

# 2013 ANNUAL REPORT

*PANAMA AMPHIBIAN RESCUE AND CONSERVATION PROJECT*



*A project partnership between: Cheyenne Mountain Zoo, Houston Zoo, Smithsonian's National Zoological Park, Smithsonian Tropical Research Institute, and Zoo New England.*



### **MISSION**

Our mission is to rescue and establish assurance colonies of amphibian species that are in extreme danger of extinction throughout Panama. We will also focus our efforts and expertise on developing methodologies to reduce the impact of the amphibian chytrid fungus (Bd) so that one day captive amphibians may be re-introduced to the wild.

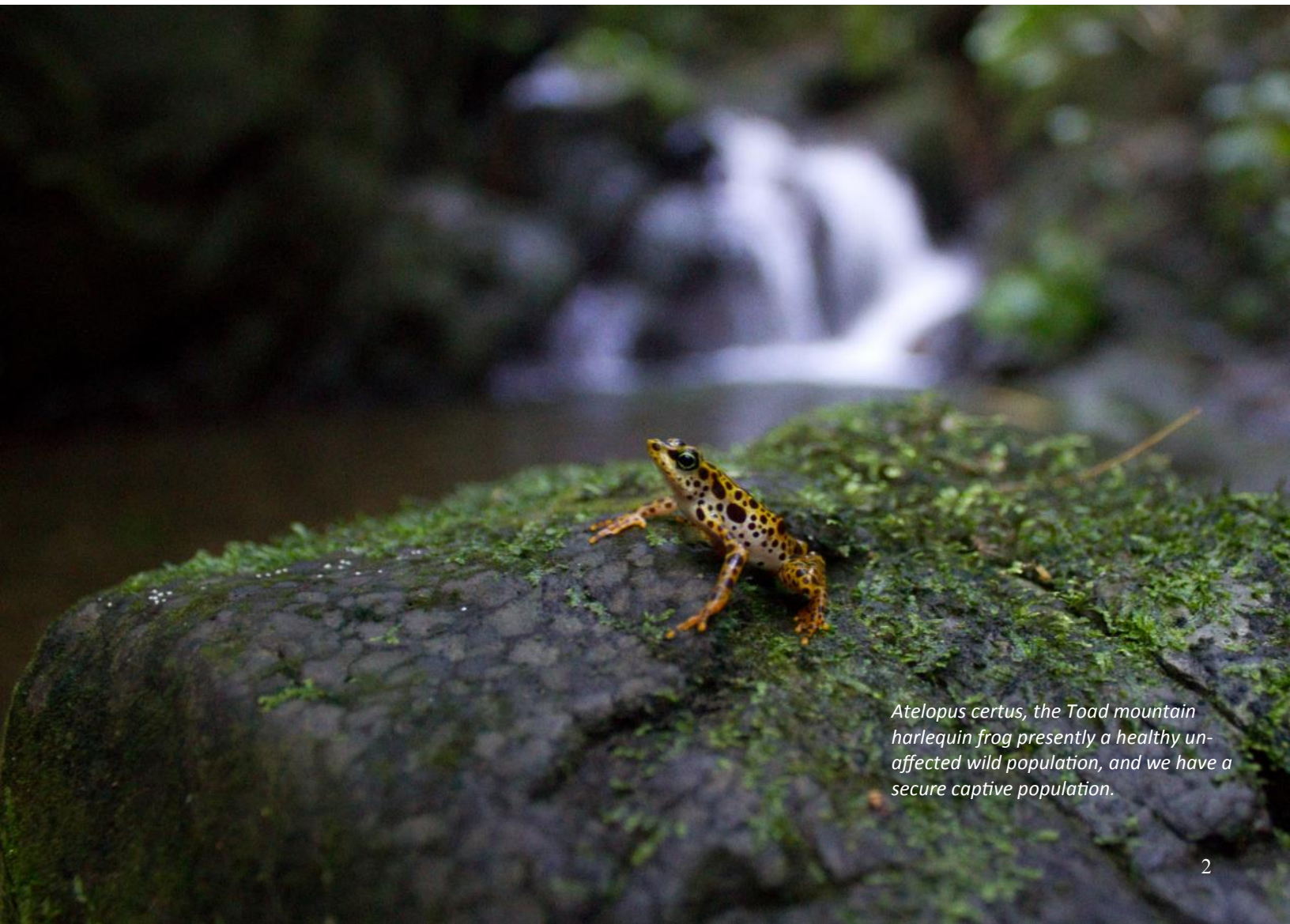
### **VISION**

The Panama Amphibian Rescue and Conservation Project will be a sustainably financed, Panamanian-led organization that has stemmed the tide of extinctions caused by amphibian chytrid fungus and other threats to amphibians. We will lead successful recovery programs for Panama's endangered amphibians and serve as an exemplary model that can be replicated to address the threat of chytridiomycosis to the survival of amphibians worldwide.



