

The Department of

#### Arkansas Heritage

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Arkansas Arts Council

Arkansas Historic Preservation Program

Delta Cultural Center

Historic Arkansas Museum

Mosaic Templars Cultural Center

Old State House Museum



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October 19, 2010

David Ferguson, Director Arkansas Bureau of Legislative Research State Capitol Room 315 Little Rock, Arkansas 72201

Dear Mr. Ferguson:

Arkansas Statute Annotated §15-20-308 requires the Arkansas Natural Heritage Commission to submit an annual report to the Governor and to the General Assembly on or before December 1 of each year.

The large, coil-bound document is a detailed status report for both the System of Natural Areas and the Registry of Natural Areas. It is an important reference tool for citizens, land resource managers, and local decision makers. The status reports (green pages) for each site within the System include ownership information, driving directions, and stewardship activities. The county-by-county listings of rare species, which make up the Registry, are contained in the blue pages. An Executive Summary, containing additional information on the commission and the year in review, can be found inside the back cover pocket.

Thank you for your continued support of the commission and our state's natural heritage. Please contact me if I can provide additional information.

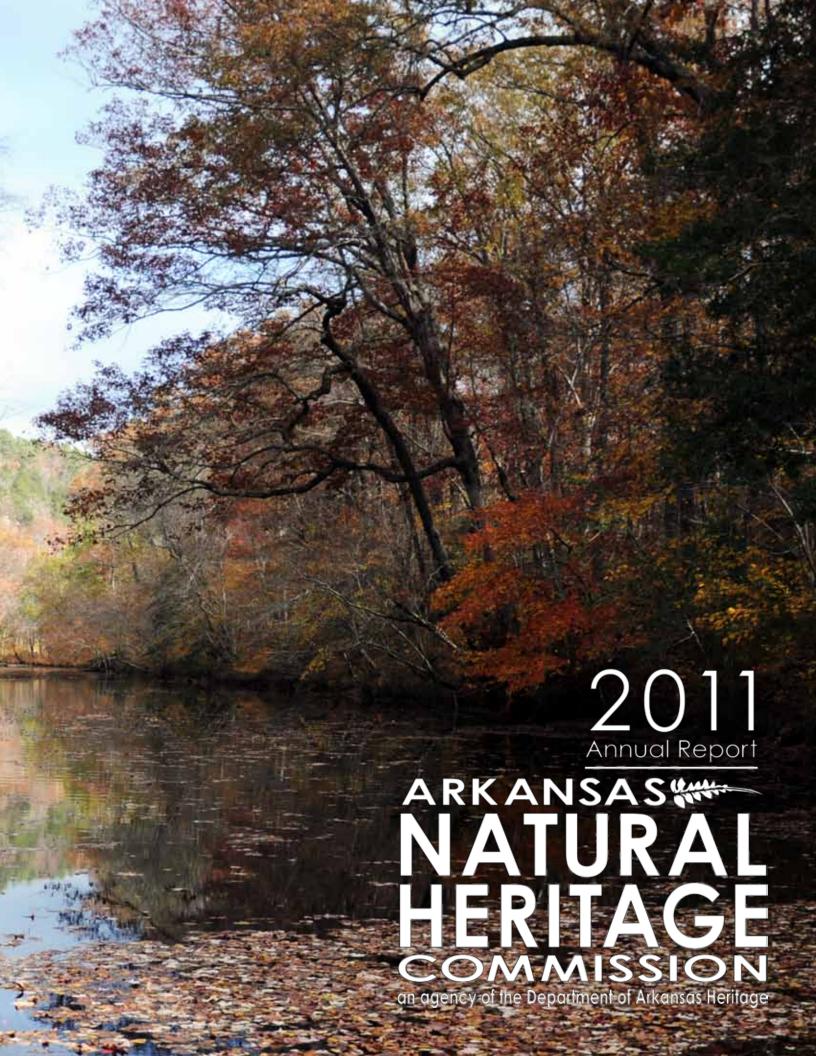
Sincerely.

Karen Smith, Director

Arkansas Natural Heritage Commission

enclosure





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Cover image: Big Creek Natural Area.



Arkansas is called the Natural State for a very good reason. Its scenic beauty and natural heritage provide magnificent views to show off to visitors, while they also illuminate our past history and point us along a path to our future as a State.

In 1971, the Arkansas General Assembly passed Act 297. This established a system for the preservation of "natural areas" and provided for the inventory, acquisition, and protection of such areas that represent the diversity with which Arkansas is blessed. These natural divisions form the framework of the conservation efforts of the Arkansas Natural Heritage Commission to this day. Over the past forty years, the Commission has worked to expand the impact of conservation across Arkansas's landscape through sound science and responsible stewardship.

This annual report features results of the Commission's endeavors within each of the six natural divisions that emerged from Act 297. It contains some of this year's significant achievements in our efforts to sustain the health of our natural world and preserve our precious heritage for generations to come.

Sincerely,

/Mike Béebe

MB:jb

#### **Natural**

#### **Divisions**

#### **OZARK MOUNTAINS**

The flat-topped OZARK MOUNTAINS are more accurately described as uplifted plateaus separated in three distinct subdivisions. Each has a unique topography, geology, and vegetation. The Boston Plateau is the highest, with streams that cut through its valleys to form the headwaters of the White, Buffalo, Mulberry, Big Piney, and Little Red Rivers. In most areas oak-hickory forests predominate, but shortleaf pine trees can be found on its sunnier and drier south-facing slopes. The Springfield Plateau is lower in elevation, and its plateau surface forms extensive, relatively flat plains. The underlying limestone here contains prominent cave and karst features. Rocky, open glades and widespread hardwood forests are natural communities still found here. The once extensive tallgrass prairies have almost all been converted to pastures, cities, or developed for other uses. The Salem Plateau is the lowest in elevation and forms extensive plains, with numerous rock exposures and bluffs along streams. Its level hilltops with rocky soils were once covered with oak forests, open oak woodlands, and open rocky glades.

**O7ARK MOUNTAINS** 

ARKANSAS VALLEY

**OUACHITA MOUNTAINS** 

COASTAL PLAIN

Traversing the center of the state, the ARKANSAS VALLEY parallels the Arkansas River (and Interstate 40) for most of its length. Up to 40-miles wide at some points, the Arkansas Valley features dissected plateaus similar to those found in the Ozark Mountains to the north and ridges like those found in the Ouachita Mountains to the south. Steep-sided mesas, such as Petit Jean Mountain, Mount Nebo, and Mount Magazine, are unique to this natural division. The Arkansas River and its tributaries formed wide bottomlands and flat terraces that contribute to the distinctive character and natural communities of the valley. Average precipitation declines noticeably from east to west in the Arkansas Valley. The natural vegetation responds to this precipitation gradient as forests at the eastern end give way to open woodlands, savannas, and prairies at the western end.

