

A. Title of Project:

Assessment and Restoration of Aquatic Habitats in Central Arkansas

B. Project Summary:

Audubon Arkansas will work on assessment and restoration of aquatic habitats in urban environments in Central Arkansas.

First, Audubon will conduct marsh habitat restoration, extensive fish surveys and stream assessment work on Fourche Creek and its tributaries.

Secondly, working with Waste Management, Audubon will create marsh habitat at the Two Pine Landfill in the Bayou Meto Watershed providing habitat for marshbirds including the King Rail, a species of Continental Conservation Concern.

The project will also provide valuable information on where different species of fish are found in the Fourche Creek Watershed and the impact various human activities have on fish diversity. With assistance from John Harris of the Arkansas State Highways and Transportation Department, we will conduct mussel sampling to determine the range of the newly discovered mussel, '*Lampsilis species-A*', that has so far been found exclusively on Fourche Creek.

C. Name of Project Leader and Job Title:

Dan Scheiman, Ph.D., Director of Bird Conservation

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H. Project Partners; Other Principal Individuals Involved

- Johnnie Chamberlin, Assistant Director of Conservation, Audubon Arkansas, jchamberlin@audubon.org, 501-244-2229
- Brent Kelley, Field Programs Coordinator, Audubon Arkansas, mkelley@audubon.org, 501-244-2229
- Clifton Jackson, Urban Fisheries Specialist, Arkansas Game and Fish Commission, cjackson@agfc.state.ar.us, 501-978-7322
- John Harris, Biologist, Arkansas State Highway and Transportation Department, John.Harris@arkansashighways.com 501-569-2000

I. Total Project Cost: \$266,200

J. Total SWG Money Requested: \$133,100

K. Sources and Amounts of Matching Funds/In-kind Services

Audubon Arkansas (cash from Waste Management, in-kind services)	\$104,100
Arkansas Game and Fish Commission (in-kind services)	\$19,000
Arkansas State Highway and Transportation Department (in-kind services)	<u>\$10,000</u>
Total	\$133,100

A. Conservation Priorities

Often overlooked are conservation opportunities for Species of Greatest Conservation Need (SGCN) in the interface between urban and wilderness areas. As human populations take over more and more of the natural landscape of Arkansas, how to protect species at the urban/wilderness interface becomes critically important.

The Fourche Creek Watershed is one of the most important urban watersheds in Arkansas. Before entering the Arkansas River, Fourche Creek drains and filters runoff from Little Rock. Decades of abuse have eroded wildlife habitat along Fourche Creek, though Fourche Bottoms, an 1,800-acre core wetland, maintains some natural functions and character.

Waste Management's Two Pine Landfill (between North Little Rock and Jacksonville) is located within the Bayou Meto watershed. Since the early 1900's, much of the original vegetation in the Bayou Meto watershed has been altered or removed especially in its headwaters near Jacksonville. In particular, natural wetlands have been degraded or replaced by agricultural and urban development. Consequently, most of the values and benefits associated with these wetlands have been lost. Expansion of the landfill necessitates excavation of a flood relief channel, but also creates the opportunity for wetlands creation, thus restoring marshbird habitat and improving the quality of water that flows from the site into the Bayou Meto.

Within these urban settings Audubon with its partners propose to assess and improve the status of fish, mussel, and marshbird SGCN. Our project will:

1. Improve understanding of the distribution and abundance of 24 large-river oriented Species of Greatest Conservation Need (SGCN).
2. Improve understanding of the distribution and abundance of '*Lampsilis species-A*', a newly described mussel SGCN.
3. Survey headwater aquatic biodiversity and anthropogenic impacts to headwater streams.
4. Protect, re-establish, and restore emergent wetlands for marshbird SGCN, including the King Rail.
5. Restore, enhance and maintain wetland integrity.

B. Ecoregions and Habitats

- 1) Fourche Creek and its tributaries flow through three of Arkansas' major ecoregions: the Ouachita Mountains, the West Gulf Coastal Plain, and the Mississippi River Alluvial Plain.
- 2) The upper portion of the Bayou Meto lies within the Ouachita Mountains and Mississippi River Alluvial Plain natural divisions.

Our work will occur primarily in the following habitats: Ouachita Riparian, West Gulf Coastal Plain Small Stream Forest, West Gulf Coastal Plain Wet Hardwood Flatwoods, Emergent Marsh Wetland, Urban/Suburban, and Pastureland.

