



Mississippi Native Plants and Environmental Education



Newsletter of The Mississippi Native Plant Society and the Mississippi Environmental Education Alliance

Volume 29 Number 2 We went skinny dipping and we did things that frightened the fish – Julia Roberts Summer 2011

The **Mississippi Native Plant Society** promotes the preservation of native plants and their habitats through conservation, education, and utilization.

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Paradise Revisited by Gail Barton

Years ago I went with Dr. Sidney McDaniel to a beautiful place in the Bienville National Forest. As I remember it, the site was mucky with standing ephemeral pools. The higher ground was populated with atamasco lilies – a.k.a. “Easter lilies” (*Zephyranthes atamasca*), buttertop (*Senecio glabellus*), spring cress (*Cardamine bulbosa*) and woodland phlox (*Phlox divaricata*). So the flowers were white, yellow and blue. The light glistened on the water. We wandered through the swamp forest, admiring the flowers. The moment was frozen in time and I thought it was one of the most beautiful places I had ever seen. I have always wanted to go back.

Last year, one of my co-workers drew a map to such a site. I drove for a couple of hours looking for it until I realized that I had made a mistake while writing the directions. Then during our recent field trip to Roosevelt State Park, Heather Sullivan mentioned that she was considering taking a trip to see the Easter lilies. When I realized that Heather was talking about a place that was similar to the Bienville National Forest site, I carefully transcribed her directions.

On April 9, Marc Pastorek and I went looking for Heather’s Easter Lilies. We found them on a gravel road near a bridge. The atamasco lilies were in bloom as far as we could see – a frothy ribbon of white weaving through the woods. They were reflected in the ephemeral pools. Scattered buttertops and woodland phlox were in bloom but the spring cress had gone to seed. It was not *the* site that I had longed to see for so many years. However it was similar with perhaps more diversity.

Cinnamon fern was in residence as was Solomon’s seal and an unusual trillium that turned out to be *Trillium recurvatum*. A leatherflower (*Clematis crispa*) was blooming robustly blooming nearby. Indian pink or pinkroot (*Spigelia marilandica*) was waiting in the wings – budded and ready to flower in a couple of weeks. We found a couple of mystery plants. I took pictures until my battery died. It doesn’t get much better than that!

Even though this site is not the “original”, I think it is fine. I hope that was the first of many annual pilgrimages to the Easter Lily Woods. It is in my mind the perfect distillation of spring. I have plans to schedule a MNPS field trip there next year. I’ll ask Heather early and hope that we can wander among the Easter lilies and the phlox and buttertop and spring cress again.

Atamasco lily (*Zephyranthes atamasco*) clipart is courtesy of FCIT (<http://etc.usf.edu/clipart>).



MNP & EE Calendar, Field Trips, Native Plant Sales, et cetera

Native Plants for Sale at Any Time! Native plants are available throughout the year from Strawberry Plains Audubon Center's Nursery by appointment. Please contact Kristin Lamberson at 662-252-1155 for more information. Bring a wagon.

For additional opportunities monitor: EEinMississippi, <http://bigcypressoutdoorclub.wikispaces.com>, www.clintonnaturecenter.org, <http://www.crosbyarboretum.msstate.edu/>

Field Trips

May 24 After the Mississippi Environmental Education Alliance Spring Board Meeting they will view the Mississippi River from the visitor center, the Yazoo River from Fort Nogales Hill in the Vicksburg Military Park, and take other tours.

May 28 MNPS Field Trip to Buttercup Flats and Mars Hill sandhill, east of Wiggins, DeSoto National Forest. We will meet at McDonalds in Wiggins (at the intersection of US 49 and MS 26) at 9:00 A.M.

Buttercup Flats is one of the world's most famous pine savannahs and pitcher plant bogs. With more pitcher plants (mostly *Sarracenia alata*) than the eye can see, the place is rather awe-inspiring. Like most bogs, the site is also rich in many other herbs, including sundews, butterworts, bog buttons, meadow beauties, colic root, and the aptly named "bog cheetos." After a sack lunch, we will proceed to Mars Hill to see the opposite end of the spectrum, a xeric sandhill with lots of turkey oak, bluejack oak, sand post oak, and saw palmetto. Contact Dr. Mac Alford 601-266-6531, mac.alford@usm.edu if you plan to participate or for additional information.

