

The Rufford Foundation
Final Report

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.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Luis Enrique Vera Pérez
Project title	Snakes diversity and strategies for its conservation at the Parque Nacional Natural Munchique, State of Cauca, Colombia
RSG reference	15249-1
Reporting period	September 2014 – March 2016
Amount of grant	£6000
Your email address	luchoveraperez@gmail.com
Date of this report	May 10, 2016

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
Contribute to snake conservation			X	Knowledge delivered to the communities living within the protected area of the park and the surrounding areas through environmental education workshops and interaction with live snakes was overwhelming to generate a change in perspective that had rural community towards these animals which causes a decrease in the tendency to kill snakes and increase the admiration and respect for them. Also people of rural communities were capacitated about the correct identification of venomous and nonvenomous snakes, prevention and first aid of snake bites.
Determine the richness, abundance and species composition of snakes at Parque Nacional Natural Munchique			X	After 180 paths adding up to a sampling effort of 540 hours and about 473 walked km we found 39 snakes which correspond to 16 species. Some of the species are present among different sectors of PNN Munchique and other ones were specific, restricted to a determined sector. Taking in account two possible new species of the genus <i>Atractus</i> , the findings included six Colombian endemic species also.
Increase the list of snakes species at PNN Munchique			X	Taxonomic identification of the snakes that were found in the field work of this project allowed to record 7 new species for Parque Nacional Natural Munchique and its surrounding areas.
Advance the knowledge of biological and ecological aspects of snakes species			X	We have collected important information on the natural history of most species registered PNN Munchique which includes aspects of the preference of habitat and microhabitats, activity schedules, behavior, reproduction and ontogenetic changes of colouration. Aspects of diet were inferred from a variety of other animals that also were recorded during sampling, especially lizards and amphibians.
Share the project's results		X		We have already shared the results of this research through the development of educational material which was delivered to rural schools of the involved sectors and surrounding areas of the PNN Munchique and some institutions related to

				<p>science and the environment. A detailed document of this research was also delivered to the different offices as stated in the research permit granted by Ministerio de Ambiente y Desarrollo Sostenible.</p> <p>This objective is partially achieved because we are preparing the dissemination of results to the scientific community by submitting manuscripts and participation in next related events.</p>
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

First, we had problems in receiving the grant funds, which were initially returned because of the bank preventive policies. So we had to present detailed information to prove the veracity of the project and the funds were finally received in September 2014 causing a delay in the purchase of equipment and materials needed for the project execution. There were also delays in some of the respective procedures to obtain the research permit which was finally granted in December 2014.

We also had some problems in fulfilling the schedule of activities due to a change in the direction of Parque Nacional Natural Munchique and the development of other projects. So we had to wait some time for staff were available to our project because the accompaniment of at least one park employee is mandatory to enter the study area. Although the schedule was modified, we perform eight entrances to the park: one to present the project and develop the environmental education workshops; six for the field trips (two per sector) and the last to present the results and deliver the produced educational materials to rural communities.

By safety recommendations provided by people of rural community and park employees, the paths at La Romelia sector were developed on roads and some routes already established by park officials strictly in daytime; all this due to the presence of a military base to few km from the cabin and the possible presence of landmines in forested areas. Finally, during the last field trips at sectors El Condor and El Rosal the number of samples (and records) decreased due to increased rainfall which corresponded with the end of the second period of heavy rains established for the area (November).

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

1. Based on demographics data at El C6ndor sector inhabits 30 families (27 inside the protected area of the park), 39 at El Rosal sectors (27 inside the protected area) and no families in La Romelia sector despite there is a vereda (namesake) near this sector where inhabit several families whose relation with the protected area has not been studied but which were included into this project. According to this, we conclude that the attendance of approximately 150 people in all the environmental education workshops developed at the three sectors it was significantly high. This shows that rural communities reflect a great interest to know and participate in research processes for conservation; which it should be taken into account as a priority to the development of future researches of this kind because these people are all the time in direct contact with nature and everything that we want to save from outside depends of them finally.

