

TITLE:

Continuation Survey of the Diversity and Distribution of Freshwater Gastropods in Arkansas:
The Mississippi Alluvial Plain and South Central Plains.

DESCRIPTION: We aim to document the diversity and distribution of freshwater gastropods from the Mississippi Alluvial Plain and the South Central Plains regions of Arkansas. The proposed objectives of this study are to conduct gastropod surveys of this region including: a.) conduct current field surveys, b.) incorporate museum and literature records to establish historical distributions, c.) use all data to create distribution maps of all species of freshwater gastropods from Arkansas.

PROJECT LEADER:

Alan D. Christian
Assistant Professor of Aquatic Ecology
Arkansas State University,
E-mail: achristian@astate.edu
Department of Biological Sciences
P.O. Box 599
State University, AR 72467
870-972-3296
870-972-2638 FAX

PROJECT PARTNERS:

David M. Hayes
PhD Student
Environmental Sciences Program
P.O. Box 599
State University, AR 72467
870-972-3296
870-972-2638 FAX

William R. Posey, Malacologist, Commercial Fisheries Biologist
Arkansas Game and Fish Commission, P.O. Box 6740
Perrytown, AR 71801
(877) 777-5580

TOTAL AMOUNT REQUESTED: \$9,049.54

AMOUNT AND SOURCE OF MATCHING FUNDS: \$9,049.44

| | |
|--------------------------------------|------------|
| ASU Inkind (Indirect Cost Recovery) | \$1,363.50 |
| ADC Salary ASU Match (1.97 credits) | \$2,194.91 |
| ADC Fringe ASU Match (1.97 credits) | \$658.47 |
| ADC SW&F ASU Indirects at 46% Match | \$1,312.56 |
| WRP AGFC Salary Match | \$3,520.00 |

1. WHICH OF THE FUNDING PRIORITIES DOES OUR PREPROPOSAL ADDRESS?

The freshwater snails of North America are a diverse and imperiled group but little is known about their status in the State of Arkansas. Eighty-percent of freshwater gastropod species in Arkansas have a state ranking of SU, while in comparison, only 4% of Arkansas mussel species have a state ranking of SU. This is most likely a reflection of the freshwater gastropod fauna of Arkansas being a poorly surveyed group. As there is a need to fill significant data gap concerning the diversity and distribution of Arkansas gastropods, we propose a continuation analysis of the freshwater gastropod fauna of Arkansas by surveying the diversity and distribution of gastropods in the Mississippi Alluvial Plain (including Crowley's Ridge) and the South Central Plains regions of Arkansas. General distributions and current species lists are necessary for proper conservation and management of this imperiled group.

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

The proposed research will focus on the Mississippi Alluvial Plain, including Crowley's Ridge, and the South Central Plains regions of Arkansas. These areas represent the final areas needed to complete a statewide survey of freshwater gastropods. Previous studies have focused on the Ozark Mountain Region and surveys of the Ouachita Mountain Region are in progress.

3. WHAT IS THE GOAL(S) OF OUR PROJECT AND WHAT MAJOR OBJECTIVES OR TASKS WILL WE UNDERTAKE TO ACHIEVE THAT GOAL?

The goal of this project is to document the distributions of freshwater gastropods throughout the Mississippi Alluvial Plain and South Central Plains regions of Arkansas. Our survey will include all major tributaries of eastern Arkansas, south and east of the Interior Highlands. Our sampling will target major tributaries as well as minor tributaries and lentic habitats. The results of this survey will then be combined to create distribution maps for all species which will then be combined with an ongoing state-wide survey.

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

Freshwater gastropods will be sampled by hand or with dip nets from a variety of habitats (i.e. lakes, ponds, rivers, vernal pools etc). Voucher specimens will be relaxed in an ice bath and placed in 100% ethanol to preserve genetic integrity for later studies and deposited in the Arkansas State University Museum. Literature records, museum collections, and field collection data will be recorded to create distribution maps for each individual species found within southwestern Arkansas using ArcGIS v.9.0.

