Newsletter
amphibian ark

In This Issue

AArk Newsletter No. 12, September 2010

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 newsletter is now available in Spanish!

Kevin Johnson, Communications & Development Officer, Amphibian Ark

We are really excited to announce that from this edition of the AArk newsletter, we will be providing our newsletter in both English and Spanish versions.

Read More >>

New Amphibian Ark web site launched

Kevin Johnson, Communications & Development Officer, Amphibian Ark

The new-look Amphibian Ark web site was launched in August and we hope you will like the new site and its features.

Read More >>

Amphibian Ark mailing lists are here!

Why not join our global community of partners to exchange information on a range of subjects on our new mailing lists?

Read More >>

Mohamed bin Zayed Species Conservation Fund helps conserve Caribbean amphibians… and you can too!

Kevin Zippel, Amphibian Program Director, Amphibian Ark

In an effort to identify conservation action for species in need, the Amphibian Ark is planning a conservation needs assessment workshop for the Caribbean islands.

Read More >>

Amphibian Survival Alliance update

Kevin Zippel, Amphibian Program Director, Amphibian Ark

Kevin Zippel provides an update on the latest developments of the Amphibian Survival Alliance.

Read More >>

Just shoot me! - *An amphibian photography contest*

Amphibian Ark is planning another sensational amphibian calendar for 2012, but this time, we'll be featuring your stunning photos!

Read More >>

News

Amphibian health and management course in Colombia

Ron Gagliardo, Training Officer, Amphibian Ark

In August staff from the Wildlife Conservation Society based at the Bronx Zoo, along with AArk Training Officer Ron Gagliardo ran a four-day course at the Cali Zoo focused on health and management of amphibians in captivity and *in situ* techniques for surveying amphibians in the field.

Read More >>

Spotlight on amphibian research in zoos

Robert Browne, AArk Research Officer, Royal Zoological Society of Antwerp, Ross Alford, ASG Research Liaison to the AArk, James Cook University, Joe Mendelson, Curator of Herpetology,

Sent to you courtesy of:
The AArk Team

Kevin Zippel
Program Director

Robert Browne
Research Officer

Ron Gagliardo
Training Officer

Richard Gibson
Taxon Officer

Kevin Johnson
Taxon Officer
Communications & Development

Carlos Martinez-Rivera
Taxon Officer for Latin America

Elizabeth Townsend
Administrative Assistant

Would you like to support AArk's amphibian conservation work?
Click here to make a donation!

Click here to download a pdf version of this newsletter.

To forward your copy of this issue to a friend, Click here

Vist our Website.

If this email does not appear correctly Click Here to receive the text-only version of this newsletter

Zoo Atlanta, Kevin Zippel, Amphibian Program Director, Amphibian Ark

The Amphibian Ark recently conducted a survey of global partners to better understand the amount and variety of amphibian research currently conducted in our community. This article outlines the key findings of the survey.

Read More >>

The amphibian extinction crisis knows no boundaries: the U.S. Fish and Wildlife Service's Wildlife Without Borders - Amphibians in Decline Program helps save amphibians in southern Ecuador

Carlos C. Martinez Rivera, Curator of Reptiles and Amphibians, The Philadelphia Zoo

The US Fish and Wildlife Service's Wildlife Without Borders - Amphibians in Decline Program will help stop the amphibian extinction crisis by funding the Amphibian Conservation Center – Mazán Forest, in southern Ecuador.

Read More >>

Tiny toads tumbling towards Tanzania

Jennifer B. Pramuk, Curator of Herpetology, Bronx Zoo/Wildlife Conservation Society

In August 2010, the Bronx and Toledo Zoos returned 100 Kihansi Spray Toads to Tanzania for the first time since they went extinct in their native habitat. This effort is the first of its kind: a reintroduction of an extinct-in-the-wild amphibian from captive stock maintained in a foreign country.

Read More >>

The first *Telmatobius* offspring in the captive breeding program of the Bolivian amphibian initiative

Arturo Muñoz Saravia, Museo de Historia Natural Alcide d'Orbigny

Two hundred and fifty-six species of amphibians can be found in Bolivia: more than sixty of these are found only in Bolivia, thirty-four species are listed in the IUCN Red List and fifty-four are in the Red Book of Bolivian Vertebrates. A captive breeding component at the Museo de Historia Natural Alcide d'Orbigny includes *Telmatobius hintoni* and *Telmatobius culeus*.

Read More >>

Denver Zoo partners with Universidad Peruana Cayetano to help save the Lake Titicaca Frog

Thomas J. Weaver, Area Supervisor of Tropical Discovery, Denver Zoological Foundation

In 2007 the Denver Zoological Foundation granted funding for a non-designated *in situ* amphibian conservation project at the Universidad Peruana Cayetano Heredia, to help them develop a conservation program and frog reproductive facility at the university, and potentially an education component to alert locals of the plight of the Lake Titicaca Frog.

Read More >>

Ex situ program for an 'extinct' Australian frog

Michael McFadden, Unit Supervisor, Herpetofauna Division, Taronga Conservation Society Australia

Taronga Zoo reports great progress with its program for the Yellow-spotted Bell Frog, which was discovered recently after being thought to have gone extinct before 1980.

Read More >>

Amphibian news from Chester Zoo, UK

Richard Gibson, Curator Lower Vertebrates and Invertebrates, Chester Zoo

Chester Zoo has seen a number of significant events for amphibians during 2010, not the least of which is the formalisation of a permanent amphibian conservation program with dedicated core funding on an annual basis.

Read More >>

ARKive: promoting conservation through the power of wildlife imagery

ARKive, a not-for profit initiative of UK-based NGO, Wildscreen, is leading the 'virtual' conservation effort, creating the ultimate multimedia guide to the world's threatened species using the world's best wildlife media.

Read More >>

Another great reason to visit the Oceanário – Amphibians: Interesting by nature

Oceanário de Lisboa

In support of Oceanário de Lisboa's increasingly comprehensive approach to global environmental conservation education, and the permanent effort to contribute directly to various conservation initiatives, a new amphibian exhibit was opened in an attempt to educate our visitors about the wonders of amphibians.

Read More >>

World Museum Liverpool highlights the Amphibian Ark's conservation efforts

Phil Lewis, Education Demonstrator - Aquarium & Bug House, National Museums Liverpool

As part of Wild Wild World week World Museum Liverpool highlighted the Amphibian Ark's efforts in trying to reverse the global trend in amphibian declines and extinctions via a number of presentations in the museum theatre.

Read More >>

Toad Tracking… Across the Universe!

Rachel Rommel, Conservation Programs Manager, Houston Zoo

The Houston Zoo is proud to announce the completion of the first year of Toad Trackers, an interactive program which aims to teach students real world field research methods used by conservation biologists to study animal populations.

Read More >>

ALPZA, the Latin American Association of Zoological Parks and Aquariums, steps it up for amphibian conservation!

Carlos C. Martínez Rivera, Luis Carrillo, and Gustavo Valencia, ALPZA's Amphibian Group

Ever since the Amphibian Ark was created, the Latin American Association of Zoological Parks and Aquariums, or ALPZA by its acronym in Spanish, (www.alpza.com) has been carrying the AArk's message of amphibian conservation through its amphibian education campaigns and by promoting research and conservation programs at individual ALPZA institutions.

Read More >>

An update from the Association of Zoos & Aquariums

Shelly Grow, Conservation Biologist, AZA

AZA Conservation Biologist Shelly Grow provides updates on some of the amphibian projects that AZA and its member institutions have been involved with.

Read More >>

Review of Costa Rican amphibians in the IUCN Red List and evaluation of the actions from the Costa Rican Amphibian Conservation Strategy

Yolanda Matamoros, President, Mesoamerican Association of Zoos

In August, Federico Bolaños, herpetologist from the Biology School of Universidad de Costa Rica, requested the support of CBSG Mesoamerica to organize a workshop to update the information of different species reviewed in the Costa Rica Amphibians CAMP II and IUCN's Global Amphibian Assessment (GAA), and to review the progress of actions from the Conservation Strategy of 2006.

Read More >>

Amphibian Ark newsletter is now available in Spanish!

Kevin Johnson, Communications & Development Officer, Amphibian Ark

We are really excited to announce that from this edition of the AArk newsletter, we will be providing our newsletter in both English and Spanish versions. We are sure that our Spanish-speaking members will appreciate this new initiative, and it will certainly allow us to provide access to news from AArk and our partners to a much wider audience. We very much appreciate the efforts of our newsletter translator, Silvia Flores, who has very generously offered to translate the newsletter for us each quarter.

If you would like to subscribe to the Spanish version of the newsletter, and haven't yet done so, please click the button below, and you will receive subsequent newsletters in Spanish.

If you no longer wish to receive the English version, please click the Unsubscribe link on the left side of the Contents page of this newsletter. You will then only receive the Spanish version.

Return to Article Index

New Amphibian Ark web site launched

Kevin Johnson, Communications & Development Officer, Amphibian Ark

The new-look Amphibian Ark web site was launched in August and we hope you will like the new site and its features. Our web address remains the same, www.amphibianark.org

We are very grateful for the generous support from the team at Moxie Interactive, an Atlanta-based internet marketing solutions company, who worked with us to develop the theme and templates for our new site. I'm sure you'll agree that the new site has a fresh, vibrant new feel to it, is easier to navigate, and includes exciting new features.

We aim to deliver the entire site in English, Spanish, German and Portuguese, and as a result of our call-out to AArk members in the last newsletter for help with translation, we were lucky enough to have a number of willing volunteers step forward to assist us with the translation. We'd like to thank all of these volunteers who've offered their time – due to their help, we're able to reach out to a much wider audience around the world. We're not quite done though, so ***if you are fluent in Spanish or German, and would be willing to offer a little time to help translate some pages on the site*** we'd very much appreciate hearing from you. Please contact webmaster@amphibianark.org We are very grateful for the generous funding from Oceanário de Lisboa in Portugal, who are covering the cost of translation of our site into Portuguese. The Portuguese site will be avialable soon.

