

Restoration of Wetlands in the Arkansas Valley Ecoregion

Project Summary:

Marshbird Species of Greatest Conservation Need are threatened range wide due in large to degradation and loss of wetland habitat. This project will restore hydrology and control invasive vegetation in a 300 acre wetland complex within the Arkansas Valley Ecoregion. The emphasis of the conservation actions within this project will be the restoration of 200 acres of emergent wetlands and the restoration of over 100 acres of adjacent bottomland hardwood forest within the Petit Jean River Wildlife Management Area (PJRWMA). Marsh bird species including the American Bittern (*Botaurus lentiginosus*), Least Bittern (*Ixobrychus exilis*) and Pie-billed Grebe (*Podilymbus podiceps*) along with other priority wetland birds in the Arkansas Valley will benefit from this project.

Project Leaders:

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Budget Summary:

State Wildlife Grant Request - **\$70,000**
Matching Funds and In-kind Service - **\$70,000**
Total Project costs - **\$140,000**

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Funding and Conservation Priorities:

This project addresses conservation priorities outlined in the Arkansas Wildlife Action Plan (AWAP) regarding the restoration and enhancement of wetlands and funding priorities outlined in the 2009 State Wildlife Grants Request for Proposals (RFP), specifically concerning the restoration of emergent wetlands. This project addresses needs of multiple marshbird species that have been identified as species of greatest conservation need (SGCN) within the AWAP but will also benefit other fish and wildlife species that rely on both bottomland hardwood forests and emergent wetland habitats. Specific additional benefits include increased available forage production from moist soil plants for a wide array of migratory waterfowl species thereby helping to attain the goals outlined within the North American Waterfowl Management Plan (NAWMP). In addition, other wetland-dependent species such as the Bird-voiced Treefrog (*Hyla avivoca*), which has been documented in close proximity to the project site will benefit from this project as well. Lastly, this is an on-the-ground stewardship and restoration project that can also serve as a demonstration project for other state, federal, and private lands and for management on other Arkansas Game and Fish Commission (AGFC) Wildlife Management Areas (WMAs) that contain degraded wetland habitats.

The proposed project addresses three funding priorities outlined in the 2008 State Wildlife Grants RFP. This project will: 1) protect, re-establish, and restore emergent wetlands 2) habitat management of bottomland forests to maintain or increase habitat quality for SGCN, and 3) restore, enhance and/or maintain wetland integrity. Over a two year period, this project will restore the hydrology and control invasive vegetation on approximately 300 acres of wetlands within the Arkansas Valley Ecoregion.

Project Need:

Wetlands have declined at an alarming rate over the past century throughout the United States. Likewise, wetland dependent bird species have experienced severe declines over much of their range in the United States, including species identified as high priority species in the AWAP as well as within the North American Waterbird Conservation Plan. Subsequently, emergent wetlands and their importance to associated marsh bird species have been identified to be a high priority for conservation actions in Arkansas by the steering committee of the AWAP. Threats to these species include habitat loss as a result of degradation, conversion to agriculture, and fragmentation. Marsh bird and water bird species of concern in the Arkansas Valley include Common Moorhen, Least Bittern, Little Blue Heron, Yellow-crowned Night Heron, American Bittern, and Pie-billed Grebe. Conservation actions suggested for marsh bird species include the restoration and protection of emergent wetlands to provide for diverse habitat conditions consisting of dense, emergent vegetation interspersed with open water with a gradient of vegetation height and water depth.

Project Site:

This project will occur on the Petit Jean River Wildlife Management Area (PJRWMA) located in Yell County (Figure 1). The PJRWMA (15,581 acres) is owned and managed by the Arkansas Game and Fish Commission (AGFC) and lies within the south-central portion of the Arkansas Valley Ecoregion. The PJRWMA is an extremely diverse area including upland pine-oak forests and woodlands, mesic oak forests, remnant agricultural fields, numerous old field systems in various early-successional stages, developed moist soil impoundments, bottomland hardwood forests, and various small oxbows, sloughs and reservoirs. The proposed project will be conducted at the Pullen Pond area (approximately 310 acres, Figure 2) within the PJRWMA. Currently, Pullen Pond is a deep-water reservoir that is covered almost entirely with buttonbush (*Cephalanthus occidentalis*) with some invasion of black willow (*Salix nigra*) on the higher elevations within the western end of the area. Pullen Pond was created as a combination green

