

## Introduction

This document serves to update on the progress of the Rufford Small Grant 32649-1; describing recently discovered critical sites for the Endangered shortfin devil ray in Southern Africa. The research will help global understanding of this population to validate and support its conservation and protection and will also support similar projects in other hot spots. This update presents the activities conducted to date, since the first funding allocation made on 4 May 2021 (delayed from April due to Covid 19).

## Field Research Activity

Fieldwork on Aliwal Shoal: Contributes to research objectives one to four

Six research SCUBA dives supported by the Rufford Foundation have so far been conducted. Two on the 19 and 20 May, two on the 9 June, and two on the 15 and 16 June. These activities support research objectives one, two, three, and four as outlined in the Grant Application/Proposal (please see original proposal).

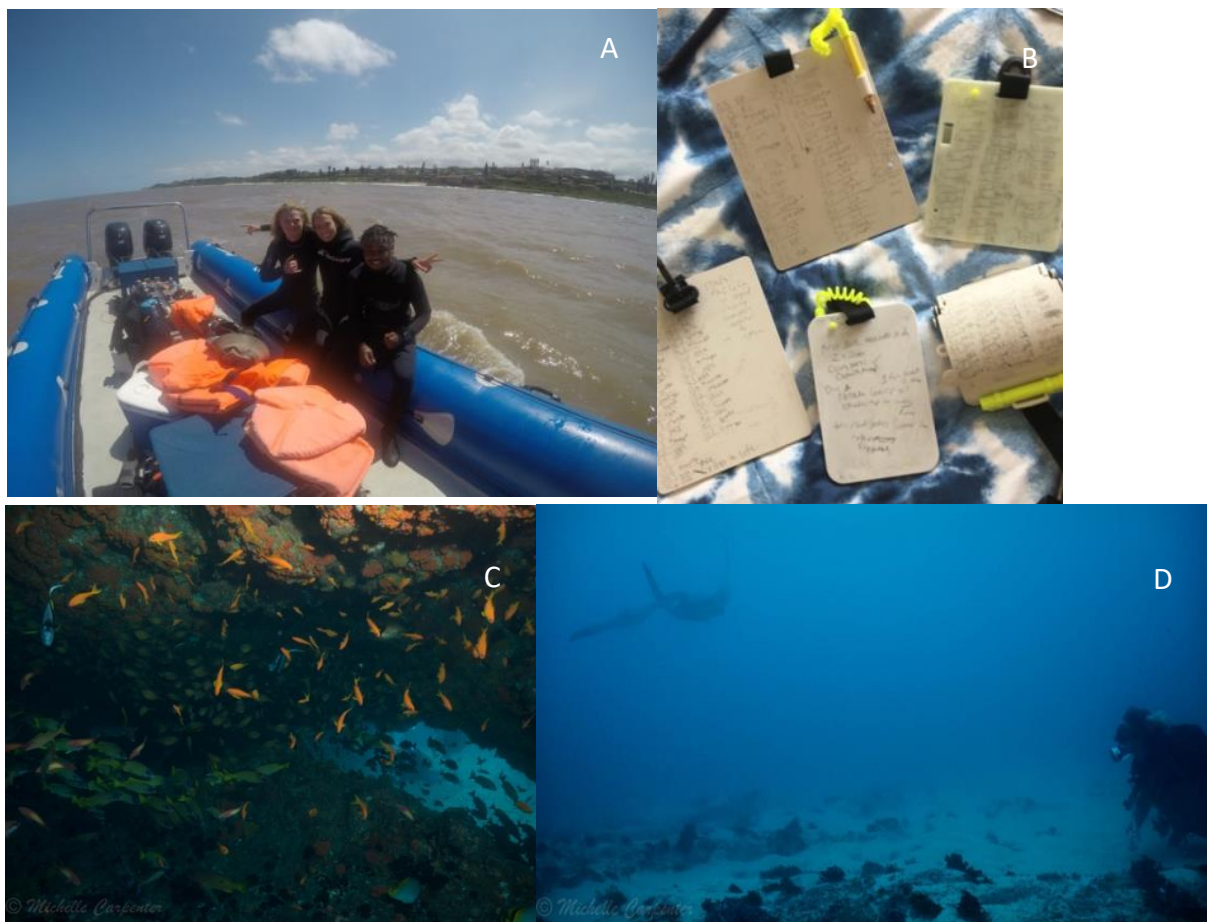


Figure 1. In the field: (a) research assistants and I, (b) data entry from benthic surveys, (c) a photo of a cleaner fish community, and (d) practicing code of conduct at the devil ray study site.

