

Lower Saline River Stream Inventory and Landscape GIS Assessment, Upper West Gulf Coastal Plain Ecoregion, Arkansas

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February, 2015



Cover Photo: Saline River at US 278 bridge near Warren, Arkansas.

Project Summary:

This project aims to conduct a coarse scale stream stability inventory and stream habitat characterization on a portion of the lower Saline River and its major tributaries. The stream assessment will be accompanied by a GIS (Geographic Information System) landscape assessment of the watershed, including sediment production and delivery components, to help determine the highest priority segments of river to be addressed through conservation practices and/or restoration.

Project Partners:

Robin McClendon

SeaArk Boats

Monticello, Arkansas

(870) 367-5317

Total Project Cost: \$49,011

Total Amount Requested: \$31,827

Total Matching Funds/In-kind Services: \$17,183

State Wildlife Action Plan Priority to be addressed

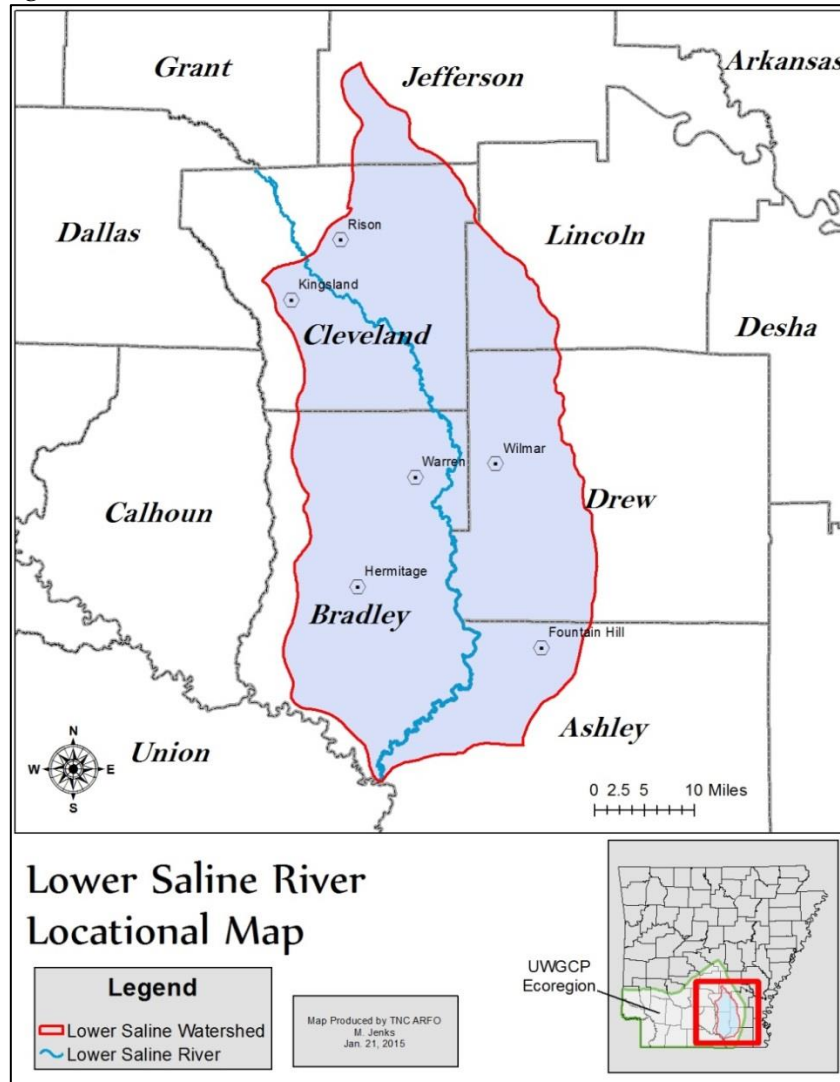
This project is geared toward “restoring, enhancing, and/or maintaining the integrity of aquatic habitat,” within the lower Saline River Watershed. This action was identified as a conservation

priority for the Arkansas State Wildlife Plan. Completing this project will identify and prioritize appropriate conservation practices for approximately 50 miles of the lower Saline River and encourage proactive management to benefit twenty-four aquatic species of greatest conservation need (see Figure 2). Of these twenty-four species, there are eight fish and sixteen mussels.

Project Area

The lower Saline River watershed lies within the Upper West Gulf Coastal Plain (UWGCP) ecoregion. Very prominent terrace deposits are found along the lower Saline River; most are the remnants of floodplains that were deposited in the late Early Pleistocene, more than 800,000 years ago. Soil formation in the UWGCP is very different from those of the Ouachita Mountain Ecoregion primarily because of the differences in parent material, aspect, and slope. Though the UWGCP is 51% forested, most of that area is under commercial timber management. Additional land uses include grazing and agriculture, habitat fragmentation caused by urban growth, and suburban sprawl.

Figure 1.



The Need

The lower Saline River is home to sixteen mussel Species of Greatest Conservation Need (SGCN) including the endangered Pink Mucket (*Lampsilis abrupta*) and Winged Mapleleaf (*Quadrula fragosa*). The Saline River is identified as both an Extraordinary Resource Waterbody (ERW) and Ecologically Sensitive Waterway (ESW) by the Arkansas Department of Environmental Quality (ADEQ). In 2006, The Nature Conservancy, in partnership with Arkansas Natural Resource Commission (ANRC), completed a nine-element plan for the Upper Saline River watershed. Within the plan, suspended sediment was identified by ADEQ and ANRC as a priority non-point source pollutant in the watershed, thus an assessment is needed for the lower Saline to prioritize restoration and sediment reduction in the lower section of river. As a result of the Upper Saline nine-element plan a road rehabilitation project and stream restoration were completed in the Middle Fork Saline River watershed, partially funded by SWG.