June 4 Please join the Mississippi Native Plant Society for a field trip to Harrell Prairie. We will meet at 9:00 a.m at Wendy's in Forest, Mississippi. Take Exit 88 for Highway 35 off I-20. Go north toward Forest, and Wendy's will be on the right at the first intersection. We will go first to Harrell Prairie Hill, which is only a few minutes away. We will then move on and visit a few other prairie remnants in the area.

Dr. Tim Schauwecker and former MNPS President Marc Pastorek will be on hand to talk about the prairie and identify plants. The Pine Woods Audubon Society from Hattiesburg will be along for this trip. After the prairie outing, the Audubon group will go back to Gail Barton's home in Meridian. The Audubon group wants to walk the nature trails and discuss maintenance techniques. MNPS members are invited to join in.

Hopefully purple coneflower (*Echinacea purpurea*) will be coming into bloom along with bee balm (*Monarda fistulosa*), prairie clover (*Dalea spp.*), green and orange flowered butterfly weed (*Asclepias spp.*), mountain mint (*Pycnanthemum spp.*), New Jersey tea (*Ceanothus americanus*), beard tongue (*Penstemon spp.*), prairie coneflower (*Ratibida pinnata*) and early compass plant (*Silphium spp.*).

If you plan to participate in this field trip, please contact Gail Barton at 601-483-3588 or email her at lgbarton@gmail.com. It should be a lovely time to visit the prairie. Be sure to bring water, a hat, and bug spray.

Letter from Laura Beiser, President of the Mississippi Environmental Education Alliance

MEEA had planned to meet in Tunica for their Spring Board retreat in May; however, the venue has been moved to Tony's Restaurant in Vicksburg (1903 Mission 66, Vicksburg, MS, 39180...phone 601-636-0024) and is scheduled for May 24, 2011 at 10:00. The meeting will be followed by a viewing of the Mississippi River from the visitor center and a viewing of the Yazoo River from Fort Nogales Hill in the Vicksburg Military Park, plus other tours. The meeting was moved to Vicksburg onto high ground when record flooding on the Mississippi River forced the closure of Tunica businesses and casinos. Flood risers were placed in the sea wall at Vicksburg on April 28 and 29. The fact is that the largest flood since 1937 is expected to occur when the Mississippi River crests in mid-May, 2011 at 53.5 feet (53.2 feet in 1937). Spring flooding on the Mississippi River is predicted to peak at a level 2nd only to the flood of 1927 which was the worst flood across the Delta to the loess bluffs. These flood event levels are clearly marked on the flood wall on Clay street in Vicksburg where the wall will soon be covered with water again. The area north of Vicksburg in Warren, Sharkey and Issaquena counties are the lowest elevation of the entire Delta. I graduated from Vicksburg High School in June 1973, the year of a record-setting flood on the Mississippi, and attended a Senior party in Hollandale in the Mississippi Delta that spring. Only the road was above the water for many miles north of Vicksburg.

The "Mississippi Delta" is a unique geographic and cultural region of Mississippi which is actually not a Delta at all, but is the large alluvial flood plain of the Mississippi River, one of the largest rivers in the world. The Delta encompasses 17 counties: Washington, DeSoto, Humphreys, Carroll, Issaquena, Panola, Quitman, Bolivar, Coahoma, LeFlore, Sunflower, Sharkey, Tunica, Tallahatchie, Holmes, Yazoo, and Warren. Historically, the Delta in the state of Mississippi begins on Catfish Row in Vicksburg, Mississippi and extends northward to the lobby of the Peabody Hotel in Memphis, Tennessee. The western boundary of the Delta is the Mississippi River and the eastern boundary is the "loess bluffs" which is a unique windblown, highly-erodible soil type deposited on top of the original soil. The "Mississippi Delta" still has a few remnants of the deep, dark hardwood forests that made up the primary ecology of the area, but land use has shifted almost exclusively to agricultural since this is some of the richest soil in the world.

Please contact either Laura Beiser at 601-961-5373 or Angel Rohnke at angel.rohnke@mmns.state.ms.us if you plan to attend the Spring Retreat on May 24, 2011 in Vicksburg, MS at 10:00 A.M.

