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 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	Steven Lee
Project title	The Ecosystem Role of *Holothuria scabra*, impacts of farming and overharvest on a Fijian reef flat
RSG reference	RSG 17605
Reporting period	September 2015 – September 2016
Amount of grant	£5000
Your email address	sitiveni.lee@gmail.com or ste_lee@uni-bremen.de
Date of this report	03. 08.16

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
6 months field work – Natuvu, Vanua Levu, Fiji			x	Project ran for the full course, the start of the project was delayed by ca. 1 week and a few weeks were lost due to weather events such as flooding and storms but the enclosures survived and we were able to get a full 6 month time series for our main parameters.
Collaborate research with Wildlife Conservation Society (WCS)			x	Meetings with WCS prior to commencing fieldwork and close collaboration with WCS throughout the course of the study and with writing up research.
Engage a local student from the University of the South Pacific as a research assistant	x			Despite multiple advertisements and students expressing interest we were not able to get any to participate in fieldwork. Village leaders were hesitant about having a local female research assistant staying in the village, prohibiting us from having a female research assistant. The remaining applicants eventually dropped out due to family obligations and illness.
Master's thesis based on research from project			x	Thesis submitted 02.08.16
Presented research at the 2016 International Coral Reef Symposium			x	Link: http://tinyurl.com/jgwrbuc Presented on: 21.06.16 NGO representatives and prominent scientists (Steven Purcell and Sven Uthicke) were present in the audience and expressed interest in the project/research.
Presented research at 2016 YOUMARES conference		x		Oral presentation on research scheduled for 12.09.16 at Uni Hamburg ESTA ost, Hamburg,

				Germany.
Disseminate research findings to Fiji Government and non-governmental organisations		x		Research based on project will form a chapter in the status of sea cucumber fishery in Fiji – Part 2 report. This report will be distributed to government departments (Fisheries in particular) and to NGOs in the region.
Use research to educate local communities on the merits and need for sustainable resource management		x		Spoke extensively with villagers particularly the village headman, fish warden, and members of the local Fisheries Authority. Engaged members of the community in the project where applicable. We have been invited back to the community to continue work and neighbouring communities are very interested in more conservation work based within their marine protected areas and traditional marine tenure areas. Most encouraging is that communities in the area have asked for a best practices guide that they can enact themselves.
Return to community to present findings of the work to them.		x		I plan on returning to Fiji in mid-October 2016, upon which I will meet with WCS and join their team on a tour of communities in the area to collectively disseminate our research findings and provide management recommendations

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

- Camera malfunctioned due to humidity within the first few weeks of the project, had to arrange a replacement while I tried to repair my camera. Eventually my camera began working again but not fully functional, I lost out on 2 months of oxygen penetration depth data as a result.
- Transport to and from the village was much more expensive than we had anticipated, had to limit trips as a result, using the same company to transport our equipment allowed us to get a better rate per trip.
- Food and water in the village was not always safe, I had to bring my own water in every time I was working which drove up costs further,

eventually I limited my time in the village to 5-6 days consecutive days at a time avoiding Sunday.

- Tropical depression, floods, and other extreme weather events made transport to the village difficult and unsafe at times – would have to hire a 4x4 truck rather than take the bus (2 buses capsized during my time there), enclosures had to be re-enforced with extra steel re-bar and rope to secure the corners – we recycled as much as possible, our time line had to be adjusted 'on the fly' to account for weather events
- Members of the village, one particular group of old men demanded I pay "access fees" to the site and refused to let me continue my work in November. Demanding, "access fees" such as this is illegal in Fiji and against best practice guidelines for scientific and conservation work. We consulted with WCS, who advised us on what to do, eventually organised a meeting with the villagers to discuss the issue, which was resolved. The root of the issue appeared to be a lack of leadership in the village as their chief was away in Syria on a military tour, he had always dealt with NGOs and researchers directly and controlled the village accounts in regard to how money came in and how it was distributed. We advised the villagers to come up with their own system, and Skype called the chief (still in Syria) to discuss the issue. The village then allowed our project to continue, and began discussing ways of managing any funds that come to the village as a results of projects such as mine or that of WCS's. As a response WCS has begun to put together a code of conduct for any community work in Fiji as they and other organisations have also had similar issues with community work in Fiji.

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

- Established that sea cucumber removal does indeed reduce the function of reef sand (one of their primary roles in ecosystem functioning). Thus the ecosystem function and productivity is reduced as a result of overfishing sea cucumbers. This is some of the first tangible research showing that sea cucumber fisheries do have a negative effect on the ecosystem thus providing more support for the closure of overexploited fisheries and strict fisheries management practices to be established on any remaining open sea cucumber fisheries. NGOs can now tell communities for a fact that overfishing sea cucumbers does harm to their reefs ultimately affecting them.
- Obtained some of the first data for Fiji on *Holothuria scabra*; habitat preference, size-contingent habitat distribution, length-weight relationship of, spawning season, and size at maturity. Additionally we helped to establish methods for quantifying this data.
- Disseminated the research and its findings to a very wide audience (two conferences and one national report), going well beyond what was initially planned. Furthermore we intend on developing the findings into two published papers.