In addition to the new look of the site, we have simplified the navigation menu and have added additional pages about the work that the AArk is involved in, and additional amphibian husbandry resource pages. In the coming weeks, we'll be adding additional husbandry-related material and advice for our some of our partners who may need some help setting up new conservation programs. We have started a series of amphibian fact sheets, and we'll be adding new species to these pages on an ongoing basis. There's also a new page show-casing a number of artists and photographers who feature amphibians in their work. We hope you'll visit this page and support artists who in turn, support amphibian conservation.

As mentioned elsewhere in this newsletter, we have also initiated a series of electronic mailing lists that will be of particular interest to those people who are directly involved in amphibian husbandry, conservation programs, and both *in situ* and *ex situ* research. See the AArk mailing list article in this newsletter for more information.

We hope you enjoy our new web site!

Return to Article Index

Amphibian Ark mailing lists are here!

Another new initiative that we have recently started is a series of electronic mailing lists. Why not join our global community of partners to exchange information on a range of subjects?

Just click any of the links below to sign-up to any of our mailing lists:

- Animals For ACAP – A forum for AArk partners to list their surplus captive-bred animals available to Amphibian Conservation Action Plan (ACAP) researchers, and for ACAP researchers to post requests (membership of this list requires moderator approval).
- Funding Opportunities – Receive (and post) announcements about grants and other funding opportunities appropriate for amphibian projects.
- Husbandry Chat – Discuss everything related to the art and science of maintaining living collections; share successful techniques with newbies or present your challenge to the experts.
- Jobs – Looking for a frog keeper or other dedicated amphibian position? Post here!
- Meetings – Announcements for conferences, workshops, etc. with amphibian content.
- News and Publications – For sharing the latest amphibian news updates and PDF publications.

All of our mailing lists can deliver emails in real time, or in a daily digest format. We also keep archives of all messages on our web site, so list members can always refer back to older discussions.

Got an idea for another list? Tell us! Just email webmaster@amphibianark.org

Return to Article Index

Mohamed bin Zayed Species Conservation Fund helps conserve Caribbean amphibians… and you can too!

Kevin Zippel, Amphibian Program Director, Amphibian Ark

You know that amphibians are vitally important, and you know they are at the leading edge of an extinction crisis on par with that of the dinosaurs. But did you know that perhaps nowhere is this crisis more severe than in the Caribbean islands?

In considering countries with the highest percentage of threatened amphibians, the IUCN states that: the top five countries are all in the Caribbean, at least 70% of all the amphibians in these five countries are threatened, more than 80% of amphibians are threatened or extinct in the Dominican Republic, Cuba, and Jamaica, and a staggering 92% in Haiti. “Compared with other regions, the Caribbean stands out with by far the highest percentage of threatened or extinct species.”

In an effort to identify conservation action for species in need, the Amphibian Ark is planning a conservation needs assessment workshop for the Caribbean islands. We are thrilled to inform you the Mohamed bin Zayed Species Conservation Fund is supporting this work! In addition, this workshop will be our first time working jointly with the IUCN Species Programme in an effort to merge our conservation needs assessment workshops into their Red List update process.

صندوق محمد بن زايد
للمحافظة على الكائنات الحية
The Mohamed bin Zayed SPECIES CONSERVATION FUND

You can help too!

1. Our partners have already identified some species that clearly need help. We are promoting projects that need outside support in Cuba, the Dominican Republic, Haiti, and Puerto Rico, plus newly identified possibilities in Jamaica. If you are interested in any of these projects, please contact the AArk or the individual leaders of these projects.

2. We are also planning a husbandry training workshop for the Caribbean in order to share husbandry skills with the nationals who will be caring for rescued species. We are currently trying to raise ~$25,000. If you can help with funds, air fares or accommodation costs, please let us know!

Please consider investing in the conservation of Caribbean amphibians. You too can help create for our Caribbean partners a solid foundation for safeguarding an imperilled component of their natural and cultural heritage.

Thanks!

Return to Article Index

Amphibian Survival Alliance update

Kevin Zippel, Amphibian Program Director, Amphibian Ark

In Newsletter No.8 (September 2009), we told you about a renewed effort to launch the Amphibian Survival Alliance (ASA). Recall that the ASA is intended to provide an umbrella over all partners around the world working to fulfil the Amphibian Conservation Action Plan (ACAP), including the *ex situ* and biobanking efforts of the AArk, plus other vital efforts such as habitat protection, disease research, over-harvesting, systematics and ongoing species assessment.

In the past year, important new ASA donors have come aboard (Detroit Zoological Society, Wildlife Conservation Society, and Zoological Society of London), an interim board of directors was formed, and a first board meeting was held in London on 12 August 2010. With sufficient funds in place to hire an ASA Executive Director for the first two years, a position description was approved and will be posted soon with a new hire hopefully by the end of the year. The ASA Director will undertake formation and coordination of a global network of partner organizations, with staff and programs to facilitate implementation of research, conservation, and assessment programs as outlined in the ACAP, and will also hopefully serve on the AArk Executive Committee to help guide our activities. Check back with the AArk website for updates!

Return to Article Index

Just shoot me! - *An amphibian photography contest*

Amphibian Ark is planning another sensational amphibian calendar for 2012, but this time, we'll be featuring ***your*** stunning photos!

We're running a really cool photographic competition and we're inviting you to contribute your best photos for the calendar. Our panel of judges will select the twelve best images to be used in the calendar, with the overall winner featuring on the front cover.

Additionally, amongst the twelve winning entries, one photo will also be selected as the best image in each of the categories of Youth, *In situ*, and *Ex situ*

> Youth – open to photographers who are under 18 years of age
> *In situ* – photos must be of amphibians in the wild. The location where the photo was taken must be provided
> *Ex situ* – photos of amphibians in a captive environment, e.g. zoos, aquariums, pets etc.

More details will be provided in the next AArk newsletter, with entries for the competition being accepted between January and the end of April 2011. Calendars will be available for sale in August 2011, and proceeds will be used to assist Amphibian Ark conservation programs.

Return to Article Index

Amphibian health and management course in Colombia

Ron Gagliardo, Training Officer, Amphibian Ark

With nearly 750 species, Colombia is home to some of the greatest amphibian biodiversity on the planet. Unfortunately, many species in this mega-diverse country face enormous threats ranging from habitat loss to over-collecting to disease. In recent years more and more *in* and *ex situ* conservation efforts have been initiated to help with this crisis.

The Wildlife Conservation Society (WCS) and its Global Health Program (GHP) has been an active participant in advancing amphibian conservation efforts in Colombia, working with staff of the Cali Zoo and its Center for Conservation of Endangered Amphibians (CREA). From August 17-21, staff from the WCS/GHP based at the Bronx Zoo, along with AArk Training Officer Ron Gagliardo ran a four-day course at the Cali Zoo focused on health and management of amphibians in captivity and also *in situ* techniques for surveying amphibians in the field. The course was attended by over thirty-five participants from all over Colombia and covered not only some of the basics of husbandry, water quality, and reproduction but also focused heavily on pathology, clinical care and nutrition. Staff on hand from the Bronx Zoo included Dr. Carlos Rodriguez (veterinary pathologist), Dr. John Sykes (clinical veterinarian), Krysten Marchese (clinical veterinary technician) and Dr. Jennifer Pramuk (curator of herpetology). Colombia WCS staff Padu Franco, Julian Velasco and Nestor Roncancio, along with staff at the Cali Zoo were incredible in-country hosts and organizers.

Carlos Rodriguez from the Wildlife Conservation Society prepares students for veterinary activities. Photo: Ron Gagliardo.

To get the course off to a great start and foster the exchange of information and ideas, students shared their own experiences with the class, as many are currently working with either *in* or *ex situ* programs. During the next several days, a combination of lecture topics and hands-on exercises helped to engage the students, many of whom arrived with varying degrees of knowledge on keeping and breeding amphibians. Students participated in water quality testing, enclosure building, and veterinary (including pathology and parasitology) activities. In addition, during an overnight visit to the Yotoco National Forest Reserve, students learned various *in situ* monitoring and field diagnostic techniques to round out their experience. The students represented a diverse group, including zoo professionals, university students, non-government staff and more and it is hoped that this course also served to bring more synergy and communication among scientists working in Colombia to further the amphibian conservation.

Oophaga lehmanni (left) and *O. sylvatica* (right) are some of the most sought-after poison frogs in the world. The appetite for brilliantly colored poison frogs from Colombia in the trade seems insatiable and it creates many issues with smuggling. Photos: Ron Gagliardo.

Return to Article Index

Spotlight on amphibian research in zoos

Robert Browne, AArk Research Officer, Royal Zoological Society of Antwerp, Ross Alford, ASG Research Liaison to the AArk, James Cook University, Joe Mendelson, Curator of Herpetology, Zoo Atlanta, Kevin Zippel, Amphibian Program Director, Amphibian Ark

The Amphibian Ark conducted a web survey of global partners to better understand the amount and variety of amphibian research currently conducted in our community, to gauge the resources available for amphibian research in our community, and to determine our potential to better collaborate with other Amphibian Conservation Action Plan (ACAP) researchers in their work to understand and mitigate threats to amphibians. Key findings are that:

1. research in progress encompassed a wide range of both *ex situ* and *in situ* subjects of value to the ACAP,
2. caudates (salamanders and newts) are receiving a disproportionately large share of research effort,
3. research funding is predicted to decrease, and
4. many institutions could supply surplus amphibians to external research projects.

Overall the survey shows that there is a very active research foundation in the amphibian *ex situ* community.

Eighty-nine institutions responded, with most from USA institutions with 47% of responses from the Association of Zoos and Aquariums, and 10% from each of the European Association of Zoos and Aquariums, the Latin American Zoo and Aquarium Association, the Zoo and Aquarium Association, or other respondents that were not members of regional zoo associations.

