amphibian ark

Keeping threatened amphibian species afloat

Newsletter

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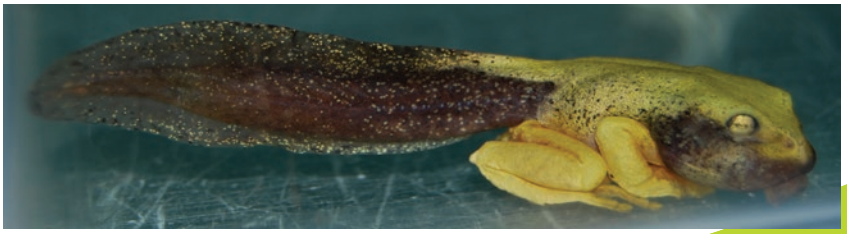

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Amphibian Ambassadors tell their own stories!

In mid-November, Amphibian Ark launched a new campaign called ***Amphibian Ambassadors***, in which dedicated amphibian conservationists and others who care about amphibians are telling their stories through a series of short videos. Through captive-breeding, community education, habitat restoration and a range of other conservation activities, thousands of people are making a big difference to the plight of amphibians, and we're helping them to share their stories with you.

The first of our featured Amphibian Ambassadors was Jenny Pramuk from Woodland Park Zoo in Seattle, USA, followed by AArk's Creative Officer, Danny Beckwth. Each fortnight, a new Amphibian Ambassador will be featured on the AArk web site, www.amphibianark.org/amphibian-ambassadors/. The response to our first two featured Amphibian Ambassadors has been fantastic, with other professional and community amphibian ambassadors producing their own videos and sending them to us. We'll be featuring all of these over the coming months.

As well as featuring professional amphibian ambassadors, we're also inviting everyone who has a passion for amphibians to share their stores. It's as simple as recording a brief video about why you think amphibians are important, using your mobile phone or video camera and then uploading your video to the AArk web site. Details about how to produce your own Amphibian Ambassador video are on our web site www.amphibianark.org/become-an-amphibian-ambassador/ and you can also send us your file from that page. You can record your message in English or in your own language.

So why not join other leading amphibian conservationists, and tell the world your amphibian stories!

By sharing our collective contributions towards amphibian conservation, we not only raise awareness of the problems amphibians are facing around the world, but we're letting others know how we are making a difference, and encouraging others to join us.

We'd love you to join us as an Amphibian Ambassador!

An update on the amphibian programs at Perth Zoo

Kay Bradfield, Acting Curator, Collections, Perth Zoo

In late September, Perth Zoo and the Western Australian Department of Parks and Wildlife staff released 68 head-started juvenile White-bellied Frogs (*Geocrinia alba*; Critically Endangered) and 65 head-started juvenile Orange-bellied Frogs (*Geocrinia vitellina*; Vulnerable) into the wild in the south-west of the Western Australia. In the wild, *Geocrinia* egg clutches are subject to high levels of mortality, due largely to predation by invertebrates. Head-starting (removing egg clutches from the wild and rearing them at the Zoo for twelve months before releasing them back into the wild as juvenile frogs) protects them through this highly vulnerable stage and thus increases the number of frogs that survive their first year.

Since the head-starting program began in 2008, we have been collecting White-bellied Frog egg clutches from a single source population and then rearing them at Perth Zoo before releasing them to a different site to re-establish a population that had gone extinct. We released a total of 145 White-bellied Frogs into this reintroduction site between 2010 and 2012, and monitoring by Department of Parks and Wildlife staff indicates that post-release survival is very high and/or recruitment is occurring. Given that this population appears to be off to a good start, this year the 68 juvenile White-bellied Frogs that were head-started at the Zoo over the previous twelve months were released back into the source, or donor, population. This is to compensate for the removal of egg clutches over the last few years and thus ensure that the source population is not adversely affected by its role in this important program to boost numbers and re-establish populations in areas where they once existed.

In late September, Perth Zoo and the Western Australian Department of Parks and Wildlife staff released 68 head-started juvenile White-bellied Frogs and 65 head-started juvenile Orange-bellied Frogs into the wild. Photo: Perth Zoo.

As in 2011 and 2012, we released the 65 head-started Orange-bellied Frogs to supplement numbers at a translocation site in Blackwood River National Park in the State's south-west. Another five juvenile Orange-bellied Frogs were retained at the Zoo for the breeding program.

Following the frog releases, Zoo staff spent time in the field searching for and collecting egg clutches of both species to bring back to the Zoo for our head-starting programs. Six White-bellied Frog clutches and two clutches of Orange-bellied Frogs were collected, and another collection trip will be held in mid-November. The eggs and resulting froglets will be reared at the Zoo through until Spring 2014, when they will be released to the wild as juveniles.

Building the Amphibian Educator Ark

Rachel E. Rommel, Community Education Officer and Dr. Joe Mendelson, Research and Fundraising Officer, Amphibian Ark

The National Association of Biology Teachers (NABT) is a leader in biology education. Since 1938, "thousands of educators have joined NABT to share experiences and expertise with colleagues from around the world, keep up with trends and developments in the field, and grow professionally" (www.nabt.org). Amphibian Ark was honored to be invited speakers and a wildlife conservation vendor for their 2013 annual conference held in downtown Atlanta, Georgia, November 20th – 22nd. We were represented by AArk Research and Fundraising Officer, Joe Mendelson, and Community Education Officer, Rachel Rommel.

The NABT annual conference draws in thousands of primary school and undergraduate biology teachers, in addition to science education academics from universities across North America. Participants attend presentations and hands-on workshops to learn about some of the best methods for teaching about science in the classroom. They also have the opportunity to connect with vendors and organizations with the newest technologies, products, and resources for a diversity of biology related subjects – like virtual frog dissection software.

