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Number 15, June 2011

The Amphibian Ark team is pleased to send you the latest edition of our e-newsletter. We hope you enjoy reading it.

The Amphibian Ark

Amphibian Ark photography contest winners announced!

What an amazing response to our amphibian photography competition! And the winners are....

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Pre-order your 2012 AArk calendars now!

The twelve winning photos from our international amphibian photography competition have now been made into a beautiful calendar for 2012. You can order your calendars now!

[Read More >>](#)

AArk 2011 Seed Grant winners

Amphibian Ark is pleased to announce the winners of the 2011 Seed Grant program. These \$5,000 competitive grants are designed to fund small start-up projects that are in need of seed money in order to build successful long-term programs that attract larger funding.

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Wouldn't you like to be an AArk Sustaining Donor too?

In 2009, three institutions pledged to donate their current amount of general operating support to the Amphibian Ark each year through 2013. We're asking other zoos, aquariums and other facilities to follow their lead and become AArk Sustaining Donors.

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Conservation Needs Assessment workshop for Caribbean amphibians

In March 2011, Amphibian AArk staff facilitated two Amphibian Conservation Needs Assessment workshops in Santo Domingo, Dominican Republic, in the Caribbean.

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New AArk brochure and booklet

With the help from a graphic design student from the University of Central Florida, we've just released a new tri-fold brochure and a full-color 16-page booklet, about AArk and saving amphibians.

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Conservation Center - Mazán forest in Ecuador

Prioritising research on South African amphibians

Frogs Forever: A 'Spring Forward' event at Disney's Animal Kingdom

Conservation strategy for Chiapas' critically endangered amphibians

American Frog Day 2011, New York City

Amphibian project at Aquazoo/Löbbecke-Museum Düsseldorf

Australian amphibian programs - Taking a local approach

An update from the Association of Zoos & Aquariums

Sent to you courtesy of:
The AArk Team

Kevin Zippel
Program Director

Ron Gagliardo
Training Officer

Richard Gibson
Taxon Officer

Kevin Johnson
Taxon Officer
Communications & Development

Elizabeth Townsend
Administrative Assistant

New Frog MatchMaker projects

In this newsletter, we're featuring three more projects from our conservation project list, Frog MatchMaker, that are seeking support to carry out their amphibian conservation projects.

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News

Launch of the Global Amphibian Blitz

Kevin Johnson, Taxon Officer, Amphibian Ark

To better understand and conserve amphibians, which are rapidly disappearing around the world, scientists need your help! Now you can contribute your photographs of amphibians along with the dates and locations where you observed them from anywhere in the world, even from your mobile phone.

[Read More >>](#)

Frog vets on the go! Amphibian Veterinary Outreach Program continues work in Ecuador

Ron Gagliardo, Training Officer, Amphibian Ark

With support from the Turner Foundation, Nipmuc High School, and Amphibian Ark an Amphibian Veterinary Outreach Program was initiated in 2009. Read about the team behind this initiative and their work to date.

[Read More >>](#)

Conservation and breeding of the Japanese Giant Salamander at Asa Zoo

Yuki Taguchi, Animal Keeper, Hiroshima City Asa Zoological Park

Hiroshima City Asa Zoological Park in Japan is the most successful zoo in the world for breeding the Hanzaki (Japanese Giant Salamander), and has a long-running program of working with local people to help conserve this species and its fragile environment.

[Read More >>](#)

The Spotted Tree Frog program at Healesville Sanctuary

Kristy Penrose, Acting Supervisor, and Mason Hill, Keeper, Threatened Species, Healesville Sanctuary

Healesville Sanctuary in Victoria, Australia, maintains an insurance population of Spotted Tree Frogs and assists in the recovery of the species by captive breeding and releasing tadpoles into the environment.

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Amplexus, egg deposition and tadpole hatching in the Black Cajas Harlequin Toad at the Amphibian Conservation Center - Mazán forest in Ecuador

Fasuto Siavichay (1,2), Diego Alvarado (1,2), Ernesto Arbeláez (1,2) and Carlos C. Martínez (1,3), (1) Centro de Conservación de Anfibios, (2) Zoo Amaru, (3) The Philadelphia Zoo

Amphibian Conservation Center – Mazán Forest was established in 2008 to help save some of the most critically endangered amphibians from Cajas National Park near Cuenca in Ecuador. A pair of Black Cajas Harlequin Toads recently laid a clutch of eggs.

[Read More >>](#)

Would you like to support AArk's amphibian conservation work? Click [here](#) to make a donation!

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Prioritising research on South African amphibians

John Measey, Amphibian RLA, Applied Biodiversity Research Division, South African National Biodiversity Institute

South African amphibian researchers held a two-day workshop in 2009 with the aim of prioritising research by producing a list of clear actions and responsible agencies. This has resulted in the publication of a research strategy for the region's amphibians.

[Read More >>](#)

Frogs Forever: A 'Spring Forward' event at Disney's Animal Kingdom

Kathy Lehnhardt, Curator of Education, Disney's Animal Kingdom

To demonstrate their commitment to saving amphibians, every year Disney's Animal Kingdom in Orlando, Florida, holds a special event, offering a variety of activities for Disney guests to join in and learn more about frogs, toads and salamanders.

[Read More >>](#)

Conservation strategy for Chiapas' critically endangered amphibians

Tuxtla Gutiérrez, Chiapas, México

The Conservation Strategy for Chiapas' Critically Endangered Amphibians was presented on April 26, as part of the first annual "Week for the Understanding and Appreciation of Amphibians".

[Read More >>](#)

American Frog Day 2011, New York City

Matt Mirabello, New York City Event Organizer, American Frog Day Committee and Ray Coderre, TMG leader, Amphibian Steward Network, Tree Walkers International

American Frog Day is an annual event focused on assisting scientific study and captive maintenance of Dendrobatid frogs and other amphibians. This year, Frog Day was held in New York.

[Read More >>](#)

Amphibian project at Aquazoo/Löbbecke-Museum Düsseldorf

Beate Pelzer, Marc Meßing and Sandra Honigs, Aquazoo

In 2008 the Aquazoo/Löbbecke-Museum started a project called "Protection and Breeding Station for Amphibians". The aim of the project is to establish solid amphibian populations in captivity to avoid poaching in nature.

[Read More >>](#)

Australian amphibian programs – Taking a local approach

Michael McFadden, Co-convenor, ZAA Amphibian Taxon Advisory Group and Supervisor, Herpetofauna Department, Taronga Zoo

One of the unique features of Australia's approach to amphibian conservation is the focus only on *ex situ* programs for those species native to the country.

[Read More >>](#)

An update from the Association of Zoos & Aquariums

Shelly Grow, Conservation Biologist, AZA

The Association of Zoos and Aquariums reports on a number of projects that the Association and its members are involved in.

[Read More >>](#)

Amphibian Ark photography contest winners announced!

We received many more photos than we had anticipated, with 950 entries being submitted, from fifty-two countries. The judges had an extremely difficult time selecting the winners, with so many outstanding images being considered.

We are very pleased to announce that the overall winner was Gonçalo M. Rosa, from Lisboa, Portugal, with a spectacular photo of a *Boophis* sp., taken in Betampona, Madagascar. Gonçalo says: "The photo was taking during a frog survey at Betampona reserve - possibly the largest relict of low-altitude rainforest block in the east coast region". As well as being awarded the best photo in the competition, Gonçalo's photo also was the winner in the category of *In the Wild*.



Boophis sp. aff. *boehmei*. Gonçalo M. Rosa, Lisboa, Portugal.

The winning photos in the *Youth* and *In Captivity* categories were a magnificent Chacoan Horned Frog (*Ceratophrys cranwelli*), taken by Lena White (aged 14) from Atlanta, USA, and J.P. Lawrence from Kalamazoo, USA submitted the winning entry in the category of *In Captivity*, with a fantastic photo of a Mimic Poison Dart Frog (*Ranitomeya imitator*).



Chacoan Horned Frog (*Ceratophrys cranwelli*).
Lena White (aged 14) from Atlanta, USA.



Mimic Poison Dart Frog (*Ranitomeya imitator*).
J.P. Lawrence from Kalamazoo, USA.

Gonçalo, Lena and J.P. will each receive:

- A copy of *Frogs of Panama* by Dr. Douglas Woodhams, which explores the diversity of amphibians and the impact of disease on Panamanian populations (see www.blurb.com/bookstore/detail/174126)
- A copy of *Sapos*, a beautiful book from Ecuador by Santiago Ron, Martin Bustamante, Luis Coloma and Belén Mena, which uses the surreal patterns and colors of naturally beautiful amphibians in combination with and as inspiration for graphic art (www.puce.edu.ec/zoologia/sron/sapos/index.html).

The additional nine winners are:



Ghost Glass Frog (*Sachatamia ilex*).
Gert Benaets, Alken, Belgium.



Splendid Leaf Frog (*Cruziohyla calcarifer*).
Matt Wilson, Manchester, United Kingdom.



Black-Bellied Salamander (*Desmognathus quadramaculatus*).
Todd Pierson, Athens, GA, USA.



Pacific Robber Frog (*Pristimantis appendiculatus*).
Alejandro Arteaga, Quito, Ecuador.



Snouted Treefrog (*Scinax fuscovarius*).
Fábio Maffei, Bauru, Brazil.



Harlequin Frog (*Atelopus laetissimus*).
Victor Luna-Mora, Ibaguè, Colombia.



Shovelhead Treefrog (*Diaglena spatulata*).
Jorge Armín Escalante Pasos, Mérida, Mexico.



Splendid Leaf Frog (*Cruziohyla calcarifer*).
Dustin Smith, Homestead, Florida, USA.



Spix's Snouted Treefrog (*Scinax nebulosus*).
Pedro Peloso, New York, USA.

