

Panama Amphibian Rescue and Conservation Project

Strategic Plan 2023-2027



A project partnership between Cheyenne Mountain Zoo, Smithsonian's National Zoo & Conservation Biology Institute, Smithsonian Tropical Research Institute, and Zoo New England.

This workshop was held in Panama in January 31 & February 1 2023 at the Smithsonian Tropical Research Institute laboratory in Gamboa.

Participants

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Steering Committee

Bob Chastain, President and CEO Cheyenne Mountain Zoo; Dr. William C. Pitt, Director of Conservation and Science Smithsonian's National Zoo and Conservation Biology Institute; Dr. Oris Sanjur, Deputy Director Smithsonian Tropical Research Institute; John Linehan, President and CEO Zoo New England & Jamie Kratt, at-large member

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Mission

Our mission is to rescue and establish sustainable assurance colonies of amphibian species that are in extreme danger of extinction throughout Panama. We will also focus our efforts and expertise on developing methodologies to reduce the impact of the amphibian chytrid fungus (Bd) and proceed to reintroduction trials.

Goal 1: Grow and sustain captive populations of priority amphibians

OBJECTIVE 1. Effectively manage captive populations

- Evaluate all currently held species and develop conservation objectives for each (e.g., population goals, biobanking goals, and reproductive plans, potential addition of new species, and consider satellite captive breeding plans for some species.
- Hire a full-time registrar and conduct studbook training.
- Revise management structure and review position classification.
- Standardize husbandry and breeding data collection and treatment of data.
- Define opportunistic collection methods and archiving of biomaterials.

OBJECTIVE 2. Train and engage staff to create a rewarding work environment

- Develop training modules for critical work areas like recordkeeping, population management, medicine, parasitology and a seminar series for communicating research among project staff and researchers, and ensure staff are cross-trained in all areas.
- Hold weekly “curator rounds” to with staff to review record-keeping and address welfare/ logistics and cleanliness concerns, and opportunities to share research updates and results.
- Create quarterly lunchtime seminar series to be attended by all staff that cover research, veterinary care etc.
- Develop team-building activities to improve camaraderie.
- Create staff onboarding checklist and orientation program.



Staff of the Panama Amphibian Rescue and Conservation Project January 2023

OBJECTIVE 3. Improve availability of local veterinary care

- Create a formal process for pathology exports every 6 months.
- Formalize Summit Zoo veterinary involvement and identify training opportunities.
 - Include Summit vets on veterinary related emails
 - Invite Summit vets to Parc during international vet visits
 - Look for AArk training opportunities
- Conduct presentations to animal care staff to improve understanding of veterinary care issues and treatment protocols.
- Explore veterinary school opportunities.
- Expand the veterinary advisory group including international veterinarians.
- Explore in-country diagnostics (e.g., veterinary laboratories, culture/cytology/PCR).
- Create monthly morbidity/mortality report.

OBJECTIVE 4. Improve our understanding of species biology and needs

- Prioritize research needs and develop research plans for priority research lines (e.g. reproduction, genetics, welfare, health care, toxins and analogues for dietary bacteria for tadpoles.)
- Recruit additional students, fellows, or researchers for the project.
- Ensure representation of research collections in the US captive collections.
- Help to build regional ex-situ capacity in Latin America through training and collaboration.
- Publish at least one peer-reviewed paper per year on ex-situ amphibian husbandry, reproduction, nutrition, or welfare.
- Engage animal care staff in the research process, share results and participate as authors in publications.

OBJECTIVE 5. Ensure that animals thrive, not just survive

- Perform biannual welfare assessments, using protocols modelled after AZA Accreditation Standard 1.5.0
- Incorporate data to develop evidence-based best practices in husbandry (e.g. measuring ammonia levels to determine appropriate frequency for cleaning tanks/changing substrate; incorporate pathology results as important feedback to determine good/poor environmental conditions, nutrition, etc.)
- Increase behavioral and environmental enrichment that does not compromise biosecurity or biological control of parasite life cycles in the enclosures.
- Assess feasibility and implementation of any pre-release conditioning for future reintroductions.
- Standardize pest control measures in pods.



Atelopus limosus CR



Atelopus certus CR



Atelopus glyphus CR



Atelopus zeteki EW



Atelopus varius CR



Oophaga vicentei EN



Strabomantis bufoniformis EN



Andinobates geminisae CR



Craugastor evanescens CR



Agalychnis lemur CR



Gastrotheca cornuta EN



Triprion spinosus NT

Goal 2: Restore wild populations of priority species

OBJECTIVE 1. Plan and execute new release trials.

