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AArk Newsletter No. 8, September 2009

Dear Kevin,

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

#### **The Amphibian Ark launches its membership program!**

Come on board the Amphibian Ark - Become a member and help save threatened amphibians today!

We are happy to announce that Amphibian Ark is now a formal membership organization open to **ANYONE** interested in keeping amphibians on the planet.

Your support is critical to help us reach our goals and protect species on the brink.



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#### **Twelve months in the life of the AArk**

Kevin Zippel, Program Director, Amphibian Ark

Amphibian Ark Program Director, Kevin Zippel, has compiled this summary of some of the more significant happenings over the past twelve months.

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#### **Meet the Amphibian Ark's Steering Committee**

Kevin Zippel, Program Director, Amphibian Ark

The Amphibian Ark Steering Committee brings together representatives from the entire AArk stakeholder community. The Steering Committee is the AArk's primary conduit for sharing information quickly throughout our global network, and for seeking direction from our stakeholders on AArk's strategic directions.

[Read More >>](#)

#### **An umbrella over the AArk: A new *Amphibian Survival Alliance* will facilitate implementation of the ACAP**

Kevin Zippel, Program Director, Amphibian Ark

The formation of an Amphibian Survival Alliance (ASA) was proposed at a recent amphibian conservation mini summit in London. The ASA will be a consortium of all organizations committed to facilitating implementation of the Amphibian Conservation Action Plan.

[Read More >>](#)

#### **Indonesian Amphibian Species Prioritization Workshop**

Kevin Johnson, Taxon Officer, Amphibian Ark

Amphibian Ark staff facilitated a species prioritization workshop for Indonesian amphibians, kindly hosted by Taman Safari Indonesia, in July 2009.

[Read More >>](#)

#### **Brazilian Amphibian Conservation Planning Workshop**

Richard Gibson and Kevin Johnson, Taxon Officers, Amphibian Ark

A three-day Brazilian amphibian conservation planning workshop was held in August at São Paulo Zoo, Brazil. The aim of the workshop was to identify priority threatened amphibian species and their immediate conservation needs.

[Read More >>](#)

Sent to you courtesy of:  
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## News

### Amphibians in the news

Some links from recent copies of the Amphibian Ark's Monthly Activity Reports provide some interesting reading about recent events in the amphibian world.

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### Helping save endangered amphibians in Southern Ecuador

Carlos C. Martínez-Rivera, Taxon Officer for Latin America, Amphibian Ark

The Amphibian Conservation Center-Mazán (ACC–Mazán) in Ecuador began operation earlier this year as an *ex situ/in situ* conservation program for endangered amphibians.

[Read More >>](#)

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### Local conservation: Agile Frog head-starting 2009

Gerardo García, Head of Herpetology Department, Durrell Wildlife Conservation Trust

The Durrell Wildlife Conservation Trust is heavily involved with conservation efforts for Agile Frogs on Jersey, on the Channel Islands through a 'head-starting' program.

[Read More >>](#)

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### 2009 National Reptile Breeders' Expo auction benefits Costa Rican amphibians

Dustin Smith and Ron Gagliardo, Training Officer, Amphibian Ark

Every year, thousands of dollars destined for high-profile conservation programs are raised at the National Reptile Breeders' Expo (NRBE) benefit auction in Daytona Beach, Florida.

[Read More >>](#)

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### Amphibian Conservation Husbandry Sri Lanka

Richard Gibson, Taxon Officer, Amphibian Ark

Amphibian Conservation Husbandry is an eight-day course designed by the Durrell Wildlife Conservation Trust and Chester Zoo staff and being held in Sri Lanka in November 2009 for keepers and animal managers concerned with amphibian conservation.

[Read More >>](#)

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### In search of the Oxapampa poison frog

Margarita Medina-Müller, Departamento de Herpetología, Museo de Historia Natural, Universidad Nacional Mayor de San Marcos and Carlos C. Martínez-Rivera, Taxon Officer for Latin America, Amphibian Ark

A team of Peruvian researchers is studying the ecological parameters of the habitat of the Oxapampa poison frog in order to test if habitat destruction and trout are the main cause for the low numbers for this species and the team is testing for the presence of the pathogenic fungus *Batrachochytridium dendrobatidis* in amphibians in Oxapampa in Perú.

[Read More >>](#)

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### Capacity building for amphibian conservation in Cameroon

Dr Robert Browne, Antwerp Zoo, Royal Zoological Society of Antwerp, Belgium

A critical component of the global initiative to reduce the rate of amphibian extinction is the development of regional capacity and programs. The core of regional conservation programs is government, NGO and individual incentives toward habitat protection, which in turn requires a sound knowledge of species distribution, autecology, and the current and potential threats to species. This knowledge enables the targeting of resources to conserve the essential habitat and populations of the maximum number of species.

[Read More >>](#)

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### Update on the mountain chicken program

Gerardo García, Head of Herpetology Department, Durrell Wildlife Conservation Trust

Gerardo García provides an update on the mountain chicken program on the island of Montserrat.

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## A view on amphibian feet

Anke Stolk, Center for Research and Conservation, Royal Zoological Society of Antwerp, and Antwerp University, Belgium

Recently a study started at Antwerp Zoo, investigating the occurrence and generality of sexual dimorphism in the digit ratio among a range of Amphibia.

[Read More >>](#)

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## Small change to make big change – making cents for frogs

Helen Lockhart, Communications & Sustainability Manager, Two Oceans Aquarium

The Two Oceans Aquarium in Cape Town, South Africa, has joined a number of zoos and aquariums around the world which committed to amphibian displays to raise awareness of the plight of frogs, inform visitors about what they can do to create frog-friendly environments and raise funds for the Amphibian Ark.

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## New Amphibian Committee at the Latin-American Zoos and Aquariums Association

Luis Carillo, Curator of Reptiles and Amphibians, Africam Safari

At its 16th congress in Panama City, Panama this May, the Latin-American Zoos and Aquariums Association formed a new Amphibian Committee.

[Read More >>](#)

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## AMACZOOA report

Yolanda Matamoros, President of the Mesoamerican Association of Zoos

During the last few months AMACZOOA has printed education banners, thanks to the support of students from the Biology School, Universidad de Costa Rica.

[Read More >>](#)

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## ARAZPA amphibian update

Kevin Johnson, ARAZPA

ARAZPA reports on some of the successes resulting from participation in the 2008 Year of the Frog campaign.

[Read More >>](#)

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## An update from the Association of Zoos & Aquariums

Shelly Grow, Conservation Biologist, AZA

Read the latest update on AZA's amphibian programs.

[Read More >>](#)

# The Amphibian Ark launches its membership program!

## Did you know?

Nearly one third of the world's 6,000 amphibian species are threatened and nearly one half are experiencing population declines.

These figures represent more threatened amphibians (frogs, salamanders and caecilians) than birds, fishes or mammals, making them the most threatened class of vertebrates on the planet.

In the past few decades, as many as 159 amphibian species may have gone extinct, and all experts involved know that this is an underestimate.

Amphibians are more than cultural icons or simply the creatures we grew up with as kids. They are an important component of the global ecosystem, act as indicators of condition of the environment and contribute to human health. They survived on this planet for millions of years yet now, largely as a result of our own reckless activities, find themselves threatened with extinction.

Addressing this crisis represents the greatest species conservation challenge in the history of humanity. The global conservation community has formulated a response in the Amphibian Conservation Action Plan (ACAP), and an integral part of this response is the Amphibian Ark, in which select species that would otherwise go extinct will be safeguarded in breeding programs as a stopgap until they can be secured in the wild.

The successful Amphibian Ark 2008 Year of the Frog campaign brought news of the amphibian crisis to the masses and began to catalyze an organized, global response.

Scientists and conservationists around the world learned a great deal about the state of amphibians on a global level and are organizing to attack the threats facing these very important and diverse creatures. This is only the beginning and there is much to do!

We are happy to announce that Amphibian Ark is now a formal membership organization open to ANYONE

interested in keeping amphibians on the planet. Boarding the Ark does not require that you work at a zoo, hold a PhD or bring in a six-figure income. Anyone can be a part! Join us in helping to save amphibians, a challenge that will ultimately be quite important to all!

Your support is critical to help us reach our goals and protect species on the brink.

If you received this newsletter from the Amphibian Ark, you will have automatically been signed up as an official member - **thanks for your support!** Maybe you'd like to consider becoming a [Contributing Member](#) to help us save amphibians?

For more information please contact Kevin Johnson, Communications Director, Amphibian Ark at [kevinj@amphibianark.org](mailto:kevinj@amphibianark.org)



Photo: Brad Wilson



Photo: Brad Wilson

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# Twelve months in the life of the AArk

Kevin Zippel, Program Director, Amphibian Ark

As I prepared for meetings in London and St. Louis, I compiled this summary of some of the more significant happenings over the past twelve months. In that time, the threats to amphibians have only intensified. In Central America, [amphibian chytrid jumped the Panama Canal](#) and headed into eastern Panama where it is expected to be as devastating as it was in the west. In South America, the disease was documented for the first time in [Bolivia](#). And in Asia, the first record of amphibian chytrid (in [Japan](#)) was published, followed not long after by other offshore reports (in [Indonesia](#) and the [Philippines](#)) and now the mainland ([South Korea](#)). Although research on [‘anti-Bd’ metabolites from naturally occurring bacteria](#) is promising, showing that resistance can be given to susceptible amphibian species in the lab, field trials seem so far off...

