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	Nohelia Esperanza Farías Curtidor
Project title	Diagnosis of distribution, ecotoxicology, and conservation threats of small cetaceans in The Guajira
RSG reference	23333-2
Reporting period	November 2017 – November 2018
Amount of grant	£5000
Your email address	nohefa@yahoo.com
Date of this report	December 10th 2018

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
Environmental education with local communities				We conducted environmental education with local people, mainly fishermen. We did workshops with them talking about our preliminary results from last year, and our conservation initiative. Furthermore, we had a meeting with the local environmental corporation CORPOGUAJIRA, in which we could present our preliminary results, highlighting the importance of La Guajira for dolphins. They are the most important local environmental authority, and we established with them a good link to collaborate in the development of future management plans.
Data collection about distribution of small cetaceans, photos, skin samples, and collection of muscle tissue from fish.				We conducted a fieldtrip during May and June 2018. We followed 40 transects in zig zag around the cost, each one with 20 nm of distance from the shore. We recorded ten sightings of three dolphin species: common dolphin (*Delphinus* spp.), bottlenose dolphin (*Tursiops truncatus*) and spotted Atlantic dolphin (*Stenella frontalis*). From three fishing localities, we also collected muscle tissue samples of fish that are considered potential prey for dolphins and part of local community diet, in order to assess ecotoxicological status of both prey and top predators.
Built a photo-ID catalogue of dolphins.				We could identify some individuals using photos that we took during this field trip and comparing with photos collected in previous years.
Determine mercury concentrations in				We conducted ecotoxicological analysis of skin samples from wild

dolphins and fish.				dolphin species and seven coastal fish species collected in La Guajira, including snappers, beltfish, triggerfish, among others. Toxicological findings indicated that both dolphins and fish are bioaccumulating mercury in their tissues. Fish showed lower mercury concentrations, but this element is biomagnifying in the food chain, so dolphins as top predators showed highest concentrations. Preliminary risk assessment indicates a potential health risk on dolphins in the long term by fish consumption.

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

We had two unforeseen difficulties. The first one was that when we arrived to conduct the environmental education with schools, they had special activities during our stay in the field, so it was impossible to work with local children. Despite of this, we focus on working with local people and mainly fishermen, who showed interest in the workshops and our project findings.

The second difficulty was related on weather conditions that hindered sampling. Particularly one day that we were in the field, we were around 18 nm away from shore in the north part of the area and the weather changed dramatically from Beaufort scale two to five. The sea was very rough and the wind strong; thankfully our captain is very good and has a lot of experience at sea, so we could return to shore safely. But we are going to be more carefully next time in that part of the survey area, we are not going so far from shore again. Consequently, we could not collect data in the northern portion of La Guajira. For next field trips, we plan to start from north to south in order we can collect data in this unexplored area.

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

1. CORPOGUAJIRA is the most important local environmental authority, and we established with them a good link to collaborate in the development of future management plans. The results of the meeting were positive, and it is possible that we can work together in the long-term on conservation of cetaceans, ecosystems, and local communities. Although we need to collect more data, our preliminary findings indicate that La Guajira is an important transit area for dolphins, so one of our long-term goal is propose this region as an IMMA (Important Marine Mammal Area) or protected area. The link with CORPOGUAJIRA is very important to work in the creation of this protected area in the long-term.

2. Preliminary analyses using the photo ID – catalogue, we found some recaptures in some species. For instance, we observed the same individuals for common dolphins and spotted dolphins, in different years. We highlight these results because although dolphin species did not show high philopatry to La Guajira, it is possible that this is an important area for feeding and transit for dolphins, because this region provides a good food source because is influenced by local upwelling during all year.

3. Toxicological findings indicated that both dolphins and fish are bioaccumulating mercury in their tissues. These results have important implications for health, mainly because fish are an important food source for local people. Although mercury concentrations are low, and risk assessment shows a marginal risk, it is needed to evaluate more prey and other organic pollutants related to coal mining industry and port activities, in order to evaluate the real impact of pollution on dolphins and humans in this area.

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

The involvement of local community is one of the most important outcomes of our project. First, we are helping to local economy, because we are creating direct and indirect jobs; for instance, to the captain and his assistant, the women who cook our meals and the people who rent us rooms to spend the night.

Second, the workshops with fishermen are having positive results, because they are learning more about dolphin species that they can find at sea, about the garbage management and the different techniques that we are using in our researchers. Similarly, the link with CORPOGUAJIRA is very important to create a management plan related to garbage manage in the region, which would be very useful for environmental conservation in La Guajira.

Toxicological findings can create awareness in local community about pollution in La Guajira. Our plan for next year is show these results to local community and CORPOGUAJIRA in order to manage this pollution situation in the area.