## EXPEDITIONS

In 2013 we were not able to access Cerro Pirre, one of our priority target collection sites in the Darien region due to security concerns. The majority of new accessioned animals were Bd infected conservation-priority species from the Donoso area of central Panama taken in coordination with biologists working for Minera Panama. We continued monitoring amphibian populations, skin microbiota and Bd prevalence at Cerro Sapo in the Darien region, and several sites in the Chagres watershed of central Panama as part of an ongoing NSF-funded collaboration with Virginia Tech, Villanova and James Madison Universities. We also continued to assist a golden frog monitoring effort called project *Atelopus*, led by collaborators at Tulane University and New Mexico Tech. The team was unable to find any surviving Panamanian golden frogs *Atelopus zeteki*, but found a few surviving variable harlequin frogs *Atelopus varius*, a close relative of the Panamanian golden frog.



*Atelopus certus*, the Toad mountain harlequin frog presently a healthy unaffected wild population, and we have a secure captive population.



Adult captive-bred *Atelopus zeteki*  
at the El Valle Amphibian  
Conservation Center.



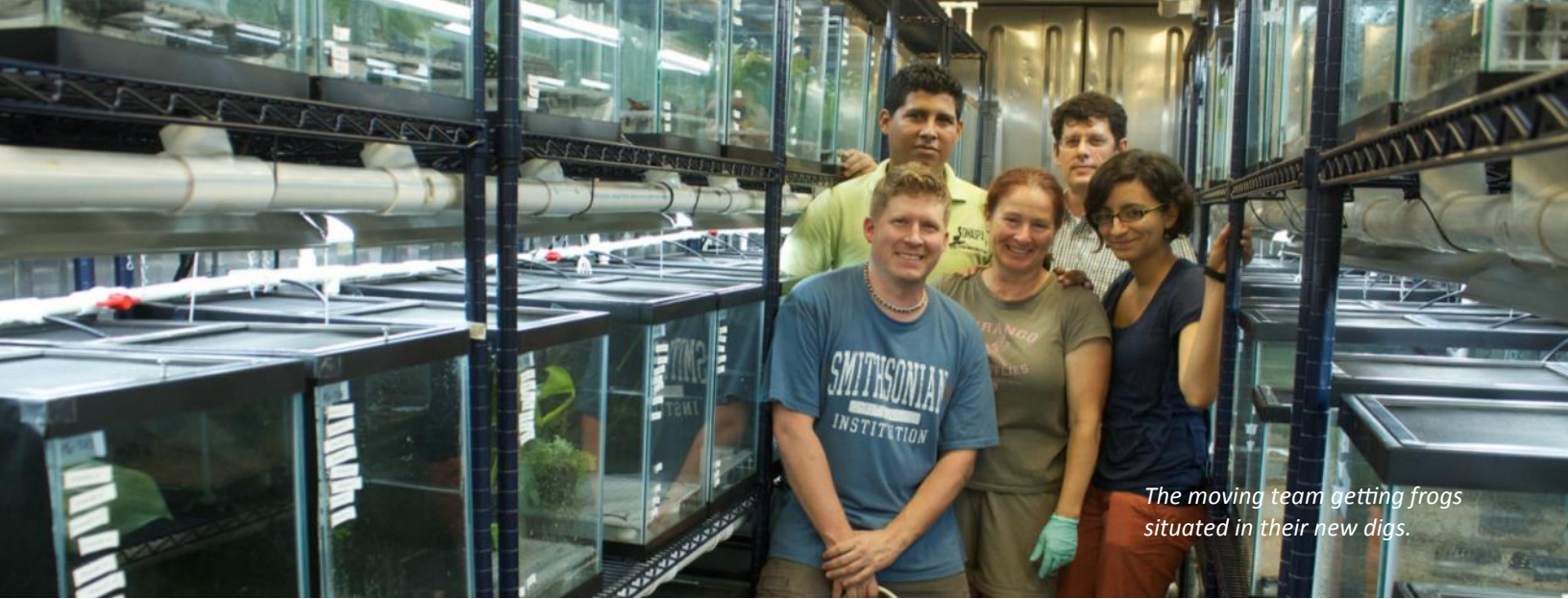
## EL VALLE AMPHIBIAN CONSERVATION CENTER

