

amphibian ark

keeping threatened amphibian species afloat

Newsletter

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Above: A family of stewards for Sylvia's tree frog in Costa Rica (pg 5).

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Farewell and Tribute to Anne Baker, Retiring after 9 years as AArk's Executive Director

As Amphibian Ark's Executive Director for the better part of a decade, Anne Baker has been an incredible champion for amphibian conservation and a wonderful leader of the organization. She has decided to retire this year. We are going to miss her, but she will always be an integral part of the AArk family!

"Stepping down as Executive Director of the Amphibian Ark is bittersweet. My time working with the Amphibian Ark staff, its volunteers, the passionate amphibian biologists that I've gotten to know over the years, and our amazing donors has been incredibly rewarding. Coming from a background working with both human and non-human primates, I started at AArk with a woefully deficient knowledge of amphibians. Over the years I've learned that amphibians come in all shapes and sizes, ranging from the Kihansi spray toad that is smaller than a fingernail to the critically endangered mountain chicken of Dominica and Monserrat that can weigh as much as a kilogram. I've marveled at their strikingly beautiful color patterns, chuckled at more than a few of their common names, and been intrigued by their (sometimes bizarre) reproductive strategies. Most of all, I've learned that the world's amphibians are at risk, some perilously so, and that we must do all that we can to ensure their continued survival. It is reassuring to know that AArk will be in the very capable hands of Jonathan Wilcken and the excellent AArk staff. I will continue to support it, and amphibian conservation however I can, and will delight in monitoring the frogs and salamanders as they go about their lives in the little pond in our backyard. A heartfelt thank you to all who work to ensure a future for amphibians." -Anne Baker

Many of Anne's colleagues sent in quotes as a tribute to her legacy:

"Anne's leadership became available at a crucial juncture for AArk and she brought exactly the skills, perspective, and abundant experience in both conservation and administration to our organization as it was settling into a stable long-term organization. I'm not sure AArk would be here today if not for Anne's very timely arrival. Thanks, Anne!"

-Joe Mendelson, Director of Herpetological Research, Zoo Atlanta & former AArk Research and Development Officer

"Anne, you have been a true inspiration during your time as Executive Director at AArk and a fantastic advocate for all those wonderful amphibians. You leave a huge legacy behind you and I wish you all the very best going forward."

-Ben Tapley, Curator of Reptiles and Amphibians, Zoological Society of London

"I can't believe it has been almost a decade since I talked Anne into becoming AArk's Executive Director. I still marvel at AArk's good fortune! AArk has thrived under Anne's steady, supportive, confident leadership. Her straight-forward approach, willingness to listen to all voices, ability to laugh at herself and commitment to her team made Anne an even better leader AArk could have hoped for. What a luxury it was to know that she always had everything under control. It has been an absolute pleasure to work with Anne and I wish her nothing but the very best. I hope she succeeds at retirement the second time around!!"

-Onnie Byers, CPSG Chair

"After many years working in demanding senior executive positions, Anne might have been expected to reduce her workload after she retired as a zoo director. But, as all those who have been fortunate enough to work with Anne know, her commitment to conservation took her straight into another leadership role. Amphibian Ark was undergoing a leadership transition, and Anne agreed to step in and take the organization through a critical period of change and growth. Anne's leadership has been strong and effective. She can be tough and forthright when this is required, but she is also very much a team-player and collaborator, and has greatly strengthened AArk's work with other organizations working on amphibian conservation. She is much appreciated as a mentor, and she leads by example. She never seeks to build her own profile or visibility, but is always driven by what is best for achieving conservation. Anne, it's been a huge privilege to work with you – thanks for all that you have given to the amphibians. As George might say at his most effusive: 'good job!'."

-Simon Stuart, Chief Scientific Advisor, Synchronicity Earth

"Anne Baker, as Director of the Toledo Zoo and subsequently, Amphibian Ark, has been a steadfast advocate of conservation of many animals, but particularly amphibians. Anne's trust in her team at the Toledo Zoo resulted in (pardon the pun) major leaps in the captive breeding of threatened amphibians and the transfer of knowledge to others. Hosting the AZA Amphibian School and supporting Amphibian Ark initiatives created many practicing conservation specialists around the world. The global amphibian conservation field would not be as successful or advanced without Anne's abilities and contributions. It has been a great pleasure and honor to have worked with her."

-Ron Gagliardo, Horticultural Experience Specialist and former AArk Training Officer



One of Anne's favorite pictures, taken during AArk's first 'Advance' Meeting. Kevin Johnson (left), Anne Baker (center), and Luis Carrillo (right). Photo: Amphibian Ark

"Anne's strategic and committed leadership of Amphibian Ark over the last decade, and her continued support of the IUCN SSC Amphibian Specialist Group and the Amphibian Survival Alliance, have made an indelible imprint on global amphibian conservation. A massive thank you, Anne, for your leadership and collegiality. It has been a privilege and a pleasure to work with you."

-Ariadne Angulo, IUCN SSC Amphibian Specialist Group Co-Chair

"It has been a rewarding experience to have worked with Anne over the past few years and to have developed a good friendship. She has dedicated many, many hours of her own time to support not only the Amphibian Ark, but some of our allies too, including the Amphibian Survival Alliance and the Amphibian Specialist Group. I wish you all the best in your retirement!"

