CLAYTONIA

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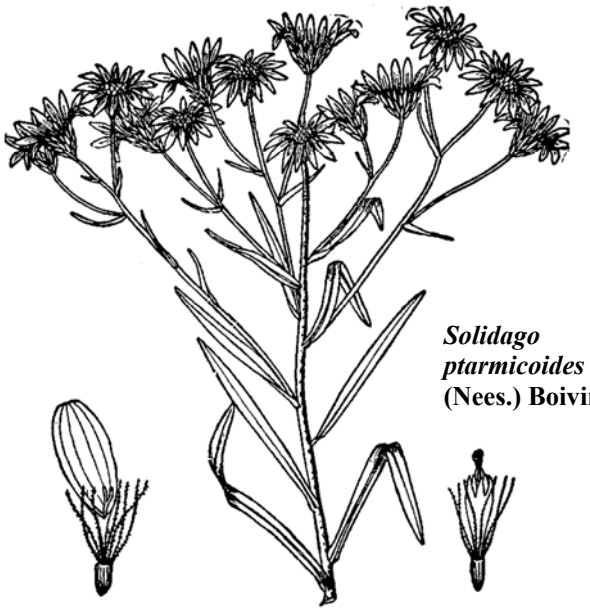
In this issue:

White-Flowered Goldenrod (*Solidago ptarmicoides*) Rediscovered in Northwest Arkansas after 125 Years!

by Theo Witsell

Joe Woolbright, of Ozark Ecological Restorations Inc., made a significant discovery late last summer while he was conducting restoration work at Chesney Prairie Natural Area in Benton County. While walking through the drier, upper end of the prairie, he noticed a number of white-flowered composites that he hadn't seen before, despite scores of trips to the site over the past several years. After some study, Joe correctly identified the plants as *Solidago ptarmicoides*, the white-flowered goldenrod, a rare species not documented from that part of the state since 1879.



***Solidago ptarmicoides* (Nees.) Boivin**

White-flowered goldenrod is rare in Arkansas and is tracked by the Arkansas Natural Heritage Commission as an element of special concern. It is a species of native grasslands (prairies and glades) and of open savannas and dry, rocky woodlands – all habitats that have seriously declined throughout the region. Prior to Joe's discovery, it was known in Arkansas from just three collections, from scattered sites in the Ozark Mountains. In September of 1879, it was collected by F. Leroy Harvey from "flint hills" in Washington County—a site that was never relocated. The next known Arkansas record is from Mary Alice Beer of Fairfield Bay, who collected it in Van Buren County on 31 August, 1990. On a field trip during the Fall 2004 ANPS Meeting, Mary Alice showed a small group of ANPS members a second, nearby population that she found in a power line right-of-way in Cleburne County. She also showed us the Van Buren County site but explained that she had not seen plants there in several years. It was next collected on 1 August 1991 by Phil Hyatt from a sandstone glade on the Sylamore Ranger District of the Ozark National Forest in Baxter County.

In his *Atlas and Annotated List of the Vascular Plants of Arkansas* (2nd edition, 1988), Dr. Ed Smith had an "R" listed for this species in Benton County, meaning that he had

knowledge of a reliable report that was not substantiated by a specimen. There is, however, no record of where that site was, when the plant was observed, or who reported it. It is possible that it was observed by someone at the Rice Prairie near Siloam Springs, where a number of botanical trips were made by botanists prior to 1988. Unfortunately, this site was destroyed forever when it was converted to a bean field in 2000. With the destruction of the Rice Prairie, there are only three small remnants of native prairie left in Benton County: Chesney and Stump Prairies northwest of Siloam Springs, and Searles Prairie in Rogers. Stump and Searles Prairies should be intensively checked for this species next year.

Solidago ptarmicoides looks a lot like a white-flowered species of aster. In fact, it was long included in that genus, as *Aster ptarmicoides*, until it was observed that it hybridized readily with some species of goldenrod. It is a member of the flat-topped section of goldenrods, which some authors put in the segregate genus *Oligoneuron* (as *Oligoneuron ptarmicoides*). In Arkansas, white-topped goldenrod differs from our white-flowered species of aster by having both white ray and disk flowers (as opposed to white ray flowers and yellow disk flowers in the asters) and a flat-topped inflorescence or flower arrangement. These differences can be subtle and will probably require the collection of a voucher specimen for confirmation.

Woolbright, who manages Chesney Prairie under contract with the Arkansas Natural Heritage Commission, believes the sudden appearance of the species at Chesney Prairie is likely a direct result of the reintroduction of (prescribed) fire to the area in recent years. He led a field trip to the site during the 2004 Arkansas Grass Identification Workshop and specimens were collected to voucher the occurrence. These will be deposited at the U of A Herbarium at Fayetteville and the herbarium of the Arkansas Natural Heritage Commission in Little Rock. If you believe you have found a site for this species, please contact the Arkansas Natural Heritage Commission at 501.324.9615 or email theo@arkansasheritage.org.

Montgomery County Floristic Inventory Yields 1,111 Taxa of Vascular Plants

Travis Marsico, who recently graduated with a Masters degree in botany from the U of A Fayetteville, and is now pursuing a PhD in Plant Ecology at Notre Dame University, has documented 1,111 kinds of vascular plants from Montgomery County, Arkansas. The Montgomery County Flora was completed as part of Travis's Masters Thesis. He also completed an ecological study of the endemic Arkansas plant Browne's waterleaf (*Hydrophyllum brownei*) [*see Plant of the Issue- ed.*]. Travis not only documented what species were found in the county, but where they were found, what habitats they were found in, how many and which are considered native (975), how many and which are introduced (136) and which of these are considered invasive, and which are tracked as rare or vulnerable by state and federal agencies (58 total). A detailed report on his findings is being sent to the botanical journal *Sida* for publication. Congratulations to Travis on his thesis and graduation!

Ouachita and Ozark-St. Francis National Forest Plans Available for Review and Comment

The official public comment periods for the *Proposed Revised Forest Plans and Draft Environmental Impact Statements* for both the Ouachita and Ozark-St. Francis National Forests are open and the draft plans are available for review. These plans will determine how the forests will be managed for the next 10 to 15 years and the Forest Service is soliciting public comment until May 20, 2005. The documents can be downloaded from the following websites: Ouachita National Forest = http://www.fs.fed.us/r8/ouachita/ , Ozark-St. Francis National Forest = http://www.fs.fed.us/oonf/ozark/ .

Gates Rogers Foundation Announces Project

The Gates Rogers Foundation, a 501c-3 non profit organization established in 2001, announces its initial project: the "South Fork Native Plants Preserve" located on Greer's Ferry Lake. The Foundation, established by an endowment from Mr. Victor C. Gates of Choctaw, Arkansas, intends to establish a Native Plants Preserve on the land donated to the Foundation by Mr. Gates. The land, encompassing an entire peninsula on the lake, is located on the South Fork of the Little Red River near point 14A on the lake map. The Foundation has hired Arkansas Native Plant Society members Brent Baker and Theo Witsell to provide a Comprehensive Floristic Inventory and Habitat Assessment of the project land. The Gates Rogers Foundation is committed to protecting and preserving Arkansas native flora and fauna in a manner that ensures and encourages public access, esthetic appreciation, and an understanding of the importance of biodiversity preservation. The Foundation is dedicated to the development, application and dissemination of ecologically sound land management practices that further this mission.

For more information visit their website at www.gatesrogersfoundation.com.

PLANT OF THE ISSUE: BROWNE'S WATERLEAF

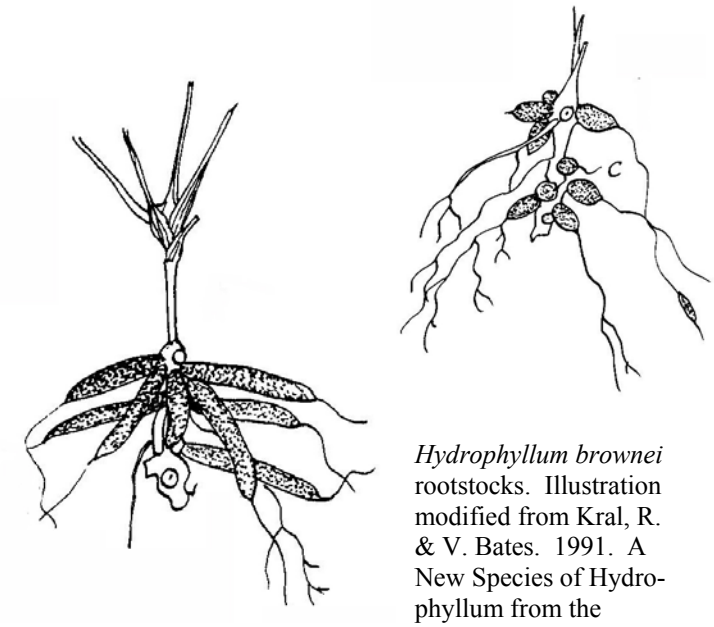
Browne's waterleaf (Hydrophyllum brownei). Photo by John Pelton.