All twelve photographers will each receive:

- A copy of the [2012 Amphibian Ark calendar](#), featuring the winning photos from the competition.
- A copy of Threatened Amphibians of the World published by the IUCN and NatureServe and edited by Simon Stuart et al. (www.lynxeds.com/product/threatened-amphibians-world).
- A copy of Treefrogs...prehistoric survivors with a global message - the latest book from National Geographic photographer Ted Schiffman (see www.imageartisan.com/treefrogs.html).

The judges also made special mention of two additional wonderful photos, which were Highly Commended:



Purple Frog (*Nasikabatrachus sahyadrensis*).
K.P. Dinesh, Bangalore, India.



European Toad (*Bufo bufo*).
Gleb Elenev from Smolensk, Russia.

Amphibian Ark Patron, Sir David Attenborough said: *"I am a firm believer of the powerful impact of beautiful photographs and images, and that when presented with succinct information about these species they can help to further raise awareness about the plight of amphibians. By participating in this event, you will help raise awareness of the plight the world's amphibians and play an important role in helping to save them."*

The twelve winning photos will be featured in the 2012 Amphibian Ark calendar, which will be available for sale around the world from August. This beautiful calendar not only features the winning photographs, but includes information about each of the species and information about what is being done to ensure the survival of these species in the wild. Additional information about the calendars and how to purchase them can be found elsewhere in this newsletter.

We'd also like to take this opportunity to sincerely thank the six international judges, who had a huge task reviewing all of the entries. Each of our judges has many years experience in wildlife photography or wildlife conservation, and it has been a privilege to have them contribute their valuable time during this competition. The judges were:

- Franco Andreone, Italy
- Jeff Corwin, USA
- Pavel German, Australia
- Francisco José López López, Colombia
- Bryan Maltais, USA
- Dr. George B. Rabb, USA

Detailed biographies on all of the judges can be found in the [last edition of our newsletter](#).

The top 100 scoring photographs from the amphibian competition are now available for everyone to enjoy on our web site, at www.amphibianark.org/photo-competition/ Check out these amazing photos!

Congratulations to all of the winners!

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Pre-order your 2012 AArk calendars now!



The twelve winning photos from our international amphibian photography competition [insert link to article] have now been made into a beautiful calendar for 2012. These calendars will be available for sale in August and proceeds from sales of the calendar will go towards saving threatened amphibian species.

Calendars will be for sale via our web site from August onwards, but you can pre-order your calendar now at, www.amphibianark.org/calendar-order-form/ for just US\$15 each (plus postage).

We are also offering discount prices for purchases of 11 or more calendars. Why not purchase some calendars for re-sale through your retail outlets, or for gifts for staff, sponsors, or at fund-raising events? If you order between 11-25 calendars, they will be available at the special price of US\$12 each – that's a saving of

US\$3 each. For orders of 26-99 calendars, the price drops even more, to just US\$10 each, a whopping US\$5 saving per calendar.

Remember – as well as having a spectacular calendar to keep track of all your important dates, you'll also be directly helping to save amphibians, as all profits will be used to support amphibian conservation projects.

[Order your calendar now!](#)

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AArk 2011 Seed Grant winners

Amphibian Ark is pleased to announce the winners of the 2011 Seed Grant program. These \$5,000 competitive grants are designed to fund small start-up projects that are in need of seed money in order to build successful long-term programs that attract larger funding. We would like to acknowledge the generous support of the Andrew Sabin Family Foundation, Ronna Erickson, Josie Lowman, [Woodland Park Zoo](#) and the [European Association of Zoos and Aquariums](#) in establishing these grants. Applications for seed grants in 2012 will be called for early in 2012.



The successful projects are:

- [Captive breeding of the Canasí Frog from Cuba](#) – Museo Nacional de Historia Natural de Cuba (\$5,000)
- [Ex situ management of five extant species of *Atelopus* in Ecuador](#) – Centro Jambatu de Investigación y Conservación de Anfibios/Fundación Otonga, Ecuador (\$5,000)
- [Conservation of *Scinax alcatraz*](#) – Fundação Parque Zoológico de São Paulo, Brazil (\$5,000)

Captive breeding of the Canasí Frog from Cuba – Museo Nacional de Historia Natural de Cuba

The recent [Amphibian Conservation Needs Assessments for Cuba](#) (27–30 April 2011) by AArk in the Dominican Republic concluded that *Eleutherodactylus blairhedgesi* is the highest priority species for *ex situ* conservation actions in Cuba. The species is listed as Critically Endangered (CR) by the IUCN (Hedges and Díaz, 2004, 2010), and threats are not expected to be reversed in time to avoid extinction.



This frog is a local endemic to the north coast of Havana and is currently affected by increasing impacts of crude oil mining and the development of tourism. The funding from the AArk Seed Grant will assist with developing a facility for *ex situ* conservation of *E. blairhedgesi*; and monitoring wild populations of the species to gather basic information on its biology and threats. This project is expected to develop the first action plan to protect the species through a combination of *ex situ* and *in situ* strategies.

This project will facilitate the publication of several aspects of the species' natural history and new protocols for *ex situ* conservation.

The complete project proposal can be viewed [here](#).

Ex situ management of five extant species of *Atelopus* in Ecuador – Centro Jambatu de Investigación y Conservación de Anfibios/Fundación Otonga, Ecuador

This project aims to save five extant species of harlequin frogs, *Atelopus* spp. from extinction in Ecuador, through *ex situ* breeding and management. Most harlequin frogs went extinct and most of the extant are Critically Endangered (based on IUCN criteria) through all its distribution. Given the threats this genus faces, *in situ* management is not enough to save the species, and at this point, *ex situ* management is an urgently needed proactive solution to save extant species from extinction.



Previous efforts to captive breed *Atelopus* have been relatively minor and unsuccessful, except for *A. zeteki*. Some of these efforts have failed because they relied on the spontaneous breeding of amplexant pairs kept under lab conditions. Previous experience shows that breeding under such

circumstances rarely occurs. Thus, our objectives and activities are directed to find additional founders, adequately equip the *ex situ* facilities for the program Arca de los Sapos of Jambatu Center, and perform essays of assisted reproduction (using hormones) of *A. sp.*, *A. elegans*, *A. spumarius*, *A. balios*, and *A. nanay*, on the basis of successful previous essays with two of the species.

With this project we expect to produce the first descendants of future genetically viable populations of these five species. We will keep them under laboratory conditions until the causes of their declines and disappearances are better understood and mitigated in nature, so their reintroduction would be feasible.

The complete project proposal can be viewed [here](#).

Conservation of *Scinax alcatraz* (Anura: Hylidae): Captive breeding and in situ monitoring of a Critically Endangered tree frog species – Fundação Parque Zoológico de São Paulo, Brazil

Scinax alcatraz is a tree frog, endemic to Alcatrazes Island and is listed as Critically Endangered in the IUCN Red List. Part of the island belongs to the Brazilian Navy, and it is used as a target practice by navy ships. This practice often causes spot fires on the island and consequently destroys bromeliads, the habitat of *S. alcatraz*. For this reason the establishment of an *ex situ* breeding program, as well as maintaining a viable population in captivity, is necessary and urgent.

Founders for the captive population will be collected during the rainy season and will be placed in a captive biosecure breeding facility (modified shipping container), inside Fundação Parque Zoológico de São Paulo facilities. The funds received from AArk will be used for husbandry and care materials. Parallel to the captive program, constant monitoring of the species will be conducted to enable the investigation of possible population declines, and if necessary, the genetic and sanitary viable population of *Scinax alcatraz* maintained in captivity will be ready for possible supplementation or reintroduction.

The results of this project will be published in a guideline, which can be used to ensure that amphibian conservation is a priority in public policies in Brazil.

The complete project proposal can be viewed [here](#).



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Wouldn't you like to be an AArk Sustaining Donor too?

In 2009, the AArk put out a request for institutional donors to make a five-year pledge; that is, for zoos, aquariums and other facilities to pledge to donate their current amount of general operating support each year through 2013. Three beneficent institutions stepped up to answer that challenge.



[Sedgwick County Zoo](#) in Kansas, USA, is active in numerous amphibian programs, including the Species Survival Programs (SSPs) for Puerto Rican Crested Toads and Panamanian Golden Frogs, in addition to basic husbandry research on obscure taxa like tailed frogs and caecilians. They also support fieldwork on Iranian Newts through the sale of captive-bred offspring. "Amphibian Ark is very important to Sedgwick County Zoo and we consider it a duty and a privilege to be part of the greatest species conservation challenge in the history of mankind." - *Mark Reed, Executive Director, Sedgwick County Zoo.*



[Nordens Ark](#) in Sweden aims to provide self-sustainable viable populations of threatened amphibian species in the wild.

As deterioration or absence of suitable habitats is a main reason for the

degree of threat, environmental restoration is combined with conservation breeding to ensure successful reintroduction programs. The engagement must also be combined with a careful scientific experimental approach. Many species previously Red Listed in Sweden have been removed from the Red List or downgraded. One of the most successful reintroduction projects is that of the Fire-bellied Toad, *Bombina bombina*, which died out in the 1960s and now has a strong viable population in south Sweden. For the moment the most important reintroduction project of a native species is the Green Toad. *Bufo viridis*, which is still a conservation challenge. Nordens Ark is presently working together with Turkish



Nordens Ark continues its involvement in the important reintroduction project of the native Green Toad.

scientists to ensure that the endemic Taurus Frog, *Rana holtzi*, will have a sustainable viable population in the Taurus mountains in south Turkey. "It is a true honor, and nothing else, to support such an important project as AArk! One of the few initiatives that really work to help endangered species that cannot be saved in the wild! I wish we had more of that in the zoo community." - *Lena Linden, Director, Nordens Ark.*

[Denver Zoo](#) in Colorado, USA, is involved with the Lake Titicaca Frog, *Telmatobius culeus* Project in Peru and Bolivia, including population surveys, ex

Sedgwick County Zoo supports fieldwork on Iranian Newts through the sale of captive-bred offspring.

situ assurance population, captive propagation, holding stakeholder workshops, and a national education campaign about the effects of human consumption on this critically endangered species. "The amphibian crisis we all face did not occur overnight and can't be solved without a sustained effort. We feel our initial five-year AArk commitment is an excellent investment in securing a future for amphibians. Collectively, we've supported programs to produce greater awareness of the complex challenges, to build expertise in professionals to address the challenges, and to establish a myriad of projects that are yielding effective results. Denver Zoo will continue to invest in our own amphibian field projects and to support AArk as long as it takes. We encourage others to join us." - *Craig Piper, President/CEO, Denver Zoo.*



Denver Zoo is involved with the Lake Titicaca Frog Project in Peru and Bolivia, including population surveys, *ex situ* assurance population and captive propagation.

