of Conservation and the Cape Girardeau County Master Gardeners host the fourth annual native plant seminar. Using native grasses, wildflowers, trees and shrubs adds variety and color to your landscape, attracts wildlife and reduces the cost of energy-consuming lawns. A list of scheduled guest speakers is available at the Nature Center. Registration begins Feb. 1.

St. Louis Chapter

Wednesday, March 25: Chapter meeting at 7:30 p.m. at Powder Valley Nature Center, 11715 Cragwold Dr., Kirkwood (off Geyer Rd. Watson and Big Bend). Program by the ever-alliterative Dr. George Yatskievych on "Philosophy and Practice of Preparing Pressed Plant Specimens."

Wednesday, April 22: Chapter meeting at 7:30 p.m. at Powder Valley Nature Center. Chapter member George Van Brunt will be giving the program, "The Ins and Outs of Pollen Morphology, Mostly the Outs."

Spring Field Trip – April 17-19

We will be staying in Sikeston, Mo., and traveling to Crowley's Ridge to see acid seeps, loess-glacial till woodlands, sand forests and a small, relictual sand prairie.

Friday, April 17

7-8:30 p.m. — Meet at the Drury Inn for an evening program about Morris State Park and Crowley's Ridge.

Saturday, April 18

8 a.m. — Meet at the Drury Inn parking lot. We will carpool to Morris State Park where we will meet the DNR Natural Resource Steward assigned to the park. We should be there by 9 a.m. The Trail of the Beech Trees is 3 miles and includes steep topography. At the end of the trail, the NRS will show us a collapse revealing the multiple soil and sand layers that make up Crowley's Ridge. We will encounter loess aprons and acid seeps rich with plant life. Large, stately beech trees populate the bottom of the slope and a small prairie and bottomland hardwood forest can be found a short distance from the trail. Please wear long trousers, as poison ivy is present in large amounts in the understory. Pack a sack

lunch. Benches, a small pavilion, drinking water and a pit latrine are at the end of the trail.

1 p.m. — We will travel from Morris State Park to Holly Ridge Conservation Area outside of Bloomfield. We should arrive by 1:45 p.m.

7 p.m. — MONPS Board meeting at the Drury Inn meeting room. All members are welcome.

Sunday, April 19

8 a.m. — Meet at the Drury Inn parking lot. Travel to Big Oak Tree State Park to see bottomland woodlands and forest, *Clematis crispa* and *Carex socialis*.

Lodging

Drury Inn 2602 E. Malone – Telephone (573) 471-4100

Please note that by April there will be two Drury Inns in Sikeston. A block of rooms are reserved at the Drury Inn listed above under the Missouri Native Plant Society's name.

- King, nonsmoking: \$59 + tax per room
- Double, nonsmoking: \$69 + tax per room

Sikeston, Mo., is on Highway 61 north of Highway 60 and just west of Interstate 55.



Bonus trip on Friday: For those interested, George Yatskiyevych will be traveling to Little River Conservation Area in search of *Sideroxylon lycioides* (swamp bumelia). You will have to contact George at George.Yatskiyevych@mobot.org or call (314) 577-9522 for the time and place to meet on Friday morning.

Carol Radford earns the Coneflower Award

Congratulations to Carol Radford on earning the Coneflower patch. She took the time to fulfill the eight steps necessary to receive this award, and she did so in a most enthusiastic and creative way. I had the pleasure of reviewing her application and enjoyed her thorough report. She included some very beautiful drawings, and from her work it was clear that she is an ardent native plant enthusiast.

Many of us, myself included, have not yet earned this award, and it is there for us to do. The current requirements can be obtained from the MONPS Web site, and I believe once we begin working on it we will find that the requirements fit very well with the activities we pursue in fulfillment of our native plant interests.

Rex Hill, president



MONPS award nominations sought

To all members of the Missouri Native Plant Society, please be thinking about any individuals or organizations deserving of the accolades of the prestigious Missouri Native Plant Society. If you have been admiring someone's work, this is a great opportunity to recognize them.

Recipients need not be members of MONPS to be eligible for the awards.

