Final Project 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.

Complete the form in English and be as concise as you can. Note that the information may be edited before posting on our website.

Please email this report to jane@rufford.org.

Your Details	
Full Name	Viviana Márquez Velásquez
Project Title	Evaluation of ecological function of freshwater stingray *Potamotrygon magdalenae* on a trophic food web of the Colombian Andes
Application ID	18238-1
Grant Amount	£4450
Email Address	viviomar@gmail.com
Date of this Report	June 29 2017

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
Periodic collection of data				Data were collected from June 2016 onwards.
To evaluate ecological role of the freshwater stingray *Potamotrygon magdalenae* through isotopic analysis, fatty acid and topological index				Fatty acid analysis could not be performed it because samples were damaged during shipment.
To assess the importance of the species in the structure and stability of the food web of this ecosystem.				Topological analyses were conducted to identify the importance of the *P. magdalenae* (and the other fish species) in the structure and stability of the food web of the Magdalena River.
Presentations of findings/results				Preliminary and final findings from this project were presented to the University Federal of Paraiba, (Brazil), university where I developed my master project; and to the Squalus Foundation, Colombian Foundation for research and conservation of sharks and rays in Colombia. A poster was presented in the Colombian meeting of Chondrichthyes at the Pontificia Javeriana University, Bogotá, Colombia. A poster was presented at the Brazilian meeting of ichthyology in Bahia, Brazil.

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

The main difficulty that we faced was the climatic phenomenon "El Niño", which generated a great decline in the country's fisheries, and mainly brought months of dry spell, generating critical low water levels of the rivers throughout the region, and consequently, atypical isotopic signals. However, RSG kindly gave us 6 more months to successfully complete all analyses.

The analysis of fatty acids could not be performed because the samples were damaged in the shipment to the laboratories.

Unfortunately, the conditions of the sampling location of the lower river basin (floodplain Lake Malambo) were not the best, showing a low fish diversity. After the severe drought of the "El Niño" phenomenon, the area did not recover sufficiently with respect to its fish fauna, and in addition, the environment was severely affected. However, due to the difficulty in accessing to this area, it was not possible to change the sampling location.

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

a) We assessed the role of *P. magdalenae* in shaping community structure of Magdalena river basin, Colombia, building a trophic network based on interspecific trophic relationships and applying local and meso-scale network indices. *P. magdalenae* was identified as a secondary consumer of intermediate trophic level. Although the batoid fishes are considered meso-predators that provide an important links between the top predators and the lower trophic levels, this species possibly displays an exclusive role of predator in the ecosystem, because no natural predators have been recorded. We found that *P. magdalenae* play an important ecological role in top-down control in each portion of the basin, and in propagating direct effects through the system owing to medium-high values of the node degree, centrality and topological importance indices, and therefore, its loss or elimination would affect the dispersion of direct effects within the network.

b) Detritus in the mid and lower portion of the basin had higher connectivity and topological importance in the networks, suggesting that its structure could be governed mainly by the bottom-up control mechanism. This type of control in the tropical rivers trophic networks have been identified in several studies, being considered the detritivority-based ecosystems like a more stable system, both in terms of energy flow and in the dynamics of their predators. Conversely, in the upper portion, in a dam system, fishes had higher connectivity and topological importance.

c) In relation to the isotopic analysis, *P. magdalenae* occupied medium trophic positions in the trophic networks in the upper and middle portions of the basin, and a high position in the lower portion, indicating different ecosystem roles in each system. It also showed differentiated carbon isotopic signals, indicating that the carbon sources that sustain its biomass differ mainly in the reservoir system (high portion) and in the river channel (medium portion).

Our results represent an initial vision of the system, evaluating the participation of the endemic freshwater stingray *Potamotrygon magdalenae* and other various species in the structure of the Magdalena basin's aquatic communities, where ecosystems are mostly impacted by pollution, overfishing, hydraulic interventions and introduction of invasive species.