Wouldn't you like your institution to be a sustaining donor too? Let us know if **your institution** would like to commit to donate annually from now until 2015 and we will celebrate you as we do these three wonderful supporters of the AArk. Please contact [Elizabeth Townsend](#) at AArk to confirm a payment method that best suits your institution.

Have you thought of taking out a monthly individual subscription? Individual donors can make automatic monthly donations to the AArk via our secure PayPal account. These regular, smaller donations suit many people, rather than making a single larger donation. You can subscribe in just a few minutes using our [monthly subscription form](#).

Unable to make a long-term commitment? That's fine; we love all our donors! Please contact [Elizabeth Townsend](#) at AArk with inquiries about institutional donations; individual donors can go to our website and [donate today](#).

Watch upcoming newsletters for recognition of our seed grant donors, officer time donors, and individual monthly donors.

Thank you to all of you for your support of the Amphibian Ark!

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Conservation Needs Assessment workshop for Caribbean amphibians

In March 2011, Amphibian AArk staff facilitated two Amphibian Conservation Needs Assessment workshops in Santo Domingo, Dominican Republic, in the Caribbean.

The first workshop, which also included the updating of many Red List Assessments, focussed on species from Haiti, the Dominican Republic and Jamaica. During this workshop sixty-three species were reassessed according to the IUCN Red List Categories and Criteria and distribution maps for these species. Sixteen Jamaican species and forty-seven species from Haiti and the Dominican Republic were reassessed.

The second workshop assessed the conservation needs of amphibians of Puerto Rico and Cuba, plus a few species from the Lesser Antilles.

During the nine days, sixteen field experts and observers worked with staff from the AArk, IUCN Amphibian Specialist Group and Conservation International, with various sub-groups being formed as necessary to tackle multiple assessments at the same time.

One hundred and seventy-eight amphibian species were assessed for their conservation needs of which, 54 species occur in Haiti, 44 in the Dominican Republic, 24 in Jamaica, 62 in Cuba, 22 species in Puerto Rico and 6 from the Lesser Antilles. The assessment process resulted in the following recommendations: 25 species in need of *ex situ* Rescue programs; 112 species could still be saved in the wild with *in situ* conservation action; 41 species require further *in situ* research to determine more about the species population status and/or the threats they face; 78 species are currently undergoing, or are proposed for specific *ex situ* research that contributes to the conservation of the species, or a related species; 90 species that are suitable for either *in situ* or *ex situ* conservation education programs; and 26 species recommended for cryopreservation. Only twelve species were not recommended for any conservation action. The breakdown of these species by country is:



Osteopilus dominicensis.
Photo: Richard Gibson.

	Rescue	<i>In Situ</i> Conservation	<i>In Situ</i> Research	<i>Ex Situ</i> Research	Conservation Education	Cryopreservation	None
Haiti	10	41	17	20	20	10	2
Dominican Republic	4	29	8	17	20	4	1
Jamaica	1	4	10	6	6	1	8
Cuba	3	45	8	41	34	3	1
Puerto Rico	7	6	1	8	22	7	-
Lesser Antilles*	1	4	-	2	5	1	-

* (only 6 species assessed)

We are currently identifying additional field experts in the Lesser Antilles and Trinidad & Tobago to help complete the assessments for those islands. Data sheets will be updated as additional assessments are made.

The more detailed conservation action reports can be found on Amphibian Ark's data portal, www.amphibianark.org/assessmentresults.htm

During the workshop we reviewed the results of the species assessments for each country and discussed options for following up with various conservation actions identified during the workshop. Volunteers were identified in each country to be the focal point for continued actions, assessment updates, and to encourage amphibian conservation activities for the countries. These volunteers are: Susan Koenig and Iris Holmes for Jamaica; Rafael Joglar for Puerto Rico; Sixto Inchaustegui for the Dominican Republic; Luis Díaz and Ariel Rodríguez for Cuba and Joel Timyan for Haiti.

We also spent several hours on the last day of the workshop discussing *ex situ* amphibian husbandry issues, with many examples of both simple and sophisticated facilities being shown and discussed. Participants found this particularly helpful, and they gained many good ideas to put into practice at their own facilities.



Eleutherodactylus inoptatus.
Photo: Richard Gibson.

Workshop participants enjoyed three trips during the workshop: a night walk around Parque Zoológico Nacional (ZooDom); a field trip to a wonderful cloud forest in the 23 km² protected area Reserva Científica de Ebano Verde; and a night trip to the Santo Domingo Botanical Gardens. Several frog, lizard and snake species were found during these trips, as well as a couple of huge tarantulas. We'd like to extend our thanks to Adrell Núñez from ZooDom and Miguel Landestoy for their hospitality in providing these trips for us, thereby allowing us all to experience a little of the local flora and fauna.

We'd also like to thank the [Mohamed bin Zayed Species Conservation Fund](#), which provided the funds to support this workshop.

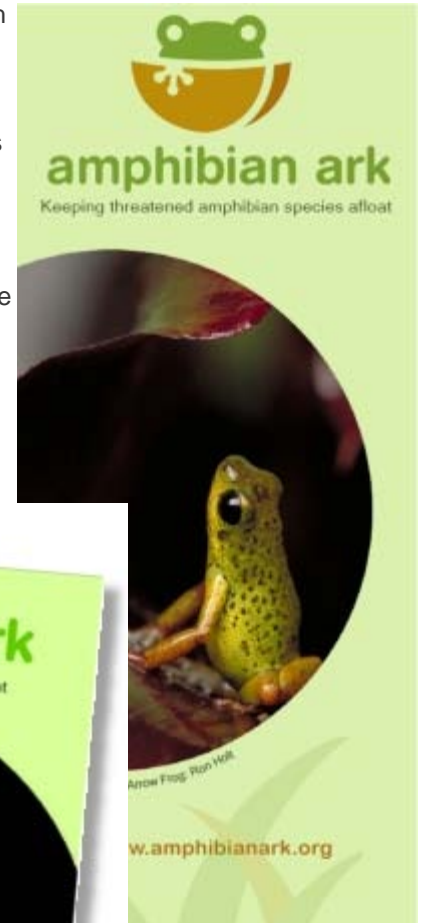
The result of the workshop can be found on the [Conservation Needs Assessment Results](#) page on our data portal.

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New AArk brochure and booklet

We've just released a new [tri-fold brochure](#) and a full-color [16-page booklet](#), which provide information about how Amphibian Ark is helping to save amphibians, and emphasize steps everyone can take in order to help preserve them. Both the booklet and the brochure are available to read on our web site, and print-quality versions of both documents can be downloaded from our [web site](#). These versions are suitable for your organization to print and to hand out at any amphibian activities or events that you may be running.

The designer, Melissa Nunes, is currently studying Graphic Design at the University of Central Florida. These designs resulted from an assignment to choose a non-profit organization she is interested in to design items for. Melissa also designed a magazine ad and a T-shirt to help spread the word about Amphibian Ark, and we will be launching Melissa's T-shirt design, along with a range of other new and exciting T-shirts in the coming months. You can contact Melissa at mnunesmedia@gmail.com.



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New Frog MatchMaker projects

In 2010, we launched our conservation project list, Frog MatchMaker, which now includes 53 amphibian conservation projects from twenty-one countries. The complete list can be searched by genus, country, project type, or by the amount of support required, and we would urge you to take a minute to look through the list and find a project that you or your organization might be able to support.

In this newsletter, we're featuring three more projects from the list that are seeking support to carry out their amphibian conservation projects.

Wildlife Institute of India

The crisis of amphibian decline is undoubtedly of serious concern, but also presents a unique opportunity to gather new information on amphibian biology and to develop *ex situ* conservation programs. *Ex situ* populations of amphibian species will serve as assurance populations and could be used to supplement or re-stock the wild population in the event of decline or extinction.

Because of high levels of endemism among amphibians and reptiles the Western Ghats of India is a global biodiversity hot spot. Only 12% of the region falls under wildlife reserves and therefore, it excludes protection for several endemic anurans. Nearly 75% of the endemic amphibians of this region are threatened and some of them might require *ex situ* conservation on a priority basis. One of the major deficiencies in implementing an *ex situ* conservation program for amphibians in the region is the lack of information on the microhabitats, breeding biology, feeding ecology and larval ecology. Apart from the short effort made by Dr. Brij Kishore Gupta in rearing and breeding some endemic anurans of the Western Ghats, there is no information on their conservation breeding. Existing *ex situ* conservation facilities do not have the infrastructure, knowledge or trained manpower for inducting endemic anurans.



The Purple Pig-Nose Frog, *Nasikabatrachus sahyadrensis*, being studied by the Wildlife Institute of India.