The [food trade](#) continues to apply considerable pressure to wild amphibians with one billion frogs harvested as food per year, and we continue to document [new ways pesticides harm amphibians](#) and [threaten us](#). Habitat loss continues as the number one threat at as great a pace as ever, although we are thrilled that the IUCN/SSC Amphibian Specialist Group and partners [preserved habitat for eleven threatened amphibian species in Sri Lanka](#).

Regardless of which of these threats is behind a particular decline, when amphibians disappear, [their losses are surely felt](#).

And so the AArk community has continued to work hard this past year to do our part to help amphibians. We added new Training Officer [Ron Gagliardo](#), who helped lead the AZA husbandry course twice in the past year, as well as another in [Malaysia](#). Ron's position is funded through a private foundation and hosted by Zoo Atlanta. Our partners at Durrell Wildlife Conservation Trust led a workshop in Bolivia, and saw several offspring courses in Latvia, the Netherlands, and Germany spawned from their 2008 course in [Jersey](#). Our partners in ARAZPA held a workshop in Sydney, and Taronga Zoo staff assisted us by running courses in Thailand and Malaysia. Since 2004, we have collectively run twenty-four training workshops in thirteen countries with nearly 1,000 students! Upcoming AArk training workshops include Indonesia, Sri Lanka, Brazil, and possibly also Argentina, Cuba, Gabon, and Panama.

Continuing our efforts in [conservation planning](#), we held workshops in [Panama](#), [Indonesia](#), and [Brazil](#), bringing our total to sixteen countries/regions and ~25% of global species, and 50% of threatened and Data Deficient species evaluated. We are currently tracking ninety-five priority amphibian species in captivity, with over half of these brought in since the writing of the Amphibian Conservation Action Plan. Three of those species - *Neurergus kaiseri*, *N. microspilotus*, and *Xenopus longipes* - now have Taxon Management Coordinators assigned and are working on the production of associated Taxon Management Plans, Husbandry Guidelines, and Species Profiles. Upcoming conservation planning workshop plans include Argentina, Bolivia, Cameroon, Caribbean, Chile, and Guatemala. [Our process](#) has impressed our colleagues enough that it has now been adapted to evaluate trees in Costa Rica, and soon, chameleons in Madagascar! Furthermore, our Taxon Officers have continued to hone the tool to make broader conservation action recommendations (not just *ex situ* prioritization), and as a result our partners from the IUCN Red List have agreed to incorporate it into their update process for amphibians. AArk has also recently added Carlos Martinez-Rivera as our Taxon Officer for Latin America, where he facilitates partnerships and will help coordinate Taxon Management Groups. Carlos is based in Philadelphia and his part-time work with AArk is donated by The Philadelphia Zoo.



Three AArk officers joined a team of amphibian experts at San Diego Zoo to draft updated standards for [amphibian biosecurity practices](#). In addition, the AArk Biobanking Advisory Committee (ABAC) now has twenty-seven members from eight different countries and is assembling biobanking protocols and a database of repositories. AArk Research Officer [Robert Browne](#) has drafted an Amphibian Conservation Research Guide, which will help our partners make meaningful contributions to research, particularly to the conservation research agenda of the ACAP. Robert has also substantially developed the [Science and Research](#) section of the AArk website.

Our partners around the world continue to lead model rescue and management programs, including the [public opening of the El Valle Amphibian Conservation Center](#) in western Panama, a [new coalition](#) to start a similar program in eastern Panama, and the [rescue of Caribbean mountain chickens](#) (also see [article in this newsletter](#)).



AArk launched a new Seed Grant program awarding two \$5,000 grants to [projects in Kenya and Madagascar](#). We also worked with the enthusiasts at [Caudata.org](#) to launch a new annual grant program for salamander conservation with \$1,000 going to “Pandi mushroom-tongue salamander Project: Conservation status assessment of a threatened Andean salamander from Colombia - Bolitoglossa pandi” submitted by Giovanni Alberto Chaves Portilla, Fundacion Ecodiversidad Colombia.

For publicity, we supported wonderful articles in [The New Yorker](#), [National Geographic](#), [CSM](#), [Time For Kids](#), and the PBS documentary [The Thin Green Line](#) (a must see!), as well as our own [AArk Newsletter #6](#) and [Recommendations for Raising Live Amphibians in Classrooms](#). Through our species naming auctions, we were able to raise \$23,000 for Venezuelan biologists and saw our [first new species published](#). We also solidified our presence on the public networking sites and invite you to join us in our Facebook [Group](#) and [Cause](#) as well as on [MySpace](#). And in addition, we are thrilled to announce that current half-time Taxon Officer [Kevin Johnson](#) has been able to join us as a Communications Officer for the rest of his time.

In the near future, we look forward to nurturing the development of the new [Amphibian Survival Alliance](#) as an [umbrella organization over the AArk](#) responsible for implementing the entire [Amphibian Conservation Action Plan](#). And watch the [AArk Newsletter](#) for the launch of our new [membership drive](#).

Many thanks to all of our partners who are involved in and support these important conservation actions. Progress is measurable, but slow and not in proportion to the need. The glass is only 5% full! Please, if you are not already involved, get onboard the [AArk](#)!



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# Meet the Amphibian Ark's Steering Committee

Kevin Zippel, Program Director, Amphibian Ark

In the last AArk Newsletter, we got to know the [AArk Executive Committee](#), which comprises representation from each of the three parent organizations: the IUCN/SSC [Conservation Breeding Specialist Group](#) (CBSG), the IUCN/SSC [Amphibian Specialist Group](#) (ASG), and the [World Association of Zoos and Aquariums](#) (WAZA). The Executive Committee oversees the Steering Committee, which itself brings together representatives from the entire AArk stakeholder community. The Steering Committee is the AArk's primary conduit for sharing information quickly throughout our global network, and for seeking direction from our stakeholders on AArk's strategic directions (see Fig.1, AArk's organizational hierarchy).

The AArk Steering Committee currently has twenty-one members, including thirteen representatives of regional/national zoo associations, three from the private sector, and one each from communities for academia, aquariums, botanical gardens, ISIS, and natural history museums. Here are the communities represented, with some Steering Committee members introduced now and others in subsequent newsletters:

[The Association of Latin American Zoological Parks and Aquariums \(ALPZA\)](#): Diana Sarmiento Parra

Diana is a biologist from the Universidad Nacional de Colombia. Her thesis received a distinction and the award for 'Best Thesis Award 1998-1999' by the Universidad Nacional de Colombia. From 1997-2005 she was Head of the Conservation and Education Department in Piscilago Zoo, Colombia, in charge of the collection as General Curator and Zoo Coordinator. In 2001, she received the Diploma from the ITC- Durrell Wildlife Conservation Trust at the University of Kent in Endangered Species Management and participated in the PHVA Facilitators course given by IUCN/CBSG. In 2004 Diana received the AZA Award to participate in the course 'Developing an *In Situ* Institutional Conservation Strategy'. Author of different publications such as *Animal Collections in Colombian Zoos: An Analysis for a National Conservation Strategy in DWCT*, *Involving European Visitors in Latin American Conservation*, *Minimum standards for ACOPAZOA Zoos*, *Tools and Institutional Collection Plans of Santacruz Zoo, Piscilago Zoo and SantaFe Zoo* and co-author of different documents and *ex situ* conservation plans done by the ACOPAZOA and the Colombian Environmental Ministry.



From 2001-2005 Diana shared the coordination of the ACOPAZOA Technique Committee. In 2006, she finished with merit her MSc in Conservation and Tourism in Durrell Institute of Ecology and Conservation at the University of Kent, Canterbury, UK. Since 2006, she has been the Executive Director of the Latin American Zoo and Aquarium Association and currently, ISIS Regional Coordinator for Latin America.

Currently ALPZA has reorganized its working group on Amphibians, electing new coordinators. The main objectives in the region are:

- Promote training on captive management and conservation of Amphibians.
- To generate standards of the species managed in captivity in Latin America.
- Description of the current status of the amphibian collections in Latin America.
- Keep informed our members of grants and other opportunity for amphibians 'projects
- To evaluate results and success of the accomplished initiatives in the region.

Coordinators of the group are: Carlos Martinez (new ALPZA professional member -Zoo Philadelphia- AARK), Gustavo Valencia (Zoo Santafé) and Luis Carrillo (Africam Safari).

[The Association of Mesoamerican and Caribbean Zoos and Aquariums \(AMACZOOA\)](#): Yolanda Matamoros

[The Association of Zoos and Aquariums \(AZA\)](#): Shelly Grow

At AZA, I help AZA members respond to amphibian population declines by working closely with the Amphibian Taxon Advisory Group, AZA members, public

awareness and education committees, and global partners. Other amphibian-related responsibilities at AZA include chairing AZA's Conservation Endowment Fund and Amphibian Fund, managing our citizen science program, FrogWatch USA, and serving on the steering committee of Northeast Partners in Amphibian and Reptile Conservation (NEPARC). The AZA community has been actively expanding its role in amphibian conservation, engaging in cutting-edge disease and nutrition research, discerning husbandry techniques for unfamiliar species, and shifting collections to reflect conservation priorities. Read more about recent amphibian-related activities at AZA in the AZA Update in this newsletter and in AZA newsletters available at: <http://www.aza.org/amphibian-news/>.



