Final Evaluation Report

Your Details	
Full Name	Jose Luis Perez Gonzalez
Project Title	Ensuring the comprehensive conservation of three threatened species of Harlequin Toads in key biodiversity areas in Sierra Nevada de Santa Marta.
Application ID	43489-B
Date of this Report	05/2025

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
We will assess the population status of *Atelopus laetissimus*, *Atelopus nahumae*, and *Atelopus arsyecue* in the localities of San Lorenzo, San Pedro de la Sierra, and Sogrome.			X	We successfully completed all our field expeditions during the implementation year, timed with the reproductive seasons, conducting a total of 4 surveys in each locality. We updated our population database and analyzed the species' behavioral patterns. During the monitoring phase, various surveys were conducted in the study sites. In the locality of San Lorenzo, the presence of two different species was documented: Atelopus laetissimus and A. nahumae. A total of 75 individuals of A. laetissimus were recorded, while A. nahumae had a population of 36 individuals, suggesting coexistence, albeit in smaller numbers. In the locality of San Pedro, 146 individuals of A. laetissimus were recorded. Finally, in the community of Sogrome, monitoring focused on Atelopus arsyecue, with a total of 176 individuals counted. During the monitoring, we were able to record reproductive peaks from May to July, which were common across all populations. In San Lorenzo, 6 amplexus events of A. laetissimus were recorded, and in San Pedro, 9 amplexus. In Sogrome, 12 amplexus of A. arsyecue were observed. Additionally, during these reproductive peaks, we noticed that amplexed males tend to

				weigh slightly less than non-amplexed males, a phenomenon already documented and attributed to the fact that males do not feed during the reproductive process, which may last for days or even months.
Swab samples were collected to determine the presence and prevalence of *Batrachochytrium dendrobatidis* (Bd) in each population.			X	We analyzed a total of 113 samples across all populations, distributed as follows: 48 from *Atelopus arsyecue*, 53 from *A. laetissimus*, and 12 from *A. nahumae*. Our current results for *Batrachochytrium dendrobatidis* (Bd) represent an early warning, indicating a potential detection of the chytrid fungus exclusively in the San Lorenzo population, specifically in two individuals. This finding highlights the need to focus epidemiological monitoring efforts on this population
Participation in and organization of the first Bioblitz (August 2024), aimed at training children and focal groups in scientific data recording and collection			X	We successfully conducted the first Bioblitz session with the ecological group of San Pedro de la Sierra, fostering a sense of local ownership within the community and promoting collective engagement of children and youth in the protection of their territory and biodiversity. The Bioblitz event involved 20 young people from the rural community of San Pedro de la Sierra, all members of the ecological group "Amigos de la Sierra." The activity also included the participation of local biodiversity experts, who provided training on native species identification, sampling methodologies, and conservation strategies for the territory.
An ecological station will be installed in the community of Cuchilla de San Lorenzo as a mitigation measure to control the impact of			X	The ecological station was installed in the area of influence of the San Lorenzo Hydric Star IBA, with the participation of the local community, social leaders, and youth engaged in environmental

solid waste.				education activities. our ecological station consists of a bin for separating paper, plastic, and non-recyclable materials. However, its symbolic value goes beyond waste management, as it incorporates messages promoting territorial conservation. It is also complemented by interactive environmental education activities aimed at children in the San Lorenzo watershed community. We currently know that the station is being used by both local and foreign visitors who frequent the area, and this seems to have gradually reduced the accumulation of solid waste near water bodies. However, we plan to implement a participatory monitoring process in the short term, involving members of the local community to assess the effectiveness of the installed ecological station. These include themed concerts on the knowledge and protection of local biodiversity, carried out in collaboration with Jacana Jacana, an organization that integrates art with environmental education processes. This initiative also serves as a targeted mitigation action to address threats to the amphibian assemblage in the locality.
Two workshops will be conducted with rural schools to promote awareness and empowerment for the conservation of harlequin toads.			X	We successfully carried out educational activities, including talks, workshops, and awareness campaigns with the local schools of San Pedro and La Tagua. These activities engaged young students and teachers in understanding the importance of conserving the territory, using amphibians as key species for environmental protection. To promote awareness and empowerment in the