In 2013, we made significant progress digitizing our records-keeping due to our new partnership with the ISIS using the Zoological Information Management System (ZIMS). About half of the collection is now accessioned, and we can access our records on the cloud. This has greatly improved our ability to track and manage breeding, husbandry and veterinary care, especially because our collaborating team is offsite. One of the highlights of this collaboration was a successful surgical operation performed via Skype. Dr. Eric Baitchman was able to remotely supervise Edgardo Griffith who performed a life-saving surgical procedure to rectify a severe prolapsed rectum on a horned marsupial frog, *Gastrotheca cornuta*. We are happy to report that the frog is alive and well today.

Infrastructure-wise, we resolved a longstanding issue of frequent power outages that were hindering our breeding programs. A generous donor who visited EVACC in early 2013 provided the funding for a large backup power generator that can provide backup power for the whole facility. As a result, survivorship of tadpole clutches has improved and we successfully bred offspring from four of our five stream breeding conservation priority species, including Panamanian golden frogs *Atelopus zeteki*, variable harlequin frogs *Atelopus varius*, Pirre harlequin frogs *Atelopus glyphus*, and Limosa harlequin frogs *Atelopus limosus*. Four other species of the 13 priority species were successfully bred, making a total of nine priority species.

The project continued its education activities within the El Valle community and the amphibian exhibit continues to be a major attraction at the El Nispero Zoo, drawing around 100,000 visitors per year. Project staff lead tours and helped to coordinate the August 14th national golden frog day celebrations and parade in El Valle which has grown in popularity.





The moving team getting frogs situated in their new digs.

## GAMBOA AMPHIBIAN RESCUE CENTER

2013 was the year we moved frogs from the Summit Municipal Park to the newly completed Phase I Amphibian Rescue Center on STRI property in Gamboa. With the major facility move, our primary collection focus this year was to maintain and grow our existing five conservation priority species. Highlights include captive breeding of all three harlequin frog species: the Limosa harlequin frogs *Atelopus limosus*, Toad mountain harlequin frogs *Atelopus certus* and Pirre harlequin frogs *Atelopus glyphus*.

At our new facility we now have one modified shipping container or amphibian rescue pod serving as a quarantine area, a second pod for cricket production, a third for fruitflies and springtails and the remaining four pods for frogs. The Gamboa ARC is now operational with backup power, redundant air conditioning systems for each pod and a fire-safety plans in place. Prior to moving our amphibian collection to Gamboa, we conducted baseline Bd surveys in Gamboa and documented that the disease is already present and endemic in the wild amphibian community in the immediate vicinity. Nonetheless, out of an abundance of precaution all our waste water from our facility is treated by ozonation prior to disposal to the municipal sewer in order to reduce the risk of spreading endemic pathogens or parasites from our captive collection to the local amphibian community.

Phase II designs for the amphibian rescue lab were completed and approved by the Smithsonian Office of Facilities and Engineering, and put out for bids. The contract was awarded at the beginning of 2014. This new building will have office space for staff and visiting researchers, a toilet and kitchenette, a lab space, a quarantine space and storage space as well as a small exhibit niche that will allow visitors to look into a working rescue pod. This lab will greatly facilitate conservation-related research using the captive collection.



The Gamboa Amphibian Rescue Center Phase I created 2,000 square feet of new facility space for amphibian conservation.



*Participants of the 2013 stakeholder meeting on the Conservation of Panamanian golden frogs*

## RESEARCH

**Golden frog meeting:** We brought together 40 key individual stakeholders and experts from amphibian conservation research groups, NGOs and relevant government ministries and departments at the Hotel Campestre in El Valle, Panama November 19-22, 2013. The meeting was hosted by Project Golden Frog and PARC and facilitated by the IUCN Conservation Breeding Specialist group. We identified critical issues necessary to conserve golden frogs in Panama, foster collaboration and information-sharing and to develop a roadmap for a large, forward-looking collaborative conservation effort. The vision statement developed by participants “We are saving a national treasure, returning the Panamanian golden frog to nature.”

