Amphibian Ark

20 Years Rescuing Amphibians in Crisis

Pithecopus rusticus © Parque das Aves

Story on page 13

June 2026

Newsletter No. 74, ISSN 2640-4141

Amphibian Ark

20 Years Rescuing Amphibians in Crisis

This year, we celebrate 20 years of amphibian rescue.

In 2004, the first IUCN Global Amphibian Assessment revealed that one-third of all amphibians were already threatened with extinction. As the scale of the crisis became clear, so did the urgent need for *ex situ* conservation breeding—but at the time, most institutions were not equipped to respond.

As a result, the IUCN SSC Amphibian Specialist Group (ASG), the IUCN SSC Conservation Planning Specialist Group (CPSG), and the World Association of Zoos and Aquariums **established Amphibian Ark in 2007 to help coordinate the *ex situ* component of the first Amphibian Conservation Action Plan.**

Twenty years on, we continue working with partners around the world to safeguard amphibians through *ex situ* conservation: buying species time while threats in the wild are addressed, and supporting their return to their natural habitats when conditions allow. In these two decades, significant progress has been made, yet many species still face critical threats and depend on timely conservation action.

41%
of all amphibians are now designated as Threatened by the IUCN

3600+
species assessed by the AArk Conservation Needs Assessments

75
species in rescue programs

As we mark this milestone, we move forward with greater experience, strong partnerships, and a clearer path to protecting amphibians at risk. With your support, we can continue to secure a future for these extraordinary species.

Support AArk

Left: *Bolitoglossa helmrichi* © José Renato Morales
Right: *Hyperolius pickersgilli* © Keir Lynch

Newsletter No. 74, June 2026
ISSN 2640-4141

Amphibian Ark

20 Years Rescuing Amphibians in Crisis

In this issue:

A quick guide to our frequently used acronyms:

AArk	Amphibian Ark
ARLA	Amphibian Red List Authority
ASG	Amphibian Specialist Group
CNA	Conservation Needs Assessments
CPSG	Conservation Planning Specialist Group
IUCN	International Union for the Conservation of Nature
SSC	Species Survival Commission
WAZA	World Association of Zoos and Aquariums

Newsletter No. 74, June 2026
ISSN 2640-4141

Amphibian Ark News

Welcome to Issue No. 74 of the Amphibian Ark Newsletter!

Here's what's been keeping us busy this quarter:

Reviewing the AArk CNA tool - Workshop in London

The AArk CNA was first developed at an IUCN SSC CPSG workshop in 2006 in response to the emergence of the chytrid fungus. The CNA has since helped assess more than 3,600 amphibian species and prioritize those most urgently in need of *ex situ* conservation. However, as needs and knowledge evolve, so too must the tool.

At the end of May 2026, we brought together partners from the IUCN SSC Conservation Planning Specialist Group (CPSG), IUCN SSC Amphibian Specialist Group (ASG), Synchronicity Earth, the Zoological Society of London (ZSL), and Extinct in the Wild Action Partnership (EWAP) for a workshop in London to review the AArk Conservation Needs Assessment (CNA) process.

Partners representing Amphibian Ark, IUCN SSC CPSG, IUCN SSC ASG, Synchronicity Earth, ZSL and EWAP at the workshop at ZSL. © N. Peters

Following a first major review in 2016 (published in Oryx in 2018), this gathering in late May 2026 marked the first major review of the process in a decade, bringing experts together to refine and strengthen it for the years ahead. This work is ongoing—we'll share more as it develops! Many thanks to everyone who has contributed to the CNAs over the years; your input and feedback continue to shape this work. And many thanks to our partners at ZSL for hosting us!

Left to right: Jonathan Wilcken, AArk Director; Luis Carrillo, AArk Program Director for Latin America & the Caribbean; Devin Edmonds, AArk Program Director for Africa & South Asia. © N. Peters

Newsletter No. 74, June 2026
ISSN 2640-4141

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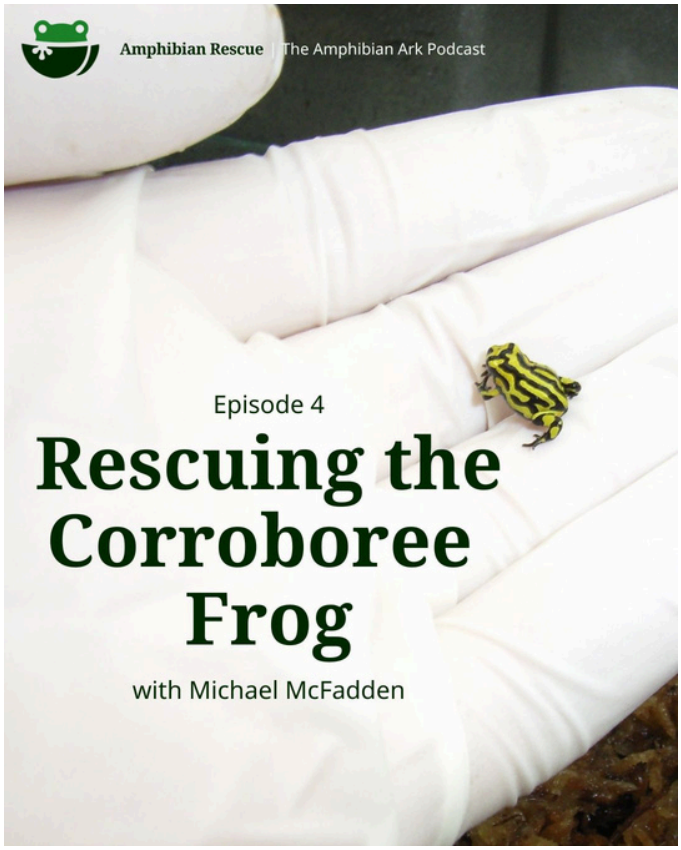
New on *Amphibian Rescue*, the Amphibian Ark podcast:

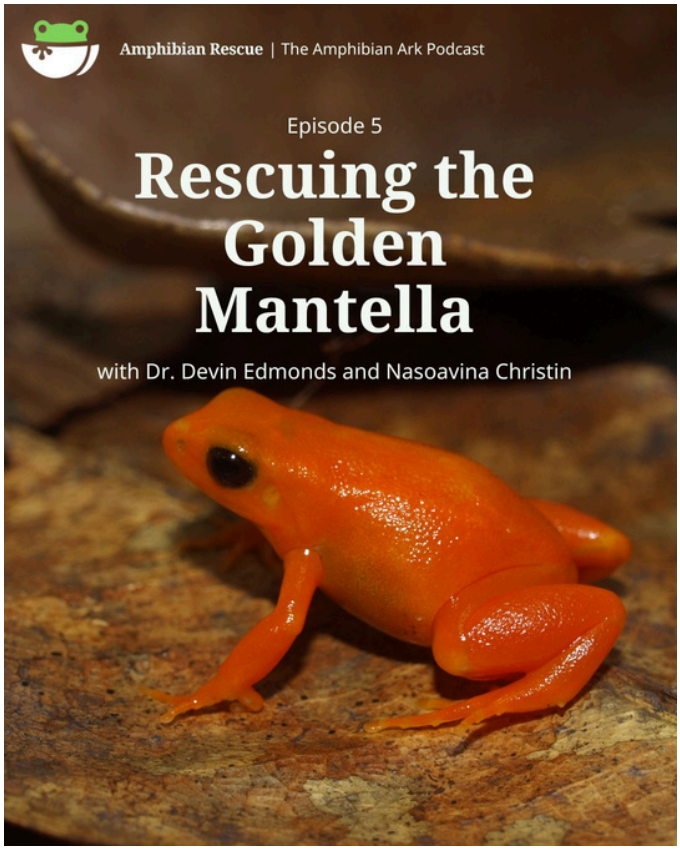
In case you missed them, catch up on the two latest episodes of our podcast, *Amphibian Rescue:*

Episode 4 features Michael McFadden, Wildlife Conservation Officer at Taronga Conservation Society Australia, on more than two decades of work to save the Southern and Northern Corroboree frogs. These tiny, striking black-and-yellow species from the Australian Alps have been pushed to the brink by chytrid. But, as Michael tells us, there are many reasons for hope.

