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	Neethi Mahesh
Project title	Spatial ecology and conservation of Mahseer, in the Western Ghats region.
RSG reference	18284-1
Reporting period	1 year
Amount of grant	£4754
Your email address	neeti.mahesh@gmail.com
Date of this report	20/10/16

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
Spatial and Temporal monitoring of Mahseer movement and habitat use.				• February 2015- October 2016: A total of 40 Blue-fin Mahseer, ranging from 1.4lbs- 43.4lbs (mean weight= 8.32lbs) were tagged with external radio transmitters to facilitate the spatial ecology study. Tracking and monitoring of tagged fish yielded movement maps for fish over the span of 1 year, providing insight and scope for more work to be carried out. • The data highlights habitat use during the lean flow months from March to June. Many of the tagged individuals could not be located during the flooded period, with a search spanning 45 km. Furthermore, the sample size reduced during the receding floods. The drop in water level was earlier than expected due to less than average rainfall during the monsoon of 2015 and 2016 (June-October).
River profile mapping and habitat assessment.				• River profile mapping was carried out briefly in the beginning of the monsoon/ flooded season and is yet to be completed in the coming months. The riparian habitat assessment will be completed as per availability of the team from the district Forestry College.
Workshops and participatory surveys.				• A series of workshops based on resource use pertinent to riverine communities along the study site, was carried out in collaboration with a professor and student from the National Institute of Advanced

				Studies, under the banner of the 'Student Scientist'/ 'Student Network' initiative. The work entailed facilitating student groups from government and private institutions, to create questionnaires based on resource use specific to the Cauvery River. This was later standardised and distributed to schools, where students carried out neighbourhood surveys, with immediate neighbours. The work is ongoing. • An assessment of the River Cauvery catchment was carried out by a group of students from, Kodagu Vidyalaya, a private school in Kodagu district. The report was submitted at the National Science Congress- an all India science congress for students. Activities entailed working with teachers and the students in assessing water quality in the river and carrying out questionnaire surveys related to waste management and disposal in the Cauvery catchment. The project set the platform for a potential river monitoring programme. The feasibility of creating and sustaining a river monitoring network in the district was ascertained. • Water quality assessments were carried out with schools and colleges in the Cauvery catchment and the river. Water testing was carried out on-site, with the help of a Jal-Tara testing kit, developed by Environment Systems branch of Development Alternatives. The kit is specifically tailored for students' and citizens' water monitoring initiatives and contains equipment, chemicals and simple instructions to carry out

				water quality testing for dissolved oxygen, flouride, nitrates, iron, ammonia, phosphate, hardness, turbidity, pH, temperature and faecal coliform (coliform bacteria).
Questionnaires on fishing practices and outreach with riparian community, subsistence and commercial fishers.				• Planned for the months of May-July 2017, coinciding with the onset of the South West monsoon.

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

Regulatory authorities:
Upon receiving the grant, an order for external radio- transmitters was placed from Advanced Telemetry Systems, USA. The delivery was channelled through Bangalore customs, air cargo, import division. Government authorities acted as per new rules of the government which mandated a thorough safety check of the radio transmitters. This led to a delay in receiving the aforementioned equipment up to the month of April, 2016. Furthermore, it was necessary to get an 'Equipment type approval' from the telecommunications department in Chennai, India, for release of the same, because the customs had never cleared radio- transmitters before.

Local community/ Coorg Wildlife Society:
A new set of rules and regulations were drafted out for the project by Coorg Wildlife Society (CWS), in May, 2016. The rules restricted participation of additional team members or volunteers entering the leased, protected stretch of the river to assist with catch and release, radio- tagging of Mahseer fish. This proved to be a challenge in reaching the target of tagging 10 additional fish, as per the objective.