President Rex Hill has appointed a 2009 Awards Committee. The committee is charged to receive nominations from members of the Society and to render final award designations.

Awards will be conferred periodically (normally not more than annually) based solely on merit and are usually presented at the annual meeting.

Missouri is rich in talent quietly doing extraordinary things on behalf of our native flora. We solicit your assistance in bringing these folks to our attention so they can be considered for appropriate recognition.

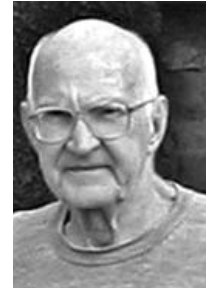
Nominations may be made for five categories as follows:

■ **Erna Eisendrath Memorial Education Award** — To be awarded to an individual who, through teaching, writing, or other activity, has conveyed to others a significant appreciation and knowledge of Missouri's native flora.

■ **Arthur Christ Research Award** — To



Last year the society presented two awards. Ann Wakeman was given the Erna R. Eisendrath Memorial Education Award and Don Robinson was given the Plant Stewardship Award



be awarded to an individual who has made a significant contribution toward furthering the knowledge of Missouri flora.

■ **Plant Stewardship Award** — To be awarded to an individual or organization for the preservation of important elements of Missouri's flora through purchase, registry, and/or management practice.

■ **John E. Wylie Award** — To recognize individuals who have provided exceptional service to the Society.

■ **Julian A. Steyermark Award** — The Society's highest award. To be presented to an individual who has made outstanding contributions to any and all aspects of Missouri botany. This award is given

as merited for superior achievement.

The Awards Committee will consider all nominations received by April 15.

Nominations should contain the full name of the nominee, the name of the nominator and set forth a short synopsis of the contributions of the individual or organization that merits recognition by the society.

These may be sent via postal or e-mail channels.

Nominations may be sent to Awards Committee Chairman Steve Buback at sbuback@forestparkforever.org

If you would like assistance in preparing a nomination, the committee will be happy to provide advice and assistance.

Register for Missouri prairies class

Join Rex and Nels to learn more about the historical contribution of the prairie ecosystem to Missouri's natural history in a community college class sponsored by the Missouri Native Plant Society.

Where: St. Louis Community College – Meramec

When: Wednesday, April 29, 7-9 p.m.

Field Trips: Saturdays, 9 a.m. to Noon

■ Saturday, May 2, Cuivre River State Park

■ Saturday May 9, Shaw Nature Reserve

Optional trip: Friday-Sunday, May 29-31, Joint field trip with MONPS to Springfield, Mo., and Southwest Missouri Prairie Country

Register online at: www.stlcc.edu or by calling Meramec Continuing Education at (314) 984-7777

New MONPS members

- Eric Nulsen, St. Louis
- Christopher Kopek, Cedar creek
- Doug Keever, Maryville
- Becky Ginnings, Buffalo

Post pictures and take part in blogging with other members of the Missouri Native Plant Society at www.MissouriNativePlantSociety.org

New invaders for Missouri

By Steve Buback

It should come as no surprise to members of the Missouri Native Plant Society that invasive species are a problem within the state.

One of the major components of an invasive species control program is monitoring, identification, and control of new species before they become a major threat.

Forest Park in St Louis provides a great opportunity for documenting new invasive species because of its urban location and long history of land use. Forest Park consists of 1,271 acres of parkland in the city of St Louis. Within the Park there exists 150 acres of natural areas: 80 acres in the John F. Kennedy Memorial Forest, which was set aside during the 1904 World's Fair as wilderness, a 24-acre forest that was formally turf and has been allowed to revegetate naturally, and 50 acres of restored prairie and savanna habitat.

Within the Kennedy Forest, several woody species have started to naturalize which should be of note to botanists throughout the state. Several of these have been documented before in the state, but all are known to be highly invasive in the Eastern U.S. and thus should be carefully monitored within Missouri. The species of concern are Amur cork tree (*Phellodendron amurense*), European euonymus (*Euonymus europeaus*) and jet black bead (*Rhodotypos scandens*).

