Final Evaluation Report

We ask all grant recipients to complete a project evaluation that helps us to gauge the success of your project. This must be sent in **MS Word and not PDF 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 – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please DO NOT fill in and submit this form until the project has been completed.

Complete the form in English. Note that the information may be edited before posting on our website.

Please email this report to jane@rufford.org.

Your Details	
Full Name	Bibiana Tovar
Project Title	Involving the local community and practitioners in the conservation and monitoring of a hotspot of threatened frogs in Colombia
Application ID	43435-1
Date of this Report	January 15, 2026

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
To characterize the vocal activity patterns, distribution, abundance, temporal dynamics, ecology, and soundscape of the frog assemblage in Selva de Florencia National Natural Park			X	Only the publication of the results and the submission of the technical report to the park administration are still pending. These activities will require a few additional months, as a substantial amount of passive acoustic data remains to be processed and analyzed. Nevertheless, all core objectives related to characterization of vocal activity patterns, distribution, abundance, temporal dynamics, ecology, and soundscape have been achieved. Regarding the assessment of local threats, a perception-based exercise was conducted during a human–wildlife conflict workshop with secondary school students (n = 117). However, the data were not statistically robust and could not be extrapolated. Additionally, restricted access to the protected area prevented the collection of field-based data to validate or quantify threats. While only limited evidence of habitat loss is available, discussions with park staff suggest the potential existence of direct threats, including attempted extraction of *Andinobates daleswansoni* for commercial purposes (denied by authorities) and possible illegal extraction.

				Therefore, although a statistically supported threat assessment was not feasible, there are indications of unquantified pressures beyond expert-based observations.
To train and consolidate a citizen science team composed of students, local community members, and park staff in bioacoustics, ecoacoustics, and amphibian monitoring, fostering active participation in data collection, analysis, and biodiversity documentation		**X**		All activities (environmental education workshops, training workshops, and outreach materials) with the local community and park staff were carried out, and the project concluded with a training workshop held with personnel from PNN Selva de Florencia, in which **24** park staff members were trained (Fig. 8). However, it is important to note that the park remains closed to the general public; therefore, students and local community members were not permitted to enter the protected area to conduct species mapping or trail recognition activities, in accordance with institutional regulations. During the final workshop, participants identified the need for a second project phase, in which more specialized training activities could be developed, including automated acoustic monitoring, biostatistics, and programming. These points were among the main conclusions of the workshop. As well as focusing research questions, hypotheses, and results on generating practical inputs to support the opening of the park to the general public.
To disseminate scientific and community-generated results to local stakeholders		**X**		The park is currently closed due to the vacation period. However, within the next few weeks, it is expected that a feedback session on the

and decision-makers, strengthen environmental awareness, and provide evidence-based inputs to support conservation planning and management in Selva de Florencia National Natural Park				project outcomes will be held with local stakeholders and park authorities, with the aim of jointly defining priorities for future acoustic monitoring of frogs within the protected area. The outcomes of these meetings will be consolidated in the final document to be submitted to the park, as part of the adaptive management plans for amphibians and the conservation strategy of PNN Selva de Florencia.

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

a). We mapped **37** sampling points within the protected area, of which **9** have yielded important results involving several threatened species (Fig. 1). The acoustic dataset from PNN Selva de Florencia comprises more than 2.04 TB of recordings, of which approximately 5% have been analyzed to date. These analyses correspond to vocal activity patterns of the species *Centrolene antioquiensis*, *Andinobates opisthomelas* (VU), *Nymphargus rosada* (VU), and *Nymphargus grandisonae*. Taken together, field observations and records obtained through passive acoustic monitoring (PAM) suggest a strong potential of the park for long-term passive acoustic monitoring (Figs. 2, 3).

b). We consolidated a strong collaboration with the staff of PNN Selva de Florencia. This relationship has been translated into full support for future proposals and research within the park. This outcome represents the result of close, collaborative work with the park since the approval of a research agreement carried out jointly with park authorities (Fig. 4). This collaboration encompasses field activities (Figs. 5–6), training and capacity building of staff in bioacoustics, ecoacoustics, and soundscape tools (Figs. 7–8), as well as joint efforts in scientific and academic outreach.

c). A significant dissemination of the project's activities within the park was achieved through three main outcomes. First, a total of **five** environmental education workshops were conducted with the Pío XII educational institution (Figs. 9–10), including sessions on: (1) project socialization, (2) biodiversity loss and climate change, and (3) human–wildlife conflict, as well as two additional workshops focused on amphibian biology and ecology, and arts-and-crafts activities (e.g., mask design) related to amphibians. These activities were carried out simultaneously with different age groups. Approximately **60** primary school students participated in the workshops designed for younger children, while secondary school students were engaged in more structured

sessions, including topics such as ecosystem services, sound properties and perception, and an introduction to bioacoustics and acoustic monitoring.

In addition, an amphibian biology and ecology workshop was conducted during the park's anniversary celebrations in Pensilvania (Caldas), at Escuela Normal Superior de la Presentación, reaching approximately **40** primary school students across three classes, due to time constraints during the two-day activity (Figs. 11, 12, 19 and 20).

The second dissemination outcome involved the distribution of educational materials such as stickers, T-shirts, and other items that allowed children to recognize and construct models of threatened amphibian species within the protected area (Fig. 12). A total of **40** T-shirts were distributed (30 for children and 10 for adults, including park staff), along with **1,000** stickers featuring two species (*Andinobates daleswansoni* and *Pristimantis tribulosus*).

Finally, dissemination at broader academic and scientific levels was achieved through the presentation of results at the 4th Colombian Congress of Herpetology (Figs. 13–14). During this event, Sebastián Lozano (volunteer) won the undergraduate oral presentation award (Fig. 15), highlighting this research as a high-impact and highly relevant contribution to amphibian conservation in Colombia.