Letter from the President of the MNPS

This spring has been the busiest I can remember. Partly because I had a lightened teaching load this semester (only two classes and one lab), I mistakenly thought that I could do a dozen other things that I've been wanting to do! So, I've got three undergraduates working on projects, and I've spent a lot of time in the field—for the first time in a while. One thing that has been done poorly is communication: I have received e-mails, calls, or notes from several of you and have not replied in a timely manner. So, there are probably a dozen neat stories about working with native plants that I could have included here in the newsletter, but I didn't make the time to talk to the people with them. Please forgive me. On the other hand, the time in the field has revealed to me even more treasures we have in this state. In Wayne County, for example, I have seen caves surrounded by southern maidenhair fern, bogs full of pitcher plants, and sandhills with turkey oak, pinewoods milkweed, and lady lupine—all within 20 miles of each other! Hopefully, I can put together field trips to some of these sites in the near future.

In Hattiesburg, USM has officially opened the Lake Thoreau Environmental Center. It includes a lake, upland longleaf pine forest, and bottomland hardwood forest full of neat native plants, including a few really large yellow poplars. There are several trails, and a platform for birding (and checking plant canopies, of course) is being constructed. It's now open to the public on the weekends free-of-charge, unless you want to fish. See

<http://www.usm.edu/news/article/southern-miss-announces-plans-lake-thoreau-center-eubanks-preserve> for more information.

Mac Alford, Ph. D.

Plants and Religion by Mac Alford

My planned trilogy of plants and taboo topics was interrupted last time, which places this article a little late for Easter/Pascha, but taboos are amazingly adept at keeping their shelf-lives. This issue's topic: religion. You would probably be horrified if you knew how many "interesting" telephone calls university professors receive. I started to get so many that I had to quit answering the phone. If there's one time of the year, though, that I got (and get) interesting plant questions, it's around Easter and involves plants of the Bible. Was Jesus crucified on a dogwood? Are there olives that date to the time of Christ? What is nard, the source of the perfume with which the woman anointed Jesus, and where can I buy it? Why were myrrh and aloes used for preparing the bodies of the dead? How does Easter Lily bloom on Easter every year, even though the day changes so much? And on and on. Not surprisingly, most of these questions do not involve plants native to Mississippi! But there are connections....

The most obvious connection is that plants play a prominent role in our religions, our traditions, and our cultures (all however entwined). In the northern hemisphere, this role is highlighted because Easter, the date of God/man's resurrection, is clearly on schedule with that of spring, the time of nature's resurrection. Thus, there are usually a lot of flowers in churches during the Easter season, and quite naturally, a church full of flowers has a special appeal. (For the recent royal wedding, there were even trees in the church!) What is even better are native plants around the church, church hall, and cemetery. For those of us who are members of churches, here's another area where we can (and should) play a role as native plant enthusiasts. Why bring cut dogwoods to church if we can plant them outside? Why fill mosquito-infested vases with silk flowers in cemeteries when we can plant beautiful or sweet-smelling trees and shrubs (e.g., southern magnolia, oaks, native azaleas, dogwood, snowbell) and hardy bulbous or bulb-like perennials (e.g., blazing star, iris, trout lily, wild indigo, trillium)? And let's not forget the children: here's another great opportunity for them to connect with their traditions and families ... and learn something about native plants at the same time.

The second connection is Lytton Musselman. Musselman is the author of a recent book entitled *Figs and Dates, Laurel and Myrrh: Plants of the Bible and the Quran*. So, no doubt you can guess it: I have used his book extensively in answering my phone calls and e-mails. I met him last year at the annual Association of Southeastern Biologists/Southern Appalachian Botanical Society meeting, and we have enjoyed several conversations about plants and religion, international work, and ... Mississippi native plants. (Among other things, he's a specialist on those terribly difficult-to-spot, rush-like quillworts, the genus *Isoetes*, of which we have a federally endangered species in Mississippi.) This year we met again, and there were moments of joy and moments of sadness. In sadness, the research continues to tell us that interest and training in the botanical sciences is dwindling in the U.S., although the demand for such knowledge is actually rather high. In joy, where students gave presentations on botany at the meetings, they were very good and they demonstrated that there are many botanical discoveries yet to be made in the southeastern U.S. The only problem for me was that most of the students were from Tennessee and were attending universities in Tennessee! We've got to get that same oxygen to our spark in Mississippi. Or, to use a religious metaphor appropriate for the theme, we need our mustard seed to germinate.

