

RESTORING BLACKLAND PRAIRIE ON A LANDSCAPE SCALE TO BENEFIT SPECIES OF GREATEST CONSERVATION NEED

Project Summary

Blackland communities of the Coastal Plain, as well as calcareous prairie, limestone glade, and oak and pine-oak woodlands and savanna, will be restored through mechanical methods, herbicide treatments, prescribed burns, expansion of burn unit sizes, and re-establishment of prairie flora using local genotype seed at the following sites: Byers Preserve, Columbus Prairie Preserve, Nacatoch Ravines Natural Area, Saratoga Blackland Prairie Natural Area, Stone Road Glade Natural Area, and Terre Noire Natural Area/Preserve. This will address four funding priorities, notably including native grassland restoration, the highest priority of the bird taxa team. At least 15 Arkansas Wildlife Action Plan species of greatest conservation need (SGCN) will benefit from this project's landscape-scale restoration, which will increase the amount of suitable habitat available to SGCN at local (patch size) and regional scales.

Project Leader

Bryan Rugar, Chief of Acquisitions and Stewardship
Arkansas Natural Heritage Commission
323 Center St., Suite 1500
Little Rock, AR 72201
(501) 682-1587, Fax: (501) 324-9618
bryan@arkansasheritage.org

Project Partners

Doug Zollner, Director of Science
The Nature Conservancy
601 North University Ave.
Little Rock, AR 72205
(501) 614-5083, Fax: (501) 663-8332
dzollner@tnc.org

Susan Nimmo, Biologist Supervisor
Arkansas Game and Fish Commission
P.O. Box 110
Camden, AR 71711
(877) 836-4612, Fax: (870) 836-6508
sknimmo@agfc.state.ar.us

Griffin Park, Biologist Supervisor
Arkansas Game and Fish Commission
7004 Hwy 67 East
Perrytown, AR 71801
(877) 777-5580, Fax: (870) 777-3032
gpark@agfc.state.ar.us



Terre Noire Natural Area:
(above) Felled rows of cedar burned to restore blackland habitat.
(below) Pale Purple Coneflowers post-restoration.

SWG Funding Requested: \$80,000 (50%)

Amount and Source of Matching Funds: \$80,000 (50%) will be provided from the Arkansas Natural Heritage Commission, Arkansas Game and Fish Commission, and The Nature Conservancy

NEED: Blackland prairies and woodlands were historically abundant in the south-central United States, occurring primarily in northeast and east-central Texas with smaller tracts in southwest Arkansas, northwest Louisiana, Mississippi, and Alabama. Before European settlement, there were approximately 12 million acres of this blackland ecosystem, but by 1975, only about one percent (~100,000 acres) remained as remnant tracts with fewer than 5,000 acres of high-quality habitat. In the past 25 years, these remnants have been converted to agricultural fields, urban areas, and other land uses, further reducing the amount of extant blackland prairie. Beyond land conversion, other major threats to blackland remnants include altered fire regimes, the encroachment of invasive non-native and native plant species (e.g., eastern red cedar and white sweet clover), conversion to non-native pasture grasses (e.g., tall fescue and bermuda grass), and habitat fragmentation through development.

Byers Preserve, Columbus Prairie Preserve, Nacatoch Ravines Natural Area, Saratoga Blackland Prairie Natural Area, Stone Road Glade Natural Area, and Terre Noire Natural Area/Preserve are among the highest-quality blackland prairie complexes remaining in the state. Collectively, these sites encompass 3,724 acres of blackland community types, including prairie, oak-hickory woodlands, oak and pine-dominated forests, and bottomland oak forests.

Grassland-associated birds such as Henslow's sparrow and painted bunting, and woodland birds including Bachman's sparrow and yellow-billed cuckoo have been observed throughout the blackland system. Additionally, Terre Noire Natural Area/Preserve is one of only several sites in Arkansas known to host an anthophorid bee (*Tetraloniella albata*), a pollen-specialist apparently dependent solely upon purple prairie clover, an indicator of quality blackland prairie. Another habitat specialist found within the blackland prairie complex is the Diana fritillary; adults feed on nectar-producing plants in the prairie and woodlands, and caterpillars feed on woodland violets, the host plant.

Fire is the most important ecological process maintaining the distribution, composition, and diversity of blackland prairie, woodland, and forest communities. Decades of fire suppression have altered the species composition and structure of prairie and woodlands throughout the blackland ecosystem. Prairie openings have declined in size due to encroaching woody vegetation, and coupled with grazing, likely facilitated the invasion of eastern red cedar and other woody species. A lack of fire also facilitated woody succession in the oak-hickory woodlands, resulting in high stem density and a minimal herbaceous layer.

Because so much of Arkansas's blackland ecosystem has been lost, restoring extant habitat is crucial to increase the number and viability of SGCN. This project builds upon decades of prior strategic work and planning, including the success of State Wildlife Grants T-39-R2 and T-30-R5: a focus of efforts by various partners within the best remaining remnants concentrated in landscape-scale areas. Restoration of degraded blackland prairie and woodlands at six sites within a landscape context will further this long-term effort and benefit at least 15 SGCN.