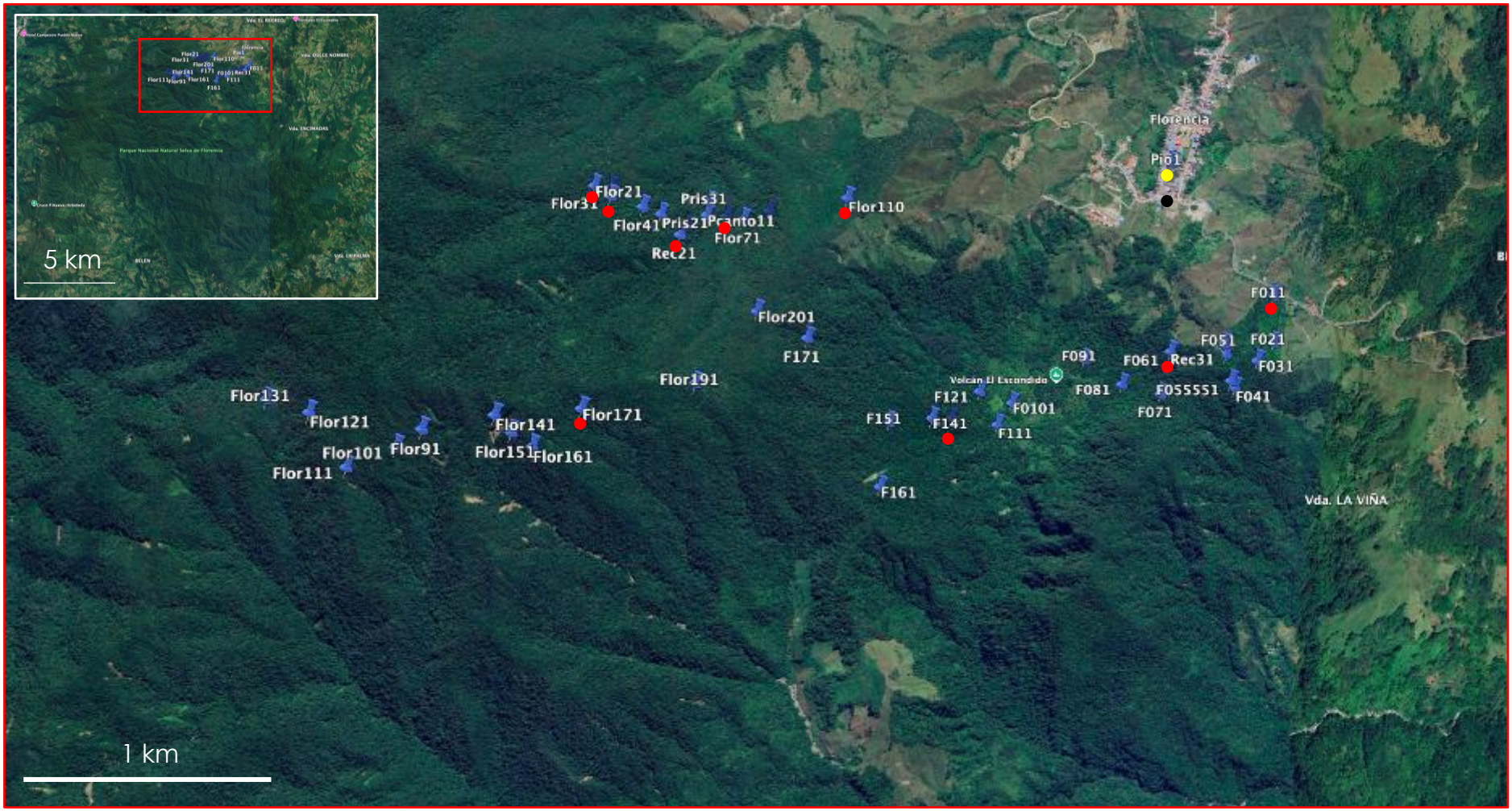


Figure 1. Map of the 37 sites acoustically surveyed. Red points represent sites where anuran species were confirmed through acoustic detections. The yellow point indicates the location of Pío XII School, and the black point indicates the headquarters of Parque Nacional Natural Selva de Florencia.

Scientific name	Common name	IUCN Status
Gastrotheca bufona	Antioquia Marsupial Frog	Vulnerable
Pristimantis fallax	Rana de Garganta Manchada	Vulnerable
Pristimantis lemur	Rana Picuda	Vulnerable
Pristimantis maculosus	Spotted Robber Frog	Vulnerable
Pristimantis dorsopictus	Serna's Robber Frog	Vulnerable
Pristimantis suetus	Rana Minuscula	Vulnerable
Andinobates opisthomelas	Andean Poison Frog	Vulnerable
Rhinella macrorhina	Santa Rita Beaked Toad	Vulnerable
Nymphargus rosada	Pink Glass Frog	Vulnerable
Andinobates daleswansoni	Andean Poison Frog	Endangered
Pristimantis parectatus	Rana Diminuta	Endangered
Pristimantis helvolus	Rana Pierniamarilla	Endangered
Pristimantis actinolaimus	Rain Frog	Endangered
Pristimantis veletis	Rana Camuflada	Critically Endangered
Pristimantis torrenticola	Rana de Lluvia de los Torrentes	Critically Endangered
Pristimantis lichenoides	Rana Camuflada	Critically Endangered
Pristimantis tribulosus	Rana Ornamentada	Critically Endangered
Bolitoglossa lozanoi	Salamander	Least Concern
Nymphargus grandisonae	Red-spotted Glassfrog	Least Concern
Espadarana prosoblepon	Nicaragua Giant Glass Frog	Least Concern
Pristimantis factiosus	Rain Frog	Least Concern
Rheobates pseudopalmatus	Torrent Frog	Least Concern
Boana platanera	Banana Tree Dwelling Frog	Least Concern
Pristimantis permixtus	Rana de Muslos Naranja	Least Concern
Rhinella horribilis	Mesoamerican Cane Toad	Least Concern
Rhinella humboldti	Rivero's Toad	Least Concern
Smilisca phaeota	New Granada Cross-banded Treefrog	Least Concern
Pristimantis fetosus	Rain Frog	Near Treatened
Bolitoglossa ramosi	Ramos' Mushroomtongue Salamander	Near Treatened
Centrolene antioquiensis	Antioquia Giant Glass Frog	Near Treatened
Nymphargus spilotus	Glass Frog	Near Treatened
Nymphargus aff chami	Glass Frog	Near Treatened
Rulyrana susatamai	Glass Frog	Near Treatened
Sachatamia punctulata	Glass Frog	Vulnerable
Diasporus anthrax	Direct-developing frog	Vulnerable
Centrolene aff huilensis	Huila Glass Frog	Endangered

