# 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** | Rupabanhi Debnath |
| **Project title** | Towards Conservation Of A Vulnerable Reef Fish-Bumphead Parrotfish (*Bolbometopon Muricatum)* In Andaman Islands, India |
| **RSG reference** | 19624-1 |
| **Reporting period** | 15 months |
| **Amount of grant** | £5000 |
| **Your email address** | rupabanhi@gmail.com |
| **Date of this report** | 21/01/2018 |

**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 |
|---|---|---|---|---|
| Population estimation of Bumphead Parrotfish | | | | The project successfully revealed the population status of Bumphead parrotfish in the Andaman Islands. The species have been sighted in 10 out of the 17 study sites surveyed. Two isolated sleeping aggregations have also been found out. |
| Mapping of foraging habitat of Bumphead parrotfish | | | | The project was successfully able to assess the foraging habitats of bumphead parrotfish. Bite marks of bumphead parrotfish on *Porites* sp. were identified with the help of divers and local fishermen. These bite marks helped me to identify the foraging sites, study the habitat structure as well as map the foraging sites. |
| Mapping of juvenile habitat | | | | No juvenile bumpheads were encountered while surveying the sampling sites. As per literature, the juveniles prefer mangrove swamps and seagrass beds. But, due to heavy crocodile infestation in the mangrove habitat of Andaman islands, mapping and finding juvenile bumphead was ruled out for safety reasons. |
| Socio-economic surveys | | | | Questionnaire surveys were conducted on both study sites among a group of local fishermen, professional Scuba divers, and tourists who volunteered, to understand their perception towards bumphead parrotfish. From the collective data, I learnt that local divers had developed a negative opinion towards the species. Large-sized bite marks left by bumpheads on the corals post feeding led the divers to believe the species were destroying the corals and that they have a |

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| | | | | negative impact on the coral reefs. Information obtained from the sport fishing community confirmed rare to nil bumphead parrotfish catch as part of their recreational sport. To conduct questionnaires with the fishermen population, I, along with my team, made regular visits to the landing centres. Data collected from landing centres led us to draw two important conclusions confirmed. Firstly, the bumphead parrotfish was not caught as part of commercial targeted fisheries. Secondly, the species was not caught as part of the bycatch also. However, they could not provide us with any information about juvenile bumpheads. |

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

1) Due to change in government policies, all offshore dives had been banned throughout Andaman Islands from March to October 2017. For cost efficiency purpose, during this period, I recruited two local field assistants from dive shops to continue the field surveys. One of the field assistant carried out systematic surveys in the South Andaman group of islands while the other surveyed Ritchie's Archipelago.

2) Indian Government announced demonetisation in November 2016 banning the use of 500INR and 1000 INR banknotes. Due to currency unavailability, my stay in the field station had to be cut short and I could not be present in the field from December 2016 to January 2017. In July 2017, the Government of India levied the Goods and Service Tax thereby increasing my travel and accommodation expenses during the tenure of the project.

3) The prospective exit of United Kingdom from the European Union (Brexit) caused a drop in pound value. Due to this, the grant amount which I received was less (in terms of Indian currency) than the actual budgeted amount. This caused amendments in my overall expenses in order to compensate for the shortage of money.

4) In the event of unforeseen cyclones and torrential rain, dives had to be called off and certain dive sites became inaccessible. This problem was mostly faced during the monsoon period (May-August) and post-monsoon period (September-December). To overcome this problem, dives would have to be rescheduled. Surveys could not be conducted at the sites which became inaccessible during such events. There were times when dives were rescheduled after weeks until the rains and tidal currents subsided.

5) Some of the dive sites have been closed down by the A&N administration because of boat traffic. These sites were surveyed by snorkelling.

6) Fluctuations in visibility made taking photos and spotting fishes challenging- dives would be scheduled depending upon tidal charts to avoid tidal changing periods as much as possible. In certain cases dives were scheduled at different hours outside the usual survey timings strictly for videography and photography so as to obtain maximum visibility.

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

**1) Sleeping aggregations**
Sleeping aggregations of bumphead parrotfish have been found at two different study sites. The aggregation found at one of the dive site in South Andaman comprised about 200 individuals. The second aggregation located at a dive site near Havelock comprised about 100 individuals. This has been the most important outcome of my project. Even though the juveniles could not be located, we can still evaluate the population status by counting the adults associated with the sleeping aggregations. Regular surveys and review schedules from a team of skilled divers and knowledgeable fishermen helped me to monitor these two sleeping aggregations.