The specific research activities included:

- 1) Six visual census surveys at the study site; collecting data on devil ray sightings and environmental parameters including, but not limited to, water temperature, current, visibility, zooplankton presence, surface conditions, oceanographic conditions, and anthropogenic impact.
- 2) Filming cleaning behaviour of devil rays while SCUBA diving at the study site.
- 3) Deployment of Remote Underwater Video (RUV) five times, enabling us to record ray cleaning and social behaviour in the absence of human divers for a total of one out of five hours of footage of the cleaning station.
- 4) Conducting nine benthic surveys (20m length) to characterise substrate in and outside the devil ray cleaning stations.



Figure 2. Photos of the transect line in benthic surveys outside (left) and within (right) the cleaning station.

- 5) Surveying of fish cleaner communities using transects and reef cameras.
- 6) Construction of a map of the devil ray cleaning station sites using measurements, compass headings, and the depth gauge on the Rufford Foundation-supported dive computer.

### Key Findings at Aliwal Shoal

During the first seven weeks of this project, we managed to collect one hour of total visual data on the rays cleaning utilising manned and five hours of RUV footage. We captured maximum numbers of 23 and 30 devil ray individuals using the cleaning station at the same time, by the remote cameras and me manning an underwater camera respectively. Much longer cleaning durations were observed in the remote cameras, in the absence of human divers, compared to when divers were present. This indicated that it is extremely pertinent to develop a strong code of conduct as a

key component of devil ray ecotourism if we are not to disrupt or alter natural behaviours.

Two new additional cleaning station sites were identified, mapped, and surveyed for substrate composition and fish communities composition.



Figure 3. Devil rays cleaning at the study site, filmed on a RUV.

Since the discovery of this cleaning station area, 535 sightings of shortfin devil rays over 3379 minutes of sampling effort (average of 0.15 devil rays per every minute sampling time) have been recorded. These data were collected across 89 SCUBA dives, making an average of 6.01 devil rays per dive. Unexpected findings also included first-time footage of shortfin devil ray mating behaviour at the study site.





Figure 4. Large schools of devil rays travelling near the study site.

In addition to the generous support of the Rufford Foundation, the kind support of local dive centres provided enormous field sampling effort through gathering data by working as a divemaster or assisting on dives, and through the support of the UCT fellowship awarded in November 2020. Therefore I would like to request an adjustment\* to the original request which is to spread the Aliwal Shoal fieldwork funds across seven months instead of one month (originally planned in the proposal), in order to document any temporal or seasonal changes in the use of cleaning stations by devil rays at Aliwal Shoal. All analyses and final synthesis will still be completed within the timeframe of this project (by April 2022).

#### Fieldwork in Bazaruto Archipelago National Park, Mozambique

There has been significant delay in travel to Mozambique due to COVID-19 restrictions and the uncertainty of South Africa and Mozambique lockdowns. A study permit for Mozambique is required for fieldwork in the Bazaruto Archipelago. A visa is being applied for fieldwork to begin in August. Thus far, contact has been made with the consulate in Durban and all paperwork prepared, with the exception of the South African Police Clearance which was applied for in late April. It is expected to hear the outcome in July, at which point a visa will be applied for immediately in time for August.

#### Dissemination of results: Contributes to dissemination of results objective

Current research findings have been shared through social media platforms (Instagram: personal @sol.fins.photography\_, page @freedivingsa and Facebook: personal, Michelle Carpenter, and through dive centres Agulhas House Dive Centre, Blue Ocean Dive Resort, Freediving South Africa reaching between 10,000-15,000 readers), popular articles (Good Things Guy, Durban TV, Sunday Times), South African radio (SABC News), a magazine (Designing Ways), newspapers (South Coast Herald, The Witness) and in person through public talks supported by the Rufford Foundation. The relevant stakeholders who have been looking forward to the

updates on the project are enjoying learning about the findings to date and find it very useful in the context of their work, to share informally the activities we are conducting, and to demonstrate their commitment to conservation to their clients/local communities.



Figure 5. Dissemination of results in local newspaper (left) and magazine (right).

## Education

### Ecotourism model development: Contributes to conservation management objective

A survey to determine the potential ecotourism benefits of devil rays and the current awareness of their conservation concern was developed and is a current focus of our activity. This was developed with input and advice from colleagues at the Marine Megafauna Foundation (MMF). Between 50-100 local stakeholders and tourists will be surveyed for their input on this topic. Codes of conduct for diver behaviour at the cleaning station have been developed and practiced *in situ* with various divemasters and tourists. Thus far, the optimal best practice to ensure divers witness devil rays at cleaning stations without disturbing ray behaviour have proven to be groups of three divers or less, with everyone kneeling in the sand 3-4m to the Southwest from the West side of the devil ray cleaning station.

