

Final Evaluation Report

Your Details	
Full Name	Jhon Jairo Ospina Sarria
Project Title	Amphibian Diversity from the Serranía De Los Paraguas: Status, Trends, and Conservation Needs
Application ID	27658-1
Grant Amount	£5,000
Email Address	jhon.sarria@fundacioncalima.org
Date of this Report	22 May, 2021

1. 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
Assess the conservation status of the amphibian assemblage from the Serranía de los Paraguas, Valle del Cauca, Colombia				The main factors affecting the accomplishment of this objective were related to extraneous variables to our study (e.g., difficulties accessing remote areas, extreme weather and heavy rains).
Engage students from the local University in this research ensuring knowledge and skills transfer to develop conservation plans and make the monitoring of The Serranía de los Paraguas an ongoing process.				We found no factors affecting the achievement of this objective.
Disseminate the results from our research to the scientific community through the publication of scientific papers, and to the local community and interested actors at national level through symposiums or local meetings.				The main factor affecting the achievement of this objective was related to the COVID-19 pandemic. As a result, the publication of the scientific papers was delayed that in turn delayed all the activities related to outreach to public. Fortunately, the main scientific paper was published in March 2021 and therefore we start all activities related to outreach to the public.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.

The main unexpected difficulties during the development of the project were related to extraneous variables that delayed the expeditions. In particular, we reschedule the dates of the expeditions based on two unforeseen events. The first was related to rural security, therefore that prompted us to defer the dates based on the recommendation of the local NGO Serraniagua. The second unforeseen event was related to seasonal changes in precipitation. We planned to visit the Serranía de los Paraguas after the rainy season; however, the rainy season was longer than expected. Fortunately, our expeditions were rescheduled and carried out successfully.

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

- Our results showed that although the Serranía de los Paraguas maintains vast primary forests (i.e., forests that have not been disturbed by human activity), the historically known amphibian diversity from the Serranía de los Paraguas seems to be decreasing because several species listed as common during the 1980s and 1990s have not been observed again, for instance, *Ectopoglossus atopoglossus*, *Hyloxalus abditaurantius*, *Pristimantis deinops*, *Pristimantis gracilis*, and *Pristimantis xylochobates*.
- We engaged four young volunteer researchers (undergraduate students) to participate in our research. These young researchers received training in all aspects of the scientific work derived from this research, that is, best practices in field surveys, data collection and management, manuscript writing, and experience in the scientific peer review process. In addition, two of these undergraduate students are currently carrying out their undergraduate research with data directly related to this project. In these dissertations additional topics related with the conservation of the amphibians are being addressed. The undergraduate students will earn their Bachelor of Science degree in October 2021. All these researchers participated as authors of the article published as a result of our research.
- We prepared five scientific papers for peer review journals, of which three have already been published; one is accepted, and one is under review. Regarding the local community and other interested actors, the results were widely disseminated through their publication in newspapers (five), news websites (three), television interviews (one), radio interviews (two), and through one virtual meeting in which participated local farmers, high school students, researchers and staff members of the local NGO Serraniagua. In addition, some of our findings were publicised on the social networks of the Calima Foundation, Serraniagua, and the National Ministry of Environment of Colombia.

4. Briefly describe the involvement of local communities and how they have benefited from the project.

Currently, the local human populations in the buffer zone limit of the Serranía de los Paraguas are part of an area recognised as a Coffee Cultural Landscape and World Heritage Site by the United Nations Educational, Scientific and Cultural Organization. Based on this, the management practices recognised as being successful and sustainable in this area include linking local people in site management, to create innovative policies and regulate tourism. We consider that such shared visions will greatly benefit from the results obtained in our research. This is because we demonstrated that the Serranía de los Paraguas is inhabited by at least 63 species of frogs. Of these species, 10 are endemic, 17 species are threatened according to the IUCN Red List (seven Critically Endangered, five Endangered, and five Vulnerable), and 29 terraranan species may be found in a single place within The Serranía de los Paraguas—the Reserva Natural Comunitaria Cerro El Inglés. Thus, based on the species richness, endemism, diversity at higher

taxonomic levels, and the number of threatened species, we proposed for the first time in a published paper that the Serranía de los Paraguas be recognised as a site of high biodiversity value in the world.