From building insurance populations and cracking the code on breeding the species, to disease-free *exclosures* and the biotech that might secure their future. Oh yeah, and yelling at frogs.

Listen to it here.





On Episode 5 we turn to Madagascar and the almost accidental rescue story of the Golden Mantella. Dr. Devin Edmonds (AArk) and Nasoavina Christin (Association Mitsinjo) take us behind the scenes of the early effort to build a conservation breeding facility in Andasibe—meant to safeguard common frog species in case chytrid ever reached Madagascar—until a mining company came knocking, looking for someone to rescue the Golden Mantella before its habitat was cleared. It turned out the team in Andasibe was (almost) ready for a threat they hadn't seen coming.

Listen to it here.

You can find Amphibian Rescue in all podcast platforms and YouTube—you can also make use of YouTube's tools to listen to it in your language or adapt the subtitles to your preferred language!

Newsletter No. 74, June 2026
ISSN 2640-4141

Amphibian Ark at Brazil's National Zoo and Aquarium Congress

Renata Ibelli Vaz | AArk National Co-Coordinator Brazil; IUCN SSC Amphibian Specialist Regional Group Brazil
Cybele Sabino Lisboa | AArk National Co-Coordinator Brazil; IUCN SSC Amphibian Specialist Regional Group Brazil

Amphibian Ark was represented at the 49th Congress of the Brazilian Association of Zoos and Aquariums (AZAB), held at Bioparque Pantanal in Campo Grande, Mato Grosso do Sul, Brazil, from 26 to 30 May 2026. Bioparque Pantanal (Figure 1), recognized as the world's largest freshwater aquarium, provided an impressive setting for the event. As the principal annual gathering of Brazilian zoo and aquarium professionals, the AZAB Congress provides an important forum for sharing knowledge, strengthening partnerships, and advancing conservation initiatives nationwide.

The event brought together zoo and aquarium professionals from across the country, including directors, curators, veterinarians, biologists, educators, researchers, and animal care staff, providing an excellent opportunity to strengthen relationships and discuss conservation priorities.

As part of the congress program, Amphibian Ark Regional Coordinators for Brazil (Figure 2) **Renata Vaz and Cybele Lisboa delivered the closing plenary presentation entitled *"Amphibian Conservation in Brazilian Zoos: Evolution, Perspectives, and the Role of Amphibian Ark."*** The presentation highlighted the global amphibian extinction crisis, the current status of amphibian conservation in Brazil, the development of *ex situ* conservation programs, and the growing role that Brazilian zoological institutions can play in safeguarding threatened amphibian species.

The congress also provided a valuable opportunity for in-person discussions with partners involved in Amphibian Ark-supported programs across Brazil. Representatives from Parque das Aves and collaborators working on the conservation of *Pithecopus rusticus*, as well as team members from BioParque do Rio involved in the *Physalaemus*

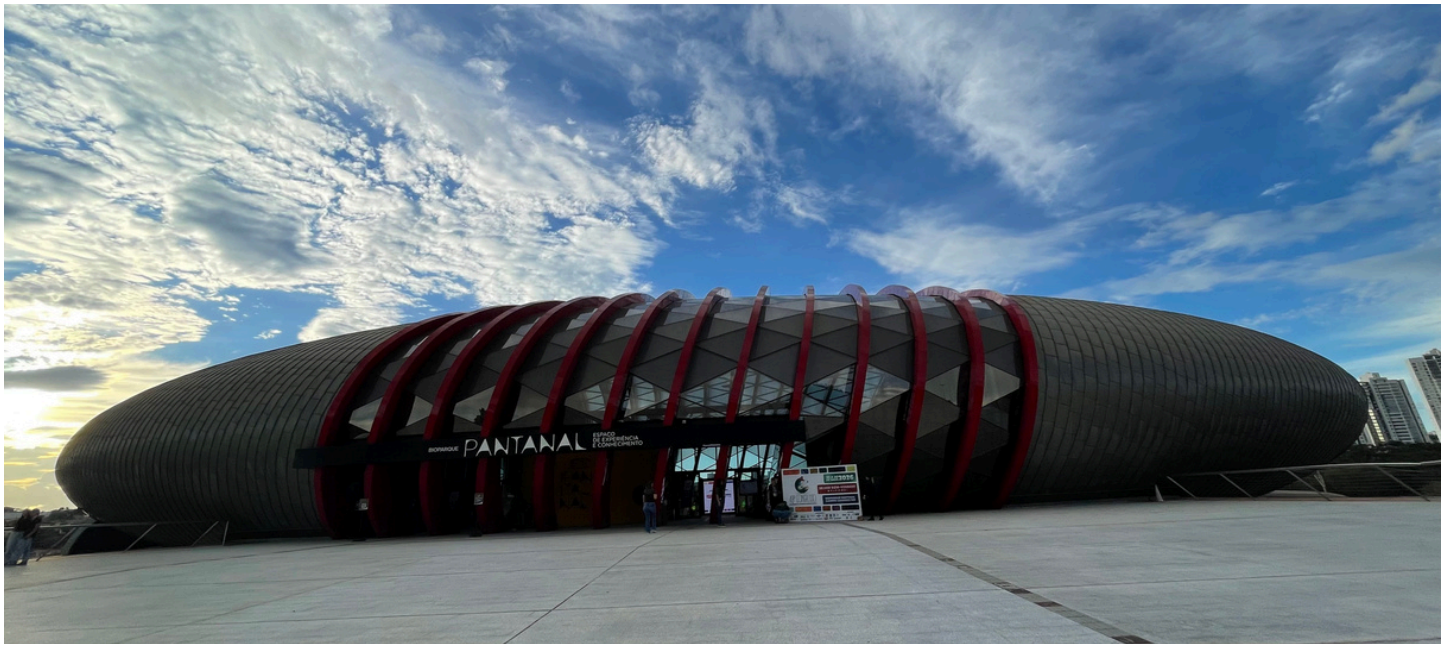


Figure 1. Bioparque Pantanal in Campo Grande, Mato Grosso do Sul, Brazil, host venue of the 49th AZAB Congress and recognized as the world's largest freshwater aquarium.

soaresi program (Figure 3), attended the event. These face-to-face conversations complemented the regular virtual meetings held throughout the year and helped strengthen collaboration, share recent achievements, discuss challenges, and coordinate future actions.

The congress served as an important platform to introduce Amphibian Ark's work to a broader audience within the Brazilian zoo and aquarium community and to strengthen relationships with current and potential partners. We are grateful to AZAB, the conference organizers, and all participants for their interest, enthusiasm, and commitment to wildlife conservation. Events such as the AZAB Congress play a vital role in fostering collaboration and creating new opportunities to expand amphibian conservation efforts throughout Brazil.