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

- Some members of the local community were employed as research assistants.
- Provided a source of income as I paid for accommodation.
- Educated community members
- Hands-on training on how to assess *H. scabra* stocks on their reef flat
- Brought attention to the local community as a possible research site

5. Are there any plans to continue this work?

- Yes. Upon returning to Fiji I intend on joining with local NGOs and private sector to do more research and implement ecologically sustainable management practices of the sea cucumber stocks within the community and neighbouring communities. The idea is to use the community as a demonstration site to show that sustainable sea cucumber fisheries are viable and a better option than the current 'roving bandit' style in which many Pacific island sea cucumber fisheries are currently conducted.

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

- Through my thesis, oral presentations at two conferences (ICRS and YouMARES), a chapter summarising my research findings in the Status of Sea Cucumbers in Fiji – Part 2 report
- I intend on publishing two papers using the research that I conducted during the project, and upon returning to Fiji going back to the community and presenting my findings.

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 Rufford Foundation grant was used between September 2015 – February 2016, I received the grant towards the end of September, and ideally I would have liked to receive the grant in August. Other than that it worked quite well with the actual length of the project

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.

* based on February 2016 conversion rate (FJD to GBP, and EUR to GBP)

Item	Budgeted Amount	Actual Amount	Difference	Comments
Sedimentary oxygen chamber (x 35)	75.00	75.00	0	
Travel within Fiji (ferry between islands, rental vehicle, boat hire, shipping materials to site)	1000.00	753.56	-246.44	I had to stay on site longer in order to monitor my site closely and more often as the village assistant was not completely reliable and there were unforeseen events such as extreme weather and *H. scabra* spawning, therefore I travelled between islands less frequently and spent more time on site.
Housing in Fiji	360.00	529.95	169.95	The cost of living allowance in Fiji was higher than expected, and I wanted to comply with the accommodation rates payed by Wildlife Conservation Society staff when on fieldwork in order to avoid conflict
Consumables	600.00	834.95	234.95	Had to purchase additional fieldwork materials such as dry bags/cases, power packs, disposable batteries (2 sets every week of sampling), zip-loc bags, cable ties, binding wire, tools for enclosure maintenance and an ice box
Enclosure materials (HDPE plastic mesh for 16 enclosures - 128m2)[3]	250.00	687.72	437.72	Had to import materials from China as there was none available in Fiji, import taxes were much higher than expected
Enclosure materials (64m galvanised steel re-bar for enclosure	150.00	90.57	-59.43	Salvaged re-bar from enclosures left over by a previous project by Cathy Hair

(1m x 4 poles x 16 enclosures)[3]				
Binocular microscope 4	220.00	0.00	-220	Shipped samples back to Bremen, Germany for analysis at the ZMT* rather than analysing them in the field due to time restraints
Fine scales (/0.1g) (x 4)	80.00	80.00	0	
Sample bottles and vials	70.00	70.00	0	
Local research assistant from USP (transport and consumables - 9 trips, 1 week/trip)5	650.00	54.45	-595.55	Unable to secure a long-term reliable local research assistant due to a host of reasons including but not limited to illness, injury, and a schedule clash. The village/site (Natuvu) then decided in January that they did not want any additional researchers in the area, they could not provide a reason for this decision.
Local assistant from village (for enclosure maintenance - 100 FJD/week x 20 weeks)[6,7]	600.00	689.70	89.7	Hired additional villagers in-order to assemble and disassemble enclosures to keep within the study time-line
Thesis printing + distribution	100.00	80.00	-20	Require multiple copies for the university, WCS Fiji, personal copy, Natuvu (site).
Return flight (HAM - NAN, NAN - HAM)	0.00	971.43	971.43	Flight change fees due to the wrong name being printed on my ticket for the first leg of my trip. Flight change fees and purchasing a new ticket from NAN-SYD due to unexpected visa issues with my transit in Australia.
TOTAL	4155.00	4917.33	-209.1	

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

- To keep the momentum moving forward in this area, return to Fiji get in contact with local NGOs and private sector, and involve the Leibniz Centre for Tropical Marine Ecology (ZMT) to get more projects running that try to implement a sustainable sea cucumber fisheries

management plan for local communities. I intend on finding a way to wean such project off the need for constant funding from second and third parties to stay afloat as I believe projects (particularly fisheries) in the Pacific need to be nurtured for at least 4 years where as a lot of funding through NGOs and research institutes only last a year or two before they expect results to be in.

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?

- Yes. The Rufford Foundation logo was featured prominently on my thesis cover and presentation to the 2016 International Coral Reef Symposium.
- I will place the Rufford Foundation logo on my YouMARES presentation, presentations that I will give upon returning to Fiji, and acknowledge funding from the Rufford Foundation in any publications that result from the projects.