#### ARKANSAS VALLEY

#### **OUACHITA MOUNTAINS**

Created by violent folding of the Earth's crust, the OUACHITA MOUNTAINS are characterized by narrow ridges that sometimes run over 100 miles long. Generally on an east-to-west alignment, the Ouachita Mountains are an unusual formation for North America. Because of this orientation, the south-facing slopes of the ridges are more exposed to the heat and light of the sun, pine and dry oak woodlands can be found here. North-facing slopes are cooler and with more moisture present support diverse hardwood forests. Small creeks, often fed by seeps and springs on the mountains, have narrow floodplains with high plant diversity. Outcrops of sandstone, shale, and novaculite rock form glade openings dominated by grasses, wildflowers, and shrubs.

## of Arkansas



The smallest of the natural divisions, CROWLEY'S RIDGE extends 150 miles from southeastern Missouri almost due south to the city of Helena, Arkansas. It ranges from one-half mile to 20 miles wide, except for one break that occurs outside of Marianna, Arkansas. Up to 200 feet higher than the surrounding Delta, the ridge was formed as the Delta rivers carved out their valleys leaving a narrow strip of older ocean-bottom materials that became the base of Crowley's Ridge. When the last glaciers retreated, the rivers deposited silt in their floodplains. The silt dried out, was picked up by winds, and piled atop Crowley's Ridge. This wind-blown dust, or loess, capping the ridge gives it much of its unique character. Water cuts through it very easily and has eroded deep valleys and sharp ridges. The steep hills of Crowley's Ridge support upland forests with hardwood trees that have adapted to well-drained slopes. Streams here are small, and at times flow rapidly down steep slopes.

#### **COASTAL PLAIN**

A rolling landscape, the COASTAL PLAIN was once covered by the water of the Gulf of Mexico. The sands and gravel that once formed the floor of the Gulf and its beaches now support forest habitat dominated by pine trees. After the Gulf of Mexico retreated, large rivers began coursing through the area creating wide floodplains and terraces. The floodplains are now dominated by bottomland hardwoods while extensive pine flatwoods are characteristic of the terraces. The lowest terrace also supports several smaller habitats such as saline barrens, which are home to specific grassland communities with plants adapted to its unique soil conditions. The blackland prairie region of southwest Arkansas is marked by chalk outcrops, black velvety soil, and cuestas. The chalk is made up of the shells of marine animals that drifted to the ocean floor. Cuestas are long, low ridges with a relatively steep face on one side and a long, gentle slope on the other.

Often called the Delta, the MISSISSIPPI ALLUVIAL PLAIN covers the eastern third of Arkansas. This area was also once covered by the Gulf of Mexico. After the gulf receded, big rivers such as the White, the Mississippi, the Arkansas, and even the Ohio, flowed through the area, sweeping away the ocean bottom and replacing it with sand, silt, and clay. Oxbow lakes are prominent features. Swamps, sloughs, and the margins of bayous and lakes are flooded more than half of the time, supporting vegetation dominated by cypress and tupelo trees. Oak, persimmon, and native pecan trees thrive with the abundant water and deep soil. Not all of the Mississippi Alluvial Plain was covered by forest. As its name implies, the Grand Prairie of eastern Arkansas once contained impressive grasslands which were the largest in the state. Over 400,000 acres of tallgrass prairie occurred here prior to European settlement.

## ...in the Ozark Mountains

For many years, extensive field surveys and biota inventories near Foushee Cave in Independence County verified its rich biological diversity, including 10 significant cave species. Two federally endangered species, gray bats and Indiana bats, are known from the site, and the Foushee Cave snail occurs only in this cave system.



The significant biodiversity makes protecting this site an acquisition priority for the System of Natural Areas. Using the results of recharge zone

studies conducted by Ozark Underground Laboratory, in FY2011 commission staff negotiated with landowners toward the purchase of 1,677 acres containing the mouth of Foushee Cave and a significant portion of its recharge zone. County roads and a state highway will offer excellent public access to the proposed new natural area, and the property will be open for public hunting. The acquisition process should be finalized in early FY2012, with the addition of Foushee Cave Natural Area to the System of Natural Areas.

Above: ANHC staff John O'Dell (left) and Bryan Rupar (right) inventory Foushee Cave for rare animals.





Above left: Devil's Knob-Devil's Backbone Natural Area. Above right: Katie, one of the mules used to remove invasive eastern red-cedar from glades.

The commission develops management plans for each of the 69 properties in Arkansas's System of Natural Areas. Each plan is unique and dictates habitat conservation strategies. Stewardship staff use new and innovative land management methods, but at times, they also find it necessary to return to the old ways. A portion of the limestone-dolomite glades at Devil's Knob-Devil's Backbone Natural Area had become overrun with eastern red-cedar trees. A local contractor felled the invasive trees by hand, then used a mule team to remove the logs. This method minimizes disturbance to the sensitive glade ecosystem. Video of the mules in action was shared with e-newsletter subscribers and posted on our website. We now have plans to follow up with a prescribed fire regime to help the glades return to their native condition.

As an agency that uses science to make conservation and management decisions, we believe it is important to inspire Arkansas's up-and-coming scientists. Programs on Arkansas's endangered bats to 78 students, including the science club, at Westfork Middle School, are examples of 35 such educational programs offered to 1,265 students throughout the state this year.



The commission's staff also judges local, regional, and state science fairs (above) and sponsors four natural heritage awards for students demonstrating commitment to further conservation research.

The commission's botanists conduct field inventory throughout Arkansas. Working individually and with conservation partners, they often traverse difficult terrain searching for rare plants and natural communities on public and private lands. At one unique privately-owned site in Benton County, they documented 22 plant species of conservation concern. A forested portion of this property became the only confirmed location of the rare black maple tree (below). In addition, preliminary aquatic animal species inventory noted the presence of the rare ringed crayfish at this location.