				conservation of harlequin toads and local biodiversity in the Sierra Nevada de Santa Marta (SNSM), two environmental education workshops were held in the localities of San Pedro (Bioblitz) and San Lorenzo (Bio-concert), with the participation of approximately 60 young people in total.
Development of a dissemination brochure on the biodiversity of the Sierra Nevada de Santa Marta, from the perspective and worldview of the indigenous Arhuaca communities in the study areas		X		We have successfully made progress in the joint creation with the indigenous community of Sogrome on a brochure focused on biodiversity and the ancestral knowledge of the original communities of the SNSM. This process has been long and detailed due to the working methods of the indigenous group, and it is now in the final stages of layout and printing for the schools of the indigenous community in the Sogrome area, SNSM.

2. Describe the three most important outcomes of your project.

a). "Active participation and development of the first BioBlitz event in the rural community of San Pedro, SNSM, involving the local ecological monitoring group in teaching biodiversity monitoring techniques, such as transect surveys, bird identification using binoculars, mammal monitoring with camera traps, and water quality analysis. This activity was widely embraced by teachers and parents, where we were able to provide the necessary tools and uniforms to the group members to carry out the activity. The goal is for them to eventually lead their own monitoring sessions in their territory, enabling them to issue early warnings before serious impacts on biodiversity or natural resources occur."

b). "The update of our databases with current monitoring data for three endemic and critically endangered harlequin toad species from the SNSM, which allows us to track the survival of these key species in ecosystems and their cultural significance to local communities. In addition, we continue our efforts to maintain detailed epidemiological monitoring, enabling preventive actions and alerting environmental authorities regarding the possible spread of the Bd fungus in these populations."

c). "The development of the first brochure for collecting traditional and cultural knowledge for the Arhuaca indigenous community, focused on the biodiversity of the territory as a tool for conservation and governance in their traditional processes. This product reflects the hard and integrated work of scientific researchers alongside the ancestral knowledge of the communities, through leaders and knowledgeable

individuals who elevate the message of protection for Mother Nature and encourage the continued efforts to ensure the sanctuary of life for biodiversity, such as the SNSM.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

The main challenge in the development of the project has been access to our work areas, as the access roads are often in poor condition due to the intense rainy season. These conditions cause deterioration in the unpaved sections of the road, leading to the accumulation of mud and landslides, which significantly hinder mobility. Additionally, we have encountered some setbacks related to the constant mechanical failures of our transport vehicle due to continuous use over the years, particularly on difficult-to-access roads. However, we have managed these inconveniences by incorporating reasonable time margins into our annual activity schedule to account for such unforeseen issues, ensuring the successful execution of all proposed objectives and activities.

4. Describe the involvement of local communities and how they have benefitted from the project.

During the project's execution, we were pleasantly surprised by the willingness, commitment, enthusiasm, and initiative of the local community in the various activities carried out in the territory. A direct benefit, both in the short and long term, that we have observed is the emergence of community empowerment among the youth, who have learned various basic sampling techniques and recognized different native species of the area. Moreover, the young people are now aware of the importance of the harlequin toads and how the conservation of biodiversity in their territory directly contributes to improving their quality of life.

On the other hand, the development of the first brochure of traditional and cultural knowledge from the Arhuaco people, focused on the biodiversity of the territory, is a tribute to the dialogue between science and ancestral knowledge. This valuable conservation and governance tool reflects the commitment of leaders and knowledgeable individuals who, with deep love for Mother Nature, inspire us to protect the Sierra Nevada de Santa Marta as a sacred sanctuary of life.