-Kevin Johnson, former AArk Taxon and Communications Officer

"Anne came to the AArk in a moment of uncertainty and her experience and passion guided us through and beyond. Her kindness and vision have inspired all of us and had make the AArk a much stronger organization. Anne was always there to help us handle difficult work situations but also on the personal level. Over the last 9 years, AArk became a true team with Anne as our leader! We will miss you, but you deserve a second retirement!!"

-Luis Carrillo, AArk Training Director

"Although I've only known Anne for a relatively short amount of time, I have been inspired by her fierce commitment to both conservation and to her community. Anne embodies a rare combination of perception, passion, and a propensity to believe in others—she is a true leader. She has already had a wonderful impact on my life, and I feel very lucky to have worked with her."

-Becca Brunner, AArk Program Director

"Both professionally and personally, it has been wonderful working with Anne!! I've seen firsthand how her generosity – sharing her time and her talents as AArk's Executive Director – has impacted AArk in so many positive ways. It's been my great pleasure to work with her on AArk. Cheers and congratulations Anne!"

-Elizabeth Townsend, AArk and CPSG Finance Officer

Welcoming Amphibian Ark's new Executive Director, Jonathan Wilcken



Amphibian Ark is thrilled to announce the appointment of our new Executive Director, Jonathan Wilcken!

Jonathan has worked for more than 20 years within the *ex-situ* community. As the former director of Auckland Zoo in New Zealand, he steered the organization through 10 years of growth and development as a modern conservation-focussed zoo. Prior to this, he led the Australasian Zoo and Aquarium Association. In recent times, Jonathan has worked in regional government, developing strategy and policy for Auckland's cultural sector, and heading up the city's cultural infrastructure investment program.

Jonathan has also worked extensively with the global zoo community, having led efforts to establish global conservation breeding programs for zoos under the World Association of Zoos and Aquariums (WAZA) and promoted global standards for wildlife data as Chair of Species360. As part of the Species Survival Commission's Conservation Planning Specialist Group, Jonathan helped develop the OnePlan philosophy, aimed at integrating the management of *ex situ* and *in situ* wildlife populations for conservation.

Jonathan is excited to return to the conservation community, taking up the role of Executive Director of Amphibian Ark in September.

Jonathan Wilcken, Amphibian Ark's new Executive Director. Originally from Australia, Jonathan currently lives in England with his family.

Photo: Jonathan Wilcken

A successful veterinary medicine training course at Ecoparque, Buenos Aires

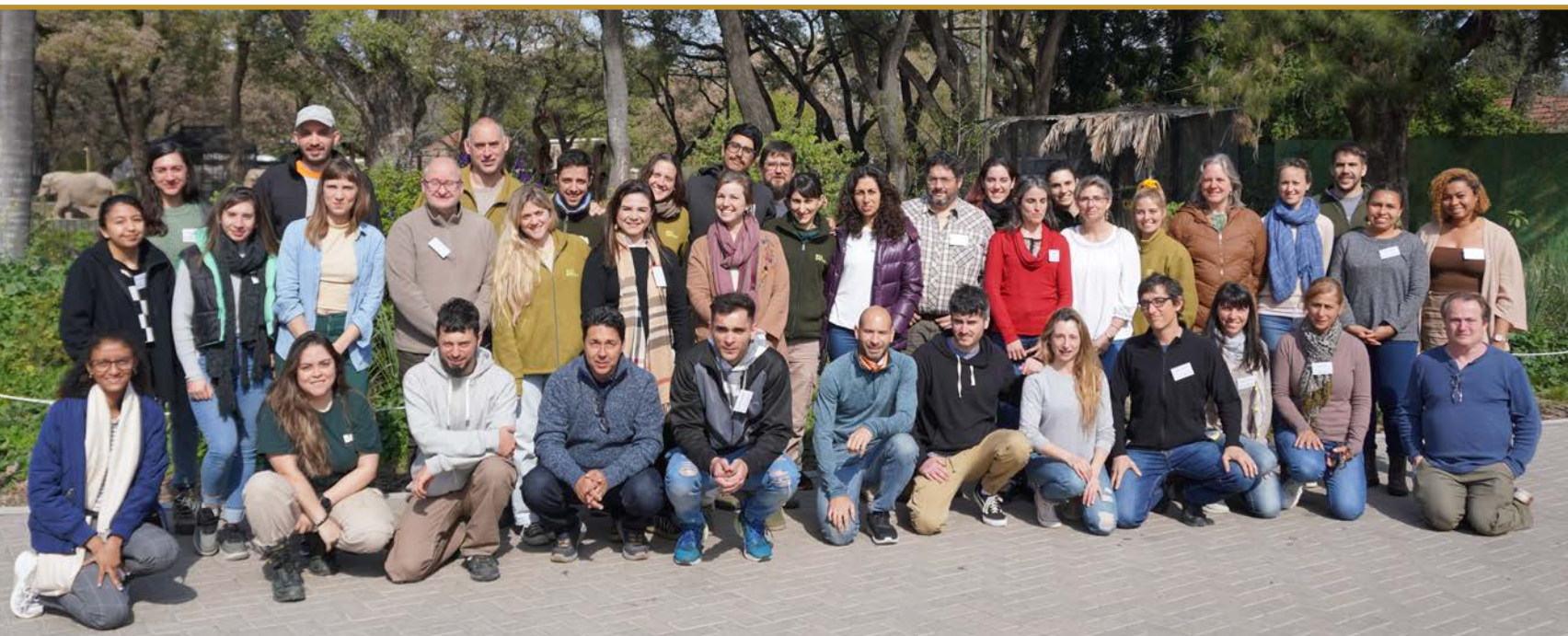
Luis Carrillo | Director of Training, Amphibian Ark
Federico Kacolis | Fundación Somuncura & CONICET-UNLP
Borja Baguette | Ecoparque, Buenos Aires, Argentina

