

CONSERVATION ACTIONS FOR NATIVE AND THREATENED AMPHIBIANS OF COLOMBIAN CARIBBEAN REGION

Andrea Marcela Echeverry. BSc. Biology. Animal Collection and Research Coordinator, Fundación Botánica y Zoológica de Barranquilla. a.echeverry@zoobaq.org

Total funding amount requested from Amphibian Ark: USD\$ 5000 for meet objective one of this proposal.

Executive summary

The amphibian biodiversity of Colombia's Caribbean region is rich, but most is threatened to some degree. Fundación Botánica y Zoológica de Barranquilla, as the only zoo in the region pretends to contribute to the plight of amphibians via a holistic amphibian conservation project that includes an amphibian exhibition and education program, ex situ conservation via captive breeding program of two local, endangered amphibians; *Allobates wayuu* (VU-IUCN) from Makaira National Natural Park and *Colostethus ruthvenni* (EN-IUCN) from Sierra Nevada de Santa Marta, educational activities at the zoo and at localities where endangered amphibians are found and by monitoring the health of several amphibian populations. Both species, assessed by the Colombian-AArk species prioritization workshop in 2007, were recommended for captive breeding programs. We hope to make people aware about amphibians, the threats they are facing and the actions we could do to protect them both in wild and at the zoo.

Introduction

Owing the privileged geographic location and topographic structure, Colombia is classified as the second most diverse country in amphibian fauna. Of the 6546 globally reported species, our country has almost 745 amphibian species ([Amphibiaweb](#), 2010) distributed in almost 700 anurans, 17 salamanders and 31 caecilians (Acosta-Galvis, 2000, IUCN 2010), but many areas remain biologically unexplored, and numbers might be even greater. This species are vital in nature, for many reasons. Also, they possess cultural importance, for indigenous cultures, in Colombia; like the Tayrona indigenous peoples from Sierra Nevada de Santa Marta.

During the last decades, the scientific community has seen how amphibian populations have diminished or become extinct (Stuart *et al.* 2004). This crisis, originated by habitat degradation and fragmentation and the introduction of exotic species, has been aggravated by the appearance of the fungus *Batrachochytrium dendrobatidis* (Bd), which has caused the decrease of many species and is moving quickly and effortlessly through South America (Lips *et al.* 2008; Global Amphibian Assessment, 2004). In Colombia Bd has been reported from many species including *Pristimantis gracilis* in the department of Antioquia (REF), but has probably been introduced to many other areas by now. Unfortunately, Bd and other threats faced by amphibians cannot be currently handled only in the wild. It is then clear that for many species "Amphibian survival depends on management measurements taken both in wild and captivity". In this context, zoos, due to its characteristics have a vital role to help through precise actions (Zipel, 2005). Although there are some initiatives in Colombia to protect amphibians, few are geared to amphibians

of the Caribbean Region of Colombia. An area characterized for having many unique and endemic species. However most species lack of basic biological information of natural history, demography, ecology, physiology, etc.

For all that, Fundación Botánica y Zoológica de Barranquilla, conscious of its responsibility as the only zoological institution in the Caribbean region of Colombia, and in response to the great contribution that zoos can make to amphibian conservation and its habitat, developed an amphibian conservation project which includes a holistic approach with four main objectives: 1) adapt an amphibian's exhibition in Barranquilla Zoo to promote awareness about local amphibian species, 2) Build a specialized laboratory for ex situ conservation including captive reproduction and research of threatened frogs from Colombia's Caribbean region, *Allobates wayuu* (VU-UICN) and *Colostethus ruthvenni* (EN-UICN) from Sierra Nevada de Santa Marta and Makaira National Natural Parks (species included in the Colombian Amphibian Ark prioritization list; AArk, 2007), 3) Develop an educational strategy, outside the zoo to create consciousness about threats amphibians are facing in the communities that directly impact this species and its habitats and 4) Promote field research in natural history, biology and ecology of target species. With this project we hope to contribute specifically by helping two endangered species from the brink of extinction and by making people aware about what is an amphibian, what are the threats amphibians are facing and the actions we could do to protect them. We request from AArk support to start the adaptation of the exhibition at the zoo with the interpretative boards for our two threatened species. This will permit us to show that we are concern with their status and then raise fund for other entities to complete the objectives of our project.

Methodology

Objective One: For the amphibian exhibitions we improve our existing aquarium facilities, which includes an exhibition and management area to meet the biosecurity standards and husbandry requirements of the species on our project. To accomplish this, we will follow the general recommendation included in the AZA Amphibians Husbandry Manual (Poole and Grow, 2008), We will follow this guidelines to improve the design of the exhibit terrariums and service areas (construction, plumbing, drainage, decoration, illumination, and humidity) in order to adapt them to meet the necessities and specific requirements of our species. Food for all frogs (exhibition and laboratory) will be obtained from an established insect colony of our zoo where we grow house crickets (*Acheta domestica*), meal worms (*Tenebrio molitor*), and fruit flies (*Drosophyla melanogaster*).