The range of research activities is very broad and shows that AArk partners are supporting both *in situ* and *ex situ* projects through research. There are a large number of popular publications by both staff and the press and these are of particular value in promoting amphibian conservation. Nevertheless, there could be a greater emphasis on publicity, with many institutions producing less than three popular or peer reviewed publications. The number of peer reviewed publications is also substantial. Most institutions had dedicated research staff and animal husbandry space, but many lacked dedicated funding or research labs. The need for laboratory facilities could be satisfied by greater outreach; most partners were interested in greater collaboration with academic institutions. Many partners could supply animals for research to external institutions and this activity could form a bridge toward greater research collaborations. Opportunities for increased scientific collaborations, networking, provision of projects, and articles were presented as research needs.

The range of research included work addressing all major topics in the Amphibian Conservation Action Plan. Participation in research of specific value to both *in situ* and *ex situ* projects included phylogenetics/taxonomy (23%) and reintroductions (30%). Participation in research for *in situ* management was highest for status assessment (46%) and disease (35%), 11 to 13% for land/water use, climate change, introduced species, and 5% for environmental contamination and over-harvesting. Participation in research for *ex situ* management was highest (54%) for captive breeding including hormonal induction of sperm or ooctyes, then 40% for population management and conservation education, 30% for diet/nutrition, and 22% for disease management, with only 5% for biobanking.

In terms of taxa focused on, 90% of respondents are doing work on anurans (frogs and toads), 40% on caudates (salamanders), and 5% on caecilians (many projects included more than one of these taxa). While the preponderance of projects focus on anurans and caudates, this is not surprising as 97% of amphibians are in these two groups. What is surprising is the research focus on these taxa relative to their diversity. 88% of amphibians are anurans, and 3% are caecilians, and this is in alignment with the attention they receive from our research community. However, salamanders represent just 9% of amphibians but attract attention from 40% of respondents. This bias is not negative, and in fact, might reflect the fact that

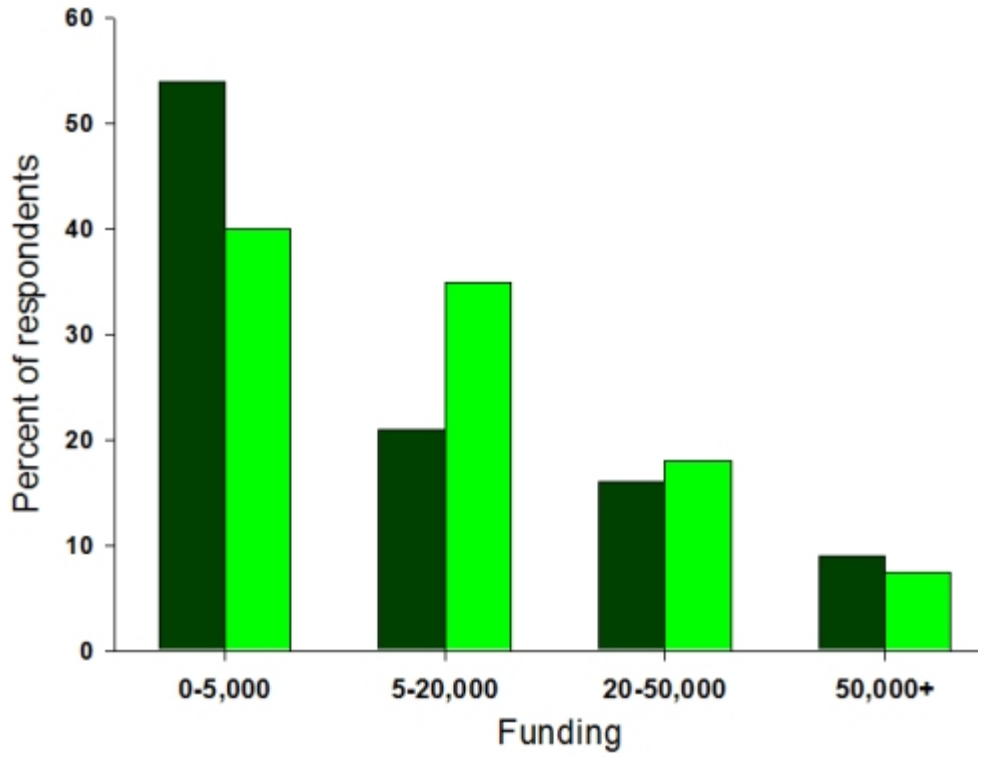
A male Hellbender with a swollen cloaca collected for sperm sampling. Biobanking only represented 5% of research participation. However, a major

salamanders are disproportionately threatened (nearly 50%). Almost 25% of institutions had no species used for *in situ* research, 15% had one species, 20% had 1 to 5 species, and 25% had more than five species.

project for a biobanking and conservation breeding program of the sperm of North America's largest amphibian, the Hellbender, incorporates most aspects of *ex situ* and *in situ* research for a threatened amphibian including a global range of collaborators, pollution and habitat assessment, and a conservation breeding program. Photo: Dale McGinnity.

Approximately 80% of institutions had dedicated research staff, and 50% had space for studies and access to museum or university support. However, only 35% had laboratory space or research funding. For genetic studies 15% had access to PCR equipment. Sixty-three institutions were conducting scientific research for peer reviewed assessment.

There was increased research effort over the last two years. In the last two years the majority of institutions had less than US$5k in research funding, with a predicted increased proportion of funding being in the bracket from US$5-50k over the next two years. The greatest single funding of US$750,000 was shared between two zoos. About 45% of institutions could supply excess amphibians for research; however, only 26% of institutions had so far had the opportunity to provide animals. Many institutions accepted the proposal to include their surplus animals in an online database.



The amounts of funding used for amphibian research addressing the ACAP as a percentage of respondents. Dark green - last two years 2008-2010. Light green – next two years 2010-2012.

Most institutions had not produced peer reviewed scientific papers. However, many had produced popular articles through staff or the press. In contrast to peer reviewed or popular articles by staff, the greatest total number of press articles were from a few publications with very wide distribution numbering up to hundreds (not shown in table). This emphasises the importance of establishing solid relationships with the global media.

	Respondents	0	1-2	3-5	5-10	10+
Peer reviewed	78	47	16	5	5	2

Popular staff	79	29	22	15	8	3
Popular press	79	35	24	5	4	8

The number of peer reviewed scientific publications and the number of popular publications produced over the last two years.

In conclusion, the survey shows that amphibian research in zoos is making a substantial contribution to both the *in situ* and *ex situ* components of the ACAP. Research topics range across the spectrum of the ACAP. The development of greater collaboration and networking between zoos, conservation breeding programs, academic institutions, and other partners will lead to even greater achievements in the future. Institutions should take every opportunity to publicise their research projects and achievements, particularly through global press networks.

Return to Article Index

The amphibian extinction crisis knows no boundaries: the U.S. Fish and Wildlife Service's Wildlife Without Borders - Amphibians in Decline Program helps save amphibians in southern Ecuador

Carlos C. Martinez Rivera, Curator of Reptiles and Amphibians, The Philadelphia Zoo

The amphibian community of Cajas National Park and Mazán forest, in the Andes of southern Ecuador, used to be rich. Seventeen amphibian species were found here, nine of which were endemic to the region including three harlequin toads (genus *Atelopus*; Figure 1).

These numbers are high considering that most of the park lies above 3,000 meters elevation. All were common to a certain degree; today however, only three species are still abundant and six species can be seen after a considerable search effort, including two harlequin toads which have all but disappeared. The rest, including the critically endangered Highland Poison Frog, *Colostethus anthracinus*, have not been seen in the park for over twenty years and are possibly extirpated from the region, while the Molleturo Harlequin Toad, *Atelopus onorei*, and the South American Water Frog, *Telmatobius niger*, have not been seen at all and may be extinct.

The Fish and Wildlife Service's Wildlife Without Borders (FWS-WWB) - Amphibians in Decline Program will help save the last critically endangered amphibians found at Cajas National Park and Mazán forest through support of a holistic, grassroots conservation program created between the Philadelphia Zoo, the local Zoo Amaru and Cajas National Park. This grant will supplement funding provided by the Philadelphia Zoo and a 2009 grant from the Disney Worldwide Conservation Fund (DWCF) to help save the green Cajas Harlequin Toad, *Atelopus exiguus,* the Black Cajas Harlequin Toad, *Atelopus nanay,* the San Lucas Marsupial Frog, *Gastrotheca pseustes*, and the Andean Rocket Frog, *Hyloxalus vertebralis* (Figure 2).

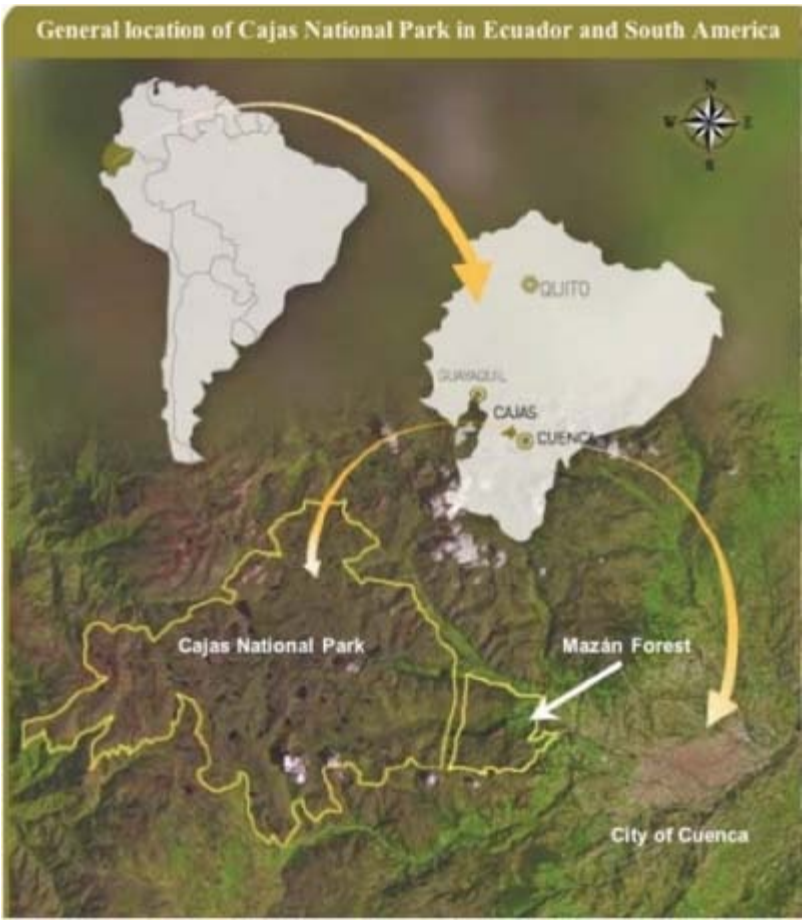


Figure 1: Satellite image of Cajas National Park, Mazán Forest and the City of Cuenca in Southern Ecuador. Map modified and reprinted with permission from authors. Guía de los Anfibios, Peces y Reptiles del Parque Nacional Cajas / Guide of the Amphibians, Fishes and Reptiles of Cajas National Park. Corporación Parque Nacional Cajas, ETAPA. Cuenca Ecuador. 2008.