A total of seven fish, with four individuals weighing less than 10 lbs were tagged between May and June 2016. However, fish weighing less than 10lbs were observed to be most prone to getting caught by subsistence fishers, who practice sustainable fishing. Their omnivorous diet coupled with an opportunistic and voracious feeding behaviour made them more susceptible to getting caught. Fishing effort eventually involved tagging fish above 10 lbs, making fishing more challenging.

Additionally, the riparian habitat assessment will now be carried out, within jurisdiction of the 'reserve forest' riparian stretch, with a permit from the Karnataka Forest Department, as opposed to the Coorg Wildlife Society stretch, along the study area.

Weather:
Unpredicted and erratic rainfall coupled with increased drought conditions also played an important role in determining the period of fishing and hence the number

of tagged individuals. The tagging exercise was incomplete due to climatic conditions and restricted people effort.

Schools:
It has taken a considerable amount of time and many school visits to establish an open relationship with schools, in Kodagu district. Schools in the district lay more emphasis on academics, relevant to the respective state and central government syllabus, with little time for field based activities. With continued effort and constant interaction, work with schools has been increasing steadily over time.

Gender/ culture:
Living and working in the field as a lone, single woman in rural India is a challenging task, well known and acknowledged. It proved to be additionally challenging with the lack of an appropriate platform to interact or discuss research objectives and field level concerns with various stakeholders. This proved to be the biggest challenge, as time progressed in the field. Most decisions were passed with no face-to- face interactions, or discussions to help reach objectives of the field study, leading to delays.

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

- Spatial monitoring of radio tagged Blue-finned Mahseer, over a period of one year.
- Identifying the importance of conservation of riparian habitats, with emphasis on native species of trees and vegetation that the blue-fin Mahseer, depend on. Information is based primarily on telemetry spatial observations and data.
- Network of schools for planning and implementation of a citizen science based river monitoring programme, including participatory surveys.

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

The involvement of Coorg Wildlife Society (CWS), especially members of landholding clans who control local conservation efforts by the river, played an integral role in the success and progress of the study. The angling based conservation model offered protection, benefitting the study in many ways, where major threats to the study such as unsustainable fishing, i.e.: dynamiting, gill netting and poisoning were kept under control in the study location. Daily tracking gave us an insight into spatial behaviour of fish above 20 lbs (individuals tagged in the year 2015). Mahseer of this size class, were found to be habituated to feeding of ragi (local cooked millet) bait, during angling season and remained in a stretch that has been privately declared as a sanctuary with minimal angling pressure. Options were discussed with key community members for safeguarding the privately protected stretch, by looking into measures that can ensure a permanent protected status, accorded by the government, as an alternative to renewal of the conservation lease, every 10 years.

Participatory surveys with schools have led to a better understanding of environmental health and resource use, using various assessment methods, within the stakeholder group. Discussions are now trending towards field assessments that are action based and can be highlighted with government regulatory authorities and various stakeholder groups.

5. Are there any plans to continue this work?

Spatial ecology of Mahseer:
Various challenges over the period of the study, led to the exploration of continuing the work in a protected area that falls under the jurisdiction of the Forest Department. The study has potential to be continued lower downstream where Cauvery river flows through the Cauvery Wildlife Sanctuary, in Karnataka.

Stakeholder surveys/ outreach:
The scope for participatory and citizen science work with schools and colleges has improved greatly over a period of 1 year. Continued efforts in the coming months have potential for a sustainable conservation initiative, tied up with various conservation NGOs, education NGOs, and individuals involved in campaigning for conservation of the Cauvery river catchment, in Kodagu district.

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

Regulatory authorities: The results thus far have been communicated to the Fisheries Department and the Forest Department of Karnataka. The respective regulatory authorities are yet to be contacted to discuss the results of the work further, to ascertain necessary steps to be taken in the future for policy changes and restoration plans.

Communications: The work carried out will result in publications for spatial ecology and citizen science based surveys with schools. Popular articles will be written to complement the publications, in order to communicate findings to a wider audience outside of the scientific community.

