

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. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and to 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. 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	Ketki Jog
Project title	Small cetaceans of the Maharashtra Coast: A study to identify the habitat, threats and local perception to facilitate a conservation effort.
RSG reference	11232-1
Reporting period	February 2013
Amount of grant	£ 5999
Your email address	ketki.jog@gmail.com
Date of this report	April 2013

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
<p>1. To understand the local communities' perception of small cetaceans.</p>			✓	<p>We conducted semi-structured interviews, using snowball-sampling method, with 129 fishers based in the 29 fishing villages along the study area. Questions were asked to collect data about cetaceans regarding perception, presence/absence, current and historical sightings, perceived damages/catch-loss and threats posed to cetaceans due to fishing, boat traffic and tourism. At present, we are analysing this dataset. Our preliminary findings indicate that the fishers have a strong negative sentiment and low tolerance towards Indo-Pacific humpbacked dolphins (<i>Sousa chinensis</i>) or "Gada Reda" as it is locally called. Other species like finless porpoises (<i>Neophocaena phocaenoides</i>) or "Buliya" (local name) invoke no such resentment, whereas larger whales are revered as deities. Indo-pacific humpbacked dolphins are perceived as a high conflict species while finless porpoises are not. Of the 129 interviewee's, only 2.2% had negative perceptions towards finless porpoises, while 75.1% had a negative attitude towards Indo-Pacific humpbacked dolphins. Of these, fishers using shallow water gear like small-sized gill nets and shore-seines exhibited higher degree of negative attitudes (82.2% and 72.41% respectively) in comparison to people using large-sized nets and trawlers (46.2% and 37.5% respectively). Indo-Pacific humpbacked dolphins are known to opportunistically feed from or near fishing nets, in waters less than 20 m in depth and this competition for prey leads to catch loss and damage to nets while at the same time increasing their risk of mortalities. Positive perceptions towards dolphins are influenced mainly by primary fishing gear, and the</p>

				possibility of developing guided wild dolphin-watching programmes. This study is helping us understand the complex relationship between the stakeholders and the small cetaceans in a fisheries intensive habitat, laying the ground work for future conservation policies and action.
2. To assess species composition, habitat requirements and distribution of small cetaceans.			✓	<p>We conducted three replicates of transect surveys in winter from November 2012 to January 2013. A total distance of 501 km and an area of 520 km². were covered in 114 hours of effort. Data such as number of animals spotted on the transects, species and environmental variables (temperature of water, turbidity of water, depth and salinity) were collected. We are analysing this data in order to create a habitat profile in relation with the sightings. We encountered only Indo-Pacific humpback dolphins, (<i>Sousa chinensis</i>) (47 groups with mean group-size = 7.54) and finless porpoises, (<i>Neophocaena phocaenoides</i>) (16 groups and mean group-size= 4.8). Of the 62 pods sighted, 47 (75 %) were Indo-Pacific humpbacked dolphins and 15 (24 %) were finless porpoises. For Indo-Pacific humpbacked dolphins, observed group size varied from 1 to 50 individuals. A maximum of 394 and a minimum of 311 individuals were observed. And for finless porpoises the group size varied from 1 to 20 individuals.</p> <p>Most of the Indo-Pacific humpbacked dolphins sightings (78%) were within 10 m of water and only 4% were beyond 15 m. This may point towards a narrower depth usage in this area as compared to the species' habitat in other locations where studies have shown a wider range. To ascertain this fact, we suggest that more surveys, around the year are needed. This raises concerns towards a greater chance of conflict with land-based and shallow water fisheries.</p> <p>There are previous unconfirmed reports</p>

				<p>of other species of cetaceans in this area and recent sightings support the conjecture that there may be more cetacean species present in the study area. This include, images of what appear to be a spinner dolphin, a bottlenose dolphin and a few baleen whale bones, from local fishermen. However, we did not encounter any other species in our efforts. We also encountered carcasses of finless porpoises and Indo-Pacific humpbacked dolphins, one unidentified dolphin and one badly disintegrated carcass of a large baleen whale. Our data, even over this short duration points towards cetacean mortalities being a regular occurrence, and suggest that the level of awareness about cetaceans is high among fishermen.</p>
3. To identify direct and indirect anthropogenic threats to small cetaceans		✓		<p>We did not obtain enough data to conduct analysis but we achieved our goal of obtaining pilot data from the interviews and the observations made during transect surveys. This has helped us understand the factors that need to be examined in the future phases.</p>
4. GIS map of small cetacean sightings and presence of boats.		✓		<p>A GIS map of cetacean sightings, environmental parameters and boat traffic is being compiled. This map will help us understand geographical range of the two species, the overlap with areas of heavy boat traffic and in planning future studies.</p>
5. To generate a photo identification database		✓		<p>During the transect survey we have captured photographs of dorsal fins of most of the Indo-Pacific humpbacked dolphins that were sighted, to identify individual animals. Finless porpoises proved more difficult to photograph and even more so to distinguish and hence the results for this species were unsatisfactory. We have obtained 7160 photos of humpbacked dolphins, with the help of which we were able to id/mark 46- 51 individuals in the entire area. We will continue to build the database both for studying focal animals and for estimating population size using mark-recapture methods.</p>