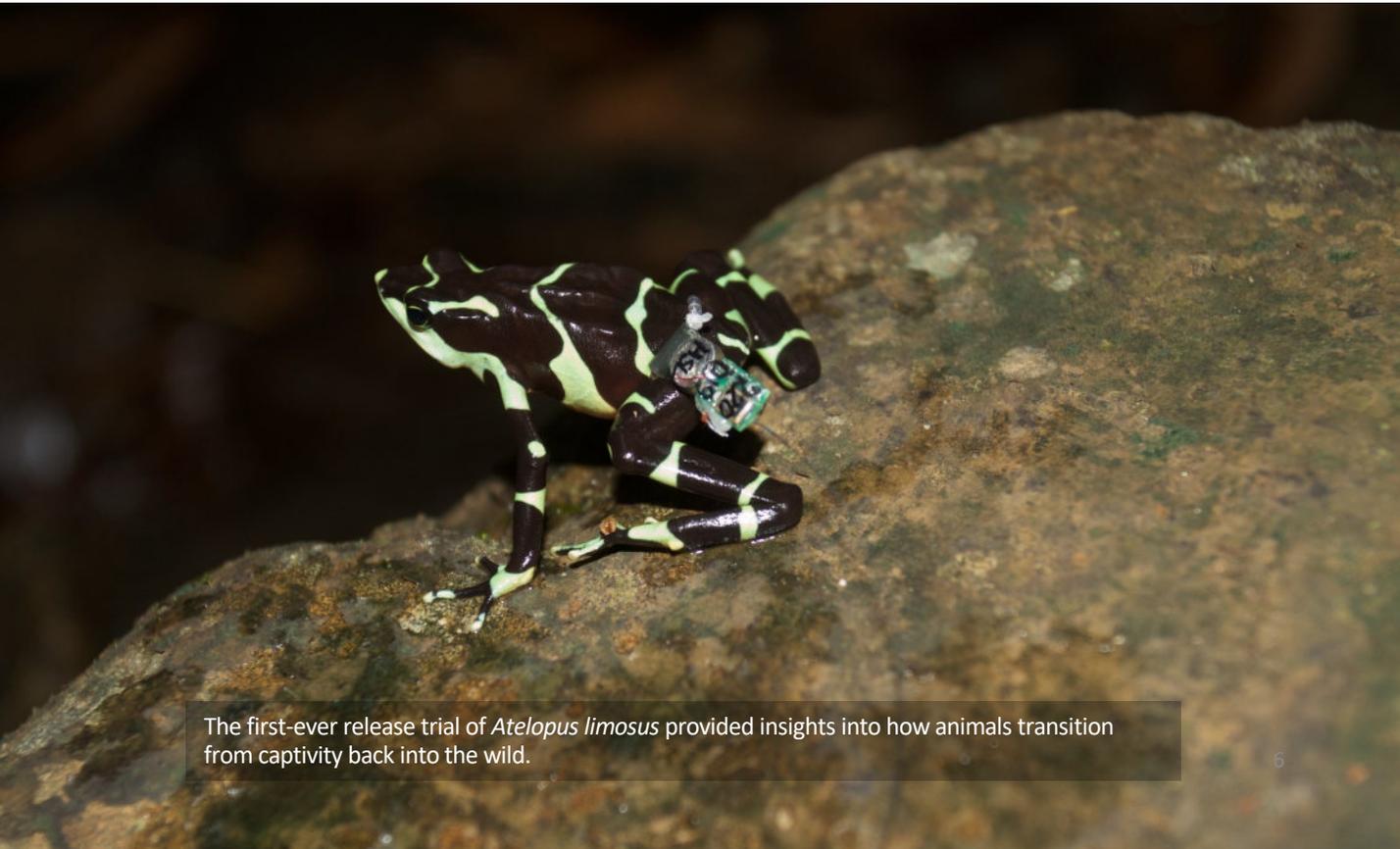
- Develop species-specific reintroduction plans.
- Refine and optimize mesocosm designs.
- Conduct tadpole release experiments.
- Add two new reintroduction sites.
- Perform release trials for 3 species over the next 5 years.
- Improve post-release monitoring methods.
- Conduct post-release assessment and plan for next year's release.
- Ensure all staff have an opportunity to participate in field work.

OBJECTIVE 2. Broadly contribute to *in situ* amphibian scientific research and innovation that supports conservation objectives.

- Prioritize research lines that develop plans for *Batrachochytrium dendrobatidis* (Bd) mitigation, taxonomy, monitoring wild populations, climate change and ecosystem restoration
- Seek funding to support students, fellows, and one additional full-time research staff researcher.
- Publish at least one paper peer-reviewed per year on in-situ amphibian populations and reintroductions.

OBJECTIVE 3. Conduct research on cryptic species, including genetics and taxonomy.

- Check taxonomy of each species at PARC * needs a post-doctoral fellow.
- Sequences in gene bank and captive specimens.



The first-ever release trial of *Atelopus limosus* provided insights into how animals transition from captivity back into the wild.

Goal 3: Foster an appreciation for amphibians

OBJECTIVE 1. Highlight the contributions of scientific work and how it positively impacts communities

- Increase social media reach at least 25% per year.
- Conduct education programs/outreach activities/events outside the STRI to reach people within their own communities, targeting at least one new community per year, and explore joint activities with the Summit Zoo.
- Use Qrioso public programs to more widely share work (primary exhibit Punta Culebra and create digital content featuring Panamanian scientists as role models for online outreach).
- Obtain at least five popular (earned) media pieces mentioning the project annually.

OBJECTIVE 2. Create novel ways to share amphibian biodiversity information.

- Retrofit one pod at PARC to safely accommodate visitors (taking into consideration biosecurity concerns); advertise keeper demonstrations/talks to engage and document the numbers of visitors.
- Explore decoration of pods e.g. signs/skin/murals.
- Create opportunities for facility tours by school groups and universities to visit the center and engage with staff.
- Secure an education intern who can focus on assisting with education, marketing and event coordination and build goodwill with other stakeholders and organizers of the Golden Frog Day.



Exhibition of Panama's incredible amphibians at the Punta Culebra Nature Center, Panama City.