Method

Using a GPS inventory and modeling approach, TNC will conduct a stream inventory on a portion of the Lower Saline River channel identifying stream habitat characteristics through the use of the BEHI (Bank Erosion Hazard Index) and a hybrid of both the Pfankuch river assessment and EPA's Rapid Bioassessment methodologies. This will be cross-referenced with a GIS analysis of land uses in the riparian and floodplain areas of the watershed to assist in the overall threat analysis and determine the highest priority segments of river to be addressed through conservation practices and/or restoration.

Measurable Outcomes/Objectives

1. Assess the threat of sedimentation from stream banks and other land uses to streambed habitat for a suite of aquatic SGCN. Predict coarse scale erosion rates for the river miles assessed.
2. Model sediment production and delivery components using GIS to identify the greatest and most proximate impacts to species habitat.

Budget

| Category | Funds Required | TNC Match | 3rd Party Match | Total |
|------------------------------|-----------------|----------------|-----------------|-----------------|
| Salaries and Benefits* | \$26,142 | \$5,900 | \$0 | \$32,042 |
| Operating Expenses | \$0 | \$0 | \$10,000 | \$10,000 |
| Capital Expenses | \$0 | \$0 | \$0 | \$0 |
| Subtotal | \$26,142 | \$5,900 | \$10,000 | \$42,042 |
| Indirect Cost (21.75% NICRA) | \$5,686 | \$1,283 | | \$6,969 |
| TOTAL | \$31,827 | \$7,183 | \$10,000 | \$49,011 |

*The Nature Conservancy has a current 21.75% Negotiated Indirect Cost Rate (NICRA) that is accepted by USFWS.

Deliverables

- Prioritized map of high priority stream segments to focus conservation practices and/or restoration within the watershed.
- GIS layers of features, maps, and model documentation of landscape GIS and BEHI assessments.
- Final Report

Figure 2.

| Lower Saline River SGCN | | | |
|--------------------------------|-----------------------------------|----------------------|--------------------------|
| | Scientific Name | Common Name | Global/State Rank |
| Fish | <i>Crystallaria asprella</i> | Crystal Darter | G3/S2? |
| | <i>Erimyzon sucetta</i> | Lake Chubsucker | G5/S2? |
| | <i>Etheostoma fusiforme</i> | Swamp Darter | G5/S2? |
| | <i>Etheostoma parvipinne</i> | Goldstripe Darter | G4G5/S2 |
| | <i>Notropis maculatus</i> | Taillight Shiner | G5/S3 |
| | <i>Notropis perpallidus</i> | Peppered Shiner | G3/S2 |
| | <i>Percina uranidea</i> | Stargazing Darter | G3/S3 |
| | <i>Pteronotropis hubbsi</i> | Bluehead Shiner | G3/S3 |
| Mussels | <i>Alasmidonta marginata</i> | Elktoe | G4/S3 |
| | <i>Cyprogenia aberti</i> | Western Fanshell | G2/S2 |
| | <i>Ellipsaria lineolate</i> | Butterfly | G4/S3 |
| | <i>Lampsilis abrupta</i> | Pink Mucket | G2/S2 |
| | <i>Lampsilis hydiana</i> | Louisiana Fatmucket | G4/S3 |
| | <i>Lasmigona costata</i> | Flutedshell | G5/S3 |
| | <i>Ligumia recta</i> | Black Sandshell | G5/S2 |
| | <i>Obovaria jacksoniana</i> | Southern Hickorynut | G1G2/S2 |
| | <i>Obovaria olivaria</i> | Hickorynut | G4/S3 |
| | <i>Pleurobema cordatum</i> | Ohio Pigtoe | G3/S1 |
| | <i>Pleurobema rubrum</i> | Pyramid Pigtoe | G2/S2 |
| | <i>Ptychobranhus occidentalis</i> | Ouachita Kidneyshell | G3G4/S3 |
| | <i>Quadrula cylindrical</i> | Rabbitsfoot | G3/S2 |
| | <i>Quadrula fragosa</i> | Winged Mapleleaf | G1/S1 |
| | <i>Strophitus undulatus</i> | Creeper | G5/S3 |
| <i>Toxolasma lividus</i> | Purple Lilliput | G2/S2 | |

Melissa Jenks, Ouachita Rivers Project Specialist, will be responsible for overseeing the project, collecting and analyzing field data, conducting the GIS analysis, and reporting. 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 four courses in “Applied Fluvial Geomorphology” and “Natural Channel Design” led by instructor Dave Rosgen, Ph.D., conducted numerous geomorphic surveys, and worked to implement stream restoration projects on the Middle Fork Saline and Archey Fork Little Red Rivers. She also has six years combined experience in the Geographic Information Systems (GIS) field with the U.S. Forest Service and The Nature Conservancy.

Joy DeClerk, River Restoration Program Director, will be responsible assisting in data collection and providing technical expertise. 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 large-scale river restoration project on the Archey Fork Upper Little Red River in Clinton, 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.

Mitchell Allen, Stream Restoration Specialist, will be responsible for providing technical expertise and field data collection. 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.