2. Due to its cryptic features product of varied habits, sizes, body shapes, behaviours and the use of different habitats, snakes are one of the most complicated animal groups for field study. Furthermore the study area has high rainfall climatic conditions and mountainous terrain with steep slopes which added to the problems of the armed conflict represents a major challenge for the field work. Considering all this the 39 snakes of 16 species found in the field phase of this project represent a very high number of records which are derived from the great effort and the appropriated sampling techniques. The list of species of snakes in the park and its hinterlands currently includes 33 species which added to the information available about species of lizards and amphibians product of other researches and additional observations of our work at the park, converts the herpetofauna in one of most important groups of animals for research and monitoring which are in fact now contemplated to be included into the own programs of the Parque Nacional Natural Munchique.
3. Finally, within the records obtained we highlight the findings of the endemics and poorly known species *Saphenophis sneiderni* and *Saphenophis tristriatus* whose latest records correspond to the years 2000 and 1988 respectively; two species of *Atractus* which may be new species for science; the first records of the species *Geophis nigroalbus* and *Atractus obesus* in Cauca state; and finally the first record for Colombia of the species *Trilepida pastusa*.

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

The involvement of local communities was significant. Many people contributed to us with their knowledge about snakes. In this way we obtained information about the most frequent species in the area, most of common names of the species and mainly the appropriate schedules and places where they have found snakes. Some people were more interested in this topic and accompanied us during the sampling, where he also learned about the methodology used in sampling and specially the handling of equipment as herpetological tongs, GPS and cameras. This kind of practices make that people feel included into the project and are they who will favour that knowledge will not be forgotten in the area and even, that will carried to other people of near rural communities.

During the development of this project three known cases of venomous snakebites occurred: a mild case near to El Rosal sector and two severe cases in other surrounding areas of the park (not included in this project) where unfortunately a person died. Many accidents occur because people have received little or no knowledge about prevention of snakebites added to the complications of cases when bites occur, usually due to practice of not convenient procedures that are also a consequence of to the lack of disclosure about the suitable first aids procedures. As the prevention and first aid of snakebites were included within the topics covered in the environmental education workshops, rural communities of the three areas of the park gained knowledge about these issues which can contribute to decrease the amount of cases or at least the severity when they occur.

5. Are there any plans to continue this work?

Yes. As we mentioned above, within the Parque Nacional Natural Munchique and surrounding areas there are other locations where inhabit some human communities that are also of our interest to develop this same project and thus continue with our objectives about snakes conservation as well as the prevention of snakebites and the improvement of first aid. Moreover, taking in account the

good acceptance of the rural communities at sectors El Condor, El Rosal and La Romelia during the development of this project we see this favorable reception as a great opportunity for further studies of other herpetological groups at these places, because during the search for snakes we recorded a variety of species of amphibians and lizards also, which are even two little known groups at the park.

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

Regarding the data collected in the surveys, we are preparing manuscripts for publication in scientific journals about new records of species of snakes. We will also prepare a publication with the updated list of snakes species which we have compiled throughout our investigations at Parque Nacional Natural Munchique and its hinterlands.

Finally, we are ready to present the results of this research in the context of scientific events such as congresses, conferences, symposia, etc., and to publish the photographs on different platforms related to diversity and the website of Parques Nacionales Naturales de Colombia. We will present a summary of our research in the Primer Congreso Colombiano de Herpetología (November 20th -24th 2016; Medellin - Colombia).

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

The grant was used from September 2014, the date on which they were finally received funds to March 2016, when the results and the produced educative material were delivered to the rural communities. The actual duration of the project was more extensive than initially scheduled due to some difficulties we had (see above). However we properly use the funds to develop and finalise the project in the best way. The budget of some items was lower than expected, which served to cover the cost of others that were not included in the initial budget.

