Blackland Prairie and Woodland Restoration at Nacatoch Ravines Natural Area

PROJECT SUMMARY:

Restoration of blackland prairie and woodlands will benefit species of concern at Nacatoch Ravines Natural Area located in Hempstead County, AR. Prairie and woodland remnants will be restored through the use of fire, mechanical removal of shrubs and eastern red cedar, thinning of woodlands, control of non-native species, and the planting of native warm season grasses and will restore habitats of concern and benefit a suite of grassland bird species of greatest conservation need.

PROJECT LEAD:

Seth Pearson, Land Steward
The Nature Conservancy
spearson@tnc.org
601 N. University Avenue
Little Rock, AR 72205
Phone: (501) 912-9080
Fax: (501) 663-8322

PROJECT PARTNER:

Bill Holimon, Chief of Research
Arkansas Natural Heritage Commission
BillH@arkansasheritage.org
Phone: (501)324-9761
Fax (501)324-9618

Total Project Cost: $98,400

Request: $49,200

Matching funds from The Nature Conservancy and the Arkansas Natural Heritage Commission $49,200

FUNDING PRIORITY ADDRESSED BY PREPROPOSAL

This project addresses three of the Arkansas Wildlife Action Plan funding priorities: #2 Restore and/or maintain prairies and native grasslands for grassland bird habitat; #10 Restore fire to fire-suppressed habitats to benefit Species of Greatest Conservation Need; and #11 Manage forests to benefit Species of Greatest Conservation Need.

In addition, this project is an on-the-ground restoration and stewardship project that implements priorities outlined in the Arkansas Wildlife Action Plan (habitat restoration and improvement) and could serve as a demonstration site for other state, federal, and private lands. Completion of this project will take two years.

ECOREGION WHERE PROJECT WILL BE CONDUCTED

The project presented in this preproposal will be conducted in the South Central Plains Ecoregion, specifically at Nacatoch Ravines Natural Area located in Hempstead County, Arkansas.

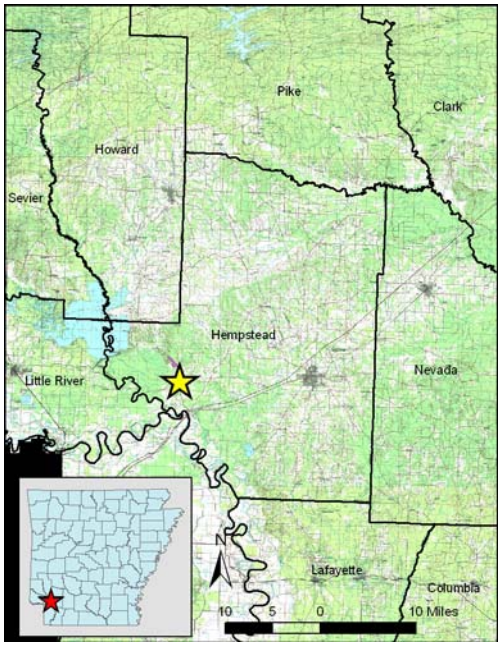

Figure 1. Location of Nacatoch Ravines Natural Area.

BACKGROUND

Historically, calcareous or blackland prairie and woodland communities were abundant in the south-central United States. As a result of land conversion for agricultural use, urbanization, and fire suppression, less than 1% of the original acreage of these communities exists today. Blackland communities can be restored through the use of prescribed fire, removal of invasive species, and reestablishment of native warm season grasses. The restored habitat will be beneficial to a variety of wildlife species.

The southern tract of Nacatoch Ravines Natural Area contains important blackland communities but needs restoration. The site is a mix of degraded blackland prairie and fire-suppressed blackland ravine, riparian, and upland woodlands. The degraded prairies were historically cultivated and used as pasture land until the mid-1970s. Because of this past use, many non-native species are present. Especially problematic are tall fescue (*Schedonorus arundinaceus*), sweet clovers (*Melilotus* spp.), Johnson grass (*Sorghum halepense*), and sericea lespedeza (*Lespedeza cuneata*). Approximately half of the old fields are grown up with a thick shrub layer of invasive woody species [eastern red cedar (*Juniperus virginiana*), persimmon (*Diospyros virginiana*), and honey locust (*Gledistia tricanthos*)]. In open areas, the native ground cover is dominated by broomsedge (*Andropogon virginicus*), Canada goldenrod (*Solidago canadensis*), southern dewberry (*Rubus trivialis*), poison ivy (*Toxicodendron radicans*), and ragweeds (*Ambrosia* spp.).