We are confident that these findings provide a baseline for developing conservation strategies and will be a great attraction for sustainable ecotourism, a growing economy activity in Colombia. Although ecotourism specifically focused on frogs is much less common or popular than that focused on mammals or birds, there is evidence showing that financial ecotourism may contribute to the protection of critically endangered frog species. Likewise, during the development of our research, we work together with the local NGO Serraniagua, which works in association with local human communities in activities aimed at obtaining sustainable benefits for the latter. Therefore, during the development of our project, the local communities actively participated in the activities carried out at each stage of the project.

5. Are there any plans to continue this work?

We certainly aim to continue with this research by focusing on the derived findings and identified needs. According to our results, we found that the Serranía de los Paraguas is a site of high value for amphibians in the world. Likewise, our results showed that although the study area maintains vast primary forests, its diversity seems to be decreasing. Due to the precipitous amphibian declines and extinctions around the world, the possibility of amphibian declines in the Serranía de los Paraguas causes much alarm given their high levels of endemism, taxonomic diversity, and threatened species. Therefore, it is crucial to prioritise research efforts and funding allocation to conduct comprehensive field research and establish conservation strategies in this area to identify possible amphibian declines before it is too late to intervene (e.g., integrating research, monitoring, and public awareness on behalf of this hotspot conservation).

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

We have disseminated our findings in two ways. First, for the scientific community we have published three scientific papers (one of them in local language). At the moment we have one paper accepted and recently we have submitted another paper to an international peer reviewed journal. Second, we have divulged these findings to the local community and interested actors at national level in the local language social media, newspapers, magazines, radio interviews, TV interviews, and through local meetings targeting all stakeholders that could potentially contribute to amphibian conservation, including local farmers, environmentalists, educators, and public relations experts.

Scientific publications:

Published

Ospina-Sarria, J. J., and T. Angarita-Sierra. 2020. A new species of *Pristimantis* (Anura: Strabomantidae) from the eastern slope of the Cordillera Oriental, Arauca,

Colombia. *Herpetologica* **76**: 93–92. <https://doi.org/10.1655/Herpetologica-D-19-00048>

Cuellar-Valencia, O. M., and A. Bernal-Rivera. 2020. *Pristimantis kelephus* (Lynch, 1998). *Catálogo de Anfibios y Reptiles de Colombia. Medellín* **6**: 51–56. ISSN: 2357-6324

Cuellar-Valencia, O. M., F. G. Arriaga-Jaramillo, I. García-Gómez, I. Ceballos-Castro, W. Bolívar-García, D. A. Velásquez-Trujillo, A. S. Ortiz-Baez, and J. J. Ospina-Sarria. 2021. Two new species of *Pristimantis* (Anura: Strabomantidae) From the Serranía de los Paraguas: A priority site for conservation of amphibians in Colombia. *Herpetologica* **77**: 72–84. <https://doi.org/10.1655/Herpetologica-D-20-00003.1>

Accepted

Arriaga-Jaramillo, F. G., Cuellar-Valencia, O. M., I. García-Gómez, I. Ceballos-Castro, W. Bolívar-García, D. A. Velásquez-Trujillo, A. S. Ortiz-Baez, and J. J. Ospina-Sarria. **In press**. Acoustic Segregation of Five Sympatric and Syntopic Species of Genus *Pristimantis* (Anura: Strabomantidae) from Western Colombia. *Studies on Neotropical Fauna and Environment*.

Submitted

Ospina-Sarria, J.J., D. A. Velásquez-Trujillo, C.O. Castaño-Saavedra, L.F. Castillo, W. Bolívar-García. A New Golden Species of *Diasporus* (Amphibia: Eleutherodactylus) from Southwestern Colombia.

Local community and interested actors at national level

Newspapers (five)

https://www.ghubo.com/epaper/cali/viewer.html?publication=Cali&date=06_04_2021#page/4

<https://occidente.co/wp-content/version-impres/2021/diario-pdf-27-de-abril-de-2021.pdf>

<https://www.semana.com/sostenibilidad/articulo/dos-nuevas-especies-de-ranas-fueron-halladas-en-la-serrania-de-los-paraguas/202144/>

<https://www.eltiempo.com/vida/medio-ambiente/dos-nuevas-especies-de-ranas-fueron-descubiertas-en-el-valle-del-cauca-583856>

<https://www.elspectador.com/ambiente/dos-nuevas-especies-de-ranas-fueron-descubiertas-en-el-valle-del-cauca-article/>