Figure 2. List of species prioritized for acoustic monitoring in PNN Selva de Florencia. Species shown in gray belong to the original proposal for the project. Species highlighted in yellow represent additionally species observed or with acoustic records during the project's field phase. Green indicates visually observed species, while blue indicates species with acoustic detections during the field phase.


A
B
C
D
E
F
G
H

Figure 3. Some species recorded during field surveys in PNN Selva de Florencia. A) *Centrolene aff. huilensis* (EN), B) *Rhinella macrorhina* (VU), C) *Rheobates pseudopalmatus*, D) *Nymphargus rosada* (VU), E) *Pristimantis factiosus*, F) *Pristimantis veletis*, G) *Nymphargus grandisonae*, H) *Andinobates opisthomelas* (VU), I) *Pristimantis fallax* (VU), J) *Pristimantis viejas*, K) *Rulyrana susatamai*, L) *Oxyrhopus leucomelas*, M) *Bolitoglossa ramosi*, and N) *Pristimantis* sp. nov.

PARQUES NACIONALES
NATURALES DE COLOMBIA

Bogotá, D.C.

MEMORANDO
20252000000053

FECHA: 08-01-2025

PARA: **HUGO FERNANDO BALLESTEROS BOTERO**
Jefe de Área Protegida Parque Nacional Natural Selva de Florencia

DE: **SUBDIRECCIÓN DE GESTIÓN Y MANEJO DE ÁREAS PROTEGIDAS**

ASUNTO: Aval de investigación para el proyecto "Maximizando los esfuerzos para conservar y monitorear especies de ranas amenazadas en el Parque Nacional Natural Selva de Florencia mediante grabadoras acústicas automáticas y registros de datos microambientales"

Respetado Jefe,

En respuesta al Memorando No. 20246240002473 del 18 de diciembre de 2024, mediante el cual el Parque Nacional Natural Selva de Florencia solicitó un aval de investigación para el proyecto del asunto, el Grupo de Planeación y Manejo (GPM) de la Subdirección de Gestión y Manejo de Áreas Protegidas (SGM) se permite comunicarle lo siguiente:

El Decreto 1376 de 2013 del Ministerio de Ambiente y Desarrollo Sostenible, mediante el cual se reglamenta el permiso de recolección de especímenes de especies silvestres de la diversidad biológica con fines de investigación científica no comercial, en su articulo 2, parágrafo 1 señala que: "El Ministerio de Ambiente y Desarrollo Sostenible, sus entidades científicas adscritas y vinculadas, Parques Nacionales Naturales de Colombia, las Corporaciones Autónomas Regionales y/o de desarrollo sostenible y los Grandes Centros Urbanos no requerirán del Permiso de Recolección de especímenes del que trata este Decreto (...)". Adicionalmente, considerando que para quienes se otorga el permiso de recolección se autoriza la movilización de especímenes,

Subdirección de Gestión y Manejo de Áreas Protegidas
Dirección: Calle 74 No. 11 - 81, Bogotá D.C., Colombia
Conmutador: (+57) 601 353 2400
Línea Gratuita: (+57) 01 8000 129722

Figure 4. Research authorization No. 20252000000053 between the researchers and/or volunteers of the present proposal and National Natural Parks of Colombia for the development of the project within the protected area PNN Selva de Florencia.

Figure 5. Field activities conducted jointly with staff from PNN Selva de Florencia. A) and B) First live streaming from a National Natural Park in Colombia. C) Search for and installation of acoustic recorders targeting *Andinobates opisthomelas*.

Figure 6. Nocturnal field outing for recorder deployment. A) Accompanying moth sampling activities. B) Jorge Henao (park staff) photographing a snake (*Oxyrophus leucomelas*) during a field outing to replace microSD memory cards and batteries in the AudioMoth recorders. C) Felipe Bohórquez (park staff) and Bibiana Tovar (team leader) recording the presence of *Oxyrophus leucomelas*.

Figure 7. Training workshop on bioacoustics, ecoacoustics, and soundscape ecology with all staff from PNN Selva de Florencia. This workshop marked the conclusion of the field activities of the project.

