

Status Survey of the Rabbitsfoot, *Quadrula c. cylindrica* (Say 1817), in the Little River Basin, Arkansas

PROJECT SUMMARY

A status survey for the rabbitsfoot, a S2 ranked freshwater mussel species with a suspected decreasing population trend, will be conducted in five streams of the Little River Basin in southwestern Arkansas. A total of 198 stream miles in Robinson Creek, Mountain Fork Little River, Rolling Fork Little River, Cossatot River, and Saline River will be surveyed using a tiered approach to locate and sample mussel aggregations. A combination of qualitative, semi-quantitative, and quantitative sample methodologies will be utilized and diving will be required.

PROJECT LEADER:

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PROJECT PARTNERS:

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Total Project Cost: \$63,161

SWG Funds Requested: \$30,130

Total Matching Funds: \$31,728

Matching Funds Source: Project Participants' Salaries

WHICH OF THE FUNDING PRIORITIES DOES OUR PREPROPOSAL ADDRESS?

The NatureServe global conservation rank for *Quadrula c. cylindrica* is G3 or vulnerable, and the Arkansas state rank is S2 or imperiled. As part of the conservation planning process, the Arkansas Wildlife Action Plan identified two data gaps / research needs for *Quadrula c. cylindrica*: 1) life history information and 2) status information. The proposed project will address the lack of status information for *Quadrula c. cylindrica* in Little River Basin streams (Red River Drainage) that have not been intensively surveyed for freshwater mussels in the past.

IN WHAT ECOREGION, ECOBASIN, TERRESTRIAL HABITAT OR AREA WILL OUR PROJECT BE CONDUCTED?

The vast majority of occurrences for *Quadrula c. cylindrica* in Arkansas are known from the Ouachita and White River drainages (Harris *et al.* 1997). The proposed status survey for *Quadrula c. cylindrica* will be conducted in two ecobasins: 1) Ouachita Mountains - Red River Basin and 2) South Central Plains - Red River Basin.

WHAT ARE THE METHODS (BRIEFLY) BY WHICH WE PROPOSE TO CARRY OUT OUR WORK?

Mussel surveys will be conducted using a combination of qualitative, semi-quantitative, and quantitative techniques. The project methodology will be entered in the Natural Resources Monitoring Partnership. A two tiered approach will be utilized. Preliminary surveys using qualitative (shell collection from depositional areas) and semi-quantitative (standardized timed search) techniques conducted over the proposed 198 stream miles (319 stream kilometers to locate mussel aggregations and assess sites that are worthy of additional quantitative surveys. Proposed streams and distances to be surveyed are:

Robinson Creek - 16 stream miles (25.7 km) - headwaters to confluence with DeQueen Lake
Mt. Fork Little River - 20 stream miles (32.2 km) - portion within Arkansas
Rolling Fork Little River - 32 stream miles (51.5 km) - headwaters to confluence with DeQueen Lake and DeQueen Lake to confluence with Little River
Saline River - 50 stream miles (80.5 km) - headwaters to confluence with Millwood Lake
Cossatot River - 80 stream miles (128.7 km) - headwaters to Gillham Lake and Gillham Lake to confluence with Little River

Quantitative (quadrat sampling) surveys will then be conducted on a maximum of 10 mussel aggregations using a stratified random sample design (Christian and Harris 2005) to achieve a pre-determined level of sample efficiency.

WHAT MEASURABLE PRODUCTS OR OUTCOMES WILL RESULT FROM OUR PROJECT?

We will be able to determine if viable, reproducing populations of *Quadrula c. cylindrica* exist in tributaries to the Little River in southwestern Arkansas. If substantial rabbitsfoot populations exist, quantitative estimates of population size will be derived and basic information regarding age structure, cohort size, and recruitment can be extracted. Voucher specimens will be collected and curated at the Unionoida Collection at Arkansas State University, Jonesboro. These will document the mussel species within the survey area and will also be valuable for future phylogenetic research projects. As a side benefit of the proposed survey, similar distribution and basic population data can be acquired for other freshwater mussel species of conservation concern such as *Arcidens confragosus* (S3), *Arkansia wheeleri* (S1, G1), *Ellipsaria lineolata* (S3), *Lampsilis abrupta* (S2, G2), *Lampsilis hydiana* (S3), *L. siliquioidea* (S3), *L. sp. cf. hydiana* (S?),

Lasmigona costata (S3), *Leptodea leptodon* (S1, G1), *Obovaria jacksoniana* (S2, G1G2), *O. olivaria* (S3), *Pleurobema rubrum* (S2, G2), *Ptychobranhus occidentalis* (S3), *Quadrula apiculata* (S2), *Strophitus undulatus* (S3), *Toxolasma texasensis* (S3), *Truncilla donaciformis* (S3), and *Villosa arkansasensis* (S2). In order to update the scientific community, the data will be submitted to the Comprehensive Wildlife Conservation Strategy database. The resulting data will be presented at the 2011 biannual meeting of the Freshwater Mollusk Conservation Society (FMCS) or the 2011 Annual Meeting of the Arkansas Academy of Science.