Southern Ladies and Birds Don't Sweat

Ladies Glow and Birds Pant - Evaporative Cooling: Nature Invented it First by Dr. John Guyton

Evaporative cooling or more specifically *swamp coolers* must have represented the pinnacle of enlightenment and the proudest technological achievement of the denizens of the swamp. Now, for sun-baked red-necks, a swamp cooler is not a case of beer in an ice chest or a newfangled beer-wine cross. When I was young and before we could afford an air conditioner, daddy built two swamp coolers, one for our home and the other for his shop. It was years before I understood the placement of the one in the house!

Our swamp coolers consisted of large box fans, each with four hardboard blades on a mandrel connected to an electric motor by a belt. The hardware cloth tacked across the front and back for protection also served as support for wicks that wormed their way up from a large metal pan of water. As the air was forced over the wicks, heat was extracted by the evaporating water molecules, thus

providing those in front of it with a steady cool breeze! It was also fun to speak into the rotating blades for their reverb/echo effect-but that is another story. . .

History credits Ralph Imhoptep IX, a distant relative of Ramses II in ancient Egypt, with accidentally discovering evaporative cooling while watching young belly dancers perform. Evidently hot and bothered he realized the breeze coming in an open window was refreshing. Once home he experimented with a wet linen robe and then he hired one nubile to fan him with a palm frond while another belly danced. According to the hieroglyphics on his tomb wall, Ralph died a happy man.

Evaporative cooling is one of the fundamental systems at work in nature. When we perspire in hot dry weather, the water evaporates, our skin dries and our body temperature drops. In order for water to evaporate it must absorb heat. As sweat evaporates heat is extracted from our bodies, wet clothing or the surrounding air, in effect cooling us. Water needs energy to speed up its molecules enough to burst through the water's surface tension escaping and becoming a gas. Temperature is a measure of molecular motion. In the process we lose heat, leaving us cooler. Now, did the Egyptians have a lock on this? I don't think so! This must have been an early intuitive observation! I figure our earliest ancestors, in order to leave the evaporative-cooled forest to roam the hot plains, had discovered the benefits of evaporative cooling and jumped into every water hole they encountered. It could not have taken people long to discover that when they were wet and the wind was blowing they were colder. Finally, these explorers may have realized anything they were carrying, that was wet, was cooler. Hum, humans may have started wearing clothing for its evaporative cooling effects!

We should not get too smug over our coopting of this fundamental natural system for our benefit. Animals and plants had been using evaporative cooling for many millennia before we arrived on the scene.

Birds lack sweat glands so they have to be more creative to stay cool. Most birds forage early and late in the day and search for shady places to bathe during the heat of the day. As opposed to fluffing up their feathers for insulation in the winter, they compress or flatten their plumage to give off more heat during the summer. They also use their unfeathered feet as radiators by increasing the circulation of blood, further cooling their bodies. On extremely hot days, birds pant dispelling moisture and inhaling dry cooling air that absorbs moisture and therefore cools their lungs. A common adaptation is *gular fluttering*, or inflating and deflating the skin on their throats while increasing blood flow, to dissipate heat much as a fan dissipates heat from a car's radiator. The same adaptation is used by dogs as they pant.

Killdeer, plovers, terns and many other birds stand over their eggs, shading them. When temperature become very hot some birds fly to the nearest water, soak their breast feathers, and return to the nest to wet their eggs or chicks. Belly-soaking helps to cool the adults and eggs at the nest through evaporative cooling.

Vultures and other large soaring birds have taken advantage of high thermals for eons to keep them several thousand feet up where the air is significantly cooler. Vultures and wood storks also take advantage of water evaporation by defecating on their bare feet and legs. Evaporative cooling is nature's plan for efficient microclimate control or one of nature's heat-sinking processes.

Why is the shade of a tree preferable to the shade of a building? A thermometer hung in both locations will provide a clue - it is cooler in the shade of a tree. If you are racing ahead you are correct - evaporative cooling again. Next time you call someone a bird brain remember that is a compliment - they have been building their nests in *air conditioned* trees for as long as they have been flying. Plants provide two huge benefits: shade and evaporative cooling. Leaf transpiration partners with evaporative cooling.