The Australasian Regional Association of Zoological Parks and Aquaria ([ARAZPA](#)): Susan Hunt

Botanic Gardens Conservation International ([BGCI](#)): David Galbraith

Despite the fact that David Galbraith heads up the science department at [Royal Botanical Gardens](#) (RBG) he is actually a herpetologist by training. David came to RBG in 1995 to launch the Canadian Botanical Conservation Network (CBCN), bringing the botanical gardens and arboreta of Canada into biodiversity and conservation programs. He had previously been working on the ecology of snapping turtles in Algonquin Provincial Park in Ontario for his M.Sc. and Ph.D. degrees. During his doctoral work David studied male reproductive success and multiple paternity in the same turtles, using DNA fingerprinting. He then delved into conservation genetics and global biodiversity issues during a two-year postdoctoral fellowship at the Durrell Institute for Conservation and Ecology at the University of Kent in Canterbury, England. When he returned to Canada in 1993 David was appointed Executive Director and Curator of the Centre for Endangered Reptiles (CER) in Granby, Quebec. The CER folded in early 1995, just as RBG was in the midst of setting up CBCN. Shortly after moving to RBG, David started working closely with [Botanic Gardens Conservation International](#), an association he is pleased to say continues to this day. BGCI is the global network of botanical gardens and a driving force behind several critical programs such as the [Global Strategy for Plant Conservation](#). David serves as a member of BGCI's International Advisory Council, and continues some work in herpetology; he was recently appointed an Associate Editor for [Herpetological Conservation and Biology](#).



The global botanical garden community is deeply involved in the conservation of biodiversity, at several levels. While many institutions are focused on species-level issues, many of the larger institutions are also directly involved in habitat conservation projects. Over 70 percent of the botanical gardens in Canada, for example, own or manage natural areas. Royal Botanical Gardens, where David is based, owns about 900 hectares (2,200 acres) of highly significant nature sanctuaries in addition to its gardens and other built features. These natural areas (including large wetlands, forests and remnant savannah habitat) are among the richest in Canada for both plant and animal diversity, and in 2008 were named Canada's fourth Important Amphibian and Reptile Area by the [Canadian Amphibian and Reptile Conservation Network](#). Some botanical gardens have dedicated amphibian conservation programs. [Atlanta Botanical Garden's Amphibian Conservation Program](#) is perhaps the best known, and has a wonderful programmatic mix of *ex situ* and field work. Atlanta Botanical Garden also brings attention to the plight of amphibians through public display. While the public may perceive substantial differences between botanical gardens and zoos, they share the same goal of protecting Earth's declining biodiversity. As many as a quarter of the planet's 400,000 plant species may be endangered, a staggering 100,000 species.

The Canadian Association of Zoos and Aquariums ([CAZA](#)): Greg Tarry

The Chinese Association of Zoological Gardens (CAZG): Zhang Enquan

The European Association of Zoos and Aquaria ([EAZA](#)): Gerardo Garcia

Euro-Asian Regional Association of Zoos and Aquariums ([EARAZA](#)): Oleg Shubrav

International Aquarium Congress ([IAC](#)): Paul Van den Sande

International Council of Museums ([ICOM](#)): Andrew Gray



International Species Information System ([ISIS](#)): Nate Flesness

Japanese Association of Zoos and Aquariums ([JAZA](#)): Kaszushi Kuwabara

The African Association of Zoos and Aquaria ([PAAZAB](#)): Dave Morgan

Although Welsh by birth, Dave's early and formative years were spent in Malawi, Central Africa before moving down to Pretoria, South Africa where he presently resides. Dave attended Rhodes University in Grahamstown and following this took up the post of Assistant Curator of the Transvaal Snake Park, Halfway House, South Africa in 1981. Over the years he worked up through the ranks becoming Curator of the Park in 1987 and finally CEO in 1995. In 2000 the development of an acute hypersensitivity to snake venoms forced a move away from reptiles to birds when he became the CEO of Montecasino Bird Gardens.



Dave moved on from Montecasino in 2003 and became the first professional Executive Director of the African Association of Zoos and Aquaria (PAAZAB), the position he currently holds. Dave is in fact a founder member of PAAZAB having attended the inaugural meeting of the Association in 1989. He has been intimately involved with this organization ever since and has held several voluntary ranks of office from Treasurer to Vice-Chairman. In 2004 Dave was awarded the Chairman's Award for outstanding and meritorious service to the Association. He represents PAAZAB at various forums within the World Association of Zoos and Aquariums (WAZA) and is currently the Chairman of the WAZA Committee for Population Management (CPM) and sits on the WAZA Conservation Committee. He has served on the Board of the International Species Information System (ISIS), was a contributing author to the World Zoo and Aquarium Conservation Strategy and is presently on the Editorial Board of the International Zoo Yearbook. In 2007 Dave was appointed life-time regent of the Animal Keepers Association of Africa (AKAA). Dave is also an associate of the internationally-renown zoo consultancy group, Bernard Harrison and Friends based in Singapore.

Dave and colleagues have convened the Southern African Amphibian Taxon Advisory Group under PAAZAB, convened by Ian Visser of the South African Marine Biological Research Association. This TAG will disseminate relevant information on amphibian issues in southern Africa and solicit consultation and comment on amphibian-related matters. The South African National Biodiversity Institute are hosting a South African Amphibian Conservation planning meeting in December 2009.

Private sector Australia: Gerry Marantelli (Amphibian Research Centre, [ARC](#))

Private sector Europe: Peter Janzen (Deutsche Gesellschaft für Herpetologie und Terrarienkunde, [DGHT](#))

Private sector USA: Mike Ready (Tree Walkers International, [TWI](#))

Michael Ready is a naturalist and photographer based in San Diego, California. He has worked as an amphibian specialist for Sandfire Dragon Ranch since 2004. Mike's fascination with wildlife was inherent it seems, though his parents and grandparents were vital in nurturing that trait.

His interest has long been the smaller lesser-known species. So much wildlife is undervalued simply for the reason that it is not itself easily recognizable, and its contribution to the ecosystem even less so. The bulk of his work focuses on these captivating unusual forms: this interest along with an extensive background in aquatic systems eventually led him to a work with amphibians and their captive reproduction. Mike is dedicated to the preservation of amphibians in the wild, and to the advancement of captive husbandry and breeding as a tool for conservation and research. He has been on the Steering Committee of Amphibian Ark since 2006, where he acts as the liaison to the US private sector. He is also on the board of the Amphibian Steward Network, a project of [Tree Walkers International](#) that seeks to eliminate the unsustainable harvest of amphibians from the wild and support the protection and restoration of critically threatened amphibian populations. Though his husbandry and field experience encompass a variety of amphibians, Mike's primary focus has been on arboreal species. His milestones in herpetoculture include the first US breeding of the blue-sided leaf frog (*Agalychnis annae*) and the first known captive reproduction of Wallace's flying frog (*Rhacophorus nigropalmatus*) - which led to his discovery of its distinct juvenile form. He continues to expand his work



with rhacophorid frogs and has most recently had success breeding and raising the rare Javan pearly frog (*Nyctixalus margaritifer*), another first.

In 1994 Mike received the IHS Joseph Laszlo Memorial Award for his contribution to herpetology - specifically for advances in the husbandry and captive reproduction of phyllomedusine frogs. He continues to push for progress in this arena and collaborates with other biologists on various aspects of amphibian science and conservation. His field expeditions have taken him to locales around the world including, Tottori, Japan, where he was honored to swim in the mountain streams and photograph giant salamanders older than he.

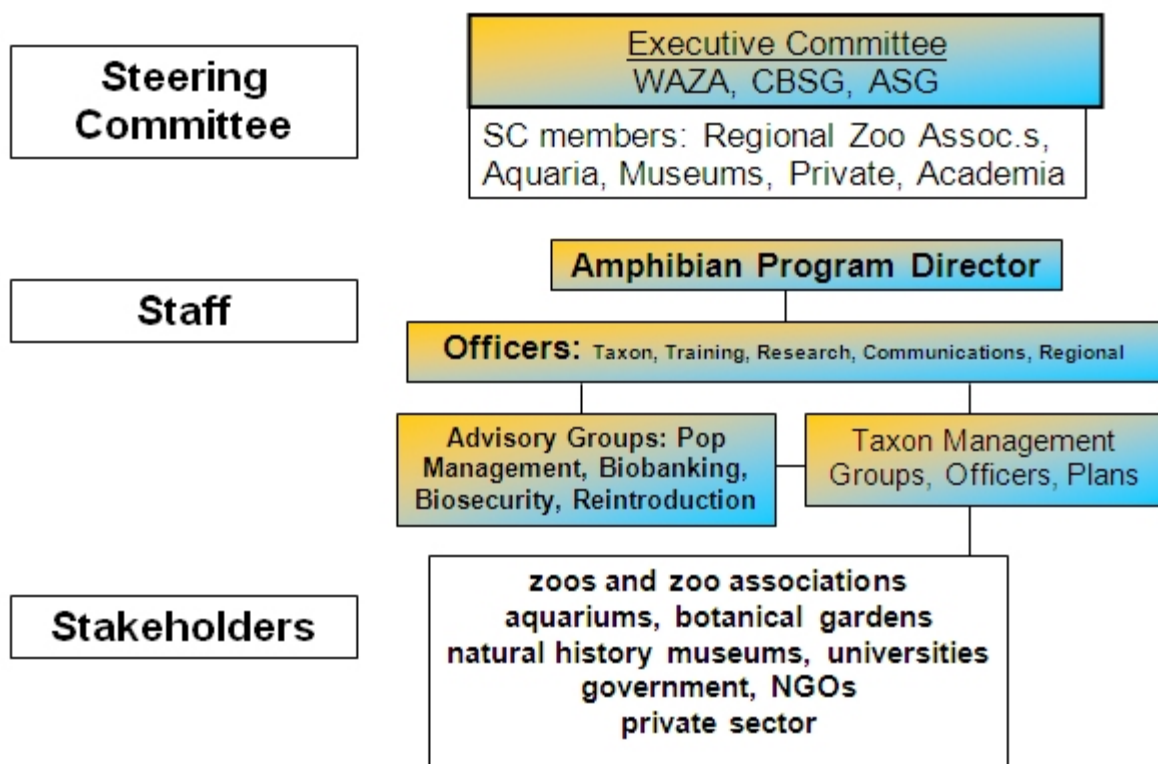
The South Asian Zoo Association for Regional Cooperation ([SAZARC](#)): Sally Walker/Sanjay Molur