This project aims at creating the much needed baseline information on the five sympatric, endemic anurans of the Western Ghats. It will achieve this by documenting *in situ* behavior and ecology of species and rearing adults and larvae of these species in order to develop conservation breeding protocols. The five species selected for the present study are *Indirana phrynoderma*, *Micrixalus fuscus*, *Nyctibatrachus major*, *Nasikabatrachus sahyadrensis*, and *Rhacophorus pseudomalabaricus*.

This project will be executed with partial support from an ongoing project in the region and, material support that the host Institution would extend. The project is in need of glass or plastic terrariums and chytrid testing supplies, and requires \$8,000 support in total.

More information about this project is available on the [Frog MatchMaker web site](#), or contact: Dr Karthikeyan Vasudevan karthik@wii.gov.in

Chengdu Institute of Biology

The Chinhai Salamander, *Echinotriton chinhaiensis*, is a medium-sized, warty brown salamander with areas of orange on the underside of the tail and feet. Like its single congener the Anderson's Newt, *E. andersoni*, the ribs are sharp-tipped and penetrate the skin and poison glands when grasped by a predator. Adults are terrestrial,



laying their eggs in damp vegetation along the edge of puddles and ponds; hatching larvae fall into the water below where they develop.

The Chinhai Salamander is one of the rarest species endemic to China, known from only three localities in a narrow strip of the Zhejiang province. Because of the limited range, number and size of populations, and due to human-induced habitat destruction, the Chinhai Salamander has been listed in the Grade 2 Category of Major State Protected Wildlife, as endangered in the Chinese Red Book, and as Critically Endangered in the Global Amphibian Assessment.



A female Chinhai Salamander and her eggs.

Dr. Xie Feng has been working with Chinese amphibians for nearly two decades; he and his research team have already completed a decade of studies on the Chinhai Salamander. Dr. Feng's conservation actions for the Chinhai Salamander, underway and proposed within this project, fall into three categories: ongoing population monitoring, maintenance of captive assurance colony, and community outreach.

A breeding centre will be constructed, and requires support in the way of funds for construction, animal care and captive breeding, costs associated with field work, and support for the organization of the school lectures.

More information about this project is available on the [Frog MatchMaker web site](#), or contact Dr. Feng Xie xiefeng@cib.ac.cn

Uganda Amphibian Centre

The Uganda Amphibian Centre is establishing one of the first modern captive breeding facilities in Uganda and the region, engaging national biologists and international institutions to access data for proper management and reintroduction programs of endangered species. The project is in its early stage and currently requires donations in the form of funds, training opportunities, materials etc. Support is required for training staff in captive breeding and they would also appreciate any helpful relevant literature. They also require aquariums, filters, thermometers and Ph test kits. Project running cost is approximately \$7,000 per year.

The Centre is also involved in research activities and community awareness campaigns where they engage local authorities in seminars aimed at educating the local population about the dangers of poaching and deforestation.

More information about this project is available on the [Frog MatchMaker web site](#), or contact Peter Mugabe peter_mugabe@yahoo.com

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Launch of the Global Amphibian Blitz

Kevin Johnson, Taxon Officer, Amphibian Ark

We recently emailed all AArk members about the new Global Amphibian Blitz project. To better understand and conserve amphibians, which are rapidly disappearing around the world, **scientists need your help!**

Amphibian Ark has joined with [AmphibiaWeb](#), the [Smithsonian Conservation Biology Institute](#), [Center for Biological Diversity](#) and the IUCN/SSC [Amphibian Specialist Group](#), to launch the [Global Amphibian Blitz](#).



Now you can contribute your photographs of amphibians along with the dates and locations where you observed them from anywhere in the world, even from your mobile phone. Together, through the cooperation of scientists and amateur naturalists from around the globe, let's census the world's amphibians and ask which species are still here and where they persist. **Let's find every one!**

To hear more about the Global Amphibian Blitz watch [this video](#), read [this flyer](#), or visit the [Global Amphibian Blitz web site](#).

The screenshot displays the Global Amphibian Blitz website interface. At the top, there is a banner with the project logo, a yellow frog, and the text "304 of 6814 species and counting! See more stats...". Logos for the Smithsonian Conservation Biology Institute and the Amphibian Specialist Group (ASG) are also visible. Below the banner is a world map with blue location pins across various continents. To the right of the map is a sidebar with navigation options: "Observations / Map" (with links for Atom, KML, and CSV), "Checklist" (showing 304 species total), and "Top Contributors". The top contributors list includes:

- 1. **jplarry**: 61 species, 100 observations
- 2. **benjamin**: 40 species, 40 observations
- 3. **briang**: 34 species, 46 observations

Below the list are links for "View leaderboard >" and "View all members >". At the bottom of the page, there is an "About" section with the text: "Amphibians around the world are rapidly disappearing. To conserve these fascinating creatures, scientists need your help! To hear more watch this video or read this flyer. Contribute your photographs (locations of rare

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Frog vets on the go! Amphibian Veterinary Outreach Program continues work in Ecuador

Ron Gagliardo, Training Officer, Amphibian Ark

Many threatened amphibian species require conservation intervention of some sort, and those that cannot be saved in the wild in a timely manner require captive rescue. However, it is not enough to simply collect them, place them in glass boxes, and consider the job finished. Long-term health issues related to basic husbandry, nutrition, and disease will, if left unchecked, eventually cause the captive population to follow the wild one into extinction, wasting precious time and other resources in the process. Amphibian caretakers must be enabled with the skills to properly manage the species in their care from a health, veterinary and population management perspective.

In late 2008, after visiting *ex situ* facilities in Latin America where problems were evident, an idea germinated to help range-country programs reach higher levels of success in their breeding programs through on-site training with experts in amphibian husbandry, veterinary work and population management. With support from the Turner Foundation, Nipmuc High School, and Amphibian Ark we initiated an Amphibian Veterinary Outreach Program (AVOP) in 2009.

The AVOP team works with an overall objective to improve regional and local capacity for training, diagnostic and treatment. Specifically, this team consists of:

- *Brad Wilson, DVM*. A private clinical veterinarian from Atlanta, Georgia, Brad has been the consulting veterinarian for the Atlanta Botanical Garden since the mid-1990s and has worked on projects in Panama, Ecuador and also in Georgia. He is an Amphibian Ark Consulting Veterinarian and has been an instructor with AArk husbandry workshops around the world.
- *Sam Rivera, DVM*. Also a clinical veterinarian, Sam is based at Zoo Atlanta where he has been since 2005. Sam has a long teaching history and his clinical experience ranges from Giant Pandas to Galapagos Tortoises to extremely endangered Panamanian amphibians. Sam's fluency in Spanish is a huge help in making sure our collaborators in Latin America fully comprehend the information provided.
- *Allan Pessier, DVM* is an amphibian pathologist in the Wildlife Disease Laboratory at the Institute of Conservation Research at the San Diego Zoo, where he has worked since 2003. Allan's contributions to the field of identifying, diagnosing and treating amphibian chytrid fungus are recognized worldwide. He has trained many students around the world in the sampling, staining and diagnoses of amphibian ailments.

Initially, we wanted to offer the services of AVOP to facilities in Brazil, Panama, Ecuador and Colombia, however, funding limitations prevented this and it was decided to narrow the focus and budget in lieu of not doing anything at all. During 2008–2010, we made initial surveys and site visits to several facilities in Ecuador and Panama. During these visits, the team works directly with local stakeholders including staff, students, and local veterinarians, demonstrating diagnostic, surgical and necropsy techniques. In some cases, histopathology samples were collected and prepared on site, followed by examination and evaluation of any treatment options. The AVOP team also helps to develop protocols for biosecurity, quarantine and other husbandry-related issues. Those visits identified health problems in these situations including metabolic bone disease, rhabditiform nematode infections (*Rhabdias* and *Strongyloides*), and infectious diseases such as chytridiomycosis. Many of these problems are related to nutrition and husbandry and have solutions that can be easily implemented if staff receive appropriate training.

There are now three active centers in Ecuador involved in maintaining assurance populations of endangered amphibians: The [Balsa de los Sapos Center](#) program at the Pontificia Universidad Católica del Ecuador (PUCE), the [Jambatu Amphibian Conservation Center](#) in Quito operated by Dr. Luis A.



Above: Allan Pessier demonstrates necropsy techniques to PUCE staff. Below: Zoo Atlanta veterinarian, Sam Rivera examines a frog with Kathya Bustamante at the Balsa de los Sapos facility in Quito. Photos: Ron Gagliardo.

Coloma, and the [Amaru Zoo's Amphibian Conservation Center – Mazán](#). The AVOP program is helping all three of these facilities that are now collaborating within Ecuador to further the conservation of these unique and valuable species.

In March 2011, the AVOP team spent a week working at PUCE in the Balsa de los Sapos Center. This is the very successful and well known facility that was started many years ago by Professor Luis Coloma and is now headed by one of Dr. Coloma's former students, Dr. Andres Merino-Viteri. Over the course of the past several years, the program has been home to populations of several critically endangered species from Ecuador. While success has been sweet for the Balsa, lingering health, nutrition and management issues have held the program back in some ways. The AVOP team made its first visit to the lab in January 2010 followed by another visit in September 2010 to work side by side with the Balsa staff in helping to isolate, diagnose and treat problems. We also visited the Amaru Zoo facility and the Jambatu Center where we observed great progress on their *ex situ* projects and where we will be visiting again before the end of 2011.



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Conservation and breeding of the Japanese Giant Salamander at Asa Zoo

Yuki Taguchi, Animal Keeper, Hiroshima City Asa Zoological Park

As you might already know, our zoo, Hiroshima City Asa Zoological Park, is the most successful zoo in the world for breeding the Hanzaki (Japanese Giant Salamander), *Andrias japonicus*. Many zoo keepers, researchers and TV crews from abroad have come to Asa Zoo to learn about *A. japonicus*, and to see our breeding facilities.

