

## The Rufford Foundation

### Final Report

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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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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Grant Recipient Details	
<b>Your name</b>	Divya Karnad
<b>Project title</b>	Finding spaces for co-existence: marine fisheries livelihoods and threatened species in India
<b>RSG reference</b>	13840-1
<b>Reporting period</b>	January 2014 – February 2015
<b>Amount of grant</b>	£5966
<b>Your email address</b>	ecodivs@gmail.com
<b>Date of this report</b>	10/3/2015

**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) Documenting and linking traditional and modern fishery management			X	I conducted 150 surveys, with the help of volunteers, and 25 interviews with key informants, and interviews with fisheries department officers in all regional fisheries offices across two districts of Maharashtra State, India. Through this I identified the key concerns of the traditional community and found several overlaps with state fisheries legislation. However the major gap between the two forms of management is a lack of enforcement of state fisheries legislation.
2) Predicting impacts of fisheries on threatened species			X	Using a combination of GIS data, observations of fish landings and interviews, I identified the key fishing zones for each category of fishing gear that was being used in this region. I also used observations at fish landing sites and interviews to develop a list of threatened marine species that are caught in the fisheries. The locations of capture of these species were then plotted using GIS to identify the impacts of fisheries on threatened species.
3) Local capacity development:			X	I trained nine student volunteers in scientific study design, data collection protocol, data entry and basic GIS. Over 200 fishermen were directly involved in the project through participation in interviews and help with collecting fish landing data. Fishermen were also trained to use GPS units.
4) Documenting local priorities		X		A short documentary about local fishing issues and a website about local fish species is currently being developed.
5) Public outreach			X	A training workshop for 15 participants on identification of marine species protected by Indian law was conducted in Dec 2014. A fisherman's community meeting was attended in December 2014, where some results from the project were discussed with the

				fishermen. A beachfront outreach and awareness programme was conducted for 800 school children and college students in January 2015. Three articles were published in national and international magazines and newspapers with 3 more forthcoming.
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**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).**

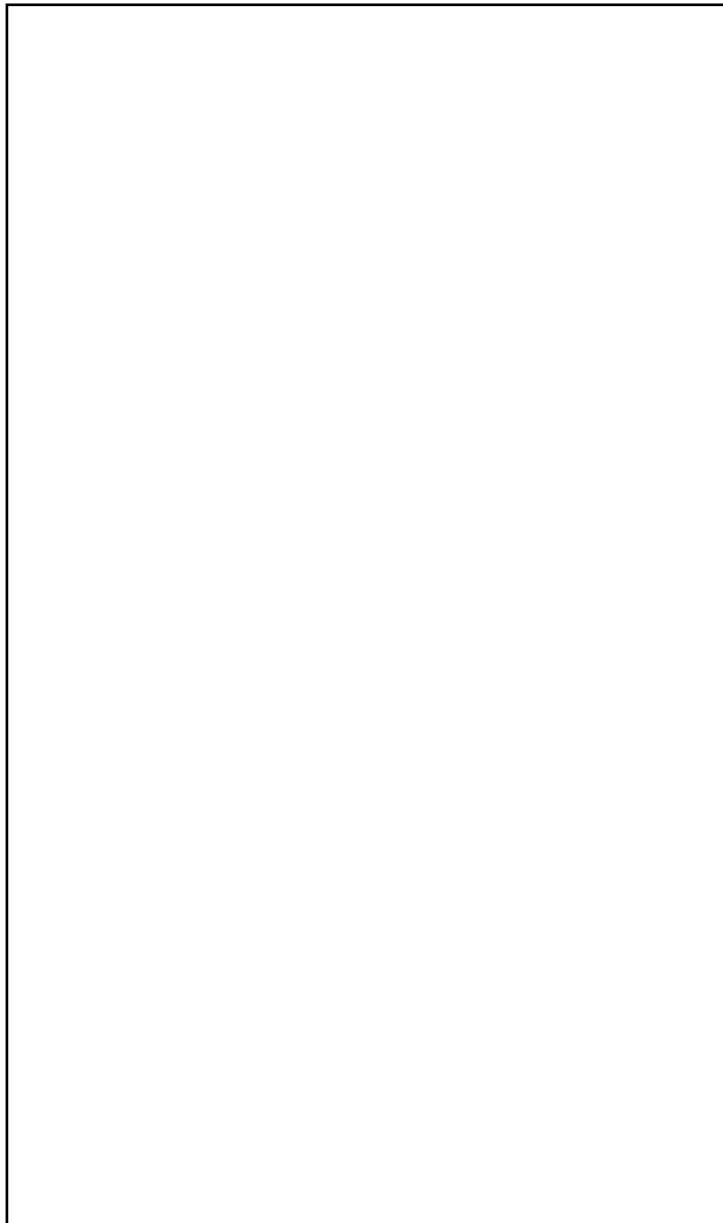
Developing a co-management plan for the fishery was confounded by the fact that multiple forms of coastal development began to change the fishery during the study period. These unexpected coastal developments, including tourism infrastructure and plans to develop a more strictly enforced marine protected area, changed fishing practices and the social fabric of the community. The community near the marine protected area became further isolated from decision making, resulting in their increased resistance to the idea of a no-take zone. The multiple government agencies involved in these sorts of development, further complicated the idea of co-management. Consequently, bridges with the fishing community needed to be rebuilt before fieldwork could continue.