Searles Prairie Natural Area (above) is a 10-acre remnant of a once expansive 10,000acre tallgrass prairie. The property was generously donated to the commission by Mrs. Anna Mae Searles in 1988, who knew this unplowed prairie was a rare jewel. Located within the city limits of Rogers, this natural area presents a number of unique management hurdles. In FY2011, a new partnership with the Arkansas Master Naturalists brought volunteer workers to Searles Prairie. The group organized a trash pickup and worked to remove woody vegetation from the prairie mounds. The commission's staff conducted a prescribed burn at the property this year in an effort to control non-prairie plant species.



The Ozark karst ecosystem hosts a diverse array of 62 organisms adapted to cave and karst habitats found nowhere else in the world. Inventory shows three areas of caves in the Arkansas and Oklahoma Ozarks sustain the world's population of the Ozark big-eared bat (left). The Slippery Hollow cave system near Yellville is the eastern anchor to this suite of caves. Two FY2011 land acquisitions, funded by the Natural and

Cultural Resources Council, increased the size of Slippery Hollow Natural Area (left) to 995 total acres. Connectivity is important when protecting karst ecosystems as many of the rare plants and animals require large swaths of undisturbed landscape for feeding and reproduction.

## ...in the Arkansas Valley

Thomas Nuttall, a renowned British botanist, traveled up the Arkansas River and his notes on early Arkansas are highly regarded. His account of climbing Dardanelle Rock can be found in his book, "A Journal of Travels into the Arkansas Territory during the year 1819, with occasional Observations on the Manners of the Aborigines."

On June 2, 2011, Dardanelle Rock Natural Area was featured in two KATV Channel 7 live weather segments as part of an eight-week promotional campaign series sponsored by KATV and the Department of Arkansas Heritage. This year, the commission added central Arkansas radio stations to its media outreach, amplifying our "voice" to inspire support of our conservation endeavors. These segments aired 290 times in April and May, relating that Arkansas's rich and diverse natural heritage includes fireflies, frogs, and other amazing animals and plants, and the special places they live. The central theme of our message stressed that natural heritage is passed from one generation to the next.



Above: View of the Arkansas River from atop Dardanelle Rock Natural Area



H.E. Flanagan Prairie Natural Area is one of the highest quality prairie remnants in the Arkansas Valley. Native prairies in the Arkansas Valley differ from other prairies in the state because their soils were formed from shale. With ten rare species supported by this natural area, much of its biota is representative of a once vast 135,000-acre tallgrass prairie ecosystem in western Arkansas. Using the 1/8 Cent Conservation Sales Tax funding increase for land acquisition authorized by Governor Beebe in 2009, a 74-acre addition in FY2011 brings the natural area to a total of 340 acres in state conservation ownership. There are known occurrences of the rare ornate box turtle on the new tract, and, during a recent bird survey, staff observed Sprague's Pipit, a rare and declining prairie songbird. ANHC commissioners visited this natural area after their May 10th meeting at Mt. Magazine State Park to see firsthand the positive results of our stewardship efforts.

Left: A yellow variant of Indian paintbrush at H.E. Flanagan Prairie Natural

Field inventory work by the commission's botanists documents the locations of rare plants. Discoveries are made throughout the growing season and new locations are recorded. In FY2011, Nuttall's pleat-leaf was observed for the first time at Cherokee Prairie Natural Area in Franklin County. Sometimes these findings can extend the known range of a specific species. They also provide the basis for determining the current status for conservation concern as rare, threatened, or endangered species. This information is stored in our biodiversity database and is ultimately shared through environmental reviews.



Above: The rare Nuttall's pleat-leaf blooms around 6pm and lasts until just before dark. The flowers take less than one minute to fully open.



Cove Creek Natural Area (above) in Faulkner County protects almost a mile of the course of Cove Creek, near where it runs into Cadron Creek. This scenic natural area has glades, bluffs, gorges, and waterfalls. The commission's stewardship staff is constructing a 1.5 mile primitive loop trail here. "Green construction" methods include two foot bridges constructed from cedar trees cut during recent restoration work and lumber salvaged from old natural area entrance signs. The Cove Creek Loop Trail is easy to moderate in difficulty. Highlights include two scenic overlooks of the free-flowing Cove Creek.



In FY2011, the commission instituted water quality and water quantity sampling regimes at both Cove Creek and Big Creek Natural Areas. Initial reports indicate that both streams remain healthy. To date, neither has been impacted by nearby development related to natural gas extraction activities.

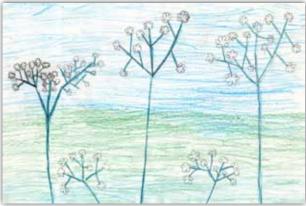
Above: Habitat for the endangered speckeled pocketbook mussel is protected by Big Creek Natural Area.



Commission staff completed inventories of natural communities and rare species found on tallgrass prairies in the Arkansas Valley during the 2008 and 2009 field seasons. Funded in part by a U.S. Fish and Wildlife Service grant, the results of these biota surveys determined the focus of the commission's acquisition priorities leading to this year's 74-acre addition at H.E. Flanagan Prairie Natural Area. Based on demonstrated quality of our work and effective grants administration by our professional staff, the commission received an additional FY2011 federal fund allocation to enhance rare plant field inventory work throughout the state.

## ...in the Ouachita Mountains

Our enabling legislation empowers the commission to establish working relationships with outside agencies and organizations. We formalize our collaboration process within our rules and regulations to extend the impact of our staff and financial resources beyond what we can accomplish alone. Some of our best opportunities for effective partnerships exist in the Ouachita Mountains. The U.S. Forest Service is the largest public land holder in the Ouachitas, with approximately 1.4 million acres. The commission's staff worked with Ouachita National Forest personnel to explore, discover, and document some of the amazing ecological resources of this unusual mountain chain.



The commission's botanists discovered new

locations of rare plants such as the Arkansas twistflower and Ouachita bluestar. They also kayaked a number of Ouachita streams and found new sites for the federally endangered plant harperella, including a total population of several thousand plants. Surveys also yielded new records for 12 other plant species of state and global conservation concern. These records are shared through the commission's biodiversity database and guide habitat management efforts in the region.

Above: A drawing of the endangered plant harperella by a Hot Springs elementary student that was submitted to the Arkansas Endangered Species Day Art Contest.



Cossatot leafcup grows in some of the most rugged terrain of the Ouachita Mountains. It prefers woodland openings on the south and east sides of steep,

rocky slopes. Since its discovery in 1988, this rare plant has only been known from four sites in Arkansas. On August 18, 2010, after coming up empty-handed in strenuous yet seemingly perfect habitat, and in extremely hot and humid weather conditions, ANHC and USFS researchers struck gold in the botanical sense. The eastern toe slope of a small, unnamed "knob" between Bald and Gap mountains in Montgomery County (above left) yielded over 400 plants and became the fifth known site in the world for the species!