The South East Asian Zoo Association ([SEAZA](#)): Suzanne Gendron

The Society of Brazilian Zoos ([SZB](#)): Marcia Cziulik

Universities: David M. Green ([McGill University](#))

We look forward to introducing our other SC members in the future, and we extend our deepest appreciation to them all for their time and guidance.



AArk's organizational hierarchy.

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## An umbrella over the AArk: A new *Amphibian Survival Alliance* will facilitate implementation of the ACAP

Kevin Zippel, Program Director, Amphibian Ark

The need for a global organization to facilitate *ex situ* (captive) conservation programs for amphibians was identified at the [Amphibian Conservation Summit](#) 17-19 September 2005 and ultimately documented in the Summit's record: the [Amphibian Conservation Action Plan](#) (ACAP). Within months, CBSG and WAZA stepped forward to develop that coordinating organization, which today we all know as the Amphibian Ark! Recall that it is the goal of the AArk to further develop and implement the *ex situ* conservation actions outlined in the ACAP, which we do by "*facilitating partnerships that ensure the global survival of amphibians, focusing on those that cannot currently be safeguarded in nature*" (our mission).



But what about the rest of the vital conservation actions called for in the ACAP? Who will continuously monitor the status of wild amphibian populations to alert us when there are problems? Who will conduct the research needed to understand why amphibians are declining and how we can halt and reverse such declines? And who will take action to mitigate the threats amphibians face in the wild? Until now, the answer was, as with the *ex situ* community before the AArk, "a small but diverse group of experts and organizations around the world, all doing great things, but with no global body to coordinate, promote the cause, and try to secure the necessary resources."

UNTIL NOW...



Almost four years after the original Amphibian Conservation Summit in Washington, DC, a second 'mini summit' was convened in London to review ACAP progress to date and develop new plans to ensure timely progress into the future. IUCN/SSC Amphibian Specialist Group (ASG) Co-Chair Jim Collins provided the group with an overview of advances in research on the causes of declines and outlined critical areas for progress (what we know vs. what we need to learn). ASG Co-Chair Claude Gascon next reviewed advances in conservation, including formation of the [ASG Network](#), National/Regional Action Plans that have been developed since ACAP, and efforts to protect critical amphibian habitat (e.g., including exemplary programs in [Sri Lanka](#), [Colombia](#), [Sulawesi](#), [Madagascar](#), and Guatemala). Then AArk Program Director (yours truly) gave the group a presentation on the origins and [activities of the AArk](#) with an emphasis on ways our community supports other parts of the ACAP (research, assessment, and *in situ* conservation) and how our cumulative activities can be used to leverage further support for our ACAP partners.

After these presentations, the group collectively identified two 'pinnacle initiatives' from among the numerous activities called for in the original ACAP, those that the group felt would have the most impact in stopping amphibian declines/extinctions and for which real progress could be made in two years before the next mini summit. They were: mitigating the threat of amphibian chytrid fungus *in situ* (e.g., further researching the potential to use '[anti-Bd](#)' [metabolites from naturally occurring bacteria](#) to confer resistance to otherwise susceptible amphibians), and continuing to protect Key Biodiversity Areas (e.g., as Claude described above). To advance these causes, and the ACAP in general, it was agreed that an [Amphibian Survival Alliance](#) (ASA) shall be formed. The ASA will be a consortium of all organizations committed to facilitating implementation of the Amphibian Conservation Action Plan. More details on the ASA structure and function are expected soon.

As was the case nearly four years ago with the genesis of the AArk, it was our *ex situ* community who stepped forward to help make the launch a reality, with Chester Zoo, Frankfurt Zoo, and Chicago Zoological Society Director Emeritus George Rabb pledging the funds (along with

Conservation International) to support an ASA coordinator for two years.

The Amphibian Survival Alliance will provide an umbrella over the AArk and all other partners around the world working to fulfil the ACAP, and we look forward to promoting its development.

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# Indonesian Amphibian Species Prioritization Workshop

Kevin Johnson, Taxon Officer, Amphibian Ark

Over fifty people gathered at Taman Safari Indonesia, Cisarua, Bogor on July 27 for the start of the amphibian workshop. After a welcome by the President of SEAZA, Mr. Jansen Manansang, presentations were given by Mr. Kevin Johnson from Amphibian Ark, Prof. Djoko Iskander from the Dosen Institut Teknologi Bandung, and Mirza Kusri from Bogor Agricultural University. These presentations outlined the global amphibian crisis, the formation of the Amphibian Ark, and amphibian issues in Indonesia.



A complete explanation of Amphibian Ark's species prioritization process was given after lunch on the first day of the workshop, and Prof. Djoko provided information on the status of the Bornean Flat-Headed Frog (*Barbourula kalimantanensis*) to use as an example. The participants then split into two groups, with Mirza Kusri facilitating those participants who have an interest in amphibian husbandry, and Kevin Johnson continuing with the species prioritization workshop.



The husbandry group laid down the initial groundwork for a forthcoming amphibian husbandry workshop, which will hopefully be held at Taman Safari Indonesia before the end of the year.

During the prioritization workshop, a total of 381 species were reviewed, with data compiled for 207 species. Workshop participants did not have sufficient information to review the remaining 174 species, but additional local amphibian experts have been identified to assist with reviewing these species.

Based on the data available during the workshop, Indonesian amphibian species were prioritized into the following conservation roles:



Participants at the Indonesian amphibian species prioritization workshop.  
Photo: Arif Rachman

- 182 species that for one or more reasons require further *in situ* research to be carried out as part of the conservation action for the species. One or more critical pieces of information is not known at this time.
- 6 species undergoing specific applied research that directly contributes to the conservation of the species, or a related species, in the wild (this would include clearly defined 'model' or 'surrogate' species).
- 1 species threatened through wild collection (e.g. as a food resource), which could be bred in captivity – normally in-country, *ex situ* - to replace a demand for wild harvested specimens.
- 86 species that are specifically selected for management – primarily in zoos and aquariums - to inspire and increase knowledge in visitors, in order to promote positive behavioral change.

Results from the workshop can be found on the [Amphibian Ark portal](#) and information about the AArk's amphibian conservation planning process can be found on our [web site](#).

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# Brazilian Amphibian Conservation Planning Workshop

Richard Gibson and Kevin Johnson, Taxon Officers, Amphibian Ark

Fourteen experts in Brazilian amphibians, representing twelve institutions, gathered for a three-day Brazilian amphibian conservation planning workshop at São Paulo Zoo, Brazil, from August 9-11, 2009. The workshop was facilitated by Richard Gibson and Kevin Johnson from the Amphibian Ark. The aim of the workshop was to identify priority threatened amphibian species and their immediate conservation needs.



During the workshop, a total of 866 species were listed for review. The participants worked through all Critically Endangered, Endangered Vulnerable and Near Threatened species first (53 species), followed by Data Deficient species (198 species). Due to time constraints it was not possible to completely review all Least Concern species, but 90 Least Concern species were identified as having excellent conservation education potential.

Workshop participants did not review 594 species, but additional local amphibian experts have been identified to assist with reviewing many of these species, and this will be undertaken in the next couple of months.

Based on the data available during the workshop, Brazilian amphibian species were prioritized within the following conservation roles:

- 14 species in the Rescue role - species that are in imminent danger of extinction (locally) and require *ex situ* management, as part of an integrated program, to ensure their survival.
- 24 species in the *In Situ* Conservation role - species for which mitigation of threats in the wild may still bring about their successful conservation.
- 204 species in the *In Situ* Research role - species that for one or more reasons require further *in situ* research to be carried out as part of the conservation action for the species. One or more critical pieces of information is not known at this time.
- 19 species in the *Ex Situ* Research role - species undergoing specific applied research that directly contributes to the conservation of the species, or a related species, in the wild (this would include clearly defined 'model' or 'surrogate' species).
- 136 species identified for Conservation Education - species that are specifically selected for management – primarily in zoos and aquariums - to inspire and increase knowledge in visitors, in order to promote positive behavioral change.