Amphibian Ark has been supporting *ex situ* conservation programs in Argentina since 2018. To date, we have supported 6 programs; some have received both start-up and continuation grants. AArk also hired Dr. Federico Kacolis from Fundación Somuncura /CONICET-UNLP in 2021 to help advise and ramp up conservation programs in Argentina.

In an AArk survey last year, former course participants in Argentina expressed their interest in veterinary medicine training since there is very little expertise in the country. In response, we partnered with Fundación Somuncura and Ecoparque Buenos Aires to organize a training course. Although the course was mainly created to support all of the current Argentinian *ex situ* amphibian conservation programs, we also opened registration to any person from other *ex situ* programs within the region to participate. We ended up training 30 participants from Argentina, Brazil, Chile, and Panama.



Dr. Allan Pessier from Washington State University
 during one of his presentations.
 Photo: Luis Carrillo



Course participants.
 Photo: Ecoparque, Buenos Aires

Borja Baguette (left) from Ecoparque de Buenos Aires welcoming participants.
 Photo: Luis Carrillo

We were fortunate to have the expertise of Dr. María Forzán from the University of Long Island and Dr. Allan Pessier from Washington State University, who shared their knowledge and experience on amphibian husbandry, veterinary medicine, and pathology.



The course covered a wide variety of topics, ranging from anatomy and physiology to anesthesia. Participants also had the opportunity to share and discuss their husbandry and veterinary issues with the faculty and their peers.

Responses from a post-course survey demonstrated that this training course not only served participants in helping them acquire and strengthen knowledge on amphibian veterinary medicine, but also in creating bonds among the existing *ex situ* conservation programs within Argentina.

New facilities and a documentary episode for Project Palaka in the Philippines

Norman Greenhawk | Project Palaka, the Philippines

It's been a hectic, busy 2023 for Project Palaka. Conservation organizations, like all others, grow and change over time. Last year, it became apparent that we needed to expand our facilities so we can eventually expand the size of our Gigantes forest frog (*Platymantis insulatus*) colony, as well as other frogs species we work with. We also needed more people to assist with care of the frogs that we do have. Thankfully, Mandai Nature, one of our supporters, introduced us to two organizations here in the Philippines: Wildlife in Need and Ocean Adventure. I'm happy to report that Project Palaka has signed a partnership agreement with both.

Wildlife in Need (WIN) is a conservation nonprofit that is dedicated to caring for wildlife that has been injured, surrendered, or seized by law enforcement officials. The WIN Rescue Center cares for everything from injured eagles, macaques, and orphaned bats to confiscated tortoises. Ocean Adventure (OA) is an open-space water marine zoological park with a heavy emphasis on conservation. OA and WIN are founders of the Philippine Marine Mammal Stranding Network, and OA's staff often travel to assist with dolphin strandings and other marine mammal emergencies.

Ocean Adventure provided us with the use of an aquarium facility that had been sitting empty since the COVID-19 pandemic. The building has been well-maintained and is strong, secure, and able to withstand typhoons, so we're certain our frogs will be safe. Now, instead of fish, it houses our *ex situ* colony of IUCN Critically Endangered *Platymantis insulatus*. Both OA and WIN staff have been trained in the proper care of *P. insulatus*, as well as the admittedly less enjoyable tasks of insect colony maintenance (the frogs' food). The staff's daily assistance with caring for the frogs is quickly turning our project into a well-oiled machine, and we're excited to see what this new partnership holds for the future.



Gigantes forest frog (*Platymantis insulatus*) juveniles, born in October 2022, are doing well in their new facilities in the Philippines!

Photo: Norman Greenhawk



Relocating the frogs was no easy task. We first visited Ocean Adventure in January 2023 to inspect the facility. But it took until June to secure the permits, hire the movers and trucks, remove the project from the UPLB hortorium, and transfer it to Subic Bay Freeport. During this time, keeping the frogs as stress-free as possible was our top priority. They were packaged as they were when we removed them from the Gigantes Islands. Each frog was placed in a small plastic container with ventilation. The containers had a substrate of sterilized, moistened "cocopeat" (shredded coconut husk) to maintain humidity. All frogs were then packed into Styrofoam coolers and moved to a dedicated, air-conditioned passenger van. A member of Project Palaka was with the frogs at all times and monitored them regularly during the transport to Ocean Adventure.