An effort to make a public connection will be made during the field work of the project. This will likely be through a local media format such as newspaper.

DELIVERABLE CALENDAR

DELIVERABLE	TIMEFRAME	
Input methodology into NRMP	Aug-Sept 2009	
Survey downstream reaches	Fall/Winter 2009	
Survey headwater reaches	Spring/Summer 2010	
Survey downstream reaches	Fall/Winter 2010	
Curation of voucher specimens	Winter 2010	
Presentation of data at FMCS or AR Academy of Science	Spring 2011	
Public connection	2009-10	
Final report	July 2011	

The extended time frame is necessary to conduct dive surveys in the downstream reaches of the Saline and Cossatot rivers during the cold seasons due to large populations of American alligator.

TO WHAT EXTENT WILL YOUR PROPOSED PROJECT BE ABLE TO TAKE ADVANTAGE OF EXISTING RESOURCES (E.G., FUNDING, TEAMS, CONSERVATION AREAS, PARTNERSHIPS)?

Field assistance will be solicited from aquatic field biologists, mussel conservationists, and malacologists currently employed with the Ouachita National Forest, Arkansas Game and Fish Commission, and U. S. Fish and Wildlife Service. The project team has substantial mussel survey experience in a variety of aquatic habitats and ecobasins.

Budget Category	State Wildlife Grant Funds (Federal)	Cash Match (Non-Federal)	In-Kind Match (Non-Federal)	Total Project Cost
Salaries	-	-	-	\$31,728
Contract Services	-	-	-	-
Supplies and Materials	\$1,000	-	-	\$1,000
Travel	\$21,010	-	-	\$21,010

Equipment	\$8,120	-	-	\$8,120
Indirect Costs		-		
TOTAL	\$30,130			\$61,859

Budget Justification

We are requesting \$30,130 from the AGFC for this project to support time, travel, equipment, and supplies. We are requesting \$21,010 for travel due to the fact that this watershed is in SW Arkansas and travel will be extensive due to the use of multiple vehicles for transporting boats, canoes, dive gear, communications, and collection containers. The estimate is based on supporting 3-4 field workers for 46 days in the field. We are requesting \$1000 for supplies (e.g. containers and preservative for curation of voucher specimens). We are requesting \$8,120 for the purchase and/or rental of equipment such as boats, motors, canoes, dive equipment, and communications gear.. The funds requested from AGFC for this project will be used to gain a better understanding of current distribution, relative abundance, and conservation status of the rabbitsfoot in the Little River drainage.

Literature Cited

Christian, A. D. and J. L. Harris. 2005. Development and assessment of a sampling design for mussel assemblages in large streams. *Am. Midl. Nat.* 153:284-292.

Harris, J. L., P. J. Rust, A. D. Christian, W. R. Posey, II, C. L. Davidson, and G. L. Harp. 1997. Revised status of rare and endangered Unionacea (Mollusca: Margaritiferidae, Unionidae) in Arkansas. *J. AR Acad. Sci.* 51:66-89.

QUALIFICATIONS OF THE INDIVIDUALS AND ORGANIZATION INVOLVED

Mickey Matthews has conducted surveys and ecological research on freshwater mussels in Arkansas and Missouri since 2005. He received a M.S. in Biology from Arkansas State University in 2007. He has been the Aquatic Ecologist with Ecological Conservation Organization since March 2007.

John L. Harris received a Ph.D. in Zoology from University of Tennessee in 1988 with emphasis in taxonomy and systematics of aquatic fauna concentrating on fish and mussels. He has 25 years experience in performing mussel surveys and impact analyses resulting in numerous peer reviewed publications and/or agency reports. As an adjunct Assistant Professor of Biology at Arkansas State University - Jonesboro, he has co-directed or been a committee member for numerous graduate students researching distribution and/or life history aspects of freshwater mussels in Arkansas.

Josh H. Seagraves has conducted surveys and ecological research on freshwater mussels in Arkansas and the eastern United States since 2001. He received his M.S. in Biology from Arkansas State University in 2006 and was employed by Ecological Specialists, Inc., a nationally respected firm specializing in conservation efforts for freshwater mussels. His M.S. thesis research on reproductive biology and habitat characterization of *Arkansia wheeleri* (Ouachita rock pocketbook) was conducted primarily in the Little River, so he is very familiar with the freshwater mussels and their habitats in this basin.