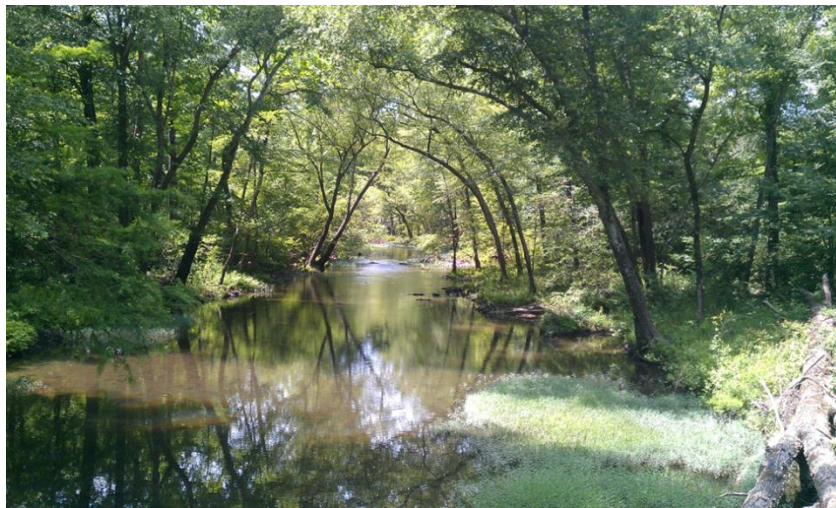


**North Fork and Alum Fork Saline Rivers Channel Stability Assessment
and Unpaved Road Improvement Project, Upper Saline River Watershed, Arkansas**

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Project Summary: The Upper Saline River watershed is a priority watershed of The Nature Conservancy’s Arkansas Chapter (TNC), a watershed covered in a Safe Harbor Agreement and Candidate Conservation Agreement with Assurances, and contains 16 Species of Greatest Conservation Need (SGCN). Water quality concerns for the watershed are primarily erosion and sedimentation– leading factors for SGCN listing. Previous projects completed by TNC in the Upper Saline River watershed include unpaved road inventories, a fish passage road project, a channel stability assessment, and a stream restoration project. TNC proposes to perform a channel stability assessment on the Alum Fork and North Fork Saline rivers to fill in data gaps of the Upper Saline River watershed as well as implement an unpaved road project within the North Fork Saline River watershed to assist in the goal of addressing sedimentation threats for aquatic SGCN.

Project Partners: Marty Polk, Saline County Road Superintendent, mepolk@sbcglobal.net

Total Amount Requested: \$44,718 TNC Matching Funds: \$24,300

Total Project Cost: \$69,018

Need: The State of Arkansas' impaired waterbody listings (303(d) within Upper Saline River watershed states that the Alum Fork Saline River exceeds water quality standards in pH, Lake Winona exceeds in mercury, and Saline River exceeds in turbidity. The Arkansas Wildlife Action Plan (AWAP) declared 16 Species of Greatest Conservation Need (SGCN) in the Upper Saline River watershed with eight species listed as state imperiled (see Table 1). The AWAP also states that the Upper Saline ecoregion, Ouachita Ecoregion - Ouachita River Drainage, is ranked 17 out of 30 for overall aquatic habitat condition, primarily due to the presence of roads. Unpaved roads are major contributors to sedimentation in streams. The Center for Advanced Spatial Technologies at the University of Arkansas calculated that 76.4% of total roads are unpaved within the North Fork Saline watershed; Alum Fork watershed contains 89.4% unpaved roads. North Fork Saline contains 5 of the 16 aquatic SGCN for the Upper Saline River watershed, with three species listed as imperiled in Arkansas. Alum Fork Saline contains 10 SGCN, with five listed as state imperiled. There is an immediate need for measures to reduce sedimentation runoff from unpaved roads. One component of this proposed project is to implement an unpaved road project in the North Fork Saline River watershed to help reduce localized sediment runoff.

A channel stability assessment of the Alum Fork and North Fork Saline rivers will also be performed in order to fill in data gaps within the Upper Saline watershed. These assessments are necessary to determine if there is a need for stream restoration and prioritize reaches for any active restoration needs.

