

2017 Arkansas State Wildlife Grant Preproposal

**RESTORING CALCAREOUS GLADE, WOODLAND, AND FEN HABITAT  
IN NORTH-CENTRAL ARKANSAS**

Project Summary

Calcareous glade, woodland, and seep-fen-spring habitat at the Blue Heaven Preserve, Strawberry River Preserve, and the Wiseman tract will be restored through the removal of ponds spring boxes, and road crossings, control of non-native plants, reduction of woody encroachment, and use of prescribed fire. These restoration activities will increase the quality of the habitat, increase the scale of restored habitat by connecting with previously restored habitat and bring in a new partner, the Arkansas Highway and Transportation Department (AHTD), that holds land due to mitigation activities that with appropriate management increases the high quality habitat available to Arkansas' Species of Greatest Conservation Concern.

Project Lead  
Douglas Zollner, Director of Conservation  
The Nature Conservancy  
601 North University  
Little Rock, Arkansas 72205  
(501) 614-5083  
dzollner@tnc.org

Project Partner  
Ben Thesing, Environmental Analyst  
Arkansas Highway & Transportation Dept.  
P.O. Box 2261  
Little Rock, AR 72203  
(501) 569-2520  
Ben.Thesing@ahtd.ar.gov



SWG Funding Requested: \$55,350 (65%)  
Amount and Source of Matching Funds: \$29,800 (35%)  
Match will be provided by the Arkansas Highway and Transportation,  
Arkansas Forestry Commission, and The Nature Conservancy.  
Total Project Costs: \$85,150

## NEED

Calcareous glades are open, rocky, grassland habitats usually found on shallow soils where limestone is close to the surface. In Arkansas these habitats are located on the Springfield and Salem plateaus in the Ozarks, mostly in the northern most two tiers of counties. Fire suppression and grazing have altered the structure and composition of calcareous glade by increasing woody stem density, especially of eastern red cedar (*Juniperus virginiana*) and the introduction of nonnative species. Herbaceous diversity and cover has declined as eastern red cedar cover has increased.

Historically, water seeping over and through the limestone glades has formed fens (high pH seepage zones). Fen and springs provide habitat to an uncommon suite of species restricted to these uncommon habits. Most of these habitats have been converted to ponds, or had other anthropogenic alterations such as spring boxes. Fire suppression and grazing also impact fen and spring habitat by increasing woody species cover and invasion of nonnative species.

The Wiseman tract (234 acres) in IZARD County was acquired by AHTD as mitigation for stream and wetland impacts from road construction. As part of the mitigation 60 acres of stream and riparian habitat is being restored and protected. However, 174 acres of upland calcareous glade and woodland, are available for habitat restoration beyond the requirements of the mitigation. Forty-seven acres of glade habitat has been mapped. These glades are currently fire-suppressed, heavily encroached by eastern red cedar, and were grazed until recently (acquisition by AHTD). A preliminary inventory by the Arkansas Natural Heritage Commission has turned up four plants species of conservation concern. Milkweed is abundant with six species present. Even though the glade quality is rated as poor, the restoration potential is high. Strawberry river darters (*Etheostoma fragi*) have been collected from the Wiseman Creek tract.

Blue Heaven Preserve (450 acres) in Marion County was acquired by TNC to protect Ozark Big-eared bat (*Corynorhinus townsendii ingens*) wintering, breeding, and foraging habitat. The Preserve lies on karst with limestone and dolomite rock outcroppings that form glades, calcareous woodlands, and caves. Sixty acres of glade and cliff line habitat have been mapped. Twenty acre of glades have been restored through removing eastern red cedar and burning. Forty aces of glades are heavily encroached by cedar and fire suppressed. Nonnative tall fescue (*Schedonorus arundinaceus*) and sericea lespedeza (*Lespedeza cuneata*) are also present. Johnnie Creek (a losing stream) and its tributaries flow through the Preserve. A spring flowing from the limestone was boxed and ponded many years ago. The flat area at the base of the pond has formed into a small fen due to leakage.