Amur cork tree (*Phellodendron amurense*)

Amur cork tree is a native of the Amur region of China, which is also the home to everyone's favorite invasive, bush honeysuckle (*Lonicera mackii*, *L. morrowi*, *L. xbella*). It can grow to be a large tree, up to 80 feet tall. It is perhaps easiest recognized by the glossy, alternate, compound leaves, thick corky bark, and bright yellow inner bark. The foliage also has a distinct citrus odor indicating its lineage in the Rutaceae family. It has been documented to naturalize both in Forest Park and at the Shaw Nature Reserve in Franklin County. Planting of this tree should be discouraged and any sighting should be documented to further understanding of the problem this species may pose.



Courtesy Missouri Botanical Garden
PlantFinder

Rhodotypos scandens

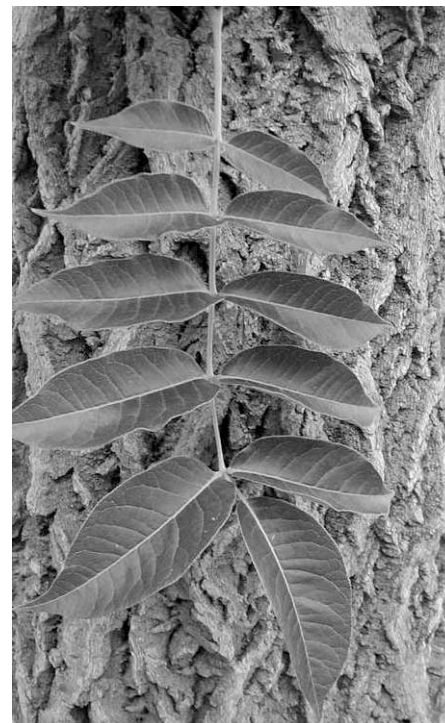
European spindle tree (*Euonymus europeaus*)

The European spindle tree at first blush can seem very similar to our native wahoo (*Euonymus atropurpureus*) with green stems, petiolate leaves and small levels of corky wings on the stems. In bloom, however, it is readily discernable as the flowers are small (less than 1 cm) and white rather than the brownish-purple blooms of wahoo. In addition, the leaves of European euonymus are glabrous while wahoo leaves are slightly hairy. European spindle tree also tends to be more colonial than wahoo, which is typically found as an isolated shrub or small tree.

Jet black bead (*Rhodotypos scandens*)

Jet black bead probably poses the least concern of the three species mentioned in this article. It is a small shrub to six feet tall with white flowers to 2-inches in diameter. The leaves are opposite and simple. Vegetatively, it may be confused for several native viburnums including *Viburnum dentatum*, because of the serration of the leaves, but the valvate terminal buds of viburnum are a good separating characteristic. Jet black bead is present in Forest Park and at Emmenger Nature Park in St Louis County, and should be looked for near ornamental plantings in other locations.

Steve Buback is nature reserve foreman and principle resource steward at the revived Forest Park in St. Louis.



Courtesy Missouri Botanical Garden
PlantFinder

Phellodendron amurense



Courtesy Missouri Botanical Garden
PlantFinder

Euonymus europeaus

Hawthorn Chapter

Submitted by Nadia Navarrete-Tindall,
chapter representative

With excerpts from the MONPS-
Hawthorn Chapter Jan-Feb newsletters
submitted by various members.

Some of the highlights during December-January period for the Hawthorn Chapter include our traditional holiday party hosted this year by our president Nancy Langworthy and her husband. In addition to great food, company and hospitality from our hosts, this was a triple purpose gathering. Before the party, elections took place to elect Paula Peters to her second term as treasurer, Vanessa Melton to her first real term as vice-president, and Nadia Navarrete-Tindall on her first term as chapter representative.

Elections were followed by a special presentation of the Blazing Star award to four of our most outstanding and loyal members, Jim Whitley, Paula Peters and Nancy and George Brackage. The Blazing Star award is offered to members who help advance the goals of our chapter including increasing awareness about the importance of adopting native plants in our lives. After business was over, the group enjoyed traditional and nontraditional dishes that included some wonderful and "decadent" desserts prepared by Nancy L.

