

## The Rufford Foundation

### Final Report

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Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to [jane@rufford.org](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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Grant Recipient Details	
<b>Your name</b>	Paul David Alfonso Gutiérrez-Cárdenas
<b>Project title</b>	Conserving amphibians in South-western Colombia: population analysis of threatened amphibians from Reserva Natural Rio Ñambí, Nariño, Colombia
<b>RSG reference</b>	13572-1
<b>Reporting period</b>	October 2013 – October 2014
<b>Amount of grant</b>	£5949
<b>Your email address</b>	pdgutierrez2@yahoo.com
<b>Date of this report</b>	October 2014

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Determine population parameters of the amphibian species <i>Andinophryne colomai</i> , <i>Pristimantis verecundus</i> and <i>Bolitoglossa medemi</i>		X		We marked individuals of the three species included in this project, in order to measure the following population parameters: population size, sex ratio, and survival rate (we are currently analysing these data). The marking method (toe-clipping, following Donnelly 1968) was successful throughout the research period for two of species ( <i>Andinophryne colomai</i> and <i>Pristimantis verecundus</i> ) but not for <i>Bolitoglossa medemi</i> . In the latter species, after four surveys we realised that the marking method was not useful. Because of the extensive webbing of the hands and feet, and the free reduced portion of the both fingers and toes, the marks were difficult to make and imperceptible. Therefore, this species will be not included in the population analysis.
Determine the microhabitat use by <i>Andinophryne colomai</i> , <i>Pristimantis verecundus</i> and <i>Bolitoglossa medemi</i>			X	Independent of the problems associated with the marking method in <i>Bolitoglossa medemi</i> , we recorded for all species the microhabitat, body size and body weight.
Planning and design strategies focused on environmental education and amphibian conservation in RNRÑ, to encourage participation and commitment of local people to the conservation of the natural resources of their region.			X	
Run environmental education strategies seeking training for local people whom to promote environmental conservation and active participation in decision-making and execution at the environment			X	

**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).**

During the project, in logistics there were few difficulties. However, a field trip in May was not performed, because at the time in Colombia were conducted presidential elections. Usually, at elections time, in geographical regions and roads where there is presence illegal armed groups, there may be problems of public order. Therefore, for safety reasons we prefer not to travel during this month with our research team. Because of this, we could not collect data on amphibian populations and neither do any of the environmental education workshops.

**3. Briefly describe the three most important outcomes of your project.**

- A. We sampled and marked a total of 121 individuals for six sampling surveys, from January to October 2014, covering two climatic seasons: dry and rainy. Of the 121 sampled individuals, 49 (40.5 %) were *Andinophryne colomai*, 50 (41.3%) *Pristimantis verecundus*, and 22 (18.2%) *Bolitoglossa medemi*. Of the 121 marked individuals, we recaptured 16 (13.2%), of which 15 (93.8%) were *Andinophryne colomai* and one (6.2%) was *Pristimantis verecundus*; we do not obtained recaptures for *Bolitoglossa medemi*. Of the 49 *A. colomai* individuals captured, 20 (41%) were adults and 29 (59%) were juveniles. For *P. verecundus* and *B. medemi*, in most cases it was not possible to identify the sex of the individuals because it meant the sacrifice of the animal.
- B. We recorded a total of 66 individuals in forests and 55 individuals in streams. The species was found in greater amounts in streams was *Andinophryne colomai* (61%) and in the forest was *Pristimantis verecundus* (7%). *Bolitoglossa medemi* was more abundant in streams (0.02%) than in the forest (0.16%). Of the nine microhabitat categories assessed (herbaceous, litterfall, mosses, shrubs, bromeliad, ferns, stones, palms and palm roots), the microhabitat used most often by the three amphibian species was the herbaceous vegetation, followed by the mosses and ferns.
- C. We conducted four environmental education workshops, which resulted in the training 15 students of the school "Santa Teresita de Altaquer". Children and young people learned about endangered amphibian species of "Reserva Natural Río Ñambi", the microhabitats used by them and their main threats. The students also contributed with new ideas about the conservation of these amphibians. We also started the eco-shop "Ñambi", which will promote the presence of the amphibian species occurring in the Reserve and included in this project, and at the same time, will constitute a financial support for students who want to belong of this initiative, also it will be used some of these funds for the maintenance of "Río Ñambi".

