

The Rufford Small Grants Foundation Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants 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	Matthew Dicken
Project title	A preliminary investigation into the size, sex and seasonal occurrence of white sharks (<i>Carcharodon carcharias</i>) within the Bird Island Marine Protected Area.
RSG reference	77.05.09
Reporting period	November 2009 to November 2010
Amount of grant	£5972
Your email address	Raggedtoothshark@bayworld.co.za
Date of this report	24 th November 2010

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
1. Collect additional historical catch and observation data on white sharks within Algoa Bay and at Bird Island from a survey of anglers, spearfishers and divers			Fully achieved	Key informant anglers who regularly catch, or have knowledge of white shark catches were identified from a survey of shore and boat anglers. Information collected from these anglers on a monthly basis suggests that white sharks are more common at inshore beach sites during the summer (October to February) than winter (June to August) months. A total of 25 white shark catches were recorded. The size of sharks caught ranged in size from 60 to 300 kg, although the majority were less than 90 kg.
2. Collect baseline data on the size, sex and seasonal occurrence of white sharks within the Bird Island MPA			Fully achieved	A total of 12 trips have been made to Bird Island to chum for sharks between November 2009 and November 2010. January 2010 was the only month we were unable to go to Bird Island due to two separate engine failures on the boat. Although chumming has been conducted at 29 different locations around the Island sharks have only been observed at certain locations. (Fig. 1). Sharks have only been observed in the months May to November (winter months). The greatest number of sharks seen on any one day is 6. Sharks have ranged in size from 1.5 to 4.5 m.
3. Investigate the relationship between environmental conditions and occurrence of white sharks within the Bird Island MPA		Partially achieved		Environmental data have been collected on every trip (water temperature, current strength and direction, water clarity), but it is too early to establish any links between oceanographic conditions and the occurrence of sharks. We have linked the project to the South African Environmental Observation Network, which will allow us to access data from their environmental monitoring stations. This should enable us to predict with greater accuracy any relationship between water conditions and shark abundance in the future.
4. Identification of individual sharks to		Partially achieved		A total of 15 different sharks have been identified using photographs of dorsal fin

<p>construct a basic population model to estimate the number of white sharks at Bird Island</p>				<p>and pigmentation patterns. We anticipate that a greater number of sharks will be photographed in the future to build a photographic library of sharks within the MPA. The construction of a population model will depend on the quality and quantity of photographs (sharks identified) obtained. (see Fig 2a)</p>
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

The biggest challenge during the project was unfavourable weather conditions, which limited the amount of time we were able to spend at sea. An agreement with South African National Parks enabled us to moor the boat at night time and during gale force winds in safe anchorage within the Bird Island MPA. Although this allowed us to spend up to 2 days at sea we were not able to spend the 3 days as we envisioned.

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

1. The high occurrence of juvenile sharks < 2 m in length recorded from angler catches suggests that the inshore areas of Algoa Bay maybe a nursery area for white sharks in South Africa. If this is the case, it will be the first identified white shark nursery area in South Africa
2. The capture of sharks by fishermen close inshore during the summer months and sightings of sharks around Bird Island during the winter suggests a seasonal offshore movement pattern. A similar pattern has been recorded for white sharks in the Western Cape.
3. The highest concentration of sharks within the MPA is perhaps not surprisingly located around the seal colony, Black Rocks. The identification of individual sharks using photographic ID has indicated that the residency patterns of sharks within the MPA varies between individuals. Some individuals have been observed over multiple months

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

Two white shark-cage diving permits have been allocated for the Bird Island MPA in 2010. Although our project is not focused on community development the information we have collected may aid the development of the industry and thus create jobs for the local community in the area.

5. Are there any plans to continue this work?

We would like to continue this existing project and collect data for a further 12-month period. In particular we would like to try and positively identify more sharks using photographic identification. To this end we have already obtained a small underwater stills and video camera (from a colleagues project) to help with this aspect of the research. Further developments to the project are outlined in Point 9.

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

1. The data collected from the project has been registered (under the name Rufford Foundation) on a database with the South African Environmental Observation Network

(SAEON). Once the data has been utilised by the project leader (Dicken), the data is accessible to other researchers who may find it useful for other projects.

2. The project will be submitted for publication (late 2011) to an internationally peer reviewed scientific journal.
3. A popular article will be written for a recognised magazine such as *Africa Geographic* for a broader awareness of the project in 2011.
4. It is hoped that aspects of the project will be shown on wildlife documentaries such as Discovery Channel and Animal Planet in 2011/2012.

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

The funding was used to conduct research between November 2009 and November 2010. This is in line with the original project proposal.