5. Are there any plans to continue this work?

Yes, continuation of this work is fundamental for developing of a protected area in La Guajira. As dolphins are frequent in the area, and they are useful as sentinel species to assess health status of local environment, we plan to continue with this research, in order to conduct an annual monitoring of small cetaceans in the area. Similarly, we plan to continue with pollutant monitoring in dolphins and fish, in order to provide accurate findings related to health risk to pollutant exposition. These analyses are needed to extrapolate to humans, and so we can assess health risk in the local community.

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

We have shared our preliminary findings in workshops and talks with local communities and authorities in La Guajira. Additionally, our findings are always presented in several conferences. Next year, we plan to present our findings during the Rufford Conference 2019 in Galápagos (Ecuador), the 5th International Conference on Marine Mammal Protected Areas in Mesinia (Greece), and the 2nd World Marine Mammal Science Conference in Barcelona (Spain). Furthermore, we are collaborating with Caribbean researchers and we shared with them dolphins' occurrence data to conduct distributional analyses and publish the manuscript "Ecological niche modelling of three species of *Stenella* dolphins in the Caribbean Basin, with application to the Seaflower Biosphere Reserve" in the Frontiers Marine Science Journal.

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 Rufford Foundation grant was use during around 8 months since we started field work on May 2018, and total period included both fieldtrip and laboratory work. The length of the project was the same than we proposed initially.

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
GPS	270	270		Same cost because we already have this equipment.
Echo sounder	209	209		
Aquatic camera GoPro Hero3+	202	202		
Digital camera	172	172		
2TB Hard Drive	65	65		
Digital camera Canon T2i	234	234		
Camera zoom lens 75-300mm	135	135		
PAXARMS rifle	5082	5082		
Laptop	670	670		
Flights Bogotá – Riohacha (2 people – roundtrip)	400	500	100	The flights were more expensive than expected due to changes in local currency.
Local transportation	160	200	40	The local transportation was more

				expensive because we needed to go to a place that we didn't plan.
Food for 15 days (4 people)	1200	1200	200	The price in the food was more expensive than expected.
Lodging for 15 days (4 people)	400	400	350	The prices in some hotels were more expensive than expected.
Field trip (boat, captain))	3000	3300	300	The fuel was more expensive than expected due to changes in local currency.
Environmental educational material for children	490	490		Same cost
Mercury analysis	860	860	300	Mercury analyses were more expensive because we collected more fish samples than we have planned initially.
TOTAL	**13749**	**14189**	**1290**	Exchange rate was consulted at: for June 29th, 2017, one (1) British Pound (GBP) equals 3,961 Colombian Pesos (COP).

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

The important next steps are to continue with environmental education with the fishermen and the schools, and maintain the link with the local environment authority.

To continue the annual monitoring of the small cetaceans in the area, taking more data like photos, distribution information and skin samples of the dolphins. This information is needed to increase our knowledge of the species present in the area and propose this region as a potential IMMA.

The toxicological analysis is very important as well, so we plan to continue monitoring pollutants to assess if the mercury concentration increases, and we plan to include this analysis with the local community as well.

Furthermore, we will try to go further to the north-western area, where we haven't been because the weather has been very rough, but we consider this area holds species that we haven't report in the south part of La Guajira.

And finally, as a long-term goal, we want to find a way to mark dolphins to assess movements and distributional patterns of dolphins in the area this is a long-term goal

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

Yes, we used the Rufford Foundation logo in the power point presentations that we conducted with the fishermen and CORPOGUAJIRA Corporation. We put the logo as well in the material that we gave to the fishermen (identification dolphin's guide). Additionally, we used the logo on our t-shirts and those that we gave to our captain and assistant.

In the manuscript "Ecological niche modelling of three species of *Stenella* dolphins in the Caribbean Basin, with application to the Seaflower Biosphere Reserve" submitted to Frontiers in Marine Science, we acknowledged to the Rufford Foundation by support Nohelia Farías Curtidor's collection data in La Guajira.

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

Nohelia Farías Curtidor: I was arranging travel logistics, doing the workshops with the fishermen and the environmental corporation CORPOGUAJIRA. Furthermore, I took photos for the photo-id catalogue. Likewise, I collected muscle samples fish during the field and I prepared samples to conduct ecotoxicological laboratory analyses. I did the link with other researchers in the Caribbean to conduct modelling analyses and to share our preliminary ecotoxicological findings.

Cristina Jiménez Pinedo: She supported the field work, mainly during the workshops. She did the link with local communities to conduct outreach activities. She also supported in dolphins skin samples collection and muscle tissue of fish as well. She prepared samples to conduct e ecotoxicological laboratory analysis.

Roger Ayala and his assistant: He was driving the boat and his assistant cooked the lunch onboard during the field trip. He knows the best way to get close to the small cetaceans' groups, so his support was the key to samples collection. Indeed, he also supported us in dolphin's samples collection.

12. Any other comments?

We want to thank to The Rufford Foundation for supporting our project twice and believe in our goals. We hope that the Foundation can support us in future projects in order we can achieve the long-term goals related to management and proposition of La Guajira as an important area for dolphins.