I began working at Asa Zoo last year after I received my PhD to investigate this unique and fantastic animal, and this year, at last, I began to take care of approximately one hundred giant salamanders here!

There are five main characteristics of Asa Zoo's conservation activities with *A. japonicus*. First, our zoo has now been researching *A. japonicus* for over forty years, since we began holding the species in 1971 when our zoo opened, and we have learnt from many field surveys how and where *A. japonicus* breed in their natural habitat. Sometimes we went to the stream for three days continuously, on 72-hour rotations, to observe the salamanders' breeding behavior. We now undertake periodic surveys in every season.

Secondly, after these vast efforts, we successfully bred *A. japonicus* in captivity in 1979, and we have bred the species every year since then. Although breeding failed for several years in the past, we overcame any problems and ultimately improved our breeding success. During the last three years though, we have failed to hatch eggs, in spite of successful oviposition, maybe due to a problem with the den master (the male salamander which guards the eggs in the nest or den). We are continuing to investigate the cause of this problem. We are proud that Asa Zoo currently has a thirty year-old giant salamander, which was born in 1980 at Asa Zoo, and she has bred since she was seventeen years old. This is the longest record of a giant salamander living in captivity in Japan.

We have also been conducting *in situ* conservation activities with the local people from the villages near where the salamanders occur in the wild, focusing on environmental education with school children and teaching them about the species and stream nature. For the past few decades, governments have modified many streams to make them safer for people who use the area. Some examples of this include building small agricultural dams to move water into rice fields, concrete bank protection, straightening the natural curve of some streams, and so on. Because of these alteration and destruction of parts of the natural habitat, *A. japonicus* began to lose their shaded nesting places, especially their breeding nest sites. So Asa Zoo developed artificial breeding nests and began to install them into the natural streams. Local people manage the nests, and take care of the salamanders and we educate the local children about the importance of conserving nature as well as the salamander.

Asa Zoo also gives advice to the government regarding the conservation of *A. japonicus*. This includes advice on precautions when undertaking any construction work on or around streams, how the locations should be surveyed before any construction work begins, and how to mitigate any problems, if they arise. Our experience has played an important role in the conservation of



Yuki Taguchi, holding a one metre-long Japanese Giant Salamanders in the purpose-built breeding facility at Asa Zoo. Photo: Yuki Taguchi.



Above: Asa Zoo staff involve local people with education about conserving nature and observing the giant salamanders. Below: A den master with his eggs, in an artificial breeding nest in a stream. Photos: Yuki Taguchi.

giant salamander habitat.

And finally, these activities have always been carried out by “the team as a whole” rather than by an individual person, and it is important that this experience and knowledge continues to be passed on from senior to the newer generation of keepers. Our zoological park is proud of this attitude towards the breeding and conservation activities of Japanese Giant Salamanders. There has definitely been a hot passion about this animal in Asa Zoo since 1971.

I began to work at Asa Zoo with great expectations for this species. From now on, I hope to acquire additional captive salamander husbandry skills as soon as possible. I’m then going to write more articles and give presentations about our activities to draw on my previous experiences. I hope to be able to demonstrate statistically the interesting ecology and conservation biology of *A. japonicus* that has been discovered from our activities with the species at Hiroshima City Asa Zoological Park.



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The Spotted Tree Frog program at Healesville Sanctuary

Kristy Penrose, Acting Supervisor, and Mason Hill, Keeper, Threatened Species, Healesville Sanctuary

The Spotted Tree Frog, *Litoria spenceri*, is a critically endangered stream-dwelling species inhabiting the fast-flowing rocky upland streams of south-eastern Australia. These frogs are threatened by a number of factors including changes to water flow, stream sedimentation, predation of tadpoles by introduced fish species and now also the amphibian chytrid fungus *Batrachochytrium dendrobatidis*. Today Spotted Tree Frogs are restricted to a small number of isolated mountain streams and are vulnerable to extinction in the wild if the factors contributing to their current decline continue.



Healesville Sanctuary maintains an insurance population of Spotted Tree Frogs and assists in the recovery of the species by captive breeding and releasing tadpoles into the environment. In captivity we have focused our efforts on refining the husbandry of this species by closely monitoring the structural and chemical characteristics of the tank environment and investigating how the environment influences breeding participation rates, embryo development and the survivorship of any offspring. In the wild, captive-bred tadpoles are released and monitored by field researchers to investigate the role that introduced trout and chytridiomycosis play in the population dynamics of the species.

Healesville Sanctuary maintains an insurance population of Spotted Tree Frogs, *Litoria spenceri*, and assists in the recovery of the species.
Photo: Matt West.

The new breeding facility has been developed to replicate the species' natural habitat. In the wild, Spotted Tree Frogs are found hiding under rocks along the banks of cold, swift-flowing streams in steep rocky areas, coming out at night to perch on overhanging vegetation or rocks to advertise for mates and to catch their food. In captivity we have attempted to recreate this environment by directing cold, filtered, well oxygenated water into each breeding tank while also providing a dry area filled with rocks for the frogs to retreat into. A number of carefully selected oviposition rocks have also been placed into the water-filled area at the front to encourage the female *L. spenceri* to lay their egg masses beneath.



The offspring produced this season have been released into sites where this species is known to be locally extinct. Approximately 500 metamorph frogs were released at two separate sites, selected on the basis of habitat suitability and accessibility. The released frogs were individually marked and swabbed for amphibian chytrid fungus prior to release and follow-up field work has identified high numbers of recaptured frogs.

One of the tanks in the Spotted Tree Frog breeding facility at Healesville Sanctuary. Photo: Kristy Penrose.

We hope to re-establish this frog in a localized area, and these trials form part of a project that aims to give us a clearer picture of the effectiveness of this method of release and should enable us to begin understanding the factors responsible for the species' decline. The long-term aim of the project is that we will be able to identify suitable streams for introduction of the Spotted Tree Frog outside its present distribution and be better able to actively manage the remaining wild population.

Amplexus, egg deposition and tadpole hatching in the Black Cajas Harlequin Toad at the Amphibian Conservation Center - Mazán forest in Ecuador

Fasuto Siavichay (1,2), Diego Alvarado (1,2), Ernesto Arbeláez (1,2) and Carlos C. Martínez (1,3), (1) Centro de Conservación de Anfibios, (2) Zoo Amaru, (3) The Philadelphia Zoo

On 31 April 2011, we observed a true first for amphibian conservation, a pair of the Critically Endangered black Cajas Harlequin Toads, *Atelopus nanay*, laid a clutch of more than 150 eggs under a rock in their terrarium at the Amphibian Conservation Center – Mazán Forest (ACC-Mazán). This pair was the first to lay eggs this year. We already had a breeding attempt last year in which the egg mass succumbed to a *Saprolegnia diclina* infection and unfortunately, only a few hatched and they died quickly afterwards. We are now ready to take proper care of this new clutch!

ACC-Mazán was established in 2008 to help save some of the most critically endangered amphibians, the Green Cajas Harlequin Toad, *Atelopus exiguus*, the Black Cajas Harlequin Toad, *A. nanay*, the San Lucas Marsupial Frog, *Gastrotheca pseustes*, and the Andean Rocket Frog, *Hyloxalus vertebralis*, which were all previously found within the boundaries of Cajas National Park near Cuenca in Ecuador. Of these four species, today only the marsupial frog is found within the park. What follows is an account of our first successful breeding event and tadpole hatching at ACC-Mazán.

Amplexus

One of the authors first observed increased movement and weariness of one of the females and noticed she was getting plumper. Concurrently, some of the males began to call. After several days of displaying these behaviors (heavier and more active females searching around the tank, and increased calling of males) we decided to place this female with two of the calling males in her terrarium, since both were actively calling and searching from their respective enclosures. One of the males was chosen by the female and paired together. Amplexus occurred immediately! Three other pairs were subsequently paired although two of them were unsuccessful as the females rejected their respective partners.



Amplectant pair of the Black Cajas Harlequin Toad. Photo: Fausto Siavichay Pesántez.

As with most male frogs and toads, male harlequin toads are more eager to mate than their female counterparts. Unlike other frogs, these males can hold on for extremely long periods of time, sometimes up to three months, and can be a burden on the female and cause serious injury. In addition, we had no data about males feeding while in amplexus, so during this period the pair were closely monitored, and notes were made about their every behavior during the following days. Males have not been observed to eat while in amplexus, which to our knowledge has not been reported for Andean *Atelopus*, however one of the amplexed males was observed feeding on crickets during amplexus.

The breeding tank set-up

We placed the amplexed pairs of harlequin toads in glass tanks that are 80 cm long by 40 cm wide by 60 cm tall. These terrariums are equipped with a false bottom and front and back mesh windows (8cm tall by 40cm wide) for proper ventilation. We use a local substrate consisting mostly of gravel, which has been boiled to kill parasites. We then add local, live vegetation, mostly moss and other epiphytes, and large, partially submerged rocks. We provide a constant flow of water in the tanks for egg deposition, since most harlequin toads lay eggs in swift flowing mountain streams. The mesh windows reduce the chance of stuffy humid air and mould build up since our facilities are located inside the Mazán Forest Reserve, which is a montane cloud forest. The reason behind this is to provide a range of dry, moist, submerged environment and also provide areas with swift and strong currents, and pools, to facilitate egg deposition selection by females. Since ACC-Mazán is a semi-open environment located in the same or similar habitat where these frogs are found, there is no need to disinfect the water. We collect our water from a tributary of the Mazán River, which is mechanically filtered to prevent clogging of our system and clouding of the tank after heavy rains. Notwithstanding, we outfit the terrarium in such a way, so that we can control the various sites where we

expect the female to lay her eggs with the intention of removing all of the extra substrate after egg deposition, and leave as few material in the tank as possible.