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
Boat trips and food	£5638.22	£4437.52	-£1200.71	Boating costs were partly subsidised by the South African Environmental Observation Network. As a result, we were able to save on boating costs.
Administration	£185.19	£287.46	£102.00	BCRE (the organisation which administered the project funds) normally charges an admin fee of 6% of the total project budget. In my original proposal (due to a tight budget) they agreed to accept payment of only 3%. Since I had under spent on boating costs I thought it only fair to pay them an extra amount of £102. This brought their admin fee to approximately 5% of the total budget.
Miscellaneous	£148.15	£1246	£1097.85	Due to a reduction of spending on boating costs I sent Jane Raymond an email on the 6 th April 2010 asking if we could spend funds on other items. We had under-budgeted on items such as the cost of bait, boat maintenance, telephone and photocopy costs etc. Jane informed us that this would be OK if they would help to ensure the project succeeded.
Total	£5 971.56	£5 970.98	£0.58	

Note: The exchange rate used in the table above is 12.26 South African Rands to £1. This was the exchange rate at the time we received funding.

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

1. Continuation of monthly trips to Bird Island to positively ID individual sharks. With the recent purchase of an underwater stills and video camera we hope to greatly increase our photographic library of sharks.
2. Now that we have a basic idea of the seasonal distribution of sharks within the MPA the next logical step is also to investigate their movement patterns. This could be achieved through the use of ultrasonic telemetry. We are busy designing a suitable shark tagging and telemetry project

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

I presented the project, in the form of a poster, at the opening ceremony of the South African Environmental Observation Network (SAEON), in Port Elizabeth, South Africa. SAEON is a government institution interested in long-term monitoring projects in Algoa Bay. The event was publicised in the local newspaper and received acclaim from attending scientists and government officials.

11. Any other comments?

This is the first study of its kind in Algoa Bay and has provided important information on the population dynamics of white sharks outside of the Western Cape and KwaZulu-Natal. We hope to continue and expand the project over the next 5 years to further investigate our nursery area hypothesis. We also hope to link the project to other studies in South Africa to form a truly collaborative and multi-disciplinary study.

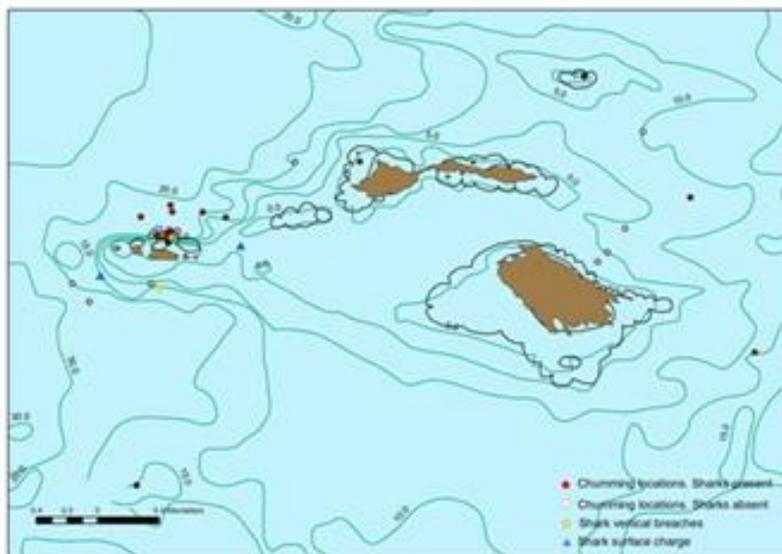


Fig. 1. Map showing the location of chumming points and shark breaches within the Bird Island Marine Protected Area

