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	Matjaž Bedjanič
Project title	Distribution Atlas of the Dragonflies of Sri Lanka: focus on the globally endangered species included on the IUCN Red List of Threatened Species
RSG reference	11448-1
Reporting period	May 2012-May 2014
Amount of grant	£5860
Your email address	matjaz_bedjanic@yahoo.com
Date of this report	9 May 2014

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
To round up years of work on the odonatological database for dragonflies of Sri Lanka and unite all available faunistic information for each species from literature, museum collections and field work in one place			X	The database consists of 11,094 faunistic records, derived from the oldest literature sources in the middle of 19th Century and spanning all the way to the recent field observations in 2013. It contains 1,237 localities with odonatological records from all over Sri Lanka. All localities have been geolocated and different analyses and distribution maps were produced from this accumulation of data.
To execute additional odonatological fieldwork in Sri Lanka in two different seasons, focusing mainly on the hereto unexplored areas		X		Fieldwork in July 2012 and in October/November 2012 was successfully executed. 210 localities with confirmed presence of dragonflies were surveyed during 32 field days. A total of 77 dragonfly species was recorded and close to 900 new faunistic records were obtained, many of them for highly threatened endemic species. Due to prolonged bad weather and difficult field conditions in October/November 2013 the second part of field work suffered and the results were not as good as anticipated.
To focus targeted field survey on 10 critically endangered endemic species, listed on global IUCN Red List of Threatened Species			X	For the selected endangered endemic species threatened with global extinction, all known localities were revisited and surveyed - gathered data and knowledge on biology and habitat requirements were extremely important for assessments of their conservation status. While *Sinhalestes orientalis,*

				Drepanosticta adami, Drepanosticta hilaris, Drepanosticta montana and *Elattoneura leucostigma* were recorded in the frame of project's fieldwork, *Heliogomphus nietneri, Heliogomphus lyratus* and *Macromia flinti* could not be found. The same goes for *Anisogomphus solitaris* and *Heliogomphus ceylonicus* for which it became clear that they are conspecific and are newly known as *Anisogomphus ceylonicus*.
To publish the book »*Distribution Atlas of the Dragonflies of Sri Lanka*«, with detailed species distributions, their seasonal phenology and threat status			X	The concept of the book has been significantly broadened during its preparation, also evident from the title "*Dragonfly fauna of Sri Lanka: distribution and biology, with threat status of its endemics*". It newly includes general chapters e.g. on Sri Lanka, on dragonflies and their habitats, but as a major part contains individual species accounts with biology outline, distribution maps, altitudinal and phenological charts, complete synopsis and bibliography etc. Special chapter cover threat status of all endemic species as well as research and conservation priorities. Altogether, the book has 320 pages, with over 142 maps, 260 charts and over 360 colour photographs.
To update IUCN assessment sheets for globally endangered endemic dragonflies from Sri Lanka			X	The complete assessments have been done for all 57 dragonfly species endemic to Sri Lanka and are summarised in the monograph on the dragonflies of the island. Assessment sheets will be submitted to the IUCN Red List Authority in short.
To disseminate results among		X		This phase is still ongoing, and will be accomplished with publication

environmental and nature conservation institutions in Sri Lanka as well as in scientific community in lay public				of the book "*Dragonfly fauna of Sri Lanka: distribution and biology, with threat status of its endemics*". The amount of useful information will surely greatly affect awareness raising and facilitate protection and conservation of endangered endemic dragonfly fauna and freshwater habitats. Echoes in scientific community and in lay public are also expected.

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

In general, all goals of the project have been fully executed, however, main unforeseen difficulties were the following:

- *Lack of support of Sri Lankan nature conservation authorities* – better communication and involvement of local officials and institutions would be needed in the very early process of project planning. This takes a lot of time and effort and is very hard to manage individually from a distant country, without institutional background and for only a very small project. Regardless of how well-intentioned the objectives and how good the delivered results are at the end, certain procedural, sociological, historical and other means in the foreign country should be respected.