During the non-breeding season, adult frogs are fed a variety of live arthropods, mainly crickets (*Gryllus* sp), bean beetles, and fruit flies (*Drosophila* sp.), however, adults were fed mainly gut-loaded crickets before and during the breeding season. The temperature in the tanks and surrounding areas fluctuated from 10 to 17 degrees during this period, and humidity ranged from 40 to 65%.

Eggs are found!

On the morning of 31 April 2011 the pair were not in amplexus. As a precaution, a meticulous search of the terrarium was made and a clutch of more than 150 eggs was found under a rock. The eggs were left in place and the parents were removed that same week and returned to their individual tanks. Water was flowing constantly in the enclosure while the pair was there in amplexus and continued to flow at a constant rate. After removing the pair of adults we also removed as much substrate as possible to reduce the possibility of contamination of the eggs.

Caring for the tadpoles

There are probably around 150 tadpoles already in the first Gosner stages, still attached to the egg mass. These are not yet free-swimming, but they are moving their tails a lot and showing the typical creamy white coloration of *Atelopus* tadpoles. Since they are not free-swimming yet, they are not eating, and depend on the energy of their receding yolk sac. We have enough Sera® Micron tadpole food ready to offer them when the time is appropriate. We have received technical support and husbandry suggestions about tadpole care and feeding from the Amphibian Veterinary Outreach Program staff, Ron Gagliardo (AArk, Woodland Park Zoo) and Allan Pessier (San Diego Zoo), who visited us earlier this year and they got to see the amplexed pairs during their visit. We also talked with Dr. Luis Coloma, who also gave us really good advice on how to care for them.

Last year, we had a clutch of *A. nanay* that succumbed to Saprolegniasis and only a few tadpoles hatched. Those that hatched were fed a prepared food source that was too high in protein. So we devised a plan over two months ago and collected natural plant matter (algae and aquatic vegetation) from the habitats and rivers where the Black Cajas Harlequin Toad was originally found inside Cajas National Park. With the aid of José Cáceres, a Biologist from the Park and Universidad del Azuay in Cuenca, we will analyze its nutritional content at the university and prepare this organic mass of natural food into pulverized tadpole diet. Our plan is to try this food with a subset of *A. nanay* tadpoles and test if it is an effective, natural food source.



Above: Single adults are kept in rows of smaller tanks. Photo: Fausto Siavichay and Ernesto Arbeláez. Below: One of the Black Cajas Harlequin Toad tadpoles from last year's breeding attempt. Note the rasping mouthparts typical of *Atelopus* tadpoles. Photo: Ernesto Arbeláez.



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Prioritising research on South African amphibians

John Measey, Amphibian RLA, Applied Biodiversity Research Division, South African National Biodiversity Institute

Many biodiverse regions share a seemingly intractable problem: where should we prioritise research with limited funds, little capacity and a growing threatened list? This is of particular importance for amphibians which have many emerging threats which are not necessarily predicted by the current Red List status. One way to approach this problem is to obtain input from all regional specialists and create a consensus for prioritised research over a realistic period. South African amphibian researchers held a two-day workshop with the aim of prioritising research by producing a list of clear actions and responsible agencies together with a five year time frame. This has resulted in the publication of a research strategy for the region's amphibians (Measey 2011).

This article is a summary of the findings, but you can download a free pdf copy of the strategy document by following this link: http://www.sanbi.org/index.php?option=com_docman&task=documentdetails&id=430&Itemid=79

Understanding and documenting species diversity

Despite a history including some of the world's best herpetologists, South Africa still has new frogs to describe, and these require a combined approach including molecular studies in conjunction with morphological and call analysis. Priorities include undescribed species of *Anhydrophryne*, *Capensibufo*, *Microbatrachella*, *Poyntonophrynus* and *Xenopus*. Timely descriptions are important as each new species is likely to have an increased threat status, also requiring reassessments of other species within the genus.

Conservation and ecological studies

The list of priorities for conservation research is particularly long and this caused a lot of concern as there is not sufficient capacity or locally available funding to conduct the work that is required. Prioritisation did not always follow Red List status, underlining the need for an active evaluation process.

Assessing status and trends

Priorities for conservation and monitoring include the (now) Critically Endangered *Vandijkophrynus amatolicus*, last seen in September 1998 and the subject of a co-ordinated effort to find them again (see Conservation International's [The Search for Lost Frogs](#)). In general, most species continue to be assessed on their distribution data (Extent of Occurrence and Area of Occupancy) and a priority to collect population data and set up long-term monitoring programs for several threatened species was identified.

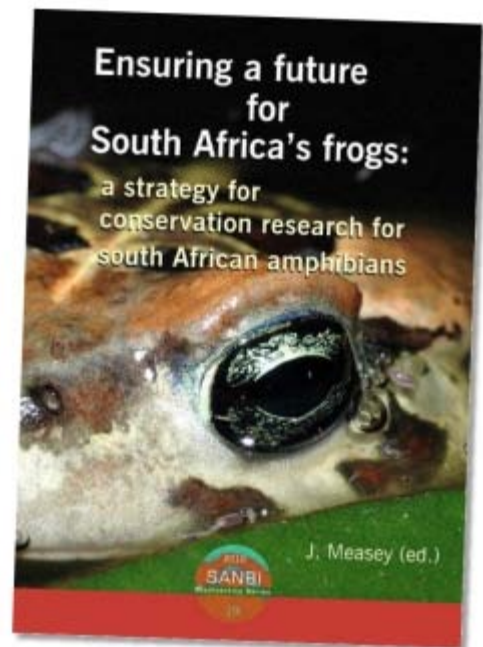
Education, awareness and capacity building

Including museums, universities, research institutions and provincial nature conservation organisations, South Africa has a total of fourteen amphibian researchers, most of whom also work on reptiles and other small vertebrates. This capacity needs to grow in order to meet the increasing threats to the country's frogs.

The reassessment and research strategy represents an important step for the conservation of amphibians in South Africa, and is a model approach for other areas of the globe. Perhaps the most impressive product of this exercise is that the work prioritised in the publication is already underway, teams are combining efforts and progress on amphibian conservation research is being made. Perhaps it is only by being ambitious that we can make a significant step to redress the loss of the region's amazing amphibian biodiversity.

Acknowledgements

Thanks to all members of the SA-FRoG team. I would particularly like to thank the South African National Biodiversity Institute (SANBI) publications department for their work on the book, and Tilla Raimondo from SANBI's Threatened Species Programme who obtained funding for the workshops and resulting publication from the Norwegian Agency for Development Co-operation (NORAD).



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Follow this link to download a free pdf of this SANBI publication http://www.sanbi.org/index.php?option=com_docman&task=documentdetails&id=430&Itemid=79



South African amphibian researchers, who attended a workshop in December 2009 to prioritise research on South Africa's amphibians. Photo: John Measey.

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Frogs Forever: A 'Spring Forward' event at Disney's Animal Kingdom

Kathy Lehnhardt, Curator of Education, Disney's Animal Kingdom

If you open your window on a warm summer night, you'll hear a cacophony of sounds, like... *croak, rivet, peep, squeal, click, squeak, trill...*

Many of these wonderful night sounds come from frogs as they seek mates. However, these familiar calls may disappear from your neighborhood, as well as worldwide, as amphibians face a global extinction crisis.

We are all too familiar with the many reasons for their disappearance. Amphibians are sensitive creatures that are affected by habitat loss due to urbanization, disease, pesticides, poor land management practices, fire suppression, introduced predators and possibly issues associated with global climate change. But once people are aware of these threats, they can initiate positive change in their local communities.

At Disney's Animal Kingdom in Orlando, Florida we are committed to saving amphibians. To demonstrate our commitment to these amazing creatures, every year we hold a special event at the same time that we adjust our clocks forward for daylight saving time. Our 'Spring Forward' event offers a variety of activities for Disney guests to join in and learn more about our friends the frogs, toads and salamanders.



Disney guests meet keeper, Jennifer, and an African Bullfrog. Photo: Kathy Lehnhardt.

All activities take place outside or inside our exhibit hall called Conservation Station and support the message that amphibians are great and we can take action to help protect them. Here are the activities that we offer to engage our guests in the world of amphibians:

Toad Abodes

Children make toad abodes for their backyards by painting small ceramic flower pots to take home and place on their side in the backyard as a small shelter for frogs and toads.

Frog Call or Not

Our animal care staff created a contest using Powerpoint that challenges children to identify the frog call from other animals. Their choices are: Is it a pig or a pig frog? Is it a cricket or a cricket frog? Is it a bull or a bullfrog? Is it a wren or a bird voice tree frog? The families have lots of fun distinguishing between the vocalizations in this auditory activity.

Frog Leap

A favourite kinaesthetic activity for children, and adults love it too, is the Frog Leap. Here, children take a standing jump to see how far they can leap. A strip of fabric is laid on the floor that includes a ruler to measure their leap and compares them to the leaps of various frog species. We ask the children to jump next to the fabric, not on it, as the fabric slips under their jump and could cause a tumble. These are the species we use on the fabric:

- European Common Brown Frog: maximum jump = 52.5 cm/ 1.72 ft
- Leopard Frog: maximum jump = 162.5 cm/ ~5.5ft
- American Bullfrog: maximum jump = 213 cm/ ~7ft
- Red-eyed tree frog: length of frog = 2.5 inches; maximum jump = 10 ft
- South African Sharp-Nosed Frog (world record holder): maximum jump = 334 cm/ over 11ft



Dress Like a Frog

This fun activity highlights the special adaptations of frogs that help them survive. Children can actually wear the items and end up “dressed like a frog.” The items include gloves with sewn on suction cups, a small balloon to hold under the chin as a vocal sac, a sport mesh shirt with holes for permeable skin, swim fins for webbed feet and swim goggles for protective eye covering.