The commission's staff takes audiences the message of what makes the Ouachita Mountains and Arkansas unique. This year we conducted family night campground programs at Hot Springs National Park, two programs for the Garland County Master Gardeners, four programs at Lakeside Middle School and judged the senior science symposium at Arkansas School for Mathematics, Sciences, and the Arts in Hot Springs. Other FY2011 programming also included: leading the Arkansas Outdoor Photographers Club on a botanical hike at Baker Prairie Natural Area, teaching natural divisions to the Arkansas Master Naturalists, and presenting endangered animal programs (above right) for K-12 students across the state.

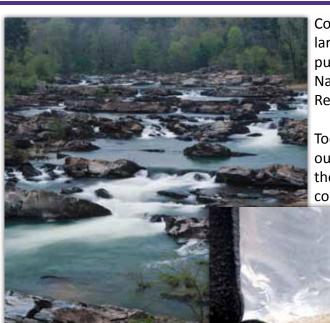


Middle Fork Barrens Natural Area (above), located along the Middle Fork of the Saline River, is a high quality mosaic of glades, barrens, oak and oakpine forests and woodlands. The glades support 11 species of rare plants, but over time, eastern red-cedar trees decreased glade size and plant diversity. Work at the natural area has focused on restoring habitat structure by removing the cedars and reintroducing fire to the landscape. Rare plant populations are flourishing, with a number of species not previously known from the site now showing up. Among the most exciting finds have been prairie parsley and ragged fringed orchid. This natural area is also known to host a population of the rare and endemic Pelton's rose-gentian.

The National Park
Service invited the
environmental
community and local
officials to participate
in the development
of strategies for the
protection of the Hot
Springs National Park
water recharge zone.
The commission's
staff joined
representatives of



the U.S. Geological Survey, City of Hot Springs, Garland County, Arkansas Natural Resources Commission, Arkansas Department of Environmental Quality, and the National Park Service, affirming that ANHC is valued as a respected source of scientific information in Arkansas. Through our environmental review program, the commission's research staff (above right) received 192 requests for high visibility projects in FY2011. Examples include the coalfired facility in Hempstead County and the Draft Comprehensive Conservation Plan and Environmental Assessment for Felsenthal and Overflow National Wildlife Refuges.



Cossatot River State Park - Natural Area (left) is one of the largest components of the System of Natural Areas. The original purchase of just over 4,000 acres was the first project for the Natural and Cultural Resource Council and its funding from the Real Estate Transfer Tax.

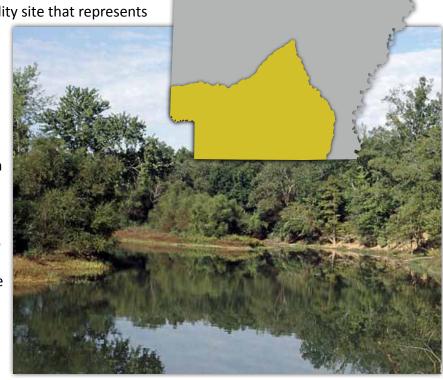
Today, the natural area encompasses 5,484 acres and is an outstanding example of lands managed cooperatively to balance the protection of natural resources with public outreach and compatible outdoor recreation. The commission's education

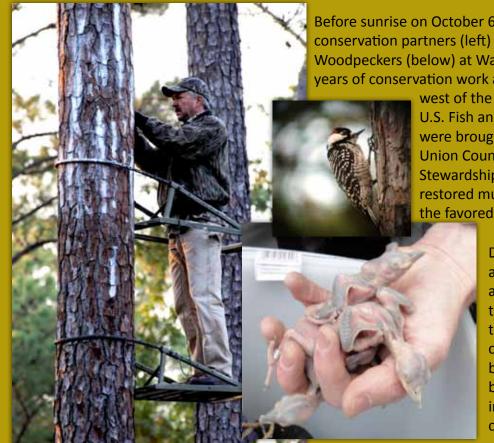
staff often conducts teacher workshops and student programs in the information and education center's classroom and we set up booths for special events. This year, the commission's aquatic specialist led Eco Fun Day participants on a fish survey for the federally threatened leopard darter (left).

## ...in the Coastal Plain

Longview Saline Natural Area in Ashley County (below right) is the newest addition to the System. The commission's 527-acre acquisition is part of an 8,000-acre high-quality site that represents

the mosaic of rare natural communities that occur in Arkansas's Coastal Plain. This new natural area lies along the Saline River and supports a population of the federally endangered Red-cockaded Woodpecker as well as federally endangered winged mapleleaf and pink mucket mussel species. This new pursuit benefits game animals such as deer, quail, and turkey, and offers easy public access along its eastern boundary. Longview Saline Natural Area also provides habitat connectivity as it is located within 25 miles of more than 85,000 acres of publiclyowned land managed for conservation. State funding for acquisitions at this site allows the commission to pursue federal grants for stewardship and future acquisitions, and conservation partnerships provide for effective cost sharing.





Before sunrise on October 6, 2010, commission staff and conservation partners (left) released five pairs of Red-cockaded Woodpeckers (below) at Warren Prairie Natural Area after 27 years of conservation work at this site. This is the first relocation

west of the Mississippi River approved by the U.S. Fish and Wildlife Service, and the birds were brought in from private timberlands in Union County and from Fort Polk in Louisiana. Stewardship of this 4,555-acre natural area has restored much of the pine flatwoods ecosystem, the favored habitat of these endangered birds.

During their first breeding season, after enduring floods, then drought, and unseasonably high temperatures, two of three nesting pairs fledged three nestlings (left). Videos of commission staff placing identifying bands on the tiny legs of the baby birds were featured on our website, in e-newsletter articles, and on the commission's Facebook page.



Fire is one of the major lacking ecological processes across today's landscape. When used as a part of an integrated management plan, prescribed fire can be a very effective natural resource management tool. Results are fast, sometimes showing increased biodiversity as quickly as one growing season after a burn. By working with the Office of State Procurement, the commission now has new opportunities to work with qualified contractors to address the need for more fire on natural areas. Four professional and highly motivated contractors, in addition to the commission's in-house burn crew, applied prescribed fire to more than 5,525 acres throughout the System of Natural Areas in FY2011.