Figure 2: (left to right): a) The Green Cajas Harlequin Toad, *Atelopus exiguous*, was very abundant and is now found only in one locality at Mazán Forest. b) The Black Cajas Harlequin Toad, *Atelopus nanay*, is nearly extinct. The native quichua people and locals that live where this frog was found expressed an uncharacteristic sadness due to the fact that their toad was gone. Hence, in its formal description in 2002, Dr. Luis Coloma gave it the name "*nanay*",

which is the Quechua word for sadness and grief in allusion to the sadness of losing a dear one. c) The small Andean Rocket Frog, *Hyloxalus vertebralis*, has been extirpated from Mazán forest. It still persists near the park border in a locality known as Soldados and in various small populations around the city of Cuenca. d) San Lucas Marsupial Frog, *Gastrotheca pseustes*. This frog can still be heard with some frequency throughout the park. However it has experienced a steady decline over the past twenty years and its future is uncertain at best.

We have already established assurance colonies for these species at ACC-Mazán frog rescue and breeding center and with the help of the DWCF grant have already gathered preliminary data that will be used to design species survival efforts for harlequin toads. The FWS-WWB Amphibians in Decline grant will allow us to continue to support the work undertaken by ACC-Mazán's amphibian keepers and monitor the existing wild populations of our target species in order to identify and mitigate the specific causes of the population collapse and will help us repopulate the wild populations of these species via our *ex situ* conservation program.

In addition, the FWS-WWB Amphibians in Decline grant will help with our Amphibian Education Program at ACC-Mazán Forest. Around 30,000 students already visit our main local partner Zoo Amaru each year, making this small zoo a primary place where we can inform concerned citizens and tourists about our project. We will work with elementary schools from the city of Cuenca and other cities in southern Ecuador and with local educators to bring our program to children from local communities in areas where endangered amphibians are found (Figures 3 and 4). Our education program will increase awareness of the local and global amphibian crisis and will forward our mission of conserving the local amphibian biodiversity. If younger generations are made aware of the loss of biodiversity, they will be more likely to preserve it in the future.

Figure 3: Children benefit the most from our education program. a) We use protocols established by Amphibian Ark and the Latin American Association of Zoological Parks and Aquariums and provide children with activities, like b) building origami frogs and c) guided jungle walks along with their parents, fomenting storytelling traditions by asking parents to share stories and their knowledge of the forest.

Figure 4: Amanda Vega Toral, (above left) is Zoo Amaru's educator. The US Fish and Wildlife WWB-Amphibians in Decline grant will allow her to continue collaborating with ACC- Mazán Forest. She goes to great lengths to carry our amphibian conservation message to children and teenagers in a fun and informative way. In these images, she is seen talking to children and teenagers from native communities in southern Ecuador.

With the help of FWS-WWB Amphibians in Decline, DWCF, and our partners in Ecuador, we will continue our efforts to save some of the most critically endangered amphibians in the world and will help educate local children living near these precious animals about the importance they play in the ecosystem.

Return to Article Index

Tiny toads tumbling towards Tanzania

Jennifer B. Pramuk, Curator of Herpetology, Bronx Zoo/Wildlife Conservation Society

Amphibian conservationists recently reached a landmark event in the ongoing effort to save a rare, tiny toad from extinction. On August 10th 2010, the Bronx and Toledo Zoos returned 100 Kihansi Spray Toads, *Nectophrynoides asperginis*, to Tanzania for the first time since they went extinct in their native habitat. Alyssa Borek, the Bronx Zoo's primary Kihansi Spray Toad keeper accompanied the toads on a KLM flight from New York to Dar es Salaam. The passengers aboard the flight were quite excited to be flying on the same plane as the diminutive toads, and the flight crew passed out frog toys and asked Alyssa to describe the project over the cabin loudspeaker. Her arrival in Tanzania was met with much fanfare and media attention, with the story of the toad's return being picked up by media outlets throughout the world. Tanzania's skit comedy TV show (a la Saturday Night Live) highlighted the story in a recent episode, lending a surreal air to this fascinating story. This effort is the first of its kind: a reintroduction of an extinct-in-the-wild amphibian from captive stock maintained in a foreign country. Getting to this point certainly has not been an easy or parsimonious route and involved the collaboration, dedication, and assistance of numerous international partners.

In the beginning

The Eastern Arc Mountains in Tanzania represent one of the worlds' biodiversity hotspots. This region of Africa is home to more amphibian species than any other ecosystem on the continent. For millennia, in a particularly small (~2 hectares or 4 acres) area that lay within the verdant spray zone of the Kihansi Falls, the Kihansi Spray Toad thrived. This bright yellow, diminutive toad, reaching a maximum length of 20 mm, is also unusual in that it is one of only a handful of amphibian species to give birth to live offspring. Females can give birth to twenty-five or fewer toadlets at one time, which are only a few millimeters in length at parturition. This mode of reproduction likely evolved as a way to prevent free living tadpoles from washing away in the Kihansi River's swift current. This unusual toad was only first discovered by Western scientists in 1996 when the native population was estimated to be approximately 20,000. Shortly after the toad's description, construction began on a hydroelectric dam that would provide up to a third of Tanzania's power. Unfortunately, before the project had been approved, a thorough biodiversity survey and inventory of the habitat that would be affected by the dam's construction had not been performed. Following construction of the dam, up to 90% of the river's former water flow was diverted for producing power and the moist habitat that had existed in the gorge dried up. Shortly thereafter, the toads' population began a sharp decline.

One of the Kihansi Spray Toads at the new facility in Dar es Salaam. Photo: Alyssa Borek.

Coming to America

Fortunately for the Kihansi Spray Toad, in 2000 the Tanzanian Ministry of Natural Resources and Tourism with aid from Norwegian and Swedish agencies launched a plan to rescue the species from extinction. Later the same year, staffs from the Wildlife Conservation Society Bronx Zoo were invited to Tanzania to collect 499 toads to initiate a captive assurance colony in New York. Despite herculean in-country efforts to restore the wetlands to their pre-dam condition through the construction of an extensive mist irrigation system, the population of toads declined sharply in 2003. By 2006, the Kihansi Spray Toad reportedly had disappeared completely from the gorge. Scientists are still investigating the species' ultimate cause of decline and have speculated that amphibian chytrid fungus, chemical contamination, attack from safari ants, or a combination of all of these factors, may have contributed to the toad's demise.

In the United States, Kihansi Spray Toad captive assurance colonies have had a long history of trials and tribulations, with early efforts spread across multiple partners including Detroit Zoo, Michigan, Toledo Zoo in Ohio, Maryland Zoo in Baltimore, Oklahoma City Zoological Park, and Buffalo Zoological Gardens, New York. Early attempts to keep the toad in zoos were challenged by lack of prior knowledge on keeping this or related species in captivity. After several initial colonies were unsuccessful, the remaining captive toads were reconvened at the Bronx and Toledo Zoos where the long work of fine-tuning husbandry parameters began. Innovations in the toad's care included increasing their exposure to UV light and improving nutritional requirements and water quality parameters. Fortunately, in the past two years populations have been stable if not explosive and more recently additional partnering zoos have been again

called upon to keep assurance colonies. Today, the Toledo and Bronx Zoos have more than 6,500 toads with Henry Doorly Zoo in Omaha, Nebraska and Chattanooga Zoo in Tennessee holding smaller Kihansi Spray Toad colonies.

In 2007, scientists from the U.S., Tanzania and other partnering countries, convened in Tanzania for a Population Habitat Viability Assessment (PHVA) workshop. During the PHVA, a reintroduction timeline was developed. Other products from this workshop included plans for in-country capacity building including the construction of a captive breeding facility at the University of Dar es Salaam and the training of Tanzanian partners on amphibian husbandry, pathology, and veterinary care. Since 2007, five Tanzanian scientists have travelled to San Diego, Toledo, and the Bronx Zoo in order to receive training on aspects of amphibian biology. Back in Tanzania, these scientists will maintain Kihansi Spray Toads in captive breeding colonies prior to soft reintroduction and on diagnosing and treating diseases and veterinary care. Last summer Kihansi Spray Toad keepers Tim Herman from Toledo Zoo and Alyssa Borek from the Bronx Zoo travelled to Tanzania to help with the construction of the captive breeding facility at the University of Dar es Salaam. More recently in February of 2010, scientists and in-country partners again convened in Tanzania for a workshop on the conservation of the Kihansi Spray Toad where an updated reintroduction timeline was drafted and the summer 2010 target for the first return of toads to the in country facility was agreed upon.

Above: Ezekiel Goboro, one of the Kihansi Spray Toad technicians, with the precious cargo from the Wildlife Conservation Society. Below: Alyssa Borek, the Bronx Zoo's primary Kihansi Spray Toad keeper, with the technicians from the amphibian propagation center at the University of Dar es Salaam. Photos: Alyssa Borek.