### Distribution of flyers for public talks

During the first week, flyers were designed to advertise for the free public talks and school talks. On 4 May 2021, 35 flyers were printed and distributed to 22 businesses in Umkomaas and Scottburgh including:

Blue Ocean Dive Resort  
African Watersports Dive Centre  
Aliwal Dive Centre  
Scottburgh Fish and Tackle  
Surf Shop Scottburgh

Blue Ocean Restaurant  
ScubaCo Dive Resort  
Enzo's Pizzeria - Umkomaas  
Ezemvelo Scottburgh Office  
Enzo's Pizzeria – Scottburgh

Anchor and Bell Restaurant  
Sea Breeze Restaurant  
Little Portugal  
Cattle & Barrel Restaurant  
CT Curry Restaurant  
Manta Point Restaurant

Skull Restaurant  
Umkomaas Fish and Tackle  
East Coast Brewery  
The Hope Shop  
The Fishy Tail Restaurant  
Waffle Restaurant Umkomaas

Several places were spacious and provided the possibility to promote our research and raise awareness to a large amount of people, in this case 4-5 flyers were posted instead of one. With the leftover printing budget, an additional 80 flyers were printed on 22 May 2021 and will be distributed locally and in Durban, Ballito, and Amanzimtoti throughout the duration of this grant. Many business premises experience an ocean breeze therefore the flyers were laminated for protection.



Figure 6. Flyer designed and distributed for public talks.

The purpose of these flyers was to invite a greater diversity of the community to the public talks by displaying a list of the dates for this year and the venue. However, when surveying the people who attended both talks held in May (45 people at the first talk on 15 May; 15 people at the second talk 22 May) most had learned about the talk at the dive centres, electronically (Facebook and Instagram), or from a friend. Therefore for future funding, less money is required for printing flyers. Nonetheless, the flyers advertised at the dive centres have been useful in achieving outreach objectives in bringing in a crowd of people to learn about devil rays at Aliwal Shoal.

Public talks and discussions: Contributes to outreach objectives three and four

The majority of the public talks in 2021 will be held at ScubaCo Guest House whom have kindly provided the venue at no cost. The fourth public talk and some future talks will be held at different venues in order to reach different communities and

stakeholders. For August, the public talks will be held in Mozambique during the sampling trip in Bazaruto Archipelago. Thus far three talks have been held and were very successful (photos attached). The talks held were on the 15 May, 22 May, and 21 June, and featured discussions about:

- 1) Devil rays and blacktip sharks: the top threats they face in KwaZulu-Natal
- 2) Devil rays and threats by offshore oil & gas in KwaZulu-Natal
- 3) Devil ray research and conservation at Aliwal Shoal

In May, the talks were slightly under budgeted to provide enough food and refreshments for 30 people, including tax. Therefore the cost was above R400, but less than R500. Some items such as tea, paper plates, and napkins were used for more than one talk, and because of this subsequent public talks cost less to make up for the extra spending from the first two. The cost for the third talk was under R300.



Figure 7. Outreach talks at ScubaCo Diving and Travel (left, right), with Rufford supported refreshments (right).

These talks thus far have successfully raised awareness to the public and local community. All local and non-local divers, fishermen, tourists, fellow scientists, and stakeholders were previously unaware of the abundance of devil rays and the presence of their cleaning stations, and have been enthusiastic to learn about the devil ray cleaning stations, how endangered the shortfin devil ray is, and the enormous sightings seen at the discovered spot on Aliwal Shoal. The public and dive centres were orally questioned each month to monitor the effectiveness of public outreach efforts.

Upcoming public talk: 30 June at Blue Ocean Dive Resort.

School talks: Contributes to outreach objectives three and four

The purpose of talks at schools is to generate awareness about their local marine environment with specific information about rays. Meetings online, through phone,



and in person, with several schools for organisation of talks were held with Scottburgh High School, Scottburgh Primary School, Umkomaas Primary School, Warner Beach High School, St. Henry's School in Durban, and Hilton College. In May, one school talk was held at Future Kids School Widenham, KwaZulu-Natal with teacher Chantal. The reaction of the students was positive, and the impact has been an increased interest in exploring and protecting the ocean, this is known as the resulting questions, discussions, and comments given during the talk and subsequent weeks in class (the teacher notified me). Because of this great interest, there is opportunity to take the students out on a local boat to snorkel, and will be included in future grant proposals.



Figure 8. Giving a talk to children at Meyer School (top) and to the Nature, Environment, & Wildlife Filmmakers Congress (NEWF) students (bottom).