			<p>Although this is a preliminary effort and little can be inferred from such a limited amount of data, we plan to extend this effort further in order to create a more robust database. This data will form the baseline for the population estimates using mark-recapture in the future and for other studies based on identification for pod dynamics, site fidelity, range, age estimates and behavioural studies.</p>
<p>6. To identify key habitats and areas of high risk within the study area.</p>		<p>✓</p>	<p>In the transect survey we have gathered data on different environmental parameters (turbidity, salinity, depth and temperature of water) corresponding to the Indo-Pacific humpback dolphin and finless porpoise sightings. We are in the process of building a habitat profile. Due to changing flow of many of seasonal rivers and the dynamic nature of the area it is difficult to create habitat profile based on single season data. We will continue to collect data across seasons, tidal amplitudes and times of day to obtain patterns, in the next few phases.</p> <p>Water surface temperature varied significantly with time of day. In the future we plan to look at temperature-depth profiles to obtain a greater understanding of currents and upwelling. Salinity fluctuated widely from 20 to 41‰ depending on the distance from river mouths, depth, tidal amplitude and direction of current due to coastal topography. Turbidity also has a complex pattern of variation, but we found a distinct rise in areas close to the mining operations onshore (possibly due to runoffs) and near the loading operations in the jetty (spillage). We are planning to consult with oceanographic profiling experts to streamline data collection in the future and to make better sense of this information.</p> <p>In addition, we were able to determine the area overlap between these two species and fishing activities/ boat traffic. We will look at negative or positive correlation of these two species</p>

			<p>with various gear types and with other vessel traffic (large ships and tourist boats). We are planning to study these cetacean and boat interactions in the next phase in further detail.</p> <p>As the transect surveys were conducted only during winter, the effort throughout the year has been inadequate, to determine key habitats. The sighting data and the habitat profile will help us plan our next surveys more effectively.</p>
7. To develop a community based monitoring network.		✓	<p>During this study, we have managed to find eight fishers from six different villages along the study area who were interested in informing us about cetacean strandings and sightings. These key informants have reported sighting and mortality/stranding in the past year and continue to do so even now. Considering the vast area, the number of informants is quite low, but given the situation, where the fishermen have a hostile attitude towards small cetaceans and there is animosity even within different fishing groups, we believe that support of eight fishermen is a good start, considering short duration of the study.</p> <p>We plan to involve more such willing members of the local communities along the coastline to constantly keep a track of mortalities and strandings and sightings along the entire coast of Maharashtra.</p>

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

In duration of the study, the fuel prices were hiked thrice. We had to adjust our travel to minimise vehicle usage and the donated motorcycle gave us a better mileage than the scooter we had based our budget on, so we managed within our allocated funds. It was also difficult to rent boats for the transect survey due to the surveys overlapping with the tourist season (winter), which caused minor delays. In addition, the areas we are working in are relatively remote and were lacking in large boats that could be rented for research; hence we had to make do with much smaller craft. Thus, we saved a great deal on the rent and fuel in spite of the hike and managed to invest thrice the survey effort as compared to our initial plans.

Another problem we faced was manpower. We had not budgeted living expenses for the two extra seasons of transect surveys. Also, we had to involve extra observers on the boat to relieve fatigue

during transect surveys. This skewed the budgeted expense considerably, but few alterations in our expenses helped tide us over.

As the transect surveys were conducted only during winter, the effort throughout the year has been inadequate, to determine key habitats. We also need to obtain a better understanding of reasons of mortality from examination of carcasses, which we were unable to, due to lack of requisite permissions.

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

The main outcomes of our study are as follows:

- a) We have gathered baseline data from this area, which will be helpful in designing future finer scale studies on cetaceans in this area.
- b) We have initiated a small-scale community based cetacean-monitoring programme.
- c) The strandings and mortalities database of cetaceans along this coast, obtained in this study can be used to gain more official support from the authorities for future studies.

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

At this stage we have only sown the seeds of a community-based monitoring programme as a result of which, eight key local informants are directly involved in this study, who have been keeping us informed about sightings and strandings of cetaceans and unusual fish landings like large sharks or whale sharks.

During our transect surveys we managed to educate many fishermen in the local community including the boatmen, about using navigational and safety equipment. We have also taken a few local children on our transect surveys, whenever possible, to introduce them to our work on dolphins. They have all been pleased about our enthusiasm to study something they consider mundane - dolphins. We are keen to use this momentum to plan an awareness campaign in the future.

The responses of most people that we gathered during the interviews made us realise that any awareness or education drive would be premature at this stage and would only be detrimental to our cause.

5. Are there any plans to continue this work?

This pilot study has provided us with valuable baseline information about cetaceans, fishing community as well as tourism and fishing in general from this area. We plan to use this data to design finer scale studies about cetaceans along the Konkan coast.