Figure 8. Program and attendance spreadsheet of the final training workshop with park staff. ***[Intentionally deleted]***

Figure 9. Environmental workshops on "*Amphibian threatened species in PNN Selva de Florencia*" with different students ages from Pío XII – Primary School in Florencia (Caldas) (5.526405, -75.039918; 1573 m). ***[Intentionally deleted]***

Figure 10. Environmental workshops on A) "*Human-wildlife conflict*", B) and C) "*Biodiversity loss and climate change*", and D) "*Ecosystem services*" with older students from Pío XII School in Florencia (Caldas) (5.523508, −75.042190; 1592 m). The red arrow indicates The Rufford Foundation logo on presentations. Green arrow shows volunteer Natalia Benavides during her talk. ***[Intentionally deleted]***

Figure 11. Environmental workshops on "*Amphibian Biology*" with different students ages from Escuela Normal Superior de la Presentación – Primary School in Pensilvania (Caldas) (5.382116, -75.161304; 2058 m), conducted as part of the celebration of the 20th anniversary of the creation of PNN Selva de Florencia. The red arrow indicates The Rufford Foundation logo on the distributed stickers. ***[Intentionally deleted]***

Figure 12. Materials developed and distributed to children and young people as a strategy for outreach and knowledge appropriation related to the species of PNN Selva de Florencia. The red arrow indicates T-shirts, the green arrow stickers, and the blue arrows other materials. The red point marks Sebastián Lozano (volunteer), the green point Natalia Benavides (volunteer), and the blue point María Fernanda Moya (volunteer). ***[Intentionally deleted]***

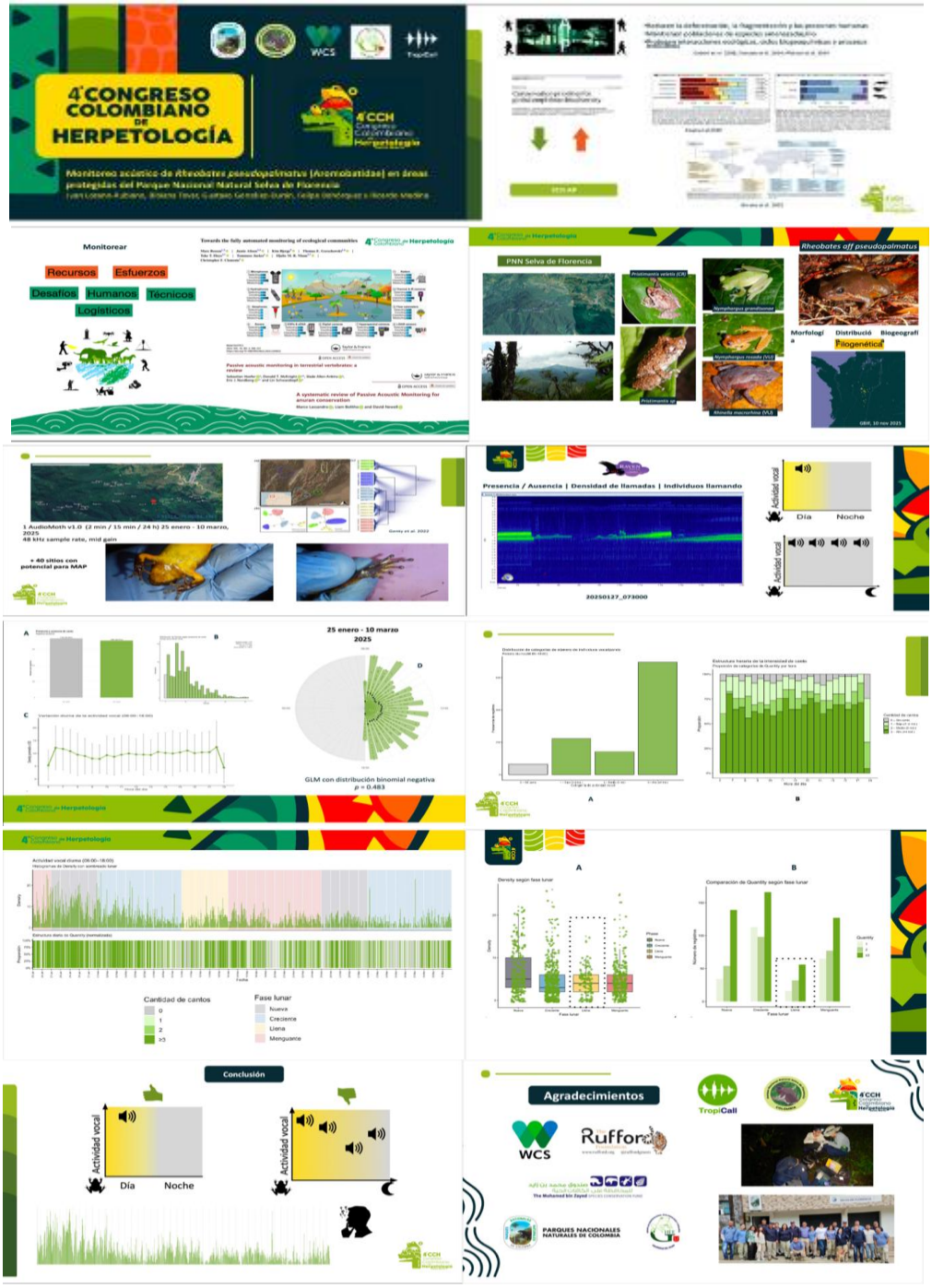
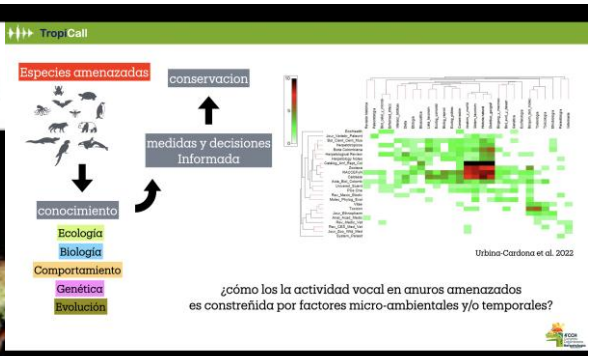
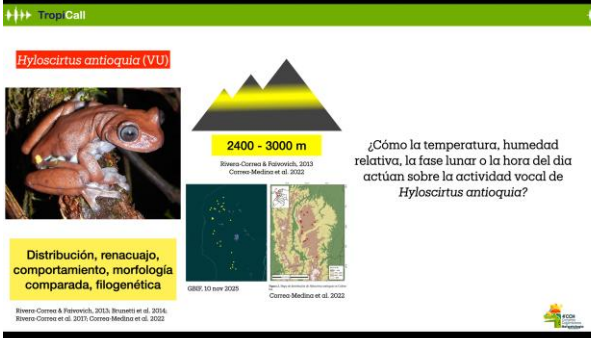
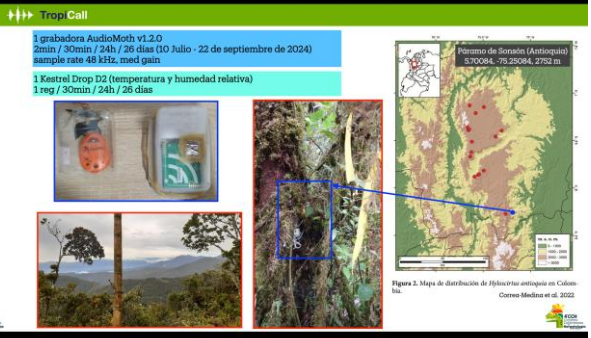


