A. Title: Distribution and habitat use of *Scaphiopus herterii, Spea bombifrons, Gastrophryne olivacea,* and *Pseudacris streckeri* in the Arkansas River Valley

B. Project summary: I will conduct breeding season surveys for *Scaphiopus herterii, Spea Bombifrons, Gastrophryne olivacea*, and *Pseudacris streckeri* in the Arkansas River Valley. I will determine whether sites that were formerly occupied are still occupied and also will determine whether the range of each species is more extensive than previously thought. In addition, I will attempt to develop a predictive model for each species based on, soil, agricultural, and wetland characteristics.

C. Project Leader: Dr. Chris Kellner

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H. Project Partners: None

I. Total Cost: $67,811.00

J. SWG (AWAP) Share: $50,230.00

K. Amount and Source of Cooperator Match: Arkansas Tech University will provide $17,537.00 in salaries (35% of AWAP Share) in matching funds.

Project Statement

A. Need

My proposal specifically addresses the need to locate current breeding populations of four anurans which is specifically addressed in the Arkansas Wildlife Action Plan for 2013. The four species occur over a small portion of the Arkansas River Valley and have not been recently surveyed in a systematic fashion. In fact, virtually nothing is published concerning *Gastrophryne olivacea* or *Spea bombifrons* in Arkansas (Trauth et al. 2004). Consequently, the proposed research would significantly add to our knowledge concerning those species' distributions and abundances in Arkansas. Because intensive agricultural activities may alter habitat suitability for these four species, my students and I will begin by surveying sites historically used by the species to document continued use of those areas. We will then expand our search to locate additional areas for each species. Finally, in order to aid in management, my students and I will also build a predictive model of habitat use for each species to aid in future searches for those species in the River Valley and also to aid in prioritizing areas for conservation activities.

B. Objectives

Four objectives for this project are to: 1), determine the size and distribution of breeding populations for each species in the Arkansas River Valley, 2) obtain detailed information on the habitat structure that each species uses, and 3) evaluate reproductive success and 4) produce a predictive habitat model to aid in management and location of additional populations. The predictive model will focus on landscape features of the habitat.

C1. Expected Results

Populations of *P. streckeri, G. olivacea,* and S. hurterii use relatively small temporary wet areas for breeding and have been detected over a large area of the river valley. Consequently, I expect intervening areas of suitable habitat to contain undocumented populations of those species. I am not sure what to expect for *S. bombifrons* since it has only been documented in two areas that are fairly close

together. The weather could also be an issue especially for *G. olivacea,* and *S. bombifrons* which breed during the summer and will not be active in absence of rain.

C2. Benefits

In order to manage the four species of anurans addressed in this proposal within Arkansas we need to know where the species are located and what habitat configuration is associated with their presence and successful breeding. The proposed research will provide important information on both the distribution and structure of habitat necessary for four species of anurans that are relatively uncommon in Arkansas. In addition, I may be able to infer the degree to which the species presence and reproductive success are influenced by agricultural activities that are common within the River Valley.

D. Approach

My field assistants and I will conduct aural searches in sites that were formerly used by each species (historical records cited in Trauth et al. 2004) and along roads through appropriate habitat during optimal breeding times (we will use aerial photos and National Wetland Inventory polygons to help identify appropriate habitat). Breeding for *S. herterii* and *P. streckeri* occurs during the early spring while *S. bombifrons* and *G. olivacea* breed during the latter spring and summer. Males of the four species chorus intensely during and after strong rains and when temperatures are above freezing which is when I plan to conduct surveys. Abundance of singing males will be assessed at each occupied site following the frogwatch protocol (http://www.aza.org/frogwatch-monitoring-protocols/). Breeding populations will be georeferenced by taking a GPS location at each chorus site. To assess habitat conditions, each population will be revisited during daylight hours. The size of the wetland and distance to adjacent wetlands will be determined as well as the land use for the area occupied by the wetland and surrounding area. Those variables will be used to build a predictive model of habitat use (given a sufficient number of sites for each species). Finally, reproductive success will be assessed by locating recently metamorphosed froglets of each species adjacent to breeding areas.

E. Location of Work

Research will be conducted in the Arkansas River Valley, from Morrilton to Fort Smith.

F. Budget

PI Salary ….....…….....…….……...$ 4,000.00
Benefits (18.13%)……$ 725.00

Graduate Research Assistant Stipend……..……...$26,000.00
Benefits…….$ 125.00
Tuition……. $ 6,880.00

Supplies….....……...…....……..…..$ 500.00

Travel ….....….....……..……$12,000.00

Amount requested From Arkansas Game and Fish…...…$50,230.00

ATU Match…..……..$17,581.00

TOTAL COST…..….....…….…….....……...……$67,811.00

Qualifications:

I have been teaching herpetology at Arkansas Tech for over 10 years. In that course, I teach students how to identify all of the frogs that have been documented to occur in Arkansas. On several occasions I have also required students to learn how to identify the different species by their vocalizations. We commonly encounter singing frogs on field trips and I have helped students learn how to identify the songs on those occasions. Finally, in the past, I have had students organize a survey of frogs in Russellville. For that survey, we used the Frogwatch protocol to document presence and abundance. The project that I propose here, is very straight-forward and I am confident that I will not have any problems performing the survey.

I have had quite a bit of experience modeling habitat use by several species of birds including cerulean warblers, Bell's vireos, and northern bobwhite. Those techniques are also appropriate for modeling and predicting anuran habitat use.