We plan to conduct following studies in near future:

1. To study behaviour and community structure of Indo-Pacific humpbacked dolphins.
2. To continue photo identification along an extended area to study focal animal groups and estimate population size using mark-recapture methods.
3. To obtain finer scale estimates of cetacean mortality, birth rates, migrant/resident individuals along the Sindhudurg coastline.

4. To monitor dolphin tourism activities along the Maharashtra coastline to understand both the socio-economic impact on the existing fisheries dominated community and the effects of dolphin tourism on small cetaceans.

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

The results of this study will be widely shared with the policy makers and decision-making authorities to implement conservation measures. We are planning to publish our work in peer-review journals. Most importantly, we will share outcomes of the study with the local community by conducting community workshops and audio-visual presentations and through the local media.

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

The RSG was used over a period of one year from March 2012 to February 2013.

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 budget was calculated at the exchange rate £ 1= INR 78.10; the exchange rate at the time of the funds transfer was £ 1= INR 77.19.

Figures in red in the difference column indicate the heads where we have overspent.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Binoculars- Nikon 7 X 50 marine	£ 240	£ 342	£ 102	Had to buy a second pair (Fujinon 7X 50) to share among the three observers on transect surveys.
GPS + Rechargeable Batteries + Charger	£293	£28	£265	The GPS was provided by the IdeaWild grant and we only had to buy the batteries and charger.
Garmin echo350 Depth sounder + Lead-acid battery and charger	£0	£232	£232	The money saved from the GPS was utilised to obtain some equipment that we had not foreseen we would require.
Salinity refractometer	£0	£28	£28	Our advisors suggested it as a parameter during the transect survey.
Secchi's disk	£0	£ 16	£ 16	Used it to measure turbidity but was very impractical on the field due to strong currents and was lost during the first day of use. We upgraded to collecting water samples and using the

				Nephelometer.
Nephelometer	£0	£101	£101	Our advisors suggested it as a parameter for distribution.
Compass	£12	£5	£7	Bought a cheaper brand.
First Aid kit	£ 67	£ 11	£ 56	Bought a cheaper brand.
Travel to the field site	£93	£190	£97	We had to engage a lot more manpower for the transect surveys, than previously expected.
Physical and Electronic Charts-for GIS	£107	£91	£16	Bought only physical charts and had them digitised for navigation. The GIS charts were obtained from open source sites.
Fuel for Boat	£1335	£ 1289	£ 46	We were unable to procure boats with a raised viewing platforms as we had planned, instead we worked out of small fishing boats, about 7 to 11 m long. The rent was cheaper for a small boat and the fuel consumed was much lesser than expected, hence we were able to accomplish three replicates of sampling instead of a single survey as we had initially planned.
Boat rent	£528	£321	£ 207	
Fuel for Bike	£307	£237	£70	The fuel costs were calculated for a scooter, the bike donated to us gave better average than the scooter and saved us some money on fuel.
Living expenses- Researchers	£ 2160	£ 1975	£ 185	At actuals.
Living expenses- Volunteers	£ 320	£ 678	£ 358	We required to engage a lot more volunteers on the transect surveys for a longer duration than we had planned for initially.
Stationary	£80	£ 30	£ 50	This amount has been kept in reserve for the cost that will be incurred during publication of the results from this study in the form of research papers, reports
Literature and document information	£ 83	£ 0	£ 83	

				to the concerned authorities and literature for the stakeholders.
Communication- Phone + Internet charges+ postage etc.	£ 254	£ 248	£ 6	At actuals.
Miscellaneous	£ 120	£ 88	£ 32	Spent on glassware, gloves, preservatives and other surgical equipment required for sample collection from dead cetaceans. Some money was spent on equipment repairs and maintenance.
Total	£5999	£ 5910	£ 89	The difference as mention above has been set aside for publication of the data after completion of analysis.

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

Important future steps:

- a) Most importantly, increase the monitoring network with local fishermen by extending area and involving more people.
- b) Obtaining population estimates for Indo-Pacific humpbacked dolphins and finless porpoises.
- c) Study the range and pod dynamics of Indo-Pacific humpbacked dolphins.
- d) Study altered behaviour of Indo-Pacific humpbacked dolphins due to increased dolphin tourism.

For this, we look forward to apply for a booster grant from RSG.

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?

We have mentioned RSGF as our funding source in all our correspondence with the local and regional governing agencies and with experts whom we consulted during the study. We have also used the logo on all the letters for permit applications and other official communication, on the vouchers we had signed for places where bills were unavailable and on the letters of appreciation given to our volunteers. We also plan to use the logo in all the published information after the analyses of the data, namely: scientific publication(s), information brochure for the local tourist centres and reports and recommendations to the concerned authorities.

11. Any other comments?

As mentioned above, this was a pilot project and the major objectives of this project have been completed. We have attempted to obtain a lot of auxiliary data from this study and this has been greatly beneficial for us in giving us preliminary data to work with in future studies. The lack of any previous studied in this location on cetaceans makes this even more valuable.



My team and I are thankful to the Rufford Small Grants Foundation for awarding us this grant and thus helping us get a clear picture of the status of these marine mammals from an area where there was want of data. This has given us an excellent platform for more research effort.