With the new location came a new corporate structure. I'm happy to announce that as of July 2023, Project Palaka is now officially a Philippine nonprofit organization, registered and recognized by the Philippine Securities and Exchange Commission. This is significant, as Project Palaka is now an independent legal entity in the Philippines, increasing the chances of long-term sustainability and viability for our conservation efforts. Our first Board of Directors consists of John David Pilapil (Chairman), Abdullaziz Sam Arcillo (Vice-President of Research), Jazz Torres Ong (Vice-President of Educational and Community Outreach) and myself, Norman Greenhawk (President). We look forward to expanding and growing our board to include both conservationists and conservation-minded business professionals here in the Philippines.

Ocean Adventure staff Jayson Oliver and Thabit Al-huneirny check on the frogs.

Photo: Norman Greenhawk



Left: A gravid/pregnant female of the Gigantes forest frog. Right: A welcome surprise after a new breeding strategy: eggs!
Photo: Norman Greenhawk/Project Palaka

Perhaps the most unexpected development in our project occurred in the beginning of September. Thanks to our new partners at Wildlife in Need, we were introduced to the cast and crew of “Born to be Wild”, an immensely popular TV nature documentary series here in the Philippines. On September 8th, our team spent the day filming with Dr. Ferds Recio, one of the show’s hosts. It was an interesting experience, and after experiencing what it is like “behind the scenes”, we came away with a newfound appreciation of the amount of work and dedication it takes to produce a single show. The episode featuring Project Palaka will air in October, and we are excited; “Born to be Wild” is a Tagalog-language show with a large audience, and no doubt their feature will bring new awareness to our work.

Most importantly, while we were filming, we came across a most welcome surprise. The extra space at our new facility has allowed us to set up the *P. insulatus* in 75-gallon communal tanks, which we hope will encourage them to breed even more. Previously, we paired the frogs (one male, one female) for breeding attempts—this did not work. Then, we housed the frogs in 20-gallon tanks with one male and three females; this worked, with our first breeding success occurring in October 2022. However, we have only been able to breed the frogs twice since then. During filming, Sam noticed that the mulch covering one of the plant pots had been flung about the tank. Upon inspecting closer, I found not one, but two clutches of eggs buried at the base of the houseplants we placed in the tanks; two females successfully mated and deposited eggs at around the same time. The plants containing the eggs were removed from tank and placed in a nursery tank, allowing us to monitor the development of the eggs and ensure that the young are protected from potential cannibalism by the adults when they hatch. We believe that there are some yet-understood factors in mate selection, and so the frogs are now housed with 8-10 individuals (2 males) per 75-gallon tank.

This, in the end, is what we’re here to do; our primary purpose. The new facilities, the television exposure, and the registration of our nonprofit are wonderful developments, but they would be for naught if we don’t actually succeed in our goal: to produce captive-bred *P. insulatus* and return them to the wild. To that end, we’re in the process of securing the necessary permits to release the first batch of offspring (born October 2022) back into the wild in Gigantes. We look forward to continuing our efforts to protect *P. insulatus*, with the goal of stabilizing the population enough to downlist it from its current IUCN status of “Critically Endangered”.



Shooting the episode of “Born to be Wild” with host Dr. Ferdz Recio (center), Project Palaka Assistant Director Sam Arcillo (left), and Director Norman Greenhawk (right).
Photo: Norman Greenhawk

Acknowledgements and thanks:

These developments would not have occurred without the support of our funders, including **Amphibian Ark, which provided an Emergency Grant to allow for our relocation.** Emergency funding was also provided by Mandai Nature, IUCN Asian Species Action Partnership, and Synchronicity Earth. We are thankful for the continued support of these organizations. Project Palaka’s attorneys, Atienza & Pedrosa Law Offices in Metro Manila, did a phenomenal job with the nonprofit incorporation paperwork. We want to thank our new partners, Ocean Adventure and Wildlife in Need, for helping Project Palaka take this leap in growing our organization. We thank the cast and crew of Born to be Wild for taking an interest in our project and featuring us in their upcoming episode. We thank our former partner, the UPLB Museum of Natural History, for providing use of the hortorium to house the project until June 2023.

A local family's efforts to protect Sylvia's tree frog in Costa Rica

Amanda Bamford | University of Manchester, England

The Montsant-Casado family made a special discovery on their land during the Covid-19 lockdown in Costa Rica: a thriving population of Sylvia's tree frog (*Cruziohyla sylviae*). Described in 2018 by Andrew Gray, this species is not well documented in the wild and may be under threat, as it was once believed to be a subpopulation of a different species altogether.

When the Montsant-Casado family found this species at their renowned La Kukula Lodge on the humid Caribbean coast, they contacted Andrew and invited him to visit. He finally had a chance to meet the family on his recent trip to Costa Rica to support the University of Manchester's tropical field course.

The Montsant-Casado family has since been documenting new aspects of Sylvia's Tree Frog's natural history. They have also been supporting its conservation through habitat preservation and tadpole rearing, ensuring healthy young froglets get a real head start into their protected area. This incredible family effort has thus helped boost the local wild population of Sylvia's Tree Frog. They declared the La Kukula Lodge as a main sanctuary for the species.