5. WHAT MEASURABLE PRODUCTS OR OUTCOMES WILL RESULT FROM OUR PROJECT?

1. Provide current distributions and status of freshwater gastropods in Arkansas.
2. Establish historical distributions based on museum and literature records.
3. Create distribution maps and identify areas of conservation need for freshwater gastropods of Arkansas.

The combination of literature records, museum collections, and recent field collections will not only help to further knowledge of biodiversity in Arkansas, but will also help to update distributions of a highly imperiled group of organisms which have been neglected in freshwater studies. The preservation of specimens in 100% ethanol will serve as a 'bank' of genetic information for later studies because the taxonomic validity of many species of freshwater gastropods is currently under review. This survey, combined with surveys from the Ozark region and Ouachita region and will provide the most comprehensive freshwater gastropod inventory of the State of Arkansas to date. The future, statewide survey will involve distribution maps for each species as well as keys to species that educators, students, and conservation biologists may use to further the study of freshwater gastropods in Arkansas.

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

1. We will be able to match a graduate student assistantship and the difference in indirect cost to reach the 50% matching requirement.

7. BUDGET

| Item | Amount | Sub-total |
|---|------------------------------------|--------------------|
| <u>Salaries</u> | | |
| Graduate Assistant: DMH Summer | \$4,500.00 | |
| Fringe at 1% | \$45.00 | |
| <i>Salaries sub-total</i> | | \$4,545.00 |
| <u>Travel</u> | | |
| Mileage | 5000 Miles 0.43 Rate \$2,150.00 | |
| Lodging | 25 Days 55 Rate \$1,375.00 | |
| <i>Travel sub-total</i> | | \$3,525.00 |
| <u>Supplies</u> | | |
| 95% ethanol, 10 gallons | \$154.70 | |
| Glass Vials, 144pk (2x) | \$97.64 | |
| <i>Supplies sub-total</i> | | \$252.34 |
| Direct Cost Total | | \$8,322.34 |
| Indirect Cost (16% of SWF) | | \$727.20 |
| Total Funding Requested | | \$9,049.54 |
| ASU Inkind (Indirect Cost Recovery) | | \$1,363.50 |
| ADC Salary ASU Match (1.97 credits) | | \$2,194.91 |
| ADC Fringe ASU Match (1.97 credits) | | \$658.47 |
| ADC S&F ASU Indirects at 46% Match | | \$1,312.56 |
| WRP AGFC Salary Match | | \$3,520.00 |
| Total Match | | \$9,049.44 |
| Total Project Cost | | \$18,098.98 |
| Percent Match | | 50.00 |

8. BUDGET JUSTIFICATION;

We are asking for a total of \$9,049.54 of which, \$4545.00 including fringes of \$302, will go towards a summer research assistantship for David Hayes in order to collect, sort, identify, curate and enter data. We are also asking for \$252.34 in curation supplies, and \$3525.00 in travel. The indirect cost for this project, 16% of salaries, wages, and fringes are \$727.20.

In order to meet the 50% match we were able to come up with two means: 1) unrecovered indirect cost (Difference between 46% versus AGFC 16% of 30%) are \$1,363.50 that ASU is willing to use as match 2) a 1.97 credit hour match of Dr Alan D. Christian's academic year time resulting in \$2,194.91 in salary, \$658.47 in fringes, and \$1312.56 in indirects at the university negotiated rate of 46%, and 3) Arkansas Game and Fish Commission employee William R Posey has committed to 10 days of field work for a total of \$3,520. This totals \$9,049.44 for the matching funds and results in a total budget of \$18,098.98

8. QUALIFICATIONS OF THE INDIVIDUALS AND ORGANIZATION INVOLVED

1. Alan D. Christian, Assistant Professor of Biological Sciences. Working on aquatic invertebrates since 1992, received MS at ASU in 1995, Ph.D. at Miami University in 2002, and have been working in the state of Arkansas as an aquatic ecologist since 1992 specializing in mollusc ecology and distribution.
2. David M. Hayes, PhD Student. Environmental Sciences Program. Working on freshwater gastropods since 2003, received MS at University of Louisiana-Monroe 2005 and has worked on various aspects of gastropod taxonomy, ecology, and distribution.
3. William R. Posey. Conducted graduate research on freshwater mussels and is the State Malacologist and Fisheries Biologist.