

**RESTORING AN OAK WOODLAND SAND DUNE COMMUNITY
IN THE MISSISSIPPI RIVER DELTA**

Project Summary:

This project will restore approximately 40 acres of sand dune woodland community, an extirpated habitat in Arkansas. The goals of the project are to 1) develop a restoration protocol for the sand dune woodland community and 2) implement this protocol at Stateline Sandponds Natural Area in Clay County, Arkansas. Restoring the habitat structure and species composition of this rare community will provide habitat for several Arkansas Wildlife Action Plan Species of Greatest Conservation Need and other nongame and game animal species.

Project Leader:

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Total Project Amount: \$54,120

Matching Funds from TNC and ANHC: \$27,060 (50%)

Total Amount Requested: \$27,060 (50%)

FUNDING PRIORITY ADDRESSED BY PREPROPOSAL

This project addresses 2008 State Wildlife Grant funding priorities #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 for future restoration in the Mississippi River Alluvial Plain and the Mississippi Valley Loess Plains. Completion of this project will take two years.

ECOREGION WHERE PROJECT WILL BE CONDUCTED

Restoration activities will be conducted in the Mississippi River Alluvial Plain ecoregion, specifically at Stateline Sandponds Natural Area in Clay County, AR (Figure 1). This project will focus on restoring Lower Mississippi River Dune Woodland and Forest habitat.

BACKGROUND

The sand dune region of northeast Arkansas harbors a distinctive group of plant communities supporting several rare animal and plant species. This region is characterized by dune fields, which contain a number of individual sand mounds. The upland sand dunes represent an extreme example of xeric conditions in the Mississippi River Delta ecosystem.

High quality sand dune woodland habitat is extirpated from Arkansas. Only a few degraded occurrences of this community are known to remain. Most of the original sites have been destroyed by logging, grazing, conversion to agricultural land or forest due to fire suppression, or invasion by exotic species. Historically, this open woodland community was dominated by stunted (7-20 meter tall) post oak (*Quercus stellata*) and other oak species such as white oak (*Q. alba*), black-jack oak (*Q. marilandica*), and black oak (*Q. velutina*), with scattered hawthorn (*Crataegus* spp.) and short-leaf pine (*Pinus echinata*). The open woodland contributed to a little bluestem dominated herbaceous layer with a mosaic of scattered shrubs which provided habitat for grassland and shrub nesting birds and woodland animal species.

Stateline Sand Ponds Natural Area, a 140-acre nature preserve owned by the Arkansas Natural Heritage Commission, consists of a wooded tract composed of a mix of forest and dry woodland types set within a completely cleared agricultural landscape (Figure 1). The natural area contains intermittently flooded interdunal areas and a dune ridge, which rises above the surrounding landscape and covers approximately 40 acres. The dune community is degraded due to fire suppression and former agricultural practices and currently dominated by early successional sweetgum (*Liquidambar styraciflua*) trees and broomsedge (*Andropogon virginicus*). Restoring the structure and species composition of this rare sand dune community will provide suitable habitat to benefit several Arkansas State Wildlife Action Plan Species of Greatest Conservation Need such as Northern Bobwhite and Yellow-billed Cuckoo.

GOALS AND OBJECTIVES

The primary goal of this project is to develop a restoration protocol for the sand dune woodland community and restore/ improve species composition, diversity, and structure on approximately 40 acres

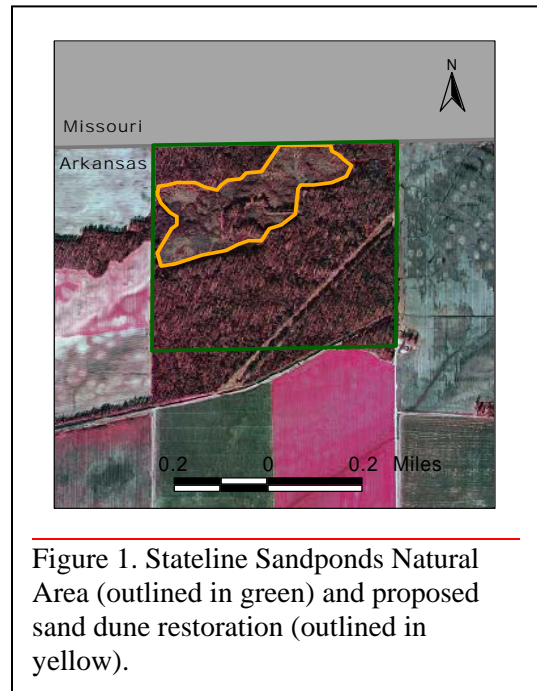


Figure 1. Stateline Sandponds Natural Area (outlined in green) and proposed sand dune restoration (outlined in yellow).

of this extirpated habitat on public land to benefit species of conservation concern. The Arkansas Game and Fish Commission’s database lists 10 terrestrial Species of Greatest Conservation Need for this community type, the Lower Mississippi River Dune Woodland and Forest (Table 1).

Objectives:

1. Develop a sand dune woodland restoration protocol to restore habitat structure and species composition.
2. Implement the restoration protocol at the degraded sand dune site on Stateline Sandponds Natural Area to increase the amount and quality of this extirpated community.
3. Measure progress towards desired ecological conditions through conducting habitat restoration monitoring.