The overall goal for Amphibian Ark's presentation/workshop portion was to raise awareness with biology teachers about amphibian declines. We primarily focused on why we need teachers supporting our efforts, and provided tangible and holistic examples of how teachers can use amphibian conservation in the classroom to link curricula with practice and also support ongoing *ex* and *in situ* conservation efforts. We shared partnership programs from zoos and schools across North America to give examples of how other teachers are already taking action in their communities and to provide examples and inspiration for new programs. We were able to highlight these programs thanks to great input and contribution from the AZA community. In addition, we also raised awareness about amphibian citizen science programs such as GAB (Global Amphibian Bioblitz) from iNaturalist, USGS NAAMP (North American Amphibian Monitoring Program) and AZA's Frogwatch USA (Association of Zoos and Aquariums). We closed the workshop by learning call index for estimating relative abundance of chorusing Anurans, in addition to learning the calls of some of the natives of Georgia.

Our NABT booth was well received and visited with videos, T-shirts, books, field equipment, and suggested reading. In addition, we were lucky to have a native amphibian friend, a live Southern Toad (*Anaxyrus terrestris*) to help bring visitors to our table. Perhaps most importantly, we were well prepared with an educator resource folder for download which included regional common Anuran calls, photos of amphibians, and advanced chorus activities. We also provided resources and curricula for elementary to university level, and a module on amphibian declines, Frogwatch USA (thanks, AZA!), and suggested reading. We downloaded and sent these resources to close to 100 educators during and after the conference. Many teachers also joined the "Amphibian Rescue Team" by showing their support with the purchase of our newly designed T-shirts available at our booth.

Joe Mendelson (AArk) downloading resources for a biology teacher at our National Association of Biology Teachers (NABT) booth. Photo: Rachel Rommel.

Rachel Rommel (AArk) presenting on how biology teachers can use amphibian conservation in the classroom. Photo: Joe Mendelson.

A Southern Toad helps to sell Amphibian Rescue Team T-shirts at the AArk NABT booth. Photo: Rachel Rommel.

The Amphibian Ark presentation was very well received; we had lots of great questions, and follow-up discussions at our booth with active and concerned educators and biologists wanting to help and start programs like the ones highlighted. The conference was inspiring and motivating as we learned there are also many teach-

ers that are already doing many great things in their schools and communities to explore the world of amphibians with their students. Overall, the conference provided lots of new potential for future partnerships with this delegation.

Special thanks for presentation material, resources and supplements (photos and frog calls): Rachel Garza (AZA), Woodland Park Zoo (Jenny Pramuk and Eli Weiss), Cassidy Johnson (Houston Zoo), Jen Stabile (Albuquerque Biological Park), Greg Lipps, Andy Odum (Toledo Zoo), Diane Barber (Fort Worth Zoo), Olney School Friends (Leonard Guindon), Cindy and Kerri Rogers, Lang Elliot, Todd Pierson, Michael McFadden, and Paul Crump.

Thanks to our Amphibian Ark associates!

In this newsletter we are pleased to feature another of our professional associates, who regularly offer their services to support our amphibian conservation work. These individuals have contributed many hundreds of hours of their time to share their expertise and help with workshop facilitation, instructing at training courses, and chairing advisory groups.

We very much appreciate the continued support of these individuals, and their respective institutions.

For a list of our associates, please visit: www.amphibianark.org/associates/.

Dr. Sam Rivera, Associate Veterinarian, Zoo Atlanta

Dr. Sam Rivera, Associate Veterinarian at Zoo Atlanta joined the Amphibian Ark team in 2009. Sam grew up in Ponce, Puerto Rico, and his passion for amphibians started at an early age. He grew up in a rural area surrounded by coquis which always fascinated him. This early experience cemented his interest in amphibian care and conservation.

After finishing his DVM at Kansas State University, Sam worked in private practice in Atlanta for ten years. The practice included a large exotic pet client base, including many common and not so common amphibian species. For the past eight years Sam has worked at Zoo Atlanta as an associate veterinarian. His specialities include exotic and zoo animals of a wide variety and of course amphibians! Sam is an adjunct faculty at the University of Georgia College Of Veterinary Medicine. He has a long history of teaching at various universities and colleges in the area and also is an active participant in the internship program at Zoo Atlanta for up and coming veterinarians.

As a Veterinary Associate for Amphibian Ark, Sam has volunteered hundreds of hours to help people working in *ex situ* programs to reach new levels of success by sharing his knowledge. Sam has been instrumental in developing the Amphibian Veterinary Outreach Program (AVOP, www.amphibianark.org/veterinary-program/), visiting programs in Ecuador numerous times to share his expertise in clinical care of amphibians. Sam's relaxed demeanor makes him an excellent teacher, instantly putting people at ease and allowing them to focus on the tasks at hand.

We are tremendously grateful for his commitment of time and energy to help Amphibian Ark and feel very fortunate to have him on the team!

Dr. Sam Rivera (right) during an Amphibian Veterinary Outreach Program workshop in Quito, Ecuador. Photo: Ron Gagliardo.

The Pickersgill's Reed Frog breeding program at the South African Association for Marine Biological Research

Carl Schloms, Senior Herpetologist, South African Association for Marine Biological Research

The Pickersgill's Reed Frog (*Hyperolius pickersgilli*) is threatened mainly due to habitat degradation. This tiny reed frog is found on the east coast of Durban, South Africa and measures no longer than 30 mm. It inhabits coastal reed beds and coastal wetlands.

Our introduction to the Pickersgill's Reed Frog breeding program for the South African Association for Marine Biological Research (SAAMBR) in Durban, South Africa, began on September 16th, with a trip to Mt Moreland in Durban. My colleague Nick Evans and I wanted to establish whether the Pickersgill's Reed Frogs had made their Spring appearance. Not only had they made an appearance but an adult male frog was observed calling to a large female. We decided then and there to collect the courting pair in the hope that they would continue their breeding behavior in the Association's newly-established breeding facility. We were keen to begin efforts to preserve this endangered amphibian due to its Critically Endangered status.

