

2017 Arkansas State Wildlife Grant Preproposal

RESTORING SHALE GLADE AND WOODLAND HABITAT IN THE OUACHITA MOUNTAINS OF CENTRAL ARKANSAS

Project Summary

Shale glade and woodland habitat will be restored in the Redbank Project Area (RPA) on the Ouachita National Forest (Jessieville/Winona/Fourche Ranger District) through removal of encroaching woody species and control of invasive plants. These activities will help expedite the restoration process that is underway in the Redbank Project Area, working in concert with prescribed burning that is already funded and planned for the future (including prescribed burning by the U.S. Forest Service and cooperative burns with The Nature Conservancy). These restoration activities, happening at landscape scales, will be of great benefit to 16 species of greatest conservation need (SGCN). In addition, glade mapping, plant community monitoring (PCM), photo monitoring, and general plant inventories will document the restoration process, providing valuable information for this and other (future) shale glade/woodland restoration efforts in the region.

Project Lead

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SWG Funding Requested: \$26,210
Amount and source of Matching Funds: \$13,866
Match will be provided by The Nature Conservancy and
The Arkansas Natural Heritage Commission
Total Project Costs: \$40,076

NEED

Glades are shallow bedrock, natural communities or associations that support unique assemblages of drought-adapted forbs, warm-season grasses, and specialized fauna. The open vegetation structure and herbaceous plant-dominated ground layer of glades is maintained by natural disturbances, such as fire, drought, frost upheaval and grazing, but the most critical of these is fire. In a suppressed fire regime, glades are invaded by woody species, especially eastern red cedar. The altered light environment due to woody plant encroachment results in lower herbaceous species diversity. Historically, many glades were associated with open woodland communities, forming glade-woodland 'mosaics' in the landscape. Under suppressed fire regimes, open woodland stands become denser with woody vegetation, leading to declines in herbaceous species diversity and decreasing the amount of habitat for wildlife that frequently use or are wholly dependent on an open vegetation structure. Other persistent threats to glades and their associated flora and fauna include overgrazing, logging, land development, quarrying, conversion to fescue, non-native species introductions, plant and animal collecting, and rock harvesting for use in landscaping.

The RPA consists of 1900 acres of land owned and managed by the U.S. Forest Service. Located in the east-central Ouachita Mountains, it sits on the Stanley Shale formation, a significant geologic formation in this ecoregion, known to produce many glades in valleys and along headwater streams. Shale glades in this region are exceptionally diverse, supporting many globally rare and endemic plants, including Missouri bladderpod (*Physaria filiformis*), Ouachita blazing star (*Liatris compacta*)[†], Ouachita leadplant (*Amorpha ouachitensis*)[†], Ouachita bluestar (*Amsonia hubrichtii*)[†], openground whitlow-grass (*Draba aprica*)[†], plantain-leaf sunflower (*Helianthus occidentalis* ssp. *plantagineus*)[†], clasping jewelflower (*Streptanthus maculatus* ssp. *obtusifolius*)[†], Pelton's rose-gentian (*Sabatia arkansana*), royal catchfly (*Silene regia*), Nuttal's cornsalad (*Valerianella nuttallii*)[†], and Palmer's cornsalad (*Valerianella palmerii*)[†] (species marked with a † have been found in the RPA or within 3 miles of its boundaries).

Historically, the RPA landscape contained shallow-soiled, open woodlands interspersed with shale glades. Repeated pine planting, logging operations, and fire suppression have severely degraded the natural communities therein. Reintroducing fire, controlling invasive species, and opening up the canopy through the removal of woody vegetation will help drive the system back to its natural state, to the benefit of many SGCN. This proposed project will help expedite the restoration process, which is already underway, by returning several glades and adjoining woodlands to the desired, open habitat. The proposal objectives for this project include:

1. Increase the size and quality of glades and woodlands by reducing woody stem density.
2. Increase the quality of shale glade habitat by controlling invasive species.
3. Map existing glades in the RPA (approx. 1900 acres) and conduct general plant inventories.
4. Conduct pre- and post-restoration photo monitoring and PCM on 67 acres of shale glades.

LOCATION OF WORK

The project will take place in the Ouachita Mountains ecoregion in central Arkansas on the Jessieville/Winona/Fourche Ranger District, Ouachita National Forest. The RPA is found just north of Lake Ouachita and straddles the border between Montgomery and Garland counties (see map).

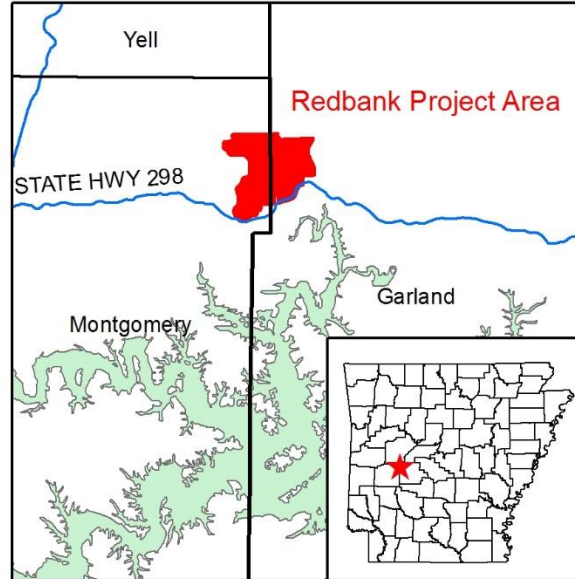
APPROACH

Objective 1 will be addressed the first year of the project, following glade mapping, spring plant inventories and pre-treatment plant community monitoring. Mechanical removal of eastern red cedar will occur during the first summer/fall, focusing on 3 glades of both low and high quality.