Discoveries of new plant species don't happen everyday, especially not in temperate parts of the world, or in areas as well-explored as Arkansas. That doesn't mean, of course, that we don't still have species to discover here, just that it is really exciting when they are found! The plant of this issue is one that was described fairly recently from the Ouachita Mountains. Browne's waterleaf (*Hydrophyllum brownei* Kral & Bates) was described new-to-science in 1991 by Dr. Robert Kral of Vanderbilt University and Vernon Bates, who was exploring and collecting plants in the Ouachita National Forest of western Arkansas and eastern Oklahoma. Browne's waterleaf is known only from seven Arkansas counties, all in the Ouachita Mountains, and is the only species of *Hydrophyllum* known from that region.

The species is globally rare, carrying a global rank of G2 (typically meaning there are just 7-20 known viable occurrences in the world, or having some other factor that contributes to its being vulnerable). It grows on shady, rich, wooded stream terraces and can be found in bloom from early April to early May. Though there are specimens of the plant (now known as Browne's waterleaf) dating back to 1837 (collected by Dr. George Engelmann along the Saline River), it wasn't until Bates collected a proper specimen (with roots included) that it was understood that the material from the Ouachitas represented a new species. The 1837 specimen, and all others collected from the Ouachitas prior to Bates' specimens, were "top-snatched" (only the above ground portions were collected) and all were identified as the superficially similar species *Hydrophyllum macrophyllum*. The most obvious difference between *H. brownei* and *H. macrophyllum* is the presence of obvious "sweet-potato-like" tuberous thickenings on the roots of *H. brownei* (there are also less obvious, but equally diagnostic differences in flower and hair structure between the species). These tubers are absent from all other species of *Hydrophyllum*.

With the addition of *H. brownei* to the state's flora and the subsequent exclusion of *H. macrophyllum* (which grows only east of the Mississppi River), we now have three species of this genus in Arkansas. *Hydrophyllum appendiculatum* and *H. virginianum* both occur in the Ozarks, but are not known from the Ouachitas (or any other part of the state).

There are now a total of 27 known sites for Browne's waterleaf in Garland, Howard, Montgomery, Pike, Polk, Saline, Sevier, and Yell Counties. A number of these are in the Ouachita National Forest, but two of the easiest places to see it are at the Cossatot River State Park Natural Area (along the river below the visitor's center) and at Big Fork Creek Natural Area in Polk County.



Hydrophyllum brownei rootstocks. Illustration modified from Kral, R. & V. Bates. 1991. A New Species of Hydrophyllum from the Ouachita Mountains of Arkansas. Novon 1:60-66.

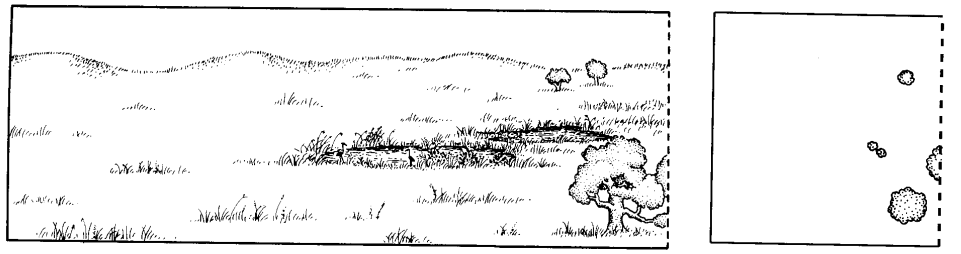
Prairies Part 3: The Role of Fire in Prairies, Savannas, and Woodlands

by Theo Witsell

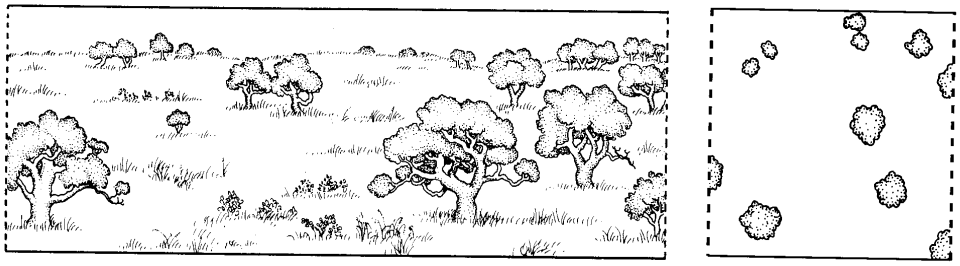
As mentioned in previous issues of *Claytonia*, there are three main ecological processes that work to maintain prairie and woodland ecosystems. These are drought, fire, and native grazing. This article will focus on fire – its role historically, how it works to shape plant communities, and how it is used in the restoration of prairies, savannas, and woodlands.

In Arkansas, as in other states on the eastern edge of the tallgrass prairie biome, fire is the major ecological process responsible for the maintenance of most of our native grasslands and associated woodlands. These ecosystems were made by and for fire. The plants are dormant in the late fall and winter and the above ground vegetation is flammable for a large part of the year. Many of the herbaceous plants native to this ecosystem have most of their biomass below ground and can withstand repeated fires. In presettlement times, when the fall storms would arrive and lightning would strike on a large expanse of dry grassland, it could burn for miles until it came to a natural firebreak or rainstorm. Woodlands along streams and at the edges of grasslands would burn as well, becoming more open in times of frequent fire and more dense in periods without much fire. Native Americans, and in some cases European immigrants, would also burn the prairies and woodlands to make travel easier, to improve wildlife habitat, and to encourage the fresh shoots of the grasses which were favored by bison, and later, by cattle.

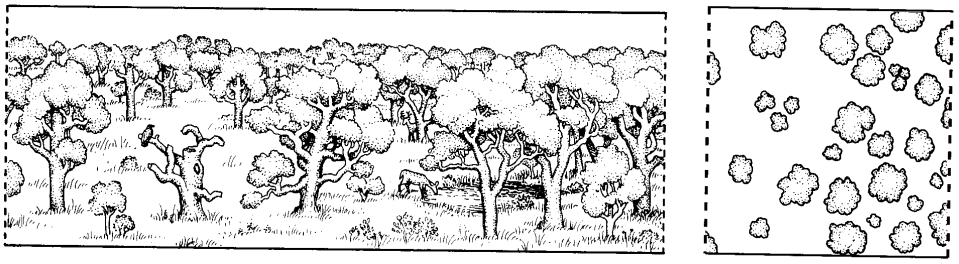
In the context of this discussion, as we will talk about the continuum of habitats from prairie to forest, we will need to define four very specific terms: **prairie**, **savanna**, **woodland**, and **forest**. These relate to the density of trees on a landscape and, while they are sometimes defined by a specific number of trees per acre, or a certain basal (trunk) area or canopy area per acre, we will define them



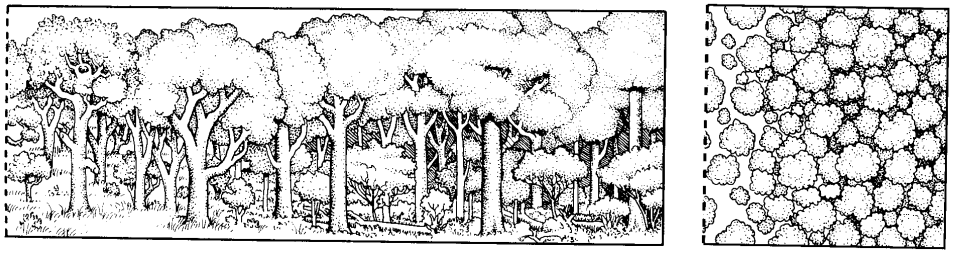
A. Prairie: Grassland with few or no trees.



