

PINE FLATWOODS FOREVER: LANDSCAPE SCALE RESTORATION

Project Summary

Pine-oak flatwoods, woodland, and savanna and associated saline barrens/glades will be restored at Warren Prairie and Pine City Natural Areas using a forestry mulcher (grinder), herbicide treatment, and prescribed fire. This will address an important conservation action funding priority and benefit at least ten SGCN by providing additional high-quality habitat, building upon prior and current restoration projects by providing connectivity to previously restored high-quality habitat, and restoring a large landscape of priority habitat to benefit Arkansas Wildlife Action Plan species of greatest conservation need.

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Pine Flatwoods pre-(above) and post-restoration (below) using a grinder at WPNA

SWG Funding Requested: \$103,450 (65%)

Amount and Source of Matching Funds: \$55,800 (35%) will be provided from the Arkansas Natural Heritage Commission and Five Oaks Wildlife Services

Total Project Costs: \$159,250

NEED: Flatwoods have faced dramatic changes in the South Central Plains (SCP) and Mississippi Alluvial Plain (MAP) ecoregions. Much of the MAP has been converted to agricultural land, affecting most of the natural vegetation including the unique pine flatwoods of Monroe County. Similarly, largescale conversion of flatwoods and pine-oak forests to pine plantations occurred in the SCP. The Arkansas Natural Heritage Commission (ANHC) and The Nature Conservancy (TNC) identified pine-oak flatwoods as one of the most endangered forested ecosystem in the state. Major threats to this plant community include conversion to agricultural land and plantations, altered fire regimes, establishment and encroachment of invasive plant species, and habitat fragmentation through development.

Flatwoods are open woodlands dominated by oak and/or pine. Natural flatwoods have a wider range of hydrology than do plantations and subsequently support a greater variety of trees and structure, which in turn support a greater diversity of animal species. This project addresses the conservation action funding priority “Conduct habitat management to maintain or increase habitat quality – including forest management for species of greatest conservation need (SGCN) in pine-oak flatwoods, woodlands, savannas, and glades/barrens” by restoring each of these habitat types at two unique locations: Warren Prairie Natural Area (WPNA) and Pine City Natural Area (PCNA).

WPNA, located in Drew and Bradley counties, supports an array of specialized plant communities: West Gulf Coastal Plain Dry Pine-Hardwood Flatwoods, Pine-Hardwood Forests, Wet Hardwood Flatwoods, and Saline Glades. This mosaic of plant communities provides habitat for at least 16 SGCN animal species and 14 species of rare plants of federal, regional, or state concern. The site is recognized by the National Audubon Society as a globally Important Bird Area (IBA) because of the large population of wintering Henslow’s Sparrow (the largest known wintering site in Arkansas). An IBA is a site that provides essential habitat for one or more breeding, wintering, and/or migrating species of bird. Brown-headed Nuthatch, Red-headed Woodpecker, and Northern Bobwhite also occur at WPNA year-round and Bachman’s Sparrow breed at WPNA. Five pairs of Red-cockaded Woodpecker (RCW) were released at WPNA in October of 2010 to initiate a reintroduction program and they are faring well. Restoration of habitat quality and connectivity under a previous Arkansas State Wildlife Grant (T27-11) contributed to the success of the release. The project in this proposal will build on the success of T27-11 by restoring additional habitat needed to support sustainable populations of the many SGCN at WPNA, including RCW, dependent on open woodland and savanna.

Extensive stands of Lower Mississippi Flatwoods Woodland and Forest occur at PCNA, which are among the last remaining high-quality natural stands of that type. There are 27 SGCN associated with this habitat type in Arkansas. PCNA lies within a region of about 500 square miles, primarily in Monroe County, that was the only substantial area of the MAP where loblolly pine stands were characteristic at the time of European settlement. The pines are all loblolly and are an isolated population within the MAP, and as a result have become genetically distinct from other loblolly pine. Saline Glades (also known as Barrens) on Bonn soils at PCNA support additional SGCN.