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

Local communities were the main contributors to the project, accompanying the development of work. They allowed us to carry out the research in each zone and the approach to the whole community. They also indicated the sites of catches of the species, and participated in all samplings. Each sampling was used to show them the importance of the species in the river.

5. Are there any plans to continue this work?

Our plan is to continue this research, for monitoring the changes in the ecological roles of *P. magdalenae* and the other fish species and of the energy flows of the ecosystem, in relation to the drastic climatic changes that this region experiences and in relation to the different impacts that the basin suffers constantly, like as the constructions of dams, pollution, and human activities.

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

In March 2017, the results of this project were presented at my Master's defence in Federal University of Paraíba (UFPB), Brazil.

The other hand, we are planning to share the results of our work with others, publishing them in scientific journals and divulge through oral presentations in scientific conferences or meetings, such as the Sharks International Conference, an important event of elamobranch research, to be held in Joao Pessoa, Brazil, in 2018.

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

The funding was timely and was fully used for the whole project duration as per the work plan. So, all proposed activities in the field were carried out without problems. However, RSG gave us 6 months more for completing the project, postponing the field sampling to June 2016 (not from February, as it had initially been planned) and consequently also postponing the isotopic analyses. This situation was due to the fact that from 2015 Colombia was affected by an atypical climatic event, El Niño, which caused an intense drought, remaining in the range of strong intensity during the first quarter of 2016 and causing the decline of fisheries along the Colombian rivers, and as a consequence for my project, the isotopic signal would be atypical.

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
Accommodation and food in sampling area (x 40 days)	1290	0	0	All planned field sampling (40 days in total) were carried out and 100% of the money destined for the accommodation and food in the field was executed.
Rent-fishing boat (x 32 days)	2000	0	0	100% of this item was executed during the field sampling.
Assistant (fisherman) to take field samples (x 40 days)	600	0	0	The 40 days of sampling with the help and assistance of local fishermen were made, executing 100% of this budget.
Rental freezers in field (x 40 days)	340	0	0	In the sampling locations, the fishermen rented the freezers to us, to preserve the tissue samples in the field. 100% of this item was executed.
Sending the samples to laboratory (x4)	215	0	0	All the samples were sent to laboratory of California Davis (The Stable Isotope Facility, SIF). 100% of this item was executed.
Total	**4450**	**0**	**0**	*Rate of conversion from Colombian local currency (COP) to Pounds, when the application was made: 0.0002*

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

The important next step is to show the final results to the local community of fishermen and to the community in general, through participation in scientific events and publications in high impact scientific journals. Also, is so important to participate in workshops to update of PAN-Sharks Colombia (National Action Plan Conservation and Management Sharks, Rays and Chimeras).

The other hand, continue joining efforts in the field of the conservation of the freshwater stingrays and the ichthyofauna of the most important fluvial artery in Colombia, trying to get more funds to include more sampling location, more trophic components, temporal analyses, and the fatty acid analyses, that allow a more detailed analysis of the dynamics of the system and thus complement the

management measures for the species. Also is so important to include and examine how ontogenetic dietary changes of *P. magdalenae* and the other fishes affect the trophic roles in the freshwater tropical networks.

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?

All the material produced in relation to this project showed the RSGF logo: presentations, posters and reports.

First, in all the presentations realized in the University of Paraíba, Brazil, when was developed the master's study with this project.

Second, I had the opportunity to attend to the Colombian meeting of elasmobranchs in Bogotá, Colombia (October 2016), when this work was selected like one of the best poster of the meeting (attached certificated). Also, we attend the Brazilian Meeting of Ichthyology, in Porto Seguro, BH, Brazil (attached certificated), where we received positive comment and new ideas to complement this research.

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

12. Any other comments?

RF is a great organisation that allows and stimulates research in young people from countries with great biodiversity but with very limited financial resources from the government and research institutions, thus generating incentives for future generations of researchers.