You can supplement your home's cooling as simply as growing deciduous trees on the south side of your house or deciduous vines, such as muscadine, Carolina jessamine or Virginia creeper against the walls to shade or insulate and cool them in summer and expose the walls to sunlight during the winter. If you have ever sat under a pergola or if you have a grape arbor you have enjoyed the same benefit. Shade houses were once very popular outdoors since they made an attractive and cool retreat from scorching summer temperatures. They were often complex structures of lattice and shade cloth and often featured vines growing over and plants suspended from them. The polyethylene fabrics available today resist rot and mildew and do not become brittle, and PVC pipes would make construction fast and easy, so consider building a shade house in the back yard or around your pool.

Drip systems use evaporative cooling and can be installed on the roofs of houses, where abundant water is available. Often these systems collect the water that does not evaporate and pump it back to the peak. Of course, you could use water from the rain barrel and allow it to water plants after trickling down the roof, although you need to monitor its temperature. Mist nozzles are also nice for decks, gardens and in children's outdoor play areas.

Evaporative cooling from aquariums below sunny windows also helps in homes, however you need to remember that the water will need to be changed more frequently since salt does not evaporate with the water and will accumulate. Aquatic features in the garden or yard perform similar functions.

Portable window boxes or vine walls in a box that you can roll around the deck provide shade, evaporative cooling, and privacy where you need it. If you plant evergreens in the rolling planter it is useful all year. You can always add some bulbs or flowers for a little color. Or what about an edible plants garden with blackberries or blueberries that you can pull up next to the table on the patio? If there is a little wind blowing you might use these to funnel the breeze to where you are lounging or working. They are also great for screening a window when not in use elsewhere. We can learn a lot from wildlife, and that can be pretty cool.

Editors suggestion - Slow down, take a vicarious field trip with your favorite native plant books as you peruse the following lists.

Trip Report for MNPS Roosevelt State Park Field Trip submitted by: Gail Barton

On Saturday, March 19, 2011 a small group of MNPS members met to botanize at Roosevelt State Park near Forest, Mississippi. We were fortunate to have Heather Sullivan as our field trip leader. Also in attendance were Gail Barton, Deb Mann, Jennifer Heffner and Tom Pullen. Jennifer's dog friend Mr. Otis Williams tagged along as well.

We first went to explore the trails near the frisbee golf course. As we arrived at the site we were immediately treated to large vistas of May apple (*Podophyllum peltatum*)*. We found the interesting adder's tongue fern (*Ophioglossum vulgatum*) along with three species of grape fern. We also encountered a blooming Southern twayblade orchid (*Listera australis*)* and a few lingering bloodroot (*Sanguinaria canadensis*)* blossoms. I enjoyed walking beneath a very large sassafras (*Sassafras albidum*) and we all studied the curious Devil's goblet fungi. Other plants that we encountered in this area included:

Arisaema triphyllum – Jack in the pulpit*

Arnoglossum ovatum – Indian plantain

Bignonia capreolata – cross vine

Botrychium biternatum - Sparse lobed winter grape fern

Botrychium virginianum - Rattlesnake fern

Botrychium dissectum - Dissected leaf grape fern

Callicarpa americana - beautyberry

Carpinus caroliniana - ironwood

Epifagus virginiana – beech drops

Euonymus americanus – strawberry bush

Gelsemium sempervirens – Carolina Jessamine

Ilex decidua – Possumhaw holly

Ilex opaca – American holly

Lonicera semervirens – coral honeysuckle

Luzula echinata - wood rush

Mitchella repens - partridge berry

Oxalis violacea – violet woodsorrell*

Phegopteris hexagonoptera -broad beech fern

Pinus glabra - Spruce pine

Pinus taeda – loblolly pine

Pleopeltis polypodioides Resurrection fern

Polygonatum biflorum - Solomon's seal

Polystichum acrostichoides Christmas fern

Pontederia cordata – pickerel weed*

Prunella vulgaris - selfheal

Salvia lyrata – lyre-leaf sage*

Senecio glabellus – butterscotch*

Smilacina racemosa - False solomon's seal

Smilax pumila – sarsaparilla

Solidago discolor - white goldenrod

Tipularia discolor - crane fly orchid

Trillium cuneatum – sweet little Betsy

Vaccinium elliotii – Mayberry

Viola cucullata – purple violet

Vitis rotundifolia – muscadine

We crossed the road to get back to our parking place and decided to walk up along the dam and explore some of the more weedy species in this disturbed area. The site was mown to about six inches. Still there were enough low blooming plants like bluets, clovers and chickweeds to attract several species of butterflies.