**4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).**

About 25 students of the school Santa Teresita de Altaquer (CSTA) actively participated in workshops and meetings conducted by the researchers during the first phase of the project. During each session, the students were involved in the learning process on amphibians occurring in the region, and likewise, showed us their perception on this group of vertebrates. In addition, we had talks on the environmental setting in which they live and talk about how to improve the environmental characteristics of the habitats and its surrounding region, in order to help conserve amphibians.

Moreover, they knew the “Reserva Natural Río Ñambi” and acquired the ability to recognise some amphibians occurring in the reserve, particularly those included in this project, its contribution to the ecosystem and its current threats. Now, for this group of students, amphibians are no longer an unknown group. At the end of the process, we trained 15 new Ecoguides, whom will work in providing the knowledge acquired in the natural reserve, and they will be involved in the program “Ecoguías Los Vicundos” which is led by Felca foundation.

#### **5. Are there any plans to continue this work?**

Yes. Actually, the fieldwork that took over 2 years in “Río Ñambi” (one of them supported by Rufford Small Grants), has yielded positive results related with amphibians and reptiles, both in the ecological area as in the issue of conservation. During this time, we have published a scientific paper (Rojas-R. *et al.* 2013<sup>1</sup>), two manuscripts submitted to the journals *Zootaxa* (Ron *et al.* submitted<sup>2</sup>, with partners from Ecuador, USA and Brazil) and *Acta Herpetologica* (Gutiérrez-Cárdenas *et al.* submitted<sup>3</sup>) and other three manuscripts in preparation.

However, we emphasise that for a full population study, six months is not enough to understand the population dynamic. Therefore, we want to continue surveying amphibian populations in the Reserve and to collect ecological data useful to learn more about the biology and ecology of these species. Similarly, we want to continue the process with children and young people, as they have shown interest in each workshop we did. This shows that continue their training will allow have future Ecoguides in the Reserve. They will be disseminators of practical knowledge learned, which will be multiplied with the people in their region and eco-tourists’ visitors to ecotourism.

#### **6. How do you plan to share the results of your work with others?**

Our work will be share through research reports, oral presentations at scientific meetings (in fact, three oral presentations will be presented in the next Latin-American Congress of Herpetology (December 2014 in Cartagena, Colombia), radio communications through the regional radio broadcasting station Altaquer, oral presentations by students from “Colegio Santa Teresita de Altaquer” (CSTA) and through scientific publications in refereed journals.

#### **7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?**

We initiated a pre-sampling phase between October and December 2013. During this period, we evaluated the potential sites to install the sampling transects and held meetings with the board of the Foundation FELCA to set as we would conduct the environmental education workshops; these meetings

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<sup>1</sup> Rojas-Rivera, A., Castillo, K. & Gutiérrez-Cárdenas, P.D.A. 2013. *Bothrocophias campbelli* (Campbell’s toad-headed pitviper, víbora boca de sapo de Campbell). Diet/ophiophagy. *Herpetological Review* 44: 518

<sup>2</sup> Ron, S.R., Mueses-Cisneros, J.J., Gutiérrez-Cárdenas, P.D., Rojas-Rivera, A., Lynch, R.L., Rocha, C.F.D. & Galarza, G. (in review *Zootaxa*) Systematics of the endangered toad genus *Andinophryne* (Anura: Bufonidae): phylogenetic position and synonymy under the genus *Rhaebo*

<sup>3</sup> Gutiérrez-Cárdenas, P.D.A., Castillo, K., Martínez, D., Rocha, C.F.D. & Rojas-Rivera, M.A. (submitted *Acta Herpetologica*). Trophic ecology and microhabitat use by *Pristimantis labiosus* (Anura: Craugastoridae) from Southwestern Colombia

were particularly to determine the children and young people with whom we would do such workshops. We conducted both the fieldwork phase as environmental education workshops between January and October 2014.