We did not have to wait long as twelve days later the pair produced an exceptionally large cluster of eggs. The egg mass was laid on the wall of the tub which at the time was inhabited by both the male and female. The large cluster of eggs was coated in a clear gelatinous mass.

The adult female Pickersgill's Reed Frog (*Hyperolius pickersgilli*). This species is listed as Critically Endangered, mainly due to habitat degradation. Photo: Carl Schloms.

It was apparent that weather played a significant role in the timing of her spawning as it was noted that the day prior to her releasing the eggs, the ambient temperature was hot and pre-frontal. Weather, humidity and barometric pressure readings were recorded.

Friday September 27, 2013:

- At 0800h barometric pressure measured 1007 and humidity 61%
- At 1100h barometric pressure measured 1005 and humidity 44%
- At 1400h barometric pressure measured 1003 and humidity 54%
- At 1700h barometric pressure measured 1009 and humidity 65%
- At 2000h barometric pressure measured 1011 and humidity 84%

Saturday September 28, 2013:

- At 0200h barometric pressure measured 1012 and humidity 84%
- At 0500h barometric pressure measured 1013 and humidity 85%
- At 0800h barometric pressure measured 1015 and humidity 85%

An interesting observation was the apparent parental care shown by the female Pickersgill's Reed Frog. She was observed descending, then returning to the egg mass at regular intervals, seemingly keeping the egg mass moist.

We decided to split the egg mass into three parts to allow us to test various incubation techniques. Two small sections of the eggs were delicately cut from the mass and placed in separate petri dishes. The first petri dish contained approximately ten eggs and was filled with reverse osmosis water. The second petri dish contained approximately 40 eggs and was placed on top of sterilized sphagnum moss before being filled with reverse osmosis water. The main egg mass was left undisturbed. A misting system fitted with a timer was installed to lightly mist the egg mass on an hourly basis. The egg mass was monitored using a photographic macro lens to observe development.

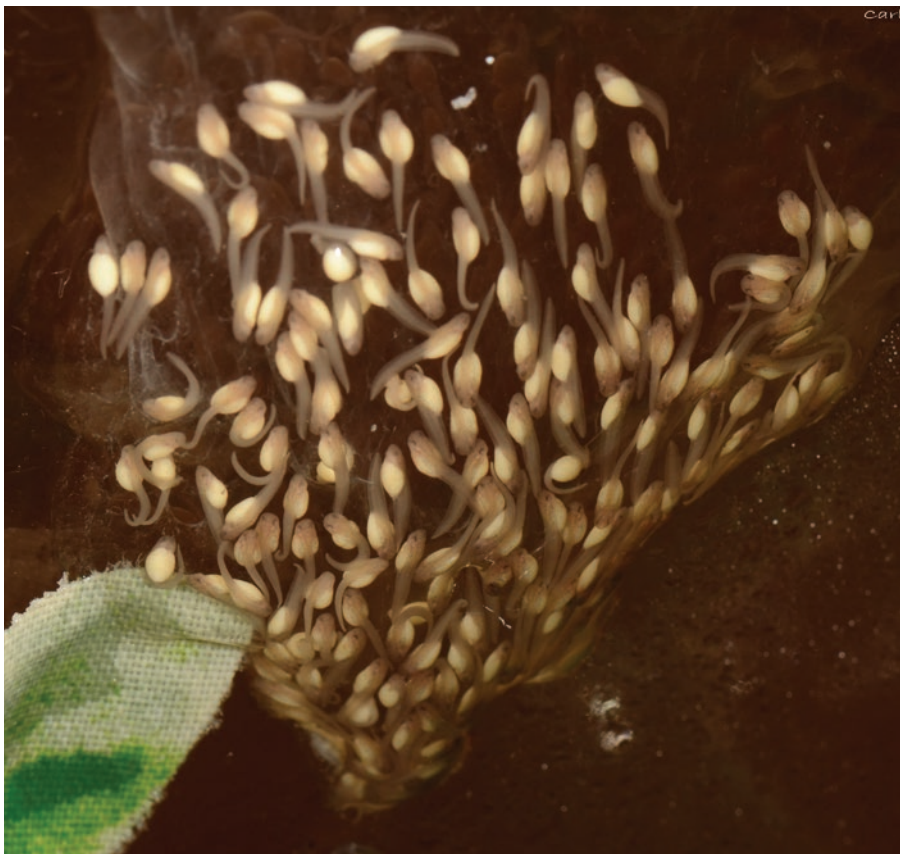
The female Pickersgill's Reed Frog with an exceptionally large egg mass. These eggs were laid only twelve days after the pair of adult frogs were collected from the wild. Photo: Carl Schloms.

Results

Free swimming tadpoles were observed in both petri dishes a total of four days after spawning observed.

The main egg mass appeared to be sliding towards the water and macro photographic evidence revealed how the tadpoles were drawn by gravity to the lower half of the gelatinous mass. It appeared that the mist stimulated the tadpoles' emergence, albeit slowly, from the mass and into the water six days after being laid. This slow emergence continued at intervals throughout the day with the final tadpole count of 100 tadpoles from this single main mass.

Success was achieved from all three methods, and this program is ongoing. At the time of writing we are the proud "parents" of ten froglets, who's journey from egg to frog took 41 days.



The main egg mass appeared to be sliding towards the water; the tadpoles were drawn by gravity to the lower half of the gelatinous mass. Photo: Carl Schloms.

By observing the larger main mass of eggs we were able to make a few interesting observations that could affect the *ex situ* reproduction of Pickersgill's Reed Frogs:

1. The egg mass appeared to depend on moisture in order to release the tadpoles, an absence of seasonal rainfall could affect an increase or decrease in population numbers.
2. If what appeared to be parental care is confirmed by further study and observation, the survival of these tadpoles is dependent on the wellbeing of one or both parents.
3. Recorded duration between laying, free swimming tadpoles and froglets which will add knowledge to similar organisations involved in the Pickersgill's project.
4. Photographic microscopic records detailing growth and development of tadpoles.