The collection plan for exhibition includes the following common species: *Dendrobates truncatus*, *Phyllomedusa venusta*, *Ceratophrys calcarata*, *Scarthyla vigilans* - *Dendrosophus microcephala* - *Scinax boulengeri*; *Oophaga histrionica* - *O. lehmanni*, *Phyllobates bicolor/terribilis*, *Typlonectes natans*. We will also incorporate our two endangered species from our ex situ conservation program, *Allobates wayuu*, *Colostethus ruthveni*, in our exhibition to increase awareness of our conservation work. *Allobates wayuu* will be collected in Makaira National Natural Park (Guajira Department), *Colostethus ruthveni* will be collected from around "La Victoria", on the northwestern slope of Sierra Nevada de Santa Marta (SNSM), between 700 to 2700 m of altitude in Gaira river basin, Santa Marta department. *Oophaga spp.* and *Phyllobates spp.* frogs will be

donated by Fundación Zoológico de Cali. The remaining frogs, which are LC (IUCN 2010), will be used for display and education and will be collected in wild in Magdalena and Atlantic Departments of Colombia.

Objective Two: To build a captive breeding facility on the second floor of the new amphibian exhibit as part of our *ex situ* conservation program. The space available consists of the second floor of the old Aquarium (new amphibian house) is, (approximately 110 m²).

Objective Three: We will work with the local communities (both rural and indigenous) and schools from Makuira National Natural Park (habitat of *Allobates wayuu*) and from La Victoria in SNSM (habitat of *Colostethus ruthveni* through interviews, workshops and teaching tools available at www.amphibianark.org to promote amphibian conservation and make sure that good practices of ecotourism are enforced in order to preserve the habitat of our endangered amphibians.

Objective Four: We already established a strategic partnerships with Universidad del Atlántico and Universidad del Magdalena to offer research opportunities to students to develop undergraduate thesis both in field and at the laboratory in concordance with our amphibian conservation program. We are in the final stages of establishing another strategic partnership with the nonprofit organization ProAves who has a Private Reserve in Sierra Nevada de Santa Marta and offers an ideal habitat for the reintroduction of *Colostethus ruthveni* in the long term.

References

- AArk,2007.<http://portal.isis.org/partners/AARK/Lists/Species%20prioritization%20%20Colombia/Allitems.aspx>
- AmphibiaWeb: Information on amphibian biology and conservation. 2009. Berkeley, California. <http://amphibiaweb.org/> (Accessed: april 30, 2010).
- Acosta-Galvis, A., and T. Grant 2004. *Allobates wayuu*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. <www.iucnredlist.org>. Downloaded on 13 July 2009.
- Lips, K., J. Diffendorfer, J. Mendelson, and M. Sears. 2008. Riding the wave: Climate change, emerging infectious disease and amphibian declines. *Public Library of Science Biology* 6(3): 72.
- Lips, K., Brem, F., Brenes, R., Reeve, J., Alford, R., Voyles, J., Carey, C., Livo, L., Pessier, A., and J. Collins. 2006. Emerging infectious disease and the loss of biodiversity in a Neotropical amphibian community. *Proceedings of the National Academy of Sciences* 103: 3165-3170.
- Poole, V., and S. Grow (Eds). 2008. Amphibian Husbandry Resource Guide. <http://www.aza.org/amphibian-population-planning/>
- Stuart, S., Chanson, J., Cox, A., Young, B., Rodriguez, A., Fishman, D., and R. Waller. 2004. Status and trends of amphibian declines and extinctions worldwide. *Science* 306: 1783-1786.
- Zippel, K. 2005. Zoos play a vital role in amphibian conservation. <http://elib.cs.berkeley.edu/aw/declines/zoo/index.html> (accessed May 8, 20

Budget category	Item/amount (Examples)	Requested from AArk	Other sources/status	Total
Species exhibit				
Design of exhibition terrariums for <i>Colostehtus ruthveni</i> and <i>Allobates wayuu</i>	2 terrariums for each of the two focal species (total of 4) with all technical specs, filter, equipments, UVB lamps, etc.	\$US 1000	\$US 1000 FUNDAZOO - Recieved	\$3,000
Design of exhibition terrariums for our other educational species	2 large exhibition units and two smaller terrariums to house the other amphibian species (with all technical specs)	-	\$US 7000 FUNDAZOO - Recieved	\$7000
Animal transportation	Some animals will come from Cali zoo and others collected from the wild	-	\$1000US FUNDAZOO – Approved	\$1000
Ex situ conservation				
Design of modular captive breeding facilities for <i>C.</i> and <i>A. wayuu</i>	Breeding terrariums, rearing tanks for tadpole colonies, biosecurity measures, etc.	\$3000	\$2000	\$5000
Purchase and adaptation of frog pod	Modified shipping containers, A/C units, back up generator, plumbing.	-	\$ US 40,000 Requested	\$40,000
Education				
Education and interpretation items	Interpretative boards and interactive stations for the two focal and threatened species.	\$US 1000	\$US 5000 FUNDAZOO – Approved	\$6,000
<i>In situ</i> Educational Activities	Educational materials (posters, booklets, etc) for 2 workshops.		\$US 3000 FUNDAZOO- Requested	
Personel				
Personal Cost	Salary for amphibian keeper for first year \$US 700 x 12 months		\$US 8400 FUUNDAZOO – Approved	
Total		\$US 5000	\$67,400	\$72,400

Timeline

Activity	July-Sep '10	Oct-Dec '10	Jan-Mar '11	Apr-Jun '11	July-Sep '11
Exhibition improvement	X				
Frog's collection	X	X			
Exhibition opens			X		
Fundraising for program expansion	X	X	X	X	
Laboratory construction				X	
Educational activities in situ			X	X	
Field research				X	X