**8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.**

Item	Budgeted Amount	Actual Amount	Difference	Comments
Communications (telephone/internet/postage), Field guidebooks, maps, journal articles and other printed materials	248.92			
Professional handheld recorder Marantz	348.85			
Unidirectional microphone Sennheiser	344.24			
Marantz carry case	45.42			
Accommodation (£7.2/day * 70 days * 4 team members)	806.40	250.82	555.58	The remaining balance in accommodation, food and transport, will be used to make two field trips to "Reserva Natural Río Ñambí", among February and March 2015
Food (£9.0/day * 70 days * 4 team members)	1764.00	360.20	1303.8	
Transport Pasto-Ñambí-Pasto (£18.0/person * 12 travels * 4 people)	864.00	280.00	484	
Workshops (includes environmental workshops and educational games)	342.72	0		
Outreach/education activities and materials (brochures, posters, video, t-shirts, video bean)	1010.12	460.70	549.42	The balance was used for travel by two researchers (Paul Gutiérrez and a student) to the Pontificia Universidad Católica del Ecuador (in Quito), in order to perform both morphological and molecular analyses to clarify the taxonomic identity of toad <i>Andinophryne colomai</i> . Based on these activities and their results, Ecuadorian colleagues and we prepared

				a manuscript and submitted it to the journal Zootaxa on <i>Andinophryne</i> toads (Ron <i>et al.</i> in review).
Report production and results dissemination	220.00			

### 9. Looking ahead, what do you feel are the important next steps?

As we mentioned above, our project includes measures of population parameters and environmental education. These measurements require continuity and, therefore, we want to continue with population surveys, focusing on working with the species *Andinophryne colomai*. We would like to continue working on the “Reserva Natural Río Ñambí”, in order to seeking *A. colomai* individuals in other areas of the Reserve not surveyed in this project, where we assume, we can find more individuals of the species. We also want to incorporate a study of population genetics of this toad. During this previous project of monitoring, we began to collect tissues, which were the finger pieces obtained from the marking technique of toe-clipping, but with a new project the goal is to improve our methodological design. In addition, we take the knowledge gained about the diversity of the Reserve, to include in our next project an edition of a field guide on the frog species occurring in the Reserve. This material is relevant to disseminate our research, not only among the students who attended our workshops, but to focus on other people, such as teachers, parents, eco-tourists and government agencies.

Regarding environmental education, we want to continue with those students who showed greater interest throughout the process, in order to train them for new Ecoguides of “Río Ñambí”. In addition, we want to incorporate more students from surrounding nature reserves (e.g. La Planada, municipality of Ricaurte) who attended some meetings, which in the future could serve as Eco-guides in both regions and reserves they represent. Finally, we want to strengthen the Eco-shop, this being an innovative and unique initiative in the region, that would benefit the reserve and students.

### 10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

Yes. We use The Rufford Foundation logo in presenting our project in meetings with the Foundation FELCA board, the Principal and teachers of the school Santa Teresita Altaquer (CSTA), in talks with children and young people who attended the educational workshops and the materials used in the workshops (shirts, mugs). In addition, we will use the logos in both national and international scientific meetings where we will present the results of the research project. We always mentioned in scientific papers already published, manuscripts in preparation, and PhD dissertation that the work was funding by the Rufford Foundation.

### 11. Any other comments?

Since experience with our project was successful, we want to continue this research and to apply for research grant “2nd Rufford Small Grant (up to £5,000)” that you offer. We really would feel very fortunate to continue to have your support.