Objective 2 will be achieved through two years of early summer herbicide treatment, primarily targeting sericea lespedeza (*Lespedeza cuneata*), on 30 acres of shale glade habitat.

Objective 3 will be addressed during both years. The shale glades will be fully mapped during the fall/spring of the first year. General plant inventories will occur primarily in springtime. These activities will guide the selection of three glades for restoration treatments.

Objective 4 will be completed during both years. Photo-monitoring locations and PCM plots will be installed in the spring and/or early summer of the first year and pre-treatment data will be collected. Monitoring data and photos will be re-collected post-treatment.



TIMELINE

Table 1. Expected timeline for accomplishing main tasks and objectives.		
Timeframe	Task	Personnel
Fall 2017	complete glade mapping, quality ranking, and select 3 glades for restoration treatments	TNC
Spring 2018	general plant inventories for spring glade species, 1st round of spring photo-monitoring (pre-treatment)	TNC, ANHC
Early summer 2018	pre-treatment PCM and photo-monitoring completed, herbicide treatments for invasive species control	TNC, ANHC, contractor
Late summer/fall 2018	mechanical removal of woody species in encroached glades and surrounding woodlands, analysis of pre-treatment PCM data	TNC, contractor
Spring 2019	continue general plant inventories for early spring glade plant species, post-treatment photo-monitoring completed	TNC, ANHC
Early summer 2019	post-treatment PCM and photo-monitoring completed, second round of herbicide treatments for invasive species control	TNC, ANHC, contractor
summer/fall 2019	analyze vegetation monitoring data and complete reporting	TNC

EXPECTED RESULTS AND BENEFITS

This project will increase the size and quality of glade habitat and surrounding open woodlands. These outcomes will be achieved by removing eastern red cedar on 67 acres of glade habitat and bordering woodland. Repeated herbicide treatment (30 acres total) will help ensure that non-native species, which proliferate along roads and can be difficult to control with prescribed fire alone, do not spread into restored areas. Prescribed burns, which are already planned for the RPA, will help maintain the open vegetation structure of the thinned glades and woodlands over the long-term, while also increasing glade/woodland habitat quantity and quality further, resulting in increased connectivity between habitat patches in the broader landscape. These activities will ultimately result in high quality habitat that will benefit wildlife, including pollinators and many SGCN (Table 2).

Table 2. SGCN expected to benefit from this project (total = 16) in alphabetical order. Species known from the site or from within 5 miles are in bold.		
American kestrel	Grasshopper sparrow	Red-headed woodpecker
Bachman's sparrow	Loggerhead shrike	Sharp-shinned hawk
Brown-headed nuthatch	Monarch	Whip-poor-will
Chimney swift	Northern bobwhite	Yellow-billed cuckoo
Chuck-will's widow	Painted bunting	<i>Melanoplus</i> spp.*
Diana fritillary	Prairie warbler	

*Two new grasshopper species, *M. seltzeriae* and *M. ouachita*, were recently described in both the region and habitat of interest for this project. Holotypes for these species were in shale glades near Hot Springs Village and Mt. Ida, respectively.

BUDGET

Table 3. Proposed budget. TNC and ANHC will provide non-federal match for restoration activities.				
Category	SWG funds	TNC match	ANHC match	Total
Personnel	\$ 5,426	\$5,426	\$2,546	\$13,398
Travel	\$ 500	\$2,830		\$ 3,330
Supplies	\$ 500	\$1,000		\$ 1,500
Contracts	\$15,000			\$15,000
Sub-total	\$21,426	\$9,256	\$2,546	\$33,228
Indirect*	\$ 4,784	\$2,064		\$ 6,848
Total	\$26,210	\$11,230	\$2,546	\$40,076

*TNC's indirect cost rate in its FY18 NICRA is 23.22%. TNC's indirect rate is negotiated annually, and TNC will charge indirect at the federally approved rate each year.

QUALIFICATIONS

Gabriel De Jong received his B.S. in Biology (plant biology and ecology focus) from Calvin College in Grand Rapids, Michigan. He received an M.A. in Plant Biology (plant community ecology focus) from the University of Texas at Austin. His work experience includes invasive species control (The Nature Conservancy, Michigan) and nature interpretation (Edinburg Scenic Wetlands and World Birding Center). Gabe currently works at The Nature Conservancy in Arkansas (two years) where he is in charge of TNC's terrestrial monitoring efforts and ecological assessments in all ecoregions throughout the state. Gabe has extensive experience in vegetation data collection, data management, statistical analysis, written reporting, and giving oral presentations.

Theo Witsell received a B.S. in Biology and M.S. in Biology from the University of Arkansas at Little Rock. Theo has been the staff botanist for the ANHC since 2000. He has also worked as a contract botanist across eastern North America for the USDA Forest Service, the National Park Service, the United States Department of Defense, the U.S. Army Corps of Engineers, and The Nature Conservancy. He is a regional reviewer for the Flora of North America project and is a co-author of the Atlas of the Vascular Plants of Arkansas and an upcoming field guide to the state's woody plants.

Mary Lynn Mentz received a B.S. in Biology from Arkansas Tech University in Russellville, Arkansas, and a M.S. in Zoology from Eastern Illinois University in Charleston, Illinois. She has worked for the USDA Forest Service for 22 years in Arkansas and Alabama as a Wildlife Biologist. Mary is passionate about the restoration of pollinator conservation and habitat creation and invasive species eradication on the forest. She created the first Forest Service Public Handicapped Accessible Pollinator Garden in Arkansas. She also has many years of experience in glade restoration, old growth management and woodland restoration on the Ouachita National Forest.