

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	Ahmed Mohamed Shawky Mohamed El-Sadek Daoud
Project title	Effect of tourism activities on the behavioural ecology of <i>dugong dugon</i> inhabiting Marsa Alam, Red Sea, Egypt.
RSG reference	21354-2
Reporting period	April 2017 – April 2018
Amount of grant	£5000
Your email address	Ahmedshawky_7@hotmail.com
Date of this report	24/4/2018

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
Identify the different behavioural categories of the dugong in Marsa Alam area.				Dugong behaviour was represented as time budget for eight behavioural categories; feeding, travelling, surfacing, resting, rolling, approach, fleeing and playing with a green turtle.
Calculate the time budget of each behavioural category for Marsa Alam dugongs generally and select the most common individual to calculate it for each separately. The dive cycle will also calculate.				Time budget was calculated for three common dugong individuals at Marsa Mubarak, Marsa Abu Dabbab and Marsa Eglā. Dive cycle data varied among individuals. Dugong focal follow lasted from 0 min 15 second to: 20 min 13 seconds. Dive depth ranged from 1–18m. Submergence intervals ranged from <3–250 seconds. The overall mean surface interval was 2.5±<1 seconds. The overall mean dive rate was approximately 43 complete dive cycles per hour.
Assess the tourism impacts on the presence and behaviour of the dugong in each site.				Dugong at Marsa Abu Dabbab recorded more fleeing (2%) than that of Marsa Mubarak (0.3% and Marsa Eglā (0.1%) respectively. Marsa Abu Dabbab is a small bay and has three resorts located along the beach. Also, six inflatable speedboats are active in the day for diving and searching for dugong. All these activities didn't let the dugong stay more time in the area during the day. On the other hand, the snorkelers and inflatable boats were recorded mainly with less than 10 m away from the dugong.

			Using interview survey with tourists before and after dugong watching tours, I found that their knowledge is limited and need more awareness.
Assess the presence of dugong, density, and habitat in Marsa Alam.			Feeding ecology of dugongs was studied at three sites in Marsa Alam; Marsa Mubarak, Marsa Abo Dabbab and Marsa Eglā. Description of seagrass habitat, feeding trails dimensions, trails abundance, amount of seagrass removal from the feeding trails and effects of grazing intensity on seagrasses species composition were investigated. Dugong fed mostly on low and moderate seagrass biomass on a sandy bottom in depths ranged from 1–9 m. The highest density was recorded in Marsa Assalaya (4588±421, SE) while the lowest was in Marsa Mubarak (1464±151). <i>Halophila stipulacea</i> and <i>Halophila ovalis</i> were the most dominant species in Marsa Assalaya (2232±454; 2024±572, respectively). Dugongs were leaving feeding trails with the length of 3.2±1.4m and width of 17.2±4cm. The density of feeding trails was the highest in Marsa Abu Dabbab (2±0.2) and the lowest in Marsa Mubarak, (1.2±0.1). Dugongs fed on 88% of seagrass shoots that were grazed along the feeding trails. The maximum was recorded in Marsa Assalaya and the minimum in Marsa Abu Dabbab (4110 shoots/m ² , 92%; 1775 shoots/m ² , 89%) respectively.
Determine the total number of dugong individuals in Marsa Alam area using Photo ID technique.			Along the 14 sites surveyed in Marsa Alam, a total of 16 individuals were sighted (12 males, two females and two calves).