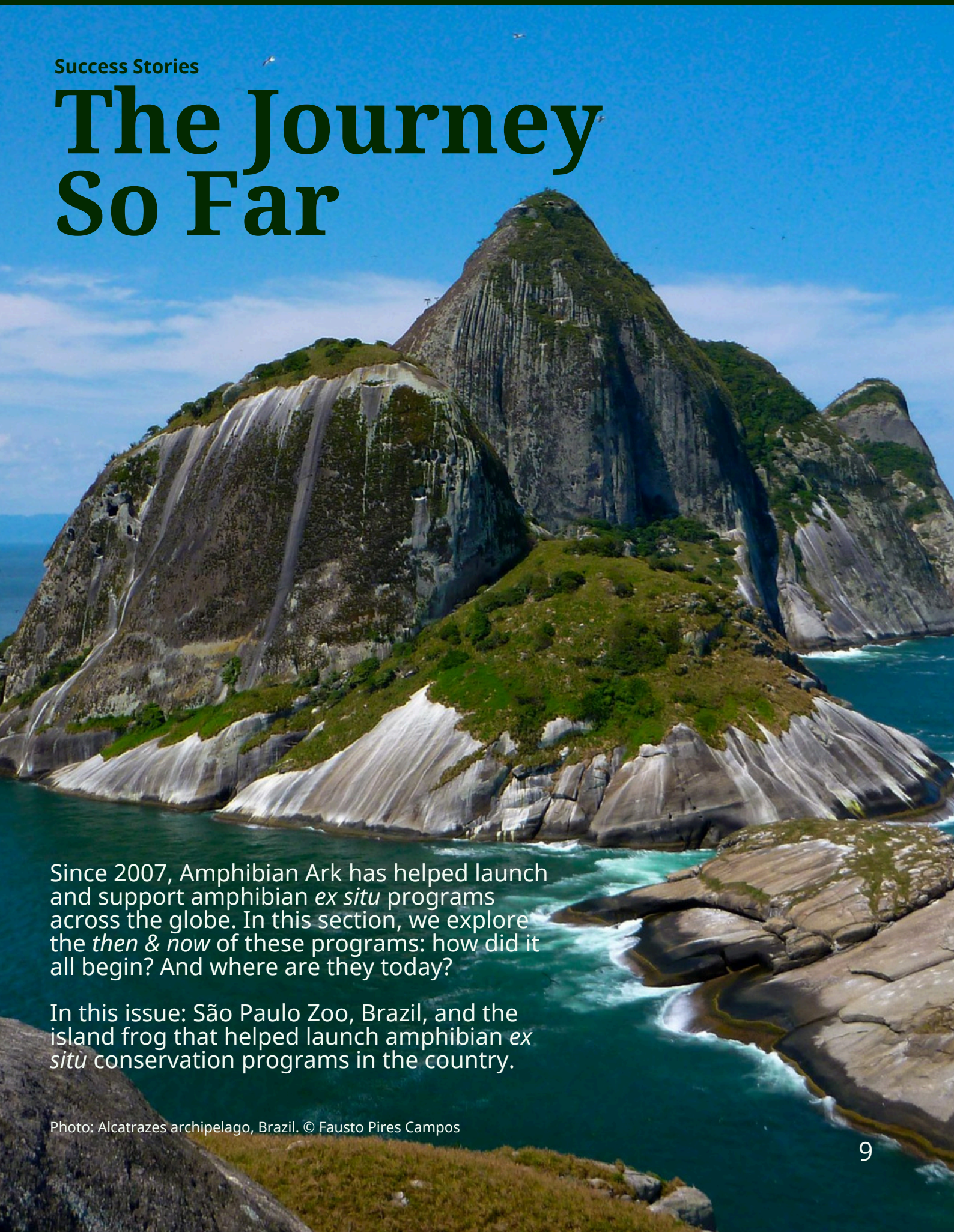
Figure 2: Amphibian Ark Regional Coordinators for Brazil, Cybele Lisboa and Renata Vaz, at the 49th Congress of the Brazilian Association of Zoos and Aquariums (AZAB), where they delivered the congress closing plenary presentation.

Figure 3: Renata Vaz and Cybele Lisboa with Samuel Vieira, coordinator of the *Physalaemus soaresi* conservation program at BioParque do Rio, during the AZAB Congress at Bioparque Pantanal. The event provided valuable opportunities for discussions with partners involved in Amphibian Ark-supported conservation programs.

Newsletter No. 74, June 2026
ISSN 2640-4141

Success Stories

The Journey So Far



Since 2007, Amphibian Ark has helped launch and support amphibian *ex situ* programs across the globe. In this section, we explore the *then & now* of these programs: how did it all begin? And where are they today?

In this issue: São Paulo Zoo, Brazil, and the island frog that helped launch amphibian *ex situ* conservation programs in the country.

Photo: Alcatrazes archipelago, Brazil. © Fausto Pires Campos

Newsletter No. 74, June 2026
ISSN 2640-4141

15 years safeguarding the Alcatraz snouted tree frog (*Ololygon alcatraz*)

For several decades, the Brazilian island, Ilha dos Alcatrazes, was used by the Brazilian Navy for heavy artillery practice. Occasionally, this practice caused wildfires, notably in November 2004, when approximately 10% of the island's vegetation burned.

Just three years after the AArk Conservation Needs Assessment (CNA) tool was developed, Amphibian Ark held its first-ever Brazilian CNA workshop in 2009. Among the results was a clear recommendation: the Critically Endangered Alcatraz snouted tree frog (*Ololygon alcatraz*), found on a single 170-hectare island off the coast of São Paulo (Ilha dos Alcatrazes), was in urgent need of *ex situ* rescue.

That same year, São Paulo Zoo began the work that would become Brazil's first dedicated amphibian conservation breeding program. The Zoo started a pilot project using the analog species *Ololygon perpusilla* to set up husbandry and breeding protocols that would later be applied to the, at the time, Critically Endangered *O. alcatraz.* The pilot project was successful, and soon enough they began the *ex situ* conservation program for *O. alcatraz,* supported in 2011 with one of Amphibian Ark's seed grants.

Where are they now?

Photo: *Ololygon alcatraz* © Diego Santana

2009

AArk holds its first Brazilian Conservation Needs Assessment workshop, where *O. alcatraz* is identified as in urgent need of *ex situ* rescue.

This same year, São Paulo Zoo launches a pilot project with the analog species *Ololygon perpusilla.*

2010

São Paulo Zoo staff complete **training** in *ex situ* conservation management delivered by AArk and AZA's Amphibian Management School.

2011

São Paulo Zoo is awarded an AArk seed grant to establish Brazil's first dedicated amphibian conservation breeding project, and collects the founders for the *O. alcatraz* program.

2012

O. alcatraz is reproduced in captivity for the first time; the *ex situ* population is successfully established.

2013

Military artillery practice on the island ceases, following an agreement between the Brazilian Navy, government authorities, and environmental stakeholders.

2016

The Alcatrazes Archipelago is declared a Wildlife Refuge, granting the species' habitat full legal protection.