Commission staff conducts inventory to determine where species and natural communities of conservation concern exist in Arkansas. In FY2011, aquatic surveys along the lower Saline River indicated the presence of the rare crystal darter, and botanical inventories produced new locations for rare plants such

as barbed rattlesnake root and earleaf false foxglove (right).

The records of the commission's biological inventory work become part



of an international network called NatureServe. This network connects the commission's data with conservation organizations, government agencies, corporations, academia, land-use planners, and others in Arkansas and beyond our borders. In FY2011 the Commission took extra steps to modify our recordkeeping methods so the data can be more functional for our work in Arkansas.



Years of research, collaboration, and record keeping have earned the commission recognition as the principal source for the distributions

locations and distributions of rare plants, animals, and natural communities in Arkansas. This includes rare species designated as threatened or endangered. In FY2011, the commission worked with large private timber companies to provide the information required to maintain their certification through the Sustainable Forestry Initiative. Certified forests are managed so that all forest values, including the environment, are considered. Products derived from these forests are labeled and marketed so that consumers, whether they are purchasing paper, lumber, or other fiber products, are aware of the certification.



Management plans guide the commission's stewardship activities and allow ANHC to document successes. Terre Noire Natural Area in Clark County is one of the highest-quality examples of the blackland prairie ecosystem remaining in Arkansas. Specific management objectives at this natural area call for the removal of eastern red-cedar trees and the reintroduction of fire to the landscape. With the help of conservation partners, the commission's extensive efforts to restore this habitat are benefitting Arkansas's state butterfly, the Diana fritillary (left). This rare species requires fire-maintained ecosystems with high native plant diversity. Flowers such as violet, purple coneflower, and butterfly weed are increasing in numbers. Surveys led by researchers from UALR show the Dianas are responding positively, and populations continue to increase across the natural area.

## ...in the Mississippi Alluvial Plain

Until the early nineteenth century, canebrakes (dense thickets of cane, right) covered large portions of the river floodplains in the Mississippi Alluvial Plain. Imagine a tall and expansive stand of bamboo, 20 feet high with shoots an inch thick. Although these cane thickets sound like something from China, where you might find a panda, the taller canebrakes most commonly consisted of giant cane (sometimes called river cane), an American relative

Canebrakes began to disappear with the rise of agriculture. Early settlers

of Asian bamboo.

associated the cane lands with fertility, and they quickly learned to seek out canebrakes as places to establish fields. As farmland, grazing, and development encroached on the canebrakes, fires became much less frequent, and the brakes became thin and invaded by other plant species. Today, ecologists estimate that 98 percent of this unique ecosystem has been lost.

Last April, ANHC land management specialists joined staff from The Nature Conservancy to replant native cane on 10 acres at Benson Creek Natural Area in Monroe County. Restoring stands of river cane will provide habitat for more than 50 species of wildlife. Canebrakes have cultural significance as well. River cane is a part of the cultural fabric of many local native American tribes in the Mississippi River Valley.

The small parcel that star is now the tenth natural a site provides vital habitat endangered Red-cockade of eastern Arkansas. Our the respect and cooperat translocate birds from po

The small parcel that started out as Pine City Natural Area (left) in 1988 is now the tenth natural area in the System to exceed 1,000 acres. The site provides vital habitat for the only known population of the federally endangered Red-cockaded Woodpecker in the Mississippi Alluvial Plain of eastern Arkansas. Our efforts to sustain this unique population gained the respect and cooperation of the staff at the Ouachita National Forest to translocate birds from populations in western Arkansas.

The natural area also contains the "Lost Pine of Arkansas." These high-quality natural stands of loblolly pines are "lost" in the sense that they are an isolated population within an area of the state that is now dominated by agricultural fields and bottomland hardwood forests. As a result, these loblolly pines have become genetically distinct from loblolly pines found elsewhere in the United States.

The**Nature** Conservancy Konecny Grove Natural Area (below top) in the Grand Prairie region of the Mississippi Alluvial Plain is a high-quality example of rare prairie slash woodlands. Today, less than three percent of this habitat type remains in the Grand Prairie. Konecny Grove supports three species of rare plants, including a large population of the rare and fragrant ladies' tresses orchid. It is the only known site in the world for Stern's medlar, a rare shrub in the rose



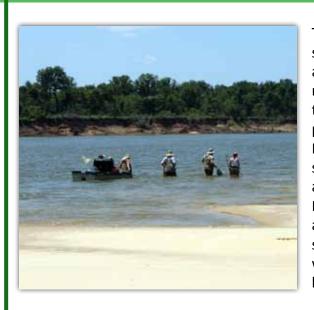
family. Using federal grant funds and working with the Arkansas Forestry Commission, intensive management strategies were developed to target and eradicate invasive plant species from the entire 22-acre natural area. Contracted workers walked the site, chemically treating



on post burn re-sprouts. This spring, the site was toured as part of the Forest Stewardship/Forest Health Program review where commission staff gave a field presentation and pointed out the successful results.



While collaborations with professional colleagues provide important updates for the commission's biodiversity database, our staff's knowledge and expertise are also sought out by a variety of academics across the country to enhance their research work. The commission's lead botanist met graduate students from Austin Peay University (Tennessee) on a tour of the Grand Prairie of eastern Arkansas (above) for a field lecture on the flora, ecology and history of the region. He also worked with researchers from Austin Peay and the University of Tennessee to determine if Arkansas specimens of leatherflower may actually be two distinct species. Additionally, plant identification work this year, at the genetic level, involved collecting leaf tissue of the endangered plant harperella for a researcher with the Illinois Natural History Survey who is working to determine if this plant should be split into three different species.



The Mississippi Alluvial Plain is a land of big rivers. Commission scientists are adding their field expertise to other federal and state agencies, along with university students and researchers, to learn more about two of the major waterways: the White River and the lower Arkansas River (left). Staff studied fish, mussels, birds, plants and other components of large river natural communities. In conjunction with a sand removal proposal, a similar team of scientists, including our aquatic specialist and botanist, conducted a preliminary mussel survey and plant survey on the middle White River. Black sandshell mussels, a tracked species, were observed and a new site for field mint - only the third record of that plant species from Arkansas - was also documented. The data collected with these surveys will provide a glimpse of how high flood waters have affected aquatic life in larger rivers.