SAAMBR is committed to assist in the conservation and preservation of amphibians and will continue to contribute wherever we are able to. Our location in a busy retail village enables us not only to manage breeding programs but to share our knowledge and passion for reptile and amphibian conservation with approximately 20,000 visitors every month – most of whom have an inherent fear of amphibians.

MAZURI® and Zoo Atlanta support AArk at the AZA annual conference

Liz Koutsos, Director, MAZURI® Exotic Animal Nutrition

Each year at the national Association of Zoos & Aquariums (AZA) conference, MAZURI® Exotic Animal Nutrition (www.mazuri.com), a leading brand of PMI Nutrition, recognizes the support of our valuable customers by creating a unique token of our appreciation. AZA attendees probably have a memory of their favorite MAZURI® goodie - from T-shirts to sunglasses, water bottles to band-aids… we've tried it all!

In 2013, we decided to extend our appreciation by providing charitable contributions to several groups. AZA attendees received $5 MAZURI® Bucks that they could donate to one of three charitable organizations. The three choices were chosen to represent the broad species interest of our company and our customers, and also to support organizations that promoted conservation, education and research as their main missions.

The MAZURI® brand was pleased to offer support to Amphibian Ark as one of the three charitable organizations supported at this years' AZA conference. Amphibian Ark was chosen because of its strong vision of protecting the world's amphibian species, through support of field conservation, conservation of captively-managed animals, training programs and education.

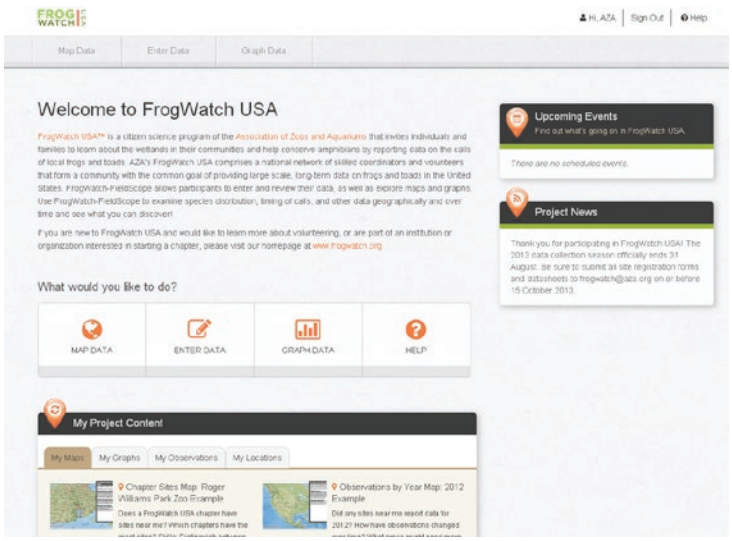
According to Dr. Liz Koutsos, Director of MAZURI® Exotic Animal Nutrition, "The threat of mass amphibian extinction is one that cannot be ignored, and MAZURI® is proud to support these efforts through charitable contributions to Amphibian Ark in addition to continued efforts to improve upon the nutrition of captively-managed amphibian species."

Amy Rutherford, Professional Development Program Manager at the Association of Zoos & Aquariums, donating her MAZURI® Bucks to Amphibian Ark during the recent AZA conference. Photo: Amy Rutherford.

[*Editor's note*]: *Amphibian Ark would also like to extend our sincere thanks to Zoo Atlanta (www.zooatlanta.org), who continue to show their support of the AArk with a direct financial match of the $1,352 donation made by MAZURI®.*

Beyond frogs in the field: Explore citizen science data online through FrogWatch-FieldScope

Rachel Gauza, Citizen Science Program Specialist; Shelly Grow, Director of Conservation Programs; and Lauren Mechak, Conservation Department Intern, AZA