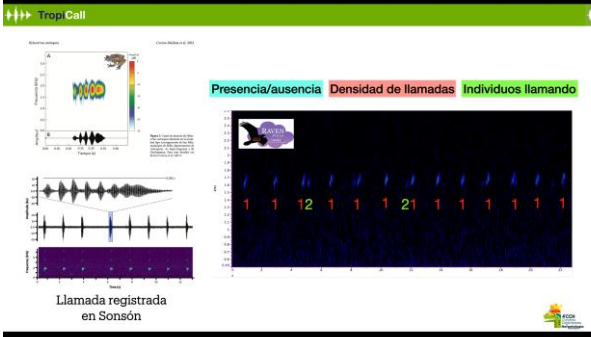
Figure 13. Presentation in the 4th Colombian Congress of Herpetology. This talk won Best Undergraduate Presentation at the Symposium on Acoustic Monitoring in Herpetology(facebook.com/photo/?fbid=862356829672148&set=a.263191242922046). Our work highlighting the high quality of the project, research, and analyses conducted through acoustic monitoring in PNN Selva de Florencia.

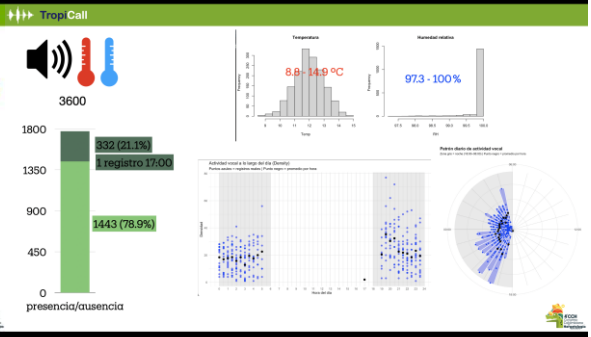

El patrón de actividad vocal de la rana amenazada chocolate de Antioquia (*Hyloscirtus antioquia*)


TropiCall
Especies amenazadas
conservacion
medidas y decisiones Informada
conocimiento
Ecología
Biología
Comportamiento
Genética
Evolución
Urbina-Cardona et al. 2022
¿cómo los la actividad vocal en anuros amenazados es constreñida por factores micro-ambientales y/o temporales?


TropiCall
Hyloscirtus antioquia (VU)
2400 - 3000 m
Distribución, renacuajo, comportamiento, morfología comparada, filogenética
¿Cómo la temperatura, humedad relativa, la fase lunar o la hora del dia actúan sobre la actividad vocal de *Hyloscirtus antioquia*?


TropiCall
1 grabadora AudioMoth v1.2.0
2min / 30min / 24h / 26 días (10 Julio - 22 de septiembre de 2024)
sample rate 48 kHz, med gain
1 Kestrel Drop D2 (temperatura y humedad relativa)
1 reg / 30min / 24h / 26 días
Páramo de Sonsón (Antioquia)
5.70084, -75.25084, 2752 m


TropiCall
Presencia/ausencia
Densidad de llamadas
Individuos llamando
Llamada registrada en Sonsón


TropiCall
3600
1800
1350
900
450
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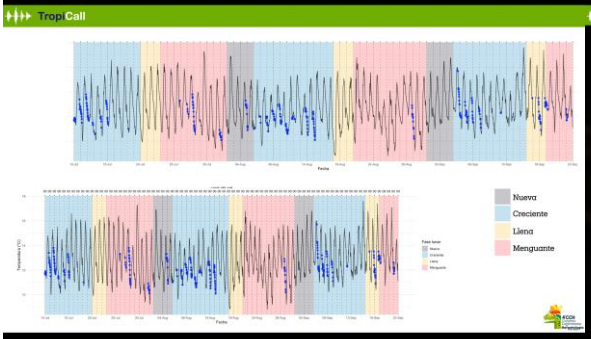
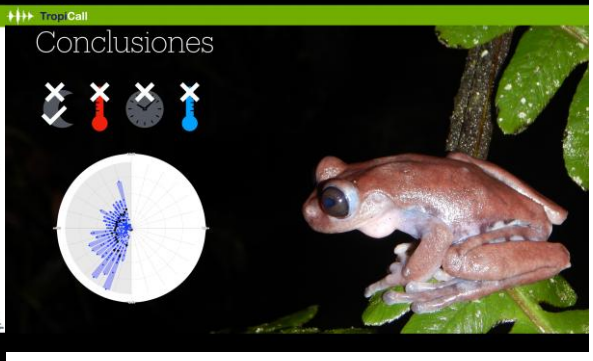
332 (21.1%)
1 registro 17:00
1443 (78.9%)
presencia/ausencia
8.8 - 14.9 °C
97.3 - 100 %


TropiCall
Nueva
Creciente
Llena
Menguante


TropiCall
Conclusiones


TropiCall
Agradecimientos

Figure 14. Presentation in the 4th Colombian Congress of Herpetology.