2021

O. alcatraz is downlisted from Critically Endangered to Vulnerable in the IUCN Red List.

Today

Photo: *Ololygon alcatraz* © Cybele Lisboa

Even though the island's designation as a Wildlife Refuge led to *O. alcatraz* being downlisted in 2021, and its habitat no longer faces the same threats as 10+ years ago, **São Paulo Zoo continues to maintain an assurance population to safeguard the species against any potential stochastic event affecting the wild population.**

Newsletter No. 74, June 2026
ISSN 2640-4141

Pristimantis sp © Tristan Vratil

Conservation breeding around the world

Newsletter No. 74, June 2026
ISSN 2640-4141

Parque das Aves achieves first reproduction of the rustic leaf frog (*Pithecopus rusticus*)

Marcio André Silva | Parque das Aves
Bruno Alencar Rodrigues | Parque das Aves
Richarlyston Brandt Pereira | Parque das Aves
Marina Somenzari | Parque das Aves
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Renata Ibelli Vaz | AArk National Co-Coordinator Brazil; IUCN SSC Amphibian Specialist Regional Group Brazil
Tiago Quaggio Vieira | Centro Nacional de Pesquisa e Conservação de Répteis e Anfíbios do Instituto Chico Mendes de Conservação da Biodiversidade (RAN ICMBio)
Roberta Biasoto Manacero | Parque das Aves

The Rustic Leaf Frog (*Pithecopus rusticus*) is a micro-endemic Atlantic Forest species found in the Subtropical Highland Grasslands of southern Brazil. Classified as Critically Endangered, the species has received increasing scientific and conservation attention in recent years. However, several aspects of its reproductive biology remain poorly understood.

Since 2022, Parque das Aves has maintained an *ex situ* population as part of a collaborative conservation effort involving partners of the *Projeto Perereca-rústica*. In 2026, the program achieved an important milestone with its first successful *ex situ* reproduction, resulting in 17 offspring, representing a significant contribution to the long-term management of this conservation population.

During the 2025–2026 breeding season, staff documented a complete reproductive event in a breeding group consisting of one male and three females housed in a planted paludarium designed to replicate the species' natural breeding habitat. Behavioral observations were conducted through remote video monitoring.

Reproductive activity began with male advertisement calls and amplexus, followed

Top: adult individual of *Pithecopus rusticus*
Bottom: *Pithecopus rusticus* in amplexus
© Parque das Aves

several hours later by courtship and the movement of a pair to their selected oviposition site. As reported for other species of the genus, the female carried the male while moving to the leaf chosen for egg deposition. Following oviposition, the female remained at the site and used her hind limbs to fold and seal the leaf around the eggs with mucus, creating the characteristic protected egg chamber. This process lasted approximately two and a half hours. The male temporarily left the oviposition site but later returned and resumed amplexus until the reproductive event was completed.

These observations are consistent with published information regarding the species' breeding season, calling behavior, and the use of elevated vegetation by calling males to attract females. However, detailed descriptions of reproductive behavior in *P. rusticus* remain scarce in the scientific literature. Interestingly, some behaviors reported in related species were not observed during this event, including prolonged male attendance during nest preparation and tactile courtship displays.

This record provides valuable information for the *ex situ* management and integrated conservation of *P. rusticus*. Continued behavioral monitoring may improve understanding of the species' environmental and reproductive requirements, supporting both *in situ* conservation efforts and the long-term management of assurance populations under human care.

After oviposition, the female *P. rusticus* folds and seals a single leaf to create an *egg chamber*. She does so with her hind legs, and with the help of her highly adhesive, gelatinous egg clutches. These clutches prevents the eggs from drying out or, in the wild, from predation. © Parque das Aves

Newsletter No. 74, June 2026
ISSN 2640-4141

From analog species reproduction to applying techniques on the critically endangered *Physalaemus soaresi*: advances in *ex situ* conservation at BioParque do Rio

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Cybele Sabino Lisboa | AArk National Co-Coordinator Brazil; IUCN SSC Amphibian Specialist Regional Group Brazil
Fábio Hepp | Universidade Federal do Rio de Janeiro; Museu Nacional, Rio de Janeiro
Renata Ibelli Vaz | AArk National Co-Coordinator Brazil; IUCN SSC Amphibian Specialist Regional Group Brazil
Samuel Villanova Vieira | BioParque do Rio

Since November 2024, the BioParque do Rio has been developing an *ex situ* conservation project for *Physalaemus soaresi*, a critically endangered anuran species (IUCN, 2023a). A dedicated laboratory space was built from scratch to support this initiative, which effectively began with the collection of individuals of a non-threatened congeneric analog species, *P. signifer* (IUCN, 2023b), in January 2025. Since then, husbandry and reproduction protocols have been developed and refined based on the analog species.

These efforts established the optimal diet for both tadpole and juvenile/adult stages, as well as methods for developing egg masses, cultivating insect colonies for live feeding, and defining appropriate abiotic conditions for maintaining the individuals, among other parameters (Tavares and Vieira, 2025). The establishment of these husbandry conditions, together with the use of calling playback, successfully stimulated reproductive behavior, which began in October 2025. This led to the observation of spontaneous calling activity, followed by the observation of amplexus behavior and, ultimately, the production of foam nests starting in January 2026 (Tavares et al., 2026).

To date, five foam nests of *P. signifer* have been observed, three of which were allowed to develop completely. The number of hatched tadpoles per nest ranged from 55 to 166, the larval stage lasted between 19 and 35 days, and complete metamorphosis was achieved within 40 days (apparently a very long time for the genus; Chuliver and Fabrezi, 2019).

Based on the success achieved with the analog species *P. signifer*, the technical team from BioParque do Rio, together with collaborators from the Laboratory of Amphibians and Reptiles, Universidade Federal do Rio de Janeiro, and local fire brigade members, conducted two field campaigns to collect *Physalaemus soaresi* individuals at the Mário Xavier National Forest (Seropédica, RJ; 22°43’ S, 43°42’ W).

The expeditions (Figure 1) took place on March 3 and March 24, 2026, resulting in the collection of six adult individuals for the project (Figure 2). The animals were transported to the Prof. Dr. Sergio Potsch Herpetofauna Laboratory at BioParque do Rio.

Upon arrival at the laboratory, individuals were placed in quarantine and housed individually in 22cm x 22cm x 10cm terraria. The terraria contained a 1cm substrate layer composed of a sterilized mixture of soil and coconut fiber, a container with filtered water, and dry leaves on the surface to serve as shelter.

The animals were handled using personal

Figure 1. Field collection of *Physalaemus soaresi* at the Mário Xavier National Forest in Seropédica, Rio de Janeiro, carried out with collaborators from the Laboratory of Amphibians and Reptiles at Universidade Federal do Rio de Janeiro and local fire brigade members. Left: Expedition of March 3, 2026. Right: Expedition of March 24, 2026. © BioParque do Rio Archives.

protective equipment, including lab coats, hairnets, and disposable gloves, which was changed between handling each specimen (Figure 3). During this period, feeding on fruit flies (genus *Drosophila spp.*) was already observed. The flies were supplemented alternately with calcium carbonate and Repashy Superfoods Supervite. The animals remained isolated until we received the test results for the presence of the fungus *Batrachochytrium dendrobatidis* (Bd). Swabs were taken in the field and analyzed at the Laboratory of Natural History of Brazilian Amphibians (LaHNAB), Universidade Estadual de Campinas (UNICAMP). Following the negative results for Bd detection, the animals were co-housed in a permanent terrarium, as previously done for the *P. signifer* adults (Tavares et al., 2026).