B. Savanna: Grassland with scattered trees. Trees may be oaks or pines, well-spaced or in clusters. May have extensive areas of shrubs and tree resprouts.



C. Woodland: An open forest with a vigorous turf of grasses and flowers throughout the growing seasons. Depends on frequent fire. Many trees have spreading lower limbs. Bright enough for oak or pine regeneration (i.e. less than 80% canopy cover).



D. Forest: Closed canopy—may be of fire tolerant species (oak & pine) or fire intolerant species (maple, beech, etc.) on infrequently burned sites. Shade tolerant species of understory trees and shrubs are present. Herbs are mostly spring ephemerals (dormant in summer) or are scattered and thin.

Figure 1. The prairie-forest continuum. Modified from *The Tallgrass Restoration Handbook* (Island Press).

more loosely here. For this article, we will consider the following: **prairie** (few or no trees – dominated by prairie grasses and forbs), **savanna** (very few scattered trees, with an herbaceous layer dominated by prairie species), **woodland** (more trees than a savanna, but less than a forest, with a mix of prairie and forest herbaceous species), and **forest** (dense, closed canopy with a shade-tolerant understory) [see figure 1]. When we use the term "prairie species" we mean those native plant species characteristically found in prairies and glades that need full sunlight, and are fire tolerant or dependent. *

How Does Fire Work?

The most obvious function of fire in prairie and woodland ecosystems is that fire suppresses woody plants (shrubs and trees) and favors herbaceous species of forbs and grasses. Savannas and open oak woodlands survive because of fire, without which brush and shade-tolerant trees would invade. Fire suppresses woody plants in two ways. First, it stimulates the prairie plants to form a vigorous sod, which prevents the establishment of woody plant seedlings. Second, fire kills the above ground portions of smaller woody plants, weakening brush (but rarely eliminating it entirely). Deciduous woody plants will resprout from the base but conifers like pines and eastern redcedar (a major invader of prairies and woodlands in Arkansas) will be killed completely provided all the needles are brown following the fire. Even a small percentage of green needles can carry these species through, however. Needless to say, the goal when burning a woodland or savanna is not to kill the largest trees. Whether this is a pine system or an oak system, the dominant (largest) trees are, by their nature, fire tolerant. They have bark thick enough to withstand fires that would kill the fire-intolerant species that have invaded the site since fire suppression, or even smaller specimens of their own species.

Another obvious result following fire is that more plants flower, produce seed, grow taller, and are more robust than the previous year. This is in part due to the removal of leaf litter and thatch but is also likely the result of increases in the available nutrients in the soil. Fire does this through indirect stimulation of soil microbial activity and by releasing small amounts of nutrients from the ash. Following a fire, careful observers might also notice a decrease in cool-season invasive Eurasian weeds (exotic species which originated in the cool meadows of Europe). This is the result of a not-so-obvious effect - fire lengthens the growing season for most native prairie plants and shortens it for many exotic Eurasian weeds. Fire lengthens the growing season for native prairie species (which do best in warm soil) by removing the leaf litter and thatch and exposing a darkened soil surface to the warming rays of the sun. In the absence of fire, the light-colored leaf litter reflects the sun and acts like a blanket, insulating the ground, slowing the soil-warming process and smothering new seedlings. This fire effect may increase the growing season by as much as four weeks. On this same note, fire shortens the growing season for many cool-season weeds (which go dormant during the heat of the summer) by warming the soil and causing the roots of these species to stop growing. Also, fall burns done after the native species have gone dormant can burn off several inches of growth on the cool-season plants, weakening them further.

Restoring Prairies, Savannas, & Woodlands With Fire

The results following a burn can be dramatic! Species that were there before in very low numbers can suddenly become common. It is not at all uncommon for species that were not there before to suddenly appear, sometimes in great numbers. These were present in the seedbank, or perhaps were barely hanging on - a single small leaf getting just enough light to keep the plant alive, but nowhere near enough to flower. Under the right conditions, this sort of response can be seen following a single burn, though these sorts of results may take several burns to achieve.

Once fire is reintroduced to a forest or woodland, it will allow more light to penetrate, which is good for most plants. This, in turn, will stimulate herbaceous plant growth, which increases the fuel for the next fire. The next fire might then be more intense, which will allow even more light to penetrate, stimulating even more herbaceous plant growth, and so on. If, however, fire is excluded for a long enough period (just a few years in some cases), the woody plants will again become dense, the herbaceous plants will die out, and low-intensity fuels (like leaf litter) will dominate. It should also be noted that when a forest reaches a certain density, fire alone will not be effective in restoring it to woodland or savanna conditions. For example, ground layer fuels in an Ozark glade that has been completely overgrown with cedars for a number of decades will not support a fire hot enough to kill the cedars and begin the cycle of reopening the glade. In cases like this, a certain percentage of the cedars (or other trees) will have to be mechanically removed to allow the herbaceous fuels to build up to a level where fire will work its magic.

Benefits to Wildlife

The benefit of fire restoration to the wildlife native to these ecosystems can also be dramatic. There is more herbaceous cover in a burned system, which is good for many animal species. There are more flowering plants, so butterflies and other nectar feeding insects have more food. Quail and other grassland bird species (many of which are in decline) need this open habitat structure. Specialist insects (including many butterflies and moths) that need specific prairie plants benefit from increased populations of their host plants. There are legitimate concerns that burning an entire isolated prairie or savanna remnant will do harm to insect and other animal populations. This can be avoided by leaving sizable portions of the area out of the burn unit in order to leave a refuge for these animals. These will then recolonize the burned areas the following year and reap the benefits of increased flowering, seed set, and plant vigor. Timing of a burn can also be important to wildlife.

Where Was Fire Historically?

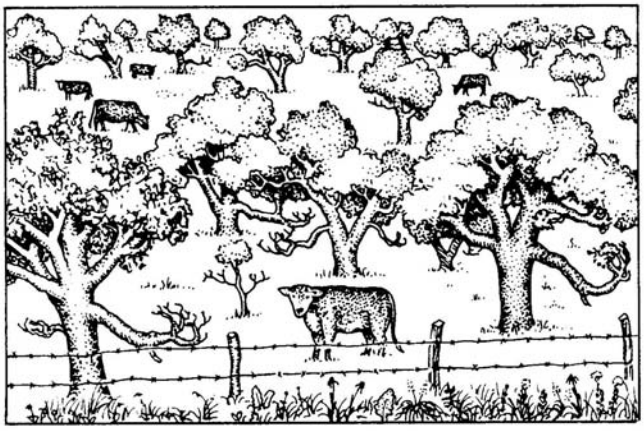
Today's landscape is so different from that of the past that it is hard for us, today, to understand the magnitude of fire's role in shaping plant communities in Arkansas historically (and prehistorically). Early explorer and settler accounts can provide

us with a glimpse into this past character in many areas. Many of these accounts described large areas of the Ozark and Ouachita Mountains as being treeless on the ridges with open oak or pine woodlands and savanna on the slopes, and forests only in the valleys (and in fire-protected areas in canyons and on some north- and east-facing slopes). In the absence of fire, following the fragmentation brought on by settlement, this open landscape became encroached by the steady march of woody species, and prairie openings, savannas, and woodlands transitioned to shrublands and forests.

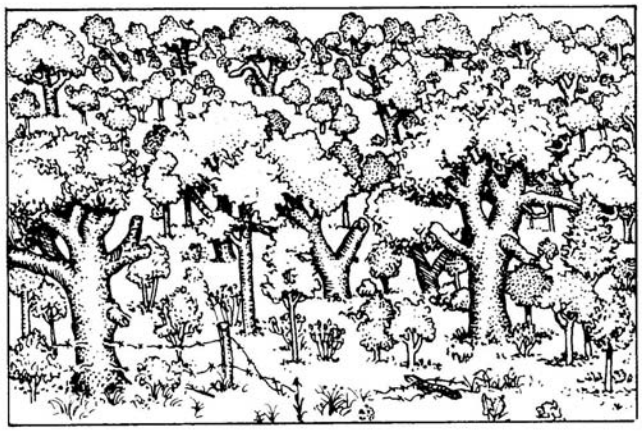
Nowhere in our region, perhaps, is this loss of open habitat more evident than in the rocky glades and hilltop prairies of the Ozark Plateau. When Henry Rowe Schoolcraft traveled through the White River Hills (in what is now northern Arkansas and southern Missouri) on December 29, 1818, he described the character of the land in the following passage:

"The country passed over yesterday, after leaving the valley of the White River, presented a character of unvaried sterility, consisting of a succession of limestone ridges, skirted with a feeble growth of oaks, with no depth of soil, often bare rocks upon the surface, and covered with coarse wild grass; and sometimes we crossed patches of considerable extent, without trees or brush of any kind, and resembling the Illinois prairies in appearance, but lacking their fertility and extent. Frequently these prairies occupied the tops of conical hills, or extended ridges, while the intervening valleys were covered with oaks…"

A: In 1800 the savanna looked as it may have looked 5000 years ago. In that period, it would have most likely spent some time as both prairie and forest.