FUNDING PRIORITIES: Restoring degraded blackland prairie and woodlands at six sites will address four 2014 Arkansas Wildlife Action Plan funding priorities for: (1) Grassland Birds – implementation and/or evaluation of habitat restoration and management for native grasslands, (2) Pine Woodland and Savanna Birds – implementation and/or evaluation of habitat restoration and management of pine woodland and savanna, (3) Woodlands – habitat management to maintain or increase habitat quality or increase patch size for SGCN, (4) Prairies and Native Grasslands – habitat management to maintain or increase habitat quality or increase patch size

for SGCN. Restoration and management of native grasslands for grassland birds is identified as the bird taxa team's highest priority in the 2014 State Wildlife Grants RFP.

PURPOSE AND OBJECTIVES: This project will restore and improve quality of blackland prairie and woodland habitat at the regional and local scale by reducing woody encroachment and invasive plants on 2,203 acres across six sites of southwestern Arkansas using mechanical and chemical methods and prescribed fire, thereby increasing viability of the SGCN that occur there. Larger burn units will be established at two sites to more easily implement prescribed fire and significantly reduce its long-term cost per acre. Project completion will take two years; proposal objectives are:

1. Increase scale of high-quality habitat at regional and local levels across southwest Arkansas to benefit SGCN that use blackland prairie habitat.
2. Increase scale and logistical and financial efficiency of prescribed burning by establishing larger burn units at two sites, thereby extending ecological benefits well beyond the project period.
3. Measure progress toward desired ecological conditions by measuring the response of SGCN.

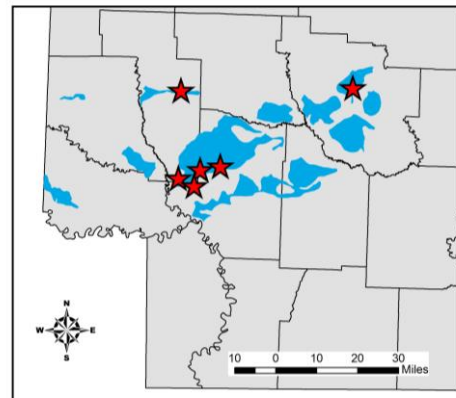
LOCATION OF WORK: Project activities will restore blackland prairie and associated woodlands in three contiguous counties (Hempstead, Clark, Howard) of the West Gulf Coastal Plain Calcareous Prairie terrestrial habitat located within the Blackland Prairie subdivision of the South Central Plains Ecoregion at Byers Preserve, Columbus Prairie Preserve, Nacatoch Ravines Natural Area, Saratoga Blackland Prairie Natural Area, Stone Road Glade Natural Area, and Terre Noire Natural Area/Preserve (Figure 1).

APPROACH:

Objective 1 will be addressed in both years of the project. A total of 2,203 acres of habitat will be restored at six sites using a variety of methods. A total of 1,988 acres will be treated using prescribed fire, which includes acres restored using methods in the previous sentence. The specifics for each site follow.

- Restoration of 80 acres at **Terre Noire Natural Area/Preserve** will be conducted with herbicide to remove non-native fescue. We will restore an additional 25 - 30 acres by treating invasive red cedar using two techniques: felling rows and girdling in rows not felled, and felling using the cut-and-lay method. Additionally, 720 acres will be treated with prescribed fire.
- Restoration of 30 acres at **Stone Road Glade Natural Area** will entail a hand crew restoring structure and composition by thinning the mid- and understory using foliar, hack-and-squirt, and cut stump herbicide application methods; focus will be on young shade-intolerant hardwoods. Sericea lespedeza and white sweet clover will be treated using a regime of mechanical and chemical means. Prescribed fire treatments will be done over 108 acres.
- Restoration of 12 - 20 acres at **Saratoga Blackland Prairie Natural Area** using a hand crew to cut hardwoods as described immediately above and to cut-and-lay red cedar.

Figure 1: Project sites in relation to blackland soil types (in blue).



- At *Nacatoch Ravines Natural Area*, 15 - 20 acres will be restored by using a forestry mulcher and chain saw hand crew and planting prairie flora using native genotype seed. An additional 10 - 15 acres will be treated with herbicides to reduce invasive plant species. Further, 710 acres will be treated with prescribed fire.
- Restoration of 15 - 20 acres will occur at the *Columbus Prairie* and *Byers Preserves* by using herbicides to reduce invasive plants and spot treat woody encroachment using mechanical methods. Additionally, 450 acres will be treated with prescribed fire.

Objective 2 will be addressed in both years of the project. Prescribed fire units will be expanded at two sites to increase scale and logistical and financial efficiency of prescribed burning. Burn units will be expanded from 54 to 66 acres at Saratoga Blackland Prairie Natural Area and from 70 to 200 acres at Nacatoch Ravines Natural Area. This will include the following methods:

- Establishment of new, permanent fire lines using a forestry mulcher and other mechanical methods.
- Hand crews to develop and maintain fire lines.
- Light-intensity prescribed burns within newly established units to reduce spotty areas with heavy fuel loads (e.g., burning piles of cut cedar or running a fire through young pine stands).