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

**1) Identifying threatened marine species in the region:** While there have been several studies on the fisheries of Maharashtra state, there has been no systematic effort to document the diversity of threatened marine species that occur along the southern Maharashtra coast. Most studies so far have focussed on species that were commercially significant, and on the impact of different types of fishing gear on these species. On the other hand, from my project, I have created an initial baseline list of all the threatened marine species that interact with fisheries in the Ratnagiri and Sindhudurg districts of Maharashtra. I used multiple data sources to identify not only observe species from fish landing sites, but also obtain anecdotal evidence of some species, such as the leatherback turtle (*Dermochelys coriacea*). The use of observation and recall techniques also helped to identify shifting baselines. For instance, while there is evidence in the literature of the 19<sup>th</sup> century of occasional encounters with dugongs in some of these waters, present day fishermen do not remember having encountered them.

Over 20 threatened species occur in these waters, making this an important region to focus conservation attention. There is already one marine protected area designated within the study region – the Malvan Marine Protected Area (MPA) covering over 3 sq. km. However its success in protecting species is limited by the fact that local fishing communities were not involved in any decision making leading up to its designation and hence vehemently oppose the rules being imposed on them. A more recent threat, in the form of indiscriminate and uncontrolled tourism is now threatening the MPA, leading to corals being taken over by algae and a reported decline in fish catch.

The threatened marine species that were identified through interviews and observations were



**2) Patterns of impacts of fisheries on threatened species:** 150 interviews were conducted with fishermen across the two districts, to identify where they fished and what types of fishing equipment (gear) they used. Spatial information about where threatened species occur was taken from the literature as well as from interviews with fishermen who remember mistakenly catching some of these species. Information provided by the fishermen was transformed into GPS locations with a degree of error associated with them. Information was gathered about all the species listed in Table 1, but since many of the species co-occur, a combined map of all threatened species was created.

Similarly, spatial patterns of where people fished using the different categories of fishing gear were also collected using interviews, observation data and GPS units. A map depicting areas of highest fishing effort across all fishing gear types was created. The map showed that overlap between fishing

and threatened marine species was unsustainably high. A more detailed examination, however revealed that temporal patterns in the usage of some types of fishing nets, along with their mesh size and strength played a crucial role in what species were caught.

### **3) Traditional fisheries management and capacity development:**

Interviews with key informants and participation in fishing community meetings allowed me to get a sense of the different forms of traditional fisheries management being practised in that landscape. Most local management occurred at the village or supra-village level, while awareness about government management was limited to knowledge about the dates of the annual fishing ban. As a result implementing standardized sustainable fishing strategies across the entire coast of the two districts appears almost impossible. Rather than taking a top-down approach of trying to impose fishing restrictions on the community, I am instead following a more long-term approach of trying to glean the essence of each of the forms of traditional management and then create situations that allow them to be more effective in protecting threatened species. This approach, since never tried before, could possibly have better results in the long term.