## ...on Crowley's Ridge

Just as we use the dynamic information in our biodiversity database to identify targets for acquisition in the System of Natural Areas, we also use the data to identify gaps in our knowledge and identify objectives for further research and inventory. One area of focus is Crowley's Ridge - the smallest but perhaps the least studied and understood of all the natural divisions of Arkansas. The formation is generally thought to have originally been an island between the Mississippi and Ohio Rivers that became a long ridge after the rivers changed course millions of years ago. New research is



looking at possible seismic activity contributing to the uplift of the ridge as well. These research questions and new theories open up exciting opportunities for discovery. The commission has contracted with Arkansas State University in Jonesboro to study the identified high-quality, remnant natural communities on the ridge. The work has focused on habitats found on sand and gravel ridges, the hardwood forests in the deep ravines (above right), and forested seepage wetlands along streams. Not only has this work given us new rare plant records, we are getting a more complete picture of the ecology of the region.

Chalk Bluff Natural Area is on the north end of the Arkansas portion of Crowley's Ridge. Despite its name, Chalk Bluff has no chalk deposits. Instead, its soils are from wind-blown materials made of light-colored clays, silts, and sands. If exposed, such soils are subject to severe erosion, creating steep slopes and deep ravines. The natural area includes a portion of the Civil War battlefield from the Battle of Chalk Bluff. A special historical marker (below) was approved for the site by the Arkansas Civil War Sesquicentennial Commission. The military advantage of the bluff and the relationship of Arkansas's ecology to events in the Civil War were also the focus of the summer workshops and lesson plans presented to 110 educators around the state as part of the Department



of Arkansas Heritage's 2011 Heritage Month focus on the Civil War. The "Nature of the Civil War in Arkansas" lesson plans are available on the DAH's new Internet education portal, the Arkansas History Hub (www. arhistoryhub.com).



Wittsburg Natural Area supports several examples of the unique character of Crowley's Ridge. The streams draining the slopes have cut deeply into the ridge, revealing the full thickness of the loess and exposing the gravels, sands, and clays below. The gravels are often studded with fossils and semiprecious stones. Petrified wood is found washed into the streams or on the hillsides. Sugar maple, tulip trees, and cucumber magnolia trees, uncommon in much of Arkansas, are well distributed in the natural area.

#### Web-Based Outreach

The commission strives to increase our visibility. We take deliberate steps so our messages resonate with all Arkansans, especially those who appreciate nature. We strategically focus our themes, content, timing, and distribution methods to meet these ends.

Our website, www.naturalheritage.com, connects Arkansans and the world to Arkansas's most unique plants, animals, and landscapes. Our constituents are quite comfortable accessing our information via the internet which is more cost effective than conventional printed offerings. The website features our educational materials about Arkansas's plants, animals, and natural communities. Highly regarded and used in traditional classrooms, by homeschoolers, and nonprofit organizations, these items reach Arkansans from all walks of life. One publication in particular, "The Natural Divisions of Arkansas," was downloaded from our website more than 50,000 times in FY2011!

In FY2011, we expanded the multimedia section of our website. Visitors can now watch videos of field work, endangered species, and prescribed fire, or they can listen to audio tours of selected natural areas.

We freshened the look of "Natural News", ANHC's monthly e-newsletter, and made our content more interactive. We saw our e-newsletter articles picked up in a variety of communication materials by conservation partners including Arkansas Forestry Association, Arkansas Game and Fish Commission, The Nature Conservancy in Arkansas, and the Arkansas Environmental Education Association.

We also began new efforts to reach out on Facebook. We now hold drawings from the responses to a survey or question posed each month in the Natural News. Questions are designed to test our fans' knowledge about The Natural State and begin conversations about the commission's work. Contest participants reached as far away as California and Delaware this year.



Website - www.naturalheritage.com

Facebook - www.facebook.com/arnaturalheritage

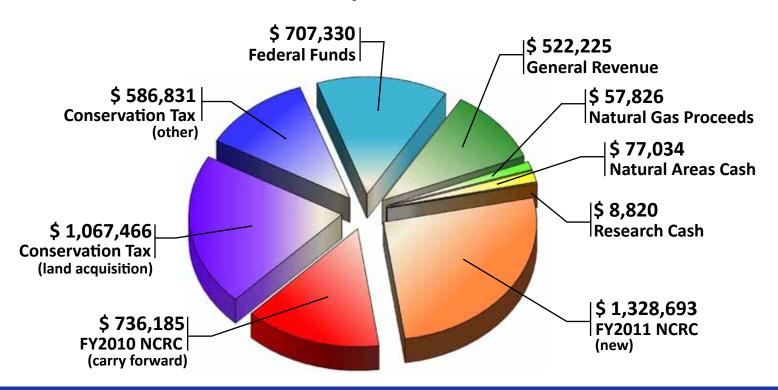
YouTube - www.youtube.com/ARNaturalHeritage

Flickr - www.flickr.com/photos/naturalheritage

## Financial Report

The commission's five key funding categories include general revenues, 1/8th-Cent Conservation Sales Tax, Natural and Cultural Resources Council grant funds, federal funds, and cash funds. Governor Beebe authorized the release of \$500,000 from the General Improvement Fund late in June 2011, that will carryforward to Fiscal Year 2012 for additions to the System of Natural Areas.

#### **Fiscal Year 2011 Expenditures = \$ 5,092,410**





Fiscal Year 2011 expenditures totaled \$5,092,410, which is \$813,161 higher than the previous year. The majority of the increase was paid with 1/8th-Cent Conservation Sales Tax funds carried over from the additional funding authorized by Governor Beebe in FY2010. The carry-over funding was used primarily for the creation of Longview Saline Natural Area. The commission also saw an increase in federal grant funds, which were used to add Hall Creek Barrens Natural Area to the System of Natural Areas.

Left: Coreopsis blooming at Longview Saline Natural Area.

Of particular note was the expenditure of \$57,826 in royalty payments from mineral leases administered by the Commissioner of State Lands. Of the no-surface-disturbance leases on 598 mineral acres at two locations, most of the revenue originates from activity near Cove Creek Natural Area, and the remainder near Big Creek Natural Area. This year we worked with the Department of Finance and Administration and the Governor's Office in the development of the appropriation act for the Department of Arkansas Heritage to provide for this income source in the future. These funds offer administrative flexibility to accommodate fluctuations in federal funding for special projects.

## Status Reports



The commission is directed by Act 112 of 1973 to maintain a registry or inventory of lands and waters in the state that are of significant scientific, educational, and/or recreational interest. We meet that responsibility through a dynamic biodiversity database maintained by our Arkansas Heritage Program that tracks the location and status of rare species of animals and plants, and natural communities in Arkansas. The Registry of Natural Areas is made up of county lists of these rare species and natural communities in our state.