- *Even if most things are under control, one can not control weather* – faunistic work on dragonflies is very weather dependant, requiring at least some sun also in the hot tropics. For the first time after several expeditions, the weather has not played along during the second part of the fieldwork, with unusually rainy season in October-November 2013. In any case, since research of seasonality of selected species in these months was an important part of the project and since it is impossible to change the weather with the flight ticket in hand, there was no other alternative. Still, the fieldwork results were good, but could be even better with a little help from above.

- *Gross underestimation of the work needed to finish the book on the dragonflies of Sri Lanka as a consequence of concept broadening along the writing and compiling of the contents* – considerable delay in publishing of the planned publication is a result of a wish to exceed the common standards, include the continuously emerging additional new faunistic data and to include everything interesting and useful for future researchers, students and conservationists. From the project's time-line perspective this is bad, but the result, when it finally comes to an end, is rewarding. The facts, that the book is rounding up more than a decade of the work on the topic and that the amount of crucial new information collected

during the Rufford project has really been extensive, may qualify under the extenuating circumstances.

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

- Important new faunistic data on globally endangered dragonfly species of Sri Lanka were collected and existing very poor knowledge on their distribution, biology and habitats has been greatly improved. Altogether, 210 localities with confirmed presence of dragonflies have been surveyed during 32 field days in July, October and November 2012, whereby the total number of visited localities has been much higher. In total, 77 dragonfly species was recorded which nice result is since the work has been oriented towards covering odonatological »white spots« and focused on selected critically endangered endemic species with special habitat requirements. More than 60% of the collected faunistic data were of the island's endemics.

- For the first time, based on existing knowledge and based on recent field experience in different regions, an in-depth assessment of the threat status of all endemic dragonflies of Sri Lanka according to IUCN Red List methodology and criteria has been performed. As an alarming overall summary, it can be pointed out that 69% of endemics or altogether 39 out of 57 dragonfly species endemic to the island have been assessed as globally threatened. This worrying situation has high biodiversity conservation importance on a global level, particularly, since most of the globally threatened taxa are restricted in their range and their known occurrence is limited almost exclusively to only a few isolated localities in the wet and intermediate zones of Sri Lanka.

- A monograph on the dragonfly fauna of the island forms a solid published background for much needed future research and conservation actions. All existing knowledge and data on the individual species' distribution, biology and behaviour, as well as their threat status and long-term conservation are gathered and are easily available in one place. In this respect, especially as regards the wide coverage of different odonatological topics and mode of results' presentation, the book on the dragonfly fauna of Sri Lanka is the first of its kind in South and Southeast Asia and even among the first in the tropics globally.

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

Not relevant.

5. Are there any plans to continue this work?

In the current project the formal involvement of Sri Lankan students was not included since time and funds were very limited and focus has been set strictly on the fieldwork necessary to fill the gaps in knowledge and field coverage. However, education and training of local odonatologists is very important for future development of odonatology and conservation of

threatened endemic dragonfly fauna of the island. Organisation of dragonfly field trainings for biology students and young conservationists, with lectures at universities and dedicated fieldwork could be a step in this direction, initiating subsequent MSc or even PhD projects and enhancing popularisation of odonatology and rising awareness on the worrying threat status of many endemics.

If there will be no interest for such cooperation in Sri Lanka or in the case of too many procedural and other restraints to accomplish such project, there are plans to continue research and conservation work on taxonomy, biology and zoogeography of dragonfly fauna of other neglected parts of Indian sub-continent.

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

The results of the work have been partly published in the form of four articles published in expert/scientific journals. Additional taxonomic and conservation articles are in preparation.

The main platform for publicly sharing the information is the book "*Dragonfly fauna of Sri Lanka: distribution and biology, with threat status of its endemics*", which brings together all available information on the dragonflies of Sri Lanka (320 A4 pages, with over 142 maps, 260 charts and over 360 colour photographs). Threat status assessments of all Sri Lankan endemic dragonflies, also presented and summarised in the mentioned book, will be published at the official IUCN Red List webpage after review and acceptance of the DSG SSC.

