

**Enhancing Aquatic Connectivity for Multiple Species of Greatest Conservation Need in Cub Creek,  
Middle Fork Saline River Watershed, Ouachita Mountain Ecoregion, Arkansas**

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*Cover Photo: Current low water crossing*

**Project Summary:**

This project aims to enhance aquatic connectivity to the Middle Fork Saline River by augmenting an existing project that will remove a fish passage impediment on Cub Creek, a major tributary stream to the Middle Fork Saline River. Specifically, this funding would be utilized for stabilizing Cub Creek immediately up and downstream of the new crossing and protecting the newly constructed fish friendly crossing. This project will expand access to 4.4 stream miles within Cub Creek, currently obstructed by the existing crossing, benefiting multiple important aquatic species of greatest conservation need.

**Project Partners:**

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Deltic Timber Corporation  
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**Total Project Cost: \$31,610**

**Total Amount Requested: \$25,457**

**Total Matching Funds/In-kind Services: \$11,729**

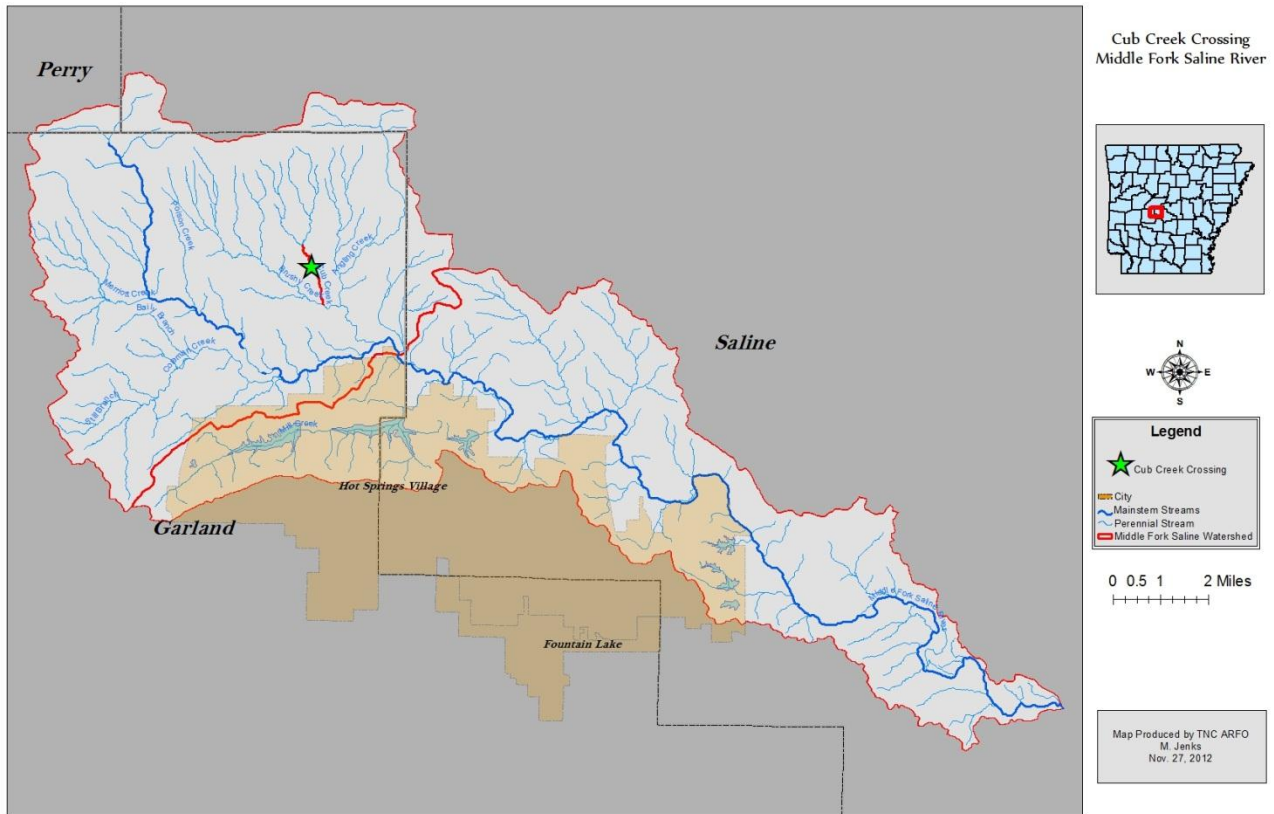
**State Wildlife Action Plan Priority to be Addressed**

This project is geared toward “Reducing aquatic barriers and habitat connectivity to restore aquatic life for all SGCN species,” within the Middle Fork Saline Watershed. This was identified as a conservation priority for the Arkansas State Wildlife Plan. Completing this project will encourage proactive management to benefit fifteen aquatic endangered, threatened, and species of greatest conservation need (see Figure 2). Of these fifteen species, there are three fish, eleven mussels, and one macroinvertebrate species of concern.