Figure 15. Juan Sebastián Lozano concluding the presentation of the talk "Acoustic monitoring of *Rheobates pseudopalmatus* (Aromobatidae) in protected areas of PNN Selva de Florencia". This presentation won the Best Undergraduate Oral Presentation Award at the 4th Colombian Congress of Herpetology. Juan is a volunteer a student in the biology program at the Universidad del Tolima. Red arrow shows the Rufford logo

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

The most significant difficulty was negotiating and obtaining the research permit to work within the protected area. It is important to highlight that there was always excellent willingness and support from Hugo Ballesteros, the director of PNN Selva de Florencia. However, the permitting process involves several administrative levels. At the local level, the proposal is first reviewed by park staff and then forwarded for approval to the central office of National Natural Parks of Colombia. Unfortunately, at the central level, several of the proposed activities were restricted.

The main limitation was the prohibition of access to the park for individuals other than the principal investigators and park staff. This restriction prevented the formation of a citizen science group that was intended to work collaboratively to learn about acoustic monitoring and to strengthen protected area management.

In addition, no permits were granted for biological collection. This significantly limited some potentially important outcomes. For example, it was not possible to obtain a voucher specimen to confirm a potential new record of *Centrolene huilensis* within the park (Fig. 3). This species is classified as Endangered and has previously been recorded only in Huila and Cauca, more than 370 km away. Similarly, on three occasions we encountered a *Pristimantis* species with unusual characteristics that may represent a new species (Fig. 16-17). However, without collection permits, it was not possible to conduct complementary morphological comparisons or genetic analyses. Despite these limitations, we were able to photograph these individuals and record their advertisement calls, and we hope that these data will help support future requests to justify the need for collection in order to confirm species identities.

Finally, we are currently managing a very large volume of acoustic data (More than 2 TB), and a substantial amount of information remains to be analyzed. This is one of the main challenges of passive acoustic monitoring, but also one of its greatest strengths. To address this, we are actively improving our analytical skills and workflows to increase efficiency in handling and interpreting these extensive datasets.

Figure 16. *Pristimantis* sp. nov. Morphological and vocal characteristics suggest that these individuals may represent an undescribed species within the protected area.

