

Arkansas's Blackland Prairie Region

by the Arkansas Natural Heritage Commission

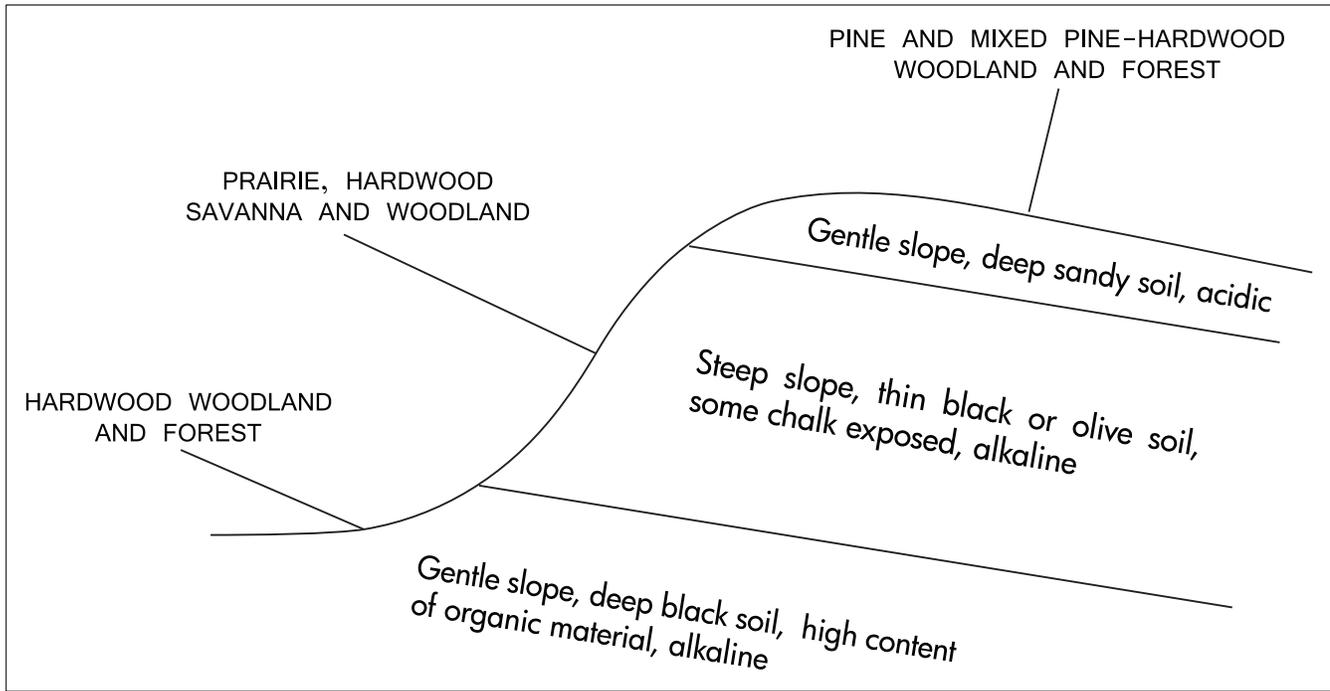
Blackland prairies and associated savanna, woodland and forest communities once covered approximately 12 million acres in northeast and east central Texas, as well as southwest Arkansas, and northwest Louisiana, Mississippi and Alabama. By 1975, only 100,000 acres of blackland remnants remained with less than 5,000 acres considered to be of high quality. It is estimated that this rare ecosystem historically spanned 321,000 acres in Arkansas. Surveys in 1989 showed less than 14,826 acres remained in relatively natural condition. Row-crop agriculture, grazing, forestry, mining, and urbanization have contributed to the loss of this unique landscape. Altered fire regimes, invasive plant species and habitat fragmentation pose major threats to remnants.

To understand why the blackland prairie ecosystem is so rare in Arkansas, you must know a little about its geology. Millions of years ago, the Gulf of Mexico covered the southeastern United States. At one time, portions of southern and eastern Arkansas were on the gulf coast. The shallow waters in this part of the gulf were full of shelled creatures, and over time, their remains accumulated on the ocean floor forming a layer of soft limestone called *chalk*. In some areas, the shells mixed with ocean sediments to create *marl*, a layer of limey clay. Then as the Gulf of Mexico receded, deposits of gravel, sand and silt were often left on top of the chalk and marl.