News website (three)

<https://www.infobae.com/america/colombia/2021/04/27/descubren-dos-nuevas-especies-de-ranas-en-la-serrania-de-los-paraguas-en-el-valle-del-cauca/>

<https://www.lafm.com.co/medio-ambiente/descubren-dos-nuevas-especies-de-rana-en-cali>

<https://www.canalrcn.com/supertrending/salud-y-vida/se-descubren-dos-nuevas-especies-de-rana-en-cali-377594>

Television interviews (one)

https://www.youtube.com/watch?v=vFmzVo-O2sY&t=73s&ab_channel=InformativoCVCInformativoCVC

Radio interviews (two)

https://alacarta.caracol.com.co/audio/1619983924_963_cut/

Part 1: <https://www.instagram.com/p/COI0EeDjnCT/>

Part 2: <https://www.instagram.com/p/COI1NfXDNSa/>

Virtual meeting with local and national stakeholders (one)

Part 1: <https://www.facebook.com/114741068558542/videos/193432525708716>

Part 2: <https://www.facebook.com/114741068558542/videos/758362041706493>

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

The grant was used for 18 months. Initially the project was scheduled for 1 year, ending in May 2020. Nevertheless, the scheduled activities were impacted by the COVID-19 pandemic. Specifically, three phases of the project were delayed: 1) Expeditions, 2) Publication of our results in specialized scientific journals, and finally 3) Socialization of our results with stakeholders directly involved with the project (local communities). In fact, this last phase involving socialization with stakeholders was finished in April 2021.

8. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Institutional Overhead	£200	£200		
Equipment & Supplies	£600	£600		
Subsistence payments	£1700	£1700		
Food	£1500	£1500		
Other Transportation	£250	£250		
Vehicle Rental and Maintenance	£500	£500		
Fuel	£250	£250		
TOTAL	5000	5000		

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

The evidence showed in this research project demonstrated that the Serranía de los Paraguas is a global hotspot, harbouring 63 species of amphibians, of which 10 are endemic and 17 threatened according to the International Union for Conservation of Nature Red List (seven Critically Endangered, five Endangered, and five Vulnerable). That is, the Serranía de los Paraguas is a priority site for the conservation of amphibians. On this basis, we consider that the important next steps are: (1) Finding funding sources to ensure research on behalf of the Serranía de los Paraguas conservation, (2) Being aware that in many respects the conservation is local, it is essential to generate interest towards the protection of the biodiversity and highlight the value of habitat restoration and healthy biodiversity communities for human well-being, (3) Engaging stakeholders that could contribute to the conservation of the amphibians from the Serranía de los Paraguas, from conservation practitioners to researchers and government officials, making the assessment of these communities an ongoing process.

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

The logo of The Rufford Foundation was displayed in meaningful ways at all the public meetings related with our research (six in total). Likewise, the foundation's name was recognised as the sponsor of this research project in scientific publications (five), newspaper articles (five), radio broadcasts (two), websites (two), TV programmes (one), and public meetings (six).

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

Name	Role	Qualifications	Location
Jhon Jairo Ospina-Sarria	Project Leader	Ph.D., MSc., BS.	Colombia
Ayda Susana Ortiz Baez	Co-coordination and management of the project	MSc., BS.	Australia
David Andrés Velasquez-Trujillo	Research team	MSc., BS.	Spain
Irene Ceballos Castro	Internship researcher	Undergrad Student	Colombia
Isabella García-Gómez	Internship researcher	Undergrad Student	Colombia
Fray Geovanny Arriaga-Jaramillo	Young researcher	BS.	Colombia
Oscar Cuellar-Valencia	Young researcher	BS.	Colombia

12. Any other comments?

Conducting this research project made possible to increase the world awareness about the diversity and importance of the amphibian communities living in the Serrania de los Paraguas, Colombia. Likewise, this research project linked undergraduate students, who were trained in all aspects related to the scientific research. We are confident that these results will gestate the environment that pave the way for a mid- and long-term sustainability of the project results, in which we expected a broad involvement of stakeholders that may potentially contribute to amphibian's conservation. Finally, it is important to point out that all these outputs would not have been successfully concluded or even started without the essential support of the Rufford Foundation. We greatly appreciate the trust and support of the Rufford Foundation to carry out this research project.