



On the Importance of Scientific Collections

Little Frog Faces Big Challenges

Herpetology Collection is Repository for Data on Rare Frog

By Alyssa Katzenelson

The story of the Illinois chorus frog (*Pseudacris illinoensis*) demonstrates the challenges associated with natural resources management and species conservation. In this case, an agriculture best management practice has contributed to population decline for a tiny amphibian. Dr. Stan Trauth of the Department of Biological Sciences at Arkansas State University has chronicled the saga of the Illinois chorus frog in the state of Arkansas, where it is found in only a single county. Trauth is the curator of the Herpetological Collection at the Arkansas State University Museum of Zoology, and, for almost 30 years, he has been monitoring and collecting the Lilliputian frog, which weighs only 5 grams. In 1986, they had a “numerous population” in Arkansas. However, recent evidence suggests that has changed.

Precision land-leveling is an attempt to remodel the topography of farmland. The more even land is, the less water is needed for irrigation, because the water is distributed uniformly over the landscape. Although considered a Best Management Practice by the Environmental Protection Agency, land leveling destroys or shrinks the temporary pools of water that form in ditches after substantial rain. Since the Illinois chorus frog breeds in these pools, and tadpoles need these pools until they morph into adults, their population has declined with the propagation of the land leveling practice.

In 2006, Trauth published data comparing his success at locating the frog in 1992 and 2004. His work showed a 61% range reduction, suggesting “rapid population decline and range contrac-

Natural science collections are a library of Earth’s history. Biological specimens preserved in scientific collections are a record of environmental circumstances at a given time and place. Sometimes, after a species is extinct in nature, collections may be the only remaining record of its existence. The Illinois chorus frog is at risk of becoming a species that only exists in natural science collections.



The Illinois chorus frog is found in one county in Arkansas. (photo: Stan Trauth)

tion.”¹ Of note, at sites which historically had supported the Illinois chorus frog but had since been precision leveled, no frogs were observed.

The 2004 survey of the frog population revealed that frogs were found alongside farmland, in rutted areas at the edges of croplands. Trauth remembers how he tried to show farmers how to foster these pools to allow the frogs to flourish. However, his advice was not heeded, and the suitable habitat for these frogs continues to shrink. Currently, Trauth no longer collects Illinois chorus frogs because their numbers are too low to allow it. Of concern are other amphibians whose lifecycles mirror that of the Illinois chorus frog; these creatures may also be experiencing a decline in population due to common agricultural practices. For all these critters, a balance needs to be struck between land management for water conservation and habitat preservation for animal survival.

If the habitat for the Illinois chorus frog cannot be restored, and these animals do become extinct, then collections will be the only record of when and where they existed. Indeed, natural science collections play an important role in documenting the historical distribution and population decline of the Illinois chorus frog and other species. The data that Trauth has gathered over the last three decades, and similar data held in natural science collections, can also be used to answer future scientific questions. He sums it up with the following: “Biological research collections are vitally important because they represent a historic repository and database of species information. They are the mainstay to providing crucial data for biologists wishing to understand shifts in a species’ population parameters through time.”



An Illinois chorus frog rests on fallen stalks in a small pool of water; these pools are the breeding areas for these tiny frogs. (photo: Stan Trauth)

About NSCA

The NSC Alliance is a nonprofit association that supports natural science collections, their human resources, the institutions that house them, and their research activities for the benefit of science and society. Our 100 institutional members are part of an international community of institutions that house natural science collections and utilize them in research, exhibitions, academic and informal science education, and outreach activities. For more information, visit www.nscalliance.org.

¹Trauth JB, Trauth SE, Johnson RL. 2006. Best Management Practices and Drought Combine to Silence the Illinois Chorus Frog in Arkansas. *Wildlife Society Bulletin* 34(2): 514-518.