tree reservoir and fishing impoundment in the late 1950's prior to AGFC ownership. The reservoir was created by the establishment of a 300 yard long earthen dam across Pond Creek. This dam on the eastern end of Pullen Pond currently contains both a water control structure and concrete spillway that provide capabilities for water control. Over the past fifty years, the succession of the Pullen Pond area from a bottomland hardwood forest to open-water emergent wetland to a very dense buttonbush swamp has resulted in the siltation and clogging of the original creek channel through the entire Pullen Pond area resulting in the expanding degradation of the bottomland hardwood forest upstream of the reservoir as well as the continued invasion of undesirable woody species.

Project Goals:

Overall the proposed project, over two years, will restore hydrology and control invasive vegetation on 300 acres of wetlands within the Arkansas Valley Ecogregion. Specifically, 200 acres of emergent wetlands will be restored through hydrology restoration and control and removal of invasive wetland vegetation (i.e. buttonbush) in combination with subsequent water level manipulation. In addition, approximately 100 acres of degraded bottomland hardwood forest will be restored through the restoration of the area's hydrology and control of invasive wetland vegetation (i.e. black willow).

1.) Protect, re-establish, and restore emergent wetlands.

The proposed project will help to re-establish approximately 200 acres of emergent wetlands through hydrology restoration and control of invasive wetland vegetation. Specifically, a specialized trackhoe will be used to restore the hydrology within Pullen Pond by removing all silt, debris and other materials currently clogging and preventing water flow through Pullen Pond and thereby restricting drainage of the upstream bottomland hardwood forests. Once the creek channel has been cleared the Pullen Pond area will be drained, herbicides will then be applied using aerial application over the entire 300 acre project area to control the invading woody species. Following herbicide application, a dozer and roller chopper will be used to knock down all standing woody vegetation so that a fire can be used to remove the existing woody debris to allow for the growth of emergent wetland vegetation following the subsequent re-flooding of the Pullen Pond reservoir. After all woody vegetation has been completely removed; the existing water control structure will be manipulated to manage the eastern most 200 acres of the Pullen Pond area for emergent wetland vegetation with an emphasis on providing an interspersion of dense, emergent vegetation with varying gradients of vegetation height and water depth. The re-establishment of emergent wetlands is identified in the Arkansas Wildlife Action Plan as a high priority conservation action that will benefit several marsh bird species, such as American Bittern, Common Moorhen, Least Bittern, Pie-billed Grebe and Purple Gallinule.

2.) Habitat management of bottomland hardwood forests to maintain or increase habitat quality to benefit SGCN.

Over a two year period, approximately 100 acres of degraded bottomland hardwood forest will be enhanced in the Arkansas Valley Ecoregion. Currently, the western end of the Pullen Pond area on PJRWMA is comprised of a dead and/or dying overstory of bottomland hardwood species that is being replaced by a thick understory of invasive more water-tolerant species such as black willow and buttonbush. The degradation of the existing hardwood overstory is due to the inability to effectively drain the Pullen Pond area as a result of over 50 years of sedimentation and clogging of the existing creek channel. Restoration of the hydrology within the project area will allow for the ability to adequately drain the bottomland hardwood forests and subsequently increase the health of the remaining hardwood overstory as well as allow for access for the chemical and mechanical control of the undesirable understory. AGFC will monitor the vegetation response within this 100 acre area of Pullen Pond in future years and if deemed necessary, hardwood seedlings may be used to supplement natural regeneration of the bottomland hardwood forest. The enhancements to the bottomland hardwood forests within this project will

provide benefits to the Prothonotary Warbler as well as short-term benefits to early-successional bottomland hardwood dependent species such as the American Woodcock. Both of these bottomland hardwood dependent species are identified as SGCN within the AWAP.

3) *Restore, enhance and/or maintain wetland integrity to benefit SGCN.*

The overall enhancement and restoration of the 300 acre wetland complex contained within this project will benefit numerous species identified as SGCN. In addition to the marsh bird species and bottomland hardwood dependent species listed previously, other SGCN such as the Bird-voiced Treefrog that has been documented in close proximity to the project site will likely benefit from this project as well.