Participants at the recent Brazilian amphibian conservation planning workshop. Photo: Kevin Johnson

These figures will be very likely to change, once additional information has been received from amphibian experts who were not present at the workshop. As this information is received, the data sheet for Brazil will be updated, and the reports will be re-generated.

Results from the workshop can be found on the [Amphibian Ark portal](#) and a description of the AArk's amphibian conservation planning process can be found on our [web site](#).

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## Amphibians in the news

The following links are reproduced from recent copies of the Amphibian Ark's Monthly Activity Reports, and provide some interesting reading about recent events in the amphibian world.

- [First new species from AArk 'name a species' auction](#) honors supporter Jason Speer and benefits Venezuelan amphibians
- [PawTalk blog on AArk: A message to the private sector](#)
- [Considerations and recommendations for raising live amphibians in classrooms](#)
- [Ultraviolet radiation and Vitamin D3 in amphibian health, behaviour, diet and conservation](#)
- [Two Frogs, Two Pesticides and their Toxicity](#)
- [Study Released in Argentina Puts Glyphosate Under Fire](#)
- [The Philippines has become the third country in Asia to be hit by the chytrid fungus](#)
- New Yorker article features amphibian extinction crisis, [abstract podcast](#)
- Smithsonian Zoo and partners pledge "to save the most endangered amphibian species in Eastern Panama before Bd hits" through [Panama Amphibian Rescue and Conservation Project](#)
- [Reid Harris et al. publish work on probiotics in Bd-susceptible mountain yellow-legged frog](#)
- [Global Bd-Mapping Project launched](#)
- The Prince's Rainforests Project invites you to [create your own frog message](#)
- [Weird salamander may yield hope for amputees](#)
- [Malaysian workshop on caring for frogs](#)
- New York Times article: [It's Time to Learn From Frogs](#)
- ASG's Jim Collins' piece in Natural History Magazine: [Where Have All the Frogs Gone?](#)
- [Artificial fertilization for amphibian conservation: Current knowledge and future considerations.](#)
- [Applied reproductive technologies and genetic resource banking for amphibian conservation](#)
- [Researchers stunned by inmates' success raising endangered frogs](#)
- [Launch of the Amphibian Survival Alliance](#)
- [Video of spectacular maternal care in CR amphibian a web hit](#)
- [New frog family discovered \(not re-defined\) in South America](#)
- [True value of elephants finally revealed](#)
- [EPA fails to inform public about weed-killer in drinking water](#)
- [Pitt Research Suggests EPA Standard for Pesticide Safety Overlooks Poisons' Long-term Effects](#)
- [Study Links Pesticides, Declining Frog Population](#)

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# Helping save endangered amphibians in Southern Ecuador

Carlos C. Martínez-Rivera, Taxon Officer for Latin America, Amphibian Ark

The Amphibian Conservation Center-Mazán (ACC–Mazán) began operation earlier this year as an *ex situ/in situ* conservation program for endangered amphibians. This in-range country facility is located inside the intangible zone of Mazán forest at the foothills of Cajas National Park near the city of Cuenca in Ecuador. The project is a collaborative effort between ETAPA (a local city-government agency), the local Zoo Amaru and Philadelphia Zoo. The main goal of ACC-Mazán is to establish successful captive colonies for the San Lucas marsupial frogs (*Gastotheca pseustes*), the Andean rocket frogs (*Hyloxalus vertebralis*), the green Cajas harlequin toads (*Atelopus exiguus*) and the black Cajas harlequin toads (*A. nanay*) to assure their survival. We hope to eventually return these once common endangered amphibians back to their habitat in the Mazán forest and nearby Cajas National Park.



San Lucas marsupial frog, *Gastotheca pseustes*. Andean rocket frog, *Hyloxalus vertebralis*.



Green Cajas harlequin toad, *Atelopus exiguus*. Black Cajas harlequin toads *Atelopus nanay*.

ACC-Mazán employs Fausto Rodrigo Siavichay Pesantez as a full-time amphibian keeper and four associate researchers to study the causes of the decline of the amphibians of Mazán. The program receives volunteer students and interns from Ecuador and other countries in South America to carry out research, help with maintaining our *ex situ* colonies and in other duties related to the project. Currently, two undergraduate students from Loja University in Ecuador are learning techniques on how to monitor montane harlequin toads and three additional volunteers, two from Argentina and one from Bolivia are helping ACC-Mazán maintain assurance colonies of these four endangered amphibian species and study their ecology, behavior, and population status.





Part of the ACC-Mazán team, from left to right: Fausto Rodrigo Siavichay Pesantez, Gabriela, Carlos C. Martínez-Rivera and Ernesto Arbeláz Ortiz.

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## Local conservation: Agile Frog head-starting 2009

Gerardo García, Head of Herpetology Department, Durrell Wildlife Conservation Trust

Agile Frogs (*Rana dalmatina*) are one of only three amphibian species native to Jersey, and Jersey is the only place in the British Isles where this frog species occurs. Unfortunately, its population on Jersey has been declining, and its range on the island decreasing, since the early 1900's, largely due to pollution of breeding ponds and habitat loss. By the mid-1980's there were only two populations remaining on the island (both in the south-western corner of the island), and one of these was lost in 1987 due to an agri-chemical spill. As part of efforts to conserve the species, individuals from the single remaining population have been translocated to this site in recent years, and breeding is again occurring at this site.



*Rana dalmatina*. Photo: Fabio Turel

The Durrell Wildlife Conservation Trust is heavily involved with conservation efforts for Agile Frogs on the island. One of the ways we participate is through a 'head-starting' program – we rear egg clumps collected from wild populations in a safe environment (tadpole mortality is usually very high in the wild, so we maximise the number of animals that make it through this vulnerable stage of their lives). After approximately four months, we release well-developed tadpoles and froglets back into the wild. Before being released, each individual is marked with Visible Implant Elastomer, so that we can evaluate the success of our head-starting program.

In 2007, a grant from the States of Jersey Ecology Fund allowed us to establish a dedicated facility for head-starting tadpoles, and we've used this for the last two breeding seasons. The facility is a refrigerated shipping container set up as a biosecure unit; it allows us to provide a higher standard of care, and also to minimise as far as possible the chance of introducing diseases from the outside environment into the facility. This means that, if an amphibian disease (such as the amphibian chytrid fungus that is currently contributing to amphibian declines around the world) is introduced to the island, we can keep a 'clean' captive population for conservation purposes. Last year, we kept a number of tadpoles after they metamorphosed to make sure that we can successfully rear and keep frogs in the facility if necessary.

This year was a very good year for breeding in the wild. A total of fifty-five spawn clumps were laid, which is a big increase over the twenty-nine clumps laid in 2008! In late February and early March, the States of Jersey Environment Department delivered twenty-six of these spawn clumps (including three from the site the species has been returned to) to Durrell for head-starting. Almost 12,500 tadpoles hatched from these spawn clumps! In early May, we released 5,000 tadpoles; we had to release these as all the tadpoles were growing very quickly and we needed to reduce density so we could continue to provide good conditions for growth and development. All remaining tadpoles were released during June, just as they were approaching metamorphosis. The releases all went very well and a large number of the tadpoles have already metamorphosed and hopped away to start their life on land. Research is being carried out this year to determine the success of the head-starting program.



*Rana dalmatina*. Photo: HaPe Gera

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# 2009 National Reptile Breeders' Expo auction benefits Costa Rican amphibians

Dustin Smith and Ron Gagliardo, Training Officer, Amphibian Ark

Keeping with tradition, proceeds from this year's auction were used to create, landscape and maintain amphibian breeding ponds at the Costa Rican Amphibian Research Center (CRARC) in Costa Rica. Funds will also help continue *ex situ* efforts to captive breed and release local species, many of which are highly threatened.

The Costa Rican Amphibian Research Center began as a private conservation initiative in the late 1990's by its Director Brian Kubicki. Brian moved to Costa Rica in 1999, where after a short visit to study centrolenids (glass frogs), he found his calling. The Center exists on nearly 200 acres of protected land purchased and maintained by Kubicki who is now a permanent resident and is devoting his life to furthering the understanding and appreciation of Costa Rica's amphibians.

Located in the Caribbean foothills of the Talamancan mountain range, approximately two hours by car from the capital of San José, the CRARC and surrounding area boasts the highest diversity of amphibian species in the entire country with over sixty species described to date. With the help of collaborators and supporters such as the Atlanta Botanical Garden, Henry Vilas Zoo, Wildlife Conservation Society and many others, the center has developed both in situ and ex situ programs. In addition to using a captive breeding laboratory on site, Kubicki has been exploring other methods of helping amphibians, largely through in situ management. With the number of reproductive sites arguably being the most limiting factor to amphibians in the field, he set out to restore habitats that promote, stimulate and accommodate amphibian reproduction. So far, Kubicki has established breeding pools for fifteen amphibian species, including the critically endangered lemur leaf frog (*Hylomantis lemur*). Early signs show that this is paying off with several species having rebounded in the area thanks to these efforts to improve the habitat.