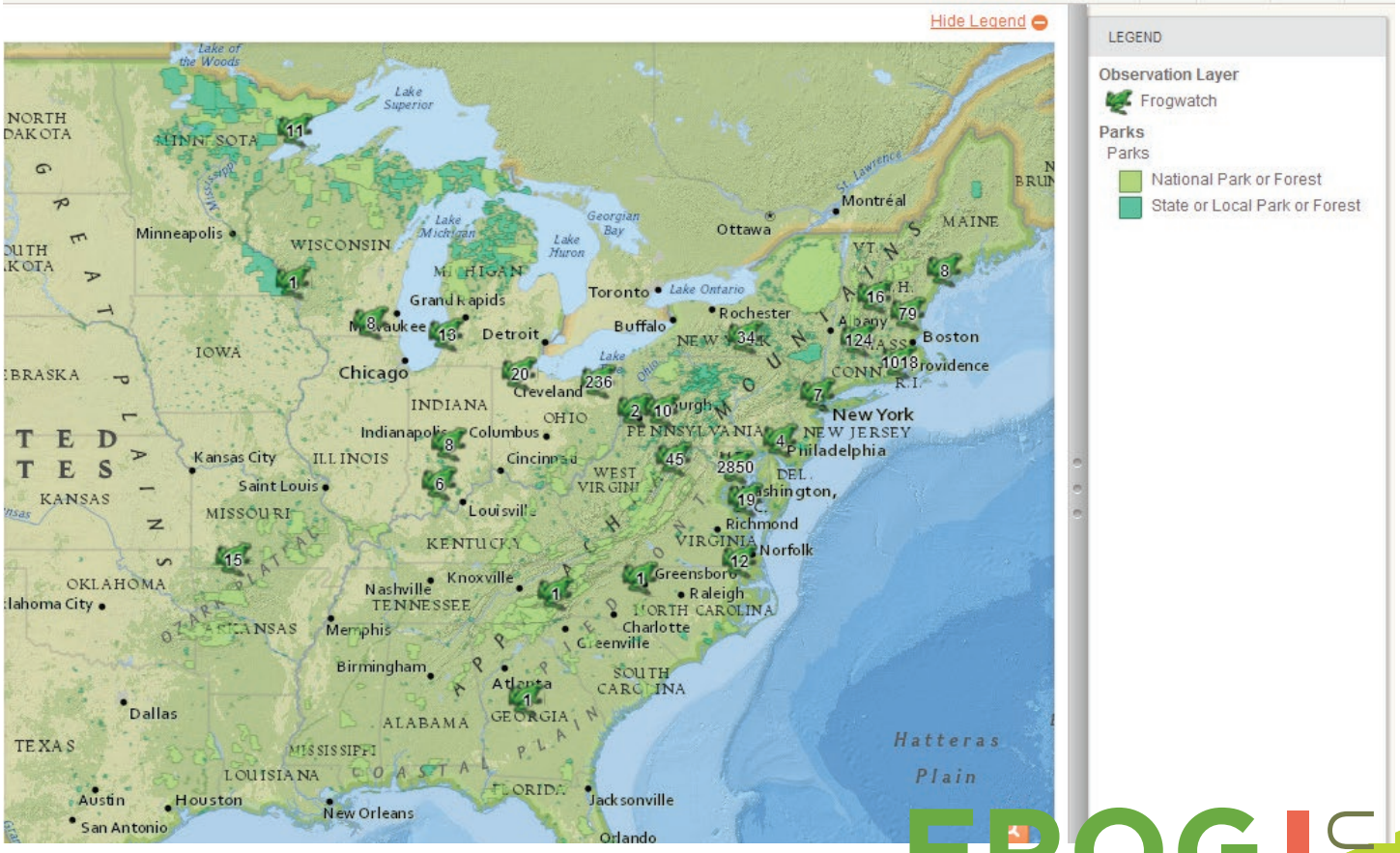


Anyone with an interest in frogs and toads can explore FrogWatch USA data. An interactive home screen guides users through tasks and features and a help guide is available for additional support.

FrogWatch USA™ is a citizen science program dedicated to collecting information about frog and toad populations while raising awareness about amphibians and wetlands and engaging the public in science. When the Association of Zoos and Aquariums (AZA) assumed program management in 2009, two top organizational goals were to 1) establish local chapters that could grow and sustain volunteer participation, improve data quality, and promote data use, and 2) transform the program's web site into a premier online citizen science interface.

Significant progress has been made towards both of these goals. By late 2013, almost 90 chapters have been established at zoos, aquariums, and like-minded organizations and each is led by a team of chapter coordinators, at least one of whom received training on how to implement and manage a local FrogWatch USA chapter. AZA appreciates the work these chapters put into the program, recognizing that the training and interactions chapter coordinators provide improves the experience for the volunteer and serves as a significant source of quality control for the data. Chapters also partner with other organizations and agencies within their communities, growing the utility of generated data to researchers and land managers.

This January, FrogWatch USA will launch an exciting new online data entry and exploration tool. FrogWatch-FieldScope is freely available, permitting anyone interested in frogs and toads to access more than a decade of valuable data collected by FrogWatch USA volunteers. Developed by the National Geographic Society specifically for citizen science programs like FrogWatch USA and with support from the National Science Foundation, this tool encourages people to input the important data they collect and to visualize and analyze those data across space and time.



Visualize where a species, such as the Spring Peeper (*Pseudacris crucifer*) shown here, has been observed as calling throughout the United States by FrogWatch USA volunteers.

FrogWatch-FieldScope gives users the opportunity to interact with data like never before, allowing them to input data and explore their interests by creating maps and graphs. The mapping interface plots spatial data, encouraging users to examine species' ranges, habitat preferences, and more. FrogWatch-FieldScope can also create custom graphs to interpret the data, answering a myriad of questions such as which habitats a species might prefer, the observed calling temperature range of a given species, etc. A unique calling calendar visualization helps volunteers explore when species have been observed calling locally and across the nation, providing an accessible introduction to phenology and seasonality. Users can promote the spread of ideas by using the built-in "Share" feature with any interesting map or graph, which will display it publicly on the FrogWatch-FieldScope website. Data can also be exported for additional analyses and sharing.

Knoxville Zoo FrogWatch USA volunteers scout a wetland site to listen for frogs and toads. Photo: Knoxville Zoo.

Introductory graphs and maps guide new users and volunteers through the process of answering exciting questions. As data are explored, users will learn how to use FrogWatch-FieldScope's many unique features, such as the incorporation of external data layers and the ability to filter data spatially and temporally. Online tutorials are also available to help users maximize their FrogWatch-FieldScope experience. Now FrogWatch USA volunteers can see in real time how their contributions feed into a national story of frogs and toads in the United States. Furthermore, these valuable data will now be available to other amphibian enthusiasts and professionals alike, who can gain more insight into the ecology of frogs and toads in the United States and share their ideas with a community of like-minded individuals united online. To get started, visit www.aza.org/current-frogwatch-volunteers/.

Darrel Frost wins the 2013 Sabin Award for amphibian conservation

Robin Moore, PhD, Conservation Officer, Amphibian Survival Alliance

The Amphibian Survival Alliance (www.amphibians.org) and Andrew Sabin Family Foundation are thrilled to announce Darrel R Frost as the winner of the 2013 Sabin Award for Amphibian Conservation. The annual award, now in its seventh year, recognizes outstanding contributions by individuals to the field of amphibian conservation and research. Darrel was selected from an exceptional list of candidates, with a nomination that was supported by 35 amphibian experts across the world.

Darrel feels strongly that meticulously prepared catalogues help knit the world's scientific community together by providing workers in the developing world with access to current literature and up-to-date summaries of our knowledge of the biodiversity of living amphibians. When it comes to catalogues for amphibian species, few come close to the *Amphibian Species of the World*, through which Darrel has contributed what many consider to be the most significant single work in the history of amphibian biology.