C. Project Methods

Stream Assessment and Aquatic Species Sampling:

1. Extensive fish sampling at points along Fourche Creek and its tributaries from its mouth at the Arkansas River to the small headwaters streams in eastern Saline and western Pulaski counties. Sampling methods will include:
 - a. Backpack shocking with Arkansas Game and Fish Commission (AGFC).
 - b. Seining and Fyke netting.
 - c. When possible, fish will be identified and released to limit mortality.
 - d. Sampling sites will vary in degree of human impacts, giving us an idea of the effect of weirs, roads, and unnatural sediment loads on species diversity.

2. While sampling fish, we will also collect mussel shells. John Harris, Arkansas State Highway and Transportation Department (AHTD), will identify which shells are those of *Lampsilis* species A.
3. Using GPS, GIS, and the Unified Stream Assessment protocol, we will record and map human impacts on headwaters streams. In 2007, Audubon Arkansas completed an initial stream assessment of Fourche Creek and many of its tributaries, but that assessment didn't cover many of the smaller headwater streams in the watershed.

Emergent Marsh Restoration and Wetland Integrity:

1. Eradicate alligatorweed (*Alternanthera philoxeroides*) using an effective, carefully tested, host-specific biological control agent, the alligatorweed flea beetle (*Agasicles hygrophila*), from a 75-acre emergent marsh in Fourche Bottoms. Dr. Robert Wiedenmann, Professor of Biological Control, University of Arkansas at Fayetteville; and Allan Beuerman, County Extension Agent, Pulaski County Extension Office, will provide guidance on release and monitoring.
2. Use herbicide (Diquat) or mechanical means to remove any remaining alligatorweed.
3. Hand plant and seed the area with select native emergent marsh species to ensure native plant establishment.
4. Monitor flea beetle effectiveness, marsh vegetation response, and marshbirds using standard protocol.
5. In partnership with Waste Management, we will conduct 15-ac of marshbird habitat restoration and carry out a water quality and wildlife monitoring plan at the Two Pine Landfill in a flood relief channel along Five Mile Creek and adjacent to Bayou Meto.

D. Measurable Products and Outcomes

By 2011 we will have:

1. A list of fish species found in Fourche Creek Watershed organized by habitat type, stream-order, and degree of local human impacts.
2. Sampling from the Arkansas River to small headwater streams will give a better picture of how far up Fourche Creek some of the large river fish travel.
3. A map detailing the distribution of '*Lampsilis* species-A', in Fourche Creek Watershed and a report detailing habitats where it was found.
4. A map, report, and GIS data detailing human impacts on Fourche Creek and its headwater streams.
5. A selection of priority stream sites for future habitat and water quality improvement projects.
6. Progress on 90 acres of restored marshbird habitat including removing exotic plants and planting natives.
7. An analysis of the response of marshbirds to habitat restoration in an urban landscape.

E. Use of Existing Resources

Audubon Arkansas will make use of many of existing partnerships. We have a strong working relationship with AGFC that includes programs such as Watchable Wildlife, Urban Fisheries, and Stream Team. Clifton Jackson, with the Urban Fisheries program, will provide fish identification expertise and sampling equipment. We have worked with the Highway Department on finding and mapping rare plants in Fourche Creek Watershed and will continue this partnership by sending mussel shells to John Harris for identification. We have worked with both AGFC and AHTD to improve access to, and wildlife habitat in, a borrow pond in Little Rock. We have long standing partnerships with University of Arkansas at Little Rock (UALR) and Arkansas Department of Environmental Quality and will seek their help with water quality testing. UALR student interns may also assist with fish sampling. We have a three-year agreement with Waste Management to enhance water quality, habitat, and environmental learning at the Two Pine Landfill. Waste Management will apply labor and equipment to wetland restoration on-site, as well as funding to Audubon Arkansas for our assistance and expertise.

As a result of years of extensive work in the Fourche Creek Watershed, Audubon Arkansas already has products that will enhance our proposed work:

1. Completed stream assessments of Fourche Creek and many of its larger tributaries.
2. Collected extensive water quality data over a five-year period.
3. Completed preliminary fish sampling at four sites in the watershed.