SCIENTIFIC NAME	COMMON NAME
<i>Pipilo erythrophthalmus</i>	Eastern Towhee
<i>Coccyzus americanus</i>	Yellow-Billed Cuckoo
<i>Colinus virginianus</i>	Northern Bobwhite
<i>Chaetura pelagica</i>	Chimney Swift
<i>Ictinia mississippiensis</i>	Mississippi Kite
<i>Scolopax minor</i>	American Woodcock
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-Eared Bat
<i>Reithrodontomys humulis</i>	Eastern Harvest Mouse
<i>Mustela frenata</i>	Long-tailed Weasel
<i>Regina rigida sinicola</i>	Gulf Crayfish Snake

Open Woodland Restoration – Objectives 1 and 2

The development of a protocol for restoring the sand dune woodland plant community in the Mississippi River Delta will combine existing literature, General Land Office survey records, expert opinion, and restoration successes from the Missouri sand dune / prairies. Implementation of the protocol during this SWG period will focus on revegetating the dune with mixed oaks, hickories, and native grasses. Restoration would include the following activities.

- Burn the site to create an open habitat structure and remove non-native species.
- Herbicide exotic and woody invasive species to increase the amount and quality of habitat.
- Plant native grasses / forbs to restore species composition.
- Plant post oak and native tree species.

Habitat Restoration Monitoring – Objective 3

The monitoring will evaluate the protocol and the effects of habitat restoration activities, including woody vegetation removal, warm season native grass establishment, and reforestation of oak and hickory species. Vegetation will be monitored using the existing, permanent, plant community monitoring transect. All plant species occurring within plots along this transect will be identified and recorded. Photomonitoring will also be used to document the removal of woody vegetation and the establishment of high-quality, native species.

PRODUCTS AND OUTCOMES

- Dune woodland and grassland species reintroduced.
- Prescribed fire applied to restoration area.
- Dune woodland restoration protocol and monitoring report.

Expected Benefits

The proposed activities will restore a woodland community currently absent from Arkansas. Restoration of the sand dune native grasses / forbs to restore species composition community will provide suitable habitat beneficial habitat to shrub nesting species and other woodland dependent wildlife of conservation concern, such as American Woodcock, Chimney Swift, Northern Bobwhite, Eastern Towhee and other grassland and woodland birds. This project may also serve as a demonstration site for future restoration in the Mississippi River Alluvial Plain and the Mississippi Valley Loess Plains.

EXISTING RESOURCES AND LONGTERM PROJECT MAINTENANCE

This project will build on the longstanding partnership between The Nature Conservancy and the Arkansas Natural Heritage Commission. These agencies have worked together for over 15 years and share a vision for restoring biodiversity to the ecosystems of Arkansas. This partnership and commitment to conservation will be important for the long-term future of restoration activities. Future maintenance of the restoration area will include continued monitoring, possible replanting, and frequent prescribed fire once the planted grasses and trees are established.

PRELIMINARY BUDGET

	Total Cost	Match	SWG
Salary/Benefits	36,000	18,000	18,000
Operating Expenses	8,000	4,000	4,000
Subtotal	<i>44,000</i>	<i>22,000</i>	<i>22,000</i>
Indirect Costs (23%)	10,120	5,060	5,060
Total	54,120	27,060	27,060

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

ORGANIZATION QUALIFICATIONS TO CARRY OUT THE PROJECT

The Nature Conservancy (TNC) has worked in the glades and woodlands of Arkansas with our partners for approximately 15 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. 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 (ANHC) 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. 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.

Jennifer Akin: Jennifer Akin is a Natural Community Ecologist for the Arkansas Natural Heritage Commission. Jennifer received a B.S. in biology and a M.S. in botany both from the University of Arkansas at Fayetteville. Jennifer has worked for The Nature Conservancy documenting the recovery of restored wetland and uplands and the National Park Service performing surveys in over two hundred vegetation types in the Sierra Nevada Mountains for production of a vegetation map. She has published two scientific papers on algae in relation to aquatic vegetation in Arkansas.

Maria Melnechuk: Maria Melnechuk is the Terrestrial Ecologist for the Arkansas Field Office. She has worked with The Nature Conservancy in Arkansas for eight years. Her responsibilities include conducting ecological assessments, writing stewardship plans, and performing plant community monitoring, rare plant monitoring and post-fire assessments. Maria also assists with the implementation of fire management activities as well as stewardship and restoration activities throughout the state. She has a Bachelor of Science degree in biology from Hendrix College and a Master of Science in biology from the University of Arkansas at Little Rock.

Mike Melnechuk: Mike Melnechuk is the Assistant Director of Stewardship for the Arkansas Field Office. His responsibilities include assisting with the implementation of fire management activities in Arkansas as well as stewardship and restoration activities on the various preserves for TNC, the Arkansas Natural Heritage Commission, and occasionally military installations. Mike is also involved with ecological monitoring and herpetological surveys. He coordinates with the Director of Conservation, as to the day to day operations of the seasonal burn crew. He has a Bachelor of Science degree in geography/natural resource management from Western Michigan University.

Douglas Zollner: Douglas Zollner is an ecologist currently serving as the Director of Conservation Science for the Arkansas Field Office. He has been working with the Conservancy for 12 years. 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 Bachelor of Science from the University of Arizona in watershed management and a Master of Science from Texas Tech University in the ecology of arid lands. He spent the 1980's working on conservation projects overseas, mostly in eastern and southern Africa.