Darrel Frost was recently announced as the winner of the 2013 Sabin Award for Amphibian Conservation.

For three decades *Amphibian Species of the World* has been the primary reference for amphibian taxonomy. By providing a centralized source of taxonomic and geographic information that is otherwise scattered across a vast literature, *Amphibian Species of the World* facilitates and enables research in systematics and provides easy access to this information for workers in fields like conservation biology and ecology. *Amphibian Species of the World* is also the authority database used by numerous governmental and non-governmental organizations and other online databases to obtain information on amphibian taxonomy.

The Amphibian Survival Alliance, the world's largest partnership for amphibian conservation, has featured Darrel as their first "Amphibian Champion" (www.amphibians.org/amphibian-champions/darrel-frost/) to honor his contribution to the field.

Please join us in recognizing a remarkable contribution from a truly remarkable individual.

AMACZOOA amphibian *ex situ* conservation course and conservation strategy workshop

Jorge Rodríguez, Meso-American and Caribbean Zoo and Aquarium Association

Twenty-five participants from Mexico, El Salvador, Nicaragua, Panama, Ecuador, Colombia, the United States and Costa Rica attended these two events which took place during September at Simon Bolivar Zoo, San Jose, Costa Rica.

To start the *ex situ* conservation course, Gerardo Chaves, Coordinator of the Amphibian Specialist Group (ASG) for Costa Rica, welcomed the participants, and was then followed by Diego Almeida, from Gustavo Orces Herpetological Foundation in Ecuador, who gave a general presentation about *ex situ* management of amphibians. During the afternoon Federico Bolaños from the University of Costa Rica gave a presentation about Latin American Amphibians, with emphasis on Costa Rica, explaining the history of the study of the group, recent research, the IUCN Red List analysis in Mesoamerica, and highlighting that this work was done with contributions from many people. John Cossel from Northwest Nazarene University explained the importance of water and several other abiotic factors that are important in a successful *ex situ* conservation program for this group of vertebrates. At the end of the day, John showed us several instruments that allow environmental factors to be measured and taught the participants how to use them and let them practice with them using the zoo as a field lab.

Jorge Guerrel explaining his experience with terrariums, during one of Diego Almeida´s presentations at the *ex situ* conservation course. Photo: Eduardo Bolaños.

On the second day, Andrea Brenes, also from the University of Costa Rica, gave a talk about amphibian nutrition, sharing her experience about this emerging field in amphibian *ex situ* management, Randall Arguedas from Fundación Pro Zoológicos (FUNDAZOO) spoke about amphibian veterinary medicine, and Diego Almeida continued his presentation about captive reproduction, egg development and culturing live food.

On Saturday the course moved to the Costa Rican Amphibian Research Center at Siquirres, Limón, where Brian Kubicki explained to the group his experiences with both *ex situ* and *in situ* amphibian conservation, showing his terrariums and the work he does at this facility to encourage amphibian reproduction in their own habitat. The day had a late finish at 10 pm.

The following three days were dedicated to developing a Conservation Strategy for Amphibians in Mesoamerica, following the Conservation Breeding Specialist Group (IUCN SSC CBSG) workshop methodologies. Four working groups were established,

Brian Kubicki shares information about his projects at the Costa Rican Amphibian Research Center. Photo: José Raúl Miranda.

one each for Education, Research, Monitoring and Habitat, and Fundraising. One of the main conclusions from the group is that amphibian conservation needs to include the work of many different interdisciplinary fields.

All of the presenters made their presentations available to all participants in a Dropbox folder. The first draft of the workshop document was finished and the final report will be ready in January 2014.

This workshop was financed by the World Association of Zoos and Aquariums (WAZA), FUNDAZOO and Amphibian Ark, with the support of Northwest Nazarene University, the University of Costa Rica and the Costa Rican Amphibian Research Center.

A male Lemur Leaf Frog (*Agalychnis lemur*), photographed during the field trip to the Costa Rican Amphibian Research Center. A robust population has been created within the reserve, through the Center's *in situ* conservation work of creating artificial breeding habitats. Photo: José Raúl Miranda.

Workshop on management techniques and veterinary care for captive amphibians in Ecuador

Diego Almeida Reinoso, Quito, Ecuador

This workshop was held at the Herpetological Foundation Gustavo Orcés from November 13th - 15th. Participants at this workshop were mainly students from different universities in Ecuador and also biologists, veterinarians and personnel from amphibian breeding facilities including La Balsa de los Sapos from the Pontificia Universidad Católica del Ecuador and the Center for Conservation from the Universidad Técnica del Cotopaxi.

A working group analyzing the major aims for the development of a National Conservation Plan for Ecuadorian amphibians. Photo: Katty Garzón.

The main goals for this workshop were to strengthen the knowledge about amphibian management and enforce awareness about the conservation of amphibians and to let participants know about the importance of amphibian in the environment and the causes of their continuing decline throughout the world and especially in Ecuador.

Some of the topics covered during this workshop included: conservation programs for amphibians in Ecuador, basic principles for amphibian management in captivity, nutrition, breeding, problems with the management of amphibians, amphibian diseases and veterinary diagnosis.

This topics were covered both in lectures and hands-on activities. There were also The six main aims for the development of a National Conservation Plan for Amphibians in Ecuador were also discussed at length. The results from this exercise are being compiled and will be published.

Workshop participants building terrariums. Photo: Katty Grazón.

Participants at the amphibian workshop held in November in Quito, Ecuador. Photo: Katty Garzón.

2014 Amphibian Academy

The Amphibian Academy course was designed in 2013 to deliver holistic training in amphibian conservation. The first iteration was held in Toledo, Ohio at the Toledo Zoo and provided hands on *in* and *ex situ* training to 16 students from around the world. We were hoping to run this course again in the first half of 2014 in Georgia, USA, an incredibly diverse State for amphibians and with numerous partners to participate in the training course.