The Montsant-Casado children, Bruna and Baxter, have been especially inspired to help this amazing frog species. They even created their very own on-site and environmental sustainability-focused 'Frog Museum'!

When we asked Andrew Gray about the Montsant-Casados, he said, "We are very proud to connect with this genuinely caring family and in awe that young people in the species' country of origin are so enthusiastic about what we call 'Head-starting' - a major positive action to support the conservation of these rare frogs. The family's efforts to help local wildlife, and those of the nearby Jaguar Rescue Centre with whom they associate, are a real credit to the community on the Caribbean coast of Costa Rica".



Bruna Montsant-Casado releasing a froglet. Her family raises Sylvia's tree frog tadpoles at their lodge to increase this frog's chances in the wild.

Pepo Montsant and his children, Bruna and Baxter, watch as a female Sylvia's tree frog lays eggs (while the male is still on her back)!



Bruna and Baxter in the Frog Museum they were inspired to create to help Sylvia's tree frog.
Photos: Montsant-Casado Family

Links

<https://www.nationalgeographic.com/animals/article/scientist-discovered-new-frog-species-sylvias-leaf-frog>

<https://www.jaguarrescue.foundation/>

<https://www.lakukulalodge.com/>

Rediscovery of an elusive Venezuelan Andean harlequin frog

Enrique La Marca | Rescue of Venezuelan Amphibian Species Center (REVA), Venezuela

Leomerth Lacruz | Guaramacal Andean Bear Project & National Parks Institute (INPARQUES), Venezuela

Marcos Hidalgo | Guaramacal Andean Bear Project & Los Andes University, Venezuela

At first glance it seemed they found what they were searching for. Marcos' and Leomerth's hearts suddenly sped up at the sight of a harlequin frog that had remained elusive for nearly 36 years. But the emotion was fleeting; the frog, on the banks of a ravine, was dead. A detailed inspection of the specimen, which was in a partial state of decomposition, revealed that it had missing parts of some digits and the viscera emerged from its open belly. No apparent causes were found as to why it was in that condition. However, this was an unexpected encounter, to see an adult specimen after an effort of years of searching. But what is this amphibian that refuses to be seen?

We must go back to December 26, 1985, when one of us, Enrique, began explorations in the almost intact cloud forests of the southern slopes of the Guaramacal branch, a mountainous region near Boconó, Trujillo state, in the Andes of Venezuela. At that time, Enrique collected seven tadpoles of a harlequin frog in intermediate stages of development that, due to their coloration, he suspected could be an unknown *Atelopus* species.

The only previous encounter with adults of the species occurred on December 10, 1987, when Enrique, in the company of his students Juan E. García, Abraham Mijares and Maricela Sosa, collected the first adults. There was no longer any doubt that they represented a yet undescribed taxon. Other amphibians, in the genera *Pristimantis*, *Aromobates*, and *Hyloscirtus*, lived in sympatry with this species.

Most of the observations of specimens of this colorful bufonid (mainly tadpoles) corresponds to the months between December and March, precisely when the least rain falls in the region. The maximum rainfall occurs during the months of June and July; while a marked decrease in rainfall begins in October, so it can be inferred that between October and November reproduction and egg-laying of the species occurs.

This frog is only known from a mountainous stream (Quebrada El Pollo) and one of its tributaries (Quebrada El Pollito), in the General Cruz Carrillo National Park in Guaramacal, an area of almost 215 km² under a special protection that was established on May 25, 1988, shortly after the collection of the type series that will be the basis for the description of the new species.



A Guaramacal harlequin frog found dead in a Venezuelan cloud forest stream. This coloration is typical of the adults in this yet-to-be described species.

Photo: Leomerth Lacruz

Even though the species seems to have a high fidelity to the site, adult specimens have not been seen for decades, which led to its inclusion in 2008 in the Red Book of Venezuelan Fauna as Critically Endangered, while its inclusion in the IUCN Red List is pending the species' formal description.

The Guaramacal *Atelopus* is the largest species in the genus in Venezuela, with females reaching up to 5.3 cm in snout-vent length and males of almost 4 cm. It has diurnal and terrestrial habits and is found associated with streams with small waterfalls. It is distinguished from all other species in the genus by differences in morphology, coloration, and its tadpole. Adults have a reddish or greenish-yellow back and a red belly. Juveniles are olive green with red dorsolateral glandular warts.

Research on this species has benefited from the direct or indirect support of different organizations, such as the *Atelopus* Survival Alliance, **Amphibian Ark**, Global Wildlife Conservation (now Re-Wild), Mohamed bin Zayed Conservation Fund, Chessington Conservation Fund, Idea Wild, Provita, Rio Verde, Guaramacal Andean Bear Project, and the Biogeos Foundation through the REVA Conservation Center.