Our third stop was a low mesic woodland. At this site, the highlight for me were the native azaleas (*Rhododendron canescens*)* that were in bloom near a seep.

Other plants that we saw here included:

Antennaria plantaginifolia – pussy toes

Athyrium filix-femina - Southern lady fern

Chamaelirium luteum – Devil's bit

Euonymus americanus – strawberry bush

Itea virginica – Virginia sweetspire

Magnolia virginiana - Sweetbay magnolia

Nyssa sylvatica – black gum

Osmunda cinnamomea Cinnamon fern

Oxydendrum arboretum - sourwood

Pinus echinata – shortleaf pine

Sphagnum spp. - sphagnum moss

Symplocos tinctoria – horse sugar

Toxicodendron vernix - poison sumac

Viola primulifolia – primrose-leaf violet*

We adjourned around lunch time after spending a wonderful morning in the woods. All the plants marked with * were in bloom. Special thanks to Heather Sullivan for leading this trip and for proofing the Latin names given here.

The Current Distribution of the Florida Harvester Ant (*Pogonomyrmex badius*) in Mississippi by Tom Mann, Zoologist, MS Natural Heritage Program

Prior to 1935, Florida harvester ants were collected or reported from fourteen Mississippi counties: George, Harrison, Lowndes, Wayne, Jackson, Jones, Rankin, Forrest, Hancock, Jasper, Monroe, Perry, Pike and Winston. However, after 1934 and the invasion of Mississippi by the non-native fire ant (*Solenopsis invicta*), harvester ants were not reported from the mainland of Mississippi (they remain on Horn and Petit Bois Islands) until December of 2006, when a population was discovered on a Smith County sandhill by Lucas Majure (MacGown and Hill, 2007). Its apparent disappearance at most sites was assumed to be related to fire ant infestations and to the almost statewide aerial application of Mirex to combat the latter (MacGown and Hill, 2007). In June of 2007, during tortoise surveys in Lamar Co., I observed harvester ants at two sandhills, and hypothesized that harvester ants might have persisted since the 1930s on widely distributed, comparatively small patches of excessively well-drained soils, because these soils are typically less thoroughly infiltrated by fire-ants than more mesic soils (Deyrup, personal communication). Over the past 20 years I have observed that tortoise recruitment is higher on sandhill soils than on longleaf pine savannah soils, and have hypothesized that fire ant predation on hatchling tortoises is less efficient in the former, and is a component of this difference in recruitment success.



Since June of 2007 research staff of the Mississippi Museum of Natural Science (MMNS), occasionally assisted by others, have conducted presence/absence surveys for harvester ants, gopher tortoises, oldfield mice, and other rare species on approximately

180 sandhills throughout southeastern Mississippi, mainly south of I-20, but also including Lauderdale and Lowndes Counties north of I-20. I am primary investigator for the harvester ant component of these surveys, which were undertaken in 22 counties, including 17 of the 19 counties in which tortoises historically occurred. Only 12 of the sites on which harvester ants were sought were on public land, and only two of the sandhills (both private tracts) were in good condition in terms of community composition and structure. Sandhills, herein defined as discrete deposits of excessively well-drained soils which never flood, were located with maps produced from digital data available from the Natural Resources Conservation Service and maps of excessively well-drained soils produced by the National Forest Service. For counties in which detailed soil maps are not or were not available (Greene and Perry), I examined aerial imagery available from mapper.acme.com, seeking reflective patches indicative of the skimpy herbaceous cover typical of excessively well-drained soils. Coordinates and activity status of all harvester ant beds, gopher tortoise burrows, and oldfield mice burrows were recorded; voucher specimens of ants were collected at each site and coordinates and voucher specimens/photographs were taken for rare plants. Gopher tortoise burrow width and height were recorded. Burrows 22.5 cm or less in width were assumed to be constructed by juvenile or subadult tortoises. I primarily searched open patches of habitat at each sandhill, as these are most likely to yield harvester ant mounds, the principal focus of my survey. I doubtless missed tortoises, mice and ants present in thicker cover. In addition, during comprehensive surveys for gopher tortoises on all excessively well-drained soil units (also known as "priority soils") on the DeSoto National Forest (DNF) (Bailey, 2009), surveyors were requested to look for harvester ant mounds.