What’s for Lunch

Children learn the types of food frogs and toads like to eat and how they catch their food. A piece of vinyl fabric is laid on the ground. A variety of plastic laminated bugs are placed on the vinyl. Children are given “Frogs with Sticky Tongue” toys to try to catch the bug with the sticky tongue. Needless to say, this is very fun and children learn it’s not that easy to catch a bug with a long tongue!

Meet a Frog

Our animal keeper team presents some cool amphibian friends on the stage for guests to get a close-up view in our specially designed show boxes. These boxes protect the frogs but still allow guests a close-up look.

At each activity, guests learn about conservation actions that they can take to help amphibians survive for the future. Here are a few:

- Find books on frogs to discover why they sing loudly, hear well and stay up late;
- Invite a bug-zapping amphibian into your backyard by placing an overturned pot as a home;
- Use less chemical pesticides on your lawn to keep amphibians healthy;
- Build a pond, plant native shrubs, and leave leaf litter and logs in your yard to create a habitat for frogs;
- Plan a family outing to a local pond to hear different species of frogs sing their love songs to one another;
- Find natural alternatives to household chemicals so these toxins don’t end up in amphibian habitats;
- Take part in a local pond or stream cleanup to ensure that native amphibians will have a clean home;
- Do a homework project and let your classmates know how important amphibians are to the environment.

Beyond their beautiful chorus, frogs also provide a free pest-control service. Frogs eat billions of harmful insects annually, including mosquitoes and their larvae. So let’s keep those summer nights filled with melodious singing and help protect frogs forever!

Above: Children seeing how far they can leap. A strip of fabric on the floor includes a ruler to measure their leap and compares them to the leaps of various frog species. Below: A little girl with frog finger puppets. Photos: Kathy Lehnhardt.



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Conservation strategy for Chiapas' critically endangered amphibians

Tuxtla Gutiérrez, Chiapas, México

The Strategy for the Conservation Strategy for Chiapas' Critically Endangered Amphibians was presented on April 26, as part of the first annual "Week for the Understanding and Appreciation of Amphibians" or "Primera Semana para el Conocimiento y Valorización de los Anfibios". This event took place at Zoológico Regional Miguel Álvarez del Toro (ZOOMAT) and it drew crowds of over 12,000 visitors on the three days it took place, from 26-28 April. Visitors were engaged in numerous activities, including a drawing contest (one hundred entries), sculptures (thirty entries), and photography (fifty entries), all about Mexican amphibians. The first, second and third place winners of the photography contest will be featured in the July edition of National Geographic en Español.



We also created the first travelling photography collection of Mexican amphibians, which includes forty-five images from fifteen different photographers. These images have already been seen at various regional expos, including two different venues during Universidad de Ciencias y Artes de Chiapas' Biodiversity Week (at Parque Ecológico San José and at the center square at San Cristóbal de las Casas) and at the Feria de la Fauna Silvestre (Wildlife Fair) in the city of Tuxtla Gutiérrez.

As part of this great initiative, ZOOMAT will now incorporate the first ever Ark of Chiapas' Amphibians, or "El Arca de los Anfibios Chiapanecos". This exhibit focuses on the display, reproduction and ex situ management, of the eleven amphibian species that inhabit El Zapotal Reserve, which is the site where the zoo is located.

This exhibit will be under the coordination of Biologist María Gabriela Palacios Mendoza. The opening of such a grand exhibit will be the beginning of a long term monitoring scheme for the amphibians of Zapotal Reserve to further support conservation programs for the regional wildlife of Chiapas.



Above: *Craugastor chac*. Photo: Biól. José Manuel Aranda Coello. Below: *Smilisca baudinii*. Photo: Biól. Mar. Jorge Douglas Brandon Pliego.



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American Frog Day 2011, New York City

Matt Mirabello, New York City Event Organizer, American Frog Day Committee and Ray Coderre, TMG leader, Amphibian Steward Network, Tree Walkers International

American Frog Day is an annual event focused on assisting scientific study and captive maintenance of Dendrobatid frogs and other amphibians through the exchange of knowledge, and the promotion of captive breeding and husbandry of these remarkable frogs.

On May 14, the 17th annual American Frog Day was hosted at the Snug Harbor Cultural Center and Botanical Garden in Staten Island, New York. This was the second time the event was hosted in New York City and this year's event was a bigger success with over 300 visitors and \$5,000 raised to benefit the continued amphibian conservation efforts of Tree Walkers International and the FrogDay.org grant through Amphibian Ark.

In 1995, Charles "Chuck" Powell and his family created and hosted the very first Frog Day in San Jose, California. Held as an annual gathering of amphibian enthusiasts, Frog Day was sponsored by Chuck and his family in San Jose for an additional nine years before they decided to take the event national in 2005. American Frog Day currently moves to a different city each year where it is hosted by a local volunteer sponsor.

The first decade of Frog Day in San Jose allowed amphibian enthusiasts from around the country to gather together, often for the first time, and to share their passion for Dendrobatid frogs. Many people met each other for the first time in person at these meetings. Buying and selling dart frogs and related supplies was of course, one of the reasons that enthusiasts attended, but the event also allowed attendees the opportunity to meet one another face to face to discuss and exchange ideas, practical advice, and to learn more about the many aspects of Dendrobatid and amphibian husbandry. This is a tradition that continues today with American Frog Day as it travels across the United States. Past locations of Frog Day include San Jose California, Phoenix Arizona, Atlanta Georgia, and New York New York.

This year's event in New York was, one could say, fit for a frog. Slightly cool and humid, the weather was ideal for transporting frogs around the venue site, which was set just outside the Tuscan Garden in an eighty-three acre cultural center and park on the northern shore of New York City's southern-most borough, Staten Island.

American Frog Day was open to the public from 9.00 am until 4.00 pm, and attracted a steady flow of over 300 visitors throughout the day. Each attendee was charged a small admission fee with proceeds going to support amphibian conservation. According to registration information, most participants were from the New York City metropolitan area, but dedicated frog enthusiasts from as far as Arizona and Denmark were also in attendance.



Above: Devin Edmonds taking a lunch break before his workshop presentation on the "Amphibians of Madagascar". Below: Ron Skylstad, Director of Tree Walkers International, at the Frog Day event, ready to answer questions about his organization's conservation mission. Photos: Ray Coderre.



Once inside, attendees were able to view and purchase naturalistic terrariums, exotic plants, feeder insects, amphibian themed art work, custom made faux logs and other decor, and of course, captive-bred frogs from any of the seventeen vendors. American Frog Day vendors, including Exo-Terra, PennPlax, and Zoo-Med, also donated a wide selection of items for a silent auction with proceeds to benefit Amphibian Ark and Tree Walkers International.

In addition to the show and sale, a number of workshops were also held throughout the day, beginning with an interactive presentation on “Basics of Poison Frog Care” by Staten Island resident and frog hobbyist Richard Lynch. Other workshops addressed topics ranging from amphibian water quality and bromeliad propagation to the Amphibians of Madagascar (presentation by Devin Edmonds). Attendees were also able to visit educational tables set up by the local Metropolitan Herpetological Society, the Staten Island Museum, and Tree Walkers International.

The day’s events culminated with a live auction sponsored by Exo-Terra, of donated captive-bred frogs and naturalistic terrariums. A total of \$3,000.00 in proceeds was raised through the auction on behalf of Amphibian Ark and Tree Walkers International.

The donation to Amphibian Ark will be part of the Frogday.org grant, which was established with the aim of actively engaging the frog hobbyist community in learning about and funding amphibian conservation efforts abroad. Qualifying applications are reviewed by a committee representing the organizations that contributed funds to the grant. This is the first year of the Frogday.org grant and the successful award recipient is scheduled to be announced on June 30.

American Frog Day is run solely by volunteers, with the majority of the preparation work being the responsibility of the local volunteer host. However the event would be impossible to run without the dedicated help of the frog hobbyist community that bring it all together on the day of the event.

Please visit www.frogday.org to learn more about American Frog Day, including when it will be coming to a city near you!

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Amphibian project at Aquazoo/Löbbecke-Museum Düsseldorf

Beate Pelzer, Marc Meßing and Sandra Honigs, Aquazoo

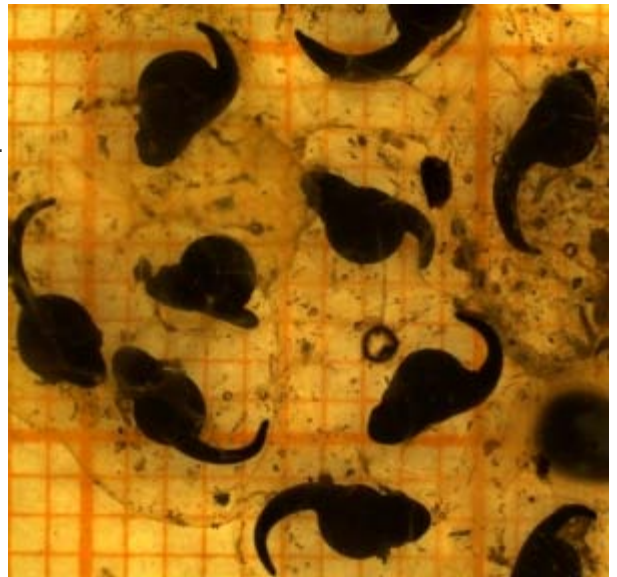
In 2008 the Aquazoo/Löbbecke-Museum in Düsseldorf, Germany, started a project called “Protection and Breeding Station for Amphibians”, which is supported by the environment department of the city of Düsseldorf. In the beginning of 2009 a special room for keeping and breeding frogs, toads and newts was established with twenty-five terrariums and two special racks of boxes for raising tadpoles. A conditioner and sprayers produce a special humidity and temperature-controlled climate. There are two main colleagues working on the project and many others are supporting it in different ways. Apart from *Salamandra salamandra* and *Phrynohyas resinifictrix*, the species in our project are either listed as Endangered, Critically Endangered or Data Deficient. Our ambition is to do what we can to establish solid populations in captivity to avoid poaching in nature.