After some careful consideration, we have decided to postpone the course. We will post updates in future AArk newsletters and on our website indicating the next course dates.

Opening of the Clarion-Limestone Amphibian Research Center

Alysha Cypher, Research and Education Coordinator, Clarion-Limestone Amphibian Research Center

The Clarion-Limestone Amphibian Research Center (CLARC) is a research and education facility housed at a public school district in western Pennsylvania, USA. The project is a unique collaboration between a non-profit, The Center for Conservation Studies Inc, Clarion-Limestone School District, and Clarion University of Pennsylvania. The goals of the facility are to perform conservation-sound research, promote professional development of our students, and connect students with nature.

The facility has been under construction since 2010. This construction included a quarantine room, lab suite, and several large exhibits. The facility finally opened on October 18th, 2013 and while it isn't completely finished, it is now functional. The facility currently houses a colony of Spotted Salamanders and a variety of display animals. An artificial wetland, river system, and bog are the largest exhibits at CLARC. The artificial wetland houses Spotted Salamanders and several species of turtles. It also features underground tunnels that can be viewed using a boreoscope. A live monitoring system will be set up to allow visitors to observe our amphibians on site and remotely. The artificial river system is currently home to crayfish and minnows.

The CLARC facility in 2010. Photo: John Johnson.

Elementary school art classes have created murals for the outside of the CLARK facility, prior to its opening in 2013. Photo: Alysha Cypher.

A fourth grade student saying farewell to a Spotted Salamander which was about to be released into the wetland. Photo: Alysha Cypher.

Classrooms at Clarion-Limestone School District are monitoring the quality of our river system over the next year and the system will ultimately house Eastern Hellbenders. If hellbenders can be successfully bred in captivity, we intend to develop a head-starting program for this species. Lastly, our artificial bog (opening in the spring) will house carnivorous plants from all over the world and will be cared for by a local expert. There are also plant beds that will be used for raising threatened tree species in addition to vegetables. We will continue to improve the quality of the facility in the coming years by adding more display areas, a clinical laboratory, and an amphibian nursery.

In addition to its role as an amphibian ark, the facility is meant to benefit students. CLARC is student-designed, built, and managed, and the blueprints for the building were drawn up by high school students. The elementary school art classes have created murals and plaques commemorating donors. Elementary students raise salamander and frog tadpoles in the classroom, while university students manage the culturing of insects, biosecurity protocols, and care of all animals. The facility is designed to provide students with the skills and experience to be critical thinkers and well-rounded individuals. They know how to fundraise, delegate tasks, recruit volunteers, manage schedules, design research projects, speak to non-scientists, and troubleshoot animal care emergencies.

The skills and experience we offer have allowed our graduates to obtain positions in graduate programs, non-profit institutions, zoos, and government institutions. In just three years, it is clear that CLARC is a great success and will continue to draw attention in the coming years.

We are always looking for collaborations and new ideas. Feel free to contact us!

Check out the awesome story and video about us at: www.wearecentralpa.com/story/one-of-a-kind-center/d/story/Nw5lNNSz_Uy1y27R-UyXiQ

Contact information:
General: contact@conservationstudies.org
Web site: www.conservationstudies.org
Facebook: www.facebook.com/TheCLARC

The Amphibian Conservation Center, Gustavo Orcés Herpetological Foundation

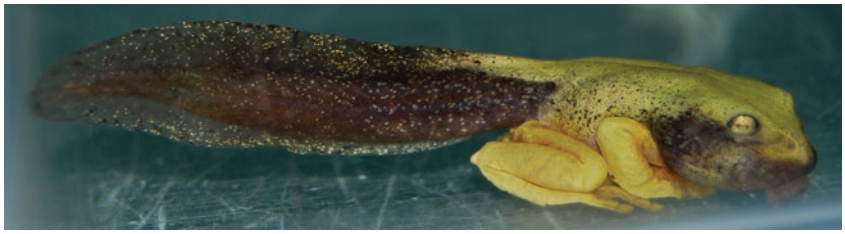
Diego Almeida Reinoso, Associate Researcher, The Amphibian Conservation Center, Gustavo Orcés Herpetological Foundation, Quito, Ecuador

Although many people have already heard of the Amphibian Conservation Center, I want to share the creation of the Amphibian Conservation Center Foundation Gustavo Herpetological Orcés, in Quito, Ecuador, in which we have initiated a conservation program for two species of frogs. The first is the Ecuadorian Tiger Frog (*Hyloscirtus tigrinus*), a species recently reported from Ecuador, which is listed as Critically Endangered because we only know of some tadpoles from a single locality in Ecuador.

The second is the Turtleshell Marsupial Frog (*Gastrotheca testudinea*), a species which is listed as Threatened, and which has a unique reproductive mode; their young are born fully formed, bypassing the tadpole stage.

The creation of the Amphibian Conservation Center was made possible thanks to the unconditional support of Maria Elena Barragán (Director of the Foundation Gustavo Herpetological Orcés), Katty Garzón (Quito Vivarium Director), funding from a 2013 Amphibian Ark Seed Grant and direct management from Ron Gagliardo (AArk Training Officer).

We currently maintain fifteen Ecuadorian Tiger Frog tadpoles and ten Turtleshell Marsupial Frogs. We hope to soon have adult Ecuadorian Tiger Frogs, which are unknown in Ecuador to date. We are really excited to have had some great results in the last three months: the first metamorphs of the tiger frogs, and ten Turtleshell Marsupial Frog metamorphs, seven of which were hatched at the Center. This is the first time the species has been bred in captivity, and we hope to continue our breeding success with this species.



One of the first metamorphs of the Ecuadorian Tiger Frog (*Hyloscirtus tigrinus*), at the Amphibian Conservation Center in Quito, Ecuador. Photo: Diego Almeida Reinoso.