Thirty-three harvester ant populations (on separate and discrete sandhills) were discovered in the following 10 counties (the last 5 of which are county records): Lowndes, Wayne, Perry, Lamar, Harrison, Smith, Greene, Pearl River, Stone, and Lauderdale (map at mississippinativeplantsociety.org). This map includes the population discovered by Lucas Majure, and each of the subsequent discoveries except the Lowndes Co. site at Chittlin Corners. Will McDearman discovered the northernmost Lamar County population; Scott Peyton (MMNS) found the Lauderdale and Lowndes Co. populations; Mark Bailey and his tortoise survey crews found two populations on the DNF during surveys on 174 priority soil patches; and I found the remaining 27 harvester ant localities. Typically, 1-3 mounds were observed per site, though the Plum Creek tortoise mitigation site just north of Richton had more than 50 (Brad Smith, pers. comm.) and the Leakesville and Lowndes County sites had 11 and 8 (at least) respectively. Harvester ants still occur on the mainland in 10 counties, and in 8 of these occur within the range of the tortoise. The species has not been observed at Camp Shelby or within the entire Special Use Permit area by biologists conducting extensive and intensive surveys of species of special concern since 1993 (Hinderliter, pers. comm.). This area encompasses 136,000 acres, including approximately 102 discrete aggregations of gopher tortoises (Wester, 2005), but most tortoise aggregations at Camp Shelby are on well-drained rather than excessively well-drained sand.

Tortoises occurred at a large majority of the sandhills surveyed and at at least 28 of the 30 harvester ant sites within the range of the tortoise. . Twenty-three (82%) of tortoise sites with harvester ants had juvenile or subadult tortoise burrows; only 50% of 128 DNF sites with tortoises manifest evidence of recruitment (Bailey, 2009). I discovered new oldfield mouse (*Peromyscus polionotus*) populations at 11 sites surveyed for harvester ants (Clarke, Jasper, and Wayne Counties) and Scott Peyton found additional oldfield mouse populations elsewhere in these counties and in Lauderdale Co.

Eight new Florida Rosemary (*Ceratiola ericoides*) sites were discovered. This is the closest approximation to a scrub community in Mississippi, and to be maintained probably requires long-interval, hot fire. None supported harvester ants, probably because of the sparse herbaceous layer in the long absence of fire, though I have often observed harvester ants in rosemary scrub communities in southeastern Florida. All supported tortoises, and juveniles were present. New populations of other rare plant species were also discovered, including sandyfield beaksedge, (*Rhynchospora megalocarpa*), 11 populations; Pickering's dawnflower (*Stylisma pickeringii*), 4; pinewoods milkweed (*Asclepias humistrata*), >10; a low growing shrub known as coastal sand frostweed or sunrose (*Helianthemum arenicola*), 2; Mohr's threeawn (*Aristida mohrii*) a perennial grass, 2; beach or seaside threeawn grass (*Aristida tuberculosa*), 3; wire sedge (*Carex tenax*), 8; and skyblue lupine (*Lupinus diffusus*), 8. The latter (skyblue lupine) was discovered just northwest of Waynesboro by Heather Sullivan in April of 2011 on a sandhill at which I found tortoises and oldfield mice in 2009. We have started to re-survey sandhills in this area for this lupine, and to date have found 3 populations in Wayne County, 3 in the Leakesville area in Greene Co. and 1 in George Co.