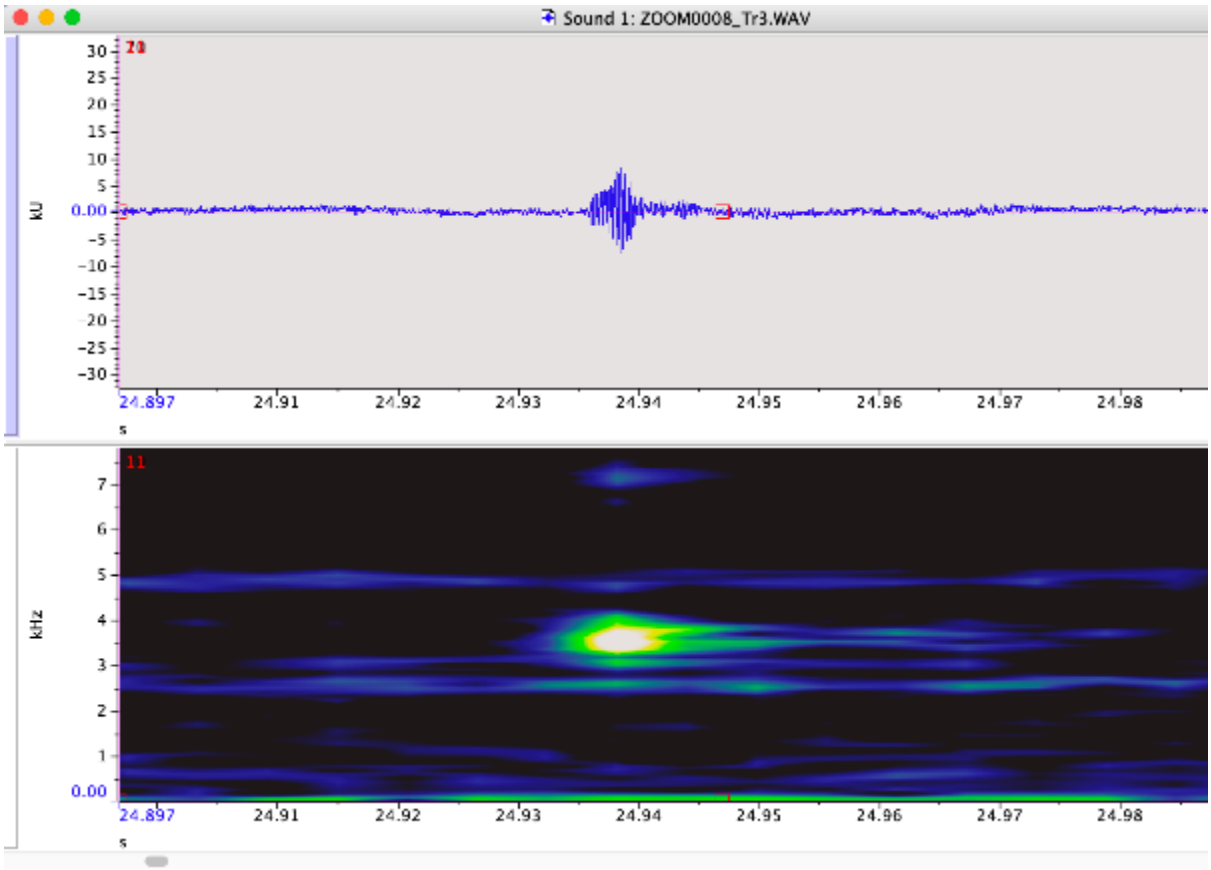


Figure 17. Advertisement call recorded *from Pristimantis* sp. nov

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

The project primarily benefited the park by improving knowledge of its species and by providing a new tool for the management, monitoring, and conservation of threatened species, particularly anurans. This knowledge was directly translated into capacity building for park staff, as the entire park team participated in a comprehensive introductory training program (Fig. 17-18). This process also generated several potential future research lines and new ideas that will be developed through continued inter-institutional collaboration between park staff and the research team.

Furthermore, awareness of the protected area, its conservation values, and its amphibian species particularly those that are endemic, threatened, or likely to be observed was strengthened. This was achieved mainly through environmental education workshops and the distribution of outreach materials to local communities (Fig. 19).

Although a formal citizen science team could not be consolidated, this was not due to a lack of capacity or interest from either the researchers or the local community. Instead, the activity could not be implemented because current park policies restrict activities to academic research and formal institutional agreements. As the park is currently closed to the general public, only research and conservation activities

conducted by accredited researchers and academic institutions are permitted. Nevertheless, the results of this project provide a strong foundation for future ecotourism initiatives and for citizen science–based and community-led monitoring programs, particularly as the park is expected to open to the public in the coming years.

Figure 17. Training workshop on bioacoustics, ecoacoustics, and soundscape ecology. A) The Q&A session for the class "*Metadata, software management, and programming*", B) the opening session "*Sound production and perception*", C) the closing session of "*Introduction to sexual selection in anurans*", and D) Ricardo Medina (Co-researcher) delivering an introductory lecture titled "*Sound production and perception*". Sessions A and C were in PNN Selva de Florencia headquarters while B and D sessions were in Pío XII school.

Taller De Bioacústica, Ecoacústica Y Paisaje Sonoro
1 y 2 de octubre de 2025 (Corregimiento de Florencia, Samaná, Caldas)

Cronograma		Titulo	Coordinación
Octubre 1	8:30 – 10:15	1) Propiedades, percepción y producción del sonido	TropiCall
	10:15 – 10:30	Descanso	
	10:30 – 12:00	2) Biología y taxonomía de anfibios	TropiCall
	12:00 - 1400	Almuerzo	
	14:00 – 15:30	3) Comunicación acústica en anuros	TropiCall
	15:30: - 16:45	4) Introducción a la selección sexual en anuros	TropiCall
	16:45 – 17:00	Descanso	
	17:00 - 18:00	5) Paisaje sonoro, bioacústica y ecoacústica (1)	TropiCall
	18:30 – 20:30	6) Salida de campo: instalación de grabadoras acústico y data loggers	PNN Selva de Florencia, TropiCall
Octubre 2	7:00 – 9:00	7) Salida de campo: Recolección de equipos y datos	PNN Selva de Florencia, TropiCall
	9:00 - 10:15	8) Paisaje sonoro, bioacústica y ecoacústica (2)	TropiCall
	10:15 - 10:30	Descanso	
	10:30 – 12:00	9) Metadatos, manejo de software y programación (1)	TropiCall
	12:00 – 14:00	Almuerzo	
	14:00 – 18:00	10) Metadatos, manejo de software y programación (2)	TropiCall

TropiCall

PARQUE NACIONAL NATURAL SELVA DE FLORENCIA 20 años

Figure 18. Schedule and topics of the bioacoustics, ecoacoustics, and soundscape ecology workshop for staff of PNN Selva de Florencia.

Figure 19. Stickers distributed during the environmental education workshops. Red arrows indicate different stickers featuring threatened frog species from PNN Selva de Florencia. ***[Intentionally deleted]***

5. Are there any plans to continue this work?

Unfortunately, National Natural Parks of Colombia do not have financial resources beyond their operational budget and routine activities (e.g. reforestation, environmental education, trail improvement and maintenance, land acquisition, support for research activities, administration, and management). PNN Selva de Florencia has maintained an acoustic monitoring program for the past six years, consisting of species searches and counts conducted during one week each October. This monitoring effort is fully funded by WCS–Colombia, as the park itself does not have a dedicated budget for these activities.

Although a strong relationship of trust, collaboration, and mutual support has been established between PNN Selva de Florencia, the principal investigators, and the organizations that supported the project, there are currently no financial resources available beyond the provision of equipment. This context encourages us to apply for a second Rufford grant; however, at present, efforts are focused on defining a clear strategy to prioritize resources and activities for a second phase of the project, together with park staff.

Although the protected area has the potential to harbor more than 90 amphibian species (based on unpublished reports by WCS and PNN Selva de Florencia), during field surveys and passive acoustic records we count 28 species (Fig. 2-3), of which 11 were classified under some threat category. Of these, seven (*Pristimantis dorsopictus* (VU), *Andinobates opisthomelas* (VU), *A. daleswansoni* (EN), *Nymphargus rosada* (VU), *Sachatamia punctulata* (VU*), Diasporus anthrax* (VU), *Centrolene aff huilensis* (EN)) show high potential for acoustic monitoring; only one of these species (*Centrolene aff huilensi)* was not observed calling during our surveys, although its advertisement call has been described in the literature. This highlights the high ecological integrity of the park and demonstrates the strong potential of the area for the development of a long-term passive acoustic monitoring and conservation program for threatened amphibians.