These sleeping aggregations are found at offshore dive sites making it difficult for tourism or fishermen to disrupt their gatherings.

**2) Socio-economic surveys**
Socio-economic surveys and interviews have helped me to found out that bumphead parrotfish is not a targeted species in the commercial fishing practices of Andaman and Nicobar Islands. This removes any kind of fishery related stress to these fishes in these islands. However, interviews and surveys have also revealed small scale non-commercial consumption of bumphead parrotfish by fishermen community. Unfortunately, the rate of such consumption remains unknown. These two findings, i.e., location of two sleeping aggregations and zero fishery related stress leads to a significant conclusion that these islands together with its environmental conditions do provide a safe haven for these majestic creatures.

Social interviews with several professional divers and sport fishing people revealed an interesting fact. Although bumphead parrotfish is easily identified, people have developed a negative attitude towards the fish because of its primary diet of corals, assuming that they might be partially responsible for coral destruction.

**3) Lack of juveniles of bumphead parrotfish**
The location of bumphead juveniles remains unknown. After exchanging ideas with international researchers working on this fish, I came to find out that juveniles often occur in mangrove areas and seagrass beds. Most of the mangrove areas are heavily infested by crocodiles. Records of several human attacks by crocodiles in the past have made it challenging to dive or even snorkel in the mangrove swamps and the adjoining areas. Also, the seagrass beds found in these islands are few and

their locations remain unidentified mostly. This finding raises two important questions: firstly, whether the failure to locate bumphead juveniles leaves a question mark on the population status of this species. Secondly, the reason behind the lack of bumphead juveniles throughout their distributional range as suggested by other research papers too.

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

The local communities formed an intricate part of the project. The local fishermen population led me to the locations of various foraging sites throughout the proposed study sites. The local divers aided in locating the sleeping aggregations of the bumphead parrotfish. The fishermen community were trained in identifying bumphead parrotfish species (using fish identifying manuals) and operate the GPS for mapping foraging as well as resting sites. The local SCUBA divers were trained to conduct belt transects, estimate population size, and map habitat data. Through social interviews and questionnaires with the local communities, I came to learn about their perception towards the species. Local perception about the species is of utmost significance as it has a noteworthy role to play in constructing species conservation plan.

Surveys carried out for the project helped the divers and the fishermen community understand the role of bumphead parrotfish as a keystone species for bio erosion. This further helped them to comprehend the significance of conserving the bumphead parrotfish.

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

Yes. This project establishes baseline information on the population status and habitat structure of bumphead parrotfish in the Andaman Islands. Based on this set of information it will now be possible to study other behavioural and ecological aspects of bumphead parrotfish. The fish still remains an understudied species so the next important step will be to successfully map their nursery habitats and study their reproductive behaviour. Their movement pattern from sleeping sites to foraging sites or from the nursery sites located miles away remains a mystery. I plan to carry out further studies on the aforementioned subjects in hopes to conserve the species and change the negative perspectives that humans have developed towards them.

Towards the end of my project, I and my teammates witnessed the mating behaviour of bumphead parrotfish, but factors like prevailing environmental constraints and lack of time did not allow us to learn further, which we hope to do in the near future.

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

The results of this project will be shared with the local government bodies to help construct a conservation plan for protecting the species. The population census of bumphead parrotfish from the Indian waters will be added to the bumphead

parrotfish SOC (Species of Concern) range identified by NOAA National Marine Fisheries Service. A full-length scientific paper will be published in a peer-reviewed journal based on the findings of this research. Additionally, I plan to submit an article on my work.

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

Rufford Small Grants funded my field work from October 2016 to December 2017, a period of 15 months. The project has been successfully completed within the proposed time period.