Purpose and Objectives: The proposed project will address the Aquatic Habitat funding priority to restore, enhance, and/or maintain the integrity of aquatic habitats to benefit. It will:

- Perform a channel stability assessment on both Alum Fork and North Fork Saline rivers to provide baseline geomorphological data, fill in data gaps in the Upper Saline River watershed, and determine if/where restoration is needed.
- Implement an unpaved road project in the North Fork Saline River watershed to reduce sedimentation from reaching the North Fork and/or its tributaries.
- Provide comparative analysis of sediment reduction using Water Erosion Prediction Project (WEPP), a physically-based soil erosion model for the road project.
- Produce a final report of project and data analysis.

Location: The North Fork Saline (HUC 0804020301) and Alum Fork Saline (HUC 0804020303 and 0804020307) rivers are located almost exclusively in Saline County, Arkansas. They are part of the Ouachita Mountains, Upper West Gulf Coastal Plain ecoregion. The North Fork Saline watershed, represented in green in Figure 1, stretches approximately 36 river miles from the Ouachita National Forest (ONF) to the confluence of the Alum Fork Saline River which forms the Saline River mainstem located northwest of Benton, AR. It is approximately 135 mi², contains over 87,300 acres, and has 264.6 miles of unpaved roads. The Alum Fork Saline watershed,

represented in yellow in Figure 1, stretches approximately 53 river miles (excluding Lake Winona) from the ONF to the confluence of the North Fork Saline River. The four HUC12 watersheds contain approximately 169 mi², 109,500 acres, and 359 miles of unpaved roads.