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

Overall, our results have already been partially shared. During the training workshop with staff from PNN Selva de Florencia, we presented the two talks (Fig. 13-14) that were subsequently delivered at the 4th Colombian Congress of Herpetology. However, these two studies, together with two additional ones, still need to be formally published. As approved in the research permit (Fig. 4), these publications will be prepared and shared in collaboration with park staff, who worked closely with the research team throughout the project.

Therefore, one of the main mechanisms for sharing results will be through peer-reviewed scientific publications. In addition, the findings have already been disseminated within the academic community through their presentation at a national scientific congress (Fig. 15).

Species-level outreach has also been carried out through environmental education workshops with children, during which stickers and T-shirts (Fig. 20) were distributed as materials to promote awareness and knowledge appropriation.

We are also open to sharing our findings and data with international initiatives such as the IUCN SSC Amphibian Specialist Group. While we have perceived that, at the national level, these networks may be somewhat limited in incorporating data beyond established academic groups, we remain fully willing to contribute, share, and disseminate our results through any appropriate platforms or collaborations.

As the vocal activity patterns of the monitored species are published, these results will be shared through social media in a more accessible and user-friendly format for the general public, while maintaining direct links to the corresponding scientific articles. We are currently finalizing the technical report and monitoring proposal for PNN Selva de Florencia, which is expected to be submitted by June 2026 and requires approval from park authorities.

We plan to share project outcomes through platforms such as the TropiCall Instagram page (https://www.instagram.com/tropicallorg/) and with The Rufford Foundation. However, the level of data disclosure (fully open, partially restricted, or confidential) will depend on the guidelines established by the park, in accordance with the research agreement. In parallel, we are developing infographics and outreach materials incorporating photographs and acoustic data, which we aim to share through Rufford and social media channels to enhance the visibility and impact of the project. While some information requires prior approval, we remain fully committed to disseminating our findings as broadly as possible.

Finally, the park will receive a baseline document and practical guideline to support the development of a long-term acoustic monitoring program.

Figure 20. Distribution of materials (stickers and T-shirts) during the celebration of the 20th anniversary of PNN Selva de Florencia.

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

A) Publish the vocal activity patterns of species for which reliable data are available (*Rheobates pseudopalmatus, Nymphargus rosada, Centrolene antioquiensis, Andinobates opisthomelas,* and *Nymphargus grandisonae*)

B) Submit a monitoring proposal and priority framework for acoustic monitoring of species with high potential within the study area

C) Seek additional funding to expand acoustic monitoring to other species that were observed and confirmed to have a high suitability for this methodology

D) Refine research questions and hypotheses that can be addressed using passive acoustic and microenvironmental recorders

E) Support Park management by improving knowledge of its species to inform and facilitate the future opening of the area to the public

F) Design and implement a dissemination strategy that integrates diverse visual and audiovisual elements to strengthen local community engagement, knowledge appropriate, and oversight of the management and conservation of PNN Selva de Florencia

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 was included in several materials produced during the project. Specifically, the logo was displayed on stickers distributed to participants (Fig. 11, 19-20), on T-shirts given away during the celebration of the 20th anniversary of Parque Nacional Natural Selva de Florencia (Fig. 20), and on promotional materials presented in Pensilvania (Caldas) during the park's anniversary events (Fig. 20).

In addition, acknowledgements to The Rufford Foundation were presented at every environmental education workshop and during the final training workshop (Fig. 21). Finally, during the 4th Colombian Congress of Herpetology (Fig. 13-15), formal acknowledgements to The Rufford Foundation and all participating institutions were also presented

Figure 21. Different workshops and outreach events were conducted during the project. A) Bioacoustics, ecoacoustics, and soundscape workshop with all staff of Parque Nacional Natural Selva de Florencia (5.522444, −75.042473; 1607 m) on 25–26 November 2025. B) Commemoration of the 20th anniversary of Parque Nacional Natural Selva de Florencia in Pensilvania (Caldas) (5.383391, −75.161082; 2074 m) from 5–7 June 2025. C) Environmental education workshop on "*human–wildlife conflict*" at Pío XII School (5.523508, −75.042190; 1592 m). Red arrows indicate acknowledgements to The Rufford Foundation displayed at all events.

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

- **Juan Sebastián Lozano** (Volunteer - Universidad del Tolima)
- **Natalia Benavides** (Volunteer - Universidad del Tolima)
- **Ivonne Santa Cruz** (Volunteer - Universidad del Tolima)
- **María Fernanda Moya** (Volunteer - Universidad del Tolima)
- **Anamaria Ocampo** (Volunteer - Universidad del Tolima)
- **Andrés Felipe Bohórquez** (Research coordination plan - PNN Selva de Florencia)
- **Jorge Henao** (Amphibian research - PNN Selva de Florencia)
- **Gustavo González Durán** (Amphibian strategy - WCS-Colombia)
- **Camilo Loaiza Gómez** (Acoustic monitoring strategy - WCS-Colombia)
- **Ricardo Medina** (Co-researcher - TropiCall)
- **Bibiana Tovar** (Team leader - TropiCall)

All members are involved in field activities, and some volunteers have gone further by contributing as co-authors to several manuscripts currently in preparation, including "*Advertisement call and vocal behavior of Rheobates pseudopalmatus (Anura: Aromobatidae) in the Selva de Florencia KBA (Colombia)*", "*The vocal activity pattern of* Centrolene antioquiensis", "*Geographic variation in the advertisement call and vocal activity patterns of Andinobates opisthomelas*", and "*The vocal activity pattern of Nymphargus grandisonae*".

ANNEX – Financial Report

[Intentionally deleted]