CRARC table at the National Reptile Breeders Expo in Daytona Beach, Florida. August 22, 2009. Photo: Dustin Smith

Dustin Smith, Zoological Supervisor at the Miami Metrozoo not only spearheaded efforts to make the CRARC this year's auction recipient, but also organized dozens of volunteers to gather donations of supplies, artwork and books for the auction. The effort paid off tremendously with approximately \$24,738 raised in the course of three hours of live and silent auctions held on the Saturday night of the NRBE expo. The Central Florida Zoo contributed \$685 from their July round-up month (visitors asked to round up their admission price from \$9.95 to \$10.00 with the \$0.05 going to conservation) and adding in sales of books and T-shirts at the CRARC table, a total of \$25,091 was raised to help Costa Rican amphibians! These resources will be used directly on the CRARC reserve for further habitat restoration and improvement to create additional breeding grounds for threatened amphibians of the area.



Hundreds of herpetoculturists participated in the auction to benefit Costa Rican amphibians. Photo: Brian Kubicki

The CRARC is open to visitors by appointment. Information on the reserve, lodging and guide services are available on their website at [www.cramphibian.com](http://www.cramphibian.com).

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# Amphibian Conservation Husbandry (ACH) Sri Lanka

*A course for amphibian keepers and captive population managers*

**4<sup>th</sup> - 12<sup>th</sup> November 2009**



## **What is ACH Sri Lanka?**

Amphibian Conservation Husbandry (ACH) is an 8 day course designed by the Durrell Wildlife Conservation Trust and Chester Zoo staff for keepers/animal managers concerned with amphibian conservation. The course was launched at Durrell's headquarters in Jersey in 2008. This year we are tailoring the course to the needs of amphibian managers in South East Asia and in particular, Sri Lanka. The aim is to expose participants to the latest theory and practice of amphibian conservation husbandry and equip them with low-tech alternatives for managing captive populations to a good standard.

## **Why is it needed?**

Several amphibians have been saved from the brink of extinction with the support of captive populations; but much more work needs to be done. Captive facilities are being called upon to play a vital role in current amphibian conservation efforts. To meet this challenge, high standards of care, reproductive management and strong biosecurity protocols will be needed.



This experience does exist but must be disseminated if the critical mass required to contend with the

global amphibian crisis is to be achieved. By taking this course overseas we hope to begin to build capacity within in-range zoos and other breeding facilities for local captive

management of threatened species. Participants will develop new skills and understanding placing them in an ideal position to develop their institution's contribution to regional amphibian conservation initiatives.

## **Who is it for?**

ACH is designed primarily for curators, keepers and veterinarians involved in the captive management of amphibian populations within South East Asian zoological institutions. University staff concerned with raising awareness and understanding of amphibian conservation issues will also be welcome.

Trained individuals can make a difference but only with the support of their organisations; this course is for staff working for institutions that can demonstrate how the skills acquired by the participants will further their conservation work.

Participants on ACH will be encouraged to train others in the skills and understanding gained on the course. All course materials will be made available for this purpose as well as advice from experienced training staff on how to structure such courses/seminars.



Applicants from beyond Sri Lanka will be welcomed, particularly when there is a clear link with the amphibian conservation work being conducted within the region.

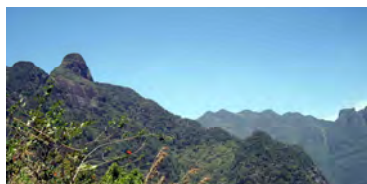


### **Where is ACH being run?**



The ACH course will be run in Kandy, "the hill capital of Sri Lanka". This location allows us to make regular fieldtrips out

into the surrounding countryside to observe amphibians in their natural surroundings. A day-long fieldtrip to Knuckles Mountain Range is included in the course.



### **Who will you learn from?**

The course will be facilitated by Durrell's Head of Herpetology and Head of the International



Training Centre, in collaboration with Chester Zoo's Curator of Herpetology and local, Sri Lankan amphibian experts. Durrell staff will draw on the organisation's extensive in-house experience in managing amphibian species from the Caribbean, Mediterranean, Indian Ocean and Australia, as well as on the island of Jersey itself, both *in-situ* and *ex-situ* at our

world-famous headquarters in Jersey, British Channel Islands.

Chester Zoo staff have recent field experience working on amphibian projects in Europe, the Caribbean and the Americas with the emphasis of linking *ex-situ* and *in-situ* conservation expertise. Guest lectures will be given by visiting speakers. Most valuably, participants will learn from each other.

### **What topics will be covered?**

The course is divided into five modules with associated themes:

- 1: *Amphibian natural history & threat*
- 2: *Captive facility design and construction*
- 3: *Keeping & breeding captive colonies*
- 4: *Managing captive populations*
- 5: *Developing invertebrate live food facilities*

### **How will the course be taught?**

Lectures will be interspersed with opportunities for small group work and whole group discussions. A significant component of the course will be the development of participants' practical skills in captive facility design and management. Lecturers will highlight the best practice possible while also identifying low-tech solutions which are relevant to resource limitations in the region. The final timetable will be developed based on the selected participants' needs and interests.

### **How much does it cost?**

There are a limited number of full scholarships available to cover accommodation and course fees. Please contact the International Training Centre for specific costs should you be interested in attending the course. Organising travel is the responsibility of the participant.

**Closing date for applications 30<sup>th</sup> September 2009**

NB: the course will be run subject to level of interest. Spaces on the course will be limited.



### **What should I do next?**

Download application form & other course details at [www.durrellwildlife.org](http://www.durrellwildlife.org). Or contact the ITC by:

Phone: 44-1534 860037

Fax: 44-1534 860002

E-mail: [itc@durrell.org](mailto:itc@durrell.org)

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**Photo credits:** Anslem de Silva, Gerardo Garcia

# Capacity building for amphibian conservation in Cameroon

Dr Robert Browne, Antwerp Zoo, Royal Zoological Society of Antwerp, Belgium

A critical component of the global initiative to reduce the rate of amphibian extinction is the development of regional capacity and programs. The core of regional conservation programs is government, NGO and individual incentives toward habitat protection, which in turn requires a sound knowledge of species distribution, autecology, and the current and potential threats to species. This knowledge enables the targeting of resources to conserve the essential habitat and populations of the maximum number of species.

These regional incentives are the anchor of the conservation chain linking global support for species conservation and that, in some cases with critically endangered amphibians, may require conservation breeding programs. Conservation breeding programs are best initiated before species populations become diminished to the extent that sampling becomes difficult or genetic variation is lost. In these cases, where species may possibly be saved in their native habitat, conservation breeding programs can be directly linked to *in situ* conservation initiatives by supporting habitat protection, education and awareness raising, providing animals for rehabilitation, and through research in fields such as genetics and autecology. To effectively build and implement this strategy all stakeholders from regional to global must work in concert and both regional groups and organisations and international liaisons are needed.

The Amphibian Ark is facilitating this global capacity for amphibian conservation through capacity-building workshops, training, and species prioritisation, and specifically through the appointment of Taxon Management Coordinators for species, clades and regions. However, in some of the regions with the highest amphibian biodiversity, limited regional capacity for species-specific conservation of critically endangered amphibians exists.

Cameroon has among the highest amphibian biodiversity in western Central Africa. Cameroon is also geographically central to this highly biodiverse region and has one of the highest numbers of species per area in the world. The maximum number of amphibians at one location in Cameroon is an impressive ninety-two at Mt Nlonako, the number of described species is one hundred and ninety-six anurans and eight caecilians, and in the future in Cameroon there are expected to be numerous other amphibian species discovered and described. Unfortunately, several Cameroon species are critically endangered or endangered and the conservation status of others is uncertain as they are very rare and live in small isolated habitats.

Unfortunately, Central Africa and Cameroon need further development of a strong proactive program for the conservation of critically endangered amphibians and currently have no conservation breeding programs. This is of particular concern when considering that although Cameroon still maintains large tracts of forest it also has the highest rate of forest clearance in Central Africa and that the highest amphibian diversity exists on volcanic mountains. These mountains provide cooler thermal islands within the hot and steamy tropical lowlands. Some have large caldera lakes and in others swamps and wetlands are found. Some unique amphibians of Cameroon are the strange aquatic Lake Oku clawed frog *Xenopus longipes*, which is found only in Lake Oku, on Mt Oku, and the goliath frog *Conraua goliath* that is the largest frog in the world. Earlier this year, Antwerp Zoo and London Zoo established a rescue population of the Lake Oku clawed frog. Antwerp Zoo has a long tradition of biodiversity conservation in Cameroon.



The workshop and symposium in Yaoundé were attended by a wide variety of Cameroonian and international supporters. Photo: Peter Janzen

To facilitate the conservation of amphibians in Cameroon, and in particular to identify opportunities to develop regional expertise and range-country programs, Antwerp Zoo sponsored the first Cameroon Amphibian Symposium and Workshop in April 2009 in the capital Yaoundé. Other supporters were the Zoological Society of London (ZSL), German Society of Herpetology and Terrariums (DGHT), Natural History Museum of London, Berlin Museum, Cameroon Biodiversity Conservation Society, and the Organization of German Zoo Directors.

We were honoured to have the director of the Cameroon Ministry of Forest and Fauna (MINFOF), Mr Tabi-tek,



opening and co-chairing the workshop. Discussions and presentations were made on the main conservation issues affecting amphibians; biodiversity assessment, habitat conservation, establishment of a web-based conservation society, updating of threatened species lists, building conservation breeding programs, collaborations with international institutions, and the micro-economic potential of amphibians in Cameroon.

