

Graduate Student Research: Conservation of Amphibians and the Peculiar Frogs of Eastern Oklahoma

by **Stephen Richter**

If you are ever driving through eastern Oklahoma at night during the first heavy rains of spring, stop by a few cattle pastures or large roadside ditches, and you might be lucky enough to hear loud, deep snores intermingled with scattered chuckles. These unique sounds are the mating calls of male crawfish frogs (*Rana areolata*) who are attempting to attract females to their calling sites. However, because crawfish frogs breed over a period of only a few weeks (considered “explosive breeders”), they are sometimes difficult to find. To hear the call of a crawfish frog, visit the Kansas Anuran Monitoring Program’s website: <http://www.cnah.org/kamp> and follow the “Species” link.



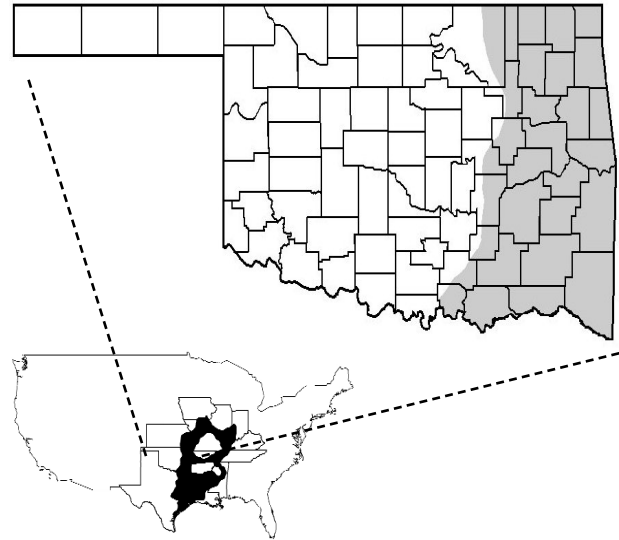
Crawfish frog (*Rana areolata*). Photo by Mike Redmer.

Many species of amphibians are declining worldwide. In some areas, exact causes are unknown but are hypothesized to be interactions of factors including pesticides, herbicides, introduction of exotic species, increased UV-b radiation, climate change, and infectious diseases. The primary cause of worldwide population declines is more obvious—habitat modification as human populations continue to expand. Habitat modification ranges in severity from fragmentation of suitable habitat to complete habitat loss. Most amphibian species cannot thrive in human-dominated landscapes.

Oklahoma is home to one species of frog that has the ability to coexist with humans, at least in rural areas. Crawfish frogs are found in the central United States, primarily in lowland areas. In many parts of the frog’s distribution, populations are vanishing because their habitat is being converted to agricultural fields, parking lots, home sites, and other human constructs. Once found in prairie habitat throughout most of their range, crawfish frogs have been reduced to patches of cattle pastures and remnant prairie habitat.

Fortunately for crawfish frogs, many of the modifications to their habitat in eastern Oklahoma are conversion of prairie

habitat to cattle pastures, and crawfish frogs appear to do relatively well in cattle pastures that are not overgrazed. Additionally, most cattle ponds turn out to be great breeding grounds for these frogs. Homes for these unusual frogs are abandoned crayfish burrows, abandoned mammal burrows, and other below-ground cavities.



Geographic distribution of crawfish frogs.

As an amphibian biologist, my research focuses on the ecological, demographic, and genetic consequences of habitat fragmentation and various levels of population isolation. Populations that become completely isolated (that is, have only one breeding pond) are much more likely to go extinct because of catastrophes (e.g., infectious disease), environmental variables (e.g., drought), and demographic factors (e.g., inbreeding). What’s more, they have no nearby sources to allow for recolonization. At the other extreme, subpopulations that are situated within a complex of ponds have the benefits of individual movements between ponds. These among-pond movements act to maintain genetic variation and provide recolonizers to subpopulations with the misfortune of decline or extinction. Perhaps what is more interesting is the range of scenarios and consequences between complete isolation and complete interconnectedness. It is within this range of scenarios that man and amphibian can coexist given proper management based on sound science.

Stephen Richter is currently a PhD student in Zoology under the direction of Drs. Richard Broughton and Janalee Caldwell. His dissertation research is focused on within and among population-level genetics of crawfish and gopher frogs.