**Search for a cure:** We continued analyzing all bacterial and skin metabolite data and transcriptome information from our 2012 probiotics experiment on golden frogs. We found some promising new leads, and identified unique skin bacteria and metabolites associated with the frogs that cleared Bd infection. This is the result of a large multidisciplinary collaboration led by Virginia Tech PhD student Matt Becker. The collaboration involves the Virginia Tech, Villanova University, Tulane University, the Smithsonian Conservation Biology Institute and James Madison University who have all worked on Bd analysis, skin microbiome analysis, skin chemistry and analysis of frog transcriptomes in the frogs that exhibited different disease outcomes. We plan to publish our findings in 2014 and have secured funding for Matt Becker to further pursue these observations further over the next two years as a Smithsonian post-doctoral fellow.

**Redlisting:** The Smithsonian Conservation Biology Institute signed an agreement with the IUCN Redlist to lead the 2014 Redlist assessments for all amphibians in Panama. The last systematic assessment was completed in 2004, and we are engaging the amphibian specialist group and researchers on the ground to systematically re-evaluate all Panamanian species using the information we have learned in the last 10 years.

### **Publications:**

**Baitchman, E. J., and A. P. Pessier 2013.** Pathogenesis, Diagnosis, and Treatment of Amphibian Chytridiomycosis. *Veterinary Clinics of North America: Exotic Animal Practice*. 16:3 669–685.





*Atelopus certus* getting acquainted with her new tank at the new Gamboa amphibian conservation center at the Smithsonian Tropical Research Institute



Golden frog day fun at the Punta Culebra Nature Center



New back-up generator for EVACC provided by a generous donor solving a long-standing problem.



Heidi Ross explains amphibian husbandry to a group of potential donors and nature-lovers.



*Kids dressed as golden frogs in the annual golden frog day parade, El Valle de Anton*

## EDUCATION AND OUTREACH

Now in its fourth year, we expanded golden frog day celebrations to include a weeklong series of events in Panama City, Summit Municipal Park and El Valle de Anton. Activities were featured in four newspaper and five television reports. This year's celebrations were the largest yet, drawing 40 volunteers to help run nine events that drew 6,200 participants, about half of whom were school children. This year included a popular new pubtalk at the Rana Dorada Pub [www.laranadorada.com](http://www.laranadorada.com) who kindly donated a portion of their proceeds to amphibian conservation. The exhibit at EVACC in the El Nispero Zoo draws 100,000 visitors a year and plays a significant role in highlighting the importance of frogs to the Panamanian public and is the only place in Panama where visitors can see golden frogs. We have been working with STRI's director of public programs Sharon Ryan and the BioMuseo curator George Angehr to create a new public exhibit at the Smithsonian's Punta Culebra Nature Center. This new exhibit highlights the cultural, scientific and conservation value of amphibian biodiversity in Panama and will open in 2014. The exhibit will help us to engage Panamanian audiences in amphibian conservation issues and we developed a draft amphibian curriculum that will be produced for school teachers to connect the two exhibits at EVACC and Punta Culebra to classroom activities that are relevant to the Panamanian school curriculum.

**Online:** We received more than 48,000 unique visitors to [amphibianrescue.org](http://amphibianrescue.org) in 2013, a 14% increase from 2012. Visitors from 178 countries around the world viewed 92,000 web pages. Our social media strategy focused on building an online constituency for amphibians. In 2013 we gained 1,300 new Facebook fans for a total of 7,000 followers. We increased our twitter following by 25% to 2,500 people.

**Traditional media:** We had six unique stories featuring our project in traditional media. Other highlights included a feature story in Science magazine.