In January, we had two important events.

During our regular meeting, Bill Clark, a well-known *Columbia Tribune* columnist and chapter member offered a slide show about wildflowers from different countries especially from Nicaragua, Curacao, Australia, Mali and El Salvador, which make attendees feel warmer than the outside temperature! Bill has been in 50 countries that he traveled as a major-league baseball talent scout.

During the meeting Laura Ellifrit passed around a sample of *Lycopodium digitatum*, a rare club moss, only found in eight counties around the Taum Sauk area. Laura's son Paul found it in the Mark Twain National Forest. This is the first find in Boone County and the furthest northwest location in the state according to Drs. Robin Kennedy and George Yatskievych.

On Jan. 17, another traditional activity took place at home of Laura Hickman – the Seed Exchange and Propagation Workshop which is a joint event between the Wild Ones and the Hawthorn Chapter. Becky Erickson, Hawthorn chapter member, instructed members about seed treatments for particular species before planting in pots. Some of these seedlings will be used for fund raising during activities throughout the year, especially during the Native Plant Sale at Bradford Farm on April 11 and Earth Day Celebration on April 19, both in Columbia.



Photo by Nadia Navarrete-Tindall

Lycopodium digitatum is a rare club moss only found in eight counties around the Taum Sauk area.

Kansas City Chapter

Submitted by Daniel Rice, chapter representative

The members of the Kansas City Chapter met in the parking lot of the Discovery Center on the cold night of Jan. 15. We had to meet in the parking lot as we found out that the Discovery Center was not open for some unknown reason.

After standing around for a few minutes, it was unanimously decided to move the meeting to a local hamburger restaurant named Winstead's. Not only was it *much* warmer than the parking lot, but we also could fit around the large oblong table there! We placed our orders, then began the meeting.

Two main orders of business took place.

First, we re-elected our present officers by acclamation, so Dave Winn remains our chapter president, Lance Jesse is vice-president, Kathy Winn is secretary, Ed O'Donnell is treasurer and Dan Rice is chapter Representative. Congratulations to all!

Our second order of business was to set field trip sites and dates. We have several interesting field trips planned, so keep watching the Petal Pusher and the Web site for more information. (A big hint: one will be to look for an interesting reptile!).

Our next meeting will be on Thursday, March 19, at the Discovery Center. We haven't finalized a speaker at this time, but we are indeed working on it. Everyone is invited!

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Osage Plains Chapter

Submitted by Marlene T. Miller, chapter representative

We do not have meetings during the months of January and February, but we are always eager to get back together in March.

On a personal note, I want to thank everyone for their prayers for my back surgery. It went very well. I have to wear a back brace the month of February yet. I have had no complications. The pain and numbness were gone the same day I had the surgery, and I was back to work full time in five weeks — back brace and all.

My very favorite thing this time of year is our witch hazels. I've raised them from little twigs.

They are still only about 3½ to 4 feet tall. They are just about done blooming for this year. We had one in particular that just outdid itself with wonderful fragrant yellow blooms, and the dog and I checked on it frequently even in the below-freezing weather.

Our President Emily Horner reminded us of a few things by e-mail that I thought I would pass on to you:

The Annual Backyard Birdcount is Feb. 13-16. View at <http://www.birdsource.org/gbbc/>. The Clinton Missouri Department of Conservation is having a workshop Feb. 11 at 6:30 p.m.

Hi Lonsome Chapter (Cole Camp) Missouri Master Naturalist classes begin Feb. 16-April 27. Classes will meet weekly on Monday nights, 6-9 p.m. at Cole Camp High School. There will be three Saturday field trips. More information at <http://extension.missouri.edu/masternaturalist/colecamp/>.



Witch hazel flower

Ozarks Chapter

Submitted by Susan Farrington, chapter representative

No news to report, since we have not met since November. We are on "winter break," resuming regular meetings in February.

Perennis Chapter

Submitted by Allison Vaughn, chapter representative

On a cold day in December, Perennis members met at Big Oak Tree State Park in search of mistletoe.

