

## Final Project Evaluation Report

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Your Details	
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<b>Project Title</b>	Community-based Conservation of River Turtles
<b>Application ID</b>	25238-1
<b>Grant Amount</b>	£ 5,000
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<b>Date of this Report</b>	06/29/2019

**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
Training of spawning beach protection agents				The training was conducted during the 1st Community Conservation Workshop of Chelonia in July / August 2018. About 25 people from eight communities of MSDR participated.
Protection and data collection of spawning beaches				Eight spawning beaches were protected and about 100 people were directly involved in the protection, data collected were: number of nests per species and hatchlings returned to nature.
Collect biological data				Data collection was done by researchers at Horizonte Beach and the data collected were number of females caught, morphometry of females and number of nests per species, number of nests transferred, number of hatchlings returned to nature and hatching success.
UAVs aircraft test				It was carried out in the last week of September 2018, when the water level was low, with WWF-Brazil partnership.
Conduct environmental education activities				In October 2018, the beach was cleaned in each participating community, involving approximately 245 people. In December 2018 and January 2019, hatchling release events also involved 314 people.

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

The difficulty in catching chelonians away from protected areas causes monitored sites to suffer frequent invasions. These invasions occur either by people from nearby towns or communities or by the community members themselves who are guarding the beach, creating a serious conflict of interest. Despite environmental education efforts and informal conversations, not all community dwellers are willing to contribute to conservation, and the predation of nests, females and offspring of protected beaches has caused inconsistencies in data collection. For the damage to be minimised, meetings were held with the Municipal and State Department of Environment to oversee the area. In addition, MSDI also aided from Volunteer

Environmental Agents for this monitoring. Even with the aid received about 17% of the nests were predated by humans.

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

From July 30 to August 1, 2018, the First Community Conservation Workshop of Chelonia in the city of Tefé-AM (03°21'15 "S; 64°42'41" W) was held, where eight communities participated, and 24 volunteers were trained for the protection of spawning beaches. The communities involved were: Novo Horizonte (2 ° 45'35.51 "S, 65 ° 14'57.11"W), Porto Braga (2 ° 45'57.59"S, 65 ° 21'03.53"W), Camador (2 ° 45'57.59 "S, 65 ° 21'03.53"W), São Raimundo do Panauã (2 ° 23'34.81"S, 65 ° 15'34.91"W), São Francisco do Bóia (2 23'48.67 "S; 65 ° 13'38.84"W), Novo Pirapucu, Novo Tapiira (3 ° 03'05.47"S, 64 ° 46'53.03"W) and Caburini (3 ° 09'51.65 64 ° 46'43.43 ° W;).

From August 2018 to January 2019, the spawning beaches of these communities were monitored by the volunteers and about 100 people from the communities were directly involved in this work. They were provided with field material, such as: lantern, canvas, mosquito net, boots and helmets, as well as the collection of data on the number of nests and hatchlings. To assist them, the researcher was visited monthly to clarify doubts and follow the work of the community.

Through these completed records, 558 nests of the genus *Podocnemis* were counted in these eight protection beaches, according to the table below:

TABLE 1: Number of nests of three *Podocnemis* species recorded on protected beaches by trained community members.

Community	Nests		
	<i>P. sex</i>	<i>P. uni</i>	<i>P. exp</i>
Novo Horizonte	76	39	16
Novo Tapiira	75	0	1
Novo Pirapucu	23	3	0
S. F. do Bóia	24	5	4
Porto Braga	65	8	19
Camador	91	3	16
Caburini	6	25	0
S. R. Panauã	54	5	0
<b>Total</b>	<b>414</b>	<b>88</b>	<b>56</b>

The difference of nests found in some beaches does not reflect the lack of community effort in the protection but can be associated to the conditions of the spawning site, such as the type of granulometry, height of the beach in relation to the river and presence of boiadouros (Ferreira Jr and Castro, 2006).