5. Are there any plans to continue this work?

Our plans always include continuing this work, as studying the population dynamics of *Atelopus* species is crucial to understanding their conservation needs and ensuring their long-term survival. Future research will focus on exploring new areas where additional populations of *Atelopus* may be found, thus expanding the distribution range of these species, as well as examining additional ecological factors that may influence their distribution and survival. Additionally, the area for ecological reforestation will be expanded to support the long-term conservation of the fauna and flora of the SNSM. Lastly, participatory monitoring programs will be established, with the inclusion of more members from rural and indigenous communities, particularly the participation of women. This will ensure a more holistic approach and

allow for continuous tracking of population trends over time, guaranteeing a comprehensive understanding of the conservation status of these species.

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

The results of this work will be shared through various platforms to ensure wide dissemination and foster collaboration. A scientific article containing population data of *Atelopus* from recent years is currently being submitted to relevant peer-reviewed journals in herpetology and conservation biology for publication. Additionally, a recent scientific article with updated population data of *Atelopus* is in the process of being submitted to high-impact scientific journals in herpetology and conservation biology for peer review and publication. Moreover, the results will be presented at national and international conferences to engage with other researchers and conservationists. Local communities in the areas where the study was conducted will also be involved through outreach programs, ensuring that the findings are accessible and applicable at the grassroots level. Our goal is to use both traditional academic channels and community-based approaches to maximize the impact of the research.

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

Looking towards the future, we believe it is essential to continue strengthening the community and interinstitutional actions that have emerged from the project. One of the key next steps will be to consolidate a long-term participatory monitoring system that ensures the continuity of the population status assessment of *Atelopus laetissimus*, *A. nahumae*, and *A. arsyecue*, as well as monitoring the presence of *Batrachochytrium dendrobatidis* (Bd) in their habitats. Additionally, we see it as a priority to continue with the educational processes initiated, particularly with rural schools and the focal groups that participated in the Bioblitz. These actions have proven to be a powerful tool for fostering local ownership of knowledge and promoting a conservation culture from an early age. Finally, we aim to continue the development of educational and outreach materials, such as the brochure created with the Arhuaca communities, and explore ways to further integrate their traditional knowledge into conservation strategies, ensuring that the intercultural approach remains a core element in our work

8. 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?

Yes, The Rufford Foundation logo has been used in various spaces and materials related to the project. Specifically, the logo has been present in environmental education workshops held in local communities, where the foundation's support has been recognized as a fundamental part of the activities carried out. It has also been included in presentations and posters displayed at symposia and academic events, highlighting the support received for the development of conservation work.
In addition, The Rufford Foundation logo has been incorporated into all outreach materials produced by the Atelopus Foundation within the framework of this project, such as posters, newsletters, infographics, and digital publications. In this way, the

Foundation has received constant visibility and recognition throughout the process, both in community and scientific and educational spaces.

9. Provide a full list of all the members of your team and their role in the project.

José Luis Pérez González: Leader and scientific coordinator of the project. Coordinate the schedule, create research protocols, train team members for research and education and outreach activities, define tasks and responsibilities, and ensure integration of work and achievement of objectives.

Jeferson Villalba Fuentes: Fieldwork Coordinator. Coordinate field trips, protocols, and methodologies for population monitoring and associated data analysis. Organization of meetings with local and indigenous communities and environmental authorities in the study area.

Yurladis Mariño: Community leader in San Pedro de la Sierra, president of Rural Women Building Future, coordination and planning of environmental education activities, and meetings with environmental entities in San Pedro de la Sierra.

Sintana Rojas Montaño: Coordinator of environmental education. Coordinate methodologies in environmental education activities and workshops in local schools and focus groups in the local community.

José Daniel Barros: Communication and Education Coordinator. Organization and planning of environmental education activities, dissemination of results of the activities, and workshops developed during the execution of the project.

Andres Rocha Usuga: Communication and Education Coordinator. Organization and planning of environmental education activities, dissemination of results of the activities, and workshops developed during the execution of the project.