A known host plant for the great purple hairstreak butterfly, mistletoe is a hemiparasite spread by bird droppings. Near the

entrance of the park, members discovered a large sycamore with nine clumps of mistletoe high in the canopy. President Kent Fothergill shared with the group a mistletoe specimen he collected in Louisiana.

More notable than the mistletoe was the evidence of a large blowdown event in the bottomland forest. High winds caused by Hurricane Ike downed roughly 114 trees along the boardwalk trail, all knocked down during the growing season. The former National Champion black willow incurred severe damage from the hurricane. Following the hike, members enjoyed homemade Christmas cookies.

Through the month of February, Perennis is hosting a native plant sale to members and the general public. Details and plant lists can be found at semonps.org.

St. Louis Chapter

Submitted by Martha Hill, chapter representative

In January, amidst the swirling snow, we were treated to a program by Dr. Peter Hoch, curator at the Missouri Botanical Garden.

Dr. Hoch's talk on the changing taxonomic classification of the Onagraceae (evening-primrose) family claimed at least one well-known genus in the forthcoming Volume 3 of the "Flora of Missouri." Yes, that's right. Read my lips. **No more Gaura** (or *Stenosiphon*).

Some of these changes in this family will be:

- *Gaura coccinea* to *Oenothera suffrutescens*
- *Gaura longiflora* to *Oenothera filiformis*
- *Gaura parviflora* to *Oenothera curtiflora*
- *Gaura sinuata* to *Oenothera sinuosa*, and the lonely:
- *Stenosiphon linifolius* to *Oenothera glaucifolia*.



Gaura coccinea before she changed her name to *Oenothera suffrutescens*.

Feb. 25 will bring us a program by Steve Buback, nature reserve foreman and principle resource steward at the revived Forest Park in St. Louis.

His talk on winter tree identification should be just right for preparing the chapter members to explore the bare deciduous Missouri forest on a following Saturday fieldtrip.

Steve has excellent tree-identification credentials, having spent time in the Ozarks working for the MOFEP project earlier in his career. In a shameless attempt to pack the audience with members of the newly named InBev Corp., Steve has subtitled his talk, "This Bud Scale's for You."

Fronds in high places

By H. Diamond and L.J. Swartzell
Department of Biology,
Southeast Missouri State University,
Cape Girardeau, Mo.

Introduction

Missouri's limestone bluffs are familiar giants that rise up from rich soil. They are integral parts of our history, as we are of theirs. For us, they have been icehouses in Hannibal, home to demons on the Mississippi (Tower Rock), and used as landmarks at Cape Girardeau (Cape Rock). We quarry them. We play beneath them and on them. We treat them as we see them, as invincible. And yet these mammoth precipices are not invincible but vulnerable to the ravages of nature. Still, our bluffs have "friends" that maintain their integrity. They have fronds in high places.

Bluff and Soil Formation

Missouri limestone is composed of carbonate marine deposits. About 470 million years ago and again around 300 million years ago this land was covered by shallow oceans. Many microscopic shelled creatures lived and died in the oceans, and their shells formed thick layers of carbonate material that compressed into limestone. Since then, millions of years of river flow and rains cut away the limestone and created the bluff faces. Still, bluffs are more than just limestone. Natural bluffs are topped by delicate, mature soil layers that are home to a variety of plants and animals, and bluff faces are dotted by tenacious plant species. The gleaming white faces and soil deposits on natural bluffs take a long time to form. In fact, the bluff maturation process creates a unique microenvironment that provides habitat for some interesting vegetation.

Maturation begins with mineral weathering of the exposed limestone. As the bare limestone ages, calcium is often displaced by magnesium. The tiny pore spaces within the rock that hold water change size. The surface of the bluff face becomes "cemented" and retains moisture. Crevices form as the rocks undergo temperature fluctuations and as water erodes them. Limestone bluff faces bake in the sun and freeze during those icy Missouri winters. Organic matter cascades down the surface and is deposited in the crevices.