The data collection carried out by researchers occurred only in Horizonte beach with the help of community members from the Novo Horizonte community. This beach has already been used for this type of study for some years and has been the largest beach in size and number of spawns during this time. In the spawning season of 2018, 14 females were captured, being eight of six-tubercled, four of yellow-spotted and two of giant South American. These animals were measured, marked and returned to nature. The carapace length (CRC) and mass means are in the table below.

TABLE 2: Mean length of CRC (carapace length) and Mass of females captured by researcher in Horizonte beach.

	<i>P.sex</i>	<i>P.uni</i>	<i>P.exp</i>	N
<b>CRC</b>	28.71±1.57	40.8±1.29	81.1±11.74	14
<b>Massa</b>	2.63±0.49	8.42±1.17	34.0±1.41	14

In relation to hatching success, the following averages were recorded:  $81.63 \pm 28.58$  for *P. sextuberculata*,  $81.75 \pm 33.53$  for *P. unifilis* and  $84.48 \pm 7.47$  for *P. expansa*. All data were analyzed using free software RStudio version 1.2.1335 of 2019.

The drone model used was the Phantom 4 DJI with GoPro Hero camera coupled. The tests were done during the hours of 11.00-14.00, because of the perpendicularity of the sun's rays and less shading of the area, and the heights tested were 100 m, 50 m, 30 m, and 20 m. In addition to the mapping of spawning grounds, filming of the entire length of the beach was also performed at an altitude of 100 m. The mapping was done with 80% of overlap between the captured images, in order to improve the quality of the mosaics. During the tests, about 3000 photos were taken, of which 12 mosaics (overlapping the photos for single generation) were made using the free-running DroneMap Pix4DMapper software for 15 days. Through observation of the photos, it was possible to identify both the nests and traces of the females that had spawned the night before and the wood pickets of old nests, and for photos and videos of 20 m altitude this observation was more accurate, even with the presence of birds that attacked the drone. However, when these photos were converted into mosaics, they became less clear, probably due to the overlap of 80% between them. The UAV test proved to be unsatisfactory in terms of nests counting in the mosaics, since this conversion is necessary, not the photo-to-photo analysis, since the number of photos to be analysed would require a lot of time. More tests need to be done so that the overlap area of the photos can be corrected. In addition to assisting in the counting and checking of the count made by protection agents, this methodology will allow access in areas that cannot be verified on foot. The verification of the counting made by the agents will allow the data to become scientific and publishable, being more accurate for conservation programmes.

#### **4. Briefly describe the involvement of local communities and how they have benefited from the project**

The protection of the nesting areas of the chelonians was a demand of the communities themselves in 1996, where they requested the help of MSDI researchers to increase the populations of these animals that were declining in the area. Since 1998, community members together with researchers have been doing a study to improve the ways of protecting beaches and other spawning grounds. The activities of environmental education and training of beach agents have never stopped at this time and more and more communities have accepted the works and if related to them. Community conservation works, besides informing and conserving the species, generate greater involvement among the residents of the riverbanks and the environment where they live, learning that although the resources are theirs, they still need to withdraw them in a sustainable way. When they themselves do this kind of work, the feeling of belonging is created. Sustainable management of chelonians has always been an activity dreamed up by the communities, but there was still no legislation to support the trade in animals taken from nature. In 2017, a State Normative Instruction (No. 26) came into effect, releasing to the communities of Conservation Units of Sustainable Use the commercialisation of this resource, once it has had at least 5 consecutive years of conservation work on spawning grounds and a responsible technician. This newness has generated greater will of the community, because now they can see an ideal and make them collect the data with greater responsibility

#### **5. Are there any plans to continue this work?**

Yes, the work of community conservation of spawning beaches is a continuous activity that not only favors the populations of studied chelonians and the environment, but also generates knowledge to the riverside inhabitants and can be a source of future resource. This activity has always had national funding, but with the problem of the country's financial crisis, it has been supported by international funding. That is why we would like to call for the continuation of this Rufford project. In addition, it is necessary that more tests using the UAVS be made. This method of conservation is very promising and will help in the protection of spawning beaches.