Some of the young Turtleshell Marsupial Frogs (*Gastrotheca testudinea*) at the Center. This is the first time this species has been bred in captivity. Photo: Diego Almeida Reinoso.

We will soon publish guidelines on the reproduction of this species and the management of the species as juveniles and as adults. We hope to form a communication network for the conservation of Ecuadorian and Latin American amphibians and begin a coordinated effort with a common goal: the conservation of amphibians.

New Frog MatchMaker projects

Amphibian Conservation Center at Zoo Amaru, Ecuador

The Amphibian Conservation Center at Amaru is an in-habitat facility located in a private urban natural reserve in the vicinities of Cuenca, Ecuador and manages seven species of endemic endangered frogs from the south of Ecuador. Most of these species are high Andean range species and they have many threats occurring in their natural habitats. Amaru had documented declining populations of this entire group of species in the past ten years of research, even in national or local community protected forest areas. In our facility that has been operating since 2008, we manage around 400 frogs that have been rescued during research surveys since the beginning of 2008.

Our focus is captive breeding and natural habitat research of these species, and we have had a lot of success with the *ex situ* reproduction of *Atelopus nanay*, *Atelopus* sp. nov (Wampukrum), *Gastrotheca litonedis* and *Hyloxalus vertebralis*. We are currently developing more studies and experience with three other species (*Gastrotheca litonedis*, *Gastrotheca monticola* and *Nelsonophryne aequatorialis*) to ensure breeding success. More scientific publications of our past *in situ* and *ex situ* studies are coming soon. In the past four years of work we have received great help and financial support from the Philadelphia Zoological Gardens, but this joint venture has now been finalized, and we now need to find funding support from any institution, individual or conservation initiative to cover the basic operation expenses of this project.

For more information see http://aark.portal.isis.org/Amphibian%20Partnerships/Lists/Amphiban%20partnershis/DispForm.aspx?ID=72 or contact Ernesto Arbeláez Ortiz, earbelaez@zooamaru.com.

Securing a sustainable future for Chinese Giant Salamanders

The largest amphibian in the world is the Critically Endangered Chinese Giant Salamander (*Andrias davidianus*). The Zoological Society of London (ZSL) and partners are working together to secure a future for this amazing species in China. Aspects of this program include:

1. Establish the conservation status of the Chinese Giant Salamander. Further information about range-wide giant salamanders is essential, including: current distribution and relative abundance; genetics of fragmented populations; presence and level of threats.
2. Focus on conservation genetics and phylogeography: Ascertain whether there are multiple subspecies of the Chinese Giant Salamander and/or cryptic species and develop a Chinese Giant Salamander genetics database and biobank to inform future conservation actions and the growing farming industry, safeguarding genetic diversity and leading to protocol development for genetic screening of released animals.
3. Disease represents a poorly-understood threat to Chinese Giant Salamanders, increase diagnostic capacity in China.
4. Develop *ex situ* protocols for conservation: To improve future conservation release programs, conservation-breeding capacity must be developed to produce disease-free and genetically-appropriate Chinese Giant Salamanders.
5. Raise the profile of the Chinese Giant Salamander and the importance of freshwater ecosystems to facilitate conservation at the local, national and international level.

For more information see http://aark.portal.isis.org/Amphibian%20Partnerships/Lists/Amphiban%20partnershis/DispForm.aspx?ID=73 or contact Ben Tapley, ben.tapley@zsl.org.

Help save a frog this holiday season!

This holiday season, you can give a gift that will help support an amphibian conservation program in their efforts to save threatened amphibians. You can simply make a donation towards any of the programs listed below, or you can make a donation as a gift for someone you care about - just let us know who your gift is for, and we'll let your friends and family know about your generous donation in their name.

This holiday season, we'll be listing all donors who contribute to the following projects on our Facebook page, so you can let the world know that you are helping to save our precious amphibians!

- Large-crested Toad, Africam Safari, Mexico - www.amphibianark.org/donation-for-the-large-crested-toad-program/
- Threatened Malagasy amphibians, Association Mitsinjo, Madagascar- www.amphibianark.org/donation-for-mitsinjo-project/
- Threatened Ecuadorian frogs, Balsa de los Sapos, Ecuador- www.amphibianark.org/donation-for-the-balsa-de-los-sapos-project/
- Prince Charles Stream Tree Frog, Centro Jambatu, Ecuador- www.amphibianark.org/donation-for-prince-charles-stream-treefrog-project/
- Alcatraz Snouted Tree Frog, Sao Paulo Zoo, Brazil - www.amphibianark.org/donation-for-the-scinax-alcatraz-program/
- Conservation of Venezuelan frogs, Venezuelan Andean Reptile and Amphibian Conservation Center, Venezuela - www.amphibianark.org/donation-for-endangered-venezuelan-frogs-project/

Amphibian Ark - www.amphibianark.org/donation-form/

Amphibian Ark donors, January-November 2013

The work of AArk is possible due to the generous support of the following individuals and institutions:

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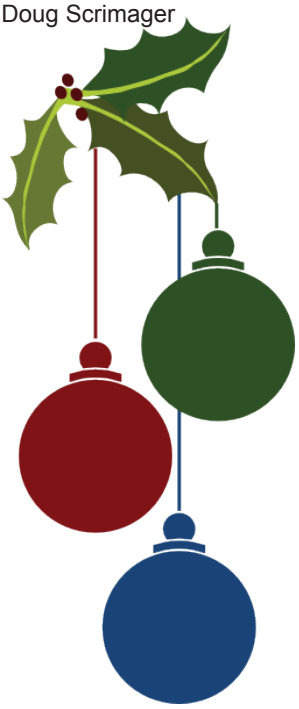

Happy holidays from the Amphibian Ark team!

Red-spotted Glassfrog.
Photo: Alejandro Arteaga.