PICTURES PROJECT

“Conserving amphibians in South-western Colombia: population analysis of threatened amphibians from Reserva Natural Río Ñambí, Nariño, Colombia”

RSG reference: 13572-1



Figure 1. Meeting with students (left) and teachers (right) of the school “Santa Teresita de Altaquer” (CSTA), in which we explained the goals of the ecological research and environmental education to be carried out in the Reserva Natural Río Ñambí.

María Alejandra Rojas Rivera - mariaalejandra@paua.com  
Paul David A. Gálvez Cárdenas - pgalvez@paua.com

## CONSERVANDO los anfibios

en el Sur Oeste de Colombia: Análisis poblacional de anfibios amenazados Reserva Natural Río Nambí, Nariño, Colombia

**Objetivo general**

Determinar el estatus poblacional y el uso de microhábitats de tres especies de anfibios amenazados y detectar sus principales amenazas. Promover la participación activa y el desarrollo de estrategias de conservación junto a la comunidad local.

**Objetivos específicos**

- Cuantificar parámetros poblacionales de las ranas *Andinophryne colomai*, *Pristimantis verecundus* y de la salamandrita *Bolitoglossa medemi*.
- Determinar el uso de microhábitat usado por las tres especies de anfibios.
- Diseñar estrategias enfocadas hacia la educación ambiental y la conservación de anfibios en la Reserva Natural Río Ñambí, incentivando la participación y el compromiso de la gente local hacia la conservación de los recursos naturales de la región.
- Capacitar a la comunidad local, a través de procesos de educación ambiental, para promover la conservación del medio ambiente y la participación activa en la toma de decisiones en la región.

**Resultados esperados**

Al finalizar el proyecto de monitoreo de las poblaciones de anfibios y las actividades con la población de la región, documentaremos detalladamente tanto el proceso llevado a cabo como los resultados obtenidos de un muestreo constante en las poblaciones de anfibios. Indicaremos el estatus poblacional de las especies estudiadas y propondremos acciones para el manejo y conservación. Además, generaremos información de base para futuras acciones en materia de gestión y conservación de las especies. La publicación de materiales educativos como material visual (carnets, fotografías, camisetas), dirigidos tanto a la comunidad estudiantil y a la población adulta, promoverá la sensibilización y facilitará la obtención de un conocimiento adecuado de la situación actual de la reserva y los componentes de la fauna de anfibios allí presentes.

**CONOZCAMOS Y CONSERVEMOS EL SAPITO ANDINO DE COLOMA**

Presente en la Reserva Río Ñambí

*Andinophryne colomai* es un sapito que habitaba los bosques montanos de la Provincia de Carchi en Ecuador. Lamentablemente, esta especie no ha sido reportada en esa región desde el año 1984, por lo cual se considera extinta en este país. Sin embargo, recientemente la especie fue encontrada en los bosques de la Reserva Natural Río Ñambí, en Nariño, Colombia!!!

**Es la oportunidad para conocerlo y protegerlo**



Figure 2. Posters used to promote the research project, which were used during the meeting in school “Santa Teresita de Altaquer” (CSTA), and finally left permanently exposed in the “Centro de Interpretación Ambiental Ñankara-Yal” (Environmental Interpretation Centre) and in the Reserva Natural Río Ñambí.



**Figure 3.** “Centro de Interpretación Ambiental Ñankara-Yal” (Environmental Interpretation Centre) (corregimiento Altaquer, municipio de Barbacoas, Nariño, Colombia).



**Figure 4.** Workshop on major threats for amphibian conservation in the study area.



**Figure 5.** Group of children and youth, who will be future environmental interpreters in the “Reserva Natural Río Ñambi”.