In addition to supporting distinctive pines, the flatwoods woodland and savanna at PCNA support several SGCN, such as Red-headed Woodpecker, RCW, Rusty Blackbird, Northern Bobwhite, and American Woodcock. PCNA is recognized by Audubon Arkansas as an IBA. Barrens at PCNA provide valuable habitat for priority woodland and grassland birds such as wintering Henslow’s Sparrows, and Bachman’s Sparrow has also been observed there.

Government Land Office survey notes and aerial photography indicate that the historical flatwoods, savanna, and barrens/glades were much more open than they are today at WPNA and PCNA. Fire is the most important ecological process maintaining the distribution, composition and diversity of this system. Decades of fire suppression prior to state ownership at both sites altered species composition and structure resulting in densification to forested stands ranging from 90-150 ft²/acre BA with little to no herbaceous understory. In addition, most of WPNA was planted with loblolly pine and converted from an open to a closed canopy structure. Management of over-, mid- and understory-habitat is needed at both WPNA and PCNA to provide the habitat structure and species composition preferred by the SGCN that occur in the habitat types at those natural areas. For this proposal, we want to restore degraded (i.e. densified) pine-oak flatwoods woodland and savanna habitat and associated saline barrens/glades in areas

adjacent to existing managed land (WPNA and PCNA) and on recently acquired land (PCNA). This project will create additional high-quality habitat and increase the scale of managed land thereby providing a larger landscape for priority animal species of conservation concern.

OBJECTIVES: This project directly addresses the following conservation actions identified in Arkansas Wildlife Action Plan (AWAP) species reports: conduct prescribed burns (Brown-headed Nuthatch), restore native warm season grasses and forbs (Northern Bobwhite, Sedge Wren), disturb (fire management) grasslands every 4-5 years/ establish large blocks of grassland habitat/ restore native grasslands (Henslow’s Sparrow, LeConte’s Sparrow), maintain open mature pine forest habitat/ maintain or restore historical fire regimes/ maintain or restore pine/bluestem communities (Bachman’s Sparrow), restore oak-savanna (Red-headed Woodpecker), and restore habitat (Red-cockaded Woodpecker). Project completion will take two years. The objectives of this proposal are:

1. Restore habitat structure (50-70 ft²/acre BA) and species composition by reducing shrub and midstory cover by 40-60% on 100-160 acres at WPNA and PCNA.
2. Restore suppressed ecological processes, namely fire, to increase the amount and quality of native grassland habitat on 700-1,200 acres at WPNA and PCNA.
3. Measure progress towards desired ecological conditions by monitoring habitat response and response of species of greatest conservation need at WPNA and PCNA.

EXPECTED RESULTS AND BENEFITS TO SPECIES OF CONCERN: Restoring degraded pine-oak flatwoods woodland and savanna, and saline barrens/glades at WPNA and PCNA will (1) create additional high-quality habitat for woodland and grassland priority birds, (2) help restore an ecological fire regime that is necessary to maintain this system, (3) provide connectivity by restoring degraded habitat adjacent to existing high-quality habitat, and (4) increase the scale of managed land which will provide a large landscape to benefit animal SGCN and other wildlife.

Prescribed burning alone will take decades to reach ecological goals due to decades of fire suppression. Mechanical thinning of priority stands coupled with the reintroduction of fire will restore community structure; reduce abundance of invasive plant species; favor native warm season grasses; increase the size and connectedness of pine flatwoods woodland and savanna and barrens/glades; and stimulate the herbaceous layer. Fire and woodland restoration are key habitat enhancement actions called for in the AWAP for both grassland and woodland bird species.

This project will benefit 10 SGCN known from WPNA and PCNA (Table 1). Open and frequently burned pine-oak flatwoods, savanna and barrens/glades will improve habitat for Wild Turkey,

Table 1: Arkansas Wildlife Action Plan SGCN which will benefit from this project (10). All species have been documented at WPNA and/or PCNA.