Searching for frogs in Quebrada El Pollo, Guaramacal National Park, Venezuela. Photo: Erik La Marca





General view of the montane forests in the Guaramacal National Park, from the viewpoint of Laguna de Los Cedros.
Photo: Enrique La Marca

As with the rest of the Venezuelan Andean *Atelopus*, adults of the Guaramacal Harlequin Frog have not been seen for a long time, despite the fact that our search has been relatively continuous over the last few decades. Although the adults continue to be elusive, several groups of researchers (notably those led in the past by Juan E. García) have managed to find tadpoles and newly post-metamorphic specimens. Visual and acoustic monitoring has been carried out since 1990 (a thorough one between 1994 and 1995), once a year between 1996 and 2005, and between 2010 and 2011. From these searches, 30 tadpoles and 3 recently metamorphosed specimens were found in 1994, 30 tadpoles and 1 newly metamorphosed juvenile in 1995, 20 tadpoles in 2004, and potentially almost 350 larvae by field survey in the years 2005, 2010 and 2011. These figures and the elapsed time suggest that there is at least one reproductive pair or a small breeding population in the area.

We resumed monitoring this population in mid-2020. There were sightings of tadpoles in November 2020 (30 larvae), February 2021 (55 larvae), January 2022 (30 larvae); these records coincide precisely with the season when the streams have reduced their flow. On April 8, 2022, we found the dead specimen (snout-to-vent length 4.2 cm; sex unidentified) that we referred at the beginning of this article. That day we counted 49 tadpoles in the El Pollo stream. The 2023 dry season (January-March) has been more pronounced than in previous years. The most developed tadpoles are found in the month of March, which seems to corroborate the hypothesis that egg laying coincides with the end of the rainy season.

Our most recent visit to Quebrada El Pollo, at an elevation of 2,320 m.asl, was on August 9, 2023, during the height of the rainy season. The stream was somewhat swollen compared to its flow during the dry season. It had, in the vicinity of its intersection with the road, a variable width between 120 and 140 cm and a variable depth between 17 and 40 cm, values that practically double those observed during the immediately preceding dry season. The main flow of water, in an explored path about 200 meters long, runs in the form of a torrential stream with small waterfalls between large rocky blocks, and the presence of some lateral pools, as well as a riverbed made up of small rocks and gravel.

The vegetation of the place is of the cloud forest type, with unidentified trees up to 20 m tall, as well as other tree species (*Cecropia* sp., *Carramboa trujillensis*, *Clusia* sp.), tree ferns (*Cyathea* sp.), bamboos (*Chusquea* sp.), some shrubs (of the families Asteraceae, Piperaceae, Melastomataceae, Solanaceae, Rubeaceae), and small plants such as sedges, bromeliads, begonias, ferns, mosses and liverworts (the latter two covering mainly the rocks inside and on the sides of the ravine).

Tadpole of the Guaramacal harlequin frog, clinging to a submerged rock.

Photo: Marcos Hidalgo



Aside from the obvious intervention along the route of the narrow-paved road that leads from Boconó to the village of Guaramacal, the cloud forest appears pristine. It is likely that some flooding in the streams, coupled with pronounced droughts and landslides on the streams, have had a negative impact on the frog population. It is also likely that it was affected by the chytrid fungal pathogen (*Bd*), although this was not detected in histological samples taken from our specimens collected and preserved in 1987, a year that falls within the decade that is key to population decline in many other *Atelopus* species.

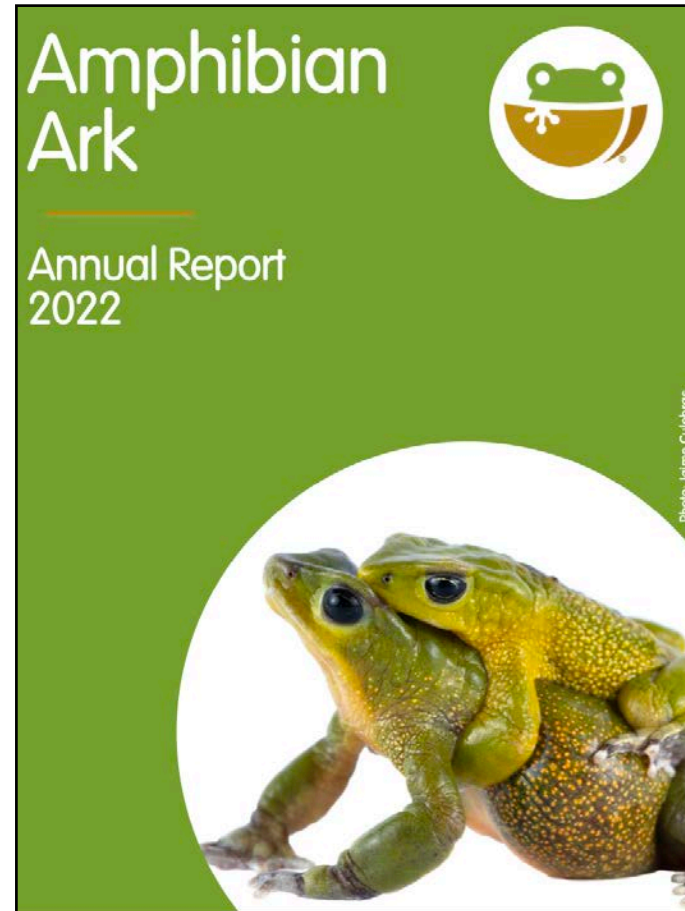
REVA and the Guaramacal Andean Bear Project maintain an alliance to continue with the search efforts for this unique species. We hope these efforts will be successful soon. Given the critical state of the population of this amphibian, the implementation of an *ex situ* conservation program for this species is urgent.