The husbandry and reproductive protocols developed for *P. signifer* have been successfully applied to *P. soaresi.* Individuals of the threatened species have already been observed feeding and vocalizing, both spontaneously and in response to playback, which indicates that the animals are well-nourished and behaviorally well-adjusted to the *ex situ* environment. Husbandry methods will continue to be refined, and it is expected that reproductive success, marked by the formation of foam nests and tadpole development, will soon be achieved. These results would indicate a well-established protocol enabling safe management and reproduction of the species under human care.

These first founder individuals of *P. soaresi* represent an important milestone in the establishment of a long-term *ex situ* conservation program. Our results shall provide the basis for future breeding efforts, research, and conservation strategies aimed at safeguarding this critically endangered species.

Figure 2. One of the adult specimens of *Physalaemus soaresi* collected at the Mário Xavier National Forest in Seropédica and transported to the Prof. Dr. Sergio Potsch Laboratory at BioParque do Rio. © Samuel Villanova Vieira.

Figure 3. BioParque do Rio biologist handling the specimens in quarantine after they arrived from the field. © BioParque do Rio Archives

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Newsletter No. 74, June 2026
ISSN 2640-4141

Assessing the *Ex Situ* Conservation Needs of Morocco's amphibians

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Olivier Marquis | Muséum National d'Histoire naturelle
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Morocco supports 14 species of amphibians, including several North African endemics such as the Moroccan midwife toad (*Alytes maurus*), North African fire salamander (*Salamandra algira*), and the Moroccan spadefoot toad (*Pelobates varaldii*). The main threat facing nearly all species is habitat loss, especially from conversion of wetlands to agriculture and urbanization. Climate change is also having an impact on water sources that many species rely on, and in the water bodies that persist, the introduction of invasive fish like *Gambusia* may be having an impact through predation of eggs and tadpoles. Most recently, the chytrid fungus *Batrachochytrium dendrobatidis* has been identified in Moroccan amphibians, including fatal chytridiomycosis in *Alytes maurus*.

During February and March 2026, a small working group had five meetings to work through the AArk Conservation Needs Assessment (CNA) framework, assessing all 14 species. The assessments confirmed that all Moroccan amphibians are overwhelmingly dependent on *in situ* actions, especially *in situ* research to better inform conservation decisions. For most species, assessing population trends and understanding connectivity among fragmented populations are among the priority research needs. For a smaller subset of species—which are range-restricted—basic surveys are also needed to confirm continued persistence and evaluate the viability of isolated populations. Further, the CNAs identified a need to assess the impact and severity of

Moroccan amphibian species. Top: *Barbarophryne brongersmai.* Middle: *Salamandra algira*. Bottom: *Sclyrophrys mauritanica*. © Abdellah Bouazz & Aziza Lansari www.moroccoherpetology.com

emerging threats such as invasive species, agricultural pollution, road mortality, and disease. The assessments revealed that most of these pressures are anthropogenic in origin and could potentially be mitigated or reversed through targeted and active management measures.

In addition to *in situ* conservation actions, the CNA identified a role for *ex situ* actions in several species. *Salamandra algira* (recommended for mass production) and *Alytes maurus* (recommended for *ex situ* research) were the highest priority species to focus on. Additionally, some species were identified as potentially serving as analogues for more threatened species, specifically *Bufotes boulengeri* for *B. cypriensis* and *B. zugmayeri*; *Discoglossus pictus* for *D. montalentii; Hyla meridionalis* for *H. carthaginiensis*; and *Sclerophrys mauritanica* for several range-restricted threatened *Sclerophrys species*.

These results were presented at the European Association of Zoos and Aquaria (EAZA) Amphibian and Reptile Taxon Advisory Group meeting hosted by CrocoParc Agadir, Morocco during April 20–22 2026. Altogether, the CNAs for Morocco provide the first comprehensive evaluation of *ex situ* conservation needs for amphibians in the country and reflect a collaborative process based on local expertise. The results can be used to help guide conservation decisions and help formalize knowledge about unique North African species that will inform their conservation.

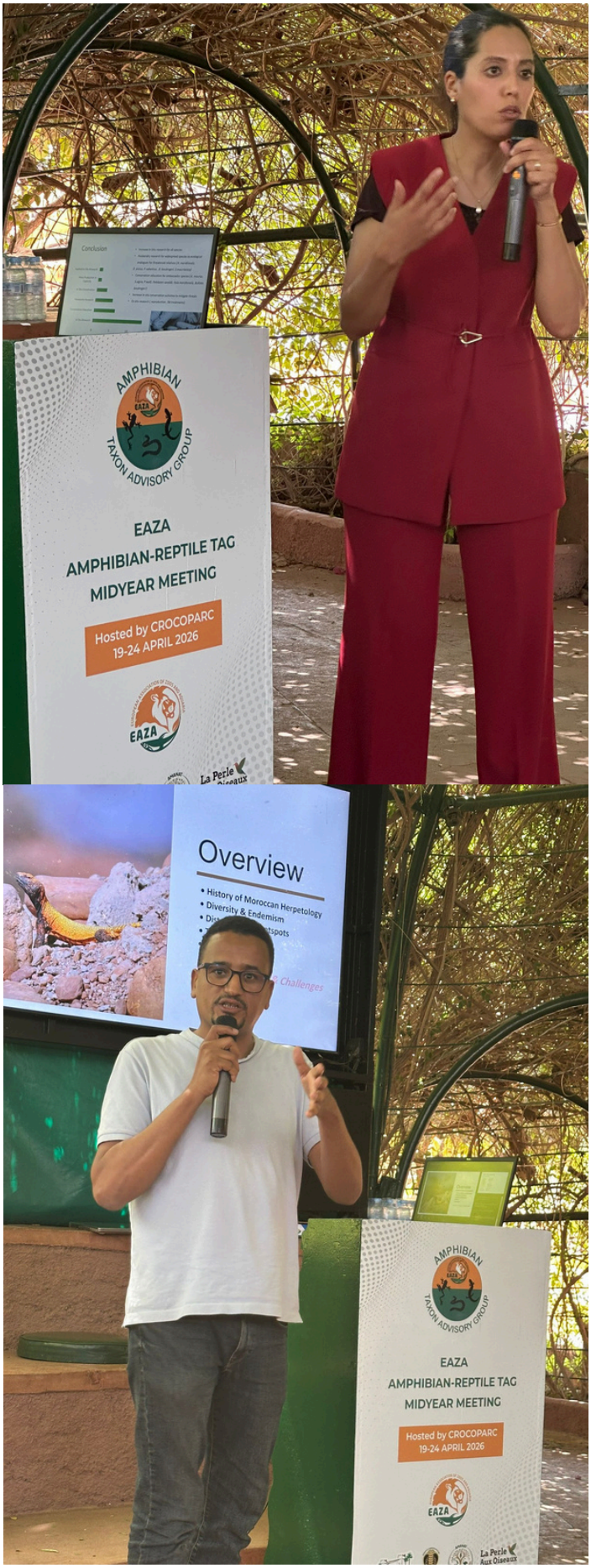

Figure 2. Aziza Lansari (top) and Abdellah Bouazza (bottom) presenting the AArk CNA results at EAZA 2026.