B: 1910. Pasture. This site had been a pasture now for half a century. Despite the absence of fire, the overall savanna structure and much of the species persisted because grazing kept brush down, although many savanna herbs, butterflies, etc., survived only on an adjacent railroad right-of-way, which remained ungrazed and burned regularly from sparks from passing trains.



C: 1980. "Preserve". The site was acquired in 1960 by a conservation agency, but at that time there was little appreciation of the savanna's need for fire. At first the native fauna and flora began to recover from 120 years of grazing, but at the same time brush began to invade.

D: 2010. "Preserve". The understory herbs have been almost entirely shaded out, and most original plant and animal species are gone. Unlike an orginal forest, this new forest has little biological diversity. Most of the original (and now rare) species of this site have been lost—replaced by relatively common, aggressive species.

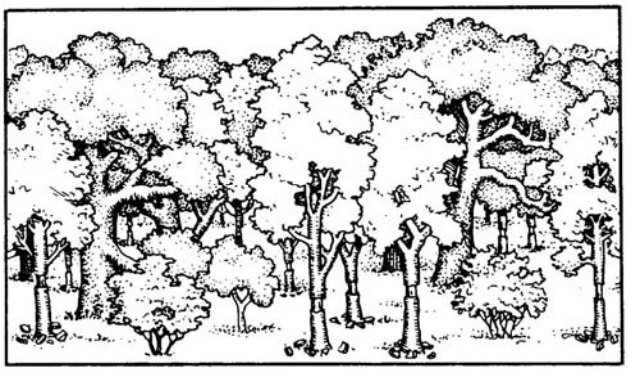
Figure 2. Savanna succession without fire. These drawings show one fate of a hypothetical "preserved" savanna that receives no burning or other restoration. Modified from *The Tallgrass Restoration Handbook* (Island Press).

Schoolcraft's rocky barrens and prairies, of course, were not really characterized by "unvaried sterility" in the botanical sense. They were dense with a tremendous diversity of native grasses and forbs. Today, however, one is hard-pressed to find more than a trace of this sort of landscape in this area. There are a few small open areas, mostly in areas that are used as hayfields or kept open by periodic mowing in powerline or gasline rights-of-way. The majority of these areas, in the absence of fire, are now dense and often impenetrable monocultures of the native, but aggressive, eastern redcedar (*Juniperus virginiana*).

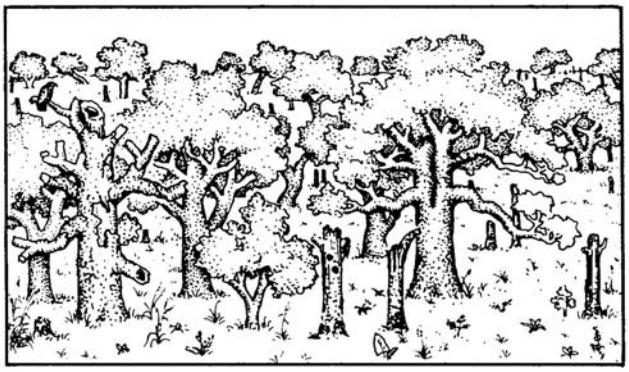
Another striking passage in Schoolcraft's journal is his description, written on December 9, 1818, of Sugarloaf Prairie and Sugarloaf Knob, just north of present day Lead Hill, Arkansas:

"…arrived at an early hour in the afternoon at the house of a Mr. Coker, at what is called Sugarloaf Prairie. This takes its name for a bald hill covered with grass rising on the verge of the river alluvion on the west side of the [White] river, and is discernible at the distance of many miles."

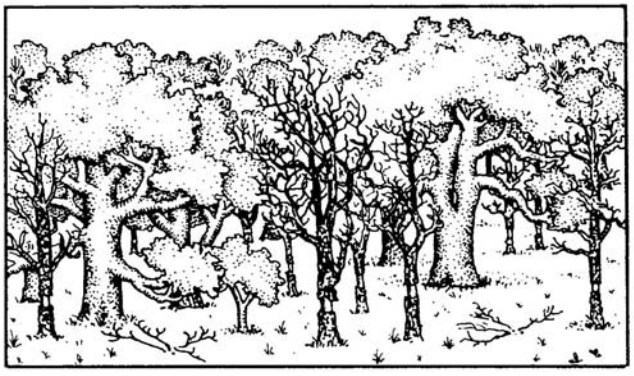
Today Sugarloaf Knob (located 1.5 miles NE of Lead Hill in Boone County, Arkansas) is wooded to the top, mostly with cedars, but with several species of hardwoods as well. Last spring I explored some parts of it with Linda Ellis, John Logan, Tim Smith, and Paul McKenzie (all experienced plant hunters from Missouri). We found vestiges of Schoolcraft's Sugarloaf Knob tucked away in a few roadsides, powerline cuts, and in the few open areas left on the knob. In these little nooks we found native grasses and plants of the showy beard-tongue (*Penstemon cobaea*), fringed puccoon (*Lithospermum incisum*), Trelease's larkspur (*Delphinium treleasei*), smoke tree (*Cotinus obovatus*), Nuttall's dwarf morning glory (*Evolvulus nuttallianus*), and Crawe's sedge (*Carex crawei*), among many other now uncommon glade and grassland species. Still, most of the knob was thick with woody plants – nothing beneath them but a few shade-tolerant species and thick layers of leaves and cedar duff.



A: 1981. Restoration begins. The site was burned in the fall of 1980, and the girdling of invasive tree species was begun in May 1981.



C: 1990. Restoration "completed". Aside from regular prescribed burning, this site may now need little additional work.



B: 1983. Intensive restoration. For the first few years, aggressive weeds and brush were carefully controlled. Seeds gathered from nearby threatened remnants were broadcast throughout the site.

D: 2010. Nature proceeds. In centuries to come, such sites may be the only places at which hundreds of savanna species survive. The restored savanna is different from the 1800 savanna, but it is a natural descendent from it and contains most of its original species.

Figure 3. An alternative, restoration-based outcome for the savanna remnant in figure 2, beginning with its condition as shown in 1980. Modified from *The Tallgrass Restoration Handbook* (Island Press).

Many other examples of our loss of open grassland habitats to fire suppression can be found in interpretation of the original General Land Office (GLO) survey notes** for the state. By and large, these tell us that much of the forest in Arkansas is considerably more dense today than it was historically. Similarly, remnant glades and prairies are smaller in many areas today than they used to be. We know that in prairie regions, wooded areas along streams are larger and more dense than they were historically. For example, we can look at the 22 acre Konecny Grove Natural Area in the Grand Prairie area of Prairie County. Today, Konecny Grove is a wet sugarberry/elm/ash/hawthorn woodland/forest with a nearly closed canopy. A number of plants that occur in the understory of this woodland (particularly around the edges where sunlight can penetrate) provide hints that it was once much more open than it is today.

One of the few remaining intact savannas in Arkansas (with a small saline soil barrens in the foreground) is on this site at Fort Chaffee Military Reservation. It has only persisted due to the frequent fires ignited on a nearby bombing range. Photo by Theo Witsell/ANHC.

Fortunately, the western boundary of Konecny Grove lies on a section line so we can get a glimpse into the past character of the area using the survey notes. Indeed, the notes, recorded on December 3, 1815, give the character of the present-day Grove as "level second rate prairie". In fact, the surveyor made a specific note indicating that he didn't encounter any trees until 1/16 mile south of the *southern boundary* of the present day Natural Area where he "entered woods". This provides evidence for ecologists' suspicions that, under a more natural fire regime, the riparian woodlands in the prairie were dynamic shrublands which would increase in times of fewer or less intense fires, and recede or give way to prairie in times of more frequent or intense fires. This guides modern day management, using fire and perhaps mechanical thinning of the woods to try and restore the pre-settlement vegetation structure to an area (as the Natural Heritage Commission is doing at Konecny Grove).