River monitoring: Citizen science work will be independent of individual work carried out, where links between local conservation organisations and educational institutions will create a sustainable method of documenting and reporting, which can be made available on a common platform in due time, with substantial data, and information. A common platform to share the citizen science work is currently under discussion with stakeholders.

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

Various challenges as listed above, led to the delay in commencing the project. Field based project work started in the 1st week of May and the work has been further extended till the monsoon months of 2017.

Additionally, all of the objectives of the study could not be met over a period of one year, due to season specific activities coinciding with each other. Activities such as fishing and tagging commenced just before the monsoon, altering the timescale for fishing, tagging and habitat assessments.

	April 2016	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr 2017
Continuation of the spatial ecology study, using telemetry.	✔	✔	✔	✔	✔	✔	✔	✔	✔				
Meetings with schools'.						✔	✔	✔	✔	✔	✔	✔	✔
Neighbourhood water use surveys, with schools.										✔	✔		
Water quality assessments with schools and colleges during lean flow season.							✔				✔	✔	
Permission from the forest department for the riparian habitat assessment.											✔		
Communications with the forestry college.						✔	✔						

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
Advanced telemetry system, external mount radio transmitters: 10 + 30% import tax.	1175	2542	1367	The quote for the transmitters was higher than expected and budgeted. The previous transmitters were bought at a bulk discounted price. The customs have come up with a new price of 30% for imports.
Field work, stakeholder meetings and workshops.	2404	1404	1000	Ongoing work.
Outreach Material	1175	400	775	Ongoing work.
Total	**4754**	**4364**		The remainder of the grant money which is a total of £ 1,614, is currently budgeted for the outreach work and riparian habitat assessment, yet to be completed.

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

Spatial ecology of Mahseer: It is imperative to continue the telemetry based study in a location with minimal anthropogenic pressure, such as the Cauvery Wildlife Sanctuary. A fairly well protected population of Mahseer fish are still known to be present, owing to an angling based conservation model that existed from the 1970s to 1999 under the care of Wildlife Association of South India (WASI) and later continued by the Forest Department and Tourism Department from 1999- 2011. Angling based conservation, is the only model that has kept Mahseer fish, and its riverine habitat protected in the wild, as an alternative to the 19 religious- temple pools in the Karnataka state. Report of the telemetry study has been submitted to WASI, and discussions to begin a new spatial ecology study in collaboration with the Forest Department and WASI are underway.

River monitoring: Kodagu district consists of predominantly small farmers with shade-grown coffee and spices and rice fields. The small towns now have growing trading construction and tourism activities. The farming community at large is nature worshipping considering the Cauvery as sacred and are highly concerned with the increasing shift in land use, coupled with an ever increasing growth in unregulated tourism which have impacted the immediate environment. Kodagu District Administration and Municipal Bodies: as policy makers and regulators of land use and waste management need scientific input on impact of anthropogenic activities on riverine systems. Links and partnership with local volunteers, government institutions, Village panchayats, conservation NGOs and education NGOs, have set the platform for implementation of a sustainable river monitoring and water use initiative. Subsequent ties with an NGO called Meghshala, primarily working on child friendly curricula with state government schools, have led to talks with the state Education Minister to incorporate water testing and monitoring in curriculums, at the high school level with government schools' situated along the Cauvery river.

Riparian habitat restoration: Collation of information of native flora, for restoration purposes is underway with the help of indigenous community members, in Kodagu district. The 'riparian habitat assessment' will further add to the growing endemic, native flora list and enable planning of nurseries and seed banks, which can find a place in schools until restoration activities can be planned and carried out.

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

RSFG logo was used for posters and communication purposes with stakeholders such as schools, the Forestry College and municipal authorities. Regulatory authorities such as the forest department and fisheries department were also made aware of RSGF as the chief grant provider, supporting the work.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

12. Any other comments?

Field level constraints and delays from decision making authorities have increased the timeline of the project, as opposed to the 1-year timeframe.