Photos by L.J. Swartzell

The hairy lip fern (Cheilanthes lanosa) at Mingo National Wildlife Preserve. Hairy lip ferns help retain soil mats on rocky bluff top and soil outcrops. Leaf litter and organic matter slowly break down into soil. Running water, an erosive force, is impeded.

Soon, lichens colonize the bare face and continue the chemical degradation. Soil on the bluff face begins to form. Microorganisms that recycle organic matter in the soil enhance it. Next, the xerophytes move in.

A xerophyte is a plant that lives in dry places. Missouri is a lush, green state, and it is difficult to accept xeric (dry) as a descriptor for it. However, a bluff top and face is an arid environment that only certain species can tolerate. Imagine for a moment that you were forced to live on bare limestone, in full sun, and unprotected from the wind. You would quickly feel the heat and begin to thirst. Bluff plants experience these very conditions and must be able to survive these extremes. In turn, as they survive, so does the bluff.

Ferns in High Places

How does a fern survive in on a dry bluff face? After all, the term xerophytic fern is kind of an oxymoron. Most ferns are found in moist woods. These ferns, however, have a few tricks to help them "weather" dry climate:

■ The ferns can live in a mutualistic relationship with fungi. The fungi, called myc-

orrhizae, are adept at extracting moisture and nutrients from difficult soils. The fungi live in the soil all around us and colonize the roots of many plants. They interface with the cells in plant roots and swap nutrients and water for sugars from photosynthesis.

■ The ferns cheat. Most likely using sugars and proteins; they make their cells very concentrated. Because they are so concentrated, even water in very dry places is absorbed.

■ The ferns maintain a very small leaf surface area from which water can dehydrate.

■ Many of the ferns are very, very hairy. The hairs trap in moisture, just as your hair does when you sweat during heavy activity.

■ The ferns may be coated with a wax (called cuticle), like a cactus, that helps prevent water loss.

They are called rock ferns. This casual name is given to a broad group of ferns: the cliff brakes, the cloak ferns, and the lip

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ferns. In Missouri, the champions are the lip ferns and the cliff brakes. Before you start chuckling over their silly names and their rough appearance, give them a little respect.

Hairy lip ferns, for example, are the masters of the mature soil mats on the tops of bluffs. The hairy lip fern (*Cheilanthes lanosa*) clings bravely to the very top edge of bluffs and rocky outcrops. Water flow over the top is impeded and soil mats that promote the colonization of other vegetation remain intact.

The slender lip fern (*Cheilanthes feei*) colonizes those wind- and rain-abused zones just below the bluff edge to approximately a meter down, or anywhere along the bluff face where it can take hold.

These two common Missouri ferns can be distinguished fairly easily if you look closely. The slender lip fern prefers limestone bluffs. It is a bluish-green because it is covered with wax for protection and many small hairs. Its pinnae, the "leaflets" of the larger fern leaf blade, give the appearance of a cluster of tiny, round, cloth-covered buttons with brown hairs underneath! The hairy lip fern can also be a bluish-green, but often more green. It tends to be more expanded and the stipes are longer (up to 16 inches) than the slender lip fern, which has a bushy appearance and may only get to be about 10 inches at its maximum length. Also, the hairy lip fern has sparser, straight hairs and the pinnae appear lobed. The hairy lip fern can be found on sandstone, chert, granite talus and shale. It generally loves to inhabit the soil just next to a rocky outcrop.

Two species of cliff brake occur in Missouri. Both are common.

The smooth cliff brake (*Pellaea glabella*) and the purple cliff brake (*Pellaea atropurpurea*) both favor limestone and are found in the same type of cracks, pits, and grooves in which lip ferns can be found.

These two *Pellaea* species may look similar at first glance, but there are some striking features to look for that help distinguish them.

The purple cliff brake, as its name implies, has a glossy purple-black stipe with trichomes, or plant hairs. The smooth cliff brake has a brown stipe that is glabrous, or smooth. Unlike their short-statured limestone neighbor, Fee's lip fern,



The slender lip fern (*Cheilanthes feei*) at Reis Biological Station, Steeleville, Mo. The slender lip fern grows on bare rock faces in crevices with almost no soil present. Roots grasp rock particles. In addition, a symbiotic fungus helps the fern hold on and obtain nutrients.