Wilson (1951) noted the scarcity of two native fire ant species and of *Pogonomyrmex badius* in areas near Mobile, AL, infested with the invasive fire ant. Harvester ants now seem to be limited to excessively well-drained soils in sandhill habitat or what was formerly sandhill habitat, though anecdotal observations indicate that they historically also occurred on well-drained soils in Mississippi (T. Lockley, pers. comm.; Don Gatlin, pers. comm.), Georgia (L. Davis, pers. comm.) and Louisiana (L. Sharp, pers. comm.) forty to seventy years earlier. Older collection records from the Mississippi State Entomological Museum and elsewhere (J. MacGown, pers. comm.) do not provide sufficient collection site resolution to address the question of a possible reduction in the soil types available to harvester ants since the arrival of the fire ant. It is suggested that fire ants may be less effective as predators/competitors on the most drought-prone soils, which hold fewer fine particles important to the architecture of fire ant nests and that this might correlate with the continued presence of harvester ants and with greater reproductive success of gopher tortoises on such soils. Most tortoise populations at Camp Shelby are located on well-drained soils, not excessively well-drained soil. Epperson and Heise (2003) found that the known take of hatchling and juvenile tortoises by fire ants at Camp Shelby was sufficient, given other predation sources, to prevent recruitment necessary to sustain the tortoise population.

Most sites at which harvester ants and tortoises still occur have been significantly degraded. Threats include sand mining, fire suppression, habitat conversion to dense stockings of off-site pine species (generally loblolly pine), highway construction, urban/suburban development, aerial application of persistent, broad-spectrum herbicides during site preparation, indiscriminate broadcast of fire ant poisons, cogon grass invasion, fire ant invasion (facilitated by limb and leaf litter accumulation in the absence of

fire), over-reliance on dormant season burning, and “land farming” (addition of drilling wastes to excessively well-drained soils to improve fertility and tilth). Remaining habitat patches are highly disjunct, rendering re-colonization by harvester ants, which is only possible by winged, newly emergent queens after breeding swarms, very unlikely. Mississippi’s sandhill habitat is ranked as critically imperiled.

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Roadside Right of Way Wetlands by Edward D. Entsminger

Strips of roadside ditches are morphing into wetlands because of road developments. The construction of roads inadvertently creates functional wetlands that are governed by wetland regulations. A few wetland indicator plants found on our roadside right of ways include common cattail (*Typha latifolia*), common rush (*Juncus effusus*), sticktight/beggerstick (*Bidens sp.*), sedge (*Carex scoparia*), slender spikerush (*Eleocharis tenuis*), Pennsylvania smartweed (*Polygonum pensylvanicum*) and black willow (*Salix nigra*).

Vegetation in ditches improves water quality by reducing erosion, increasing filtration, absorbing nutrients and recharging aquifers while supporting additional habitat for threatened and endangered species and others. Ditches undergo regular disturbances such as mowing and road maintenance which cause severe changes in soils, groundwater and surface hydrology. The saturated soils in roadside wetlands provides substrate for aquatic flora to establish roots and grow, therefore creating a wetland ecosystem and wildlife habitat. Vegetated ditches serve to carry runoff, preventing the flooding of roads. Road ditches may not always contain water, but many still represent wetland ecosystems and serve as connections to upstream and downstream adjacent wetlands, channels, creeks and rivers. If a ditch has “significant connectivity” to navigable waters, it is considered jurisdictional. The Clean Water Act requires mitigation for any loss of wetlands resulting from construction activities. Seventeen wetland projects in the United States are a result of compensatory mitigation for impacts to wetlands caused by highway construction under Section 404 requirements of the Clean Water Act. Wetlands created by road developments are classified as Wetland Conservation Act-regulated wetlands. Research has revealed a significant increase in the amount of roadside wetlands, and numerous wetland wildlife species have been observed using and successfully raising offspring in roadside wetlands. Anthropogenic ditch wetlands associated with road development provide additional nesting habitat and foods for many wildlife species.

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The 13 Year Cicadas Have Arrived on Schedule by John Guyton, Education Chair

The red eyed periodical cicadas (*Magicicada*) have arrived on schedule and can be identified by their red eyes. *Magicicada* emerge every 13 or 17 years and the male promptly begins singing a love song. Normally they quit singing at night but just for fun, find a cicada at night and shine a strong flashlight on it for a few minutes and see if you can convince him to perform a serenade. The green annual cicadas (*Tibicen*) we see every year have a three year life cycles that overlaps so we see them every year. After mating the female deposits several hundred eggs in twigs. In 6 to 8 weeks the eggs hatch and the nymphs fall to the ground where they burrow in search for roots to sustain them, occasionally molting. Look for the dime size holes near tree trunks where they emerge and count the number per square meter or yard to estimate their abundance, and pay attention when you are mowing the grass to see if your loud noise attracts them!