So where does that leave us today? How do we know if an area would benefit from the reintroduction of fire? Almost any area that has naturally occurring prairie plants will benefit from a burn. Clues to fire-suppressed woodlands are many and are easy to interpret with a little practice. They include the presence of prairie species in sunny spots like roadsides and powerline rights-of-way. Sites with swaths of pale purple coneflower, little bluestem, big bluestem, Indian grass, butterfly milkweed, etc. are likely former woodlands. These species didn't just arrive on the roadsides and utility lines, those are the only spots left where there is enough sunlight for them to express themselves and bloom. Another good clue is the presence of old, open-grown oak trees (especially post oaks, but other species too). These are easily spotted by their large diameter, often twisted trunks and spreading limbs (which indicate that they grew in an open situation). They often have the tops broken out of them and are surrounded by younger, densely spaced trees with straight trunks and compact branches. Also look for grassy openings in conjunction with these large oaks.

One excellent and easily seen example is visible from I-40 between Little Rock and Conway… Traveling north from Little Rock, just before you leave Pulaski County, you will drive across a broad, flat abandoned floodplain that is now an agricultural field (this is a well-known speed trap by some of us!). At the northern end of this floodplain is a large east-west trending ridge on the right hand (east) side of the highway. Several prairie openings are still visible on this hillside, dotted with scrubby oaks in the typical savanna style. These openings get smaller and smaller with the passage of time – the ridge is now covered in small oak saplings and a number of cedars. Just over the ridge, however, is the Bell Slough Wildlife Management Area where the Arkansas Game and Fish Commission has used prescribed fire to restore some of these wonderful ridgetop savannas which can be accessed from their interpretive trail. Check it out for yourself.

** For a complete list, check out "Appendix A: Vascular Plants of Midwestern Tallgrass Prairies" by Doug Ladd in the book The Tallgrass Restoration Handbook for Prairies, Savannas, and Woodlands, edited by Stephen Packard and Cornelia F. Mutel and published by Island Press and the Society for Ecological Restoration. This book is THE one-stop source for practical information on the ecology and management of these ecosystems. Excellent!*

*** Beginning on November 10, 1815, the entire Louisiana Purchase was surveyed according to a grid made of 1 mile by 1 mile cells, or sections. These sections were grouped into 6 mile by 6 mile (36 square mile) townships which were identified by their position relative to the baseline and the principal meridian (e.g. Township 3N, Range 16W, Section 18 is section number 18 in the township located in the third position north of the baseline and in the 18th position west of the principal meridian). When the surveyors walked this grid, they recorded several bits of information that are useful to modern day ecologists. First, they recorded the position, type, and size of four witness trees at each section and quarter section corner (provided there were trees within a reasonable distance). This allows us today to determine the forest type and a rough measure of forest density at the time of the survey. They also recorded information on the character of the land over the last mile surveyed, which included the timber quality and type (if any), the understory (shrub and herbaceous layer), and quality of the soil. Since this grid is still in use today, we know exactly where the surveyors were and when they were there.*

ARKANSAS NATIVE PLANT SOCIETY
SPRING 2005 MEETING

APRIL 15-17, 2005

South Arkansas University Tech
Charles O. Ross Center
746 California Ave. SW
Camden, AR 71701

A Welcome from Jason Anders

We Camden "natives" are looking forward to having the Society meet here in April. We'll do our *best* to take your mind off the IRS on tax day and refocus it on the natural beauty of Arkansas and the work of the ANPS.

Our meetings Friday and Saturday nights will be in the Charles O. Ross Center, a part of South Arkansas University Tech, but an in-town location rather than their main campus which is 15 miles to the east of town.

The Ross Center is very easy to find. If you don't have access to Mapquest.com, then the easiest way to find it is to look at an Arkansas Highway map and find the spot in Camden where Highway 79 South turns from a four-lane divided highway into a two-lane. That intersection (actually a pair of off-ramps) brings you off the four-lane overpass and down to the two-lane passing under it. At the end of the off ramp, go left (North) on 79B, which is California Avenue. You will see the Golden-Hart Ford dealership on your left and just after it, the Ross Center, also on your left.

When you arrive, we'll have local maps, restrooms, refreshments, directions to hotels and eateries, and lots of native plant enthusiasm ready to greet you.

At press time, we are still finalizing our Saturday night program, but let me pitch a word here for our roundtable on Friday night. The Society is 25 years old this year, and we would like to observe this milestone by looking back at the work accomplished and the members who contributed so much to our mission. If you have photographs or slides of prior meetings and trips, please bring them to share. Many of our charter members are still active, so we certainly hope to see you here to help reflect and celebrate.

We also want to spend some brainstorming time as a purposeful team, looking forward to the direction we will take in the next 25 years. Be thinking ahead of time, as well as bring questions you might have about any aspect of specific plants, conservation, preservation, and the like.

If you need assistance in driving directions, lodging information, or anything else, please contact me at any hour at work or home.

jasonanders@earthlink.net
Jason.anders@aerojet.com

Work Phone: 870-574-3353
Home Phone: 870-836-0452.

Schedule of Events

Friday, April 15th

4:00-7:00 p.m. Registration and Refreshments, Ross Center
7:00 p.m. Presentation on the Flora and Ecology of the Sand Barrens of the Poison Springs Area – site of the Saturday morning field trips, by Theo Witsell
7:45 p.m.- until ANPS at 25: Retrospective and Roundtable
9:00 p.m. Executive Board Meeting (Comfort Inn Conference Room)

Saturday, April 16th

8:00 a.m. Leave Ross Center for Field Trips
11:30 a.m. Lunch
1:00 p.m. Leave Ross Center for Carl Amason's
5:00 p.m. Dinner
6:30 p.m. General Business Meeting, Ross Center
7:30 p.m. Program – Slide show by Rector Hopgood documenting the prairie restoration on his property in Morehouse Parish, LA

Sunday, April 17th

8:30 Members are invited to tour Thera Lou Adams' natives and gardens

LODGING INFO ON NEXT PAGE...

Lodging

We are proud to have two new motels in Camden, but from the pricing, they seem to be pretty proud of them as well. If economy is a priority, then a short 15 minute drive down Highway 7 South to Smackover, Arkansas, will save significantly and still be in a new motel.

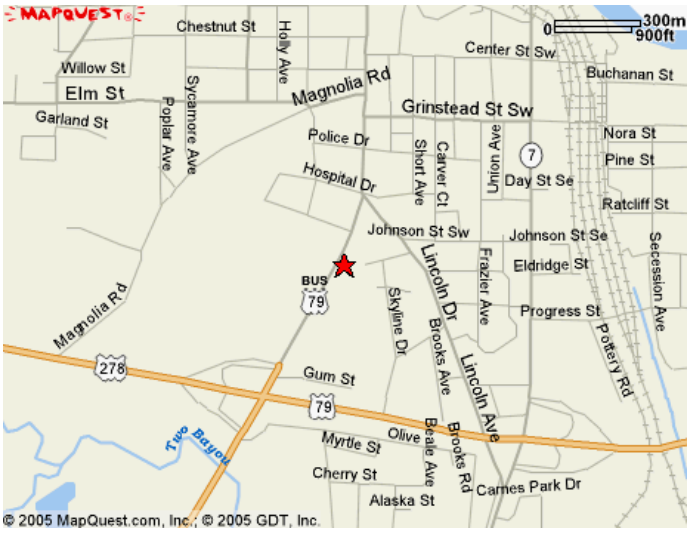
The motels in town did give us a modest discount, and that rate is noted below. (All rates shown are before tax.) Please remember to mention ANPS to get the right rates quoted, and book by April 1st or the block of rooms held will be released.

Comfort Inn
#1 Ridgecrest Drive
Camden, AR 71701
870-836-9000
$75 per night; NEW; closest to the Ross Center; many amenities, but NO PETS.

Holiday Inn Express
1450 Highway 278 West
Camden, AR 71701
870-836-8100
$71.55 per night; NEW; many amenities, only 1 mile from Ross Center; pet friendly.

King's Inn
942 Adams Avenue South
Camden, AR 71701
870-836-2535
$45.60 per night; about $5 surcharge for double occupancy; 30 years old but not a dump; $15 surcharge for pets.

Super 8
4403 Smackover Highway (Hwy. 7 S)
Smackover, AR 71762
$56.95 per night; clean and new; save even more if booked on the internet; pet friendly; 15 minutes south of Camden, but on a 4-lane divided highway.