Original distribution (in yellow) of blackland communities in southwestern Arkansas.

The ocean-bottom material left by the Gulf of Mexico usually formed the rolling hills and sandy, acidic soil typical in the Coastal Plain natural division. The blackland prairie region of Arkansas is located within the Coastal Plain, but it is atypical. Confined to the southwestern corner of the state, the region consists of several distinct areas of alkaline soil characterized by chalk outcrops, black soil and *cuestas*—long, low ridges with a relatively steep face on one side and a long, gentle slope on the other. It is on the steep sides of these *cuestas* that we find the blackland prairie communities.



General model of the geology, soil, vegetation and topography of a cuesta in southwestern Arkansas

Prairies—open areas dominated by characteristic herbaceous plants—occur on the thin soils that cover the steep slopes of the cuestas. Typical blackland prairie plants include little bluestem (*Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*), compass-plant (*Silphium laciniatum*), and purple prairie-clover (*Dalea purpurea*). On the gentle low slopes at the base of the ridges, as well as other areas with slightly thicker soil, prairie transitions to *savanna*. Here, prairie plants still dominate the landscape, but there may be scattered trees such as chinquapin oak (*Quercus muehlenbergii*), nutmeg hickory (*Carya myristiciformis*), and white ash (*Fraxinus americana*). As slopes level out, the soil becomes deeper and savanna grades into *woodland*. Woodlands have a denser canopy than savannas but remain open enough that herbaceous vegetation still dominates the understory. Woodland trees are similar to those found on savannas but also include mockernut hickory (*Carya alba*), black-gum (*Nyssa sylvatica*), and Shumard’s oak (*Quercus shumardii*). One blackland tree species of note is the bois d’arc (*Maclura pomifera*), also known as Osage-orange. It can now be found all over North America but is apparently only native to the western blackland prairie region.



Blackland prairie at Terre Noire Natural Area (left). An example of how prairie transitions into savanna and woodland on cuestas at Saratoga Blackland Prairie Natural Area (right).

By now, you must be wondering if the soils of the blacklands are actually black. G.W. Featherstonhaugh, an English geologist who traveled across Arkansas in the 1830's, described the soil as "black as charred wood." However, on cuestas, erosion is common, and the thin soil covering the chalk ridges is more often olive in color. The alkaline nature of the chalk and marl makes the soil in these areas very fertile and highly productive, likely contributing to the high content of organic material and the black color.

Blackland prairies and associated communities are not uniform. Blackland prairie and woodlands are often interspersed with pine/mixed pine-hardwood woodlands and forests, as well as bottomland hardwood forests. Historically, fire played a major role in controlling woody vegetation and in maintaining the open, grass-dominated understory characteristic of these Coastal Plain natural communities. This unique mosaic of landscapes in southwestern Arkansas supports a wide variety of plants and animals that specifically require an open, fire maintained habitat.



Male Diana fritillary (left), female Diana fritillary (center), Bachman's Sparrow (right).

For example, Bachman's Sparrow (*Aimophila aestivalis*) is a small songbird native to open habitats across the southeastern United States. Known to winter in Arkansas, it requires a dense ground layer of grasses and forbs, and an open understory with few shrubs. Bachman's Sparrow feeds by walking slowly across the ground searching for insects and seeds. It often jumps into the air to catch its prey. Frequent, natural fire is known to increase the forage preferred by this bird. The mosaic of blackland communities is also important to our state butterfly, the Diana fritillary (*Speyeria diana*). This butterfly breeds in deciduous/mixed forests and oak woodland/savanna where lots of violets (*Viola sp.*) can be found in the understory. Violets are its larval host plant. Adults feed in adjacent prairies and grasslands on the nectar of many different flower species.

Populations of both of the above species have decreased significantly as forestry, agriculture and altered fire regimes have negatively impacted suitable habitat in the landscape. Both are listed a species of greatest conservation need in the Arkansas Game and Fish Commission's (AGFC) Wildlife Action Plan. A number of Arkansas conservation agencies and nonprofits have focused efforts on maintaining and restoring biodiversity in the blackland prairie region for the benefit of the above and many other species of conservation concern.