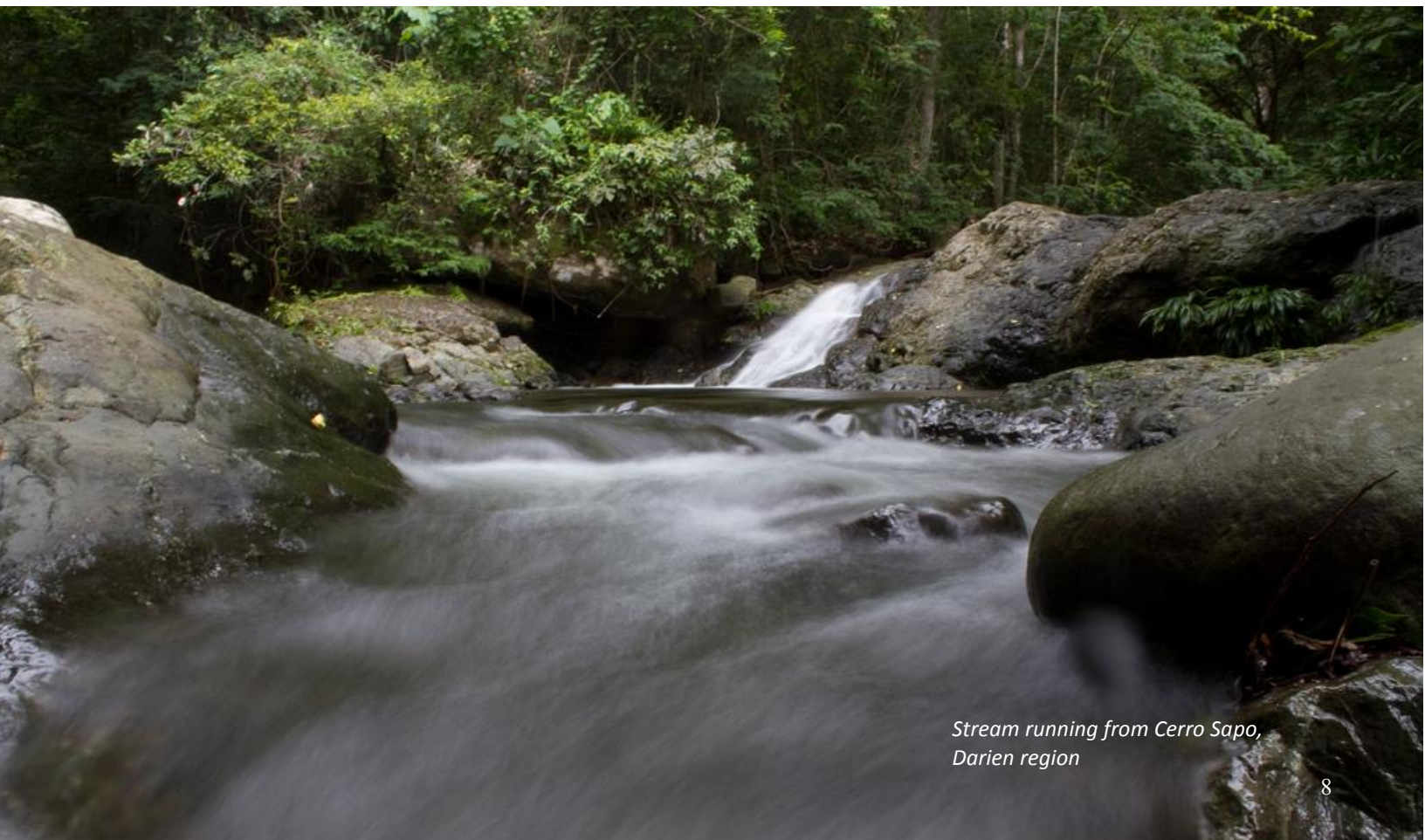
**Volunteer program:** 40 volunteers, (half local, half international) assisted us with frog care at Gamboa and with golden frog day celebrations in 2012. EVACC received no volunteers for over a two week time period.





