



Arkansas citizen science work goes national

The Arkansas Natural Heritage Commission (ANHC) is launching a new citizen science project for 2009. After cataloging information on our state's tarantulas, bumblebees, and box turtles, the work for this year focuses on plants through an existing national program called "[Project BudBurst](#)."



March
2009

The project is designed to collect data on the first appearance of buds and leaves, first flower, and other events in everything from trees to weeds. Arkansas data will be linked with the national Project BudBurst database to give a broad picture of phenological events in North America. "Phenology" is the study of cyclical biological events, such as flowering, in relation to climatic conditions. Observations of phenological events have provided indications of the progress of the natural calendar since ancient times. For example, records of grape harvests in Europe have been used to reconstruct a record of summer growing season temperatures going back more than 500 years.

Participation in Project BudBurst is easy – all you have to do is pick a plant that you can easily observe on a regular basis. Visit the [Project BudBurst](#) page on the ANHC website to see a list of the national database plants that occur in Arkansas with links to printable identification guides. The list includes native trees and shrubs, native wildflowers, common ornamentals, and common weeds – even the dandelion! The plants were chosen because they are easy to identify and widespread across the continental U.S.



Even though the project is called "BudBurst," don't worry if your favorite plant already has its first buds. Reporting other phenological phases of plants is just as critical, including: full leaf, first flower, full flower, end flower, and seed or fruit dispersal. Descriptions and details for these phases are also available.

Participants can submit their data directly to the national Project BudBurst database through the link on the ANHC website and see data reported by other citizen-scientists across the country. Data forms are also available for downloading and may be submitted through the mail.

Why are all these buds and blooms important? Phenological records have scientific value for understanding the interactions between organisms and their environment and for assessing the impacts of climate change. They also record the consequences of environmental variability vital to the public interest. Events such as the beginning of the growing season can vary by three weeks or more from year to year. Such variations have important environmental and socio-economic implications for health (allergens and infectious diseases), recreation (fall colors and wildflower displays), agriculture (planting and harvest times, pest control) and management of natural resources (water and timber).

With recent evidence of global warming, phenological data has assumed a special role as a measure of the impacts of climate change. The flowers and plants in your own backyard or neighborhood park also have a role in this global drama. To choose your plant and add Arkansas data to the national BudBurst database, visit [Project BudBurst](#)
- [Jane Jones-Schulz](#)

Arkansas's Lost Pines

Located in eastern Arkansas, [Pine City Natural Area](#) contains some of the last remaining loblolly pine (*Pinus taeda*) forests in the Mississippi Alluvial Plain. These loblolly pine forests are something of an anomaly as they are surrounded by bottomland hardwood forests and occur some distance outside of the species main range in the U.S. Isolated loblolly pine forests also occur in central Texas where these stands are called "Lost Pines." So, in essence, Arkansas has its own version of Lost Pines.



Geographically isolated from other populations for thousands of years, Pine City Natural Area's trees have adapted to grow vigorously under conditions that loblolly pine would normally not be expected to survive. Soils in and around the natural area are poorly drained and remain wet for extended periods throughout the year. Research conducted at Texas A & M University previously identified these trees as being genetically different from other loblolly pines.

To maintain this unique local genetic type, the ANHC initiated a program to propagate seedlings from Pine City Natural Area. In cooperation with the Arkansas Forestry Commission (AFC), pine cones (containing seeds) were collected from mature trees within the natural area. For the past four years, the AFC has been raising seedlings from the collected seeds at its Tree Improvement Complex in Bluff City. The ANHC plans to use these developing seedlings to reforest portions of Pine City Natural Area that were previously cleared and used for agriculture.



Planting seedlings from the local seed source helps to ensure a high rate of survival and maintain the unique genetic properties of these native Arkansas pine trees. A new research project, involving Pine City Natural Area seedlings, will test their growth and survival against more "typical" loblolly pine seedlings across a range of growing conditions. In the future the ANHC and the AFC hope to make these seedlings available for private land-owners who are interested in reforesting their land with this unique, eastern Arkansas loblolly pine.

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Digital field notes:
Anatomy of a prescribed burn

Earlier this month, the ANHC's burn crew carried out a prescribed burn at [Searles Prairie Natural Area](#) in northwestern Arkansas. Members of the ANHC burn crew have all completed prescribed burn training through the Arkansas Prescribed Fire Council. Located near Rogers, Searles Prairie is a 10-acre remnant of a 10,000-acre Ozark tallgrass prairie. The application of fire to grasslands is critical as it removes thick accumulations of thatch, returns nutrients to the soil, and limits invasion by woody plants.

A prescribed burn is a very technical undertaking and requires preparation. In fact, pre-burn preparations take more time than the actual burn itself. A burn plan must be prepared which details the logistics of applying the fire, the appropriate conditions, and emergency protocols. Fire lines are established around the area to be burned. This involves the clearing of vegetation, nearly down to bare dirt, in a 10-20 foot wide strip around the burn site.



endangered [Red-cockaded Woodpecker](#) (RCW) to the site. The ANHC has been working steadily over the past few years to restore Warren Prairie Natural Area to a condition that is both historically appropriate for this area of southern Arkansas and that will support RCWs.