**Project Area**

The project is located in the Ouachita Ecoregion, Middle Fork Saline watershed, Garland County, Arkansas; and is targeted to address both small river riparian terrestrial habitat, headwaters aquatic habitat of the Middle Fork Saline River (See Figure 1), stream quality, streambank habitat, and fifteen species of greatest conservation need (See Table 1).

Figure 1.



**The Need**

The Middle Fork Saline River and its headwater tributaries, home to six mussel species of Greatest Conservation Need (SGCN) including the threatened Arkansas Fatmucket mussel (*Lampsilis powellii*) and endemic Ouachita Creekshell (*Villosa arkansasensis*), is identified as both an Extraordinary Resource Waterbody (ERW) and Ecologically Sensitive Waterway (ESW) by the Arkansas Department of Environmental Quality.

Unfortunately, the Middle Fork and its tributaries have also been identified by the Arkansas Natural Resource Commission as one of ten high priority watersheds targeted for reduction of nonpoint source pollution.

In 2005 and 2006, TNC completed a watershed and roads assessment for the entire Middle Fork Saline River Watershed funded through a Section 319 Clean Water Act Grant. This assessment included collecting data on stream crossings, including implications to stream channel stability as well as fish and aquatic species passage, and a ranking was given to each crossing. A baseline map was then produced that identified priority locations for on-the-ground conservation actions such as installation of gravel road Best Management Practices, bank stabilization and in-stream projects to reduce sediment, and correction of poorly designed or maintained stream crossings to facilitate better channel stability and aquatic passage for fish, mussels, and invertebrates. Cub Creek crossing was identified as a high priority crossing and is considered critical due to its existing condition as a fish passage impediment and its close proximity to the Middle Fork Saline River, an Extraordinary Resource Water Body and an Ecologically Sensitive Waterway (See Figure 1). Cub Creek is an important headwater tributary to the Middle Fork Saline River.

### **Method**

The proposed project will fund Phase 3 of the Cub Creek crossing plan. A nearby site, at Cub Creek and Club Hill Drive, was selected for 2011 SWG funding and was implemented in December 2011. The 2011 SWG funding (\$13,000) assisted in rebuilding a heavily incised and improperly drained gravel road leading up to a second low water crossing, downstream of the proposed crossing. Phase 1 and 2 of the Cub Creek crossing plan, currently funded through a Southeast Aquatic Resources Partnership (SARP) grant, is being used to assess the geomorphology of Cub Creek and to remove the fish barrier, a poorly maintained low water crossing, with a downstream drop of approximately 3 feet. In phase 2, an open arch bridge or culvert system will be constructed to allow for year round fish passage. Additionally, five hundred feet (approximately 500 linear ft.) of degraded gravel road (not being corrected in Phase I) will be reconstructed and appropriate drainage will be installed to compliment and protect the new bridge system. Phase 3 of the plan, proposed for funding, includes the installation of rock structures within the channel to help guide flow and protect the headwalls and endwalls of the newly constructed open-arch bridge crossing. This project will expand access to approximately 4.4 stream miles within the Middle Fork Saline Watershed, benefiting multiple important aquatic species by removing a poorly maintained low water crossing. Stream channel stability will also be restored to this section of river and no longer act as a barrier to flow and sediment causing channel diversions around the identified barrier.

### **Measurable Outcomes/Objectives**

1. Install in-channel rock structures to increase stability of headwalls and endwalls and guide flow through the newly constructed open arch system.

2. Host a field visit for watershed stakeholders describing the open-arch bridge system and its benefits. Involve multiple partners including the nearby County Road Departments and timber industries, during construction to demonstrate techniques used for fish friendly passages.

Budget

Category	Funds Required	TNC Match	3rd Party Match**	Total
Salaries and Benefits	\$12,297	\$944	\$0	\$13,241
Operating Expenses	\$9,277	\$8,456	\$637	\$18,369
Capital Expenses	\$0	\$0	\$0	\$0
<b>Subtotal</b>	<b>\$21,574</b>	<b>\$9,400</b>	<b>\$637</b>	<b>\$31,610</b>
Indirect Cost (18% NICRA)*	\$3,883	\$1,692		
<b>TOTAL</b>	<b>\$25,457</b>	<b>\$11,092</b>	<b>\$637</b>	<b>\$31,610</b>

\*The Nature Conservancy has a current 18% Negotiated Indirect Cost Rate (NICRA) that is accepted by USFWS.