Act 112 also establishes state System of Natural Areas and requires that each year, the commission "...shall describe and account for the status and condition of each portion of the system..." Today, almost 40 years later, that reporting requirement encompasses more than 53,000 acres over 69 natural areas.

The first section of the legislation also eloquently affirms why the status of the Registry and System of Natural Areas are so important, "...it is the policy of the State of Arkansas to preserve, manage, and enhance the lands, waters, and air of the state with full recognition that this generation is a trustee of the environment for succeeding generations."



Above: Baker Prairie Natural Area in full bloom.

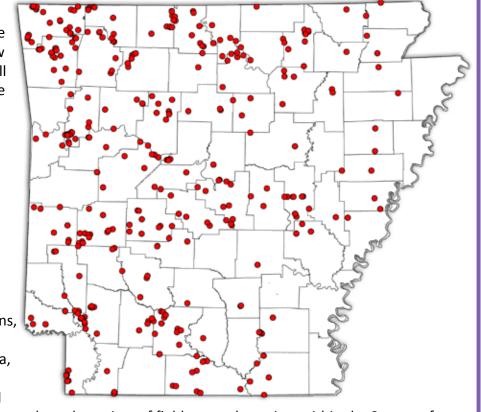
We are proud to report the status of the natural world in Arkansas today as it relates to the Registry and System of Arkansas's Natural Areas.

# Status of the Registry of Natural Areas

As of June 30, 2011, we have 13,898 records of rare species in Arkansas in the biodiversity database, including 539 new entries added this year (map at right). All of our conservation work is based on the information contained in the database, as scientific review of this information guides field survey and biota inventory efforts. Analysis of the findings and our historical records contributes to setting the focus of the commission's land acquisition priorities and also becomes a vital component of our Natural Area Management Plans.

Information is also gathered from herbaria, museums, scientific publications, research studies, and field survey collaborations with colleagues, academia, and other conservation organizations.

Nineteen collection permits were issued to academic researchers and others who conducted a variety of field research on sites within the System of Natural Areas. A condition of their collection permit is that they must provide their results to our biodiversity database. This year they shared results of bat monitoring, salamander surveys, an American burying beetle survey at Cherokee Prairie, a water mite survey at the Cossatot River, a survey for bees, Diana fritillary butterfly surveys, and insect surveys to track impacts of habitat restoration at Rock Creek and Terre Noire Natural Areas.





Above: The rare Arkansas twistflower.

We share our data with government agencies, land managers, and land use planners through the commission's Environmental Review/Information Sharing Program. This year for environmental review projects, ANHC staff performed a total of 601 data searches, such as providing data for a review of multiple locations across the state where Windstream proposes to install fiber optic lines using federal stimulus grant money.

County level information is available to the public through the Rare Species Search Engine, on the ANHC website. This year, the search engine section recorded 1,888 visits, with 6,774 views of individual data pages. Visit the "research and data" tab at www. naturalheritage.com for more information on the status of rare, threatened, and endangered species and natural communities in Arkansas.

# System of Natural Areas

As of June 30, 2011, the System of Natural Areas consisted of 69 sites totaling 53,217 acres in 45 counties across the state. The commission must hold a perpetual interest in the property to become part of the System of Natural Areas. The interest varies by site and may range from a donated conservation easement to fee title ownership.

Stewardship for each natural area includes methodical steps to restore ecosystem functions and maintain or enhance habitat conditions within the framework of a conservation vision and guided by a management plan. Plans are updated in a regular review cycle to incorporate research findings and the results of proactive land management practices. In FY2011, 21 management plans were updated.

Searches for rare species (in the field, on the Internet, and in libraries, herbaria, etc.) may reveal a conservation status change is necessary. As new information becomes available, rare species and natural communities may be added to, or eliminated from, the biodiversity database and included or no longer listed as one of the commission's Elements of Special Concern.

Stewardship work is as diverse as the communities we aim to conserve. Commission staff, contractors, and our conservation partners conducted 41 prescribed burns at 26 natural areas covering 5,525 acres throughout the System. We installed two parking lots and improved public access at four natural areas. Restoration work included large-scale invasive species removal projects at five natural areas, planting native prairie seeds to continue tallgrass prairie restoration at Downs Prairie Natural Area, and mechanical mid-story treatments to improve habitat structure at natural areas in the pine flatwoods ecosystem.

Two new natural areas were added to the System this year, both acquired in cooperation with the Arkansas Field Office of The Nature Conservancy and both located in the Coastal Plain.



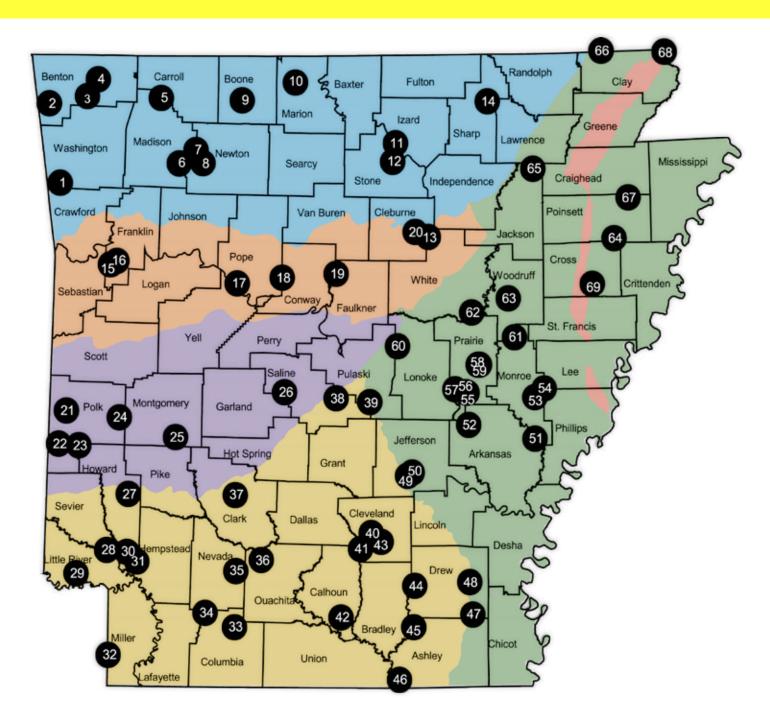
Hall Creek Barrens Natural Area (left) totals 647 acres and is located in Cleveland County. Its unique, saline (salty) soil provides habitat for the federally threatened plant geocarpon as well as nine other plant species of conservation concern.