Newsletter No. 74, June 2026
ISSN 2640-4141

Preparing to rescue Ghana's most threatened amphibians

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Anthony Churcher | Herp Conservation Ghana
Kelvin Kwamena | Herp Conservation Ghana
Unnar Karl Ævarsson | Zoological Society of London
Benjamin Tapley | Zoological Society of London

The Atewa slippery frog (*Conraua sagyimase*) and Aifa Birago's puddle frog (*Phrynobatrachus afiabirago*) are only known to occur in the Atewa Hills Forest Reserve in Ghana. Both species were described as new to science relatively recently (Ofori-Boateng et al. 2018; Neira-Salamea et al. 2021), and both are assessed as Critically Endangered by the IUCN (IUCN SSC Amphibian Specialist Group, 2019, 2021). The Atewa slippery frog is an Evolutionarily Distinct and Globally Endangered (EDGE) species and is therefore considered a global priority for species conservation (Ofori-Boateng et al. 2023).

The Atewa slippery frog is relatively abundant in the streams of the Atewa Hills Forest Reserve, but Afia Birago's puddle frog is currently known from just two pools. Unfortunately, the entire habitat of both species may be lost due to government-backed bauxite mining; more recently, an increase in small-scale gold mining; and the collection of timber and non-timber forest products, which is becoming increasingly problematic within the reserve. Both species have been assessed as requiring rescue by Amphibian Ark's Conservation Needs Assessment Process (Ofori-Boateng et al. 2023, 2026).

Herp Conservation Ghana, the Forestry Research Institute of Ghana, and the Zoological Society of London (ZSL) have been working to establish conservation breeding programs for these species in Ghana in a dedicated facility at the Forestry Research Institute of Ghana. This was developed with the generous support of Amphibian Ark. However, nothing like this has ever been attempted in West Africa before.

With both frog species facing an imminent risk of extinction, but limited regional experience in

The Atewa slippery frog (*Conraua sagyimase;* Left) and Aifa Birago's puddle frog (*Phrynobatrachus afiabirago;* Right).
© Kelvin Kwamena Mensah (Herp Conservation Ghana) and Benjamin Tapley (Zoological Society of London)

amphibian care and difficulties obtaining specialist equipment locally, it was decided that a population of the frogs should be moved to ZSL's London Zoo to establish the protocols needed for keeping and breeding the frogs while we still have the time.

In September 2025, 10 adult Atewa slippery frogs, 20 Atewa slippery frog tadpoles, and 20 adult Afia Birago's puddle frogs were collected from the Atewa Hills Forest Reserve. They were then transferred, as a loan, to London Zoo to develop the conservation breeding protocols that will later be implemented at the Forestry Research Institute of Ghana in a purpose-built facility in Kumasi.

Husbandry protocols were developed prior to animal acquisition. For the Atewa slippery frog, we sought advice on their husbandry and breeding from Brookfield Zoo and Sedgwick County Zoo. We then proposed husbandry guidelines for this species based on Herp Conservation Ghana's field observations, local climate data, and microhabitat data collected from the field.

To our knowledge, frogs of the genus *Phrynobatrachus* have not been maintained or bred under human care. Therefore, for the puddle frog, we relied on field data and observations of the animals in the wild to inform the husbandry.

All the frogs and tadpoles survived the 4,500-mile (7,240 km) journey to London. Subsequently, every Atewa slippery frog tadpole metamorphosed successfully, and in November 2025, Atewa slippery frogs bred at London Zoo. It is our hope that this success can be replicated with Afia Birago's puddle frogs. Later this year, Herp Conservation Ghana staff will receive further intensive amphibian husbandry training at London Zoo before taking this work up to a full-scale rescue in Ghana.

Herp Conservation Ghana team during fieldwork in the Atewa Hills Forest Reserve.
© Kelvin Kwamena Mensah (Herp Conservation Ghana) and Benjamin Tapley (ZSL)

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Newsletter No. 74, June 2026
ISSN 2640-4141

A new hope for the happy frog: Parque Explora launches an *ex situ* conservation program for the Endangered *Atelopus laetissimus*

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Its scientific name, *Atelopus laetissimus*, derives from the Latin word *laetus*, happiness, while *laetissimus* adds the superlative: "very happy." This cheerful name reflects its striking color pattern of brown, green, lilac, and ochre tones. The species is part of the group commonly known as harlequin frogs. This particular harlequin frog is an Endangered species endemic to the high-mountain forests of Sierra Nevada de Santa Marta in Colombia (IUCN, 2014).

Atelopus frogs face the most severe amphibian crisis: 4 of their nearly 100 species are considered Extinct, and at least 40 have disappeared from their historical ranges. Among the main threats are habitat destruction, illegal crop fumigation, and mortality caused by the chytrid fungus, to which they are particularly susceptible (Valencia, L.M. and Fonte, L.F.M. 2021).

Preparation for *ex situ* conservation

Since its inception 17 years ago, Parque Explora—a science museum, aquarium, and planetarium in Medellín, Colombia—has promoted, by means of education, the conservation of biodiversity with visitors and digital audiences. Two years ago, "Sensitive Conservation" was declared an axis of institutional impact, integrating scientific rigor with empathy, ethical responsibility, and public engagement in conservation practice. Therefore, we want to apply our experience in enclosure design, live food production, veterinary assistance, and monitoring of amphibians to enhance our role in the conservation of highly threatened species.

The Conservation Breeding Program of the happy frog we launch—which includes the development of assisted reproduction protocols and germplasm cryopreservation—seeks to ensure viable *ex situ* populations that will have a positive impact on wild populations. This initiative is not only relevant from an ecological perspective but also a cultural one: it is a water protector in the ancestral cosmologies of Sierra Nevada de Santa

Female (top) and male (bottom) individuals of *Atelopus laetissimus*. © Parque Explora

Marta. Our project responds to the urgency of protecting an Endangered species that is unique to Colombia and the need to develop models and establish institutional capacity to undertake similar actions for other *Atelopus* species in the future.

Some milestones of our commitment

- Since 2007, we have developed permanent outreach and education actions for the conservation of amphibians (Gallego, E. M. R. et al.,2015).
- We participated in the Conservation Needs Assessment workshops with Amphibian Ark (2018) [AArk/ASG Assessment Workshop, 2015; Rueda-Solano 2018; Velásquez 2025] and hosted the international workshop where the Atelopus Survival Initiative (ASI) was created (2019) [Valencia & Fonte 2021]
- We co-financed the publication of the Harlequin Toad (*Atelopus*) Conservation Action Plan (2021) [Valencia & Fonte 2021] and contributed to the Planning Workshop for the Action Plans for the *Atelopus* frogs of Colombia convened by Amphibian Ark and ASI (2025) [CPSG, 2025].
- We adapted laboratories and preliminary *ex situ* management protocols for the species (2019).
- We acquired specialized equipment and reagents (2023) to start assisted reproduction pilots and a bank of genetic resources (2024-2026) [Della Togna, G., 2024].
- We began periodic reproductive monitoring of the species using ultrasonography (2025; more on this below).
- We renovated and expanded the Vivarium, which includes the Biophilia exhibition that invites visitors to explore ways of understanding and relating to nature, as a necessary step to mitigate the environmental crisis (2025).

Amplexant *A. laetissimus* pair. Females weigh up to 4 times more than males. Males lose up to 30% of their weight due to fasting during the amplexus period. © Parque Explora

- We were founder partners of the Tropical Amphibian Research Initiative TARI (2025). Supported by the Bezos Earth Fund, TARI links four conservation centers: Panama Amphibian Rescue and Conservation Project, FUDECI (Venezuela), Centro Jambatu (Ecuador), and Parque Explora (Colombia)[ASA, 2026)].
- The conservation project obtained international certification from the Latin American Association of Zoological Parks and Aquariums (ALPZA, 2025).