Amphibian Ark 2022 Annual Report

Becca Brunner | Program Director, Amphibian Ark

Check out AArk's 2022 Annual Report, which has been redesigned and contains summaries of our accomplishments last year—including our efforts in training, collaborative conservation planning, outreach, and awarding grants to the next generation of ex situ conservationists around the world!

Read it by clicking here: https://www.amphibianark.org/wp-content/uploads/2023/09/2022_AArk_Annual_Report.pdf



Outreach



Quarterly AArk newsletters, in both English and Spanish, provided updates on captive conservation programs around the globe. Program managers shared their successes, and occasional failures, so others could learn from their husbandry and reintroduction experiences.

Our website has continued to grow. Our Husbandry Document library now contains over 300 articles on topics ranging from enclosure size, appropriate lighting, and reintroduction. It remains the most-often-visited section of the website, providing a wealth of information for amphibian program managers.

In a presentation at the Third Colombian Congress of Herpetology in Cali, Columbia, AArk staff presented a summary of the advances that amphibian conservation programs have achieved in the last 12 years with AArk's support. The presentation reached over 300 participants, increasing their awareness of the types of support AArk offers to range country programs.

Looking Ahead



In 2023 we will be repeating the very successful Argentinian effort in Brazil, hiring two Brazilian amphibian experts to work with the Brazilian zoo and university communities, as well as with the Brazilian government, to implement recommendations from the Strategic Amphibian Conservation Action Plan and the Conservation Needs Assessment (CNA) recommendations. We're looking forward to continuing to expand amphibian conservation work in Brazil and in other regions around the globe.

We will also be collaborating closely with the Atelopus Survival Initiative (ASI) to perform CNAs for all harlequin toad species (genus *Atelopus*), many of which are threatened with extinction due to habitat loss and disease.

With this report, we also say farewell to Kevin Johnson, AArk's Taxon and Communications Officer from 2009-2022. Kevin retires from AArk to complete an Australian walkabout interrupted by Covid-19. He will be replaced by Dr. Rebecca (Becca) Brunner, who is excited to continue her contributions to amphibian conservation at AArk.

Training

AArk continued building capacity around the globe through two AArk Webinar series that provided participants with access to experts in the field of assisted reproduction and nutrition.



The **11 webinars** delivered as a part of the **Amphibian Assisted Reproductive Techniques series** reached **70 participants** and included lectures on both frogs and salamanders delivered by 15 researchers. Topics covered included hormonal stimulation for gamete collection, gamete quality and viability testing, cryopreservation, sperm collection and artificial fertilization and using IVF for genetic management.

Our **Nutrition and Feeding webinar series** reached over **200 amphibian husbandry practitioners** from zoos and aquariums, universities, NGOs, and the private sector in **24 countries**. During the three-day series, professionals experienced in amphibian medicine and nutrition covered topics such as the basics of amphibian nutrition, the importance of carotenoids and vitamins, nutritional diseases, nutrient composition of insects, and establishing food colonies using native species.

For the second year in a row AArk staff delivered a talk on **Amphibian Veterinary Medicine** to **30 students** at the Congreso de Estudiantes Veterinarios del Ecuador (CEMVE).

AArk courses received high marks from participants, as well as requests for additional courses.

vision

The world's amphibians thriving in nature

mission

Ensuring the survival and diversity of amphibians, focusing on species that cannot be safeguarded in their natural environments




Fire Salamander Day: A first awareness celebration in Germany

Sandra Honigs | Aquazoo Löbbecke Museum, Düsseldorf, Germany

The lacquer-black, yellow-spotted Fire salamander (*Salamandra salamandra*) is one of the best-known amphibians of our homeland, Germany. It grows to an impressive size of over 20 cm and is native to many European countries. It is hard to imagine myths and legends without this salamander. In Germany, fire salamanders were once regarded as supernatural creatures because of their poisonous skin secretions, and they were said to be able to extinguish fires with their bodies and survive. Therefore, a lot of fire salamanders were thrown into fires; this species probably got its common name for this mysterious reason—although they actually cannot survive fire!

Despite its large distribution area, this wonderful amphibian is not doing well. We now honor the Fire salamander with its own special day. The first 'Fire Salamander Day' took place this year on September 3rd. We are proud to join the other amazing awareness days for amphibians, such as Waterfrog Day (April 1st), Salamander Saturday (first Saturday in May), the World Frog Day (March 20th), and the Save the Frogs Day (last Saturday in April).

For some years now, the Fire salamander has been gaining a lot of attention due to increased reporting on the dreaded 'salamander eater' or 'salamander plague.' The often rapidly fatal fungal disease is caused by a relatively new species of a fungal pathogen (*Batrachochytrium salamandrivorans*), Bsal for short. The fungus was introduced to Europe from Asia via the amphibian trade (Auliya, 2016) and first appeared in the Netherlands and Belgium (Martel et al., 2013, 2014). Our native caudates do not yet have a suitable response to this new threat and are dying off rapidly and in large numbers. Thus, the occurrence and diversity of native salamanders are threatened. Germany lies in the hotspot region of this fungus. The core distribution of Bsal in Europe is located in the Eifel (Bolte et al., 2023). On September 3rd, 2013, the new fungus was described scientifically for the first time (Martel et al., 2013). Therefore, the Aquazoo Löbbecke Museum has now proclaimed September 3rd as "Fire salamander Day" to counter the danger with something positive.