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

The results were and will be shared in two ways: with the community and scientifically. On June 24th and 25th 2019, the 2nd Community Conservation Workshop of Chelonians was held, where community members, trained in 2018, were able to present the results of the last reproductive period and evaluate the work on positive and negative points.

Regarding the media disclosure, follow the links:

<https://g1.globo.com/am/amazonas/noticia/2019/01/13/pesquisadores-testam-drones-para-monitorar-ninhos-de-tartarugas-em-praias-da-amazonia.ghtml>

<https://www.mamiraua.org.br/pt-br/comunicacao/noticias/2019/1/7/pesquisadores-testam-drones-para-monitorar-ninhos-de-tartarugas-em-praias-da-amazonia/>

<https://www.mamiraua.org.br/noticias/instituto-mamiraua-realiza-soltura-de-filhotes-de-tartarugas-na-amazonia>

In a scientific way, two abstracts will be presented entitled "The use of unmanned aerial vehicles (UAVs) in the count of nests of Amazonian chelonians: a possible conservation method" and "Evaluation of the Community Conservation System of the nesting areas of chelonians in the Reserve of Sustainable Development Mamirauá, Amazonas, Brazil "at the 16th Symposium on Conservation and Participatory Management in the Amazon that will take place between 3rd and 5th July 2019 in the city of Tefé - AM.

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

All the available resources were used until the end of the reproductive period of the chelonians, that is, from June to December 2018. From January to June 2019 there was no expenditure of financial resources, since this period was used for data analysis. In the reproductive period of 2018, we also had another source of resource and in this way, we were able to do a more complete work, mainly with the organization of the Workshops.

**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.**

Two items that were not in the budget requested from Rufford were added: Bank tax and media fees. In the budget, the exchange rate was set at £ 1 = £ 4.6, but the bank's exchange rate was £ 1 = £ 5,028. In the "Actual Amount" column in the table below, the amounts spent are entered.

Item	Budgeted Amount	Actual Amount*	Difference	Comments**
Fuel	824	2,006	+1,182	The fuel item was consumed in greater quantity due to the need for beach surveillance. The media value was used to make a banner for congress and shirts for the field work, once photographed.
Meals	2,000	1,572	-428	
Field assistant	2,000	1,189	-811	
Ticket boat to base	176	84	-92	
Bank tax		109	+109	
Media		39	+39	
<b>TOTAL</b>	<b>5,000</b>	<b>4,999</b>	<b>-1</b>	

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

The next steps are the search for new resources for the continuation of the community conservation works of spawning beaches of chelonians, assisting the community and increasing the stocks of the species of the genus *Podocnemis*, for a future sustainable management.

**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?**

Four field shirts were made with the Rufford Foundation logo and in all the releases there was also the mention.

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

<b>Member</b>	<b>Activity</b>
Marina Coelho Cruz Secco	Coordination, budgeting, execution, analysis and writing.
Cristiane Gomes de Araújo	Execution, analysis and writing.
Cássia Santos Camillo	Writing and scientific support.
Robinson Botero-Arias	Scientific support and research program coordinator
André Giovanni	Technical work and drone analysis
Marcelo de Oliveira	Partnership and resource WWF-Ecodrones

**12. Any other comments?**

The continuation of the work is necessary, but with the economic crisis of the country, we need external investment. In this way, we are interested in continuing the Rufford Foundation partnership. Without this resource, we cannot help the coastal residents in the activities of protection of beaches and without this help the works will not be realised.



Photo 1: Environmental Education at School



Photo 2: Beach cleaning day.



Photo 3: Measurement of chelonians.



Photo 4: Exemplary of Giant South American.



Photo 5: Test with drone.



Photo 6: Release of hatchlings.