A smooth cliff brake (*Pellaea glabella*) colonize bare rock surfaces and clings to rock crevices with only small amounts of soil. Cliff brakes are quite common in Missouri. Their tough, waxy surfaces protect them from drying and their ability to colonize a broad range of habitats make them hardy and reliable bluff inhabitants.

cliff brakes will extend gracefully out 12-18 inches. The resultant fern bouquet is quite lovely to the weary climber. The cliff brakes establish quickly into crevices with soil already in place.

Rock ferns are slow growers. Bluffs mature slowly too. The right balance of moisture and weathering put bluffs and ferns together in a mutually beneficial situation. The ferns cap the edges and crevices of bluffs and in return, the ferns are housed in a noncompetitive environ-

ment. It works well, until either one is disturbed. Road cuts lack these ferns. Limestone weathering takes thousands of years and the weathering process appears to be a prerequisite to fern colonization. Therefore, it is important to avoid disturbance when possible. But then, hey, unless you plan on hanging around on a sheer bluff face, that's not likely! Still, for those of you who enjoy our outdoors, keep a careful watch.

You have fronds in high places!

About deciduous holly

Favorite winter food for a variety of wildlife

By Nadia Navarrete-Tindall
Hawthorn Chapter representative

While botanizing and learning about my new surroundings on the grounds of Lincoln University I got a great surprise when I discovered a healthy stand of deciduous holly — *Ilex decidua* — at Busby Farm in Jefferson City. Some of the trees were so loaded with the deep-red berry-like fruits that they almost seemed to be glowing under the shade of 100-year-old or older oaks in a savanna-woodland remnant at this farm.

Deciduous holly, also called possum haw, gets its name because, unlike its more known relative American holly, *Ilex opaca*, it loses its leaves in winter. The berries, actually drupes, remain in the trees during winter unless birds find them! Inside the fruits, usually 4 (maximum 8) nutlets contain one seed each.

I was pleased with this find because this 7-plus acres remnant — now under restoration — is part of an area being protected for wildlife and to be used for environmental education. We still have to deal with two usual invasive species: Japanese honeysuckle and wintercreeper; however, finding this holly among other native species makes this project more exciting and can save us some time.

Deciduous holly is a dioecious species, which means that male and female flowers are found on separate trees. It belongs to the Aquifoliaceae family, which has 420 species worldwide. Deciduous holly can grow in shade or full sunlight, in loam to poor soil. It tolerates acidic soils and naturally grows in extreme habitats from glades to swamps along streams.

I have seen it producing more fruits in forest openings or under full sunlight than under deeply shaded sites.

Propagation can be done from seed or cuttings. Seed needs to be moist-cold stratified and may take two to three years to germinate. Propagation from cuttings should be done using indol butyric acid (IBA) to produce rooting, and will assure you the gender of the tree. Several cultivars are sold in the trade market; however local collections are sold as bareroot seedlings by the MDC-George White



Photo by Nadia Navarrete-Tindall
Deciduous holly fruiting at Lincoln University's Busby Farm in December.

Nursery and by local nurseries. Check the Grow Native Web site for nurseries in your area.

Several mammals and as many as 20 or more birds, including bobwhite quail, robins, and mockingbirds, consume the fruit. The caterpillar of Henry's elfin butterfly *Callophrys henrici* feeds on *Ilex* spp as well as blueberries (*Vaccinium* spp) and red bud (*Cercis canadensis*). Deciduous holly can be used for dry arrangements.

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Redbuds evoke a sense of place

By Chuck Robinson
Petal Pusher editor

Redbuds are well-recognized and much loved in Missouri.

The trunks of the state's redbuds, *Cercis canadensis*, evoke a spirit of bonsai, seeming to be older than their age. The purply-pink buds and flowers of redbuds reach their peak standing out amid the white blooms of serviceberry (Amelanchier), wild plum (*Prunus americana*) and the flowering dogwood (*Cornus florida*).

The muscular trunks of redbud and understated beauty of its small but prolific flowers evoke a sense of place, a sense of Missouri for me.