We would like to thank RF for the great financial support, and we hope to have again the RF support for continue with this project, to continue working for the freshwater stingrays and bony fish conservation in Colombia and South America.

FUNDACIÓN COLOMBIANA PARA LA
INVESTIGACIÓN Y CONSERVACIÓN DE
TIBURONES Y RAYAS
SQUALUS

Santiago de Cali, abril 3 de 2017

CONSTANCIA

A QUIEN PUEDA INTERESAR

Por medio de la presente me permito certificar que el trabajo “Evaluación de la función ecológica de *Potamotrygon magdalenae* (Chondrichthyes: Potamotrygonidae) en una red trófica del río Magdalena”, presentado por la bióloga Viviana Márquez, fue evaluado por tres miembros del comité científico del V Encuentro colombiano sobre condrictios (VECC) y fue premiado como uno de los 10 mejores trabajos en la modalidad POSTER.

El Comité científico del VECC estuvo conformado por investigadores de Australia, México, Brasil, Venezuela, España, y Colombia,y el evento se llevó a cabo en la Pontificia Universidad Javeriana de Bogota entre el 24 y el 28 de octubre de 2016.

Sin otro particular, y presto a resolver cualquier inquietud al respecto

Atentamente

ANDRÉS FELIPE NAVIA, Ph.D.
Director

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Ata da 289ª Apresentação e Banca de Defesa de Mestrado de Viviana Márquez Velásquez

Ao(s) vinte e dois dias do mês de março de dois mil e dezessete, às 14:00 horas, no(a) Sala do PPGCB, da Universidade Federal da Paraíba, reuniram-se, em caráter de solenidade pública, membros da banca examinadora para avaliar a dissertação de mestrado de **Viviana Márquez Velásquez**, candidato(a) ao grau de Mestre em Ciências Biológicas. A banca foi composta pelos seguintes professores/pesquisadores: **Dr. Ricardo de Souza Rosa (Orientador), Dr. Ronaldo Bastos Francini-Filho (titular), Dr. Rafael Luís Galdini Raimundo (titular) e Dra. Rosângela Paula Teixeira Lessa (titular).** Compareceram à solenidade, além do(a) candidato(a) e membros da banca examinadora, alunos e professores do PPGCB. Dando início à sessão, a coordenação fez a abertura dos trabalhos, apresentando o(a) discente e os membros da banca. Foi passada a palavra para o(a) orientador(a), para que assumisse a posição de presidente da sessão. A partir de então, o(a) presidente, após declarar o objeto da solenidade, concedeu a palavra a **Viviana Márquez Velásquez**, para que dissertasse, oral e sucintamente, a respeito de seu trabalho intitulado **"Avaliação da importância ecológica da raia *Potamotrygon magdalenae* (Chondrichtyes: Potamotrygonidae) numa rede trófica dos Andes Colombianos".** Passando então a discorrer sobre o aludido tema, dentro do prazo legal, o(a) candidato(a) foi a seguir arguido(a) pelos examinadores na forma regimental. Em seguida, passou a Comissão, em caráter secreto, a proceder à avaliação e julgamento do trabalho, concluindo por atribuir-lhe o conceito APROVADO. Perante a aprovação, declarou-se o(a) candidato(a) legalmente habilitado(a) a receber o grau de **Mestre em Ciências Biológicas**, área de concentração **Zoologia**. Nada mais havendo a tratar eu, **Dr. Ricardo de Souza Rosa**, como presidente, lavrei a presente ata que, lida e aprovada, assino juntamente com os demais membros da banca examinadora.

João Pessoa, 22/03/2017.

Dr. Ricardo de Souza Rosa (Orientador)

Dr. Ronaldo Bastos Francini-Filho (titular)

Dra. Rosângela Paula Teixeira Lessa (titular)

Dr. Rafael Luís Galdini Raimundo (titular)

Ciente do Resultado:

Viviana Márquez Velásquez