American Woodcock	Northern Bobwhite
Bachman’s Sparrow	Prairie Warbler
Brown-headed Nuthatch	Red-cockaded Woodpecker
Henslow’s Sparrow	Red-headed Woodpecker
Le Conte’s Sparrow	Sedge Wren

White-tailed Deer, and a host of non-game birds, such as Henslow’s and Bachman’s sparrows, Brown-headed Nuthatch, Red-headed Woodpecker, and RCW. ANHC has observed recent success stories using these management techniques. For example, two Henslow’s Sparrows were observed in woodland/savanna habitat that was treated in June of 2009, an RCW was observed using an area at PCNA where they previously did not occur within a week of completion of habitat restoration using a grinder and continues roosting in cavity trees within that area, and Diana Fritillary has been observed at WPNA the last three years and at PCNA in recently treated areas. We expect the management techniques proposed below will provide the connectivity and landscape scale for SGCN at WPNA and PCNA to increase their population levels and their likelihood of persistence.

APPROACH: Objective 1 will be addressed during the first year of the project period. A forestry mulcher (i.e. grinder) that can chip trees up to 20” DBH will be used to remove shrubs, saplings, and

canopy trees. Tracked machines will be used to minimize soil disturbance and damage to tree roots during dry soil conditions. At WPNA, a grinder will be used to restore and manage the mid-story in areas where the canopy has been thinned by timber harvesting. Work at PCNA includes over- and mid-story manipulation because of the difficulty in harvesting trees at this site without causing major soil disturbance. Areas to be restored include degraded habitat adjacent to existing high-quality managed habitat and on land recently acquired at PCNA. Herbicide will be used to treat re-sprouting hardwoods, invasive plant species within restoration sites, and/or inject additional mid-story trees. ANHC and Five Oaks Wildlife Service will partner in restoring habitat structure and species composition.

Monitoring results from small test plots treated by a grinder at WPNA and PCNA (2008-2010) show that soil was significantly less compacted and displaced (no rutting) than in timber harvests. In addition, treated stands are ready to be burned following the first growing season since slash is not created; slash from timber harvests takes several years to “melt down” before a burn can be executed safely.

Objective 2 will be addressed during the second year of the project period. Prescribed fire by ANHC and TNC will help maintain appropriate habitat structure, favor native warm season grasses and forbs, and invigorate the herbaceous layer. Established burn units including grinded sites will be used. This will increase the size and connectedness of the pine flatwoods woodland and savanna and saline barrens/glade system and maintain existing adjacent high-quality habitat.

Objective 3 will be addressed by ANHC staff conducting baseline and monitoring surveys over the two year period. Habitat response from restoration activities will be monitored by measuring changes in community structure and plant species composition using transects and photopoints. Surveys for wintering and breeding birds will be conducted by using a combination of point counts and general area searches.

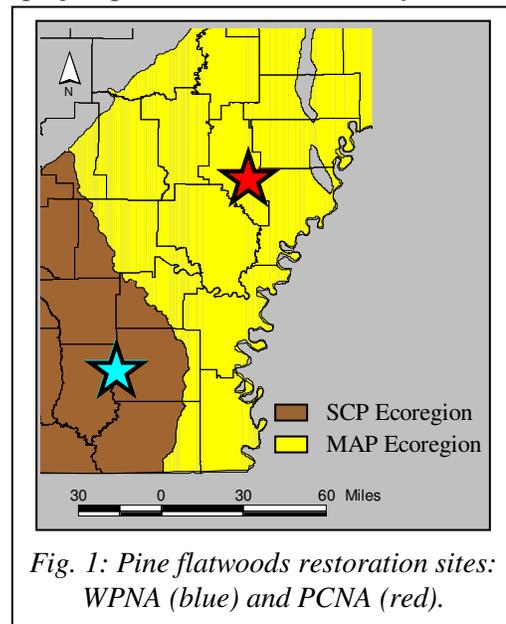


Fig. 1: Pine flatwoods restoration sites: WPNA (blue) and PCNA (red).