There are a number of opportunities in The Natural State for you to see the mosaic of blackland communities. ANHC, AGFC, and The Nature Conservancy (TNC) all protect high-quality blackland prairie communities. Please see the attached for locations and website addresses where you can find directions and more information. Also attached are lists noting a few of the special plants and animals protected by these conservation areas, a list of keywords for educators, and our sources for this article.

Visit the blackland prairie region of Arkansas:

Terre Noire Natural Area (ANHC/TNC)

<http://www.naturalheritage.com/natural-area/terre-noire/>

Saratoga Blackland Prairie Natural Area (ANHC)

<http://www.naturalheritage.com/natural-area/saratoga-blackland-prairie/>

Columbus Prairie Preserve (TNC)

<http://www.nature.org/wherewework/northamerica/states/arkansas/preserves/art11134.html>

Rick Evans Grandview Prairie Wildlife Management Area (AGFC)

<http://www.agfc.com/hunting/Pages/wmaList.aspx>

Plant species of special conservation concern:

<i>Astragalus crassicaarpus</i> var. <i>crassicaarpus</i>	ground-plum
<i>Diaperia prolifera</i> var. <i>prolifera</i>	big-head rabbit-tobacco
<i>Liatris compacta</i>	Ouachita blazing-star
<i>Liatris squarrosa</i> var. <i>squarrosa</i>	scaly blazing-star
<i>Lithospermum incisum</i>	fringed puccoon
<i>Minuartia drummondii</i>	Drummond's sandwort
<i>Scleria verticillata</i>	whorled nut-rush
<i>Spiranthes magnicamporum</i>	great plains ladies'-tresses
<i>Stenosiphon linifolius</i>	false gaura
<i>Penstemon cobaea</i>	purple beardtongue
<i>Physaria gracilis</i> ssp. <i>gracilis</i>	bladderpod

Animal species of special conservation concern:

<i>Microstylum morosum</i>	giant prairie robber fly
<i>Speyeria diana</i>	Diana fritillary
<i>Tetraloniella albata</i>	white long-horned bee
<i>Tetraopes texanus</i>	a red milkweed beetle
<i>Lanius ludovicianus migrans</i>	Migrant Loggerhead Shrike
<i>Colinus virginianus</i>	Northern Bobwhite
<i>Circus cyaneus</i>	Northern Harrier
<i>Passerina ciris</i>	Painted Bunting
<i>Dendroica discolor</i>	Prairie Warbler
<i>Cistothorus platensis</i>	Sedge Wren
<i>Coccyzus americanus</i>	Yellow-billed cuckoo
<i>Aimophila aestivalis</i>	Bachman's Sparrow
<i>Ammodramus henslowii</i>	Henslow's Sparrow
<i>Chondestes grammacus</i>	Lark Sparrow
<i>Ammodramus leconteii</i>	Le Conte's Sparrow

Keywords for Educators:

- *chalk* - a soft layer of limestone (calcium carbonate) formed by the shells of marine organisms
- *marl* - a fine-grained sedimentary rock consisting of clay and chalk
- *cuesta* - long, low ridges with a relatively steep face on one side and a long, gentle slope on the other
- *prairie* - an open area of land, mostly treeless, dominated by herbaceous plants
- *herbaceous* - fleshy, as opposed to woody, plants that generally die back at the end of each growing season
- *savanna* - an open landscape with scattered trees and dominant herbaceous plants
- *woodland* - land covered in trees whose canopy is open enough that herbaceous plants still dominate the understory
- *canopy* - formed by the highest level of the branches and foliage of trees

Sources:

Peacock, C., & Schauwecker, T. (2003). *Blackland prairies of the gulf coastal plain*. Tuscaloosa, Alabama: The University of Alabama Press.

Foti, T.L. 1989. Blackland prairies of southwestern Arkansas. *Proceedings of the Arkansas Academy of Science* 43:23-28. http://www.naturalheritage.com/!userfiles/blackland_prairie.pdf

Foti, T., & Hanson, G. (1992). *Arkansas and the land*. Fayetteville, Arkansas: The University of Arkansas Press.

Arkansas Game and Fish Commission
<http://www.agfc.com>

Arkansas Natural Heritage Commission
<http://www.naturalheritage.com>

Arkansas Wildlife Action Plan
<http://www.wildlifeactionplans.org/arkansas.html>

The Nature Conservancy
<http://www.nature.org/wherewework/northamerica/states/arkansas/>



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