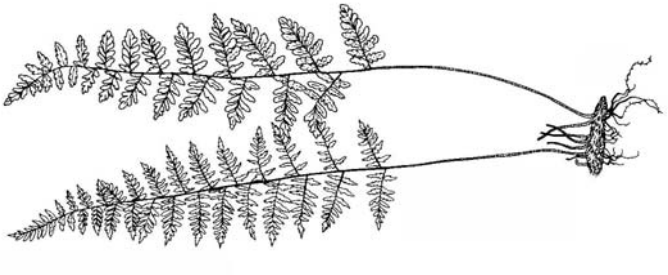
MAP TO THE ROSS CENTER

County Road Crews Wiping Out Native Plants by Switching to Herbicides

A number of ANPS members are alarmed at the increasing number of Arkansas counties that are switching from the traditional mowing of county roadsides to the spraying of non-specific herbicides to control roadside vegetation. These non-specific herbicides kill all the plants in an area, not just woody species, broad-leaved species, etc.

Saline County sprayed the majority of its county-maintained roadsides last year and wiped out a number of significant native plant areas, including one of only two sites in the Ouachita Mountains where the Alabama lipfern (*Cheilanthes alabamensis*) was known (the only other is in Hot Springs National Park). Worse still, a number of streams in Saline County were sprayed right over and dead alders, buttonbushes, and other plants still stand as witness right in the channel! As a consequence of this herbicide spraying, many roadsides are beginning to erode, some severely. Since road ditches act as de-facto streams, this channels this excess sediment (and herbicide runoff) directly to the streams in an area. Furthermore, last fall saw a noticeable increase in exotic weeds in these road ditches, some of which can become problematic. In many cases these weeds first appeared following the spraying in areas that were previously dominated by non-aggressive native species.

This spraying, done to save money on mowing costs, will likely cost more in the long run when these erosion problems have to be fixed. It is short-sighted, ugly as can be, is lowering the quality of life for residents and visitors alike, and is destroying some of our most accessible and visible displays of native wildflowers. **IF YOU KNOW OF OTHER COUNTIES THAT ARE SWITCHING TO HERBICIDES, PLEASE CONTACT THE CLAYTONIA!** The ANPS needs to document where this is happening so that we can work to stop it, or at least work with the counties so that they don't spray important native plant areas.



Alabama lipfern (*Cheilanthes alabamensis*). Gone forever from Saline County?...

ARKANSAS NATIVE PLANT SOCIETY
FALL 2004 GENERAL MEETING MINUTES

Peace Lutheran Church
Greer's Ferry, Arkansas
September 25, 2004
8:40 p.m.

President Burnetta Hinterthuer convened the General Meeting and requested a motion to accept the minutes of the Spring ANPS General Meeting as previously printed in the Claytonia. Clint Sowards so moved, and Mary Ann King seconded. The minutes were approved without dissent.

Treasurer Barbara Little-Schoenike presented the Treasurer's Report in print. Barbara presented the Treasurer's Report in print as review before the formal presentation to the general membership. Current balance as of September 25th was $27,446.86, with an Operating Fund balance of $7,902.35, and Scholarship and Awards funds totaling $19,544.51. The total balance of funds was up just slightly over $1,000 since the Spring Meeting, but that was with no scholarships awarded since the March 2004 report. Barbara reported that approximately $825 had been raised in the auction on Friday night and that another $500 had come into the Society from the Fall Meeting registrations and tee shirt sales. These figures were incidental, occurring after the Treasurer's Report had been prepared and submitted. Rob Robinson moved to accept the report as submitted, with Lana Ewing seconding. Motion carried unanimously.

Theo Witsell noted that the ANPS website's information had fallen out of date but that he had volunteered to attempt to update the webpage for the Society.

COMMITTEE REPORTS:

Jason Anders, representing the Nominating Committee, presented the following slate of nominees for office:

Theo Witsell, Editor
Barbara Little Schoenike, Treasurer
Jude Jardine, Secretary
Brent Baker, Vice President

Theo, Barbara, and Brent were submitted in the normal officer election rotation, and Jude was to fill the Secretary's post for one year to complete the vacancy created by Judy Logan's resignation. Jason reported that Burnetta was promoted to President recently following Linda Gatti Clark's resignation, and that the Executive Board had requested Mary Ann remain one more year assisting the Board as Past President. The nominating motion came from committee and therefore carried their own second. There were no nominations from the floor and the slate passed unanimously by acclamation.

Jason invited the membership to attend the Spring General Meeting to be held in Camden on April 15-16, 2005. He also announced the Fall Meeting would be held in Ft. Smith.

The Scholarship and Awards Committee, represented by Eric Sundell, announced there were no scholarships being awarded at this time, but Theo Witsell was being granted the Carl Amason Conservation Award in recognition of his tireless work in promoting the goals of the Society. Eric added that Carl Amason, who was unable to be present in person, had been consulted previously and enthusiastically endorsed the granting of the award to Theo. The award was granted with a $500.00 stipend and Theo thanked the membership for the honor.

NEW BUSINESS:

Eric Sundell reported that Sarah Nunn, Curator of the U of A Herbarium had expressed gratitude for the efforts of ANPS members writing and calling the University in the recent successful campaign to preserve the Herbarium. President Hinterthuer added her thanks for members' efforts and introduced a motion from the Executive Board to again contribute $5,000 to the Arkansas Flora Project, explaining that it would again be eligible for matching funds, doubling its benefit to the Project. The grant would be made from the Operating Fund. Broad support for the motion carried it unanimously.

Announcements followed. Jason Anders requested members contact him for any requests or suggestions for field trips in the Spring or Fall.

Dan Marsh explained that a new river walk in Ft. Smith would be a likely site to visit during the Ft. Smith General Meeting in the Fall.

Eric Sundell announced the Audubon Society would host a Tree Identification workshop would be held October 1-3 at Ferndale in West Little Rock. The classes would meet from Friday noon to Sunday noon and would cost $160 per person, including room and meals.

Plans for Sunday field trips were finalized and a motion was made to adjourn, followed by numerous seconds and the meeting adjourned.

Respectfully submitted,

Jason K. Anders
Acting Secretary

Plant Images on the Internet

Compiled by Phillip Moore

The following websites are good places to find an image of a plant that you would like to see. Say you've keyed out an unknown plant but you want to see a picture of it, or you think a plant in hand sounds like it might be a certain species… check the following links to see how you did. Some of these are line drawings, others are photos of living plants, still others are scanned images of preserved specimens.

New York Botanical Garden Images
http://www.nybg.org/bsci/herbarium_imaging/imaginglinks.html

Fairchild Virtual Herbarium, Miami Florida - scans of their specimens http://www.virtualherbarium.org/vh/db/main.htm

published volumes of Flora of North America and images, except vol. 25 on efloras.org
http://www.efloras.org/flora_page.aspx?flora_id=1

Tennessee Herbarium - can use without permission "for educational purposes only"
http://tenn.bio.utk.edu/vascular/vascular.html

North Carolina's image gallery
http://www.hawriverprogram.org/NCPlants/Alphabetical_page.html

University of Texas image gallery
http://www.sbs.utexas.edu/mbierner/bio406d/PlantPics_archive.htm

Missouri Flora- great images but you can't down load them
http://www.missouriplants.com/index.html

Tropicos images (Missouri Botanical Garden)
http://mobot.mobot.org/W3T/Search/image/imagefr.html

Noble Foundation plant images - http://www.noble.org/imagegallery/

Southwest Missouri herbarium's site
http://biology.smsu.edu/Herbarium
also has many links like Paul Redfearn's images of the ozark flora http://biology.smsu.edu/Herbarium/Plants%20of%20the%20Interior%20Highlands/photographs_of_flowering_plants.htm

Michael Moore's herbalogy -
http://www.swsbm.com/HOMEPAGE/HomePage.html

TAMU's image gallery
http://www.csdl.tamu.edu/FLORA/imaxxaca.htm

seed images at Ohio State
http://www.oardc.ohio-state.edu/seedid/all.asp?sort=family

if you're looking for images of trees or wildflowers, the list of sites gets very large many sites are listed at usda's links to plant image sites http://plants.usda.gov/cgi_bin/link_categories.cgi?category=linkphotos

And lots of images at the USDA Plants Database
http://plants.usda.gov

New ANPS Members

The following people have joined the Arkansas Native Plant Society since the last issue of Claytonia:

Maury & Barbara Baker (Hot Springs, AR)
Suzanne & Ted Barnes (Camden, AR)
Wanza Barrett (Bartlett, TN)
Jennie Cole (Little Rock, AR)
B. J. & Gene Cutrell (Edgemont, AR)
Linda Davis (Conway, AR)
Loretta Dawson (Batesville, AR)
Jane & Frits Druff (Drasco, AR)
Brenda Embry (Huntsville, AR)
Sherrie Eoff (Garfield, AR)
Lisa Garvin (Hot Springs, AR)
Ina Gene Gill (Ash Flat, AR)
Garolyn Goettsh (Edgemont, AR)
Jerry & Valerie Goodman (Fairfield Bay, AR)
Carl & Marianne Guhman (Fort Smith, AR)
Mel Harness (Harrison, AR)
Norma James (Little Rock, AR)
Margaret Johnson (Memphis, TN)
Sandra Key (Jonesboro, AR)
Jeff & Marybeth Lohr (Fayetteville, AR)
Paul McKenzie (Columbia, MO)
Sid & Mickey Roberts (Shirley, AR)
Betty Murphy (Hot Springs, AR)
Tom Neale & Eileen Oldag (Little Rock, AR)
Mrs. Hugh B. Patterson (Little Rock, AR)
Don Richardson (Clinton, AR)
Jean Sexton (Hot Springs, AR)
David O. Shepherd (Fayetteville, AR)
Ann Stanley (Little Rock, AR)
Linda Warner (Waldo, AR)
Hope Wistrand (Bigelow, AR)
Aurora Zisner & Yarri Davis (Fayetteville, AR)

We welcome these new members to the ANPS!

Classifieds

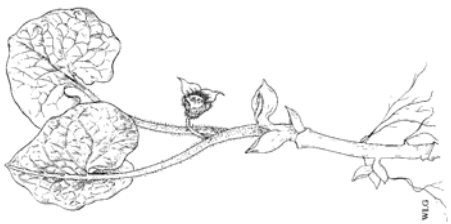
Pinnacle Mountain State Park is looking for someone to fill the Arboretum Coordinator position at the Arkansas Arboretum. Duties include planning, managing, developing and maintaining the arboretum, which is located at Pinnacle Mountain State Park west of Little Rock. Knowledge of Arkansas' native tree and plant species, ecology, landscaping, plant propagation and management of plants in both the greenhouse and nursery settings is required. Other duties may include groundskeeping, trail maintenance and construction, and grant writing. The position is part time (1800 hours per year) and pays a salary of $7.15 per hour. For an application and a more detailed job description call 501.340.3993 or visit www.arkansas.com. Or call Pinnacle Mountain State Park at 501.868.5086.

Invasives Species Field Guide Needs Help from ANPS Members— Jude Jardine is still working on updates to the Invasive Species Field Guide. She needs good photos of a number of common exotic invasive plant species. For a list of images needed, please contact Jude at jkjardine@netscape.com or call 501.676.5535.

I am working on a comprehensive floristic inventory of Scott and Yell Counties for my Masters thesis at the University of Central Arkansas at Conway. I am looking for sites within these two counties from which to collect plant specimens. If you own land in Scott or Yell Counties (or know someone who does), I would greatly appreciate the opportunity to collect on it. Thank you. Brent Baker / email: btb2001@hotmail.com / or write to: 1621 N 2nd / Dardanelle, AR 72834-2843 / Ph: 479.970.9143.

Carl Amason Conservation Award Given

At the Fall 2004 ANPS General Meeting, the Carl Amason Conservation Award was presented to Theo Witsell. The award included a $500 stipend which will be used to fund his Masters thesis work on the Flora of Saline County. Theo wishes to take this opportunity to express his sincere appreciation for the honor and to thank the members of the Arkansas Native Plant Society, not only for the recognition, but for sharing their wealth of knowledge over the past decade.



Some Tricky Wetland Trees & Their Upland Counterparts

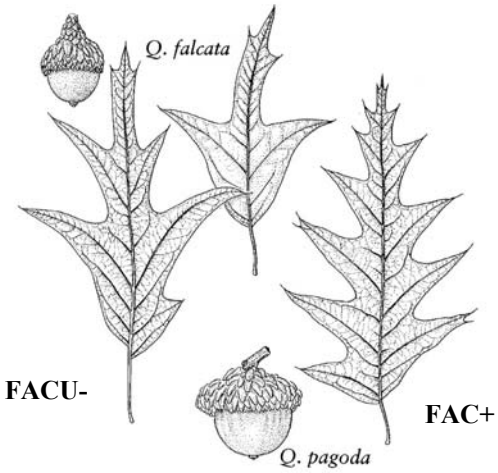
By Phillip Moore

Wetland scientists have assigned ranks to plant species that indicate how water tolerant each species is. These ranks are called the "wetland indicator status" of the species. The indicator status of each of the dominant species in a study plot allows the determination of hydrophytic vegetation, an important criterion for delineating wetlands. In 1988, the US Fish & Wildlife Service and the US Department of the Interior published these indicators in the *National List of Plant Species that Occur in Wetlands*.

Obligate (OBL) species are those that reportedly occur in wetlands more than 99% of the time. Facultative Wetland (FACW) species occur in wetlands more than 67% of the time (but not 99%). Facultative (FAC) species occur in wetlands between 33% and 66% of the time. Facultative Upland (FACU) species occur in wetlands less than 33% of the time. Upland (UP) species occur in wetlands less than 1% of the time. Vegetation is hydrophytic when more than 50% of the dominants species are OBL, FACW, or FAC.

There are four trees in Arkansas that are now recognized at the species level that were listed as subspecies or varieties in the1988 *National List*. Using the incorrect indicator status for these species pairs could significantly alter a wetland determination.

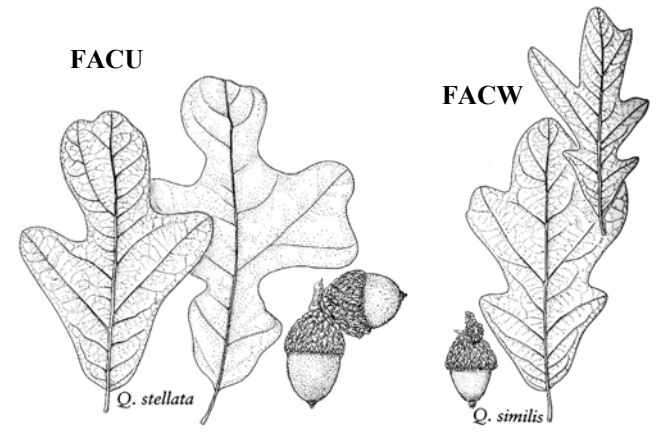
To separate these wetland species out from their upland sisters, location helps a lot, both geographically and ecologically.



Southern red oak and cherrybark oak

Cherrybark oak (*Quercus pagoda*) and southern red oak (*Q. falcata*) both have leaves that are fuzzy underneath with the

same kind of hairs, so they're closely related, but most trees are clearly one or the other species (with rare difficult in-between specimens). Most southern red oak leaves have a rounded base, often have only three lobes, and the middle lobe is often long and narrow. Cherrybark oak leaves are quite variable but usually have a wedge-shaped base and several lobes. Don't go by one or two leaves; look around on the tree for the more distinctive shape of many southern red oak leaves. If you can't find any of the typical 3-lobed, rounded base leaves of southern red oak then you can bet it's a cherrybark oak. Also, the younger bark of a cherrybark oak has horizontal streaking more or less resembling the bark of a cherry tree.