The first animals in the so-called “Frogroom” were two species of Mossy Frogs, *Theleiderma corticale* and *T. bicolor*, Maranon Poison Frogs, *Excidobates mysteriosus*, Mandarin Newts, *Tylotriton shanjing*, and two subspecies of Harlequin Toads, *Atelopus spumarius spumarius* and *Atelopus spumarius barbatonii*. Since then we have also received Taylor’s Bug-eyed Frog, *Theleiderma stellatum*, the Himalayan Newt, *T. verrucosus*, the Red-eyed Tree Frog, *Agalychnis callydrias*, the Amazon Milk Frog, *Phrynohyas resinifictrix* (syn. *Trachycephalus resinifictrix*) and local species, the Common Tree Frog, *Hyla arborea*, and the Fire Salamander, *Salamandra salamandra*.

During the next two years we successfully bred all of the three *Theleiderma* species. As is the case in other institutions, we have the problem that all *T. corticale* offspring are male. We started to investigate the reasons and how to produce female individuals. After some problems in the beginning, we were also able to breed *E. mysteriosus*. *A. callydrias* is one of the most common frog species held in zoos and like many other institutions the Aquazoo breeds it very successfully. With the offspring from these species we were able to supply other zoos, zoological institutions and even private amphibian breeders. We also achieved several egg depositions from *A. s. spumarius* and we are now trying to establish the right conditions for rearing tadpoles and even juvenile Harlequin Toads. Our team is also a little bit disappointed that we have not bred *T. shanjing* so far, although we know that other zoos have been successful with this species. We observed several matings but we have never produced eggs or tadpoles. The other species mentioned above have not been in the project long enough for successful breeding.

We are also restoring the habitats of our local amphibians. In 2008 we worked with many volunteers to clean up the ponds around the Aquazoo/Löbbecke-Museum. Just a few months later our success was clear, because we observed the Common Toad, *Bufo bufo*, and several species of *Rana* and *Pelophylax* in our ponds, mating and breeding. We also support a local biological station in the research and reestablishment of the Common Spadefoot Toad, *Pelobates fuscus*, and a student is undertaking histological work on the Vietnamese Mossy Frog, *T. corticale*, for her bachelor of science degree.

It is very important for us to raise awareness within the general public and especially our visitors about the extinction of many amphibians using brochures, presentations, and a new interactive diorama featuring local amphibian species.



Above: Maranon Poison Frog eggs, approximately four days after deposition. Below: A juvenile Mossy Frog, approximately two months after metamorphosis. Photos: Marc Meßing.



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Australian amphibian programs – Taking a local approach

Michael McFadden, Co-convenor, ZAA Amphibian Taxon Advisory Group and Supervisor, Herpetofauna Department, Taronga Zoo

One of the unique features of Australia's approach to amphibian conservation is the focus only on *ex situ* programs for those species native to the country.

Approximately one-third of Australia's 230 native frog species are currently under the threat of extinction, with many of these requiring the need for *ex situ* intervention for survival or recovery. Over the last five years, Australian zoos have risen to the challenge with eleven highly threatened species in captive populations that focus on insurance, reintroduction and conservation research. Preparations are being made for additional critically endangered species, including the current successful keeping and breeding of analogue species.

One of the unique features of Australia's approach to amphibian conservation is the focus only on *ex situ* programs for those species native to the country. This decision has been guided by a few key factors, including the diversity of Australian amphibians, the number of Australian species currently requiring *ex situ* intervention and the potential for pathogen introduction into the country. It also permits greater involvement from the zoos with all aspects of the *in situ* recovery efforts for the targeted species.

Although chytrid fungus and a number of other amphibian diseases, are present in Australia the country's isolation has prevented the outbreak of many other novel pathogens and diseases, including certain ranaviruses responsible elsewhere for mass mortality events. This has historically been aided by strict regulations prohibiting the import of amphibians into Australia for private keeping and the preference of Australian zoos to display the diversity of endemic species. Further to this, major Australian zoos have voluntarily agreed not to import amphibians due to the risk of unintentionally importing a novel pathogen or disease. A recommendation was proposed in the 2007 ARAZPA Amphibian Action Plan:

"The potential still remains for pathogens to be moved around in resistant host species undetected by the most rigorous quarantine procedures. Once in a new environment they have the potential to infect naïve hosts, resulting in new waves of decline and extinction. Until further knowledge is available on amphibian pathogens and quarantine procedures to screen for them, no more amphibians will be imported into Australia."

Currently only three exotic anuran species are held in Australian zoos (with the exclusion of the introduced and established Cane Toad, *Rhinella marina*), and two of these are housed at single institutions.

To further demonstrate the approach to local species, each of the Australian zoos involved in amphibian *ex situ* conservation programs are currently focused on threatened species only from their region, and largely on a state-by-state basis. The species in these programs have been detailed in a table below.

Region	Zoos	Species
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Above: Southern Corroboree Frog, *Pseudophryne corroboree*. Below: Spotted Tree-frog, *Litoria spenceri*. Photos: Michael McFadden.



South-western Australia	Perth Zoo	<i>Geocrinia alba</i> <i>Geocrinia vitellina</i>
South-eastern Australia	Taronga Zoo Melbourne Zoo Healesville Sanctuary Tidbinbilla Nature Reserve	<i>Pseudophryne corroboree</i> <i>Pseudophryne pengilleyi</i> <i>Litoria booroolongensis</i> <i>Litoria aurea</i> <i>Litoria castanea</i> <i>Litoria spenceri</i> <i>Litoria verreauxii alpina</i> <i>Mixophyes balbus</i>
North-eastern Australia	Currumbin Sanctuary	<i>Taudactylus</i> species

Over the last five years, the model of focusing on native species has worked well in Australia. Not only has it reduced the risk of disease outbreak or spreading, it has granted many benefits for local threatened species, including;

- Three of Australia's most critically endangered amphibians are in *ex situ* programs, with the primary focus on insurance and reintroduction.
- Seven of these Critically Endangered or Endangered species are being utilised in experimental translocations or reintroductions. The logistics of such events, in addition to subsequent monitoring, is simplified due to the relatively close proximity.
- There is reduced risk of pathogen spread through amphibian movements.
- Close relationships have been developed between state zoos, government wildlife departments and universities.
- There is opportunity for zoo staff to be involved in the *in situ* components of the recovery effort at relatively minimal cost.

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An update from the Association of Zoos & Aquariums

Shelly Grow, Conservation Biologist, AZA

Conservation Breeding and Release

May 2011 – This spring, critically endangered Puerto Rican Crested Toad, *Peltophryne lemur*, tadpoles raised at AZA-accredited zoos and aquariums were released in Puerto Rico on two occasions. The first release took place April 20 and included 1,900 tadpoles bred and raised at the Fort Worth Zoo, 1,300 tadpoles bred and raised at the Jacksonville Zoo and Gardens, and 2,760 tadpoles bred and raised at Disney's Animal Kingdom. The second release, on May 12 included another 1,300 tadpoles bred and raised at the Fort Worth Zoo, 1,875 tadpoles bred and raised at Omaha's Henry Doorly Zoo, and 1,000 tadpoles bred and raised at the San Antonio Zoo and Aquarium. The Program Leader of the Puerto Rican crested toad Species Survival Plan® (SSP) program, Diane Barber (Fort Worth Zoo) and Vice Program Leader, Dustin Smith (Zoo Miami) arrived after the first release to monitor the tadpoles as they metamorphosed in order to determine toadlet survivorship, dispersal and habitat usage.



May 2011 (excerpt from Los Angeles Zoo press release) – The Los Angeles Zoo announced that the Zoo successfully bred the highly endangered Mountain Yellow-legged Frog, *Rana muscosa*, marking the LA Zoo's first success at breeding this species. Hundreds of eggs were laid in March and over two hundred tadpoles hatched in April. The tadpoles will remain at the Zoo for the coming months and this summer they will be released into the wild in an ongoing collaborative effort to save the species. This is only the second time this species has been bred at the Zoo; in 2010, the San Diego Zoo Institute for Conservation Research bred and released Mountain Yellow-legged Frogs.

The collaborative project includes the Los Angeles Zoo, the Fresno Chaffee Zoo, and the San Diego Zoo Institute for Conservation Research, the U.S. Geological Survey, U.S. Fish and Wildlife Service, California Department of Fish and Game, U.S. Forest Service, and the University of California.

Education

March 2011 – In addition to participating in field surveys on behalf of the near threatened Hellbender, *Cryptobranchus alleganiensis*, the largest salamander found in the United States, the North Carolina Zoo actively promotes and raises public awareness about this unique animal. This spring, the Zoo's non-profit arm launched an ambitious marketing campaign around the Hellbender with an ultimate goal of ensuring clean rivers that will sustain Hellbender populations.

April 2011 – On April 29, Omaha's Henry Doorly Zoo was the proud recipient of the SeaWorld & Busch Gardens Environmental Excellence Award for their Amphibian Conservation Education Project. This project aims to develop an understanding of how a mass decline of amphibians will affect the balance of nature; and to give area youth the opportunity to conduct a state-wide amphibian survey to determine the viability of amphibian habitat and health.

May 2011 – FrogWatch USA is proud to announce that after having launched the creation of local FrogWatch USA Chapters, thirty are already up and running, including twenty-five at AZA-accredited zoos and aquariums. FrogWatch USA is a nationwide frog and toad monitoring program and AZA thanks all Chapters for their engagement. Learn more about FrogWatch USA and where Chapters are located at: www.aza.org/frogwatch.

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