Materials and Methods:

In order to restore 300 acres of wetlands (200 acres emergent wetlands and 100 acres bottomland hardwood forest) on PJRWMA the AGFC will use a contractor to restore hydrology through the project area via the restoration of the existing creek channel to facilitate the drainage of area for restoration and management purposes. A contractor will also be utilized to apply herbicides to the invading woody vegetation, roller chop the residual woody vegetation and debris and construct a fire line around the perimeter of the 300 acre project area. AGFC personnel will conduct the prescribed burn on the project area following the herbicide treatment and roller chopping activities. Hydrology restoration will be accomplished using a specialized trackhoe equipped for working in wetlands. The hydrology restoration work will be performed during late summer/early fall 2009. Herbicide application and roller chopping will be performed during summer 2010. Prescribed burning of the project site will then be conducted either during early fall 2010 (conditions permitting) or summer 2011.

Monitoring:

Marsh bird response to the conservation actions in this project will be monitored using national standardized protocols. In brief, these protocols call for point count surveys using broadcasts of marshbird vocalizations to elicit responses and improve detection. Survey points will be spaced at least 400 m apart along the upland-emergent marsh interface. This protocol also describes procedures for measuring habitat characteristics and water depth. Parameters to be estimated are densities, abundance indices, trends in bird populations, and habitat availability. Results will be summarized seasonally and shared among project partners and with the national marsh bird survey coordinator. Marsh bird monitoring will include both spring and fall migration monitoring and will be coordinated through Dr. David Kremetz at the University of Arkansas. Habitat response to manage treatments will be monitored and that information will be shared with other habitat biologists and land managers within the AGFC.

The marsh bird monitoring methodology (utilizing national marsh bird monitoring protocols) will be entered in the Natural Resources Monitoring Partnership as required by the Arkansas Wildlife Action Plan. A list of SGCN that will be monitored through the marsh bird monitoring efforts and will likely benefit from this project include: American Bittern (*Botaurus lentiginosus*), Least Bittern (*Ixobrychus exilis*) and Pie-billed Grebe (*Podilymbus podiceps*).

Results of this project will be used to update the database associated with the Comprehensive Wildlife Conservation Strategy at the conclusion of the project. Likewise, the project partners commit to presenting updates and/or findings from this project to the scientific community in order to facilitate updates and revisions to the AWAP and future funding priorities.

Study Results and Benefits:

Not only will this project result in the restoration of 200 acres of critically important emergent wetland habitat within the Arkansas Valley Ecoregion and the restoration of 100 acres of bottomland hardwood forest, but it will also result in the collection of valuable marshbird abundance information that is currently limited within the Arkansas Valley Ecoregion. This management should positively benefit multiple marshbird species that have been identified as SGCN. In addition to habitat and species benefits, this project will serve as a critically important demonstration site for both emergent wetland and bottomland hardwood restoration. There currently exist numerous areas on other AGFC-owned lands where these management actions could be duplicated not to mention potential areas for management on federal and private lands. This project site will be used to conduct field days and training sessions for both private landowners and public land managers alike.

In addition, the Yell Co. Wildlife Federation and local Audubon members will be kept abreast of the project and to the extent possible will be engaged to assist with incidental monitoring aspects for other SGCN including the American woodcock and bird-voiced tree frog.

Project Calendar:

- Pre-management Marsh Bird Monitoring – to be initiated in April 2009
- Marsh Bird Monitoring – Spring and Fall Monitoring for 2009-2010, Spring Monitoring only for 2011
- Hydrology Restoration – to be completed late summer/early fall 2009 (weather dependent)
- Invasive Vegetation Control – to be completed summer 2010
- Prescribed Burning to Remove Woody Debris – to be completed early fall 2010 (weather dependent)

Budget and Expenditures:

The budget below outlines costs, for two years, to restore hydrology and control invasive woody vegetation within a 308 acre wetland complex on the Petit Jean River Wildlife Management Area.