<p>Prepare a catalogue for the different identified Dugong individuals including movements and re-sighting among the different sites.</p>			<p>I prepared a final catalogue for all identified dugong individuals in this project and that of the previous project, where I listed a total of 30 individuals. For Marsa Alam region, out of the 16th identified dugongs, only seven were seen moving along its different sites. The individual with the least movement travelled a distance of 3 km while that with largest movement travelled 36 km.</p>
<p>Outline for Dugong Conservation Awareness Specialty Course from PADI.</p>			<p>The outline approved by PADI and now I'm Dugong Conservation Diver Specialty Instructor and authorised to teach it and certify the divers.</p>
<p>To come up with an action plan for in situ conservation of this species for some sites like Marsa Mubarak and Marsa Abu Dabbab (i.e. other sites may be included).</p>			<p>I was starting to write the first draft of the management plan.</p>
<p>Increase the number of "The Egyptian Dugong Team" concerning for dugong conservation, monitoring, research, and education.</p>			<p>Only five new members were increased but didn't take the full knowledge and training in the field work as I planned.</p>
<p>Raise awareness of tourists, dive guides, snorkeler's guides, local communities, universities, NGO's and design maker to better understand the conservation status of the target species and act in support of plant conservation efforts.</p>			<p>Not many as I planned before.</p>

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

The most difficulties are The Egyptian Pound devaluation or floating exchange rate or floating currency where the rate of currency exchange that has been floating so that its effects on increasing the price and fees of everything here in Egypt. The dive trips, renting speedboat and cars increased than I planned before. In this case, I didn't perform some aspects of printing posters or t-shirts. Also, I decreased the number of training new individuals for Egyptian Dugong Team (EDT), because it was needed more money for transportation and accommodation.

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

- 1) Identify and calculate the activity budget of eight different behavioural activities of dugong; feeding, travelling, surfacing, resting, rolling, fleeing, approaching and playing with a green turtle. In this project, feeding was the behaviour in which individuals spent most of their time doing.
- 2) Identification of 16 dugong individuals with their specific characteristics of reliable notches in different sites of Marsa Alam and listed in a catalogue. Constant observation and follow up of the 16 identified individuals using Photo ID is vital to assess the status of these mammals in the presence of tourist activities. I suggest the continued use of this technique in other sites and regions like Qosseir and Safaga that located north of Marsa Alam. None of the total identified of 30 dugongs was observed moving to or from Wadi El Gemal National Park and Marsa Alam. It is the first accurate number of the population size of dugong in the western coast of the Egyptian Red Sea.
- 3) The outline of Dugong Conservation Diver Speciality Course that approved by PADI and now is ready to teach for each diver worldwide.

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

The local community (Bedouin) were involved in a part of the project activities like questionnaire survey, where I conducted 88 interviews mainly with the fishers and boat captains. Some local peoples guided us to a special site that recorded the dugong always.

Conservation and environmental awareness to locals took place within this work especially to dive and snorkel guide, fishermen, boat captains and children.

Further education will strongly require local participation in conservation efforts and dugong monitoring.

5. Are there any plans to continue this work?

Yes, I am planning to submit a proposal for the Booster Grant from Rufford to continue the work in Marsa Alam Area. I'm going to plan to analysis the feeding trails that provide evidence of the number of dugongs excavating seagrass at key habitat at different times of the year. In this project, dugongs' size and their distribution among sites were estimated from feeding trail width, where I recorded different size of feeding trail width that related to adults and small dugong including calves. In the further project, I may distinguish between older animals and young calves, which their narrow feeding trails should be close to that of a larger animal presumably their mother.

I will try to find a relationship between dugong muzzle width, body length and trail width given through allometry of the muzzle.

I will compare the different width of feeding trails in each site with the data gathered from the photo ID catalogue. I think I can assess the number of dugong individuals excavating seagrass at a site at a given time is much more interesting biological question with feeding trails is knowing how many animals made them.

I suggest approach would give me insights into a number of animals using each site at a given time, which would supplement my sighting information which must be heavily biased to habituated animals.

Feeding trails give more information about the various sizes of dugongs that visited the area. The impact of grazing should be examined to determine the individual's preference towards the different parts of the seagrass. Also, seasonal variations in seagrass density and abundance need to be determined. Management of the preferred species is critical to ensure the sustainability of dugongs' favourite food.