Not Only Were We Ready...

...so were the frogs we care for at Parque Explora: they were the right age and size, with abundant eggs and sperm, and males and females receptive to amplexus.

We shiver! Not only because of the cold that these frogs require, but also because of the excitement of listening to the courtship songs that the males sing underwater while *hugging* the females to stimulate them to release their eggs after hormonal induction. It is soulful to see how a female dives with the male on her back, looking for the right place to lay her eggs.

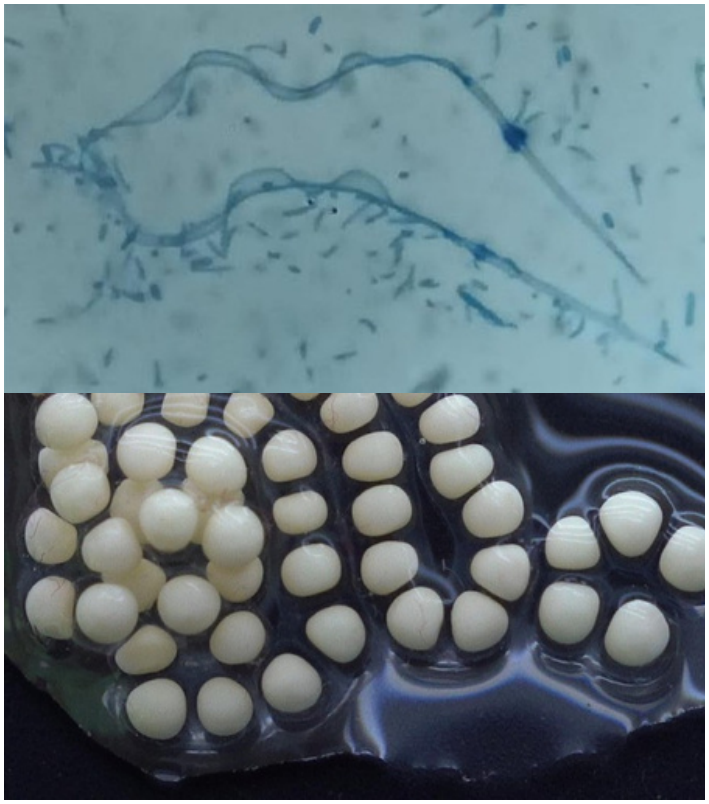
Two weeks of rigorous work under the generous leadership of Dr. Gina Della Togna (ASA) during 2024 and 2026 came with promising preliminary findings: we counted more than 35 million sperm cells in a sample obtained with Gonadotropin-releasing hormone (GnRH) stimulation, which was three times more than any previous count recorded for the genus; almost 400 eggs obtained from a single spawn in the same assisted reproduction pilot.

The Tiny Heart of a Happy Frog, Egg Constellations, and Other Stories from the First Ultrasounds

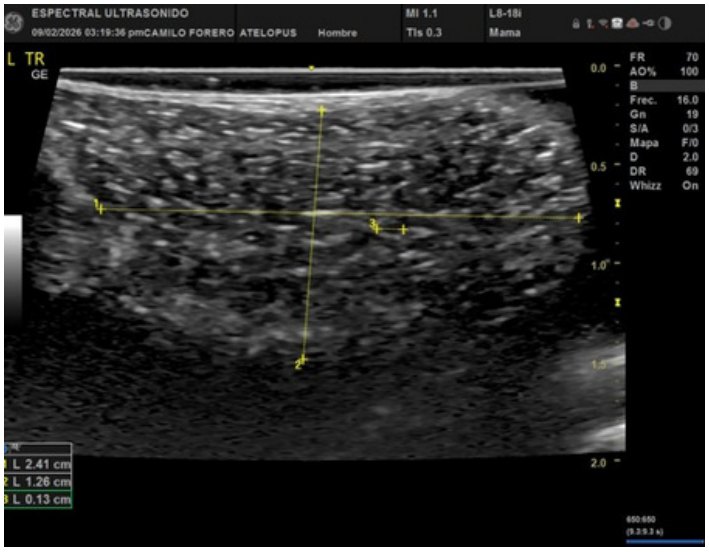
When is the ideal time for males and females to remain in amplexus for extended periods and produce the greatest number of tadpoles? Are weight gains in females related to the number of eggs they produce? In males, do the testicles mature at the same time, or first one and then the other? We don't know!

At the end of 2025, we ventured to investigate the nuptial intimacy of happy frogs through the use of a non-invasive technique: reproductive ultrasonography. To our knowledge, this represents the first reproductive ultrasound monitoring program conducted for amphibian conservation purposes in Colombia. Here they converge in a unique way: ultrasound technologies, specialists who interpret the results of this technique for such unconventional animals, and a team dedicated exclusively to the care of species that no other institution in the world has under its care.

The weekly weight records of recent years began to show statistically significant trends in the variations of increases and decreases in annual weights between different groups of females. This data will now be cross-checked with visual inspection of specimens and measurements of gonads and oocytes for the establishment of a maturation grades index.



Top: *A. laetissimus* spermatozoa obtained with Human chorionic gonadotropin (hCG) stimulation. Bottom: *A. laetissimus* eggs obtained with a prime and ovulatory dosage of GnRH. © Parque Explora.



Cross section cut of a gonad with oocytes. Ultrasonography thanks to Camilo Forero Parra from Espectral imágenes diagnósticas. © Parque Explora.

Although a conservation project is based on the highest scientific standards, it is not free of emotions. On the contrary, we are convinced that any initiative that requires caring for life needs not only technical rigor, but also sensitivity and positive attitudes to approach the beauty and fragility of life.

That is why in conversations in the Conservation and Animal Welfare team, words from specialists appear mixed, such as echogenicity, systole or anechoic, with expressions from excited people such as wow! Beautiful! Gee!

It is a privilege to uncover previously unknown aspects of the species' reproductive biology, from ovaries filled with constellations of eggs to the heartbeat of a frog smaller than a grain of corn.

Why this ex-situ program matters

National leadership: We are the first Colombian institution to develop an ex-situ conservation program for this diverse and tragically decimated group of amphibians. Our observations, records, and analyses pave the way for the conservation of other Atelopus species in the country.

(left) Juan Esteban Cano & Héctor Peña (right) Amphibian Zookeepers. © Parque Explora.

Ethical responsibility: By seeking the compassionate well-being of each egg, tadpole or adult, we achieve Sensitive Conservation that not only appeals to scientific criteria but also to our deepest ethical convictions.

Scientific opportunity: Hearing the males sing underwater for the first time during the nuptial embrace—which lasts for months—justifies every late stay up and early get up of Hector Peña and Juan Esteban Cano, "the happy zookeepers", from the Animal Welfare Team. Researching and caring for this species has enormous emotional gratification.

Gratitude and partnerships: To each sponsor, visitor, co-worker, environmental authority, partner, research center, or digital follower for the support that allows us to lead and inspire actions for the well-being and the conservation of fauna.