Item	Total	Match	Grant
Operating Expenses			
Contract Labor and Equipment Use to clear creek channel throughout entire Pullen Pond area	\$60,000		\$60,000
Contract services for herbicides and aerial application (308 acres @ \$140/acre)	\$43,000	\$43,000	
Contract labor for dozer and roller chopper (308 acres @ \$75/acre)	\$23,000	\$23,000	
Contract labor to construct 4 miles of fire line around project area	\$8,000	\$4,000	\$4,000
Contract labor for marsh bird monitoring (contract with U of A)	\$6,000		\$6,000
Project Totals:	\$140,000	\$70,000	\$70,000

*All matching funds will be provided through AGFC budgeted items. No project funds for salary/benefits or capital expenses will be utilized in this project.

Qualification of Individuals and Organizations Involved

Organization:

The Arkansas Game and Fish Commission's mission is to wisely manage all the fish and wildlife resources of Arkansas while providing maximum enjoyment for the people. The Arkansas Game and Fish Commission is responsible for the effective coordination and implementation of the Arkansas Wildlife Action Plan and the management and protection of the Species of Greatest Conservation Need and priority habitats identified therein. The implementation of the AWAP includes the implementation of priority conservation actions on AGFC owned lands with the state. Region 8 personnel within AGFC have recently completed the hydrology restoration phase of a similar project on the Galla Creek WMA using the same methodology described in this project.

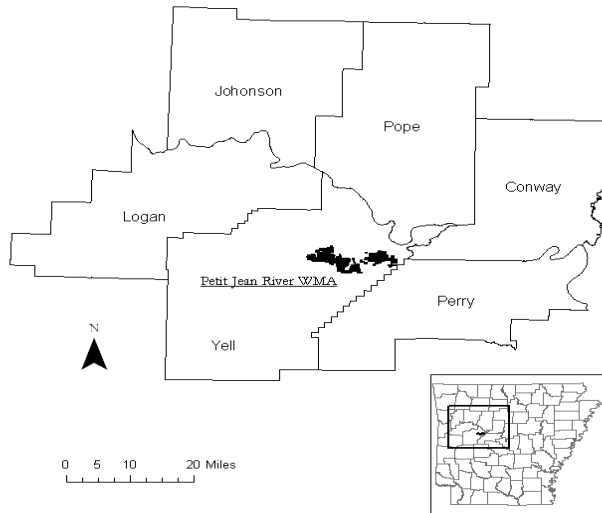
Personnel:

Brad Carner has worked in various positions with the AGFC over the past 10 years including private lands biologist, assistant regional wildlife supervisor, turkey/quail program coordinator, wildlife division assistant chief of programs and currently regional wildlife supervisor for a seven-county area in north-central Arkansas. He received his BS degree in Zoology from Arkansas State University and his MS degree in Biology from Arkansas State University studying the Dispersal, Survivorship and Reproductive Success of a Reintroduced Population of Eastern Wild Turkeys in the Delta Region of Arkansas. He is a Certified Wildlife Biologist through The Wildlife Society.

Karen Rowe is the Migratory Bird Program Coordinator for the Arkansas Game and Fish Commission. For the past two decades, Ms. Rowe has been responsible for developing and implementing conservation programs for priority non-game birds in Arkansas. These programs range from monitoring and research projects to implementing on-the ground management actions. Ms. Rowe is a Certified Wildlife Biologist through The Wildlife Society and serves as the agency representative on the Mississippi Flyway Nongame Bird Technical Section.

A. J. Riggs has worked as an Assistant Regional Supervisor for the Arkansas Game and Fish Commission since March 2004 (4 years). In addition, she has worked at Fort Chaffee Maneuver Training Center (Arkansas State Military Department, Fort Chaffee, AR) as a biologist (2.75 years), the St. Francis Ranger District of the Ozark -St. Francis National Forest (Department of Agriculture, Marriana, AR) as a forestry technician (1.25 years), and the Okefenokee National Wildlife Refuge (Department of Interior, Folkston, GA) in a biologist internship position (6 months) and as a park ranger (2 months). She received a BS degree in Ecology from Juniata College in Huntington, Pennsylvania in 1999.

Figure 1. Petit Jean River WMA located within the Arkansas Valley Ecogregion



**Location of the Petit Jean River WMA included with this project.

Figure 2. Pullen Pond Reservoir located within Petit Jean River WMA