Luis Alberto Rueda Solano PhD. Scientific and academic advisor, organization and planning of field research activities, analysis and dissemination of research results during the execution of the project.

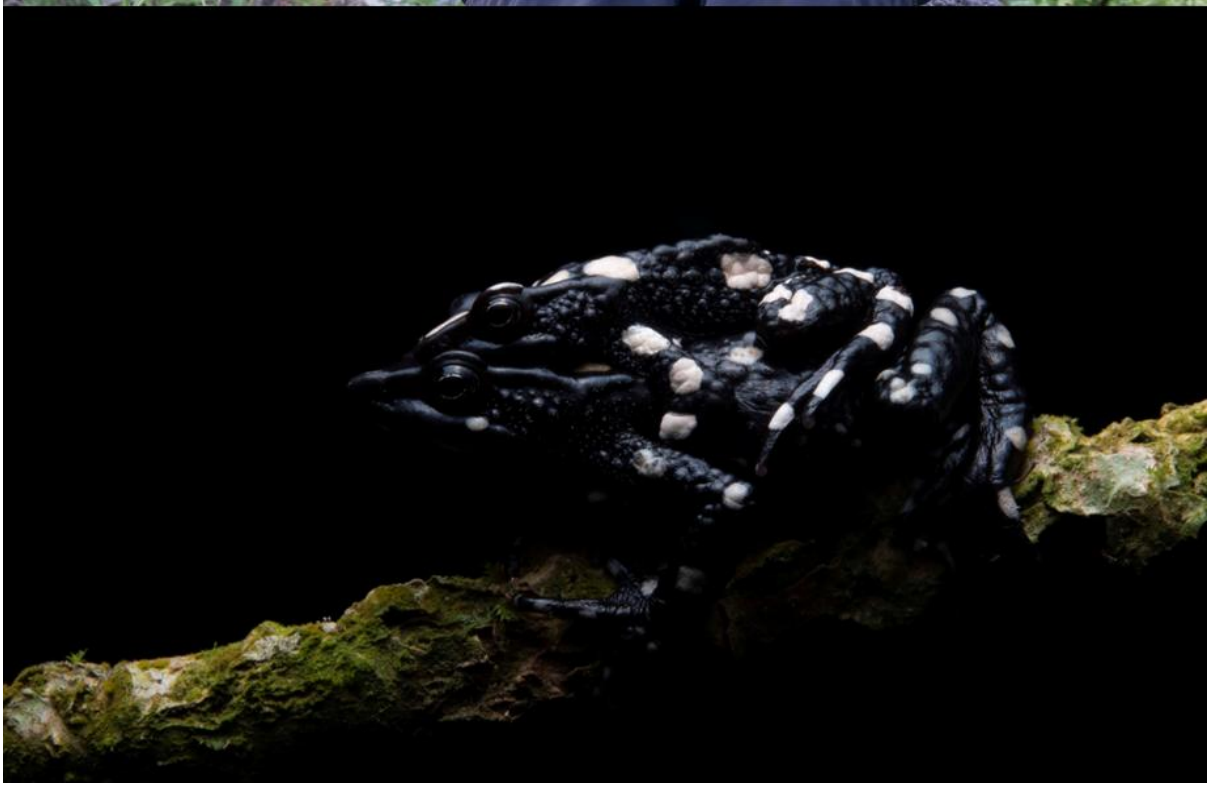
Lucelly Torres Villafaña. Indigenous Arhuaco leader, president of Wirakoku, coordination and planning of environmental education activities and meetings with Indigenous authorities in the department of Magdalena.