## FINANCIAL REPORT FOR CALENDAR YEAR 2013

	<b>FUNDING SOURCE</b>	<b>2013 Expenditures</b>
<b>EVACC facilities, supplies &amp; salaries</b>	<i>Houston Zoo and EVACC donors</i>	\$ 94,400
	<i>SCBI and donors</i>	\$ 20,000
<b>Gamboa facilities, supplies &amp; salaries</b>	<i>Friends of the National Zoo</i>	\$ 2,008
	<i>USAID</i>	\$ 42,031
	<i>SCBI and donors</i>	\$ 48,463
	<i>Zoo New England</i>	\$ 47,108
	<i>Cheyenne Mountain Zoo</i>	\$ 21,926.00
	<i>Minera Panama</i>	\$ 414,720
<b>Education &amp; exhibit</b>	<i>NSF</i>	\$ 25,000
	<i>USAID</i>	\$ 30,000
	<i>STRI and donors</i>	\$ 20,000
<b>Cure research &amp; sperm freezing</b>	<i>Wood Tiger Foundation</i>	\$ 4,000
	<i>SCBI and donors</i>	\$ 36,000
<b>Golden frog workshop</b>	<i>SCBI and donors</i>	\$ 20,000
<b>SCBI salaries &amp; travel</b>	<i>SCBI and donors</i>	\$ 100,000
		<b>\$ 925,656</b>



*Stream running from Cerro Sapo,  
Darien region*

## **Donors**

In addition to the contributions from project partners, we are grateful to the following donors who have made additional contributions to the project directly or via the Houston Zoo: Anela Kolohe Foundation, Baton Rouge Zoo, Buffalo Zoo, Cleveland MetroParks, Columbus Zoological Gardens, Dickerson Park Zoo, Hogle Zoo, Peter Kibbee, The Little School, Susan and Frank Mars, Minera Panama, National Science Foundation, George Rabb, La Rana Dorada Pub, Sedgwick County Zoo, Shared Earth Foundation, USAID, Wood Tiger Foundation.

## **Online Contributions**

Our sincere thanks to the following individuals who contributed \$25 or more online: Nancy Alderman, M J Bergart, Benny Chak, Desiree Di Mauro, DeAnna Duncan Grand, Reine Erzinger, Brian Gratwicke, Heather Hallen-Adams, Claudia Hein, Marcel Heyking, Mary Janney, Michael Jordan, Pamela Kittler, Jessica Nelson, Sean Ricard, Corinne Roberts, Michele Schaffer, Pauline Sinnett, Eric Stubbs, Sadie Watson, Alvera Wilson, Julia Young, Christian Zumner.

## **Staff**

*Lead Scientist & International Coordinator* - Dr. Brian Gratwicke

*Project Director, Panama* - Dr. Roberto Ibáñez

*Technical Staff* - Nair Cabezon, Lanki Cheucarama, Rigoberto Díaz, Angie Estrada, Jorge Guerrel.

*El Valle Amphibian Conservation Center Director* – Heidi Ross.

*Technical staff* – Lisandro Vásquez, Dalina Cosme.

*Minera Panama support staff* – Diana Troetsch, Abileth González, Edgardo Griffith.

## **Steering Committee**

Bob Chastain, President and CEO *Cheyenne Mountain Zoo*;

Rick Barongi, Executive Director *Houston Zoo*;

Steve Monfort, Director *Smithsonian Conservation Biology Institute*;

William Weislo, Director *Smithsonian Tropical Research Institute*;

John Linehan, President and CEO *Zoo New England*.

## **Implementation Committee**

Dr. Della Garelle *Cheyenne Mountain Zoo*; Peter Riger, & Heidi Ross *Houston Zoo*; Dr. Brian Gratwicke *Smithsonian Conservation Biology Institute*, Matthew Evans *Smithsonian's National Zoological Park*; Dr. Roberto Ibáñez *Smithsonian Tropical Research Institute*; Dr. Eric Baitchman *Zoo New England*.



## 2013 Volunteers

We are grateful to the following volunteers for their generous assistance: Kristina Bartowitz, Ximena Bernal and family, Sarah Candler, Ana Gabriela Castillo Rojas, Prinyanka Desilva, Jair Diaz, Jesus Diaz, Joel Diaz, Lia Diaz, Penny Dowler, Sangie Estrada, Nancy Fairchild, Caroline Ferguson-Dryden, Spencer Ferguson-Dyden, Craig Giesecke, Norman Greenhawk, Jimena Grosso, Benjamin Hawker, Myra Hughey, Curtis Kirby, Dedra Anne Kirby, Jeroen Kromer, Blake Klocke, Taylor Lanel, Shantall Marrone, Ana Martinez, Marlene Meister, Delisa Membache, Eria Rebollar, Bianca Rendom, Marisa Riley, Will Shoemaker, Kevin Simmons, Samuel Sucre, Meredith Swartwout, Justin Touchon, Elizabeth Wade, Cerrise Weiblen, Simone Welch.

## Acknowledgements

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