More than 30 institutions, associations, zoological institutions, nature parks and protected areas across Germany and Austria organized activities to draw attention to the threat posed to the Fire salamander by Bsal and the need to protect this and other amphibian species. There were inspiring ideas in numerous institutions to present the Fire salamander. Various initiatives are already breeding the Fire salamander in a coordinated manner and working groups are researching how to combat Bsal. By breeding the Fire salamander in captivity, it is possible to preserve this species until a solution or a vaccine for Bsal becomes a reality. The breeding and conservation station for amphibians in the Aquazoo Löbbecke Museum participates in this breeding and keeps several groups of Fire salamanders. One of them is registered by Citizen Conservation. This association of private keepers and scientific institutions coordinates the keeping and breeding of various endangered species that, in the medium term, only have a chance of survival under human care.



The Fire salamander (*Salamandra salamandra*).
Photo: Aquazoo Löbbecke Museum

Participants of the scientific lectures during the first Fire Salamander Day, along with the mascot 'Lurchi.'
Photo: Aquazoo Löbbecke Museum, Düsseldorf, Germany





Fire salamander habitat diorama.

Photo: Mr. Kriener/NABU/Tierpark Bochum

On the Fire Salamander Day, 'Lurchi,' the most famous Fire salamander in Germany and the mascot of a shoe manufacturer, welcomed the numerous young and old guests at the Aquazoo. As part of a free lecture program, colleagues from the Universities of Wuppertal and Leipzig, as well as from Wuppertal Zoo and the Aquazoo, reported on the biology of the Fire salamander and provided information on current results from research. The lectures were filmed and are available as Youtube videos by request. The Stiftung Artenschutz (Species Conservation Foundation) and Citizen Conservation presented their projects for the protection of endangered amphibians, and the Lower Nature Conservation Authority of Düsseldorf addressed the occurrence of the Fire salamander in the area of Düsseldorf.

At information points, guests could learn a lot of interesting facts about the Fire salamander and about Bsal. There were also films about these species by "Frogs & Friends" throughout the day. We provided important information and advice on how to behave in the forest in order to limit the rapid spread of Bsal. Since Fire salamanders prefer to live in deciduous forests with clear streams and suitable riparian zones, their ranges overlap with popular hiking routes. In 2015, there was a call for volunteers (Löfters et al. 2015) to report dead or ill-looking salamanders in order to clarify the distribution of Bsal in Germany. There is still an opportunity for the public to contribute to research and the protection of the Fire salamander.

Colleagues of the Aquazoo Löbbecke Museum designed individual 3D printed figures of the Fire salamander (© Hellbender Museum); 39 unique specimens were created, which were sold for the benefit of the Fire salamander conservation project. Each figure was uniquely designed to illustrate each animal's individuality and how valuable they are for biodiversity. Thank you to everyone who contributed to the success of our first event!



Fire salamander informational materials and 3D printed figures (© Hellbender Museum) that were sold for conservation. Photos: Aquazoo Löbbecke Museum and Tierpark Tannenkamp Wolgast e.V.

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100-year Frog Museum in Japan displays thousands of frog items from around the world

Vikki Takayama | 100-year Frog Museum (100年カエル館), Japan

The 100-year Frog Museum in Kitakata city (Fukushima prefecture), Japan displays a dedicated collection of frog items from around the world. This private museum is run by my sister, Kerori Takayama, and myself, Vikki Takayama. We are dedicated to preserving our grandfather's legacy: he started collecting frog items made of natural material about 100 years ago! His son, and now his granddaughters, have continued the family tradition by adding frog pieces to his collection. To date, our family has collected over 6,000 frog-related items.

We established the 100-year Frog Museum in 2004 in our parents' original house. We have repurposed their furniture and other features of the house as exhibition cases, which now display everything from frog-themed decorations, ornaments, fashion accessories, practical products, and art with frog motifs.



About 2,000 frog items are displayed at a time. They are thematically categorized; examples include "Frogs in Japanese traditional culture," "Frogs in the fantasy world," "Frog-themed gardening items," and "Frog figures reflected in nature." Through our exhibits, we hope to educate people about the relationship between frogs and human culture. We also hold events all over Japan and publish a tri-annual newspaper with interesting articles about frogs.

We were closed during the Covid-19 pandemic, but we are now open again for the first half of each month. If you'd like to visit our museum, please check out our website: <http://kaeru-kan.com> (look English translation on the left).

What other exhibits have inspired you to care about frogs? Tell us your story at info@amphibianark.org!



Displays of the incredible collection of frog items from around the world at the 100-year Frog Museum in Kitakata City, Japan. Many of these items are almost a century old, collected by the current curators' grandfather during his travels.

Photos: Vikki Takayama/100-year Frog Museum



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