Strawberry River Preserve (883 acres) in Sharp County was acquired by TNC to protect Chandler Creek which provides spawning habitat for the Strawberry River Darter. The Preserve lies over karst with limestone outcropping and bluffs that form calcareous glades, woodlands, and caves. One hundred acres of glades have been mapped on the Preserve. These glades are fire suppressed and over grown with eastern red cedar. Chandler creek and associated fens have grown-up with cedar over the last twenty years and nonnative tall fescue is invading the fens.

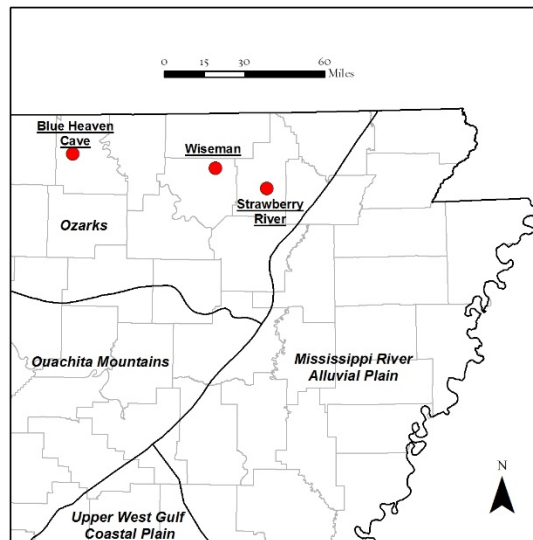
## PURPOSE AND OBJECTIVES

The purpose of this project is to restore calcareous glade and fen-spring habitat on at three locations in north central Arkansas by reducing the cover of eastern red cedar, reintroducing fire, controlling invasive species, and restoring fens and springs that have been ponded or boxed. Habitat will be improved on 567 acres of land and along 0.2 miles of small streams. Project completion will take two years; proposal objectives are:

1. Increase the size and quality of calcareous glade and woodland habitat by reducing woody invasion.
2. Increase the quality of calcareous glades and fens by controlling nonnative species.
3. Restore altered fens and spring runs by eliminating cattle ponds and box springs and restoring geomorphology to 0.1 miles at Chandler Creek.
4. Pre- and post-restoration plant and avian monitoring will occur at Wiseman Creek.

## LOCATION OF WORK

Project activities will take place in the Salem Plateau of the Ozark Mountains ecoregion. More specifically, Izard, Marion, and Sharp counties (Map 1).



## APPROACH

Objective 1 will be addressed in both years of the project. A total of 567 acres of calcareous glade, woodland, and fen habitat will be restored by using prescribed fire on 420 acres and removing eastern red cedar from 67 acres by mechanical means. Mechanical eastern red cedar treatments will be focused on glade and fen habitats. The eastern red cedar will be treated by grinder at the Wiseman tract and by hand felling and girdling (very large ones) at Strawberry River Preserve. Smaller cedar will be killed in the prescribed fires.

Objective 2 will be achieved by two years of concentrated treatment of nonnatives on 60 acres the glade and fen habitats. Treatments will occur in the spring (tall fescue) and early summer (sericea lespedeza).

Objective 3 will be addressed by mechanically removing a cattle pond, reshaping other anthropogenic features, and restoring geomorphology to retain the saturated high pH soil of the

fen habitat at both the Blue Heaven and Strawberry River preserves and restoring stream habitat for Strawberry River darter in Chandler Creek at the Strawberry River Preserve.

Objective 4 pre- and post-restoration monitoring will be completed by AHTD personnel at the Wiseman tract.