The workshop was followed by a field survey for amphibians conducted at the Antwerp Zoo, Project Grands Singes (PGS) field site ([http://webh01.ua.ac.be/crc/PGS/PGS\\_home.html](http://webh01.ua.ac.be/crc/PGS/PGS_home.html)), in south-east Cameroon at the northern edge of the Congo Rainforest. The PGS site is quite remote and nestles in low undulating hills within a watershed of low meandering streams surrounded by small swamps. The site is surrounded by magnificent tropical rainforest cloaked in epiphytic ferns and orchids with epiphytes with an understorey of a cornucopia of vines and herbs. In this exotic environment butterflies, other insects, and spiders abound, gorillas, elephants and leopards roam, still blue skies regularly change to tempestuous thunderstorms, and it is difficult to escape a sense of the primeval.



*Herpele squalostoma* was one of the caecilians found during the survey. Photo: Peter Janzen

From Yaoundé to the beginning of our trek on foot to the site took five hours of driving, largely through areas of slash and burn agriculture that in places retained very large trees festooned with vines, ferns and orchids. These lonely giants give not only the measure of the primal cathedral rainforest, but also a testament to their genesis, and as living tombstones the effects of logging on a lost world. Sadly, these logged areas, even with years of regrowth and the retention of these relicts, only ever provide habitat for a reminder of the diversity of amphibians and other species that once thrived. Forever lost are the morning chorus of the hornbills as they perch among the orchids, the cries of joy as a baby gorilla rejoins its mother, the growls of a hungry leopard lurking in the shadows, and the chattering of the colobus monkeys as they feast on forest fruit.

We spent the night in the last village before entering the forest and were impressed at the number of frogs found around the nearby stream, and the number of exotic spiders and katydids. Because of their camouflage katydids are almost impossible to see by day but forage more openly at night. Leaving early the next day we trekked the thirteen kilometres to the PGS site with seventeen porters to help carry gear and food for nine days. Our work day consisted of activities including digging for caecilians in the swamps, digging stumps and litter turning, then after an early dinner, spotlighting for amphibians in the swamps. Because of the presence of western lowland gorillas and rainforest elephants we relied on our guides to investigate potential sites during the afternoon, and to lead us by night. The frequent heavy rain at night was particularly disconcerting, not because of the chance of getting drenched, but because of the difficulty in assessing the presence of elephants. Our team retained constant good spirits and disregarded the frequent insect bites and scratches from thorns.



*Hyperolius bolifambae* was one of several *Hyperolius* species we found. Photo: Peter Janzen

The efforts of our team were well rewarded by the discovery of thirty-five frog and two caecilian species. The discovery of the caecilians was a particular testament to individual efforts. Digging caecilians in swamps in rainforest is particularly arduous when up to your knees in mud and digging between spiny palm branches. Persevering, the three caecilian enthusiasts were rewarded though a discovery of one caecilian each with our youngest and least experienced co-worker rewarded by the discovery of the second species during the expedition on the last day before leaving.

We are now working on developing an organisation devoted to fostering amphibian conservation in Cameroon, and plan to continue to support Cameroonian endangered amphibians including the Lake Oku clawed frog and the goliath frog clade *Conraua* spp. Please contact Robert Browne [robert.browne@gmail.com](mailto:robert.browne@gmail.com) if you are interested in joining our web-based group supporting amphibian conservation in Cameroon.

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## Update on the mountain chicken program

Gerardo García, Head of Herpetology Department, Durrell Wildlife Conservation Trust

The mountain chicken is the largest living *Leptodactylus* species (Kaiser 1994) and one of the largest of all living frog species. They have a unique reproductive strategy for an amphibian with an unprecedented high level of maternal care which includes mothers feeding tadpoles their own unfertilized eggs. Much of what we know about mating and parental care in mountain chickens is based upon observations of captive animals. The mountain chicken is now confined to just Dominica (severally affected by the chytrid fungus since 2002) and Montserrat, after once also occurring on Guadeloupe, Martinique, Saint Kitts and Nevis, and possibly on St Lucia and Antigua. The Durrell Wildlife Conservation Trust has been working with the species for more than ten years, monitoring populations in the wild (Gibson & Buley 2001), surveying potential diseases (Garcia et al, 2007) and breeding in captivity in collaboration with many institutions and researchers.

The Montserrat Department of the Environment encountered dead mountain chickens at Jack Boy Hills (Far Mountain spring) on February 14, 2009. Since that initial date, dead and moribund frogs affected by chytrid fungus have been collected from a number of localities. Drs Gerardo García, Javier López and Matthias Goetz from Durrell travelled to Montserrat on February 27. Their aim was to support Department of the Environment's Forestry Department in field work (specifically training on biosecurity protocols in the field and in the laboratory), to gather samples and assess the number of frogs remaining, and to evaluate a proposal for safe-guarding the future of the species by establishing a viable *ex situ* captive-bred population for eventual release back in the southern part of Montserrat. A total of fourteen surveys in thirteen localities, known to be within mountain chicken distribution ranges, were undertaken. One hundred and thirty-three frogs were recorded, of which only 20% seemed healthy. The remainder showed clinical signs of infection or were dead. The results from the samples suggest a northwest to southwest epidemic and that currently the remaining healthy frogs are in imminent danger. From studies of the spread of chytrid in Australia, Panama and Costa Rica the disease can travel 28-100 km/year (Berger et al. 1998). Given the size of the Centre Hills, it is probable that Durrell may have only a few weeks to take action.



Mountain chickens on Montserrat, being swabbed for chytrid-testing. Photo: Gerardo García

The immediate requests to the Government of Montserrat, agreed in principle by the Chief Minister of Montserrat were: rescue wild frogs and start a captive breeding program at Durrell, Jersey and initiate field trials to treat mountain chickens in the wild.

The first trials were initiated in March in an area that was once high density, called Pelican Ghaut. This area was particularly badly hit by the spread of the disease and few frogs remained. Trials to see if it was feasible to treat frogs with an anti-fungal treatment were started immediately in collaboration with Dr. Andrew Cunningham of the Zoological Society of London. The study was run for three months and has been used to design a larger and more rigorous experiment. The analysis of the results of this first treatment are still in progress but it looks as if the treatment is helping to reduce mortality in the wild.

The most important action for the first one to two years of the recovery program was to establish a captive population using animals from the healthy population in Montserrat and build up a population for reintroduction as quickly as possible. In total fifty frogs were brought into captivity from two collection trips. Twelve frogs came to Durrell's headquarters in Jersey, twelve went to London Zoo and twenty-six to Parken Zoo in Eskilstuna, Sweden. All frogs are kept in strict biosecure conditions to minimise any risk of disease transmission either to or from these animals. The challenge for each of the institutions holding the animals was to get them to reproduce, as they are notoriously difficult to breed due to their strong parental care behaviour. Although there are mountain chickens in more than twenty institutions worldwide, only Durrell has managed to breed them regularly in Europe since 1999.



Dead and dying mountain chickens on Montserrat. Photo: Gerardo García



The good news from the captive component is that there is one nest in Jersey and three in Sweden and from these four nests there could be close to 100 frogs available within the first generation born from the rescued population. This is fantastic news for the program and gives enormous encouragement to breeding efforts for next year.

For the reintroduction program, a series of field missions need to be undertaken to identify and evaluate potential reintroduction sites. These sites would need a certain degree of monitoring before any releases are made. Should suitable sites be found, a series of releases would be made and this would be accompanied by a detailed long term program of monitoring to follow the status of the released animals.

Through the collaborative efforts of the Montserrat Department of the Environment, Durrell, Parken Zoo and the Zoological Society of London the restoration of this species looks promising. By studying the spread of the fungus in the wild, how it may be controlled and then how animals can be placed in safe locations on the island, we hope to be able to start a program of reintroductions within two years. Hopefully new institutions are going to join the recovery program and unite the efforts to save a species that is closer than ever to extinction.

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## A view on amphibian feet

Anke Stolk, Center for Research and Conservation, Royal Zoological Society of Antwerp, and Antwerp University, Belgium

A study that started this year at Antwerp Zoo should teach us something more about amphibian feet. Look at your hands, maybe you've already noticed - in humans, men have a ring finger that's slightly larger compared to their index finger while with woman the reverse is true: the index finger is generally a bit longer relative to the ring finger. As a consequence, when dividing the length of the index finger through that of the ring finger the ratio will generally be lower in males than in females. A possible explanation for this pattern lies in a higher exposure of males to testosterone during early development. In the past years several studies have been conducted which looked at digit ratios in mammals, reptiles and birds but very little is known about this phenomenon in amphibia and with this study our knowledge will expand.

The amphibian crisis is a global one; several reports of malformed animals, severe population declines and extinctions have led to major concern. Research that can improve our understanding of environmental quality thus contributes to conservation biology. Dividing the length of the second finger or toe by that of the fourth gives us the digit ratio 2D:4D. In many species the 2D:4D ratio differs between the sexes making 2D:4D a sexual dimorphic trait. The sex related differences in 2D:4D are often assumed to be attributable to differential exposure to sex hormones during development in utero. However problems may arise when hormone-mimicking chemicals in the environment influence development and result in malformations in the limbs and reproductive organs of Amphibia.