Figure 1

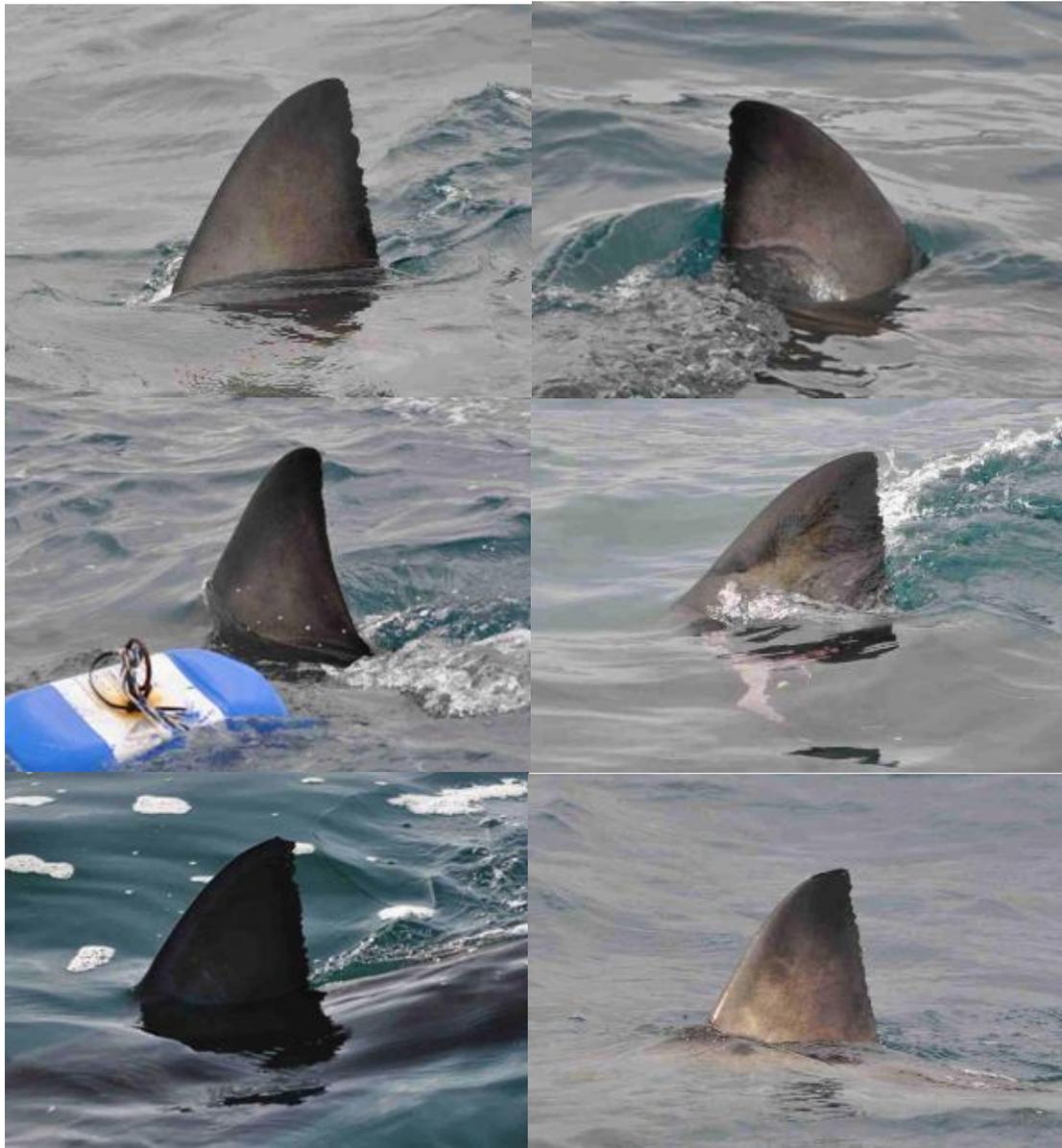


Figure 2a. Selection of photographic fin identifications for white sharks at Bird Island





Figure 2b. Selection of miscellaneous photos of white sharks at Bird Island

Table 1. Summary of white shark sightings and environmental data collected between November 2009 and November 2010 at Bird Island.

Date	Time chumming (mins)	Number sharks	Size range of sharks (m)	Water depth (m)	Water temp (°C)	Water clarity (m)
12 th November 2009	428	0		12	17	10
13 th November 2009	340	1	4	12	18	10
21 st December 2009	635	0		16	15.4	4
22 nd December 2009	455	0		16.5	15.5	5
17 th February 2010	550	0		12	19.5	10
18 th February 2010	285	0		15	19.5	11
10 th March 2010	570	0		17.6	14.6	3
11 th March 2010	360	0		10.6	15.4	3
12 th April 2010	480	0		18	18.9	3
13 th April 2010	345	0		7	19.2	5
17 th May 2010	405	1	4	16	18.6	10
18 th May 2010	285	2	2.5 to 3.5	16.4	18.5	6
24 th June 2010	355	3	1.5 to 4.5	14	18.8	5
25 th June 2010	250	5	3 to 4.5	17.9	19.2	10
20 th July 2010	395	6	2.5 to 4	15	17	6
21 st July 2010	215	2	2.5 to 4	15	17	4
1 st Sept 2010	341	4	2 to 4.5	15	16.3	10
25 th Sept 2010	280	4	3 to 4.5	12.9	16.7	6
26 th Oct 2010	300	4	2.5 to 3.5	15	17.5	6
20 th Nov 2010	375	3	1.5 to 2.5	16.7	16.1	4 to 8