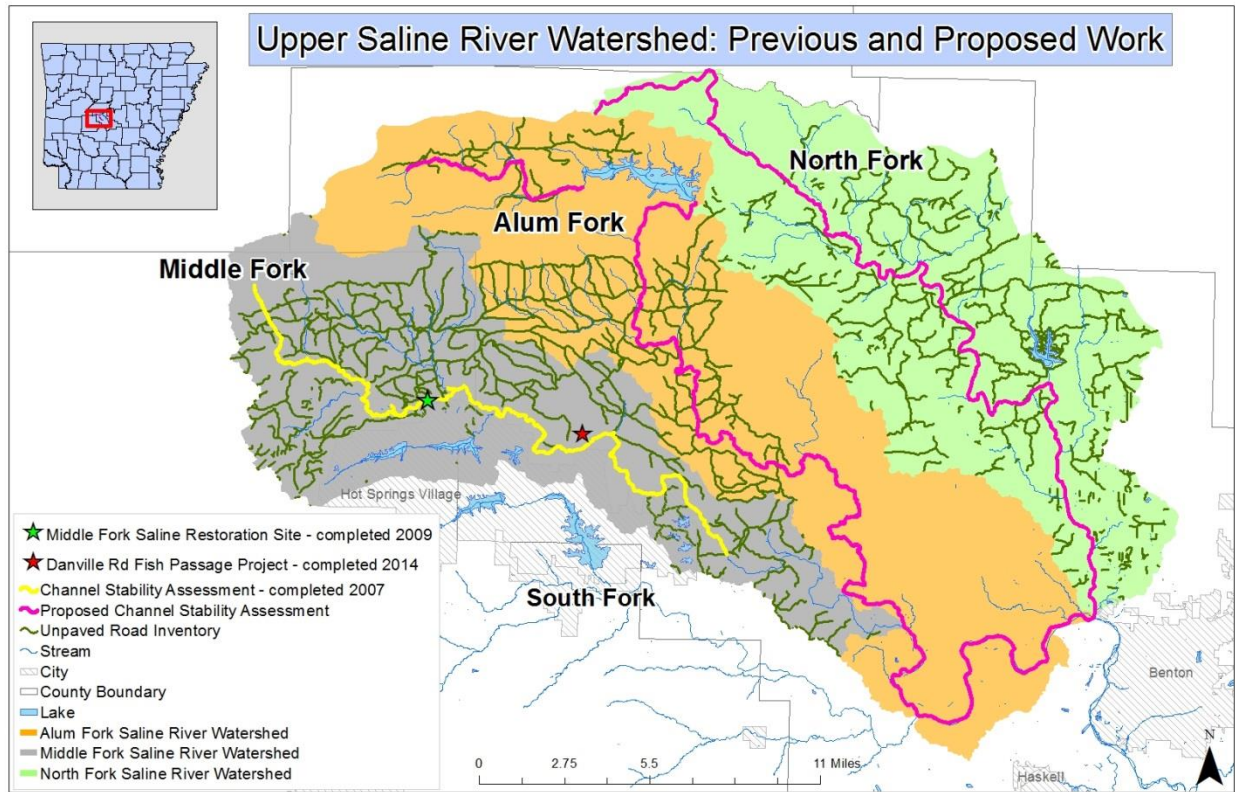


Figure 1. Previous work performed by TNC outlined in map, includes unpaved road inventory and analyses of Alum Fork (2014-2015), North Fork (2015), and Middle Fork Saline (2006) rivers watersheds.

Approach: A channel stability assessment regarding parameters of Bank Erosion Hazard Index (BEHI), Near-Bank Stress (NBS), overall channel stability, fish passage barriers, and photographic documentation with linked GPS coordinates will be performed for approximately 36 miles of the North Fork Saline River and 53 miles of the Alum Fork Saline River using handheld GPS computers. These variables are then queried to develop the stream bank erodibility index and displayed in a map using ArcGIS. NBS can be estimated to predict total bank erosion based on stream bank erodibility curves. These parameters collected will provide an in-depth view of the fluvial geomorphology of the North Fork and Alum Fork Saline rivers.

TNC completed an unpaved roads inventory in 2015 for the North Fork Saline River watershed. A high priority site will be selected from this inventory to implement a road improvement in order to prevent further sedimentation and for road stability. The project will include but not be limited to installing cross pipe, geocell, and rip rap. Soil erosion and sediment yield from roads are predicted by WEPP based upon pre-project and post-project data collected regarding the soil, climate, ground cover, and topographic characteristics.

Expected Results and Benefits: The proposed project will include collection and analysis of channel stability assessments, erodibility rankings displayed on a GIS map, records of fish barriers, and GPS coordinate-linked site photographs for the North Fork and Alum Fork Saline rivers assessments. These assessments will benefit the Safe Harbor Agreement (SHA) for the Upper Saline River, Caddo River, and headwaters of the Ouachita River watersheds by accomplishing a monitoring plan task developed by the signed Parties. Channel stability assessments were selected for tracking changes in habitat condition over the length of nine major rivers within the SHA study area. This will also provide baseline geomorphological data. North Fork and Alum Fork Saline watersheds have high development potential considering their proximity to Benton and Little Rock, AR. The assessments may also offer TNC potential reference reaches for future restoration efforts in higher disturbed portions of the watersheds. The unpaved road project will be installed to reduce sedimentation runoff in North Fork Saline watershed. WEPP analysis will give insight to the amount of sediment runoff reduced for the listed aquatic SGCN (Table 1).

Table 1. Aquatic SGCN listed for Upper Saline River, Alum Fork Saline River, and North Fork Saline River watersheds from the 2015 AWAP.