F. Proposed Budget

	Match	SWG
<u>Arkansas Game and Fish Commission</u>		
Salary and Benefits (Clifton Jackson)	\$12,000	
Operating Expenses – Use of backpack shocker and electroshocking boat	\$7,000	
Subtotal	\$19,000	
<u>Arkansas State Highway and Transportation Department</u>		
Salary and Benefits (John Harris)	\$10,000	
Subtotal	\$10,000	
<u>Audubon Arkansas</u>		
Salary and Benefits		
Project oversight and management		\$30,000
Marshbird monitoring and data analysis		\$10,000
Flea beetle monitoring		\$5,000
Planting native marsh species in Fourche Bottoms		\$10,000
Monitoring Two Pine Landfill restoration (marshbirds, wildlife, water quality, vegetation)	\$26,825	
Wildlife monitoring plan for Two Pine Landfill	\$16,825	
Fish and mussel sampling and identification		\$20,000
Stream assessment, maps, and reports		\$35,000
Operating Expenses		
Use of Audubon truck, Kubota, trailer, 4-Wheeler	\$10,000	\$3,000
Design of excavated relief channel at Two Pine Landfill	\$50,000	
Capital Expenses		
Herbicide (Diquat)		\$2,500
Marsh plant plugs (5,000 plugs at \$1/each)		\$5,000
Alligatorweed flea beetles (1500 beetles/year @ \$225 x 2 years)	\$450	
Sampling and assessment equipment		\$500
Overhead - Audubon indirect costs (10%)		\$12,100
Subtotal	\$104,100	\$133,100
TOTAL	\$133,100	\$133,100

Staff Qualifications

Daniel Scheiman, Ph.D., Director of Bird Conservation, will supervise the project, monitor marshbirds, and analyze data. Dr. Scheiman received his B.S. from Cornell University, M.S. from Eastern Illinois University, and Ph.D. from Purdue University, all in wildlife ecology. He has over ten years of bird research experience and six research publications on topics such as bird-habitat relationships, population dynamics, and detection probability.

Johnnie Chamberlin, Assistant Director of Conservation, will conduct much of the stream assessment, mussel and fish sampling, and planting of native plants. Mr. Chamberlin will supervise the college interns who will help with this project. Mr. Chamberlin joined Audubon in 2005 when he returned to Little Rock from Durham, North Carolina where he conducted bioremediation research and taught a biotechnology lab while earning his M.S. in Civil and Environmental Engineering at Duke University. While at Audubon, Mr. Chamberlin has had primary responsibility for management of a \$1.3 million EPA Targeted Wetland Initiative Grant which was concluded successfully in the fall of 2008. Mr. Chamberlin plays an important role in outreach to volunteers and citizens for Audubon Arkansas. Through numerous talks and presentations, Mr. Chamberlin has educated numerous city employees and hundreds of other citizens on ecological management of watersheds. Mr. Chamberlin is trained and certified in GIS by EAST and received an award along with Audubon's Director of Conservation Kevin Pierson for GIS work on National Audubon's Mississippi River Initiative.

Brent Kelley, Field Programs Coordinator, will oversee invasive species removal, flea beetle monitoring, and fish sampling efforts. Since 2006, Mr. Kelley has coordinated and managed all field projects within the Fourche Creek Watershed Initiative, including stream-bank stabilization projects, reforestation efforts, water quality sampling and analysis, and storm water control projects. In addition, Mr. Kelley manages the field portion of the Wetland Reserve Program (WRP) in which Audubon partners with the Natural Resources Conservation Service (NRCS) to put non-productive farmland back into its natural forested state. Mr. Kelley received his undergraduate degree in Botany from the University of Arkansas in 2001 and his Master's degree in Forest Entomology in 2006.

Audubon Arkansas' staff has extensive experience in wetlands reconstruction, reforestation, grasslands restoration, managing contracts, working with landowners, monitoring, and public outreach. We have technical training and certification in prescribed burning, wildland fire chainsaws, watershed planning, stream morphology, water quality monitoring, GIS, and vertebrate and invertebrate surveys. Audubon has successfully managed Wetland Reserve Program projects on 4,600 acres in the state. Audubon partnered with Ducks Unlimited at the Woodson Joint Venture, the single largest Wetland Reserve Program site conducted by NRCS to date. During implementation of that project, Audubon contracted with professional foresters, surveyor/engineers, dirt movers, and tree planting crews who performed the work. Audubon personnel were on site each day of the tree planting. Over 700,000 hardwoods were planted; about 150 acres of grasslands were created. Audubon continues to monitor these tracts.