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
Items included in the initial budget				
Transport contract Popayán City - PNN Munchique (all trips).	£1082	£1082	£0	
Rental pack horses (all field trips).	£270	£220	£50	Some trips were made by a horse owned by PNN Munchique
Victuals (food, hygiene items).	£2283	£1790	£493	Costs were initially overestimated. Some non-perishable products were not used in the first trips and were stored, reducing the costs for posterior trips of each sector

Herpetological tongs and hooks. 2 of each one's	£421	£380	£41	We find lower prices for these products
Local guide person. To support field during 90 days	£541	£30	£511	Almost it was not necessary because the field trips was accompanied by staff of PNN Munchique
Headlamps purchase (5).	£70	£70	£0	
Batteries for headlamps	£124	£110	£14	Fewer batteries units were purchased because we did not perform sampling at night at La Romelia sector
Gasoline (7 gal).	£22	£22	£0	
Stationery. Photocopies, printing, banners, label paper, thread, needles, markers, drawliners, pencils, notebooks, etc.	£110	£191	£-81	Cost of the produced educational material was underestimated (posters in high definition and plates)
Medical kit.	£241	£361	£-120	The anti-venom boxes purchased initially were donated to the attention of a severe snakebite case occurred in a surrounding area of the park. We had to buy two new doses.
Chemicals. alcohol (96%), formalin, Lidocaine	£57	£57	£0	
Glass flasks. Specimen storage	£61	£61	£0	
Implements for fixing specimens and preservation. Dissecting equipment, gloves, masks, etc.	£56	£56	£0	
Camera purchase (Nikon D3200)	£331	£394	£-63	The initial reference was changed by other less expensive and easy to use (Canon PowerShot SX510 HS). Considering this, we decided to buy 2 cameras to improve the recording of data. Extra batteries and sheaths for cameras were also purchased
GPS purchase (Garmin 62sc)	£331	£400	£-69	The initial reference was changed by other less expensive (Garmin 62s). We decided to buy 2 GPS.
Items not included in the initial budget				
Discounts for the exchange rate	£0	£392	£-392	The exchange rate imposed by our bank represented a decrease in the initial budget in COP calculated from the representative exchange rate used in the initial budget
Procedures for the research permit	£0	£120	£-120	Includes travel to Bogotá D.C, food and lodging for three days.

External USB hard drive purchase	£0	£92	£-92	Purchase necessary to ensure the storage of data (photos, videos, GPS data, documents)
Stereoscope purchase	£0	£165	£-165	Purchase necessary for taxonomic identification of some specimens
Digital caliper purchase	£0	£13	£-13	Purchase necessary for taxonomic identification of some specimens
Total	£6000	£6006	£-6	

Local exchange rate used: 1£ sterling = 3326.15 COP

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

The first step is to conclude with the analysis of some results of this research especially in taxonomy through the revision of specimens so we can share the information through scientific publications. We are then interested in proposing new research and the search for funding in the first instance to develop this same project in other areas of Parque Nacional Natural Munchique which allow increase the knowledge of snakes and multiply our conservation efforts towards these animals, which are certainly the less protected animals of wildlife. Sharing our results, we intend to motivate other researchers to propose the development of this kind of research that are necessary and beneficial for both wildlife as for rural communities. Finally, we are also interested in starting researches of other groups of animals like amphibians and lizards, of which we see a great potential to study at the park.

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?

The logo of The Rufford Foundation was used in the design of a poster and plate where the current diversity of snakes in the park and its hinterlands is collected. This educational material was delivered within five rural schools, the Museo de Historia Natural de la Universidad del Cauca and offices of Parque Nacional Natural Munchique and Parques Nacionales Naturales de Colombia. The logo was also used in the final report document delivered to various departments of Parques Nacionales Naturales de Colombia under the fulfillment of the obligations of the research permit.

The RSGF received publicity through multimedia presentations in the environmental education workshops. Our benefit with the RSG was shared to colleagues, students and teachers, especially those at the Universidad del Cauca to encourage the realization of other projects. The foundation will have the respective recognition in the dissemination of this research in all exhibitions, conferences, symposia, etc., which can be apply.

11. Any other comments?

We deeply appreciate to The Rufford Foundation for their interest and willingness in the conservation of nature and specially for funding our project through its RSG because without their support we would not have been possible to do. We also thank Santiago Ayerbe MD for all the knowledge he has given us through the years, the whole staff of Parque Nacional Natural Munchique and of course, to local communities of the sectors where this project was carried out for to accept and give us all their support and affection.