

2026 Amphibian TAG Meeting Abstracts

Over 30 years of Chiricahua Leopard Frog Head-starting and Breeding for Release at the Phoenix Zoo

Piper Preuss, Whitney Heuring

Arizona Center for Nature Conservation, Phoenix Zoo

The federally threatened Chiricahua leopard frog (*Rana [=Lithobates] chiricahuensis*) has faced ongoing population declines due to habitat loss and deterioration, persistent drought, disease, and invasive species. The Phoenix Zoo (Zoo) began a Chiricahua leopard frog head-starting and breeding for release program in 1995, in partnership with U.S. Fish and Wildlife Service, Arizona Game and Fish Department, U.S. Forest Service, and others. To date, the Zoo has produced 33,000 individuals and 55 egg masses for release to the wild. Field data show that translocations, including wild to wild and zoo to wild, have successfully augmented and/or re-established many wild populations, with a significant increase in Chiricahua leopard frog-occupied sites. We will discuss some of the successes and challenges of this program through the years.

Toad Smoke: Biocultural History and Conservation of the Sonoran Desert Toad (*Incilius alvarius*)

Robert A. Villa

Tucson Herpetological Society

The Desert Laboratory on Tumamoc Hill, University of Arizona

The Sonoran Desert Toad (*Incilius alvarius*) is the only known vertebrate that produces concentrated amounts of the powerful psychedelic 5-MeO-DMT. As such, it has become a paragon of a species exploited for human desire and aspiration, namely via psychedelic experience. A natural and cultural history, as well as comments on conservation, is presented.

Population Ecology of the Invasive American Bullfrog in Southeastern Arizona

Emma L. Sudbeck¹, Christopher L. Prewitt¹, David H. Hall², Audrey K. Owens³, and Javan M. Bauder⁴

¹*Arizona Cooperative Fish and Wildlife Research Unit, University of Arizona, Tucson*

²*School of Environment and Natural Resources, University of Arizona*

³*Arizona Game and Fish Department*

⁴*U.S. Geological Survey, Arizona Cooperative Fish and Wildlife Research Unit, University of Arizona*

Native to eastern North America, the American bullfrog (*Rana catesbeiana*) was introduced to western North America where it has a detrimental effect on native herpetofauna. Bullfrogs have high reproductive and dispersal potential, allowing them to readily invade unoccupied habitats. Region-specific information about bullfrog dispersal ecology can therefore inform the design of landscape-scale bullfrog eradication projects. Previous bullfrog studies are predominately from cooler regions where bullfrog ecology may differ from that in southeastern Arizona. We used mark-recapture surveys during two summers to study bullfrog dispersal in southeastern Arizona and dissected bullfrogs collected during on-going eradication efforts to describe size at and timing of reproductive maturity and bullfrog diets. We marked 528 adult and juvenile bullfrogs with toe-clips or PIT-tags across four ponds (i.e., source populations) in the San Rafael Valley, Santa Cruz County, during the summers of 2024 and 2025. Following the onset of the monsoon each year, we surveyed surrounding ponds up to 8 km from source populations through mid-September to identify dispersing individuals. We recaptured a total of eight marked

bullfrogs (two adult females [99 and 160 mm snout-vent length] and six juveniles [54-87 mm snout-vent length]) at distances of 1.1–2.8 km from each individual's source population. All movements occurred, or were suspected to occur, during 2024. We did not confirm any movement among sites during 2025, likely due to drier conditions during 2025. All movements from source populations to recapture sites were uphill with a change in elevation ranging from 25-62 meters. We dissected 647 bullfrogs (346 females) and found the smallest size at reproductive maturity for females was 110mm snout-vent length. We observed reproductively mature females during March–October with a peak in late spring/early summer. Bullfrog diets were dominated by invertebrates and appeared to reflect the availability of prey. For example, at a site dominated by invasive crayfish the diet of relatively larger bullfrogs was dominated by crayfish. This study can provide information to help inform future bullfrog eradication efforts in arid landscapes.

Lessons learned from amphibian release trials in Panama

Brian Gratwicke

Smithsonian's National Zoo and Conservation Biology Institute

Amphibians have been captive-bred as assurance colonies to prevent extinctions related to the amphibian chytrid fungus for about 20 years. During that time we have learned a great deal about the disease chytridiomycosis, and many approaches to mitigate the fungus have been proposed and some have been tested. This presentation will give an overview of this work and describe observations and findings from rewilding studies conducted by the Panama Amphibian Rescue and Conservation Project of 3 *Atelopus* species, *Agalychnis lemur*, *Tripurion spinosus* and *Colostethus panamansis*.