The biggest outcome of the project was the exposure received by volunteers to the project. Several of the volunteers were students of fisheries and ocean sciences, but had never been exposed to the realities of fishing beyond the classroom. Some of them are continuing to work on similar topics for their Master's dissertation and one is now interested in developing his own independent research project.

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

Local communities were involved throughout the project. Since much of the project dealt with documenting their existing traditions and culture, the fishing community was very happy to participate in the project. Additionally, the traditional fishing community encouraged the project since it related directly to sustainability of their fisheries and livelihoods. They were very interested in any results that I could share, and information was regularly communicated to respondents of the interviews. This form of participatory research has allowed the fishing community to continue to tolerate the presence of researchers and their intrusive questions as they carry out their livelihood activities. Many people volunteered to provide information even though they received no promise of direct monetary benefits for their participation.

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

This study is part of long-term research being undertaken at this site. There has already been one project that attempted to enumerate the differential impacts of different fishing gear on commercially important species, as well as studies on the Indo-Pacific humpback dolphin that regularly occurs in the coastal waters of the study site. The combined impact of these studies will be directly felt within the fishing community, since the community has been so closely involved in these projects. For my project, I plan to take direct action that is based on the suggestions provided by the fishing communities. This includes completing and uploading the short documentary and website in order to reach out to the wider community.

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

Results from this project have been published in Indian newspapers, magazines and international magazines. The articles are listed below:

1. Between the devil and the deep blue sea. Shark Focus Magazine
2. Still life from the sea. Saevus Magazine (Hard copy)
3. Climate costs of seafood. Deccan Herald

In addition training in data collection methods and basic data analysis was conducted for nine volunteers and one research assistant. A training workshop was held for 15 participants, to help them identify threatened marine species. Outreach programmes were conducted for 800 school children and college students to help them understand marine conservation issues and their solutions in an experiential learning framework.

There are plans to publish two scientific articles based on this project, as well as popularise this project through conference presentations.

## 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 project was conducted from January 2014 – February 2015. The anticipated start date for the project was December 2014 and the project was expected to run until December 2015.

## 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.

The funding was received at the exchange rate 1 GBP = INR 98.1575

Item	Budgeted Amount	Actual Amount	Difference	Comments
Travel	809	811	-2	An extra 20 villages were added to the study area to cover greater spatial scale and diversity of fishing. As a result, the travel budget for the PI and volunteers to travel between the thirty villages covered during field work was overshot slightly.
Equipment/ Research Assistant	87	86	1	The equipment required for this project was later received from an external grant. As a result the equipment budget was used to retain a full-time research assistant in addition to the volunteer programme
Living Expenses	4,530	4540	-10	Living expenses for the PI, all long-term volunteers and research assistant were increased due to the increased spatial area (additional twenty villages) covered in the project. As a result costs against actuals for food, room rent and honorariums slightly

				overshot the budget.
Communication	150	146	4	Phone, internet and printing charges for outreach materials
Miscellaneous	390	383	7	This item head was used to buy consumables, such as batteries etc. as well as unforeseen costs associated with the outreach programme. The leftover money is being used to adjust the other budget heads which were overshot.
<b>Total</b>	5,966	5966	0	

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

There are several important recommendations that emerge from this project:

- 1) There is a need for new and innovative ways to support existing forms of fisheries management, even though they may be diverse, rather than imposing a new set of regulations on unwilling fishing communities. Through continued work in this area and dialogue with the fishing communities, I hope to be able to create such conditions to encourage their traditional management systems.
- 2) There is a need to involve fishing communities in ecosystem monitoring. Since they are constantly out at sea in large numbers, covering a wide spatial area, their inputs into ecosystem monitoring will be invaluable. Hence I plan to develop some training modules and incentive schemes to enable to participate in real citizen science.
- 3) There is a need to move beyond fishing communities as being the source of the marine threatened species problem.

**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?**

The Rufford logo was used during a training workshop that I conducted for participants interested in identifying threatened marine species. It was also displayed during the public outreach and awareness programme, which was attended by about 800 school children and college students as well as other members of the public. This public installation was designed with the help of installation designer, Waylon D'Souza and was part of a science-meets-art festival.

**11. Any other comments?**

I am very grateful for the trust and support shown by Rufford Foundation through the entire grant period. The flexibility that was allowed has permitted my project to go far beyond the scale that was originally planned.