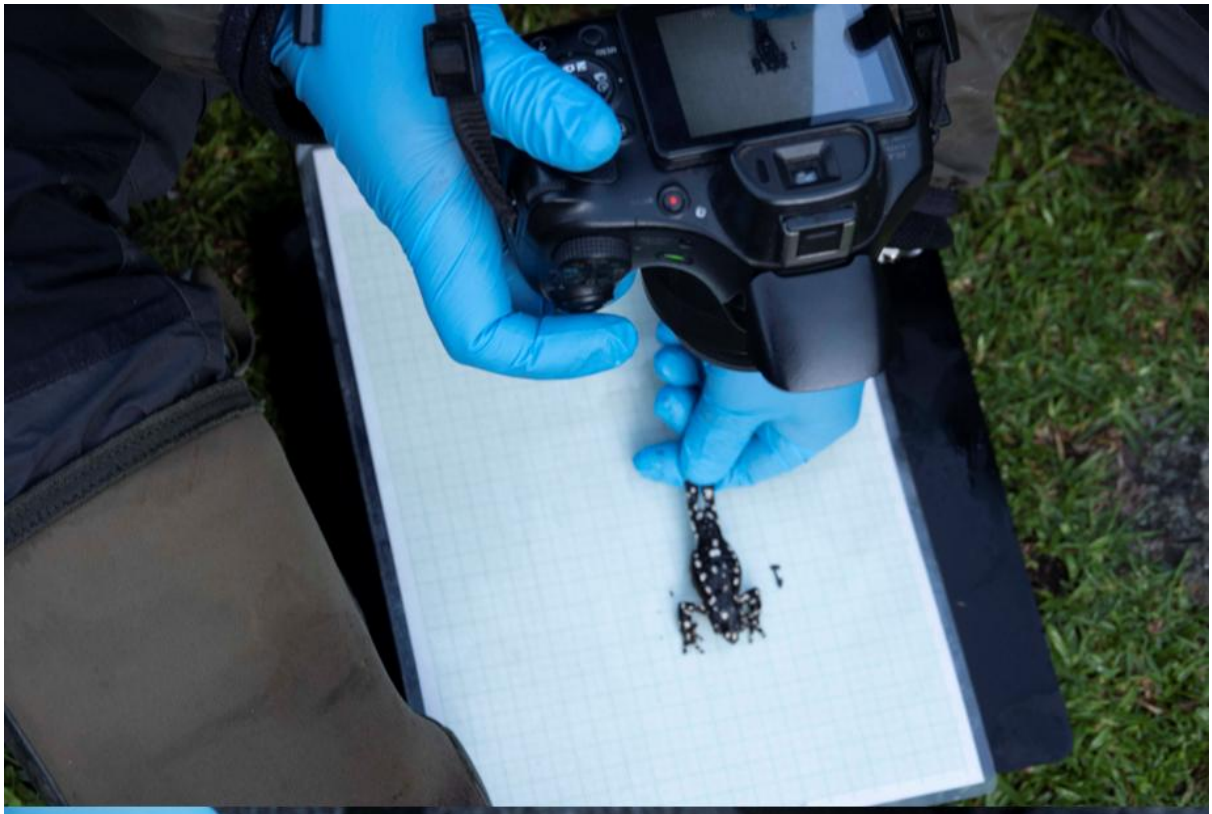
Ruperto Chaparro Villafaña. Indigenous Arhuaco leader from the community of Sogrome, president of Amas la Sierra, coordination and planning of environmental education activities and meetings with Indigenous authorities in the department of Cesar.