Rewilding species requires context-specific understanding of the frogs' behavior, susceptibility to disease, an understanding of the ecological requirements pathogen and host. In addition to the chytrid threat, poisonous frogs must regain their skin defenses to protect against predation and become acclimated to the new environment. Rewilding studies are conducted in an adaptive management monitoring framework that allows lessons learned to be applied moving forward, with the eventual goal of establishing self-sustaining wild populations. The Panama Amphibian Rescue and Conservation Project is a partnership between the

Smithsonian's National Zoo, Zoo New England and Cheyenne Mountain Zoo based at the Smithsonian Tropical Research Institute in Panama.

Salamander Conservation following a 500ish year storm in North Carolina

Dustin Smith

North Carolina Zoo

In September 2024, Hurricane Helene caused drastic ecological damage throughout the southeastern United States, especially the mountain region of North Carolina. In addition to the loss of human life and \$60 billion in damages, forests and geologic formations were destroyed and many rivers completely shifted course. In response to the storm impacts, Amphibian and Reptile Conservancy, North Carolina Wildlife Resource Commission, The Nature Conservancy (NC), and North Carolina Zoo collaborated on a rescue effort for the most impacted populations of the endangered Hickory Nut Gorge Salamander (*Aneides caryanesis*). This endemic crevice dwelling salamander only occurs within the Hickory Nut Gorge and occupies a handful of rock outcroppings, many of which were left fully-exposed to the sun and at risk due to changing microhabitat conditions. The response was to rescue portions of the most at-risk populations, and develop a breeding program for future releases within the gorge.

Developing egg counting software for use in the Houston Toad Recovery Program

Audrey Koepp

Houston Zoo

Working with a species such as the Houston toad that can lay clutches surpassing 10k+ eggs has historically posed limitations in the ability to both efficiently and accurately count eggs. While an automated egg counting software once seemed like a farfetched dream, it has now become a reality thanks to a collaboration between the Houston Zoo and medical physicist Dr. Moiz Ahmad of MD Anderson at the Texas Medical Center. Inspired by a behind the scenes tour of the Houston toad facility, Dr. Ahmad leant his expertise to learn the needs of an effective egg counting program and tested its accuracy against historic hand counted clutches. After working out the kinks and learning the nuances to best utilize the program, this has become a gamechanger with discussion of further developing it to test more parameters such as egg cleavage rates.

Updates of the Saint Louis Zoo's Amphibian Conservation Center

Justin Elden

St Louis Zoo, Center for Ecuadorian Amphibian Conservation

Ecuador is one of the most amphibian-rich countries in the world, yet its amphibian populations face severe threats. In response, the Saint Louis Zoo WildCare Institute established the Center for Ecuadorian Amphibian Conservation in partnership with Centro Jambatu to advance collaborative, science-based conservation efforts. This program integrates ex situ assurance colonies, field research, and habitat protection to better understand and safeguard endangered species. Here we give updates to this program.

Adaptive Recovery of the Southern Mountain Yellow-Legged Frog (*Rana muscosa*).

Leah Jacobs

San Diego Zoo Wildlife Alliance

The southern mountain yellow-legged frog (*Rana muscosa*) is one of the most endangered amphibians in North America. The recovery program at San Diego Zoo Wildlife Alliance began in 2006 as an emergency salvage effort and has since evolved into a comprehensive, cross-institutional conservation breeding and reintroduction program integrating ex situ management, assisted reproductive technologies (ARTs), and post-release research. Small founding populations, geographic isolation, and limited gene flow have resulted in low reproductive viability and substantial genetic management challenges. To address these constraints, the program employs a multifaceted approach that includes optimized husbandry, brumation, hormone induction, artificial fertilization, cryobanking through the SDZWA Frozen Zoo, and lineage-informed genetic pairing. Ex situ research further supports reintroduction success through predator training, natal habitat matching, immune priming, and soft-release strategies designed to improve post-release survival and site fidelity. Post-release monitoring integrates detection research and in situ health assessments to evaluate translocation outcomes and guide adaptive management. Together, these efforts demonstrate how conservation breeding programs can function as experimental systems, where incremental, data-driven refinements across reproduction, genetics, and behavior accumulate to support species recovery under real-world conservation constraints.

Amphibian Biobanking Network: A Collaborative Approach to Conservation – Discussion

Allison Julien Ph.D., Fort Worth Zoo

Derek Benson, Omaha's Henry Doorly Zoo & Aquarium

Join a targeted discussion group on the establishment, maintenance, and logistics of amphibian biobanking within your facility.

Key Questions:

Do you think your facility's amphibian population would benefit from genetic preservation through biobanking?

Is there current biobanking equipment on your facility grounds?