Longview Saline Natural Area, totaling 527 acres in Ashley County, protects 0.5 miles of the Saline River. This site continues ANHC's work to protect habitat for the federally endangered Red-cockaded Woodpecker.

An additional 884 acres were added to six existing natural areas this year, including:

- 74 acres at H.E. Flanagan Prairie that added intact prairie habitat
- 20 acres at Devil's Knob-Devil's Backbone that protects additional glade habitat
- 249 acres at Slippery Hollow that protects foraging habitat for endangered bats and consolidated current land holdings
- 320 acres at Warren Prairie that protects additional pine flatwoods
- 180 acres at Poison Springs protects additional sandhill habitat
- 41 acres at Pine City Natural Area, making this location the tenth natural area to exceed 1,000 acres

## Arkansas's System of



As of June 30, 2011, the System of Natural Areas consisted of 69 sites totaling 53,217 acres in 45 counties across the state. In the map above, natural areas are notated by numbered dots. Each numbered dot has a corresponding natural area in the list on the facing page.

Detailed information, including downloadable boundary maps and county locator maps, as well as site descriptions, driving directions, and photographs of our natural areas are available on our website – visit the "natural areas" tab at www.naturalheritage.com.

## Natural Areas

SASTATION NOISSIN

- 1 Garrett Hollow Natural Area
- 2 Chesney Prairie Natural Area
- 3 Cave Springs Cave Natural Area
- 4 Searles Prairie Natural Area
- 5 Bear Hollow Natural Area
- 6 Kings River Falls Natural Area
- 7 Sweden Creek Falls Natural Area
- 8 Pine Hollow Natural Area
- 9 Baker Prairie Natural Area
- 10 Slippery Hollow Natural Area
- 11 Devil's Knob-Devil's Backbone Natural Area
- 12 Hell Creek Natural Area
- 13 Big Creek Natural Area
- 14 Rock Creek Natural Area
- 15 Cherokee Prairie Natural Area
- 16 H. E. Flanagan Prairie Natural Area
- 17 Dardanelle Rock Natural Area
- 18 Goose Pond Natural Area
- 19 Cove Creek Natural Area
- 20 Cow Shoals Riverfront Forest Natural Area
- 21 Iron Mountain Natural Area
- 22 Fernwood Seep Natural Area
- 23 Cossatot River State Park-Natural Area
- 24 Big Fork Creek Natural Area
- 25 Gap Creek Natural Area
- 26 Middle Fork Barrens Natural Area
- 27 Stone Road Glade Natural Area
- 28 White Cliffs Natural Area
- 29 Palmetto Flats Natural Area
- 30 Saratoga Blackland Prairie Natural Area
- 31 Nacatoch Ravines Natural Area
- 32 Miller County Sandhills Natural Area
- 33 Logoly Natural Area
- 34 Falcon Bottoms Natural Area
- 35 Arkansas Oak Natural Area

- 36 Poison Springs State Forest Sand Barren and Oak-Pine Forest Preserve
- 37 Terre Noire Natural Area
- 38 Mills Park Natural Area
- 39 Lorance Creek Natural Area
- 40 Kingsland Prairie Natural Area
- 41 Moro Creek Bottoms Natural Area
- 42 Moro Big Pine Natural Area-Wildlife Management Area
- 43 Hall Creek Barrens Natural Area
- 44 Warren Prairie Natural Area
- 45 Longview Saline Natural Area
- 46 Coffee Prairie Natural Area
- 47 Cut-off Creek Ravines Natural Area
- 48 Seven Devils Swamp Natural Area
- 49 Byrd Lake Natural Area
- 50 Taylor Woodlands Natural Area
- 51 Striplin Woods Natural Area
- 52 Roth Prairie Natural Area
- 53 Pine City Natural Area
- 54 Louisiana Purchase Natural Area
- 55 Konecny Prairie Natural Area
- 56 Konecny Grove Natural Area
- 57 Smoke Hole Natural Area
- 58 Railroad Prairie Natural Area
- 59 Downs Prairie Natural Area
- 60 Holland Bottoms Willow Oak Forest Preserve
- 61 Benson Creek Natural Area
- 62 Holloway Memorial Natural Area
- 63 Cache River Natural Area
- 64 Singer Forest Natural Area
- 65 Swifton Sand Ponds Natural Area
- 66 Stateline Sand Ponds Natural Area
- 67 St. Francis Sunken Lands Natural Area
- 68 Chalk Bluff Natural Area
- 69 Wittsburg Natural Area

### Administration

Commissioners participate in quarterly meetings, provide the approvals required by law, and offer oversight to protect the public's interest. In addition, commissioners help to heighten the visibility of the Department of Arkansas Heritage and the commission, and encourage the support of our mission, projects, and programs.

<b>Mark Karnes</b> <i>C</i> Arkadelphia		<b>Ann Cornwell</b> <i>Vice-Chairman</i> Little Rock, AR		Curtis Adams, Jr. Secretary Fort Smith, AR	
<b>Manuel Barnes</b>	<b>Robert Bevis</b>	<b>Jim Daniels</b>		<b>Lucien Gillham</b>	
Bentonville, AR	Scott, AR	McGehee, AR		Sherwood, AR	
Robin Lockhart	<b>Sally McLarty</b>	<b>Stephen Morley</b>		<b>Neill Sloan</b>	
Little Rock, AR	Newport, AR	North Little Rock, AR		Lake Village, AR	
<b>Gerry Soltz</b>	<b>Doug Swann</b>	<b>Sharon Walker</b>		<b>Wade Williams</b>	
Morrilton, AR	Little Rock, AR	Lake Village, AR		Fayetteville, AR	

#### DEPARTMENT OF ARKANSAS HERITAGE

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Bryan Rupar Chief of Acquisitions and Stewardship
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John O'Dell Land Management Specialist
Patrick Solomon Land Management Specialist
Toby Von Rembow Land Management Specialist

Bill Holimon Chief of Research
Tom Foti Part-time Advisor
Cindy Osborne Conservation Data Manager and
Environmental Review Coordinator
Theo Witsell Botanist
Jennifer Akin Plant Community Ecologist
Scotty Winningham Conservation Data Specialist
Brent Baker Botanist
Jason Throneberry Biologist: Aquatic Specialist
Katie Shannon Environmental Review Specialist

# ARKANSAS NATURAL HERITAGE COMMISSION

NATURE CONNECTION www.naturalheritage.com