Fish Species Listed as SGCN						Species Range in watershed		
Scientific Name	Common Name	AWAP Priority Score	AWAP Page	Global & State Rank	State Rank	Upper Saline River	Alum Fork Saline River	North Fork Saline River
<i>Notropis ortenburgeri</i>	Kiamichi shiner	33	p.467	G3S3	Vulnerable	X	X	
<i>Noturus lachneri</i>	Ouachita madtom	46	p.485	G2S2	Imperiled	X	X	X
<i>Crystallaria asprella</i>	Crystal darter	38	p.381	G3S2	Imperiled	X		
<i>Notropis perpallidus</i>	Peppered shiner	33	p.472	G3S3	Vulnerable	X		
<i>Percina uranidea</i>	Stargazing darter	38	p.505	G3S2	Imperiled	X		
Mussel Species Listed as SGCN						Species Range in watershed		
Scientific Name	Common Name	AWAP Priority Score	AWAP Page	Global & State Rank	State Rank	Upper Saline River	Alum Fork Saline River	North Fork Saline River
<i>Alasmidonta marginata</i>	Elktoe	19	p.950	G4S3	Vulnerable	X	X	X
<i>Cypragenia aberti</i>	Western fanshell	43	p.962	G2G3Q53	Vulnerable	X	X	
<i>Lampsilis ornata</i>	Southern pocketbook	19	p.986	G5S2	Imperiled	X	X	
<i>Lampsilis powelli</i>	Arkansas fatmucket	57	p.989	G2S2	Imperiled	X	X	X
<i>Toxolasma lividum</i>	Purple lilliput	33	p.1050	G3Q53	Vulnerable	X	X	X
<i>Pleurobema rubrum</i>	Pyramid pigtoe	38	p.1018	G2G3S2	Imperiled	X	X	
<i>Villosa sp. cf. lienosa</i>	Little spectaclecase	17	p.1077	G5S2S3	Imperiled	X	X	X
<i>Ptychobranthus occidentalis</i>	Ouachita kidneyshell	23	p.1030	G3G4S3	Vulnerable	X	X	X
<i>Pleurobema cordatum</i>	Ohio pigtoe	19	p.1012	G4S3	Vulnerable	X		
<i>Lampsilis abrupta</i>	Pink mucket	46	p.983	G2S2	Imperiled	X		
<i>Quadrula cylindrica cylindrica</i>	Rabbitsfoot	52	p.1036	G3G4T3S3	Vulnerable	X		

*2 species removed in AWAP 2015 = black sandshell (*Ligumia recta*) & Ouachita creekshell (*Villosa arkansasensis*)

Budget:

Budget for North Fork and Alum Fork Saline Rivers Project				
Category	Funds Requested	TNC Match	3rd Party Match	Total
Salaries and Benefits	\$28,213	\$0	\$0	\$28,213
Supplies/Materials	\$0	\$10,844	\$0	\$10,844
Equipment Rental	\$0	\$0	\$5,350	\$5,350
Contractual	\$1,885	\$1,015	\$0	\$2,900
Travel	\$5,316	\$3,000	\$0	\$8,316
Other	\$1,300	\$700	\$0	\$2,000
Subtotal	\$36,714	\$15,559	\$5,350	\$57,623
Indirect Cost (21.8% direct)*	\$8,004	\$3,392	\$0	\$11,395
TOTAL	\$44,718	\$18,950	\$5,350	\$69,018

*TNC's indirect cost rate in its FY16 NICRA is 21.8%. TNC's indirect rate is negotiated annually, and TNC will charge indirect at the federally approved rate each year.

Qualifications:

Bonnie Earleywine has been employed by The Nature Conservancy - Arkansas Field Office for three years as a Stream Restoration Technician. Bonnie has a B.S. in environmental science from the University of Central Arkansas, M.S. in fisheries from Mississippi State University, and certifications in Applied Fluvial Geomorphology, River Morphology and Applications, and River Assessment & Monitoring from Wildland Hydrology. She has been performing physical assessments on streams across Washington, Oregon, Mississippi, Alabama, Tennessee, and Arkansas for over 10 years. She has assisted in work specifically within the Upper Saline River watershed including the unpaved roads inventory of the Alum Fork Saline River watershed, stream restoration of the Middle Fork Saline River, and serving as the lead developer of the unified biological sampling protocol for the Safe Harbor Agreement and Candidate Conservation Agreement with Assurances for the Upper Saline River, Caddo River, and Ouachita River headwaters.

The Nature Conservancy – Arkansas Field Office (ARFO) has a proven track record in leveraging limited conservation dollars through collaborations with multiple partners toward measureable conservation successes. The ARFO rivers team has completed a series of successful stream restoration projects across the state over the past ten years including the following watersheds: Middle Fork Saline River, Kings River, Little Osage Creek, Archey Fork Little Red River, Middle Fork Little Red River, Bayou DeView, and Cache River. The team has completed river stability assessments on six streams. ARFO is a signed partner in the Safe Harbor Agreement and Candidate Conservation for the Upper Saline River, Caddo River, and Ouachita River headwaters along with US Fish Wildlife, Arkansas Game & Fish Commission, and Natural Resources Conservation Service.

Marty Polk is the Road Superintendent for Saline County Road Department and has worked with TNC previously in a fish passage road project on Danville Road in 2014. The Saline County Road Department is responsible for the improvement and maintenance of the network of roads recognized as county maintained roads.