The woodlands are mostly fire-suppressed and species vary with soil type and moisture. On alkaline soils dry-mesic woodlands are dominated by Shumard's oak (*Quercus shumardii*) and nutmeg hickory (*Carya myristiciformis*) with chinquapin oak (*Quercus muehlenbergii*) and a rich to sparse herbaceous layer.

GOALS AND OBJECTIVES

The primary goal of this project is to restore blackland prairie and woodland communities as suitable habitat for a variety of species of conservation concern, identified by the 2008 State Wildlife Action Plan Steering Committee (Table 1).

Objectives:

1. Restore blackland prairie plant communities and species assemblages.
2. Restore upland woodland community and species assemblages.
3. Restore suppressed ecological processes, particularly fire.
4. Reduce abundance of non-native species.
5. Conduct habitat restoration monitoring.

METHODS

Blackland Prairie Restoration—Objectives 1, 3, and 4

Restoring blackland prairie at Nacatoch Ravines Natural Area during the SWG funding period will focus on a portion of degraded prairie currently dominated by woody, weedy, and exotic invasive species. The restoration area will be selected based on accessibility, current vegetation, and native seed availability. The restoration will serve as a demonstration of blackland prairie restoration for the remainder of Nacatoch Ravines Natural Area and degraded prairie throughout the ecoregion. Restoration will include the following activities.

- Seed collection (selecting native warm-season grass and blackland forb species) at local blackland prairie remnants (such as Rick Evans Grandview Prairie WMA).
- Mechanical removal of woody invasive species followed by herbicide application.
- Prescribed burn to restore habitat and prepare the seed bed.
- Herbicide application to emergent invasive species.
- Native grass and forb seed application.
- Maintenance of the restoration area.

Table 1. Selected terrestrial species of the West Gulf Coastal Plain Calcareous Prairie as identified as Species of Concern under the State Wildlife Grant Program (AGFC CWCS Database). Species known to occur at the site in bold.

Common Name	Scientific Name
Northern Bobwhite	***Colinus virginianus***
Prairie Warbler	***Dendroica discolor***
Painted Bunting	***Passerina ciris***
Migrant Loggerhead Shrike	*Lanius ludovicianus migrans*
American Woodcock	***Scolopax minor***
Yellow-billed Cuckoo	***Coccyzus americanus***
Le Conte's Sparrow	*Ammodramus leconteii*
Henslow's Sparrow	*Ammodramus henslowii*
Grasshopper Sparrow	*Ammodramus savannarum*
Lark Sparrow	*Chondestes grammacus*
Bell's Vireo	*Vireo bellii*
anthophorid bee	*Tetraloniella albata*
red milkweed beetle	*Tetraopes quinquemaculatus*
Texas milkweed beetle	*Tetraopes texanus*
robberfly	*Microstylum morosum*
Long-tailed Weasel	*Mustela frenata*
Desert Shrew	*Notiosorex crawfordi*
Southern Prairie Skink	*Eumeces obtusirostris*
Western Slender Glass Lizard	***Ophisaurus attenuatus attenuatus***

Woodland Restoration—Objectives 2, 3, and 4

Restoration of the woodland complex at Nacatoch Ravines Natural Area will primarily involve reintroducing fire to the uplands and the ravines. Prior to fire restoration, however, a portion of the woodlands will require midstory thinning. Removal of invasive species, like lespedeza, sweet clover, and tall fescue, at the woodland edges will be important so that these species do not move into the restored woodland. Restoration will include the following activities.

- Mechanical removal of woody invasive species in the midstory followed by herbicide application.
- Prescribed burn of restoration area.
- Herbicide application to emergent invasive species.
- Maintenance of the restoration area.

Fire Restoration—Objective 3

Fire is the most important ecological process maintaining the distribution and composition of blackland prairie and woodland communities. The reintroduction of fire to the site will reduce woody encroachment, reduce the abundance and impact of non-native species, and stimulate the growth of native warm season grasses and forbs. Fire will be applied to Nacatoch Ravines Natural Area by The Nature Conservancy's Prescribed Fire Crew.