Knowing our society to be a group of hardened taxonomists, let's not get too poetic about redbuds. At the same time let's not get so bogged down in scientific detail that we forget the object of affection.

The species name "cercis" comes from the ancient Greek word "kerkis," a weaver's shuttle, because the seedpod of the European redbud was thought to look like it.

"Canadensis," of course, refers to being of Canada. However, "Canada" once loosely referred to New France, and included what is now the U.S. Midwest as far south as the present-day Louisiana.

The name "Canada" itself comes from the Huron-Iroquois word for village. French explorer Jacques Cartier applied the name on his expedition up the St. Lawrence River in 1535.

Despite its specific epithet, *C. canadensis* is rarely found in present-day Canada. Guy Sternberg, a leading light of the Illinois Native Plant Society, dendrologist, and principal author of "Native Trees for North American Landscapes," reports in his book

finding some isolated specimens in Point Pelee and on Pelee Island in Lake Erie. However the more common range of *C. canadensis* is from Iowa (having lived in Iowa, I know they aren't common as far north as central Iowa) and Pennsylvania south throughout the Eastern U.S. and Great Plains.

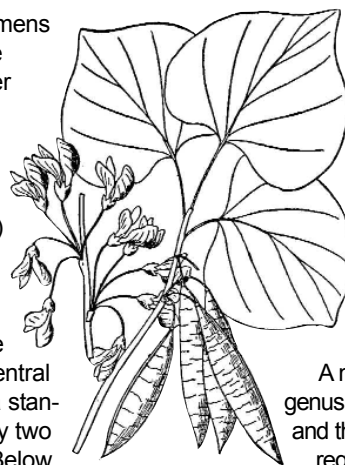
The redbud's flowers give it away as a legume. The central vertical petal, called either a standard or banner, is flanked by two more petals called wings. Below them are two more petals called keels, like the keel of a boat.

However, unlike other members of the pea family redbuds do not grow nitrogen-fixing nodules. Other legumes take nitrogen from its relatively inert molecular form in the atmosphere and convert it to nitrogen compounds in the soil, where plants can take it up.

Seed pods often hang on into the winter, perhaps because not a lot of birds find them tasty. The Peterson field guide by George Petrides, "Trees and Shrubs," notes that only bobwhites and a few songbirds eat them.

There are two cercis species in North America: our beloved *C. canadensis*, with the heart-shaped leaves with the pointed tips, and *C. occidentalis*, which is California's version with more rounded, kidney-shaped leaves. Europe and Asia have *C. siliquastrum*, which seems more closely related to the Californian species than to the eastern redbud.

There are two variations of *C. canadensis* that are often noted by authors, *texensis*



USDA-NRCS
PLANTS Database

(of Texas) and *mexicana* (of Mexico). They have thicker leaves that are more rounded and shiny.

According to molecular studies reported in "Steyermark's Flora of Missouri" by George Yatskievych, *Cercis* is related to the large tropical genus *Bauhinia*, orchid trees.

A member of the *Bauhinia* genus is the emblem of Hong Kong and the flower is featured on the regional flag. There are more than 200 *bauhinia* species, ranging mostly across India, Southeast Asia and China.

However, closer to home is the Texas plume or orchid tree (*Bauhinia lunarioides*), which the Lady Bird Johnson Wildflower Center online describes as a single-trunked or multitrunked shrub or small tree growing 20 to 40 feet tall. That seems a similar size range to that of redbuds. Sternberg reports the two largest specimens of *C. canadensis* on record are in Nashville, Tenn., and Roanoke County, Va., and in each area about 40 feet tall. In "Steyermark's Flora," *C. canadensis* ranges in height from 20-40 feet tall.

B. lunarioides has two-lobed compound leaves, but perhaps each lobe resembles the leaf of redbud. The more tropical cousin has white to pale pink orchid-like flowers, which are not much like the flowers of redbuds, but the fruit of *B. lunarioides* is a flattened pod, similar to our redbud tree's seedpods. However, pictures show them to be fatter, more like a garden pea or bean pod.

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