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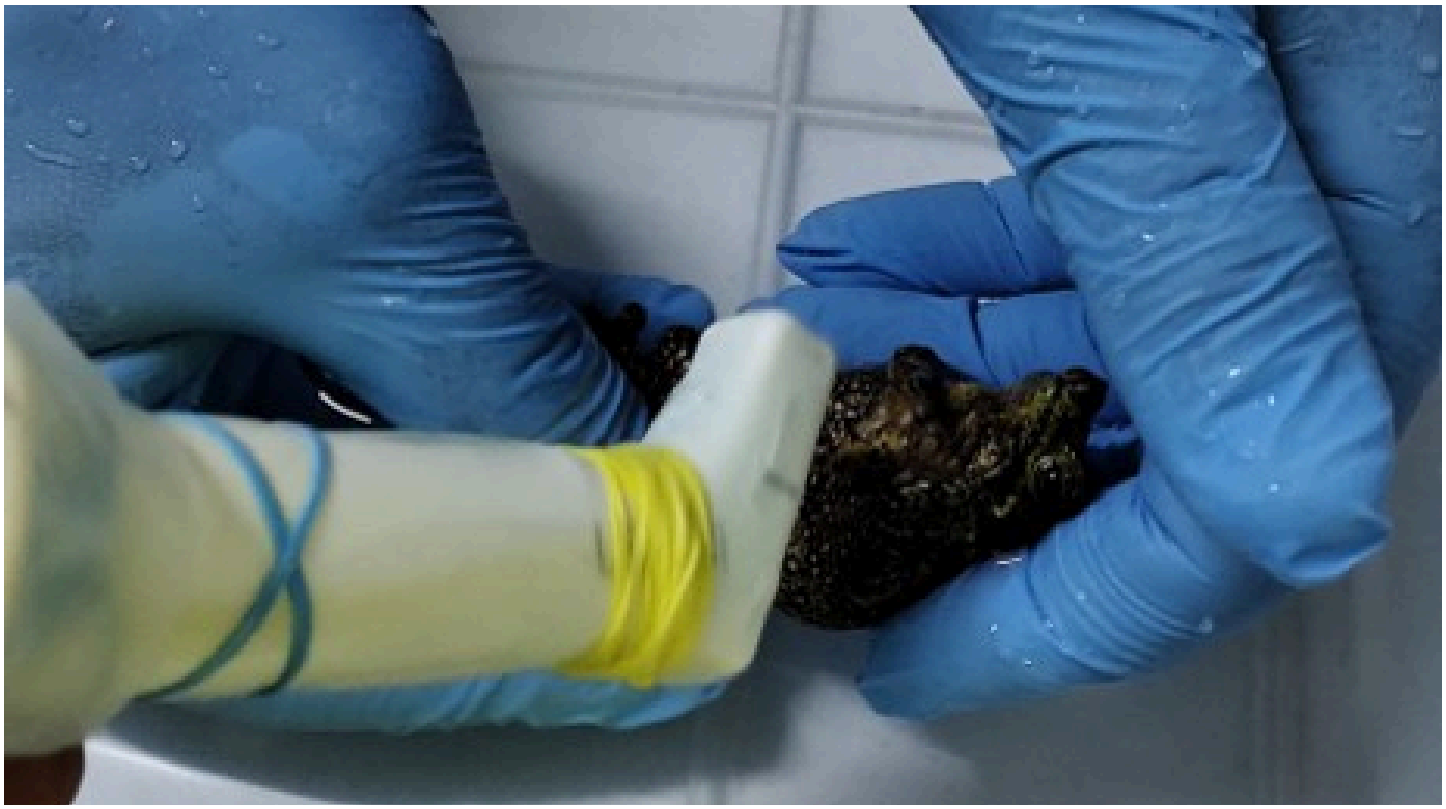

Are you now wondering how a frog gets an ultrasound?
A. laetissimus during ultrasonographic monitoring with a hockey-stick transducer.

Newsletter No. 74, June 2026
ISSN 2640-4141

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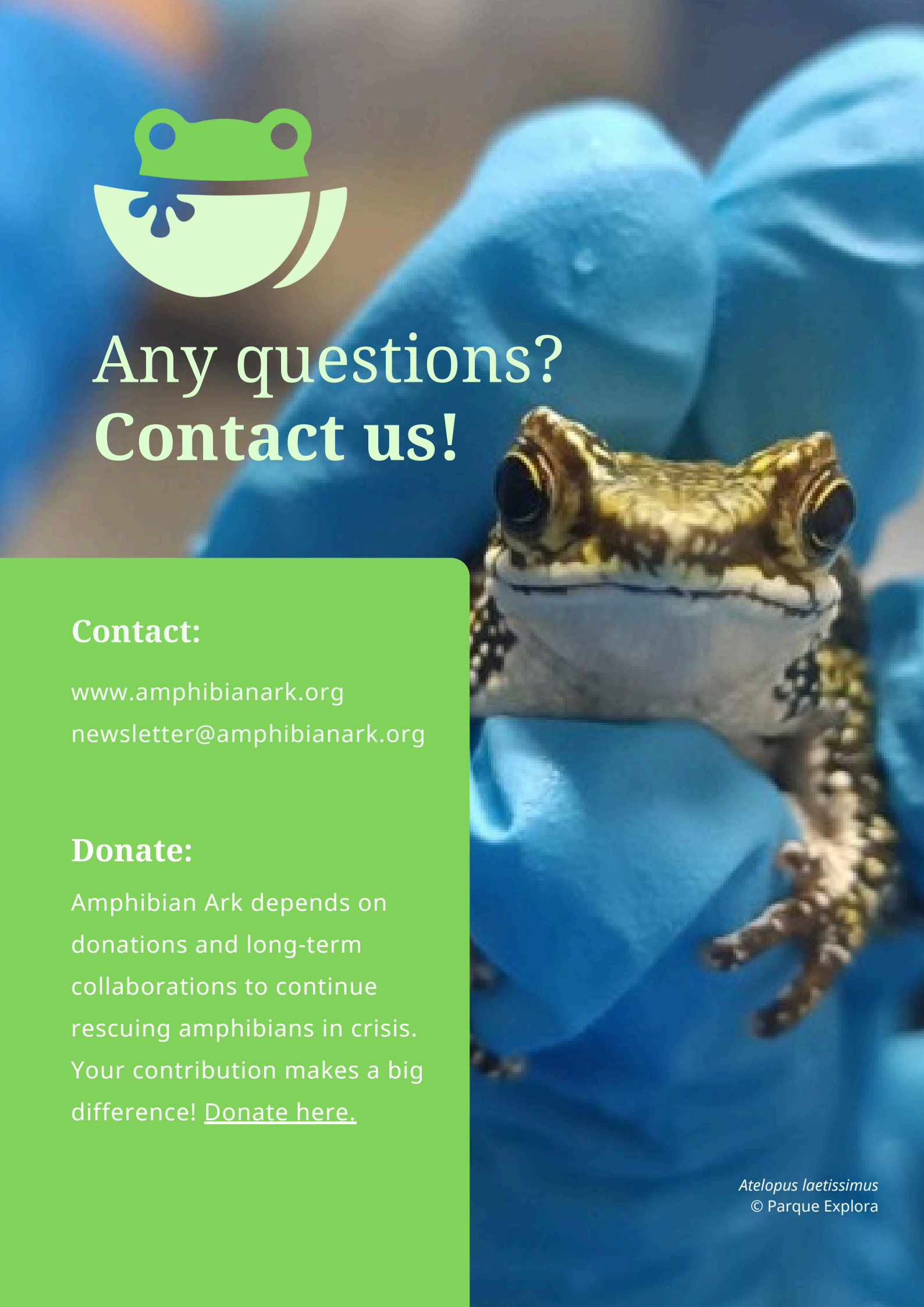

Atelopus laetissimus
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