Returning home

Ten years ago, no one imagined that collecting an assurance colony of the Kihansi Spray Toad would have later led to an opportunity to return an extinct in the wild species to its homeland. The first batch of "pioneers", a group of one hundred intrepid toads, now resides in the new, state-of the-art propagation center at the University of Dar es Salaam. The toads are now doing well and daily are eating 1000s of captive-raised insects including fruit flies. Both Bronx and Toledo Zoos will continue breeding and exhibiting the animals, returning additional shipments to Tanzania as their numbers rebound.

All partners involved in this project are looking forward to the future with goal of reintroducing the tiny amphibians into their former habitat. We have many steps to accomplish before this point including critical assays to be performed at the University of Dar es Salaam that will help determine potential disease transfer from the captive bred toads to native sentinel frogs. Arriving at this joyful and long-awaited moment in a decade-long project wouldn't have been possible without the cooperation and participation of myriad international partners. We all are looking forward to the next steps of developing a responsible and realistic reintroduction timeline and hope that this tiny yet charismatic toad will again someday be the reigning vertebrate in its former habitat.

Return to Article Index

The first *Telmatobius* offspring in the captive breeding program of the Bolivian amphibian initiative

Arturo Muñoz Saravia, Museo de Historia Natural Alcide **d**'Orbigny

Two hundred and fifty-six species of amphibians can be found in Bolivia: more than sixty of these are found only in Bolivia, thirty-four species are listed in the IUCN Red List and fifty-four are in the Red Book of Bolivian Vertebrates. For many years we have been witnessing different amphibian declines, especially in the high Andes, and mainly with frogs of the genus *Telmatobius*. All fourteen species of *Telmatobius* are listed in the IUCN Red List. For this reason the Bolivian Amphibian Initiative started to work with research, education, capacity-building and captive-breeding of some species in this genus. Our captive breeding component includes *Telmatobius hintoni* and *Telmatobius culeus*.

Telmatobius hintoni in amplexus.
Photo: Arturo Muñoz Saravia.

In 2007 we collected twelve *T. hintoni* tadpoles in stage 26 (Gosner stage), and we kept those until they metamorphosed and became sexually mature. In 2008 those animals produced their first eggs, but unfortunately they died some days after the eggs hatched. Since then we have had individuals laying eggs but none of them have been viable. At the beginning of 2010 we obtained a second group of tadpoles, and now after several months we have one individual in stage 35 and thirty-two other individuals in stage 26.

This is an important step for this initiative and it opens a lot opportunities to work with other species that have a high risk of disappearing and now we plan try to breed this species, along with *Telmatobius culeus*, as we have had some individuals in captivity for a couple of years.

The Bolivian Amphibian Initiative is a relatively new project supported mainly by Rufford small grants, Amphibian Ark's Seed Grant program, Fresno Chaffee Zoo and other small supporters, and we are obtaining very interesting data in the field and in captivity that is changing our ideas about these species and their conservation. Recently the US Fish and Wildlife Service's Wildlife Without Borders - Amphibians in Decline Program decided to support us to work with this initiative against the amphibian extinction crisis by funding our research and assisting with the captive breeding facility.

Telmatobius hintoni tadpole in stage 35 of metamorphosis.
Photo: Arturo Muñoz Saravia.

This new events and support that we are obtaining will help us to save some of the critically endangered species of the world and also to increase awareness about the amphibian crisis.

For more information please visit www.bolivianamphibianinitiative.org and www.bolivianamphibianinitiative.blogspot.com or contact Arturo Muñoz hyla_art@yahoo.com

Return to Article Index

Denver Zoo partners with Universidad Peruana Cayetano to help save the Lake Titicaca Frog

Thomas J. Weaver, Area Supervisor of Tropical Discovery, Denver Zoological Foundation

In 2007 the Denver Zoological Foundation granted funding for a non-designated *in situ* amphibian conservation project. Through the Amphibian Ark, Dr. Kevin Zippel of the IUCN Amphibian World Wide Task Force recommended that we liaise with Dr. Roberto Elias at the Universidad Peruana Cayetano Heredia, to help them develop a conservation program and frog reproductive facility at the university and potentially an education component to alert locals of the plight of the Lake Titicaca Frog, *Telmatobius culeus*.

Since then we have created a laboratory at the Universidad Peruana Cayetano Heredia under the supervision of Dr. Elais for captive husbandry and reproduction of this species. At this time we are housing a group of frogs that were confiscated from the markets of Lima. In 2010 we will be conducting a pilot survey of Lake Titicaca which will include a population survey through mark and recapture methodology, biodiversity survey of the *Telmatobius* species that are found in the lake and a survey to check for the prevalence of Bd.

Above: The Lake Titicaca Frog, focus species for a new partnership between the Denver Zoological Foundation and the Universidad Peruana Cayetano Heredia.
Below: The laboratory at the Universidad Peruana Cayetano Heredia for captive husbandry and reproduction of Lake Titicaca Frogs.
Photos: Thomas Weaver.

Our objectives for 2011 will be to continue our surveying throughout the lake and into the Bolivian side. Recent developments have led us to consider the possibility of breeding programs in Puno working with local partners, such as Proyecto Especial de Lago Titicaca (PELT) and Universidad Nacional de Altiplano (UNA). Cayetano is currently housing five individual frogs, all of which are confiscated animals. These animals are not genetically viable and are being housed as part of a study to gain insight into their captive husbandry. We are in the process of obtaining a signed agreement from the National Park Service (SERNANP) and Forestal y Fauna in Puno to collect frogs and conduct research on the lake.

Although our work began in Lima, we currently are focusing our efforts in Puno where frog harvesting is focused. We believe this will have the most direct and expedient impact for our efforts to reduce over-collection. Some activities we propose include a public awareness campaign and development of alternative income sources, such as ecotourism. We have however, had to look beyond just economic benefits and pursue a more holistic approach that includes social, political and historical implications in order to promote frog conservation (Stronza and Pegas, 2008).

Return to Article Index

Ex situ program for an ‘extinct’ Australian frog

Michael McFadden, Unit Supervisor, Herpetofauna Division, Taronga Conservation Society Australia

The Yellow-spotted Bell Frog, *Litoria castanea* was once found across the Northern, Central and Southern Tablelands of New South Wales, Australia, but suffered population crashes in the mid-1970s and was thought to have gone extinct before 1980. This decline coincided with the spread of the amphibian chytrid fungus, with many scientists believing that the pathogen was the cause of this rapid disappearance.

However, late in 2009, on a small private farm in the Southern Tablelands, the species was rediscovered by a local fisheries conservation officer, thirty years after it was feared they had disappeared forever. The population, estimated to comprise about 100 animals, has a patchy distribution along a single stream. The New South Wales Department of Environment, Climate Change and Water and Taronga Zoo immediately moved to establish an ex situ insurance colony for this species. This was undertaken to prevent the risk of losing this species should the population be declining and to provide captive-bred animals for reintroduction efforts.

Between February and April 2010, fourteen tadpoles of this species were collected from different points along the stream and transported to the zoo. Only tadpoles were collected to prevent having any impact on the remaining population. All fourteen tadpoles metamorphosed, have rapidly grown and are fast approaching maturity. Additional tadpoles will be collected next season to supplement the captive genetic pool. Once mature, the species will be bred at the zoo, with experimental reintroductions to occur at other identified suitable sites in the Southern Highlands.

Above: One of the partly-metamorphosed Yellow-spotted Bell Frog tadpoles. Below: An adult Yellow-spotted Bell Frog. Photos: Michael McFadden.

Return to Article Index

Amphibian news from Chester Zoo, UK

Richard Gibson, Curator Lower Vertebrates and Invertebrates, Chester Zoo

Chester Zoo has seen a number of significant events for amphibians during 2010, not the least of which is the formalisation of a permanent amphibian conservation program with dedicated core funding on an annual basis.

The current focal projects of this growing program all combine *in situ* and *ex situ* activities for Critically Endangered species. At Chester Zoo, each of the three project species is housed in a dedicated Amphibian Pod (APOD) – purpose designed and built mobile amphibian laboratories the same size and shape as a shipping container. Here they are kept isolated from all other animals, especially amphibians, and managed under strict quarantine conditions. Chester Zoo is very grateful for the generous support of their growing amphibian *ex situ* conservation efforts by the Oglesby Foundation.

APOD I houses a large and growing population of the Black-eyed Tree Frog, *Agalychnis moreletii*. Collected from Belize as spawn, the forty founder frogs not only represent a healthy starting point for a conservation breeding program for this highly threatened frog but, in partnership with the Manchester University, are the subject of a complex PhD study investigating the role of dietary carotenoids in skin colouration, mate choice and reproductive success (clutch size, fertility, viability and larval growth, development and survival). This research takes place both *ex situ* in the Chester Zoo APOD and *in situ* back in the forests of Belize.

Above: The breeding program for Black-eyed Tree Frogs at Chester Zoo has been extremely successful. Photo: Douglas Sheriff.
Below: Chester Zoo is the only institution that houses an *ex situ* population of Green-eyed Frogs. Photo: Douglas Sheriff.

Since June this year we have been hugely successful in reproducing this species and are currently rearing countless larva and froglets produced from adults reared on three diets differing in catotenoid content. We look forward to seeing the results of the study and incorporating any recommendations into the future husbandry of these and other tree frogs in order that they are as 'fit' as possible for the long-term benefit of the program. In 2011 we hope to be supporting further field work investigating the current distribution and population genetics of Black-eyed Tree Frogs in Belize, Honduras and Guatemala.

APOD II is home to the only *ex situ* population of Green-eyed Frogs, *Lithobates vibicarius*. Previously feared extinct, a population was found at a solitary pond in the highlands of Costa Rica near Monte Verde in 2005.