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

I invited to be a co-author of the dugong chapter entitled "Status of Red Sea Dugong" during the new edition of the book "The Red Sea" that will be going to published by Springer. The book is edited by Dr Najeeb Rasoul and with two other authors; Dr Dirar Nasr (Red Sea University, Port Sudan, Sudan) and Dr Peter Vine (Ceol na Mara, Faul, Clifden, County Galway, Ireland).

I was adding information of the dugong project on my page on Facebook, (<https://www.facebook.com/The-Egyptian-Dugong-865408530204342/?ref=bookmarks>). I shared the update reports of this project on my profile on LinkedIn (<https://www.linkedin.com/in/ahmed-shawky-a52b8669/>). Also, I was uploading the update news of the dugong project with Rufford Grant to my profile to on Research Gate (https://www.researchgate.net/profile/Ahmed_Shawky30) and have 13 followers, and 48 reads to this date.

I update the project news on my website (www.ahmedmshawky.com) about the dugong project to share our results with all peoples

I prepared a standard presentation in Arabic and English editions to introduce it in educational seminars (i.e., diving centres, resorts, schools, universities, training programs.).

I wrote a manuscript for the photo ID entitled "Photo identification of Dugongs in Marsa Alam and Wadi El Gemal National Park, western Egyptian coast of the Red Sea" and submitted the paper to an International Journal of the "Indian Journal of Geo-Marine Sciences" and another local journal of the "Al Azhar Bulletin Science". I'm going to prepare new papers to publish after the end of this project.

I will conduct the Dugong Conservation Diver Course with Reef Check during their next course that will be performing in Marsa Alam on 10th Jul 2018.

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 actual period RSG was used was from April 2017 to April 2018. This time is suitable for the field work decided to perform a special object to cover it in details in a limited area.

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
Digital camera (Go Pro Hero 4 Silver	335	335	0	

Edition)				
Memory card, SanDisk Extreme Plus 64GB UHS-I/ U1 Micro	15	15	0	
Red Filter for Go Pro Camera	30	30	0	
Case accessory for Go Pro Camera	30	30	0	
2TB Portable External Hard Drive	90	90	0	
For transportation to the survey sites 10 times per month for 11 month, we need to rent a car	600	600	0	
For field survey using speed boat 3 times per month for 11 month	1300	1300	0	400 more due to devaluation of the Egyptian Pound exchange rate
For field survey using boat trips 4 times per month for 11 month	1200	1200	0	200 more due to devaluation of the Egyptian Pound exchange rate
Two workshop for education and training for volunteers	400	400	0	
Transportation fees and accommodation for 10 team members of Egyptian Dugong Team	1000	1000	0	
Total	5000	5000	0	

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

- Studying the seasonal variation in the presence of the dugong in key habitat and assess the numbers of dugong individuals excavating seagrass at a site in each season in different sites through feeding trails width.
- Studying the feeding ecology of the dugong seasonally.
- I'm going to use the laser photogrammetry to determine the body length of the dugong and other parts including the muzzle width underwater.
- Increase the number of the Egyptian Dugong Team (EDT).
- Focused on photo ID technique to get more detail about the number of dugong individuals present in Red Sea, Egypt.

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?

I didn't print any materials except using a power point presentation that I used the Rufford Foundation logo.

The logo was published on my web site in the dugong project page.

RF received publicity in the dugong chapter of the Red Sea Book that will be published by Springer very soon. Also, RF is acknowledged in the paper of the photo ID that submitted to the journals of "*Indian Journal of Geo Marine Sciences*" and "*Al Azhar Bulletin Science*".

11. Any other comments?

Dugong project in Egypt funded by Rufford Foundation get sound and hope to continue the next step by Booster Grant.

I'd like to thank The Rufford Foundation and all the staff for its generous and support in this project, which gets a great sound in Egypt. Special thanks to Jane Raymond for kinds contacts during the project period. Also, many thanks to Rufford website staff for publishing my project activities and the project update reports.