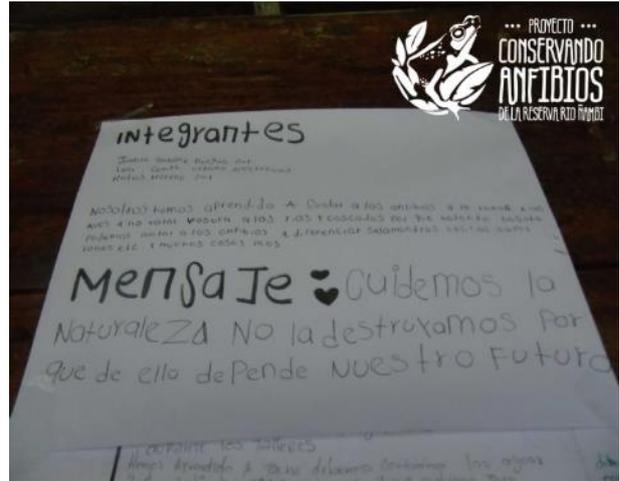
**Figure 6.** Preparing workshops for children and youth.



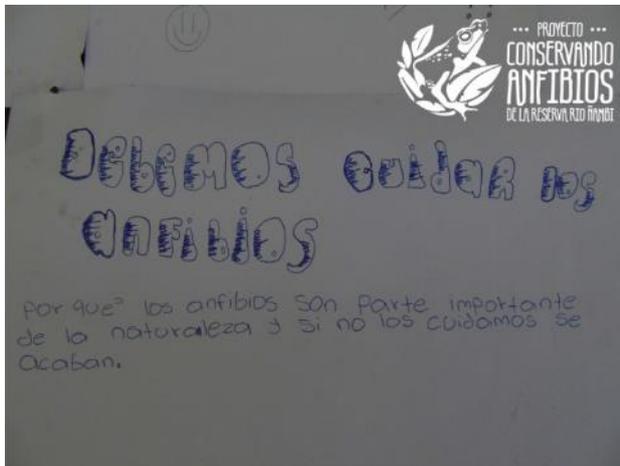
**Figure 7.** Contest drawing and painting on the three endangered species (*Andinophryne colomai*, *Pristimantis verecundus* and *Bolitoglossa medemi*) occurring in the “Reserva Natural Río Ñambi”.



**Figure 8.** Children from school and nearby villages visiting the Researchers home in the “Reserva Natural Río Ñambí”.



**Figure 9.** Message written by the children, showing their interest in environmental conservation.



**Figure 10.** Message written by the children, showing their interest in environmental conservation.



**Figure 11.** Installing and marking transects in the day. At night, these transects were surveyed for monitoring the three amphibian species included in this project.

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**Figure 12.** Adult female of the endangered frog *Andinophryne colomai* (Anura: Bufonidae).

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**Figure 13.** Juvenil of the endangered species *Andinophryne colomai* (Anura: Bufonidae).



**Figure 14.** Adult of the threatened frog *Pristimantis verecundus* (Anura: Craugastoridae)



**Figure 15.** Adult of the threatened salamander *Bolitoglossa medemi* (Caudata: Plethodontidae)



**Figure 16.** Adult of the frog *Pristimantis labiosus* (Anura: Craugastoridae)



**Figure 17.** Adult of the frog *Pristimantis latidiscus* (Anura: Craugastoridae).



**Figure 18.** Adult frog *Pristimantis* sp. (Anura: Craugastoridae).



**Figure 19.** Juvenil frog *Hypodactylus babax* (Anura: Craugastoridae).



**Figure 20.** Male adult glassfrog *Centrolene peristictum* (Anura:Centrolenidae) attending its egg clutch.



**Figure 21.** Adult frog *Ctenophryne aterrima* (Anura: Microhylidae). Picture: Mauricio Garzón Guerrero.



**Figure 22.** Mugs stamped with the logo of the project and funders. First products of the Eco-shop “Ñambí”.



**Figure 23.** T-shirts stamped with the logo of the project and funders. First products of the Eco-shop “Ñambí”.