\*\*Riggs Cat has generously agreed to donate a 20% discount on all rental equipment.

Deliverables

- Pre- and Post-site photos and final report.
- Pre- and Post- site channel surveys of Cub Creek showing degree of improvement .

Figure 2.

Upper Saline and 4 Forks SGCN				
	Scientific Name	Common Name	Global Status	State Status
Fish	<i>Noturus lachneri</i>	Ouachita madtom	G2	S2
	<i>Crystallaria asprella</i>	Crystal darter	G3	S2?
	<i>Percina uranidea</i>	Stargazing darter	G3	S3
Insects	<i>Agapetus medicus</i>	Arkansas agapetus caddisfly	G?	S?
Mussels	<i>Alasmidonta marginata</i>	elktoe	G4	S3
	<i>Cyprogenia aberti</i>	western fanshell	G2	S2
	<i>Lampsilis ornata</i>	Southern pocketbook	G5	S1
	<i>Lampsilis powellii</i>	Arkansas fatmucket*	G1G2	S2
	<i>Toxolasma lividus</i>	purple lilliput	G2	S2
	<i>Villosa arkansasensis</i>	Ouachita creekshell	G2	S2
	<i>Obovaria jacksoniana</i>	Southern hickorynut	G1G2	S2
	<i>Lampsilis abrupta</i>	Pink Mucket**	G2	S2
	<i>Pleurobema cordatum</i>	Ohio pigtoe	G3	S2
	<i>Pleurobema rubrum</i>	Pyramid pigtoe	G2	S2
	<i>Ligumia recta</i>	Black sandshell	G5	S2

\*Federally listed threatened species

\*\*Federally listed endangered species

**Joy DeClerk**, River Restoration Program Director, will be responsible for facilitation between groups, and completion of the project. DeClerk is a graduate of Hendrix College with a B.A. in Environmental Studies, and Economics and Business and has worked for The Nature Conservancy since April 2005. In her current position she has focused conservation work on assessing sedimentation from various land uses and applying natural channel design restoration techniques to reduce sedimentation and restore habitat. DeClerk has completed trainings in “Applied Fluvial Geomorphology” and “Natural Channel Design” led by instructor Dave Rosgen, Ph.D. The most recent successful project completed was a ½ mile stream restoration project on the Middle Fork Saline River, near Jessieville, AR, designed and constructed by DeClerk. Other projects completed include: Assessment and improvement project on unpaved roads in the Middle Fork Saline Watershed, in Garland County; and Development of a trail assessment and monitoring methodology for Best Management Practices on ATV trails in the Wolf Pen Gap Area, Ouachita Headwaters Watershed near Mena, Arkansas.

**Melissa Jenks**, River Restoration Project Specialist, will be responsible for facilitation between groups and completion of the project. Jenks is a graduate of Arkansas Tech University with a B.A. in Geology and Environmental Science and has worked with The Nature Conservancy since 2008. In her current position she has completed two courses in “Applied Fluvial Geomorphology” led by instructor Dave Rosgen, Ph.D., conducted numerous geomorphic surveys, and worked to implement a stream restoration project on the Middle Fork Saline River. She also has six years combined experience in the Geographic Information Systems (GIS) field with the U.S. Forest Service and The Nature Conservancy.

**Mitchell Allen**, Stream Restoration Specialist, will be responsible for bioengineering materials, site safety plans and procedures, and vehicle and equipment maintenance. Mitchell is a graduate of the University of Central Arkansas with a B.S. in Environmental Science/Biology. While working on his undergraduate degree, he was able to gain 3 years of experience with non-native plant removal and restoration ecology. Since graduating he has worked with the U.S. Fish and Wildlife Service on the Upper Colorado River Endangered Fish Program, helping restore habitat for four endangered species, as well as removing non-native fish species. He began work for The Nature Conservancy in August of 2012.

**The Nature Conservancy’s Arkansas Field Office** has a great interest and knowledge in watershed restoration, and has successfully planned for and implemented a large number of watershed projects across the country, including many in Arkansas. As a result of this and other conservation work, TNC recognizes the foundational importance of planning for successful implementation, and utilizes a four-step planning process for priority conservation areas with high biodiversity. This extensive experience has proven an excellent track record for TNC in generating public involvement for watersheds across the state. Furthermore, the Arkansas Field Office of TNC has a successful track record for leveraging limited conservation dollars via collaborations with multiple partners toward measurable conservation successes.