A small quantity of spawn was collected by the Manchester Museum in 2007 as a precaution should this population be on the decline and subsequently was moved to Chester Zoo.
The zoo works with the Association for the Conservation of Monte Verde (ACM) on whose land the breeding pond is found. Ongoing monitoring has confirmed regular successful reproduction but also a low level of chytrid fungus infection, the impacts of which are as yet unknown. A few further localities have recently been discovered within and to the south of Monte Verde, at least one of which is being studied by University of Costa Rica personnel. Perhaps this is one of those lucky species making a come back from the brink of extinction. Unfortunately attempts to breed this beautiful frog at Chester have so far failed to meet with significant success but we remain hopeful of a breakthrough in the near future.

APOD III has only just arrived and is currently nearing the end of its commissioning period to ensure all systems are fully operational. Its first role will be to house juvenile first generation captive-bred Mountain Chickens, *Leptodactylus fallax*, for possible reintroduction. Chester is one of four European zoos partnering

the governments of Montserrat and Dominica in a bid to save the extraordinary Mountain Chicken. Durrell Wildlife Conservation Trust (Jersey Zoo), Zoological Society of London (London Zoo) and Parken Zoo all hold founder adult frogs rescued from Montserrat in 2009 when chytrid fungus arrived on the tiny Caribbean island. *Ex situ* breeding is now an essential part of the recovery effort for this giant frog since the populations on both Dominica and Montserrat have now been devastated by the fungus.

Chester Zoo's amphibian conservation program also supports research on the extraordinary Darwin's Frog in Chile and caecilians in Sumatra, and is about to initiate a second Manchester University collaborative PhD investigating the impact of UVB radiation on frog fitness, behaviour and reproduction.

A wild male Mountain Chicken.
Photo: Richard Gibson.

Return to Article Index

ARKive: promoting conservation through the power of wildlife imagery

With species extinction now occurring at a faster rate than at any time in Earth's history, raising public awareness of the world's threatened species and the need for their conservation is ever more vital.

ARKive (www.arkive.org), a not-for profit initiative of UK-based NGO, Wildscreen, is leading the 'virtual' conservation effort, creating the ultimate multimedia guide to the world's threatened species using the world's best wildlife media. These important audio-visual records are being preserved and maintained for the benefit of future generations, and are being made freely available as a key resource for scientists, conservationists, educators and the general public via the award-wining ARKive website, www.arkive.org.

To date, ARKive has created digital multi-media profiles for over 9,000 species, digitising and storing more than 55,000 images and 7,000 video clips, from over 5,500 contributors, including the BBC and National Geographic, as well as some of the world's most renowned photographers, scientists, and conservationists.

With almost a third of the world's population now having access to the internet, freely-accessible online media resources are an increasingly influential conservation tool, and through its astounding collection of films, photographs, fact-files and educational resources, ARKive is helping to bring conservation to the forefront of public consciousness.

Amphibians on ARKive

With over one-third of all amphibian species currently threatened with extinction, the importance of gathering together imagery of these species and preserving them for future generations has never been more important. Currently, thirty-nine species are listed as Extinct or Extinct in the Wild and a staggering 1,895 are listed as Critically Endangered to Vulnerable on the IUCN Red List, with many more sitting precariously on the very edge of existence.

Panamanian Golden Frog.
Photo: Gonçalo M. Rosa.

Having recently become a formal partner of the IUCN Red List, ARKive has been working closely with its Species Survival Commission to source images of the world's threatened amphibian species, and with unprecedented access to a fantastic selection of amphibian imagery from the Global Amphibian Assessment, the result is one of the largest collections of audio-visual resources available to the herpetological community. To date, ARKive has profiled 890 amphibian species, but there is still a long way to go in sourcing images and footage of some of the rarest, most obscure, and lesser-known species.

Only discovered in 2005, Rabb's Fringe-limbed Treefrog, *Ecnomiohyla rabborum*, may have already been driven to extinction by the catastrophic arrival of the chytrid fungus responsible for the deadly anuran disease chytridiomicosis. Upon the discovery of this remarkable species in the mountains of Panama, several measures were immediately implemented, including *ex situ* conservation in zoos and the establishment of captive breeding programs, but its survival prospects remain

Rabb's Fringe-limbed Treefrog.
Photo: Brad Wilson, DVM

bleak: only one female is known to exist, and all captive breeding attempts have so far failed. In the sad event that the Rabb's Fringe-limbed Treefrog does become the next victim of the fungus that has devastated amphibian populations worldwide, there is perhaps one small consolation – images of this treefrog have already been kindly donated to ARKive, and these at least will remain and can be used to raise public awareness of just how vulnerable the world's amphibian species are and highlight the need to protect them.

How you can help

As part of the 2010 International Year of Biodiversity, ARKive launched its 'Most Wanted' campaign, aiming to put a face to the name of some of the world's most obscure and largely neglected species. Included in the list are many of the world's lesser known amphibians and, although we know their names, and where they live, in many cases we don't yet have a decent photo of them, let alone a film clip. We are working with scientists, specialists and enthusiasts to find images of these species and unmask the mysterious life forms that hide behind names like the Jeweled Toad.

A recent success for the ARKive team comes courtesy of Amphibian Ark. Images of the Yellow-spotted Bell Frog. *Litoria castanea*, a Critically Endangered amphibian from the Southern Tablelands of New South Wales, and one of our 'Most Wanted', have been kindly donated to the project by Michael McFadden of the Taronga Conservation Society, Australia, who contacted us at the suggestion of Amphibian Ark. Presumed extinct for the past thirty years, until it was unexpectedly stumbled across in 2008, its rediscovery has been likened by those in the amphibian world to being 'as significant as discovering the Tasmanian Tiger'. Conservation measures have now been put in place to protect the remaining population of this highly threatened species, hopefully ensuring its future survival.

If you have films or photographs of any Red Listed amphibian species, or indeed of any of the world's threatened species, then the ARKive team would be delighted to hear from you.

To achieve our ambitious goals, ARKive depends on the generous support of people and organisations from all over the world. There are many ways to help, whether it's through the contribution of media, the authentication of species fact-files, or merely by spreading the word so that more people become aware of the project, and the vital conservation message it promotes.

For further information or to find out how to get involved visit the website at www.arkive.org

Yellow-spotted Bell Frog.
Photo: Michael McFadden.

Return to Article Index

Another great reason to visit the Oceanário – Amphibians: Interesting by nature

Oceanário de Lisboa

Amphibians impact our lives and the health of our planet in countless ways. In addition to representing vital sources for numerous important biomedicines, amphibians are critical indicators of the overall health of our natural environment.

The current amphibian extinction crisis demands immediate attention and action which must begin with a deeper understanding of the critical components of amphibian environments, their vital role within distinct biomes and ecosystems, an exploration of possible sources for their increasingly rapid demise and, most importantly, the identification of effective steps that can be taken to better conserve amphibians and their delicate environments.

The new Iberic amphibian habitat display at Oceanário de Lisboa. Photo: Mafalda Frade.

In support of Oceanário de Lisboa's increasingly comprehensive approach to global environmental conservation education, and the permanent effort to contribute directly to various conservation initiatives, a new amphibian exhibit was opened in an attempt to educate our visitors about the wonders of amphibians, the potential extinction crisis that they are currently experiencing, and what can be done to better protect this vital component of our planet's ecosystem.

Amphibians inhabit all continents of the world with the exception of Antarctica, and live in a variety of distinct habitats such as rainforests, rivers and streams, ponds, deserts and alpine environments.

Traditionally, amphibian exhibits have focused on the presentation of the unique characteristics of individual species but most current research reflects the need for a more holistic view of amphibians and their environments. The new amphibian exhibit at the Oceanário de Lisboa is focused on the presentation of the connections and relationships between amphibians and the specific environmental conditions of their biomes and how the degradation and loss of their habitats represents a critical contributing factor to their accelerating decline.

The rainforest floor exhibit, with its wonderful photographic backdrop. Photo: Mafalda Frade.

The objective of the exhibit is to first, in order to make a fundamentally emotional connection with the visitors, present a collection of varied living biomes that are representative of common amphibian environments around the world. The exhibit imagery supports the main theme of presenting living amphibian communities intrinsically linked to the unique nature of their specific habitats as well as the important concept of the "dual life" (aquatic and terrestrial) of amphibians.

The living exhibits or samplings of distinct amphibian environments (moving water, still water, Iberian habitat,

rainforest canopy, rainforest floor) are presented with intentional simplicity utilizing illuminated environmental images as exhibit backdrops to visually expand the living exhibit components.

In contrast to the more centralized presentations of living biomes, the more didactic and interactive exhibit content is primarily located along the perimeter walls of the exhibit space. This physical organization of exhibit content allows the visitors to view and experience the living exhibits with an undisturbed focus required to allow a more immediate and emotional connection with the living exhibits. The supporting exhibit content located on the perimeter walls complements and enhances the visitor's experience by providing more detailed and scientifically specific information about the environments and amphibians that they have just seen within the living biomes.

The live Himalayan newt exhibit at Oceanário de Lisboa. Photo: Mafalda Frade.

The exhibits are organized as a progression of distinctly varied habitats in an attempt to underline the critical nature of environmental conservation in amphibian conservation efforts.

It is critical for visitors to understand that the isolation of species removed from their interdependent environment is an artificial construct. Most especially for the intent of environmental conservation and awareness, the living exhibit components are designed with the objective of communicating the holistic nature of the relationship of amphibians and their environments.

While the visitors are experiencing all the exhibit components, they encounter areas within the exhibit which present opportunities, either by direct behavioral changes or by supporting existing organizations such as Amphibian Ark, for them to make positive contributions to amphibian conservation.

By providing practical outreach opportunities immediately adjacent to the exhibit experience, the goal of the exhibit is to capitalize on the emotional connection and sense of wonder generated by the small yet elegant presentation of the living environments, together with supporting didactic exhibit content, to encourage immediate participation in ongoing amphibian conservation efforts.