Recently a study started at Antwerp Zoo, investigating the occurrence and generality of sexual dimorphism in the 2D:4D digit ratio among a range of Amphibia. Representatives of the orders Anura (frogs and toads) and Caudata (salamanders) are examined using an animal-friendly method in which the use of digital images and computer software is combined, enabling us to measure the lengths of the second and fourth toe. In this way an international collaboration becomes possible in which observations are being made by several institutions: Nordens Ark in Sweden, Perth Zoo in Australia, Rotterdam Zoo in The Netherlands, the British Museum in the United Kingdom, and the Russian Biophysics Institute in Pushchino, are all contributing images.

Nature point, a Belgium foundation that dedicates its work to protecting Flemish nature, made a substantial contribution to the research. Hyla, a subdivision of this foundation, has been working on herpetological projects since 1987. Since 1995, Hyla members in Brasschaat coordinate toad relocations during the annual migration of toads, frogs and salamanders towards their breeding sites.

Barriers were constructed using nets and buckets to shield animals from road kill. In addition underground passings were recently established so that animals are able to cross under the roads, avoiding the risk of being hit by cars. Many evenings Hyla members went to the area, armed with buckets and flashlights, to collect animals and move them across the road safely. Several schools also visited in the mornings to give a helping hand with relocating amphibians. In this way the children got some basic knowledge about the life of amphibians, and could experience for themselves what conservation encompasses. Hyla thus enabled us to photograph large numbers of the common toad (*Bufo bufo*) and brown frog (*Rana temporaria*).

Amphibians have a permeable skin that easily absorbs environmental substances and during their lifecourse they reside in aquatic as well as terrestrial habitats. Affects on amphibians might thus mirror the presence of toxic chemicals in the environment; and amphibians are consequently considered to be reliable bio-indicators. Affects on digit ratio might thus point to bad environmental quality.

To gather data in the field, animals were put onto a dish marked with lines of known lengths. Subsequently a digital image was



School children learn about amphibian conservation.  
Photo: Robert Browne



Amphibians are placed into dishes with marked grids. Digital images are then used to take measurements. Photos: Geert Biermans

made that enables us to later measure the toads' body length and that of the toes using computer software.

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## Small change to make big change – making cents for frogs

Helen Lockhart, Communications & Sustainability Manager, Two Oceans Aquarium

On July 7, 2009 the Two Oceans Aquarium in Cape Town, South Africa, transferred R34,633 (US \$4,560) to the Amphibian Ark. The money was collected from donations from visitors to the aquarium who dropped coins in the wishing well in the Frogs-Beyond the Pond gallery in the aquarium. The well, with the heading “*Small change to make big change – making cents for frogs*”, is one of the interactive elements in the successful large-scale temporary exhibit which was opened by the aquarium in partnership with the City of Cape Town in October 2008. The aquarium joined a number of zoos and aquariums around the world which committed to similar displays to raise awareness of the plight of frogs, inform visitors on what they can do to create frog-friendly environments and raise funds for the Amphibian Ark.

While the Two Oceans Aquarium does not breed frogs, it is committed to spreading the urgent message that amphibians, and their environments, are in serious trouble. Frogs-Beyond the Pond at the Two Oceans Aquarium is a themed and highly interactive gallery which immerses visitors in the world of frogs and invites them to ‘jump in’ to find out more about these quirky yet extremely threatened creatures. Upon entering the gallery visitors are dwarfed by giant arum lilies, mushrooms, clivias, reeds and grasses towering above them, giving them a frog perspective of a suburban garden. A large interactive touch screen in one corner magnifies frog species, their habitats and some of the threats which face these misunderstood animals.

In another corner a fully automated puppet theatre show, ‘Your Friend the Frog’, entertains young and old alike as the hero, a western leopard toad, undertakes a journey, fraught with the dangers of impenetrable garden walls, speeding cars and hungry herons, from a suburban garden to a beautiful wetland to find his mate. The toad shares the stage with a cast of other vibrant, colourful characters, including two outrageous dragonflies from the Cape Flats, who use humour and music to convey important frog messages to the audience.

In conjunction with the interactive gallery, live frog exhibits have been incorporated into the existing Sappi River Meander Exhibit. The exhibits house mainly local species including the common platanna, arum lily frog, Cape river frog and the endangered western leopard toad. These exhibits offer a glimpse of species which are fairly common in the Western Cape, but are rarely seen by most people.

Throughout the ages frogs have captured our imaginations and have inspired numerous myths, legends and folk tales. More importantly, frogs, being incredibly sensitive creatures, are key indicator species in all the environments in which they are found. Globally, frog species are disappearing at an alarming rate and we should take heed of these warning signals. Losing frogs means that we are losing our natural systems – the very systems on which we depend for our existence.

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# New Amphibian Committee at the Latin-American Zoos and Aquariums Association

Luis Carillo, Curator of Reptiles and Amphibians, Africam Safari

The Latin-American Zoos and Aquariums Association (ALPZA) has just held its 16th congress in Panama City, Panama this past May. There, a new Board was elected and new commissions and committees were formed. One of those was the Amphibian Committee which is now made up of four coordinators, Gustavo Valencia - Santafé Zoo, Colombia; Ernesto Arbeláez - Amaru Zoo, Ecuador; Carlos Martínez-Rivera - Philadelphia Zoo, USA/Puerto Rico; and Luis Carrillo – Africam Safari, México.

The committee has already developed a working plan for 2009-2010. Among the most urgent and important goals are:

1. Diagnosis of the situation of amphibian collection among ALPZA member institutions.
2. Evaluation on the use of the Amphibian Prioritization List obtained through Amphibian Ark workshops (Venezuela, Perú, Colombia, México).
3. Promote training on amphibian husbandry, breeding and live food culture.
4. Advise on the development and submission of grant proposals for amphibian conservation projects and research.



Participants at the recent Latin-American Zoos and Aquariums Association congress in May.

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## AMACZOOA report

Yolanda Matamoras, President of the Mesoamerican Association of Zoos

During the last few months we have printed education banners, thanks to the support of students from the Biology School, Universidad de Costa Rica. The banners have been on display since June. A copy of these banners can be obtained at [www.cbsgmesoamerica.org](http://www.cbsgmesoamerica.org) and or at [www.cbsg.org](http://www.cbsg.org)

A proposal to finance the AMACZOOA Amphibian Training Workshop and the AMACZOOA Amphibian Conservation Strategy was presented. We are hoping to find funds to continue conservation work with this group in the region.

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One of the banners developed with the support of students from the Biology School, Universidad de Costa Rica.

## ARAZPA amphibian update

Kevin Johnson, ARAZPA

During 2008, ARAZPA members supported the Year of the Frog campaign, which was very successful with both its main aims – of raising awareness about the amphibian extinction crisis and raising much-needed funds to support amphibian conservation projects. We are pleased to report that ARAZPA institutions contributed a little over AU\$120,000 to the regional fund-raising campaign, in addition to the funds that were raised to support institutional amphibian projects.



**amphibian ark**  
2008 YEAR OF THE FROG



The ARAZPA Board agreed to contribute 30% of all funds raised to the Amphibian Ark for global conservation programs, with an emphasis placed on programs in South-East Asia. Just over \$36,000 will be sent to the AArk, leaving almost \$85,000 to be allocated to amphibian conservation projects in Australasia. Nine grant applications have been received, and these are currently being reviewed by ARAZPA's Field Conservation Committee. We will be pleased to report about the successful applicants in the next edition of the Amphibian Ark Newsletter.

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# An update from the Association of Zoos & Aquariums

Shelly Grow, Conservation Biologist, AZA

In mid-September, AZA will announce the recipients of the 2009 Conservation Endowment Fund grants, including those that received funds from the Amphibian Fund. Recipients will be listed at: <http://www.aza.org/cef-previous-awards/>, while applications for the 2010 Conservation Endowment Fund will be available on the AZA web site in January 2010.



## Husbandry Resource Guide in Spanish

In 2008, AZA's Amphibian Taxon Advisory Group (ATAG) published an '*Amphibian Husbandry Resource Guide*' and now (May 2009), thanks to Luis Carrillo from Africam Safari, Carlos Olivera A. from the Mexico City Zoo's Office, and Alison Acosta Oakes, an independent collaborator, this impressive resource is available in Spanish ([www.aza.org/amphibian-population-planning/](http://www.aza.org/amphibian-population-planning/)). Thanks also to those AZA members that helped clarify terms, edit, and provide additional photos.

## Register now for AZA's Amphibian Biology, Conservation, and Management Course

While ATAG's Husbandry Guide is a wonderful resource, much more can be learned from the hands-on teaching and networking at AZA's Amphibian Biology, Conservation, and Management course. Registration and scholarship applications, including some sponsored by the Zoo Conservation Outreach Group for Latin American colleagues, is now open. For more information, visit: <http://www.aza.org/ProfTraining/detail.aspx?id=293>

## From Capitol Hill

In May, AZA began work with the U.S. House Interior Appropriations Subcommittee regarding conservation issues of amphibian species. In June, the Subcommittee released their budget figures for FY 2010 and have included the following language in their report:

"The Committee is aware of the impacts of the Chytrid disease on amphibian species worldwide.....The Committee urges the Service [U.S. Fish and Wildlife Service] to work with the international conservation community to establish conservation and captive breeding programs to conserve the most imperilled of these species."

Read more about the AZA community's amphibian conservation efforts in our quarterly newsletter at: <http://www.aza.org/amphibian-news/>

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