Work with Ozark Cave Fauna

Poster by: Kamryn Richard and Danté Fenolio

Center for Conservation & Research at San Antonio Zoo (CCR) has been working with imperiled and endangered cave fauna from the Ozarks since 2000 with a large, well developed regional team. Many regionally endemic species exist in the southwestern Ozarks including taxa like the Oklahoma cave crayfish (*Cambarus tartarus*), the Delaware County cave crayfish (*C. subterraneus*), Mackin's cave isopod (*Caecidotea mackini*), the Ozark cavefish (*Troglichthys rosae*), the Ozark cave silverfish (*Speleonycta ozarkensis*), and the western grotto salamander (*Eurycea spelaea*). The work involves a considerable partnership that includes: Oklahoma Department of Wildlife Conservation, United States Fish and Wildlife Service, the Arkansas Game and Fish Commission, The Nature Conservancy, the Subterranean Biodiversity Project, the Tulsa Grotto (local caving club), and dozens of private landowners. We have collectively surveyed over 1,500 subterranean systems. In the last decade, the work has included in-situ as well as ex-situ projects. In the field, we are performing a capture-mark-release-recapture project with state listed cave crayfish species to better understand population ecology. We are complimenting that effort with a lab-based study where we are developing captive husbandry and breeding techniques with a small group of regionally endemic cave crayfish. Combining field studies with lab studies is critical to best conserve the fauna of this region.

OZARK CAVE FAUNA

Images of some of the species observed during cave bioinventories

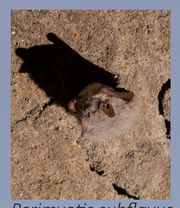
Troglichthys rosae
Photo Credit: Danté Fenolio

Speleonycta ozarkensis
Photo Credit: Danté Fenolio

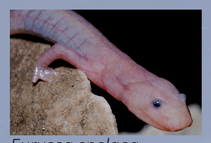
Eurycea lucifuga
Photo Credit: Danté Fenolio

Cambarus tartarus
Photo Credit: Eric Maxwell

Corynorhinus townsendii ingens
Photo Credit: Danté Fenolio



Perimyotis subflavus
Photo Credit: Amata Hinkle



Eurycea spelaea
Photo Credit: Danté Fenolio

Plethodon albagula (egg)
Photo Credit: Amata Hinkle

FIELD WORK

Field work includes regular bioinventories of poorly known cave systems in addition to a capture-mark-release-recapture project with state listed cave crayfish. During crayfish surveys, individuals are weighed, measured, sexed and marked with a unique elastomer tattoo. If marked individuals are recaptured, the unique individual is identified and current weights and measurements are recorded.

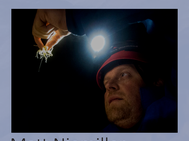
Daphne Soares and Mike Slay look at a *Cambarus tartarus* in-situ during a survey.
Photo Credit: Danté Fenolio

Team conducting a crayfish survey in January-Stansbury Cave.
Photo Credit: Amata Hinkle

This *Cambarus tartarus* was marked in November 2023 and recaptured in March 2024.
Photo Credit: Danté Fenolio

Matt Fullerton observes bat guano during a Mitchel Cave survey. Fresh guano indicates the cave is being used by bats in the area even if bats are not present during the survey.
Photo Credit: Amata Hinkle

Mike Slay observes a *Cambarus subterraneus.*
Photo Credit: Danté Fenolio



Matt Niemiller observes a *Cambarus tartarus.*
Photo Credit: Danté Fenolio

Mike Slay measuring a *Cambarus tartarus* during a crayfish survey.
Photo Credit: Danté Fenolio

Kamryn Richard records data during a crayfish survey.
Photo Credit: Danté Fenolio

LAB WORK

Center for Conservation & Research at San Antonio Zoo (CCR) is developing captive husbandry and breeding techniques with multiple species of cave crayfish. CCR was the first institution to successfully hatch both Oklahoma cave crayfish (*Cambarus tartarus)* and Dougherty Plain cave crayfish (*Cambarus cryptodytes*). In the lab we are monitoring growth rates of baby *Cambarus tartarus* and conducting a comparative diet study. We are also monitoring an adult crayfish that was collected and given marking to determine the longevity of elastomer markings.

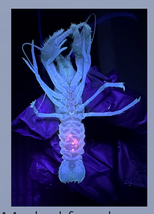
Cambarus tartarus female in berry
Photo Credit: Danté Fenolio

Cambarus cryptodytes female in berry
Photo Credit: Danté Fenolio

Lab space at the CCR at SA Zoo set up for rearing baby *Cambarus tartarus*
Photo Credit: Danté Fenolio

Danté Fenolio with baby *Cambarus tartarus*
Photo Credit: San Antonio Zoo team

Baby *Cambarus tartarus* pictured next to ruler
Photo Credit: Kamryn Richard



Marked female *Cambarus tartarus* pictured in March 2023 (few weeks after receiving elastomer marking).
Photo Credit: Kamryn Richard

Marked female *Cambarus tartarus* pictured in March 2024 (year after receiving elastomer marking).
Photo Credit: Kamryn Richard

ACTIVITIES & GOALS

(1) Performing bioinventories of poorly known cave systems and monitoring populations of imperiled and endangered subterranean species for state and federal wildlife authorities

(2) Performing capture-mark-release-recapture studies to better delineate population sizes of imperiled and endangered subterranean species

(3) Describing species which are "new to science"

(4) Identifying "biodiversity hot spots" for wildlife authorities

(5) Identifying of potential threats to subterranean biodiversity

(6) Working with private landowners to discover and protect biologically important sites

(7) Working with imperiled species in the lab to develop husbandry and breeding protocols

Center for Conservation & Research