Return to Article Index

World Museum Liverpool highlights the Amphibian Ark's conservation efforts

Phil Lewis, Education Demonstrator - Aquarium & Bug House, National Museums Liverpool

As part of Wild Wild World week (7th – 15th August) World Museum Liverpool highlighted the Amphibian Ark's efforts in trying to reverse the global trend in amphibian declines and extinctions via a number of presentations in the museum theatre. Phil Lewis delivered the talks to family audiences throughout the week and has been doing so all year, delivering monthly talks as part of international year of biodiversity. After the talks the public were able to get up close to several large live tropical frogs on display in the museum, along with amphibian conservation messages around the building. Children were encouraged to become involved in a number of frog art and craft activities such as amphibian trails, frog mask making, face painting, badge making, frog puzzles, colouring and drawing.

Over 16,000 visitors took part in activities during the week with many of them pledging support for the Amphibian Ark. The audiences seemed genuinely concerned about the state of the planet's amphibians and most had no idea they were in such trouble. As well as supporting the AArk the public were encouraged to build garden ponds in an effort to help local species across Merseyside, as many sites have been lost to development.

Above: Visitors to the World Museum Liverpool during a talk on global amphibian declines. Below: Phil shows an African Bullfrog to museum visitors during one of the amphibian events. Photos: Phil Lewis.

Phil has been able to work closely with a local primary school (Rice Lane) during outreach sessions. It came about when he noticed children from his old primary school in the aquarium and offered to visit the school with some tropical and native amphibian species and spend time in the classrooms giving talks. The deputy then showed him an unused courtyard which they wanted to develop in to an outdoor classroom and wildlife garden. Phil immediately recognised where a pond could be built and areas for invertebrates. By March 2009 Phil, along with the school gardeners, had developed the pond and wildlife garden which now has a thriving Common Frog, *Rana temporaria*, and Smooth Newt, *Lissotriton vulgaris*, population. The children now have the opportunity to be close to amphibians and go pond dipping and also regularly take part in amphibian related events. In mid Sept 2010 Phil will go to the school and judge a frog art contest and will give away prizes for first, second and third places, as well as runner-up prizes to the children who have produced the best drawings.

The deputy of the juniors has seen the success of this project and has asked Phil to help them develop a pond and wildlife garden on the grounds of the junior school. This has caught the attention of other local schools who wish to participate in pond and wild life garden development.

Return to Article Index

Toad Tracking… Across the Universe!

Rachel Rommel, Conservation Programs Manager, Houston Zoo

Nine hundred flying cockroaches. One broken GPS unit. Two missing callipers. Forty man-handled toads. Seventy-five new amphibian enthusiasts. This is what it's all about!

The Houston Zoo is proud to announce the completion of the first year of Toad Trackers, an interactive program which aims to teach students real world field research methods used by conservation biologists to study animal populations. We were able to bring this exciting program to reality thanks to a generous grant from the Texas Parks and Wildlife Outdoor Outreach Program.

Toad Trackers expands on the idea of "citizen science" such as Frog Watch USA and the North American Amphibian Monitoring Program by introducing students to the actual tools and methods field biologists use to study animal populations and assess the health of those populations. On warm and wet nights, they actively search for the Coastal Plains Toad (*Bufo nebulifer*) on the grounds of Houston Zoo for processing and data collection. This common toad has adapted seemingly well to living amongst humans and has survived despite a shrinking and fragmented habitat. The large population of this particular toad and its ability to thrive in urban areas makes it a perfect candidate to study both from a convenience and an environmental impact perspective.

When the toad round up has commenced on sticky summer nights, the kids weigh, measure, determine gender, note any mutations of each toad and record its GPS coordinates. A conservation biologist at the Zoo then inserts a pit tag into each toad and the students release it at the point of capture. Subsequent toad round ups during the same or following year will provide data (through the ability to individually recognize toads) on growth rates, reproductive events, and movement patterns.

In addition to encouraging a new generation of wildlife biologists, this program is also a forum in which students are educated about global amphibian extinctions and why monitoring local amphibian populations are important to detecting declines in our own region. Additionally, the data collected through this project will be used to publish a peer-reviewed paper on native toad populations based on the work of citizen scientists.

This program can be incorporated into diverse zoo or nature center educational settings including but not limited to home school, scout and overnight programs, community outreach, as well as continuing education for older teens with a keen interest in pursuing careers in wildlife biology and conservation.

Students about to weigh and measure a Coastal Plains Toad as part of Houston Zoo's Toad Trackers program. Photo: Rachel Rommel.

If you are interested in learning more about how to start tracking toads at your zoo or institution contact Rachel Rommel, Conservation Programs Manager at the Houston Zoo, rrommel@houstonzoo.org. What are you waiting for? Hop to it!

You can follow Toad Trackers on Facebook.

Return to Article Index

ALPZA, the Latin American Association of Zoological Parks and Aquariums, steps it up for amphibian conservation!

Carlos C. Martínez Rivera, Luis Carrillo, and Gustavo Valencia, ALPZA's Amphibian Group

Ever since the Amphibian Ark was created, the Latin American Association of Zoological Parks and Aquariums, or ALPZA by its acronym in Spanish, (www.alpza.com) has been carrying the AArk's message of amphibian conservation through its amphibian education campaigns and by promoting research and conservation programs at individual ALPZA institutions. And it makes perfect sense for ALPZA to be a regional amphibian ambassador for Latin America: ALPZA members are mostly zoological parks and aquariums from México to Argentina and the Caribbean. This geopolitical region is home to one third of the world's amphibians, it has the highest amphibian diversity - seven out of the twenty countries in the world with the highest number of endemic amphibians are found in the Americas south of the United States, i.e. Latin America. The three countries with the highest amphibian diversity in the world are Brazil, Colombia and México, and between them they have more than two thousand amphibian species, a thousand of which are endemic and found nowhere else.

The Asociación Latinoamericana de Parques Zoológicos y Acuarios (ALPZA) logo unifies the geopolitical region of Latin America, which is as diverse as the fauna it harbors.

Unfortunately, this heritage is at risk. Latin America is also home to the highest number of threatened and endangered amphibian species - eleven out of the twenty countries with the highest number of threatened amphibians in the world are also from Latin America. More than 1,200 amphibian species from this region are in danger of becoming extinct in the near future, including iconic species like harlequin toads, lungless salamanders, Mexican mole salamanders, and Neotropical poison frogs.

Amphibians suffer from diverse problems, such as habitat destruction, disease, introduced predators, and over-collection as a food source and as pets, and these problems might render these species extinct in the near future. The threatened amphibian fauna of Latin America includes some iconic species such as harlequin toads, lungless salamanders, Mexican mole salamanders, and Neotropical poison frogs. Some are shown above: A) Jambato Collarejo *Atelopus nepiozomus*; B) Alto Pastaza Harlequin Toad *Atelopus palmatus* cf*. planispina*; c) Wampukrum, *Atelopus* sp nov.; D) Panama Golden Frog; *Atelopus zeteki*; E) Esmeraldas Lungless Salamander, *Bolitoglossa sima*; F) Tropical Lungless Salamander, *Bolitoglossa* sp.; G) Oaxaca Mole Salamander *Ambystoma* sp.; H) Anderson's Mole Salamander *Ambystoma andersonii*; I) Oxapampa Poison Frog *Ameerega planipaleae*; J) Strawbery Poison Frog *Oophaga pumilio*; K) Amazon Foison Frog *Ameerega bilinguis* L) Duellman's Poison Frog *Ranitomeya duellmani*.

Photo credits: A) by Diego Armijos, Zamora Province Ecuador. B) by Mario Yánez Muñoz, Pastaza Province, Ecuador. C) Germán Petsaín, Shuar Community, Ecuador. E, F, K, L) by Cecilia Tobar Suárez, various localities in Ecuador. H) by Michael Shrom, from his personal collection. D, G, I, J) Carlos C. Martínez Rivera, various localities in México, Costa Rica, Perú and at the Philadelphia Zoo.

As a regional association for zoological parks and aquariums, ALPZA promotes conservation through education, capacity building and by promoting higher standards in animal husbandry and collection management. As such,

ALPZA has established a series of commissions, committees and working groups geared at unifying strengths, protocols, and visions for the zoos and aquariums of 21st century Latin America. One of these working groups is the Amphibian Group, which sits under ALPZA's Conservation Committee (http://www.alpza.com/esp/grupoanfibios.php). Luis Carrillo, DVM from Zoofari Zoological Park in Morelos, México is the group's chair and its coordinators are Carlos C. Martinez Rivera, PhD from Amphibian Ark and the Philadelphia Zoo (USA) and Gustavo Valencia from Zoológico Santa Fé in Medellín, Colombia. Any individual ALPZA member or any employee of an ALPZA institution with interests in amphibian conservation and education can be a part of this group. ALPZA's Amphibian Group works closely with Amphibian Ark to direct conservation efforts to existing and new amphibian conservation programs within ALPZA institutions and to help undertake AArk's Conservation Needs Assessment workshops and amphibian husbandry workshops in Latin America.

During ALPZA's strategic planning meeting held in June 2010 in Bogotá, Colombia, ALPZA's Amphibian Group gave an update on its activities and presented its working plan for the year 2011. A poll carried by the Amphibian Group in 2010 to assess the status of amphibian collections in ALPZA institutions showed that 92.3% of the participating institutions were aware that 2008 was declared the Year of the Frog (YOTF). However, 36.4% of those were not sure what YOTF 2008 was truly all about and almost half, or 41.7% of the responding institutions did not receive any educational information, even though there was plenty of information available about YOTF and AArk on the AArk and ALPZA web sites and in addition, YOTF was promoted at the 2007 and 2008 ALPZA meetings.

Carlos C. Martínez talks to participants during ALPZA's strategic planning meeting held in June 2010 in Bogotá, Colombia. The main purpose of this talk was to bring ALPZA members up to date with the progress of the Amphibian Group and to talk to members about how the group can better address the particular needs and concerns of individual ALPZA institutions working on amphibian conservation.

About two thirds, or 66.7%, of the responding ALPZA institutions have native amphibian species in their collections. However, only five ALPZA institutions are currently involved in amphibian conservation through a dedicated *ex situ* conservation program. The remaining institutions state that they are not properly outfitted to house amphibians or to be involved in an amphibian conservation program. The reasons why these institutions do not work with amphibians in their collections and do not participate in amphibian conservation projects is due to:

- lack of adequate space,
- lack of proper life support systems,
- lack of properly trained staff.