LOCATION OF WORK: Restoration activities will be conducted in two ecoregions: the South Central Plains and the Mississippi Alluvial Plain (Figure 1). This project will restore habitat of the West Gulf Coastal Plain Dry Pine-Hardwood Flatwoods, West Gulf Coastal Plain Pine-Hardwood Forests, West Gulf Coastal Plain Saline Glade, West Gulf Coastal Plain Wet Hardwood Flatwoods, and Lower Mississippi Flatwoods Woodland and Forest.

BUDGET: The estimated total cost of this project is \$159,250. The federal share is \$103,450 (65%) and the total match is \$55,800 (35%). ANHC and Five Oaks Wildlife Services will provide non-federal match for restoration activities. Grant funding for salary of ANHC staff will be used for staff paid from non-recurring federal funds.

Federal funding from another grant source may become available to restore habitat at PCNA but the funding is not guaranteed. If this occurs, funding from this project will be used to restore additional habitat at WPNA and less at PCNA to maximize use of funding. Combining funding from two sources would result in an even larger restored landscape of priority habitat to benefit SGCN.

Category	Total	Match ANHC	Match 5-Oaks	Grant
Salary / Benefits	\$ 16,800	\$ 2,800	\$ 2,000	\$ 12,000
Contract Services	134,000	50,000	0	84,000
Supplies and Materials	2,650	1,000	0	1,650
Travel	5,800	0	0	5,800
Grand Total	\$ 159,250	\$ 53,800	\$ 2,000	\$ 103,450

ORGANIZATION AND STAFF QUALIFICATIONS

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 placed a high priority on lands at Pine City and Warren Prairie Natural Areas. ANHC, TNC, and Jody Pagan of Five Oaks Wildlife Services have worked closely for more than a decade to protect, monitor and restore pine-oak flatwoods. They have proven success in restoring and protecting areas at both sites through prescribed burning and timber thinning.

The Nature Conservancy has worked with the pine-oak flatwoods and associated plant communities for approximately 20 years and has developed a broad understanding of this at-risk ecosystem through scientific observation and use of adaptive management in implementation of restoration techniques. TNC also maintains a science and conservation staff that is trained in planning and implementing prescribed fires compliant with the National Wildfire Coordination Group standards. In addition to burning expertise, TNC employs a Director of Conservation Forestry that is responsible for planning and oversight of forestry-related projects.

Project Leader: Bill Holimon is an Ornithologist and is Chief of Research for the Arkansas Natural Heritage Commission. Bill received a B.S. in biology from the University of Arkansas at Little Rock and an M.S. 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 scientific papers on rare birds of Arkansas.

Jody Pagan is the General Manager and Chief Biologist for Five Oaks Wildlife Services, LLC. Previously he worked as a biologist for USDA Natural Resources Conservation Service for twelve years. Over the years Jody has partnered with numerous state, federal, and non-profit agency employees to restore thousands of acres of wetland and other habitats in Arkansas. Jody played a major role in restoring hundreds of thousands acres of wetlands through the Wetlands Reserve Program across the country.

Mike Melnechuk is the Assistant Director of Stewardship for The Nature Conservancy 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 The Nature Conservancy, the Arkansas Natural Heritage Commission, and occasionally military installations. 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.

ALTERNATE BUDGET: An alternate budget is provided at a 50%-50% cost share ratio. This budget change is reflected in Objectives 1 and 2 by the lower number provided in the range of acres treated.

Category	Total	Match ANHC	Match 5-Oaks	Grant
Salary / Benefits	\$ 9,600	\$ 2,800	\$ 2,000	\$ 4,800
Contract Services	100,000	50,000	0	50,000
Supplies and Materials	2,000	1,000	0	1,000
Travel	5,800	2,900	0	2,900
Grand Total	\$ 117,400	\$ 56,700	\$ 2,000	\$ 58,700