As during the whole project, also in the future I will stay in close e-mail contact with a dozen of students and naturalists from Sri Lanka, eagerly interested in dragonflies, and provide them all needed help with literature, determinations and necessary background information

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 has been planned in two phases and its anticipated duration has been 1 year. The first part, related to the fieldwork in Sri Lanka, has been accomplished according to the plan in the first six months. The second part related to publication of the monograph on the dragonflies of Sri Lanka has been postponed due to the inclusion of constantly arriving new faunistic data, considerable broadening of initial concept and initial underestimation of the needed work so the project's actual duration has been two years.

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
Flight tickets (2x Vienna-Colombo-Vienna, incl. taxes and fees)	1310	1290	+ 20	
Accommodation (including food and beverages, 32 field days)	1080	920	+ 160	Despite generally increasing prices the cost of accommodation has been less than planned in some of the more remote areas.
Transportation (incl. car, driver/guide, 32 field days)	1210	1460	- 250	The costs of transportation have been underestimated from the beginning. Additionally, rising fuel prices markedly increased the costs in this segment.
Photo and field equipment	460	390	+ 70	Existing field equipment has been partly used.
Printing and layout costs for the publication "Dragonfly fauna of Sri Lanka: distribution and biology, with threat status of its endemics"	1800	1800	0	Only the RSFG planned amount for publication costs is shown. Due to considerable broadening of the contents and increase in number of pages, the total costs of publication rose considerably.
Total	5860	5860	0	

Exchange Rate, May 2012:
1 GBP = 211 SLR (Sri Lanka Rupee); 1 GBP = 1, 23 EUR (Euro)
Exchange Rate, November 2012:
1 GBP = 209 SLR (Sri Lanka Rupee); 1 GBP = 1, 24 EUR (Euro)
Exchange Rate, April 2014:
1 GBP = 1,21 EUR (Euro)

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

Most important thing is that the current work and state of knowledge on the dragonfly fauna of Sri Lanka is not interpreted in a sense of contentment, but should rather be a stimulation for future research and fieldwork, which need to be continued. Solid basis for future research and sound interpretation of new data is set, but many taxonomical, ecological and especially nature conservation challenges still remain.

Especially, the future conservation work and research on threatened species is crucial. Elaborated IUCN Red List assessments will be submitted to IUCN Red List unit and SSC to get official status. Complete georeferenced faunistic dataset for these species should be incorporated into the Sri Lanka's nature conservation databases and plans. Together with birds, amphibians, reptiles and flora, a threatened endemic dragonfly fauna locality layer can serve as an important/additional argument in nature conservation efforts.

Deeper involvement of Sri Lankan students, researchers and conservationists is definitely needed in the future and would be warmly welcomed. With the platform for odonatological research and development of odonatology set in Sri Lanka since the break of millennium, and especially recently, all prerequisites are at hand. Developing and maintaining links between experts involved in the studies of the dragonfly fauna of the island and research/nature conservation institutions and individuals both within and outside Sri Lanka is of crucial importance.

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?

Rufford Foundation logo is used in the book "*Dragonfly fauna of Sri Lanka: distribution and biology, with threat status of its endemics*", together with an acknowledgement.

Acknowledgements to RSGF were published in following articles/journals:

BEDJANIČ, M., 2013. Paragomphus campestris sp. nov., a new endemic species from Sri Lanka (Anisoptera: Gomphidae). *Odonatologica* 42(1): 45-52.

CONNIFF, K. & BEDJANIČ, M., 2013. Two new endemic representatives of the genus Archibasis from Sri Lanka (Zygoptera: Coenagrionidae). *Odonatologica* 42(3)

BEDJANIČ, M. & N. VAN DER POORTEN, 2013. On the synonymy of two enigmatic endemic Clubtails from Sri Lanka (Anisoptera: Gomphidae). *Agrion* 17(2)).
Additional scientific and conservation articles are in preparation and in all the RSGF support will be acknowledged.

Rufford Small Grant for a distribution atlas of Sri Lanka's dragonflies has been listed as a success story in the report of the IUCN Species Survival Commission Dragonfly Specialist Group, published in the Quadrennium Issue (2012) of *Species* – the magazine of the IUCN SSC.

11. Any other comments?

I am sincerely thankful to RSFG team and RSFG director for great support, patience and understanding.