Post oak and delta post oak or swamp post oak

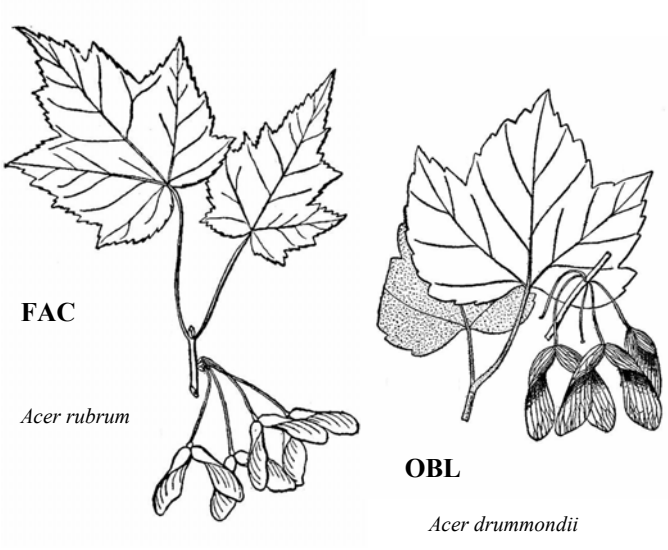
Don't make the mistake of calling a post oak (*Quercus stellata*) a Delta post oak (*Q. similis*) simply because it's in a wetland. I've seen post oaks growing in wetlands often enough, but there are a great many more growing in uplands (way more than 67% of them). If it looks like a post oak it is a post oak. Delta post oak has lighter colored, more shaggy appearing bark, and you have to look at several leaves to find any that look like the cross-shaped post oak leaves, while almost all of the leaves of post oak will be cross-shaped. Also, Delta post oak is found only in the south part of Arkansas and very rarely toward the middle part of Arkansas.

For a complete version of the 1988 *National List of Plant Species that Occur in Wetlands*, visit the following website:

http://www.charttiff.com/WetlandMaps/WetlandPlants/plantlists.html

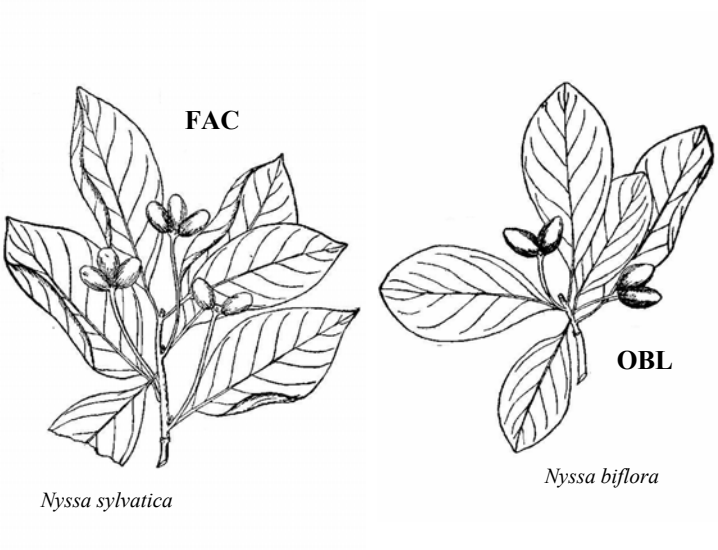
For more info on Arkansas Wetlands, visit the Arkansas Multi-Agency Wetlands Planning Team website at :

http://www.mawpt.org/default.asp



Red maple and Drummond's red maple or swamp red maple

Drummond's red maple (*Acer drummondii*) grows in swamps in the lowlands. If it's not growing in a swamp in the lowlands, it's red maple (*Acer rubrum*). The leaves of both are white below but that of red maple is a powdery white and that of Drummond's is tiny hairs.



Black gum and swamp black gum or swamp tupelo

Swamp tupelo is found in bays or seeps in southern Arkansas. If you're not in a bay, seep, depression, or swamp in southern Arkansas, it's black gum. Swamp tupelo has (1) 2 fruits per cluster and black gum has 2-4 (6) fruits per cluster. Note that both of these species are different from water tupelo (*Nyssa aquatica*) which grows in the wettest areas of swamps and sloughs, often with baldcypress.

Phillip Moore is the botanist with the Arkansas Department of Highways and Transportation. Contact him at Phillip.Moore@arkansashighways.com.

Upcoming Events

NOTICE: Many people join the Society to learn from other members and get the chance to explore unfamiliar areas of the state with a local guide. We need more people who are willing to lead field trips to areas they know. It isn't necessary to know every species on the route. We all bring our own knowledge and learn something every time we go out – even the trip leaders! Please contact the Claytonia if you would be willing to lead a trip. We know you have a special spot that is worth sharing…

The following hikes are mostly moderately strenuous; mostly level ground with slight slopes but some climbing is involved. Wear good hiking boots or shoes. We take our time on the hikes, as you know, as we spend a lot of time with our eyes to the ground. Bring plenty of water, insect repellent if you use it, and a brown bag lunch. The hikes range from 2 – 4 hours in length unless otherwise stated. We hope to see you there!

April 23: Chesney Prairie Natural Area (near Siloam Springs in Benton County) - botanical hike followed by dinner and annual prairie mole cricket count. Contact: Joe Woolbright. Meet at the Natural Area at 5:00 pm. For directions contact Joe at 479.427.4277 or visit the ANHC website at www.naturalheritage.org. Please let Joe know if you plan on attending.

April 30: Morning Star Mine (at Rush, Buffalo National River, Marion County) – hike. Meet at trailhead at 10:00 am. Contact: Burnetta Hinterthuer. For directions call Burnetta at 479.582.0317 or 479.430.0260.

May 7: Cave Mountain (Newton County) - hike. Meet at 10:00 am at parking area at upper Buffalo River, at base of Cave Mountain, just past bridge on Hwy. 21 south of Boxley. Contacts: Maria Morales & Miguela Borges.

June 18: All day field trip to explore the new Middle Fork Shale Barrens Natural Area and the igneous glades and barrens of the Bauxite area (Saline County). Join trip leaders Theo Witsell and John Pelton as we explore the Middle Fork Shale Barrens, the newest addition to the Arkansas Natural Heritage Commission's System of Natural Areas. We'll also get a detailed look at the highest quality nepheline syenite glades and barrens in the world as we visit The Nature Conservancy's Dry Lost Creek and Dunahoo Preserves. This trip will feature a number of globally rare species including the small-headed pipewort (*Eriocaulon kornickianum*), the Ouachita bluestar (*Amsonia hubrichtii*) and a species of *Sabatia* that is currently being described new-to-science and is known from just two sites in the world. This will be an all day field trip, visiting one site in the morning, having lunch at an area restaurant, and visiting the other site in the afternoon. We will meet at a single location and carpool since parking is limited at the sites. This trip may be restricted to a limited number of participants, but may be offered a second time to accommodate everyone who is interested. Contact Theo Witsell for more info: 501.324.9615 or email theo@arkansasheritage.org.

Arkansas Native Plant Society Membership Application

Please check the appropriate box below.

Membership Categories:

__ $10….. Student
__ $15….. Regular
__ $20….. Supporting
__ $25….. Family Membership
__ $30….. Contributing
__ $150… Lifetime Membership (55 and over)
__ $300… Lifetime Membership (under 55)

__ New Member
__ Renewal

__ Address Change

NAME(S) _____

ADDRESS:

Street or Box_____

City _____

State _____ Zip Code_____

Telephone _____-_____-_____

Email address _____

Please cut and send this form along with any dues to:

Eric Sundell, Membership ANPS
Division of Mathematics and Sciences
University of Arkansas at Monticello
Monticello, AR 71655

Please check your mailing label! If your mailing label has an 04 or earlier it is time to renew!

Life members will have an **LF**.

Please fill in the information form on the opposite side of this page and send it with your renewals, applications for membership, changes of name, address, email, or telephone numbers to the address given on the form: **[Not to the editor]**. Thank you.

PLEASE SEND SUBMISSIONS/SUGGESTIONS TO:
219 Beechwood St. / Little Rock, AR 72205
anpsclaytonia@yahoo.com

2004-2005 ANPS OFFICERS

Past President: Mary Ann King…….479.293.4359
President: Burnetta Hinterthuer……..…479.582.0317
President Elect: Jason Anders…...……870-836-0452
Vice President: Brent Baker……...…479.970.9143
Editor: Theo Witsell……...501.614.8465
anpsclaytonia@yahoo.com
Historian: Carl Amason…….870.748.2362
Secretary: Jude Jardine…..…… …..501.676.5535
Treasurer: Barbara Little……...870.935.6905
Membership: Eric Sundell…….870.367.2652
Ark. Coalition: Carl Hunter……...501.455.1538
Awards/Scholarhips: Eric Sundell
sundell@uamont.edu

The purpose of the Arkansas Native Plant Society is to promote the preservation, conservation, and study of the wild plants and vegetation of Arkansas, the education of the public to the value of the native flora and its habitat, and the publication of related information.

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Theo Witsell, Editor
219 Beechwood St.
Little Rock, AR 72205

anpsclaytonia@yahoo.com