**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 |
|---|---|---|---|---|
| Purchase of one Garmin etrex10 GPS | 75 | 75 | - | |
| Purchase of one Sony RX100 II digital camera | 365 | 349 | +16 | Sony RX 100 I digital camera was purchased for cost efficiency purpose to adhere to the low budget received due to Brexit. |
| Purchase of Ikelite underwater housing for Sony RX 100 II | 490 | 399 | +91 | Purchase of Meikon housing for RX 100 I digital camera. Excess amount was directed to cover other expenses incurred in rest of the research budget. |
| Purchase of two dive slates | 16 | - | +16 | 2 dive slates were given by one of the non-profit institution. Excess amount was directed to cover other expenses incurred in rest of the research budget. |
| Purchase of one SJ Cam 5000 | 135 | 112 | +23 | Negotiation of lower rate in order to cater for cost efficiency purpose and to cater to other expenses in rest of the research budget. |
| Purchase of three meter tapes | 21 | 21 | 0 | |
| Renting of SCUBA gear | 2634 | 1687 | +950 | Due to the government issued ban on diving only 55 SCUBA dives were done. The excess amount was used to cover other expenses incurred in |

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| | | | | rest of the research budget. |
| Accommodation charges for 15 months | 468 | 529 | -61 | Accommodation charges increased due to the implementation of new tax rules in India. |
| Food expenses for 15 months | 314 | 216 | +98 | Food expense went down owing to less number of days spent at the field station than estimated. Excess amount diverted for covering other expenses. |
| Travel expenses | 430 | 728 | -298 | Travel expenses increased because of the implementation of new tax rules in India. |
| Contingency | 52 | 40 | +12 | Fund used to purchase a diving wetsuit for myself as the same size was not available in majority of the dive schools. |
| Hiring of technical staff | *0* | 817 | | This was not budgeted in the proposal. However, it became necessary to hire 2 technical staff because of the government issued ban on diving and to reduce unnecessary accommodation and travel expenses on my part. |
| **Total** | **5000** | **5025** | **-25** | **Local exchange rate used at the time of field research: 1£ = 88.11INR 2 technical staffs were hired @45.40£ per month for 9 months.** |

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

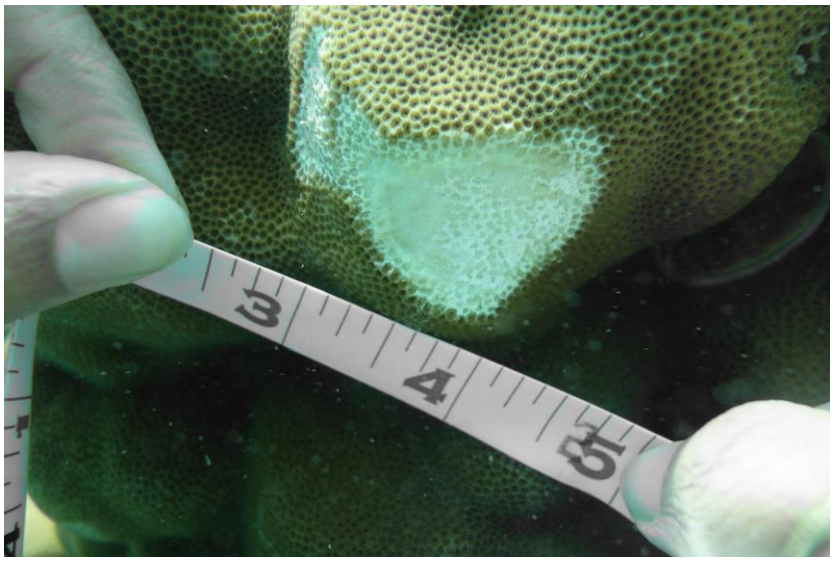
The next important step will be to build a constructive conservation plan in order to protect the population of bumphead parrotfish in this part of the world.

**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?**

Yes. I used the Rufford Foundation logo in the log sheets given to various dive institutions for recording relevant details regarding bumphead parrotfish sightings. The Rufford Foundation logo was also used in the questionnaires prepared for conducting socio-economic surveys. RF received a good deal of publicity during the course of my work.

**11. Any other comments?**

I want to express my gratitude to Rufford Foundation for providing me with financial support to pursue my project work. Without their support this would not have been possible.



Bite mark of *Bolbometopon muricatum* (Bumphead parrotfish) on *Porites nodifera*

Sleeping aggregation of *Bolbometopon muricatum* (Bumphead parrotfish) at Corruption Rock (13 metres), South Andaman Islands

Adult *Bolbometopon muricatum* (Bumphead parrotfish) foraging at one of the study sites.