On 18 June, the Adventure Mania Dive Centre in Sodwana Bay requested a talk for their Nature, Environment, & Wildlife Filmmakers Congress (NEWF) students. The reaction of the students was positive, and the impact has been an increased interest in collaboration between organisations, including governmental (Ezemvelo), academic (University of KwaZulu-Natal), and personal-professional development (South Africa's first black female freediving instructor).



Another school talk was organised on 10 June at Meyer School with teacher Stacey Meyer, however, three children tested Covid positive on the morning of the talk, and it was rescheduled for July. In May, the South African government announced schools to be reduced to 50% capacity again, which also will affect the arrangement of school talks. Thus far, upcoming school talks are scheduled for July at Sodwana Bay Primary and Umkomaas Primary, and November at St Henry's Durban.

### Printed infographics on marine life for local guides

In outreach objectives three and four, I proposed for infographics on devil rays to be printed, laminated, and distributed. I expanded this educational material to include all species of shark, ray, and turtle that use cleaning stations on Aliwal Shoal, with a particular focus on devil rays, to better encourage the use and reach of these education tools. Furthermore, I included additional local charismatic megafauna such as humpback whales. The purpose of these infographics was for local guides to use them in briefings to visiting guests and tourists, to spread awareness about research and conservation in the area. Thus far, five divemasters have volunteered to use the education cards. Two were given on the 22 of May 2021 and discussed during the second public talk at ScubaCo Guest House. I provided facts and figures to support their presentation to their respective clients and to help them to spread awareness about the biodiversity of the area and the critical threats our oceans face. Three education cards were given at Adventure Mania Dive Centre during the third school talk given to the NEWF students.

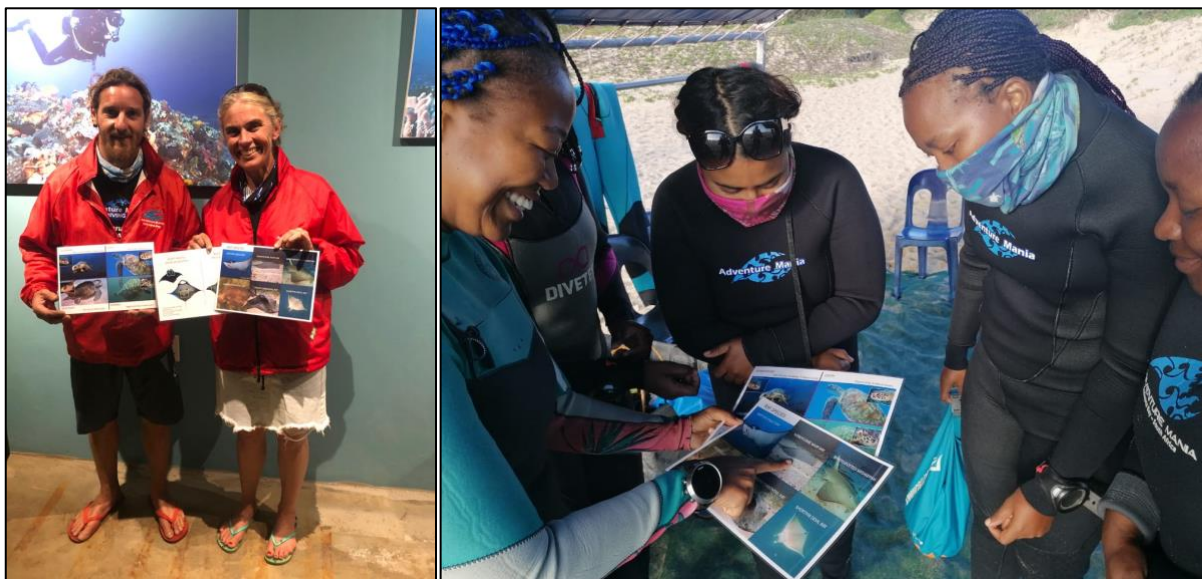




Figure 9. Local dive guides receiving educational infographics.

## Conclusions

Good progress has been made in both research and outreach efforts. Difficulties were encountered with arranging school talks due to current covid case increases and government restrictions. Though it was approved by Simon Mickleburgh to sometimes conduct two talks at the schools per month instead of one, it may need to in fact be the original plan of one. The first invoice for the discussed activities was emailed to Sarah Butchers, (COO of MMF) on 28 May 2021, and was paid on 2 June 2021. The second invoice will be sent at the end of June.

\*Would it be possible to notify me as to whether you might accept the request to spread out the fieldwork funds at Aliwal Shoal?

With kind thanks for your support to this project, and please do not hesitate to reach out should you have any questions. The next update will be sent in September 2021 as per the agreement.