<b>Timeline</b>	<b>Tasks</b>
Fall 2017:	Begin pre-treatment monitoring. Write burn plans. Execute cedar removal contract (Wiseman).
Spring 2018:	Install fire lines. Burn two units (weather permitting). Treat tall fescue.
Summer 2018:	Treat cedar at Strawberry River. Treat sericea lespedeza. Design fen restoration.
Fall 2018:	Execute pond removal and fen restoration. Install fire lines. Complete third burn (weather permitting).
Spring 2019:	Complete cedar treatments. Treat tall fescue. Monitor fen restoration.
Summer 2019:	Treat sericea lespedeza. Complete post treatment monitoring. Qualitatively monitor fen restoration for any additional work.

**EXPECTED RESULTS AND BENEFITS**

Funding priority

1. Woodlands, Savannas, Glades, and Barrens – habitat management to maintain or increase habitat quality and size for the benefit of SCGN species and pollinators.
2. Strawberry River Darter – Maintain, protect, and restore habitat.

Table 1. SCGN that will benefit from this project, known to occur on one or more of the restoration sites.

	Habitat
Diana fritillary	woodland, glade
Monarch	glade
Lace-winged roadside skipper	small stream
Northern metal mark	fen
Swamp metalmark	fen
Grasshopper sparrow	glade
Common nighthawk	woodland
Sedge wren	fen
American kestrel	glade
Bachman’s sparrow	glade
Eastern whip-poor-will	woodland
Northern bob-white	glade
Ozark big-eared bat	glade, woodland
Gray bat	glade, woodland
Indiana bat	glade, woodland
Strawberry River darter	stream

Habitat will be restored on 567 acres – (Glade = 67 acres, Woodland/Savanna = 460 acres, and Fen = 40 acres). Restoring glade and woodland habitat by removing eastern red cedar, nonnative plants, and implementing a prescribed fire regime will create higher quality habitat on conserved areas by restoring plant community structure and diversity. The diverse herbaceous layer that results from these management activities provides habitat for pollinators and 16 SCGN species listed above known to occur on the project sites. For the three cave using bats species, the structure of the habitat (open woodland and grassland) provides feeding areas with an abundance of moths and other insects that use a diverse herbaceous groundcover.

Fen habitat will be restored along 0.2 miles of small streams. The fen and stream restoration are particularly important to two SCGN species that are fen obligates and the Strawberry River darter population in Chandler Creek. Restoration will remove a pond on a tributary to Johnnie Creek, remove a box spring and road crossing on Chandler creek, remove dense cedar thickets that have grown into the altered habitat, and reduce the nonnative species.

**BUDGET**

	SWG Funds	TNC Match Funds	AFC/AHTD match funds	Total
Personnel	\$ 9,184	\$12,346	\$2,000	\$23,530
Travel	\$ 2,000	\$ 2,000		\$ 4,000
Supplies	\$ 750	\$ 750		\$ 1,500
Contracts	\$33,000		\$9,000	\$42,000
Other	\$ 250	\$ 250		\$ 500
Sub-total	\$45,184	\$15,346	\$11,000	\$71,350
ID	\$10,166	\$ 3,454		\$13,620
Total	\$55,350	\$18,800	\$11,000	\$85,150

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\*TNC’s indirect cost rate in its FY17 NICRA is 22.5%. TNC’s indirect rate is negotiated annually, and TNC will charge indirect at the federally approved rate each year.

**QUALIFICATIONS**

**Douglas Zollner** is the Director of Conservation Science for The Nature Conservancy, Arkansas Field Office. He has been working with the Conservancy for 25 years. Zollner has over 35 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 an M.S. from Texas Tech University in the Ecology of Arid Lands.

**Ben Thesing** is an Environmental Analyst for the Arkansas Highway and Transportation Department in Little Rock. He has a total of 8 years’ experience working in Arkansas in a wide variety of conservation positions including Regional Stream Team Coordinator for the Arkansas Game and Fish Commission and Field Technician for the Ecological Conservation Organization. He has experience with invasive species control, biological monitoring, and habitat restoration. He received a B.S. from the University of Wisconsin – La Crosse in Geography Environmental Science and an M.S. from University of Central Arkansas in Biology.