These institutions also expressed the need for capacity building in exhibit design and the implementation of life support systems in order to be able to begin an amphibian conservation program, and expressed a need to receive training in areas such as husbandry protocols, disease prevention and diagnosis, breeding techniques and the production of feeder invertebrate colonies.

The poll also asked the zoological parks and aquariums from the Latin American region about AArk's Conservation Needs Assessment workshops; 66.7% responded that AArk has conducted a workshop in their countries. To date, AArk has carried these workshops in Brazil, Chile, Colombia, México, Panama, Perú, and, Venezuela; 61.5% of ALPZA institutions that responded have actively participated in one of these workshop in their respective home country. Seven institutions told the Amphibian Group that they are involved in one or more of the recommendations made at these workshops.

The message is clear, conservation institutions throughout Latin America are aware of the amphibian extinction crisis and are eager to help save amphibians, but they need help. ALPZA and the Amphibian Ark do a lot to provide free access to information on their websites and AArk's officers are always accessible and actively engaged in capacity building throughout the region, but we need to be able to reach more people with our message and we need to work directly with these institutions to help them establish amphibian conservation programs. In order to address these issues directly, ALPZA's Amphibian Group will engage in the following:

- Standardize husbandry and breeding protocols for the various amphibian species kept at ALPZA institutions.
- Promote the creation of protocols for species in need of *ex situ* conservation programs
- Provide husbandry protocols and population management guidelines for feeder invertebrates.
- Continue to help individual zoos in developing amphibian conservation programs for critically endangered species that cannot currently be safeguarded in nature through ALPZA's partnership with AArk.
- Promote capacity building in specific amphibian husbandry areas, like management of *ex situ* populations, disease prevention, and feeder invertebrate colonies through online workshops and other interactive media.

ALPZA's Amphibian Group is committed to help institutions reach their goals in amphibian conservation together with AArk and other conservation partners. Our Strategic Plan for the year 2011 will address these issues and will be presented at ALPZA's annual congress, which will be held in Santiago de Chile on November 11-17, 2010 (http://www.alpza.com/esp/eventos.php#53). The group will take advantage of ALPZA's website to post husbandry protocols for amphibians and for feeder invertebrates and will also upload other documents in Spanish that will be accessible to the general ALPZA community. Luis Carrillo, along with folks from Temaikén Zoo (Argentina), Sao Paulo Zoo (Brazil) and Santa Cruz Zoo (Colombia), will start to develop interactive online workshops to teach participants about proper amphibian management and feeder invertebrate colonies, Gustavo Valencia will provide ALPZA institutions with a modified and translated version of AArk's "Husbandry Guidelines" template, where individual researchers and animal keepers can fill out the appropriate information for each of the amphibian species kept at their institutions, and Carlos C. Martínez will continue to provide technical support to existing amphibian *ex situ* conservation programs through the region by helping in facilities design, project implementation and by help in securing external funds through grant writing and institutional match-making.

Return to Article Index

"Exposicão o pulo do sapo" or the "Leap of the frog exhibit", was held at São Paulo Zoo's Water House early last year. "O pulo do sapo" was highlighted in Brazil as one of the best animal exhibits in South America. It showcases amphibians from the Brazilian Amazon and Brazilian's Atlantic Forest, a mega diverse region with an immense number of endemic and threatened amphibians. It also served to promote the work carried by the zoo's personnel towards amphibian conservation. São Paulo Zoo is one of many ALPZA member institutions carrying innovative *ex situ* conservation for critically endangered amphibians. Currently, Cybele Lisboa, the zoo's Amphibian and Reptile biologist is working with a surrogate population of the common Bromeligian Frog, *Scinax perspusillus*, as a surrogate species to learn husbandry techniques needed to work with the critically endangered Alcatraz Bromeligian Frog, *Scinax alcatraz*.

An update from the Association of Zoos & Aquariums

Shelly Grow, Conservation Biologist, AZA

U.S. Fish and Wildlife Service's "Wildlife without Borders – Amphibians in Decline" Funding

Last year, the Association of Zoos and Aquariums (AZA) was able to get the following language inserted in the U.S. House Interior Appropriations bill for FY 2010:

> "*The Committee is aware of the impacts of the Chytrid disease on amphibian species worldwide. Amphibian species are disappearing at over 200 times their historic rate, and if left unchecked, up to 30 percent of these species could be extinct within two to three decades. The Committee urges the Service to work with the international conservation community to establish conservation and captive breeding programs as well as to support the development and testing of novel methods to combat the amphibian chytrid to conserve the most imperilled of these species*."

On May 17, 2010, U.S. Fish and Wildlife Service's Division of International Conservation announced the much anticipated "Wildlife Without Borders – Amphibians in Decline" funding opportunity to support projects that conserve the world's rapidly declining amphibian species. The program will support activities that address threats to all amphibians that face an unprecedented threat of extinction. Funding will be made available for conservation of species with native ranges in countries with the greatest need for conservation funding. The goal of this grants program is to provide funding for specific conservation actions that have a high likelihood of creating durable benefits to amphibian species facing extinction. Submissions were due June 15, 2010.

FrogWatch USA Chapters opening at AZA-accredited zoos and aquariums

This year, AZA began encouraging AZA-accredited zoos and aquariums to open locally branded chapters of the citizen science program, FrogWatch USA. AZA is pleased to announce that more than ten FrogWatch USA Chapters are now operating in the United States. Citizen science programs offer strong educational opportunities for connecting people to nature through local experiences and opening a FrogWatch USA Chapter represents an opportunity to further connect the community to accredited zoos and aquariums. Learn more about FrogWatch USA at: www.aza.org/frogwatch/.

AZA Congratulates Members on New Publication

In June, *A Manual For Control of Infectious Diseases in Amphibian Survival Assurance Colonies and Reintroduction Programs* was published. This impressive publication (available at: http://www.cbsg.org/cbsg/) is a contribution of the IUCN/SSC Conservation Breeding Specialist Group in collaboration with Amphibian Ark and AZA-accredited members San Diego Zoo and Zoo Atlanta, with funding from the Institute of Library and Museum Science (IMLS). Congratulations to all who contributed to this important document, and especially to the editors, Drs. Allan Pessier and Joseph Mendelson.

Return to Article Index

Review of Costa Rican amphibians in the IUCN Red List and evaluation of the actions from the Costa Rican Amphibian Conservation Strategy

Yolanda Matamoros, President, Mesoamerican Association of Zoos

The Biology School of the Universidad de Costa Rica has maintained records of amphibian species' populations since the 1960s. This information has been the base for different conservation workshops promoted by the school with the support of national and international conservation organizations. Among the workshops that have been held in collaboration with CBSG Mesoamerica are: Costa Rican Amphibian Conservation Strategy (2006), Costa Rican Amphibian CAMP II (2007) and Amphibian Species Prioritization for *ex situ* Conservation Programs (2007). In 2010 Federico Bolaños, herpetologist from the Biology School requested the support of CBSG Mesoamerica to organize a new workshop to update the information of different species reviewed in the Costa Rica Amphibians CAMP II and IUCN's Global Amphibian Assessment (GAA), and to review the progress of actions from the Conservation Strategy of 2006.

This workshop was held August 3-4, 2010 at the Biology School of Universidad de Costa Rica, San Pedro, Costa Rica. There were twenty-seven participants from fourteen institutions, one was independent, and all of them were members of different organizations and universities that work in research and conservation of amphibian species.

The workshop was opened by Bruce Young from Nature Serve, who was the person responsible for using the IUCN's Red List computer program to enter the changes on the species during the workshop. Bruce gave a presentation about IUCN's Red List, its categories and the information needed to evaluate the species conservation status, and the proceedings needed to accept a change in the species information. After this, Federico Bolaños presented a list with 200 amphibian species for Costa Rica, given to the participants before the workshop, including new species found after 2007 and probable species cited in web pages of AmphibiaWeb, Amphibian Species of the World and IUCN, but without any registers of them in the country, which generated some confusion. The list of amphibian species described for Costa Rica can be seen at: http://museo.biologia.ucr.ac.cr/Listas/LZAPublicaciones.htm.

The group quickly reviewed the species, choosing the ones that ought to be reviewed in detail, reducing the list to a smaller one of eighty-one species. During the first afternoon and the next day, participants reviewed new information for these amphibian species and agreed to make changes in fifty-one of them that can be grouped in the following ways:

1. Three species were found again, one of which was declared Extinct (*Incilius holdridgei*), and the other two were Probably Extinct (*Isthmohyla tica* and *Craugastor fleishmanni*).
2. Four new species were described for the country, one of them is already Probably Extinct (*Atelopus chirripoensis*); and two species previously not known for the country were added, one of them an introduced species (*Eleutherodactylus coqui*).
3. The conservation status were changed for five species, three of them changed from Data Deficient to Low Risk and the other two changed their status to levels of lower risk.
4. Thirty-one species had new information about collecting points and population trends, seven categorized as Critically Endangered have increased their populations.
5. Three species are Probably Extinct, another three have uncertain presence in the country and an introduced species catalogued as native was corrected.

In the afternoon of the second day progress in the Conservation Strategy's actions were reviewed, with the following results:

- Twenty actions (48%) have been competed
- Eleven have been started but not yet completed (22%)
- Eleven (22%) have not been started.

Participants agreed to work towards completing all of the actions, with particular emphasis on three of them: producing a book about the Conservation Status of Costa Rican Amphibians that serve as a base for information for web sites such as AmphibiaWeb; producing a list of the places that keep amphibians in captivity; and continuing to work on the animal welfare protocols.

Finally, it is important to emphasize the success of the list-serve of Costa Rica's Amphibian Conservation Group (Consafi) that to date has almost one hundred members. We invite you to join this list and participate in it. Those of you who are interested can e-mail Federico Bolaños (federico.bolanos@ucr.ac.cr) for additional information.

Return to Article Index