

Final Evaluation Report

Your Details	
Full Name	Nitya Prakash Mohanty
Project Title	Invasive Indian bullfrogs on the Andaman Islands: Averting ecological and socio-economic losses in a global biodiversity hotspot
Application ID	20818-2
Grant Amount	£4924
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Date of this Report	15.12.2018

1. 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
To estimate geographical range and identify dispersal pathways of the Indian bullfrog				
Assessing population density and habitat preference				
Evaluating impact on small vertebrates and mechanisms of impact				
Formulating management plan based on modelling invasive spread under various management scenarios				
To advocate the prevention of further introduction and spread of the bullfrog		Y		We will continue the process of engaging and advocating with the concerned authorities, as this objective requires long-term commitment. We have not succeeded in obtaining written orders recommending management yet, although awareness of the issue has increased among the authorities.

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

We made continuous efforts to impress upon the authorities to take preventive measures to limit the spread of the Indian bullfrog's invasion to new islands of the Andaman archipelago. Despite such warnings, we detected a recently established bullfrog incursion on Little Andaman, in early 2018. Following this observation, we recommended immediate control of the localised population on Little Andaman and screening measures to stop intentional release of frogs in uncolonised islands of Baratang and Long. We would continue to advocate management of invasive bullfrogs (through spread prevention between islands) and draw attention to the likely invasion of Nicobar archipelago along with Baratang and Long Island.

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

1. We were successful in generating critical information on the distribution, dispersal pathways, impact and likely effective strategies for the invasive Indian bullfrog population on the Andaman archipelago.

2. Our advocacy efforts led to the listing of the Indian bullfrog as an invasive species of conservation concern on the Andaman Islands, by the National Biodiversity Authority, Ministry of Environment Forests and Climate Change Government of India (see Draft policy document on <http://nbaindia.org/uploaded/pdf/laslist.pdf>). This listing at the national level would be useful in providing legal and policy support to management of invasions (including Indian bullfrogs) on the Andaman Islands.

3. Our research garnered attention from national newspapers and magazines. The findings provided intensive information on a crucial economic issue affecting the local community.

4. Briefly describe the involvement of local communities and how they have benefited from the project.

As part of one objective, we surveyed 892 local respondents (key informants – farmers, plantation workers, and pond owners) for their perception on economic benefits and/losses associated with the bullfrog invasion. The majority reported loss, due to predation by the bullfrog on poultry and fish fingerlings. The project captured this economic impact on local livelihoods and consequently this issue was highlighted in national newspaper reports (Rao, 2018 - <https://www.thehindu.com/news/national/the-andamans-new-colonisers/article24659652.ece>). Such coverage of economic impacts of the bullfrog would hopefully lead to impetus for management action.

5. Are there any plans to continue this work?

We will continue to advocate the management of invasive Indian bullfrog and other invasions on the Andaman archipelago at the regional and national level. The long-term goal is to institute a biosecurity agency to prevent further introduction of non-native species to the Islands.

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

We have communicated the results of the project through scientific publications (Mohanty et al., 2018; Mohanty & Measey, *in press*; Mohanty & Measey, 2018), articles in popular media (<https://www.thehindu.com/news/national/the-andamans-new-colonisers/article24659652.ece>;

<https://india.mongabay.com/2018/03/01/combining-citizen-science-and-field-research-to-deal-with-the-bullfrog-invasion-of-the-andamans/>;

<https://researchmatters.in/news/croak-croak-who%E2%80%99s-there-bullfrogs-andamans>), conference presentations (*Workshop on economic and ecological*

impacts of invasive alien species, Kolkata, India, 2018; 10th International Neobiota Conference, Dublin, Ireland, 2018), and many meetings with the Department of Environment and Forests, Andaman & Nicobar Islands.

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

We used the grant till July 2018, 4 months longer than the anticipated project length. This was possible due to the judicious and effective use of the awarded budget.

8. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Converted at 86.71 INR to 1 Pound Sterling to be consistent with the exchange rate when the grant was received.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Field accommodation and subsistence	3114	3114	0	
Transportation	808	808	0	
Field assistant salary	831	1176	-345	We had to continue fieldwork for 3 additional month (April-June 2018) and annually incremented salaries (INR10, 000/ per month) resulted in the deficit.
Stomach flushing kit	59	12	+47	We were able to save resources by designing a simpler equipment
Batteries	112	69	+46	
Total	4924	5179	-252	

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

We think the problem of invasive species on the Andaman archipelago requires both regional and national commitment for management. This project has helped galvanise progress at both scales (building on the first Rufford grant). We would continue working towards specific interventions for the prevention and management of Indian bullfrog's invasion. However, our long-term goal is to address issues of biosecurity (a lack of which leads to these introductions) on Andaman and Nicobar Islands. Towards this, we would continue advocating with a large stakeholder group (Department of Environment and Forests, Department of Fisheries,

Department of Agriculture and regional institutions). With our sustained efforts in the Andaman archipelago, we have generated baseline information required for the management of invasive herbivores (including spotted deer), Indian bullfrog, birds, and the giant African snail. Our future endeavours would thus be focused on testing the efficacy of various management measures, along with building linkages for integrated management between various agencies involved.

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

We used the Rufford Foundation logo in all presentations of the project work in national and international forums. We acknowledged the contribution of the Rufford Foundation in all publications arising out of the project.

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

Nitya Prakash Mohanty – Conceptualized and executed the project; drafted reports and publications based on the project

Dr. G. John Measey – Conceptualized and supervised the execution of the project; contributed to writing

Dr. Karthikeyan Vasudevan – Served as advisor for national and regional advocacy

Manish Chandi – Provided logistical support; served as advisor for sampling and regional advocacy

12. Any other comments?

We would like to thank the Rufford Foundation for their continued support for the management of invasive species on the Andaman archipelago. This investment has generated regional and national interest in management of invasions and contributed a body of research on biological invasions in India.