Habitat Restoration Monitoring—Objective 5

Monitoring will evaluate the protocol and the effects of habitat restoration activities, including woody vegetation removal, invasive species removal, immediate post-burn effects, and native grass and forb establishment. Vegetation establishment and invasive species removal will be monitored using permanent plots and transects. Photomonitoring will also be used to document the removal of woody vegetation and the establishment of high-quality, native species.

PRODUCTS AND OUTCOMES

- Native blackland grass and forb species reintroduced.
- Two prescribed burns conducted at the natural area.
- Invasive species reduced at the natural area.
- Reduced basal area in treated woodlands.
- Restoration protocol and monitoring report.

Expected Benefits

Blackland prairie and woodland habitat will be restored in southern Arkansas. The protocol will be a valuable product for future restoration in this unique habitat type. The restoration of these habitats will provide beneficial habitat to a variety of species of conservation concern (Table 1).

EXISTING RESOURCES AND LONGTERM PROJECT MAINTENANCE

This project will build on the longstanding partnership between The Nature Conservancy, the Arkansas Natural Heritage Commission. The partner's commitment to conservation and stewardship of Natural Areas is long-term. Future maintenance of the restoration will include continued monitoring, possible replanting, and frequent prescribed fire once the planted grasses are established.

PRELIMINARY BUDGET

	Total Cost	Match	SWG Grant
Salary/Benefits	60,000	30,000	30,000
Operating Expenses	20,000	10,000	10,000
Capital Expenses	0	0	0
Subtotal	*80,000*	*40,000*	*40,000*
Indirect Costs (23%)*	18,400	9,200	9,200
Totals	**98,400**	**49,200**	**49,200**

The Nature Conservancy has a current 23% Negotiated Indirect Cost Rate (NICRA) that is accepted by USFWS.

QUALIFICATIONS OF THE NATURE CONSERVANCY TO CARRY OUT THE PROJECT

The Nature Conservancy (TNC) has worked in the blackland ecosystem of Arkansas with our partners for approximately 20 years. TNC has developed a broad understanding of this at-risk ecosystem through years of scientific observation and use of adaptive management in implementation of restoration techniques. Through work with public and private landowners, TNC has become acutely aware of the socio-political attributes of the area. TNC maintains an excellent working relationship with conservation organizations such as the Arkansas Natural Heritage Commission. This relationship increases our capacity to organize teams made up of experts in the field of restoration of at-risk habitats. TNC also maintains science and conservation staffs that are trained in implementation of strategic actions and monitoring. Finally, through completion of other restoration activities, TNC has demonstrated the ability to successfully complete this project.

The Arkansas Natural Heritage Commission is charged with the responsibility of establishing and maintaining a System of Natural Areas. Natural areas are those lands specifically managed to preserve and sometimes restore natural communities that are now rare across the state. ANHC has demonstrated success in restoring and protecting prairie habitat and has natural areas in four natural divisions of the state that support rare prairie and woodland communities. The ANHC also maintains the Natural Heritage Inventory, the central repository for information on rare species and natural communities in Arkansas. The Natural Heritage Inventory gathers information on the location of rare species and natural communities in the form of Element Occurrence Records. Data from the Natural Heritage Inventory are commonly used as a tool in land conservation programs, environmental review/information sharing, and habitat management plans.

Seth Pearson: Seth Pearson has been an employee of The Nature Conservancy for over three years and serves as the Land Steward for the Arkansas Field Office. Seth is responsible for planning and implementing stewardship and restoration work on preserves through out the state. He is also active in prescribed fire implementation throughout the state. Seth graduated from Purdue University with a Bachelors of Science Degree in Biology with a specialization in Ecology, Evolution, and Population Biology.

Bill Holimon: Bill Holimon is an Ornithologist and is Chief of Research for the Arkansas Natural Heritage Commission. Bill received a Bachelor of Science in biology from the University of Arkansas at Little Rock and a Master of Science in biology from New Mexico State University. Bill previously worked for The Nature Conservancy in Texas on conservation of two federally listed endangered bird species, the Golden-cheeked Warbler (*Dendroica chrysoparia*) and Black-capped Vireo (*Vireo atricapilla*). In addition, he has conducted extensive work on various taxa of Red Crossbills (*Loxia curvirostra*) throughout North America. Bill is a native Arkansan who has published three scientific papers on rare birds of Arkansas; two on grassland birds and the third on the endangered Red-cockaded Woodpecker (*Picoides borealis*).