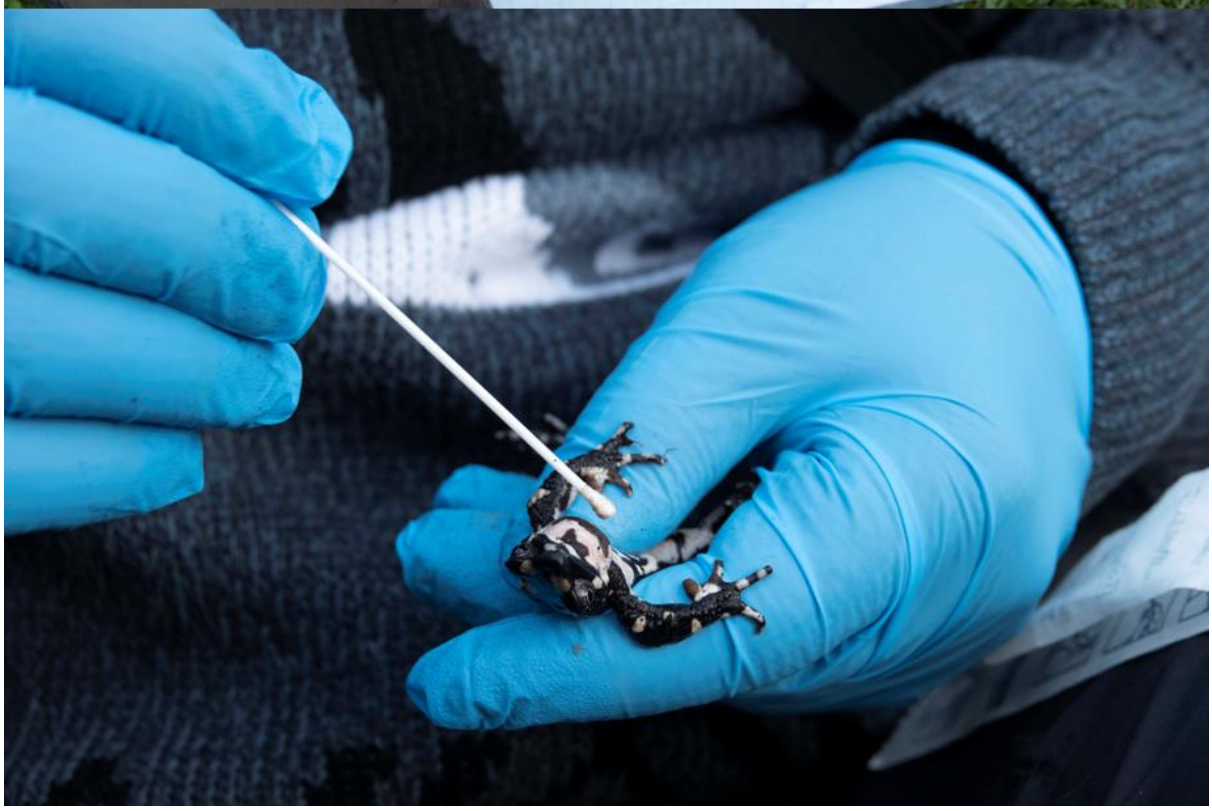
10. Any other comments?

We have made significant progress in each of the study sites where we are implementing our conservation project focused on the harlequin toads of the Sierra Nevada de Santa Marta (SNSM). Our local support network has now become a key

pillar in biodiversity protection across the region. We have expanded our efforts to mitigate threats and prioritized the integration of local communities in the design and development of long-term, sustainable strategies. These collaborative actions aim to secure a better future for both the ecosystems and the people of the SNSM.







1) Population monitoring of harlequin toads in the Sierra Nevada de Santa Marta (SNSM) to assess current population dynamics of these species, along with the collection of skin swab samples for the ongoing monitoring of the presence or absence of the chytrid fungus *Batrachochytrium dendrobatidis* (Bd) in individuals

2) Environmental education program in rural schools through interactive workshops aimed at promoting biodiversity awareness within the territory and fostering social engagement in the protection of natural resources.

3) Installation of an ecological station in a key area within the zone of influence of the San Lorenzo hydrological star, carried out in collaboration with the local ecological group and community leaders from the region.

4) Implementation of the first Bioblitz event with the ecological group in the locality of San Pedro in the Sierra Nevada, in coordination with biodiversity monitoring experts to train local youth in the development of territorial conservation strategies.

5) Design and layout of the booklet on the biodiversity and cultural importance of species in the territory on the indigenous culture of the native communities in the SNSM