RCWs are unique among cavity-nesting birds as they prefer to excavate cavities in large, living pine trees. Specifically, pine trees infected with heartrot fungi. Living trees are much harder to excavate and so construction of a nesting cavity may take a single bird months to complete.

Artificial cavities are a critical component of RCW conservation because they provide ready-made spaces for the birds to nest and/or roost. The artificial cavity itself is very much akin to a bird house. However, this bird house is inserted "into" the tree not "on" it. A rectangular block is cut out of a living pine, at about 20 feet above the ground. The artificial cavity is then inserted into the cut away space.

The ANHC hopes to re-introduce RCWs to Warren Prairie Natural Area sometime over the next three years. Timing of the re-introduction will depend on when donor populations in Arkansas, Louisiana, and Texas have adequate numbers of birds.

- [Michael D. Warriner](#)

Conservation partners

Arkansas Famous and Historic Tree Program

[Lynn Warren](#), Arkansas State Parks

In 1997, the [Arkansas Famous and Historic Tree Program](#) (AFHTP) was established to create a greater awareness and appreciation for historic trees in Arkansas (like the champion persimmon tree at right). Trees may be nominated to the program by anyone with permission from the property owner. A committee of landscape, forestry, and historic preservation specialists evaluate the nominations to determine whether trees are eligible to be listed with the AFHTP.



The AFHTP evaluates whether a tree should be recognized as significant by four main criteria. Only living trees that have been planted for a minimum of five years will be considered. Generally, a tree must be at least 50 years old to be considered eligible for listing. Trees less than 50 years of age must be exceptionally important to be listed. Groups of trees or a significant tree community may also be nominated. A tree must meet at least one of the following criteria:

- Be associated with a significant event in local, state, or national history
- Be associated with a significant person, institution or landmark in local, state, or national history
- Be significant with respect to horticultural, ecological, or structural characteristics for a local, state, or national region
- Have potential to yield significant cultural information in local, state, or national history

The AFHTP makes information about the famous and historic trees in the program available to the public. Historic trees on public land may be visited throughout Arkansas. Information about each tree and where it is located can be found at <http://www.arhistorictrees.org/>.

Endemic species of the month: March 2009 A cyanobacterium (*Phormidium treleasei*)

So far, our monthly endemic articles have included plants and animals. This month, features an organism that is neither: a species of cyanobacteria called *Phormidium treleasei*. In the 1970s, scientists determined that cyanobacteria,



formerly known as blue-green algae, have physical features that make them more closely related to bacteria than to algae. Although the exact classification of cyanobacteria is still under debate, some scientists now classify cyanobacteria as "prokaryotes"- mostly tiny, single-celled organisms whose genetic material is loose in the cell. The genetic material of plants, animals, and other "eukaryotes" (true nucleus), on the other hand, is held in the cell's nucleus.



Cyanobacteria are widely distributed over land and water, often in environments where no other life can exist. They can tolerate temperatures in the range of 158 to 163 degrees F. *Phormidium treleasei* is found in the thermal waters at Hot Springs National Park. The blue-green color of the cells of cyanobacteria (cyan means blue-green) is due to the combination of green chlorophyll pigment and a unique blue pigment (phycocyanin).

However, not all "blue-green algae" are actually blue-green. Their pigmentation includes yellow-green, green, grey-green, grey-black, and even red specimens. The Red Sea derives its name from occasional blooms of a species of scillatoria that produces large quantities of a unique pigment called phycoerythrin.

Cyanobacteria are microscopic life forms that exhibit several different types of organization. Some grow as single cells enclosed in a sheath of slime-like material, or mucilage. The cells of others, including *Phormidium treleasei*, aggregate into colonies. *Phormidium* usually forms flat, slimy mats of tangled filaments attached deep under water which can detach and float to the surface. Examples of the unique *Phormidium treleasei*, as well as other organisms adapted to life at high temperatures, can be seen in the pools and springs at [Hot Springs National Park](#), where the water temperature averages 143 degrees F.



- [Jane Jones-Schulz](#)

Upcoming Events

March 14, 2009. Cossatot Conservation Day: Cossatot River State Park-Natural Area (10:00 a.m.-4:00 p.m. - ANHC staff participating).

March 20, 2009. Hot Springs National Park Brown Bag Lunch Program: "She's wearing a dead bird on her head" by Jane Jones-Schulz (ANHC), Hot Springs, admission is free (12:00 p.m.).

April 3-4, 2009: [93rd Annual Meeting of the Arkansas Academy of Science:](#) University of the Ozarks, Clarksville.

April 3-4, 2009: [Arkansas State Science Fair:](#) University of Central Arkansas, Conway (ANHC selects four projects for natural heritage awards).

April 4, 2009. First Annual Market Place Green to Go Festival: Market Place Shopping Center, Little Rock (9:00 a.m.-4:00 p.m. - ANHC staff participating).

April 17-18, 2009. [Little Rock Zoo Earth Day Celebration:](#) Conservation education and activities for families, Little Rock (9:00 a.m.-5:00 p.m.- ANHC staff participating).

April 24-26, 2009. [Arkansas Audubon Society Spring Convention:](#) Petit Jean State Park.

June 26-July 1, 2009. [2009 Meeting of the American Arachnology Society:](#) Arkansas Tech University, Russellville.

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