Objective 3 will be addressed in both years of the project. We will use transects and general area searches pre- and post-treatment to survey bird and butterfly diversity and SGCN.

EXPECTED RESULTS AND BENEFITS:

Historically, the blackland prairie region of southwestern Arkansas supported a high species diversity in prairie, glade, and woodland communities. These habitats were greatly degraded or destroyed over the past 150 years, and many of the species are now considered SGCN. This project builds upon prior strategic work and planning: a focus of efforts by various partners within the best remaining remnants concentrated in landscape-scale areas. This project will further efforts to restore communities in a landscape context at both regional and local (patch) scales that we will maintain in future years, thereby increasing diversity and viability of 15 SGCN known from these six blackland sites (Table 1).

Table 1: SGCN that will benefit from this project (20). Species known from targeted blackland sites are in bold.

anthophorid bee	Northern bobwhite
Bachman's sparrow	Painted bunting
Brown-headed nuthatch	Prairie warbler
Byssus skipper	Red-headed woodpecker
Chuck-will's widow	Red milkweed beetle
Diana	Robberfly
Henslow's sparrow	Sedge wren
Lark sparrow	Texas milkweed beetle
Le Conte's sparrow	Yellow-billed cuckoo
Migrant loggerhead shrike	Whip-poor-will

BUDGET 50 - 50% Cost Share: Grant funding for salary will be used for staff paid from non-recurring federal funds.

Category	Total	Match ANHC	Match Partners	Grant
Contract Services	\$ 140,500	\$ 41,500	\$ 26,000	\$ 73,000
Salary / Benefits	16,500	12,250	0	4,250
Supplies and Materials	500	250	0	250
Travel	2,500	0	0	2,500
Grand Total	\$ 160,000	\$ 54,000	\$ 26,000	\$ 80,000

ORGANIZATION AND STAFF QUALIFICATIONS:

The Arkansas Natural Heritage Commission, The Nature Conservancy, and the Arkansas Game and Fish Commission have successful experience restoring and protecting blackland prairie communities. They have worked together and with private partners to develop a broad understanding of this at-risk ecosystem through years of scientific observation and use of adaptive management in implementation of restoration and conservation techniques. Each agency protects and maintains blackland prairie remnants in Arkansas. The Arkansas Game and Fish Commission's Rick Evans Grandview Prairie represents the largest contiguous tract of blackland prairie in public ownership in the nation.

Project Leader: Bryan Rupar is the Chief of Land Acquisition and Stewardship for the Arkansas Natural Heritage Commission. Bryan received a B.S. in Natural Resource Management from Grand Valley State University and an M.S. in Forest Resource Management from the University of Arkansas at Monticello. Bryan previously worked for the US Forest Service in Michigan and private forestry firms in southern Arkansas. Bryan oversees all acquisition, stewardship, and restoration projects for the 61,000-acre System of Natural Areas.

Douglas Zollner is the Director of Conservation Science for TNC, Arkansas Field Office. He has been working with the Conservancy for 12 years. Zollner also serves as the Conservancy's National Fire Restoration Coordinator, coordinating Conservancy efforts to reduce the threat of altered fire regimes to biodiversity across ownerships at landscapes in the US and Mexico. Zollner has over 25 years of working experience with ecological assessments and conservation planning, woodland and watershed restoration, fire ecology, ecological modeling, and developing and implementing measures of conservation success in an adaptive management context. He received a B.S. from the University of Arizona in Watershed Management and a M.S. from Texas Tech University in the Ecology of Arid Lands.

Susan Nimmo is the Region 4 Wildlife Supervisor with the Arkansas Game and Fish Commission. She graduated with a B.S. in Biology with a focus in Environmental Science from Furman University in Greenville, South Carolina. She earned an M.S. in Wildlife Management at the University of Arkansas in Monticello. She has worked for the Arkansas Game and Fish Commission for eight years, serving as a Private Lands Biologist and Assistant Supervisor in the region before assuming her current position. She is responsible for managing wildlife and habitat in nine counties in south-central Arkansas, including eight Wildlife Management Areas. Susan has also conducted wildlife research in Georgia, Montana, and Canada.

Griffin Park is the Region 5 Wildlife Supervisor and has worked for the Arkansas Game and Fish Commission for 24 years. He has served as a Habitat Biologist and Assistant Supervisor in the region before assuming his current position. He is responsible for managing wildlife and habitat in the seven southwest counties of Arkansas consisting of 2.7 million acres and 18 Wildlife Management Areas. One of these WMAs is Rick Evans Grandview Prairie WMA, the largest contiguous tract of blackland prairie in public ownership in the nation. Griffin graduated from the University of Arkansas at Monticello with a B.S. in Wildlife and Fisheries Biology. He is also an Arkansas Registered Forester.